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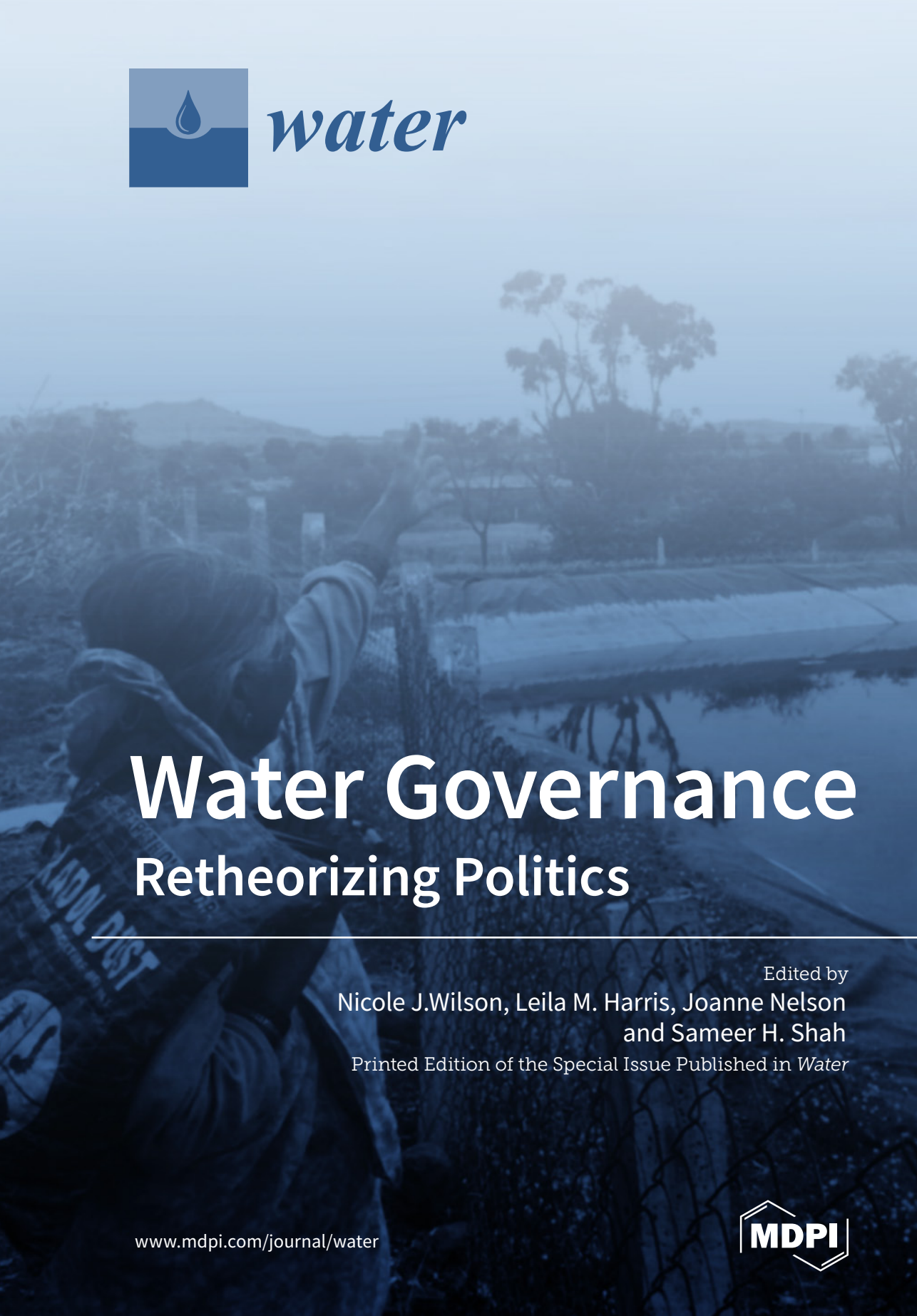

Water Governance

Retheorizing Politics

Edited by
Nicole J.Wilson, Leila M. Harris, Joanne Nelson
and Sameer H. Shah

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Cover image courtesy of Sameer H. Shah.

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Editorial

Re-Theorizing Politics in Water Governance

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Abstract: This Special Issue on water governance features a series of articles that highlight recent and emerging concepts, approaches, and case studies to re-center and re-theorize "the political" in relation to decision-making, use, and management—collectively, the governance of water. Key themes that emerged from the contributions include the politics of water infrastructure and insecurity; participatory politics and multi-scalar governance dynamics; politics related to emergent technologies of water (bottled or packaged water, and water desalination); and Indigenous water governance. Further reflected is a focus on diverse ontologies, epistemologies, meanings and values of water, related contestations concerning its use, and water's importance for livelihoods, identity, and place-making. Taken together, the articles in this Special Issue challenge the ways that water governance remains too often depoliticized and evacuated of political content or meaning. By re-centering the political, and by developing analytics that enable and support this endeavor, the contributions throughout highlight the varied, contested, and important ways that water governance needs to be recalibrated and enlivened with keen attention to politics—broadly understood.

Keywords: water governance; political ecology; Indigenous water governance; water rights; water insecurity; water justice; politics

1. Introduction

This Special Issue, "Water Governance: Re-theorizing Politics", engages in explicit and critical examinations of the role of "the political" in shaping water governance. Water governance refers to the processes through which institutions, actors, and societies broadly decide on how water is to be used, by whom, and under what circumstances [1,2]. Among the set of related definitions, the Global Water Partnership (GWP) describes water governance as "the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society" [3]. As these definitions make clear, water governance includes a wide range of considerations over how the circulation of water is animated by formal institutional structures as well as everyday negotiations, contestations, and conciliations between actors. These dynamics are embedded both within historical and geographical contexts as well as broader preferences and managerial practices of institutions [4,5]. Even within this wider understanding, the ways in which "the political" is conceptualized and analyzed in water governance realms too often remains partial or under-elaborated. Death [6] suggests that politics involves critical engagement with how power relationships produce, establish, and maintain key practices and dynamics, including:

> Who gets what, how, and why? Who or what are the most important actors, institutions, groups, movements, ideas, and practices in a given situation or issue? What are the rules

> of the game, and who sets them and why (as well as who are the winners and losers in the game)? What are the pros and cons of particular ideas, structures, rationalities, and programmes? Who is being silenced, excluded, marginalised, or harmed? What are the consequences of particular actions or ways of thinking? What values or principles should guide our action and thought? What are the conditions of possibility of change? Where can we identify resistance? [6]

This Special Issue is interested in what it might it also mean to engage more with such an expansive understanding of "the political" in water governance. To proceed, we begin with a brief overview of the ways that water governance scholars have engaged power and politics in their work to date. While we do not provide a comprehensive account, we nonetheless provide context to set the stage for the contributions of the Special Issue. The remaining sections summarize the key contributions, themes, and starting points that are offered and further elaborated in the present volume. Finally, we conclude with thoughts on how to continue advancing research and scholarship on these key concerns.

2. Theorizing Power and Politics in Water Governance

Defined above, governance differs from government in that the latter is focused on formal government institutions, rules, regulations, and managerial practices while the former involves wider considerations over how, and for whom, water is managed and made available [1]. This broader governance framework includes focus on the interplay between actors, preferences, and political-economic imperatives [1], as well as historical, socio-cultural, and legal considerations, and privileging of certain values, preferences, and worldviews. A focus on government and management invites attention to politics as the formal regulation of water, inter-jurisdictional negotiations, or outcomes of policies. Such an orientation also often implies that better information and sharing of scientific data will help mitigate or solve problem x or y. Relatedly, such pursuits might also assume that (a) water is knowable and can be managed, and (b) norms and desires are universal and can be put into practice [7–9]. The reality is often remarkably different: Water access and rights are often linked to contentious politics of struggle, water access and quality is deeply differentiated, water uses are fundamentally contested, and what water "is" and how water is known, constructed, and lived is variegated and difficult to conceptualize, let alone implement [8,10–14]. Allied with this, Perreault [15] suggests such calls for "good [water] governance", often ambiguous and vague, can:

> help conceal the political and economic interests that lie behind the institutional arrangements, social relations, material practices and scalar configurations involved in so-called 'good governance'. If we are to employ this concept, then it is imperative we do so critically, carefully elucidating the political nature inherent in the institutional arrangements and socio-environmental relationships to which it refers. [15]

The diverse understandings, constituencies and interests that surround water can be neglected, further erased, or oversimplified when water governance actors assume what normative and shared understandings of water are [2]. Feminist scholarship, Indigenous theorists, and political ecologists have contributed valuable frameworks and analytics to extend analysis of politics and governance. Applied to water, we can engage these approaches to understand water not as a hydrological or biophysical system but as a "hydro-social" system, inseparable from politics, culture, and economy [9]. Offering another important example, Indigenous scholars and allies have foregrounded Indigenous water ontologies and epistemologies, rooted in responsibilities to water as a living entity and suggesting that colonial understandings of water, as a material resource, should be challenged and decolonized to address past injustices and move towards more just and sustainable interactions with, and uses of, water (e.g., [11,13,16,17]). Ethnographers, including feminist scholars, have re-scaled and re-contextualized water's access, uses, and governance through a focus on citizenship and racialization, the emotional and affective embodiments of water, and the politics, negotiations and relations of "the everyday" (e.g., [18–23]). Examples of wider conversations opened-up include how bodies are

enrolled in uneven geographies of water access, the multi-species and multi-actor entanglements that (re)constitute "hydro-social" and infrastructural assemblages, and analytical re-orientations of governance to include *intangible* meanings and values of water (e.g., [18–23]). From such scholarship, a broader understanding of what governance might entail is brought into view, often contrasting with a narrow managerial perspective on how to "better" govern water [1]. These provocative entry points invite attention not only to the uneven distribution and access to water for humans and non-humans, but also highlight the wider governing ethics, arrangements, histories, and political-economic systems that give rise to, sustain, and reinforce such patterns (e.g., [20,24–28]).

Approaching "the political" from such a broadened perspective, the purpose of this Special Issue is to offer a set of openings and entry points regarding what politics in water governance might mean, and how we might approach it more meaningfully as scholars (and practitioners). One framing that is helpful in highlighting key elements of power that are likely to be significant for such a task is offered by Brisbois and de Loë [29,30]. Highlighted below, these authors extend Lukes' [31] elaboration of power as *instrumental, structural* and *discursive* in the context of collaborative water governance. *Instrumental power* reflects influence over others exerted through expressions of force (e.g., financial, technical and social) [30,31]. As one example, Bakker et al. [32] trace such concerns with respect to regulatory injustices of water governance for Indigenous peoples in Canada. *Structural power* refers to the historical, social, economic, and political contexts through which particular water governance arrangements come into being, and (re)produce systems of injustice and inequality [29–31]. States serve a central role in exercising structural power because they hold (and claim) the authority to determine the problem-framing and set of possible solutions for how water, or water problems, will be governed [29,30,33]. Structural power further includes broader systems of colonialism and racism that (re)produce uneven quantities and qualities of water [21,34,35]. For instance, systemic inequalities include those constituted through settler colonialism as an economic and political system that structures Indigenous peoples' ability to assert their self-determination [36,37]. As several authors have asserted through analysis of such considerations, these inequities are not necessarily about specific negotiations and interactions, but much more about the uneven playing field of structural and historical relations. For example, Mushkegowuk (Swampy Cree) scholar Michelle Daigle [38] discusses the ways neoliberal settler colonialism shapes particular types of water governmentalities. She states:

> Mushkegowuk water governance, like Indigenous water governance across Canada, is further ruptured through neoliberal policies that secure and stimulate capitalist accumulation at the expense of Indigenous autonomy and environmental sustainability. [38]

In this example, neoliberal governmentalities, structural racism, and racial capitalism coalesce resulting in particular ruptures of water-related decision making—with unjust and unsustainable outcomes. To appropriately highlight these longer histories, and broader relations of power and inequality that structure water governance, it is important to engage multi-scalar lenses, and to embed an analysis of current decisions and outcomes in relation to broader histories and contexts (e.g., of neoliberal hegemony, racial capitalism, and colonialism) (e.g., [21,35]). It is important thus to note that structural power is not necessarily the direct interplay among opposing actors or interests, but often more diffuse historical trajectories and systems (of inequality, or political economy) that impinge on water governance and its current instantiations.

Discursive power is another dimension and refers to the capacity of actors to construct or shape norms, values, and framings, including in ways that prevent actors from recognizing that particular solutions or implements can harm their interests (see [30,31]). Such power is often characterized using *governmentality*–defined by Foucault as "the conduct of conduct" [39,40], or the myriad ways that human behavior is directed and regulated, often in ways that are diffuse, everyday, self-oriented, and implicated in a range of socio-political relations beyond formal spheres of "politics" (at times referred to as *capillary power*). Among other examples, Vos and Boelens [41] examine water justice in relation to the virtual water trade and argue that *neoliberal water governmentalities* "aim to organize and direct water users' behavior by approaching users as rational, enterprising agents who economically

benefit from water development . . . " [41]. Other examples similarly highlight certain discourses of conservation, efficiency, or even the human right to water that condition particular water-related uses or shifts. Consider, for instance, the argument that a focus on the human right to water can privilege human users over ecosystems, or that this discourse and policy has also served as justification for large water transfers from rural users to urban consumers [42,43].

Political ecologists, human geographers, and anthropologists have more recently scrutinized ontological and epistemological politics or sedimented notions of how water is understood, governed, used, and incorporated into daily life practices [13,14,38,44–47]. These offerings suggest that alternative and counter-hegemonic approaches (in relation to epistemologies, axiologies, and ontologies) are of critical importance in re-defining our relationships with water in ways that might further justice and sustainability goals. A related example is the literature on the "post-political", referring to the intentional de-politicization of environmental crises particularly in service of capitalist accumulation (e.g., geo-engineering or large infrastructure development) [48,49]. These processes offer clear examples of discursive power, often working to suggest certain processes are "natural" (e.g., water scarcity), or domains of technology and engineering, in ways that work to evacuate the associated politics.

Beyond these notable examples, there are other contributions that have extended our understanding of water politics and governance, from engagements with the politics of scale regarding the consolidation of notions of the waterscape or particular river basins [50,51], to work on hydro-social territories and conflicts between rural and urban users and uses of water (see the recent Special Issue of *Water International*: [52]), to interventions that engage with the politics of emotions and embodiment in water relations and worlds [22,23]. More generally, there has also been long-standing interest with water inequities and uneven water geographies [53]. All such contributions provide a basis to affirm the foundational role of politics, broadly understood, as key to any analytical or practical engagement with water governance.

The papers that comprise this Special Issue contribute to these ongoing debates, and also extend the analytical and conceptual terrain to further these discussions. This Special Issue comprises a number of diverse and exciting research articles that met our call for engagement and (re)theorizations with the political in relation to water governance frameworks and decision-making processes. Key themes that emerged included the politics of water infrastructure and insecurity; participatory politics and multi-scalar governance dynamics; politics associated with emergent technologies of water (bottled or packaged water and water desalination); and Indigenous water governance/ontologies. We highlight several, below.

3. Key Outcomes of this Special Issue

3.1. New Terrains and Engagements with the Political in Water Governance

3.1.1. Politics of Water Infrastructure and Insecurity

Several articles of the Special Issue encompass the politics of infrastructure and water insecurity. As one example, Mawani's [54] research in Ahmedabad (Gujarat, India) demonstrates how religious difference and access to municipal water supply infrastructure operates through, and is mediated by, multiple state and non-state actors. In particular, she suggests practices of (un)mapping municipal water access can contribute as an analytical and methodological framework in water governance [54]. Water governance in certain Muslim majority spaces, ostensibly left "unmapped" and outside the remit of formal planning processes, are concordant gaps in critical infrastructure [54]. Here, the politics and practices of zoning, engineering, and other technical requirements are important factors that produce and animate "underserved" Muslim areas of the city [54]. Offering another example of entanglements between institutions and infrastructure is Rodríguez-de-Francisco et al. [55], who explore the extent to which a Payment for Ecosystem Services (PES) scheme contributes to an integrated and sustainable Water–Energy–Food nexus (WEF) in Colombia. Where PES is often idealized as an integrative institutional mechanism capable of accounting for environmental externalities, their research suggests

the program helps justify large-dam development and has enabled the developer to directly and indirectly accumulate and secure the reservoir's water while constraining the possible set of livelihoods in upstream and downstream spaces [55]. Such institutional arrangements thus do not inherently (or even, actively) contribute to a sustainable and equitable WEF nexus [55]. Their analysis attends to the diverse politics, negotiations and experiences across scales in an effort to illuminate which interests are served by such projects, and as a means of countering the universalized language, logics, and objectives of PES and the WEF nexus [55]. A third example comes from Atkins [56], who suggests the "national interest" of the Belo Monte Dam in Brazil is a core site around which both de-politicization (economic benefits) and re-politicization (corruption) movements converge and coalesce. The effects of resistance and (re)politicization movements are not contained to a singular project but have animated and altered the political terrain of hydropower development in Brazil [56]. Their analysis highlights the various narratives for and against the project, highlighting the intensely political contestations and ways it was discursively linked to ideas of corruption or elite interests [56]. In line with the "post-political" (above), both Rodríguez-de-Francisco et al. [55] and Atkins [56] highlight how "politics" can become obfuscated through particular discourses (e.g., national interests or economic benefits) and formalized social-ecological institutional arrangements (i.e., PES), producing spaces for the consolidation, justification, and development of large-dam development.

3.1.2. Participatory Politics and Multi-Scalar Governance Dynamics

Contributions further explore long-standing political questions of *who* is able to participate in water-related decision-making, *whose* knowledges and voices count in such negotiations, and *how* certain (vulnerable) actors and communities may be situated within institutions or decision-making processes (cf. [6]). For example, Razavi [57] examines the unfilled promises of social control and improved access-conditions under the re-municipalization of water service in Cochabamba (Bolivia). Contextualized using a typology to characterize different modalities of "participation", she argues that demands for "transformative" participation (i.e., implying a transfer of power) following the city's short-lived experience of water privatization have culminated in "nominal" modes of citizen engagement (i.e., reinforcing standing social orders), a process mediated, stalled, and resisted through the "radical" reception of democratization, the fragmentation of social movements, and clientistic relations between state bureaucracies and elites [57]. A second example is MacDonald's [58] critical interrogation of Water Users' Associations (WUAs) as a fundamental mechanism in water governance reform. MacDonald's [58] research in Tajikistan illustrates how WUAs reproduce exclusionary outcomes by requiring members to possess farmland, in turn threatening rural food security and sovereignty for those without such land. As a result, such households remain voiceless within architecture of WUAs, with their kitchen gardens and subsistence crops threatened (among other consequences) [58]. Again, while couched in the language of empowerment and engagement, such research helps underscore the political exclusions and consequences of these processes as they articulate with social contexts. This contribution [58] is one of several [55,57] that makes explicit linkages across the resource security nexus. Taken together, both cases [57,58] illustrate how exclusion becomes expressed, if not reinforced, both through formal governance institutions (and, processes of institutional change), as well as show re-scaled governance can re-configure exclusion in problematic fashions. In a third example, Workman [59] considers that ways that water scarcity is produced by and embedded in water policies and infrastructures in Lesotho. Highlighting the "micro-politics" of water, this contribution re-centers the political by situating local tensions (the power of chiefs) within national policies and development agendas [59]. In this way, Workman [59] highlights the complex interaction among formal and informal governance structures (or plural and multi-scalar governance structures), illustrating that politics further plays out in terms of the tension, interface, and frictions between them. Once more, we can understand how popularized water governance arrangements, here as Integrated Water Resources Management (IWRM) [59], vigorously promoted by various agencies, and across scales, produce uneven and intensely political outcomes as it plays out in practice.

3.1.3. Emergent Technologies of Water

Three articles in the Special Issue examine the political landscape of emergent technologies, including those associated with bottled and packaged water, and desalination technology. Of interest is how these emergent technologies of water treatment and distribution articulate with long-standing concerns of decision-making, regulation, uneven access, or shifting ecological and justice concerns. First, Pacheco-Vega [60] understands the proliferation of bottled water as a political phenomenon enrolled within the relationships between industrial marketing and weak regulatory regimes. While societal norms serve a partial and context-specific explanation behind the sustained growth of global bottled water, Pacheco-Vega argues a "systematic attack" on water infrastructure, utilities, and experiences has unfolded, not merely "on the part of multinational corporations with a stake in commodifying local resources, but also local governments who abdicate their responsibility towards citizens" [60]. In doing so, Pacheco-Vega [60] problematizes containerized and commodified liquids as a mechanism to enact the human right to water and as one that prioritizes (if not serves) the bottled water industry over public water distribution networks. Here, an explicit analysis of the politics of water access and associated production processes (e.g., bottled water) reveals the ways that regulatory gaps enable exploitation by the bottled water industry [60]. In a second article, Kooy and Walter [61] re-theorize the politics of packaged drinking water (PDW) in Jakarta (Indonesia) using a "situated Urban Political Ecology" (UPE) analysis of the wider urban water distributions in which it is inserted. These authors interrogate the unevenness of individual "choices" for securing safe drinking water and highlight the ambiguity of PDW's impact on water access and associated insecurities. Here, packaged water must be situated and understood in relation to broader circuits, water flows, and uneven water insecurities [61]. To do so invites us to ask and answer critical questions: What leads certain households (and communities) to rely on packaged water, and how do such situations emerge in relation to other widespread considerations consistent with a UPE approach, including governance failure, service gaps, and similar concerns [61]? Indeed, these are exactly the kinds of questions that are not commonly emphasized in work on packaged water where the focus remains on the individual, and on ideas of choice and preference [60,61]. Here, Kooy and Walter [61] further interrogate the politics of what it means to focus on individual and household water security and quality, rather than broader systemic or structural concerns. Overall, these contributions understand bottled and packaged water as emerging from particular discursive framings, regulatory gaps, and in relation to uneven and unequal access conditions in particular sites [60,61]. Herein, the politics of water governance shape the possibility for these water flows and circuits, and in turn the movement and sale of packaged water further condition the broader politics, governance, and management of water. In both senses, packaged water is an important site for the political, particularly with respect to the intersection with social/political and regulatory conditions in different times and places.

Shifting focus, Campero and Harris [62] center their analysis on water desalination technology in Chile. The authors highlight the implications of the mining industry's use of desalination within an undefined socio-legal landscape. In this case, again, the apolitical nature of the technology has the effect of masking both the uneven and shifting outcomes and the distribution of benefits from particular water uses and conditions [62]. Not surprisingly, the mining sector is able to benefit from the legal loopholes and apolitical valence of desalinization to fundamentally shift hydro-social landscapes and mining geographies in contemporary Chile [62]. Alongside the papers on bottled water [60,61], new technologies and facets of water availability are being reconfigured in relation to shifting economic requirements (e.g., mining production). There are clear regulatory gaps which are being effectively exploited by the mining industry to further mining interests.

3.1.4. Indigenous Water Governance and Politics

Perhaps not surprisingly, our calls for "re-theorizing the political" in water governance solicited a very strong response (six articles in total) from scholars working on themes of Indigenous water governance and politics – defined as the study of the complex and diverse ways that Indigenous

relationships to water and legal orders inform decision-making processes about water, which are shaped by historical and ongoing colonialism [63–66]. While this might be in part due to our context and networks (all of the editors are located at the University of British Columbia on the unceded Musqueam (xʷməθkʷəy̓əm) territory in Canada and several of us have worked on Indigenous water governance), this strong response is notable nonetheless. We consider that there are intellectual as well as historical-contextual reasons for the strong response. Among them, Indigenous water governance is a growing arena of study that has been making important contributions to the broader water governance field. For instance, work has examined how regulatory injustices, resulting from exclusion from colonial water governance frameworks, constrains Indigenous peoples' ability to protect the waters within their territories from increasing resource development. Nonetheless, Indigenous peoples are also redefining water governance by re-asserting their own understandings of governance and jurisdiction [38,63,67–69]. Still others in this field have engaged with ontological politics of water governance by highlighting how Indigenous understandings of water as a living entity frequently conflict with colonial understandings of water as a resource available for human exploitation [11,17,44]. Some of these insights and realities profoundly unsettle aspects of "hegemonic" or "modern" technocratic water governance that has been foundational and common to Western, colonial, and "modern" systems of the past decades. These challenges are ontological, epistemological, practical and deeply political.

With respect to the contributions of this Special Issue, Curran offers a case study of groundwater licensing in British Columbia (Canada) [70] to examine how Indigenous communities are re-politicizing colonial decision-making processes in order to shift away from colonial jurisdiction and towards processes that institutionalize Indigenous responsibilities and relationships with water. The article traces case studies where First Nations are reframing water governance by embedding their own Indigenous governance and legal traditions and expectations for Free Prior and Informed Consent (FPIC) [70]. In this way, decision-making about water is being transformed as Indigenous peoples are engaging on their own terms and employing Indigenous methodologies, knowledge, and institutions [70].

Baijius and Patrick [71] offer a compelling piece on the current water crisis facing First Nations in Canada, and, in particular, on the Canadian prairies. By engaging at the intersection of settler colonialism and political ecology, they demonstrate how this crisis is produced and reproduced through institutional power differentials and the persistence of colonial water governance practices. In particular, they develop a framework for analyzing water governance through the political ecological narrative of "exclusion and injustice", which they argue can be applied to reveal the influence of historical context (exclusion from decision-making) and present-day impacts (water injustice) on the persistent water crisis faced by many First Nations in Canada [71].

Taylor and colleagues [72] critique the slow response from the water sector globally to challenges from Indigenous water governance and politics. They examine the Organisation for Economic Co-operation and Development's (OECD) "12 Principles on Water Governance" (listed in [72]), a proposed framework for "good water governance", finding they are underpinned by assumptions of colonial state authority and understandings of water as a resource, consequently reinforcing colonial water governance. They propose that the principles should be revised to be more consistent with the United Nations Declaration on the Rights of Indigenous Peoples [73] and the principles of Indigenous water governance exemplified by Anishinabek and Haudenosaunee peoples. In particular, they suggest the "water justice" should be added to the OECD in order to better reflect Indigenous peoples concerns and relationships to water [72]. In this way, as with the other examples, the politics need to recognize, and remedy, colonial injustices, ultimately working to decolonize water governance.

Another contribution by Chilbow (*Ogamauh annag qwe*) [74] reframes water governance according to Anishinabek relationships to water. In particular, she engages Indigenous research methods, including interviews with Anishinabek Elders and reflections on her lived experience, to outline how Anishinabek understand and construct *giikendaaswin* (knowledge) based on Anishinabek ontology-epistemology which includes *nibi* (water) *giikendaaswin*. This powerful article also engages a gender lens as it provides insight into the special roles and responsibilities Anishinabek women have as holders of

giikendaaswin about *nibi*. It is through understanding and engaging *nibi* (water) *giikendaaswin* that water governance can be transformed and, more broadly, decolonized to better align with Indigenous ontology-epistemologies or relationships to *nibi*.

Cavazos Cohn and colleagues [75] highlight the benefits of engaging with hydro-social spatio-temporalities, or aspects of water belonging to space and time, for theorizing Indigenous water governance. In particular, they explore the spatio-temporal conceptions central to water quality, which, they argue, are biased towards colonial technical and scientific approaches. Through case studies of water governance through Tribal Water Rights under the Clean Water Act's in the United States, they conclude that water quality and associated diversity of spatio-temporalities can be transformed through adopting more holistic practices that recognize tribal sovereignty and hydro-social variability [75]. Here, then, broader concerns of Indigenous rights and sovereignty impinge in crucial ways on water quality and other material outcomes, showing again the complexity and centrality of politics for water governance and, indeed, water itself [75].

Through a case study of Tr'ondëk Hwëch'in relationships to traditional drinking water sources (e.g., creeks and springs) in Yukon, Canada, Wilson and colleagues [76] call for the need to reimagine water security based on Indigenous relationships to water. Achieving this, they argue, requires moving beyond a mere focus on the material dimensions to water security (e.g., water access, quality, quantity, and affordability) to develop a more holistic approach cognizant of a broader set of relationships to water that connect Indigenous people to their traditional territories. Again, the conceptual move is to shift away from a technocratic and apolitical understanding of water governance, or water security, and instead highlight the entwined social–cultural–political, ontological, and territorial aspects of water governance.

3.1.5. Water Governance Practices, Ethics, and Narrative

While all of the articles are inviting a re-theorization of water governance, several contributions deal with some of the broader theoretical and practical elements of how we might incorporate politics into water governance processes more fully. Meisch [77] is interested in the narrative structures of human–water-relationships and their significance to more fully grasp the political nature of water, helping to overcome and counter reductionist and technocratic forms of water governance. Focusing on the idea of narrative ethics, the work highlights the potential of this approach to make "the political" real, visible, and productive for engagement and debate [77]. The implication here is that while water governance is political, new approaches that directly uncover politics and bring them to the forefront of negotiation are required. As Meisch offers, narrative ethics can help to open spaces for wider public engagements about moral practices and social-ecological imaginations [77].

4. Conclusions: Re-theorizing Politics

Water governance practices that elide "the political" do not challenge the direct production and concealment of uneven social-ecological risks, nor do such approaches create opportunities to articulate and redraw water-related decisions, uses, or practices in ways that will be more just and sustainable. As many of the contributions make clear, particular discourses, policies, and governance frameworks too often suggest that certain "solutions"—be it decentralization, PES, participation, IWRM, or nexus approaches—will overcome problems with water governance. Yet, as these contributions demonstrate, such constructs mask the associated "politics", but politics are integral to such interventions and their uneven outcomes. There is an ongoing need for attention to these politics, as well as new analytics and methods to highlights their dimensions. There has been considerable progress to promote analyses that center and re-theorize "the political" in water governance. Clear themes emerge in this Special Issue, including the need to interrogate purportedly apolitical institutional structures and infrastructural interventions, as well as to investigate the on-the-ground realities as 'apolitical' interventions. As such, the themes outlined above help to underscore some of the concerns associated with de-politicized water governance, and further offer insights on what it means to position politics at

the forefront of water governance analyses. The contributions also include radical re-formulations of water governance, including a focus, for example, on ontologies, axiologies, and epistemologies within the contributions on Indigenous water governance. Through these contributions, the wider political terrain that enables the production of certain waters—be it desalinated, packaged, or bottled, and their uneven outcomes (e.g., private over public interests, mining industry over domestic users)—come to the fore. Together, the contributions contained within engage with and offer new insights to both re-center and re-theorize the politics of water governance.

There are also new openings made possible by the contributions here. Among them, we expect scholarship to further the types of questions and realities offered by the considerable work on Indigenous water governance. Noted here, there are many political struggles and openings provided by deeper engagement with these realities, histories, and ways of knowing and ways of governing. There are also ongoing political challenges and debates more fundamentally about what societally and politically we want to do about biophysical and water related challenges, such and those associated with climate change or ongoing water related degradation. Thus far, there has often been a reversion to the "technical" (e.g., augment supply by building new dams, the pursuit of desalinization, or compensate upstream users through schemes such as PES). Even if such options proceed with the notion that these are technical solutions, and thus evacuated of politics, this is not the reality. As such, we must make visible and confront these politics head on: Who benefits, who loses, why? In addition, there are options and possibilities such as those associated with narrative water ethics or Indigenous legal frameworks that might offer hope for bringing these contestations and trade-offs to the fore; that is, what do these offer for the future of water governance and what new work, concepts, and governance mechanisms might enable us to do this more adequately, appropriately, and with an orientation towards justice and sustainability?

As technologies and governance practices continue to change and adapt, there will undoubtedly continue to be new and different questions to be addressed and considered. As we do so, we must continue to attend to the politics of such interventions. The pretense of apolitical and win-win interventions must also be taken as a red flag—here, an analysis to understand the politics might be all the more difficult, yet of critical importance. We also see considerable value, illustrated in the pages of this volume, regarding the important learning that can occur across disciplines and geographies, whether from bringing realities of First Nations into conversation with the situation elsewhere, or by linking political ecology with urban studies, planning, anthropology, and other approaches. Here we can break new conceptual and analytical ground, whether that relates to the concept of "unmapping" [54] or thinking about the implications of *nibi* (water) *giikendaaswin* (*Ogamauh annag qwe*, see Chiblow) [74], or through understandings of Indigenous wellbeing as connected to territory and the relationships that are forged with and through water [76]. We find such critiques and learnings to be of vital importance. Especially when they can be conveyed in ways that highlight the conceptual and empirical lessons, and also that can be read in ways that are accessible and relevant to diverse audiences. We are pleased to offer this Special Issue, with the hope that we have met and maybe even exceeded these goals.

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Article

(Re)theorizing the Politics of Bottled Water: Water Insecurity in the Context of Weak Regulatory Regimes

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Abstract: Water insecurity in developing country contexts has frequently led individuals and entire communities to shift their consumptive patterns towards bottled water. Bottled water is sometimes touted as a mechanism to enact the human right to water through distribution across drought-stricken or infrastructure-compromised communities. However, the global bottled water industry is a multi-billion dollar major business. How did we reach a point where the commodification of a human right became not only commonly accepted but even promoted? In this paper, I argue that a discussion of the politics of bottled water necessitates a re-theorization of what constitutes "the political" and how politics affects policy decisions regarding the governance of bottled water. In this article I examine bottled water as a political phenomenon that occurs not in a vacuum but in a poorly regulated context. I explore the role of weakened regulatory regimes and regulatory capture in the emergence, consolidation and, ultimately, supremacy of bottled water over network-distributed, delivered-by-a-public utility tap water. My argument uses a combined framework that interweaves notions of "the political", ideas on regulatory capture, the concept of "the public", branding, and regulation theory to retheorize how we conceptualize the politics of bottled water.

Keywords: water politics; bottled water; water governance; urban water; re-theorizing

1. Introduction

Water insecurity in developing country contexts has frequently led individuals and entire communities to shift their consumptive patterns towards bottled water. Bottled water has gained popularity as a mechanism to enact the human right to water through massive distribution of containers across drought-stricken or infrastructure-compromised communities. Water insecurity is particularly acute in cities as infrastructures are substantially sensitive to exogenous shocks, including extreme climatic events, accelerating urbanization and explosive population growth. When water utility infrastructure is compromised because of a disaster or lack of maintenance, or a combination of other different factors, government officials have tended to leave it to consumers to solve their problems of water insecurity. These individuals seek to protect themselves from potentially harmful waterborne pathogens that could be ingested from dubious quality tap water sources through an "inverted quarantine" [1], whereby people protect themselves through the products they consume.

Water insecurity in cities is most frequently associated with two main factors: the inability of local governments to enable and sustain sufficiently, securely, and accessibly a steady water supply in contexts of increasing scarcity and extensive urbanization, as well as the lack of mechanisms, infrastructure, and strategies to increase access for those who remain water insecure [2]. Water insecurity can cause emotional distress [3] as well as physical affectations with extremely negative impacts, particularly in contexts of high vulnerability to disasters, such as earthquakes and flooding [4]. These negative impacts can have particularly compounding and multiplicative effects [3]. Water insecurity in cities remains a pervasive global problem. These problems are not confined to cities in

the developing world. Episodes of drinking water supply contamination in the US leading to deaths have received major global media attention and heightened concerns about the state of American urban water delivery infrastructure [5,6]. Fragility of water supply systems is compounded by a lack of transparency on the part of public officials, leading to distrust on the ability of local governments to provide safe drinking water for all [7], as required by the United Nations human right to water directive [8].

Bottled water consumption is globally on the rise. The global bottled water industry is a major business with revenues in the range of $215–$260 billion US dollars (https://globenewswire.com/news-release/2018/04/18/1480659/0/en/Global-Bottled-Water-Market-to-Breach-US-300-Billion-Worth-by-2024-Leaders-of-Global-Bottled-Water-Market-Facing-Stiff-Competition-from-Local-Vendors-notes-TMR.html), currently (2018) around $215 billion US dollars (https://www.marketwatch.com/press-release/the-global-bottled-water-market-size-is-expected-to-reach-usd-21512-billion-by-2025-2018-08-27). How is an industry that makes money from packaging a scarce resource compatible with our intentions to create the conditions for a global norm of the human right to water, when scarcity is one of the key dimensions of water insecurity? Different authors have posited a broad range of explanations about how bottled waters have come to, in the words of Hawkins, Potter, and Race, "insinuate themselves into our lives" [9]. Governmental failures to provide safe drinking water through local water utilities [10], poor networked infrastructure for water delivery throughout urban centers, rural and peri-urban areas [11], powerful marketing campaigns [12,13], regulatory failures and capture of local governments on the part of multinational corporations [14], a taste for healthy hydration through highly portable liquids [15,16], and a shift in norms where consuming bottled water has become somewhat of a cultural norm despite its negative environmental effects [17] are all factors that have contributed to the emergence and sustained growth of the global bottled water industries.

I re-theorize the politics of bottled water by engaging with the literature on branding theories as well as regulation theory to show how strategic branding choices make use of weak regulatory regimes to create new markets and/or strengthen leadership position on current ones. An examination of the interplay of these factors, therefore, offers a novel reading of the politics of bottled water beyond what has already been written elsewhere. I center my analysis on urban water as it is where the major locus of decision making exists, even if federal and state-level authorities also wield enormous power to make decisions on how water should be allocated, and on the production of containerized liquids of various types, including beer, soft drinks, and bottled water. These government actors also carry responsibilities regarding the governance of bottled water. Decisions at the federal level can have an impact on how much water is extracted and by whom. Policy choices with local impacts and implications are also frequently drawn up at the federal level.

While I follow Schmitt's work on "the political", and Winner's examination of whether artifacts have politics, my argument goes beyond by building an interdisciplinary framework that uses regulatory capture, the concept of "the public" as taken from a publicness theory lens and regulation theory to retheorize how we conceptualize the politics of bottled water governance. In this article, I answer two interrelated but under-theorized questions:

(1) how is bottled water political, and which factors make containerized liquids the locus of political analysis?
(2) how do different regulatory contexts transform the ways in which bottled water is governed?

In this article, I demonstrate that behind the incredibly rapid growth in bottled water consumption across the world, we can find a complex web of political forces that facilitate regulatory capture of government actors by industries. I show how, more than the development of a taste for the commodity itself, the exponential growth that the global bottled water market has experienced has been primarily the result of political negotiations and the politicization of public water utility infrastructure. Through a series of vignettes of different cases of growth in bottled water consumption, I explain how regulators

in different countries and cities have failed to create the right conditions for universal water access in urban and peri-urban contexts. I indicate how the confluence of weak regulatory frameworks, lax enforcement, and poor infrastructure have contributed to consolidating the current dominance of bottled water as a mechanism for drinking water provision. I do so by explaining the underlying politics of governing the vital liquid in packaged format. I draw from empirical research I have undertaken in Mexican cities, though I also refer throughout the text to several international case studies where the political dynamics might be similar.

This article is organized as follows: in the second section after this introduction, I examine how bottled water is political and which factors make water politics the focus of political analysis. In the third section, I examine the interplay between weak regulatory regimes, branding, poorly-maintained infrastructure, and strong branding and marketing campaigns. In the fourth section, I synthesize works on urban water politics by highlighting the importance of retheorizing the politics of bottled water through the inclusion of regulatory regimes in water policy discussions. I also discuss the role of cities in providing safe drinking water. Finally, in the conclusion I explain how a re-examination of the "what is politics" question and an inquiry on to the various concepts of "the political" helps us re-theorize the politics of bottled water in a novel way.

2. How is Bottled Water Political?

One of the key questions in political science (and social science in general) is: what constitutes "the political"? What is politics? What is political? What are the characteristics that make an event or a phenomenon, "political"? Even more importantly, when are objects (whether we believe they are imbued with non-human agency or not) "political"? These are all important questions to ask, even more so when we are re-theorizing politics, as we do in this special issue. My goal with this discussion is to engage with the literature on "the political" and the broader meaning of politics, from the discipline where I identify with the most (political science), but also engaging other disciplinary approaches to understanding politics. This is not a "political science summary of the literature", but I use this discipline as a springboard as it is the one with which I identify the most and am most familiar with. I will also engage works published by human geographers, another discipline with which I identify. In reviewing this literature, I will engage the four main elements I consider to be part of any analytical framework that involves human geography: space, place, location, and scale.

Canadian political theorist Mark Warren's definition of what is political is analytically powerful as it combines two main elements used in the study of water governance, power and conflict. Therefore, I use it here as a starting point for my discussion. According to Warren, we can define politics as

> "the subset of social relations characterized by conflict over goods in the face of pressure to associate for collective action, where at least one party to the conflict seeks collectively binding decisions and seeks to sanction decisions by means of power". ([18], p. 218)

Warren's excellent definition of what politics entails directly relates to the very starting point of why water as a subject matter is political. As Sultana indicates, "water is essentially about power—the power to decide, control, allocate, manage—thereby affecting people's lives" ([19], p. 485). Water is also about conflict, in the same vein that Warren is discussing it. Conflict about who gets to consume water, who gets to extract it and commodify it, and who is excluded from its consumption and, thus, denied their human right to water, therefore, facing water insecurity [19,20]. Governing water is, hence, about harnessing power and dealing with conflict in a way that ensures that there is equitable distribution and allocation.

Water governance is political and politicized. While there is a broad range of definitions I will confess my own positionality by indicating that I am writing primarily from a political science perspective. I view water governance as a model of resource management where we can find multiple nodes holding power within a network and coordinating for optimal usage and replenishment. I harness Rhodes' view of governance [21–23] and, thus, I define water governance as a set of

institutional arrangements requiring power-sharing within a networked structure of interactions between resource appropriators and other political agents. My definition of water governance implicitly highlights three elements: power-sharing, networked-structures, and multiple actors/agents. Yet I have found political science and policy science perspectives often fail to highlight the political components of water governance. Who gets to participate in the governing of this vital liquid? Who is denied access to resources? Who holds power and control over distribution within urban infrastructures? What rules and norms govern water access, use and reuse, and how are these established, enforced, and sanctioned?

Containerizing this vital and necessary liquid for sale and profit when many communities worldwide lack access to enough water for their personal use acutely highlights the importance of rethinking and re-theorizing the politics of governing bottled water. Theories of the politics of bottled water have a broad range of ontologies and epistemological approaches. While material culture scholars like Gay Hawkins have examined the different components of a bottle of water, as it pertains to actor-network theory and scholarly approaches that provide this commodity with non-human agency, my approach is completely different and, therefore, I do not follow the conceptual model of ontological interference as described by Hawkins [24–26]. I do, however, draw heavily from insights Hawkins has offered on how the mere existence of polyethylene has enabled the creation of markets for containerized liquids. More specifically, Hawkins has highlighted how having access to an easy-to-hold-and-carry plastic bottle has facilitated access to this commodity.

My argument in this paper touches upon Gay Hawkins' thoughts about how brand, oil and water assemble into becoming bottled water [27,28], and Langdon Winner's assertion that artifacts are political [29], but with a twist. I do not ascribe to actor-network theory, nor do I endow plastic and H_2O with non-human agency characteristics. I do, however, strongly follow Winner's argument that there is value in understanding how certain technologies embody specific forms of power and authority. Specifically, I argue that branding itself is a political act, and that encasing water inside a plastic bottle follows a certain kind of politics: a simultaneous politics of fear and protection, whereby consuming bottled water is an act of self-preservation (or inverse quarantine, a la Szasz) in response to fear of waterborne diseases.

According to Winner, there are two main ways in which artifacts can have politics, both of which have a key impact on how we politicize bottled water. The first one, where the device or system "becomes a way of settling an issue in a particular community" ([29], p. 123), makes the artifact inherently political. Through Winner's lens, we would argue that bottled water is inherently political because its usage can facilitate or preclude individuals or entire groups from enjoying their human right to safe drinking water. As the case of sachet water shows, there are communities where access to this type of packaged liquid is necessary [30–33] and, often times, the only way in which marginalized populations are able to enjoy their human right to water. The second lens that Winner uses is the case of inherently political technologies, "man-made systems that appear to require, or to be strongly compatible with, particular kinds of political relationships" ([29], p. 123). We could also argue that bottled water can be political because it is compatible with specific kinds of political relationships. For example, for Winner, the atom bomb is a clearly and inherently political artifact. So are transportation systems. Bottled water can be inherently political because in its creation and manufacturing process, political relationships are built between regulators and bottling companies. Government actors act as regulators of how much water is extracted, and which types of plastic can be used to package the vital liquid. These relationships can also become vitiated, as I argue later in this article, and be the source of mechanisms of regulatory capture.

Re-theorizing the politics of water necessarily means tracing back the developmental trajectories of our thinking about water, about politics and the inherent meshing of the two. Here is where I follow Winner as I look to water and the technologies through which it is delivered from aquifer or lake to consumers' hands. While not following exactly the idea of endowing water with non-human agency, I do consider, as Acevedo Guerrero asks, how "as infrastructure extracts, contains, channels, processes,

leaks or distributes waters it produces new kinds of spaces and reproduces inequalities or differences between them" ([34], p.1). Choices about infrastructure are also inherently political.

In an exercise of re-theorization of the politics of bottled water, it is fundamental that we rethink how we define and describe the politics of water governance, as it is through these governing processes that new forms of water use, appropriation, and distribution emerge. Defining and understanding the politics of water governance has become an important area of research in and of itself, and plenty of worthy contributions are available for the reader's perusal. In discussing how this term is defined, I align closely with the multidisciplinary and interdisciplinary work of Margreet Zwarteveen and the Water Governance group at the IHE-Delft Institute for Water Education, as it represents a cross-disciplinary, integrative approach to discussing politics and the governance of the vital liquid. In their recent commentary, Zwarteveen and collaborators produced an analytical examination of the politics of water governance that summarized what water governance is, at the core, and the different ways in which it intersects with politics and the political. As Zwarteveen et al. indicate:

> "water governance at heart is about political choices as to where water should flow, about the norms, rules and laws on which such choices should be based, about who is best able or qualified to decide about this, ad about the kind of societal future such choices support." ([35], p. 1)

My analysis is consistent, therefore, with Zwarteveen and collaborators' definition of what is at the core of governing water: distributions. Who gets specific flow quotas and by whom is water distributed, who gets more benefits and who loses in the distribution and allocation of authority? Whose expertise do we believe and whose voices are silenced or not considered and why? Distribution of water, voice and authority, and expertise is a useful analytical heuristic that Zwarteveen and collaborators master that can also be applied to how we govern bottled water. Which aquifers and freshwater bodies are targeted by whom and to what extent can the water that is extracted from these be transformed into a tradable commodity? Whose voices are silenced, and which livelihoods are affected through the systematic misallocation of water extractive rights and why do bottling companies still fail to pay a fair amount for the water they extract? Engaging these questions allows us to critically examine how bottled water is governed, and by whom, as well as who gets excluded from these governing processes. These are questions that, in many ways, the vast literature on political ecology has engaged upon, even if not directly centering on the politics of bottled water. However, I do not take a political ecology approach in this paper, as I believe it would be a disservice to scholars in this area to attempt to survey the literature within the constraints of this article. I do want to acknowledge the contributions of authors in this field and thank an anonymous reviewer for pointing this out to me.

3. Examining the Combined Politics of Branding, Regulation, and Infrastructure

From a political economy viewpoint, bottled water is a commodity because it is the result of economic agents who have used resources (however scarce) to manufacture a product that can be sold in markets. This commodity has been crafted to provide healthy hydration [15] through pure drinking water [17,36,37]. Given these branded properties of bottled water, finding a broad range of types of packaged beverages and highly functioning markets for each one of these types is hardly a surprise, despite the ethical implications of containerizing a vital resource [38] which should, theoretically, be treated as a common pool resource [39,40].

An overlooked mechanism that can be used to create markets for bottled water is through specialized branding and implementation of clever and powerful marketing strategies within weak regulatory regimes. While Wilk and others have emphasized the role of marketing and branding, how these interact with regulation is much less explored. Weak regulatory regimes combined with poorly regulated industries to create new markets for products that can respond to consumers' fear of the tap. This is one of the main reasons bottled water exists: to create a barrier (quarantine) between citizens, their consumed products and potential pathogens [1]. If there is poor drinking water

quality management, citizens will want to protect their health and take it upon themselves to isolate potentially harmful compounds and biological agents. Fear of the tap water [41,42] can also be often coupled with developing a taste for consuming a particular brand of beverage [14,43]. Branding is just a component of the complex phenomenon that is the very existence and explosive growth of bottled water consumption. Global markets for the containerized resource have grown, as commercially-popular brands such as Acqua Panna (Italy), Evian (Switzerland), FIJI Water (Fiji Islands), and Perrier (France) are traded across the globe. Drinking bottled water is a response to external factors but also a product of internal, individual decision-making processes.

In this section I want to highlight the political elements behind bottled water consumption as a combination of socio-political factors at the individual and collective scales. Throughout the paper I highlight that there is a politics to producing packaged liquids as well. However, I do emphasize consumption at this point because, as I will explain below, there is a particular confluence of factors with political undertones that help us elucidate how bottled water became a staple of our daily lives not only in developing countries, where drinking water infrastructure may be poorly maintained [5,6,44], but also in affluent societies where bottled water is a form of healthy hydration, considered fashionable and trendy [15].

The politics of bottled water consumption is underlined by the combination of governmental failure, industrial entrepreneurship and societal risk aversion. Water utilities are often unable to provide high quality drinking water [45], multinational corporations capitalize on this fear of the tap by creating a safer alternative for humans to hydrate [9], and citizens reject any risk of damage to their personal wellbeing, engaging in an inverted quarantine [1] protective process. Wilk suggests that "bottled water is a case where sound cultural logic leads to environmentally destructive behavior" ([17], p. 303). While this is partially true, I do not agree that cultural norms are the only (or main) factors behind the explosive growth in bottled water consumption across the globe. Beyond culture, as I show below, there is a systematic attack on local water utilities' infrastructure, not only on the part of multinational corporations with a stake in commodifying local resources, but also local governments who abdicate their responsibility towards citizens.

Branding is political. Whether a type of containerized liquid is promoted and sold as "ethical" [46,47], or whether its consumption is predicated on the basis of particularly branded properties such as body-strengthening, mind-clarifying, weight-reducing and others [48], the politics of what gets sold and how is complex but extremely interesting. The way in which companies choose to highlight a specific property is also in and of itself a political act. Not only do multinational corporations have the power to embed an idea of purity and healthiness in a packaged liquid, they are also able to maintain this notion ingrained in people's minds for generations. To further explain how branding has facilitated the erosion of public trust, I use an example from my own research and fieldwork in the Mexican bottled water industry. While the 1985 earthquake in Mexico City may have created distrust in Mexican citizens and led them to shun drinking water directly from the faucet, powerful marketing campaigns sustained this belief and carried it over the next generations. Nowadays, it is hard to find someone in Mexico who does not drink bottled water, a testament to the power of multinational corporations to erode the public trust in local water utilities' work and infrastructure. I interviewed government officials in three Mexican cities (Aguascalientes, Leon, and Mexico City). All three cities have created water treatment programmes whose efficiency is solid, delivering high-quality drinking water across the entire municipal network. Nevertheless, people in Mexican households still refuse to drink directly from the tap for fear of getting sick, purchasing 20-litre jugs to provide drinking water on a weekly or bi-weekly basis, and instead use water from the network for bathing, cooking, and other household uses. In this article I focus primarily on the politics of individual single-serving bottles, rather than on these cases of multi-gallon jugs. Their trust in government has been systematically eroded through powerful branding and marketing campaigns.

Increasing the expansive power of branding can also be facilitated by government inaction, particularly when this inaction leads to lack of regulation of the specific text or messaging. If governments do

not regulate messaging, it is unlikely that companies will exercise caution in how they portray their water-based products. Branding bottled water as owning or possessing extraordinary capabilities is a well-recognized marketing strategy, and an efficient one too. Gerber, the baby food marketer, has crafted bottles of water that are "created especially for your baby" (see: https://www.nestle.com.mx/brands/agua-gerber. Do note that although Nestle is a Swiss brand, this particular product is sold in Mexico.). Other companies thrive by selling "highly pure, glacier water, like Whistler Water, a Canadian brand based out of British Columbia's winter skiing and snowboarding resort area (see: http://whistlerwater.com/ Whistler Water boasts having "provided local and global customers with the most pristine glacial water available." WW reports the quality of its water here: http://whistlerwater.com/downloads/BottledWaterReport2018.pdf). Like FIJI Water, which is imported from Fiji, Whistler Water is promoted as extraordinarily pure and neutral (at an alleged pH of 7.2) because it comes from a glacier north of the city of Whistler.

Choosing a specific branding strategy is a political act. Which populations are targeted and with what frequency and through which channels, using what kinds of messages are all technical decisions that have political undertones and/or are motivated by political reasoning. Moreover, exaggerated and misleading branding strategies can be facilitated by governmental responses, either collaborative or through inaction. For example, if local government praises corporate social responsibility efforts by a beer company for providing free canned water to communities affected by disaster, this messaging could also be used as a branding strategy. While apparent collaboration between marketers and governmental actors may be inadvertent it could potentially also be purposeful.

4. Bottled Water Governance in Variegated Regulatory Contexts

The governance of water supply has always been political, but a disintegrated and non-systemic view of the hydrological cycle has led many scholars and policy-makers to neglect that ensuring that the human right to water is universal implicitly involves numerous decisions and conflicting policy objectives. Deciding who gets to access how much water and of which quality is a political decision. As Feldman indicates,

> "[t]he process of water supply politics generally involves an inter-play of interests having unequal power and exercised through various forums, depending on the decisional context—e.g. urban water supply vs. agricultural irrigation. Over time, water supply has evolved from being a local issue in which decision-making has been dominated by public agencies and regulatory officials to a more contested set of issues involving community groups, private entrepreneurs and investors, and environmental activists, among others." ([49], p. 26)

Water quality management is often a function bestowed upon authorities tasked with regulating drinking water sources, but this is done only through standards and guidelines instead of a rigorous command-and-control approach where quality and quantity are systematically monitored on site and where standards are strictly enforced. This is problematic because water quality management and its relationship to bottled water governance are not seen as part and parcel of a broader water policy system. This lack of a systemic approach to urban water management is clear across the board in different countries and has the potential to impose substantive negative effects on urban and peri-urban populations. Bjornlund et al. identify six specific issues at stake:

> "(1) defining water quality parameters for each water use; (2) putting each water quality to its most beneficial use; (3) the soil and water nexus; (4) pharmaceuticals in waters; (5) how to monitor and enforce water quality standards; and (6) balancing economic development and water protection." ([50], p. 324)

Surprisingly, governing bottled water and its quality are not included in the broad theme of water quality management, even though poor drinking water quality is often named as a key factor

driving growth in bottled water consumption [51–54]. It is also surprising because water utilities, while not sharing the responsibility of regulating bottling plants, do have a stake in ensuring that drinking water is of adequate quality for urban contexts and communities [55]. The problem with a lack of integration of bottled water into urban water supply governance concerns is that we treat the problem of water supply, as Melosi aptly put it, "as if its resolution can be found through some black box" ([56], p. xi). We negate the importance of bottled water for urban drinking water delivery if we simply treat the problem of providing sufficient water through engineering or "hard path" solutions. Certainly, providing water fountains and refilling stations could potentially have a positive impact in how much bottled water is consumed. However, the evidence to this end is mixed. In an ethnography of a US university campus' drinking water practices, Kaplan found that preference for water fountains had been waning [57]. Other authors have found growing interest in water refilling stations [58], particularly when peer shaming and socialized motivation strategies are used to shift behaviors and consumptive patterns [59]. As these examples show, how we govern bottled water is not only a matter of regulating infrastructure or mandating its installation, but also changing individual behaviors, and shifting patterns of drinking water consumption away from bottled water. This combination of soft-path and hard-path strategies has the potential to be quite powerful.

Governing bottled water requires us to understand regulatory contexts, organizational architectures and institutional arrangements. Institutional analysis helps us understand how bottled water consumption has become consolidated. In the words of North,

> "[i]nstitutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and, therefore, determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity." ([60], p. 97)

Institutional theory helps us explain how new norms and rules regarding bottled water consumption have emerged. Repeated consumption of packaged liquids creates individual routines that lead to the emergence of new norms, rules and, ultimately, an institutionalized definition of what type of water has the appropriate quality levels to be consumed by humans on a regular basis. Individuals consume bottled water out of systematic, continued and enduring repetition and consolidation of self-protective strategies that respond to (among other concomitant factors) extreme risk aversion. Given a choice between consuming a commodity, however negatively impactful it may be on the environment, and risking their own health through acquisition of a waterborne disease, human beings will tend to pursue a logical approach and consume bottled water. This logic is what Szasz calls the "inverse quarantine" [1]. Given the potential risks of damage that drinking contaminated tap water could have on individuals' health, human beings make the conscious choice to "create a bubble" around their consumables. Not surprisingly, "[b]ottled water was the first inverted quarantine product to achieve mass consumer item status" ([1], p. 174).

Empirical evidence drawn from interviews I have conducted during fieldwork in Mexican cities over the course of the past five years supports my claims. Using extensive surveys, ethnographic fieldwork and in-depth interviews, I have investigated whether citizens would continue to consume bottled water were they entirely certain that their local water utility would be able to provide them with continuous, uninterrupted service. I have also asked whether they would consume bottled water if the quality of the water coming out of their tap were high enough to pass the Mexican official norm for drinking water. Shockingly, most responses were of the type: "I don't trust my government, nor do I trust that water is safe, even if the test results are posted right in front of my eyes". I report these results elsewhere, and I do not want to make this the main point of this article. Readers interested in this topic can request publications by contacting me directly. This distrust is not new nor is it volatile and temporary. This strong and collectively-shared belief that drinking tap water will result in physical

harm has been ingrained in Mexican citizens' minds throughout the years. It is not the result of one specific campaign, nor (as some authors have argued) a response to the 1985 Mexican earthquake. It is a systematic, repeated cycle where what once was consumed as part of a survival strategic response to an emergency, has now become commonplace. This behaviour may have been logical one time, but the continued repetition even when infrastructure was repaired and municipalities, specifically Mexico City, were able again to provide safe drinking water, is not logical at all. What this reification of bottled water as the safest option for drinking water provision shows is the potential and power for repetition, routines for the creation of new rules and norms.

One of the biggest problems with the governance of bottled water is that regulation of this industry is quite complex, and quite frequently, encoded regulations are amorphous and complicated, providing little to no guidance as to the subject they are supposed to govern, and the different mechanisms for control, regulation, enforcement, and sanction-setting. An institutional analysis lens shows that weak regulatory regimes, poorly designed and implemented regulations, clever branding strategies and a dereliction of duty on the part of local and federal governments can combine to strengthen multinational corporations' stronghold on public drinking water provision through massive bottled water delivery. As I have indicated above, routinely consuming bottled water as a response to urban water insecurity solidifies the role that this commodity has in the provision of household-level drinking water. This routinization institutionalizes bottled water as the pseudo-official policy choice for governments.

Regulation of bottled water production will depend on where the water comes from. While in Mexico most bottled water is produced through extraction of the vital liquid from aquifers, in other countries this commodity is manufactured by transporting it from a lake or river or other form of surface reservoir. Governing extraction of water for packaging purposes is complicated because there is a great deal of variation as to who is responsible for specific components of the regulatory framework across jurisdictional levels. Water extraction is extremely poorly regulated. Across the globe, water extraction for bottling purposes is often the responsibility of state-level authorities, although, in Mexico, water is "owned" by "the Nation" and, therefore, extractive concessions are the responsibility of the federal government. This is a constitutional mandate which is followed through laws. Provinces in Canada hold responsibility for governing groundwater. In Mexico, states have very little jurisdiction on areas of drinking water governance, whether protection, extraction, or marketization.

5. Regulating Branding and Infrastructure in Weak Regulatory Regimes

If we examine the combined politics of strong branding, poorly-maintained infrastructure, powerful marketing campaigns and weak regulatory regimes we can assess how this specific combination of factors influences the creation, emergence and sustenance of new bottled water markets. Bottled water markets are created through the confluence of several different factors, that include powerful marketing campaigns [61], the interplay of an inability by local governments to provide adequate tap water with the ease of access and global pervasiveness of bottles [9,24], a promotion of living lifestyles that include hydration based on healthy packaged liquids [15], the development of a taste for bottled water [43] and the social construction of "purity" through strategic and smart branding [17,33,36]. Nevertheless, in this paper I have focused specifically on the four ones listed above for three reasons. First, there is very little written, if anything, about the regulation of bottled water as a public policy issue and about the weak regulatory regimes that emerge when countries have poor environmental regulatory enforcement. Second, to the best of my knowledge, there is no discussion in the literature about the specific interplay of branding, regulation, marketing and infrastructure and their impact on the governance of bottled water. Third, an examination of the interplay of weak regulatory regimes with smart branding necessitates a re-theorization of how politics plays a role in which branding strategies are chosen and how these connect with regulatory responses on the part of government actors.

One key reason why government actors are not willing or able to provide adequate drinking water at the city-level is because they are captured by powerful economic interests. As the literature on regulatory capture shows, one of the main strategies for capture is the cooptation of public service delivery through privatization mechanisms and strategic lobbying [62,63]. I also argue that governments that fail to provide safe water engage in what is called "dereliction of duty", an abdication of responsibility that places the onus on individuals to seek proper mechanisms that enable them to provide for their own services, instead of supplying them as public goods. Among a broad range of governmental duties is the responsibility to ensure that citizens receive public services. Therefore, when government actors decide to delegate this responsibility to the citizens they are supposed to serve, they engage in dereliction of duty [64].

Branding strategies intersect and interact with the regulation of marketing campaigns and water supply governance [14,61]. As powerful marketing campaigns take hold without much governmental supervision, controlling how bottled water is marketed and sold becomes more complicated and complex. Brei has documented the case of France while Pacheco-Vega has examined the case of Mexico. In both cases, the federal government has taken a passive stance towards marketing campaigns that promote bottled water in ways that are almost borderline criminal. For example, in Mexico a Gerber-branded bottled water promotes itself as "water especially created for your baby" ((in Spanish): https://www.nestle.com.mx/brands/agua-gerber). Unless Nestlé has managed to create a different type of hydrogen and oxygen combination that is especially suited for babies (and even then, populations are wildly diverse, different and heterogeneous), it is hard to believe that the way in which Gerber bottled water is branded can even be legally used. However, it is, as shown by the market share captured by Nestlé globally, and in Mexico. In France, Perrier brands itself as "an iconic French brand". Perrier harnesses the power of French identity to position itself as the brand for an entire country. This appeal to nationalism and national identity should technically be regulated as national symbols are supposed to be for strict government usage, but as this case shows, regulatory enforcement of these standards fails quite often. French bottled water sellers have also harnessed the popular appeal that global perceptions of French sophistication has as a brand [65].

The systematic acceptance and (in some cases) extensive promotion of the bottled water industry as a mechanism for safe drinking urban water delivery, as the cases of Flint and Mexico City show [39] show a clear dereliction of duty on the part of governments. Leaving a public responsibility in the hands of a private actor is not per se unacceptable. Water utilities' operation is often licensed to multinational corporations to enable city governments to gain leverage, improve their financial and operational performance and ensure that populations across the territory of a particular jurisdiction can access enough water to sustain their livelihoods [66]. Reports of improved utility performance through privatization indicate increased efficiency in a number of cases, though recent assessments have questioned these alleged gains [67].

Privatization of water utility operations and production of bottled water are two related, but very different, facets of water marketization [68]. Whereas privatization refers to the operation of a water utility, which may or may not provide safe drinking water at the household and community level, commodification is the transformation of a common pool resource that should theoretically also be a public good into a tradable commodity through packaging and delivering. Here, I argue that we ought to maintain these two very distinct analytical categories of water marketization if we are engaging in theoretically sound and empirically robust investigations. Avoiding conflation of these categories is important because, though related, one (privatization) is often taken as symptomatic of the other (commodification), and often the causal chain through which marketization occurs can go either way [69–71]. Nevertheless, it is important that we do not conflate both mechanisms of water marketization while recognizing that they can be inextricably linked. As these marketization processes are interconnected, so are their politics. On the one hand, communities lacking access to the municipal water network or with poor daily coverage may engage in bulk acquisition of water (through tankers or at a smaller scale, large 20–30 L bottles). Local governments may decide that to improve coverage,

they may license operations to a multinational corporation. This was the case of the Mexican city of Aguascalientes, where poor coverage was quoted as the main rationale for privatization of the water utility in 1993. On the other hand, private water service delivery may be the only mechanism to ensure that there is safe drinking water for all citizens within a specific region. The answer to the question of whether water utilities should be privately operated is never clear cut and apolitical.

Moreover, while some countries may have a formalized, constitutional human right to water, it is still unclear whether formalized rules work properly to ensure that communities have universal access. This lack of trust in formal institutions leads to the emergence of informal models of water delivery, including the emergence of "pirated bottled water", and an explosive growth in small-scale, household-level commercial purifiers. Wutich and collaborators have reported on how informal water vendors in Cochabamba, Bolivia, organize themselves to provide safe drinking water to communities that may not have access, thereby effectively enabling their enjoyment of the human right to water. Similar cases of informal water access strategies enabling the human right to water and sanitation can be found in India [72,73], Indonesia [74,75], and Mexico [76,77].

Encoded rules about water governance may potentially not match informal rules. In theory, local governments may be tasked with the responsibility as per their legal frameworks, but, in practice, citizens will do whatever it takes to ensure continued access to a safe source of drinking water. This mismatch between policy goals and regulations codified in laws and bylaws and the actual needs of communities creates conditions that foster the emergence of informal water provision systems. There is a very broad range of jurisdictional responsibilities and institutional arrangements for urban water governance with regards to drinking water, but unfortunately there is no systematic, one-stop shop kind of summary of national and subnational jurisdictional attributions. The closest thing to a global overview of drinking water responsibilities as established by various national and subnational legislative bodies is the European Directive on Water. The OECD recognizes that drinking water and water provision (for services and for human consumption) are shared responsibilities across national and subnational levels of government (see: https://www.oecd.org/environment/resources/Council-Recommendation-on-water.pdf). For example, in Mexico, cities (municipalities) are responsible for provision of potable water as stated in the Mexican Constitution. Per Article 115, municipalities are tasked with providing all public services, which include park and garden maintenance, cemeteries, waste collection and disposal and water provision at the household level [78]. Theoretically, this would mean that it is the responsibility of publicly-owned and operated local water utilities to ensure the creation and distribution of a broad-ranging, far-reaching distribution network across urban and peri-urban areas.

The very existence and increased consumption of bottled water is perceived as simultaneously a "contest for authority and public trust between governments and corporations, in a context of heightened anxieties about risk and health" ([17], p. 303). While this perspective integrates a view of the role of governments, industry and citizens in the creation of bottled water markets, it (surprisingly) neglects the role of branding. The existence of an alternative to tap water is not enough to build trust on the part of citizens. Increases in bottled water consumption also result partly from the combination of very powerful marketing campaigns that promote purity [17,36,37,79,80] and remoteness as markers of higher quality and the erosion of trust on local water utilities' networked infrastructure [14,45,81]. There are definite political undertones to this phenomenon because multinational corporations have a stake in strengthening their stronghold on drinking water provision not only at the local level but also nationally. Bottling companies have spent thousands of dollars in lobbying fees not only to enable them to continue extracting water from aquifers across the United States and Canada, but also to position themselves within a governance system where private interests have at least as much say in public service delivery as citizens do, if not more. However, these influencing activities on the part of private actors would not be successful if there were not governments willing to take money, either in the form of financial support for party activities or through water utility operations' takeover.

By discharging local governments from the responsibility of providing safe drinking water to their citizens, private entities can shape water policies from below. While the main topic of this paper is bottled water and I do not wish to expand on issues related to other types of water marketization, there is a symbiotic relationship between utilities' privatization and commodification of water through bottling. This interconnectedness between both modes of marketization is often rendered invisible because bottled water production and consumption remain as the main analytical focus. I argue that because both modes of water marketization are intertwined, therefore, so are their politics.

6. Conclusions

Bottled water, both from a production point of view and from a consumption perspective, is not only a public policy issue but a highly contentious political one. Ensuring that the human right to water can be enacted at the subnational level also involves highly complex political maneuvering across different levels of government, and multiple sectors. Nevertheless, the way in which urban water governance has been presented and discussed in the literature has frequently erased discussions on the political components of governing this vital liquid. In this article I offered a novel reading of various works on "what is politics" and "the political" while integrating scholarship focused on the study of packaged beverages to deploy a new definition of the politics of bottled water.

Bottled water is an effect and a cause for water insecurity. Poorly maintained infrastructure, weak regulatory regimes, powerful branding and strong marketing campaigns and poorly regulated industries can sustain and strengthen their market dominance. My analysis is necessarily confined to governing water in cities as most bottled water drinkers reside in urban and peri-urban contexts. As my analysis has shown, the interplay of powerful branding strategies, weak regulatory regimes and fear of the tap create political conditions that strengthen the power of multinational corporations with strong interests in maintaining a stronghold on local drinking water markets. Furthermore, a dereliction of duty on the part of local governments and apparent regulatory capture at the federal level by powerful interests in the global bottled water business also contribute to the consolidation of this model of drinking water delivery. Moreover, routine consumption and a lack of activist and civil society challenges to the status quo have facilitated and strengthened this new mechanism for public water service delivery. This governance regime responds to political pressure, powerful incentives and action (or lack thereof).

The issue of incentives is rarely explored when discussing the politics of governing bottled water, and although it isn't the central argument of my article, I want to emphasize that there are powerful incentives to sustain a robust bottled water industry and a lack of incentives to improve drinking water infrastructure both play a role in the lack of energic action aimed to reducing bottled water consumption and production. Given its routinized role as the de facto mode of safe water provision in many cities in Latin America and other countries, there is a lack of incentives to improve water infrastructure at the city level. This fact should be concerning, but it is not apparently high neither on government nor on activist agendas. While there is extensive anti-bottled water activism in Canada [82] and the United States [83], particularly against Nestlé, this is not the case in Mexico, where discussions on the human right to water have centered on stopping the privatization of water utilities [14]. How these activist and governmental agendas vary across North America and globally is an interesting issue worth researching further.

It is worrisome that bottled water is not part of any substantive policy agendas at the local level. Given the stark growth in consumption of containerized liquids as the main vehicle for hydration in contexts where infrastructure is weakened, it is quite shocking and surprising that there is little to no interest in having a discussion on the political underpinnings of bottled water consumption. Bottled water is not in the public policy agenda, as I have shown in this paper. A direct implication of this absence is that there is also no interest on the part of government agencies in funneling public resources to solve what isn't perceived as a problem. Therefore, local governments continue to abdicate

their responsibility in providing safe drinking water for all households within their purview simply by not only enabling but encouraging bottled water consumption.

In this article I re-center the discussion on the political elements of water governance focusing on two specific aspects: first, the politics of governing bottled water (specifically its regulation), and second, the role of politics in regulating production and consumption of bottled water within the context of a broader water governance framework. Both elements are interrelated but distinct. While scholarly discussions of water governance have privileged coordination between actors through multi-stakeholder round tables, the so-called Integrated Water Resources Management (IWRM) paradigm, there has been much less discussion about the politics of coordination and participation in these river basin councils, watershed councils, or citizen boards. Nowhere in these roundtables is there a place for discussions around extraction of the vital liquid by multinational corporations. As I show in this paper, bottled water is a public policy issue that suffers from agenda denial. It is simply not on the governmental agenda, and not on civil society's either.

The governance of bottled water involves several political elements. Cities are most often in charge of providing potable drinking water as one of the main public services they are entrusted with. However, as I have shown with the case of Mexico, many municipalities have abdicated their responsibility and instead have left citizens to their own devices. Those who have the financial means to purchase large plastic jugs filled with the vital liquid at affordable prices do so, but there are many individuals in marginalized communities who are unable to acquire these and, therefore, either purchase plastic containers with water that has a lower price or obtain access through illegal means (like redirecting pipes and drawing from non-point sources). These "pirated" sources of water have been growing exponentially and are now one of the main models of water delivery in numerous areas of developing countries.

As I have shown, an unexplored element of bottled water politics has been the compounding, combined and cumulative effects that weak regulatory regimes, badly designed regulations, poor infrastructure, and strong branding and marketing campaigns have had on the emergence of a dominant paradigm of urban water supply: bottled water as a permanent mechanism for drinking water delivery at the city level. An important caveat to posit is that there is not one single ("the") politics of bottled water, but many. Therefore, in this article I centered my analysis on the intersection of weak regulatory regimes and corporate incentivization of commodification, which are compounded by governmental failure to provide for water as a public good. Achieving the human right to water in a context where bottled water is the preferred mode of water delivery will, therefore, posit important challenges worth discussing further.

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Towards A Situated Urban Political Ecology Analysis of Packaged Drinking Water Supply

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Abstract: The inclusion of packaged drinking water (PDW) as a potentially improved source of safe drinking water under Goal 6.1 of the Sustainable Development Goals (SDG) reflects its growing significance in cities where piped water has never been universal or safe for drinking. Using the case of PDW in Jakarta, Indonesia, we call for theorizing the politics of PDW through a situated Urban Political Ecology (UPE) analysis of the wider urban water distributions in which it is inserted. We do so in order to interrogate the unevenness of individual "choices" for securing safe drinking water, and highlight the ambiguity of PDW's impact on inequalities in access. We first review research on PDW supply to specify how dominant theoretical approaches used for understanding PDW supply through analyses of the individual making "choices" for drinking water are power neutral, and why this matters for achieving equitable water access. We illustrate these points through a case study of PDW consumption by low income residents in Jakarta, and then identify how a situated UPE framework can help attend to the uneven societal relations shaping different socio-material conditions, within which individual "choices" for PDW are made. For Jakarta, connecting choices of the individual to power relations shaping geographies of urban water access and risk explains the rise in PDW consumption by low income residents as a situated response to the uneven exposure of poorer residents to environmental hazards. We conclude with reflections on how this can inform interventions towards more just distributions of safe drinking water.

Keywords: urban water infrastructure; political ecology; water governance; water quality; packaged drinking water (PDW); bottled water; Jakarta; Indonesia

1. Introduction: The Growth of Packaged Drinking Water Supply

In 2008, packaged drinking water (PDW) became the drinking water supply for the majority of residents in the Indonesian capital city district of Jakarta [1]. Since then, reliance on PDW for safe water supply has increased, so that in 2017, 72% of households reported drinking PDW, 15% drink groundwater, and 14% drink piped water [2]. Although Jakarta surpasses national trends in the consumption of PDW, consumption of PDW for all of Indonesia has grown at more than 12% annually over 2009–2014 [3], is used by more than 40% of the country's urban residents, and an increasing number of low-income residents [4]. This has led the World Bank to identify the rise in PDW consumption as the defining trend of the Indonesian water sector over the last 15 years, making the statement that although more households in Indonesia now have access to piped water, they are not drinking it, especially in cities [4] (p. 14).

The rise in consumption of PDW by lower income residents of Indonesia's cities illustrates global water and development trends, where the growth of PDW as a source of drinking water supply is documented in cities where improved water sources from the tap or the ground have never met

drinking water quality standards or been universally accessible. Despite the emergence of PDW in the urban water landscapes of what the International Bottled Water Association terms "developing economies" over the last decade [5], the study of PDW as a form of water supply is only recent. Most social science studies of PDW explain this phenomenon as a commercial product, a luxury, and a source of waste—not as a source of supply [6–9]. Where PDW is studied as a water supply, largely in contexts where access to improved sources is not universal, or safe for drinking, research is overwhelmingly focused on the water quality of this supply [10]. Research on PDW quality has increased awareness of the role of PDW as a source of water supply in contexts where the majority of the world's urban residents live—cities where piped water is not universally accessible, or safe for drinking without prior point of use treatment [11]—and have reinforced the importance of water quality as a dimension of equitable water access [12,13].

However, as we go on to argue, the explanatory frameworks used in the disciplines conducting the vast majority of research on PDW supply are only able to provide a partial, and what we identify as a-political, understanding of PDW. This, we contend, conceals how PDW supply might redress or reproduce the unevenness of water access or water related risks. We explain this analytical gap as the result of the dominant approach to understanding PDW supply through an analysis of the individual making "choices" for PDW supply, disconnected from the wider societal processes and social relations shaping choices. We argue this power neutral analysis delimits understanding of how PDW supply relates to urban water inequalities to what can be identified through the individual (affordability, health impacts), and therefore addressed through the individual (improving choices). Alternatively, it acknowledges—and then closes off for investigation—the identification of power relations and societal processes shaping individual choices in what are termed "governance failure", or "gaps in service provision'". As a result, the current dominant understandings of PDW supply do little to acknowledge the politics of PDW supply—what uneven power relations it responds to, and what this means for reproduction or contestation of these inequalities. Here is where we suggest a (re)theorizing of PDW supply can benefit from a situated Urban Political Ecology (UPE) analysis. This approach holds power relations as central to explain how and why urban residents live in vastly unequal conditions—with differential access to water and exposure to environmental hazards—and what this means for the unevenness of choices on how to secure safe drinking water. Towards this, we build on recent calls for a situated UPE analysis of the politics of urban water, decentering the piped network as an object through which to analyze both how power shapes distributions of water, and as an axis upon which inequalities are defined [14–16].

We develop these arguments for why it is important to understand PDW supply through an analysis of the wider politics of urban water distributions through the case of Jakarta, Indonesia. We take Jakarta as an example of one of many cities where access to piped water has never been universal or safe, and the consumer choice for PDW is not one made between tap and bottle, but between a variety of sources and providers. We anchor our analysis of the conceptual and practical limitations of understanding PDW supply through frameworks of individual choice in existing practices of household water supply—how PDW supply is used, by whom, and in what combinations with other flows of water in the city. Our documentation of these practices draws on empirical data collected in Jakarta over different periods from 2014–2017, and includes household water supply surveys, PDW consumer surveys, interviews with key informants in national and provincial government agencies, and international development partners. Our identification of the politics of choices for securing safe water concealed by dominant explanations for PDW supply is supported by empirical data collected over this period, but is also informed by our previous research on the politics of water supply in the city [14,17–19]

2. Situating Explanations of PDW Supply

In this section, we review the current research on PDW in cities where PDW exists within a variegated water provisioning landscape. We document how PDW has been studied as a consumer

product, and as a form of supply, in order to discuss how a situated UPE analysis of urban water distributions enables a (re)theorization of the politics of this supply.

Much of what is known about PDW in cities where the universal provision of drinking water from the tap has never been the norm is through the study of PDW as a consumer product, rather than a form of supply. Consumer research reports assess the contours of the PDW market in various regions to establish who the individual consumers are, what type of water they consume, and how much—in the Philippines [20], Indonesia [3,21], Jordan and Lebanon [22], and globally [5,23]. Reports on the shift of the global market for PDW to lower- and middle-income countries mirror the documentation of demographic trends, noting rise in household consumption of PDW in water and development sector reports, such as in Indonesia [4], Mexico [24], and Lao [25].

Understanding PDW as a consumer product uses consumer analyses to explain the rise in PDW consumption in these countries. Here, analysis of the influence of advertising and marketing strategies on individual perceptions of water quality [26] mirrors the approach to understanding PDW in the west, where historically, universal provision of water has meant PDW is not understood as a form of supply, but as a consumer product. In her 2017 review on bottled water research, Hawkins identifies the question dominating research globally on bottled water as "why consumers choose PDW over piped water" [27] (p. 3). She also notes that answers to this question have been concentrated in disciplines of business studies and psychology, investigating how marketing strategies have contributed to this expansion of a product which could be had for "free" from the tap [22,28–31].

Findings from consumer reports in "emerging economies" have explained consumption—or choices—of individuals for PDW in relation to a range of individual level factors. However, interestingly, the significance of income level in predicting consumption patterns is not conclusive. For Jakarta, this has set up certain paradoxes, as the poorest residents of a city are amongst those who "choose" the highest per unit volume source of water [19]. Consumer studies show that income level is not the most important or key individual factor shaping choices for PDW in Jakarta [32], Manila [20], Bandung [33], and Accra [34]. These results challenge the understanding of PDW as a result of consumer habits driven by rising income of a growing middle class [23]. Explaining what then drives consumption of PDW, if not income, has led to an even more detailed focus on the individual consumer to explain PDW supply. Stoler documents a growing evidence base of micro-consumer studies for West Africa, where an increased specification of who is consuming explains what are identified as "choices" in drinking water as a "budding evidence base regarding microeconomic consumer trends that have helped us better understand who drinks sachet water, where, and what individual level factors shape their choices" [12] (p. 4).

The shift from understanding PDW as a consumer product, to one of understanding PDW as a form of supply, has been largely driven by public health research. Like consumer analyses, public health research has overwhelmingly focused on the water quality of PDW, but quality is used to analyze impact of consumption on health of individuals, rather than the influence of advertising or marketing. This early focus of public health researchers on PDW was driven by concerns over health implications. In many cities where PDW is consumed across income levels, there are variations in quality within an essentially self-regulating domestic PDW market. Stoler highlights variations in quality for sachet water in Accra [13]; Sharma and Bhaduri flag that contamination events are under-reported in Delhi [10]; and online media documents contamination events are still occurring in Indonesian cities [35]. However, over the years, as general conclusions seem to be that quality of PDW is improving through self-regulation of the domestic industry (for Indonesia, see World Bank, 2015 [4]; for West Africa, see Stoler (2017) [12], public health research has highlighted the significance of PDW as form of supply in contexts where it is of superior quality to other "improved" sources. A recent systematic review of global research on PDW water safety concluded PDW products are substantially less likely to be contaminated than alternative water sources for consumption, including piped water [36]. Public health scholars have also documented better quality of PDW in comparison

to other point-of-use treatment options (boiling, ceramic, solar disinfection), which are, for variety of reasons, not adopted, or not applied correctly [37].

This focus on the quality of PDW supply and health impacts has shown how choices for safe drinking water are both more limited, and more heterogeneous, in cities where there has never been universal access to safe drinking water. As there is no "choice" to make between drinking water from the tap or drinking PDW—because tap water is either not accessible, or not safe for drinking—it is thus problematic to understand PDW only as a consumer product. However, although public health research has shown how choices of individuals are influenced by the contexts in which they are made—what other options are available, and to whom—it can do little to analyze how the unevenness of these contexts, and the choices made in them, are shaped by power relations. Public health, like consumer studies, focuses on the individual to explain choices, and subsequent health outcomes—choices of how to secure safe water are understood through an analysis of the individual's knowledge of disease transmission, attitudes, and hygiene practices. In Indonesia, Nastiti et al. (2017) identify choices of low-income households for PDW supply as a health risk aversion strategy informed by individual level, rather than societal, factors [33]. In Accra, Ghana, public health research, which aimed to understand PDW supply through analysis of both individual and community level factors, still rooted its four hypotheses explaining choices for PDW in the analysis of the individual: demographics, water knowledge, attitudes, and other individual level factors [34].

This also means that the understanding of PDW supply generated by public health research is power neutral, or what we identify as a-political. As choices for how to secure safe drinking water are understood through the analysis of the individual, they remain disconnected from wider societal processes or social relations. While public health is unable to ignore the limited options for safe drinking water, given their own research results, they are unable to interrogate the unevenness of choices, or impacts of choices, beyond a frequent reference to the "gap" in provision of piped water. This "gap in service provision" is what both public health researchers and consumer studies often default to for explanations of limited choices [12,26]. For consumer analyses, these gaps in service provision are included through the analysis of the individual—how PDW responds to consumer preferences for water quality, convenience, or perceptions of affordability [32,38]. For public health, societal inequalities are observed through the individual level factors shaping consumption, such as distance to improved water source. Explanations of gaps in service provision are often limited to the concept of governance failure [12,26]. This explanation tends to be power neutral, as gaps are seen as the inability of government to provide potable water to all, rather than any particular exclusions or inequalities in access shaped by power relations (exception: [34]). Conclusions tend to identify good governance as a remedy for "gaps in service provision" correcting the "missed opportunities" [12] (p. 2), rather than acknowledging how distributions of water to one place comes at the expense of reduced quantity and quality for other places.

Here is where UPE analysis of urban water distributions can contribute to understanding of PDW supply, offering analytical tools to build on existing understandings of PDW supply based on analysis of the individual. Specifically, it can attend to how "gaps" in provision—and thus responses to these gaps—are produced by uneven social relations and societal processes beyond the individual. Documenting the heterogeneity of water supply and infrastructure, UPE researchers point out that heterogeneity is not neutral. For example, research in Lilongwe [39,40] documents how differences in water quality provided by the piped network are shaped by the social relations through which maintenance practices occur, so that lower income areas of the city have poorer quality of piped water. Recognizing the unevenness of conditions in which choices for how to secure safe drinking water are made indicates these social relations are not power neutral—they reflect power differences. How this unevenness is produced demands grappling with questions of power and politics, and connects PDW supply to broader politics of urban water supply. A UPE approach to understanding PDW supply thus calls attention to how "choices" are shaped by the relations of power, producing uneven existing distributions of both water and water related risk across the city.

The limitations of an approach to understanding PDW supply through water quality or the individual have been noted before, but represent a very small sample of the research contributing to our understanding of PDW supply. In 2014, Sharma and Bhaduri showed how notions of purity (suspicion of tap water quality) or scarcity (gaps in service provision), cited by individuals as reasons for PDW use in Delhi, are shaped by broader sets of social relations [10]. They conclude that understanding PDW supply requires a more nuanced analysis [10] (p. 6) of the societal processes creating different conditions across the city. This observation has also been made for understanding PDW supply in Accra, as Morinville (2017) calls for discussions of sachet water in Accra to acknowledge the deeply political nature of water access in Accra, and uses a UPE analysis to show how choices of individuals are shaped by the different geographies of water access [41].

We agree with these previous observations of the politics of PDW supply, while noting the importance of situating analyses of the politics of urban water distributions, within which PDW is inserted [16]. While choices for PDW supply are shaped by the uneven social relations producing heterogeneous piped water service delivery [41], they are also shaped by flows of water and power not contained by infrastructure. For Jakarta, as we turn to document, situating analysis of urban water politics entails recognizing how connections between power and groundwater and piped water create uneven geographies of urban risk [14], and generates different kinds of choices by individuals on how to secure safe drinking water.

3. Research Design

We anchor our call to (re)theorize the politics of PDW supply within the existing water supply practices of low income households in Jakarta. Our analysis of how PDW is used, by whom, and in what combinations with other flows of water in the city draws on quantitative and qualitative data collected as part of a study on water access by the urban poor conducted from 2014–2017. The data collection conforms to the Amsterdam Institute of Social Science Research ethics principles (All households, consumers, and water sector personnel interviewed verbally indicated their informed consent prior to the survey or interview being conducted, following an explanation of the project and information being collected, and a guarantee of maintaining the anonymity of respondents, following the principles of voluntary participation in research, safety in participation, privacy, and trust [42]. Situating our analysis of individual household PDW consumption within the uneven geographies of access in which they are consumed draws on qualitative data collected over 2015–2017, and is supplemented by previously published historical analyses of the politics of the city's water infrastructure.

We analyze quantitative data drawn from two sets of household surveys. A first round of survey data on water supply was collected from April to November 2014 in three sub-districts (Kelurahan): Penjaringan, in the North Jakarta municipality, and Gedong and Ciracas, in the East Jakarta municipality ('Survey A'; n = 189). The sample was taken from lower-income neighborhoods (Rukun Warga/RW) in these sub-districts, identified through interviews with the sub-district heads and staff of development organizations working in these areas. A second round of data collected between July and December 2015 ('Survey B'; n = 80) specifically targeted customers of refill PDW in Penjaringan, Gedong, and Kampung Tengah—the latter location replacing Ciracas, for reasons of ease of accessibility.

The 2014 survey instrument documented household income, household water sources, volumes used per source and per unit, monthly expenses per water source, and mechanism of access. Data was collected by means of a stratified sample (n = 189), with 104 surveys collected in the southern locations (Gedong n = 55 and Ciracas n = 49) and 85 in the north (Penjaringan). The 2015 PDW customer survey recorded socioeconomic status, water sources accessed, and perceptions of price and quality of these sources. A total of n = 80 questionnaires was collected, 40 of which in Penjaringan and another 40 in Gedong and Tengah. Households were chosen by means of a systematic-sampling procedure from lists of customers from 12 refill water depots, with households randomly chosen from the 12 PDW providers. The providers were chosen through a purposeful sample of low-income

neighborhoods in the sub-districts and identified through interviews with the local administrative leaders (Rukun Warga /Rukun Tetangga leaders), and interviews with corporate social responsibility program staff of dairy company Frisian Flag (Jakarta, Indonesia), which runs a water supply, sanitation, and hygiene program in the three sub-districts.

We purposefully selected low income neighborhoods in Jakarta to document these practices and explore the societal relations through which they can be explained. We did so given our concern with equitable water access; it is neighborhoods like these where PDW supply may increase inequalities in access based on affordability, raising percentage of monthly income spent on water supply above 5% [19]. But it is also in these neighborhoods where the identification of PDW supply as and increasing inequality seems to provide little explanation for why residents are increasingly "choosing" PDW for supply. Perhaps most significantly, neighborhoods like these are the ones where the inequalities that PDW choices might respond to are being ignored by current water sector interventions who document, but fail to see the relevance of, use of PDW supply by households newly provided with access to piped water. We also take these research sites in Jakarta as representative for other low-income urban areas across Indonesia, where consumption of PDW is growing rapidly.

Sub-district Penjaringan is located along the coastline of Jakarta Bay. Although the socio-economic status of the district is improving, it has historically had a very high density of both legally occupied low-income communities, and illegal informal settlements along the riverside and under toll roads. The research sites in the south-eastern area of Jakarta (sub-districts Gedong, Kampung Tengah, and Ciracas) are all adjacent sub-districts geographically located in the southern half of Jakarta, but administratively part of the East Jakarta municipality. These districts became urban as the city expanded in the 1980s and land use changed from agricultural to residential and commercial.

Geographical conditions related to household water supply differ between the two areas. Penjaringan is low-lying and flood prone; given its coastal location, the shallow sub-surface groundwater is saline. In sub-districts Gedong, Kampung Tengah, and Ciracas, shallow sub-surface groundwater is still fresh and used for consumption and non-consumption purposes. For piped water access, Gedong, Ciracas, and Kampung Tengah are served by PT. Aetra, a private sector water supply company covering the eastern half of Jakarta. In Penjaringan, piped water supply services are supplied by PT. PAM Lyonnaise Jaya (PALYJA) (Jakarta, Indonesia), the private sector water supply company responsible for the Western half of the city. All the residents surveyed in these areas have a KTP (Kartu Tanda Penduduk, citizenship card) and can show proof of PBB (Pajak, Bumi, and Bangunan), a land and building tax payment receipt, except when the respondents are renters. Residents who have these documents are eligible for a piped water connection on their premise.

4. Understanding PDW Supply in Low Income Neighborhoods of Jakarta

4.1. Practices of Household Water Supply

We start with documenting the practices of PDW consumption in our research sites: who uses, how much, and what kind, and in what combinations with other sources. Our household survey (A) in 2014 found the majority of households (77%) surveyed in the northern and southern research sites consume at least one form of PDW (refill and/or branded) (Table 1). As Survey B sampled for refill PDW users, all of the participants consumed PDW.

Table 1. Mean monthly household income, poverty level, and PDW consumption per data collection round and research location. (Source: Authors)

	Average Household Income *	Share of Households below poverty Line **	Share of Households Consuming PDW **	Average Household Income *	Share of Households below poverty Line **	Share of Households Consuming PDW **	Average Household Income *	Share of Households below poverty Line **	Share of Households Consuming PDW *
Survey A	**Penjaringan**			**Gedong and Ciracas**			**Total**		
	4.77 (352.03)	50.58	82.35	5.17 (381.55)	50.96	76.92	4.99 (368.26)	50.79	79.37
Survey B	**Penjaringan**			**Gedong and Kampung Tengah**			**Total**		
	3.69 (272.32)	67.50	100	4.13 (304.79)	57.50	100	3.90 (287.82)	62.50	100

Note: * in million Rupiah (USD) ** in percentages.

Household income is comprised of all incomes of the individual household members plus other one-time monthly incomes where applicable. Using the poverty line (4.4 IDR/household/month) for Jakarta favored by the Ministry of Planning and Development (BAPPENAS) (Jakarta's official poverty line, as set by the Indonesian Central Bureau of Statistics' (BPS), is IDR 2.15 million or USD 158 per household per month. At an average household size of four [43], this translates to just above USD 1.40 per person per day and lies, therefore, even below the internationally used USD 2 per person per day cut off. Walter et al. [32] and Deny [44] explain how this measurement is contested and inaccurate, we find between 50.79% and 62.50% of households surveyed in this study are under the poverty line. As shown in Table 1, the average incomes of households in the PDW consumer survey are marginally lower than in the 2014 sample, since the former focused more specifically on low-income neighborhoods in the research locations. Nevertheless, both sets of results confirm the socio-economic status of the survey population as "poor".

Both surveys indicate that most households choose either branded PDW or domestically produced refill PDW, rather than combining the two (Table 2). Refill PDW (air isi ulang) is priced at around 5000 Indonesian rupiah (IDR) (USD 0.37) per 19 L, three times less expensive than brand name PDW, which is sold on average at IDR 15,000 (USD 1.11) per 19 L. Refill water is typically provided by small-scale water entrepreneurs, of which there are over 8000 estimated to be operating in Jakarta. Refill water providers purify groundwater on premises through various membrane-based filter systems, following delivery of bulk water trucked into the city from nearby springs. These are often family run businesses, owned and operated by residents who live in the neighborhoods they serve. What we call branded PDW is the bottled water produced by large corporations in an industrial production process [26]. Along with the difference in cost with refill water, there is also a difference in how water quality is regulated; branded bottled water quality is regulated by the Consumer Protection Agency, and refill water quality is regulated by the Ministry of Health, through random water quality analyses by sub-district health offices.

Table 2. Overview of PDW consumption patterns in northern and southern research locations according to type (**a**), purpose (**b**), and quantity (**c**). (Source: Authors)

		Penjaringan		Gedong and Ciracas (A)/Kampung Tengah (B)		Total	
a) PDW USE: TYPE (SURVEY A) *							
Refill PDW only		14.12		23.08		19.04	
Branded PDW only		64.71		47.12		55.02	
Combination refill/branded		3.53		6.73		5.29	
Total		82.35		76.92		79.37	
b) PDW USE: PURPOSE (SURVEY B) *							
Drinking only		35		7.5		21.25	
Home enterprise only		5		0		2.5	
Drinking and cooking		45		67.5		56.25	
Cooking and home enterprise		0		5		2.5	
Drinking and home enterprise		7.5		0		3.75	
Drinking and cooking and home enterprise		7.5		20		13.75	
c) PDW USE: VOLUME **							
		Survey A	*Survey B*	*Survey A*	*Survey B*	*Survey A*	*Survey B*
Branded PDW	*Average*	179.00	123.44	117.38	95.64	148.19	109.54
	Minimum	19.00	50.40	19.00	30.00	19.00	30.00
	Maximum	608.00	172.80	304.00	152.00	608.00	172.80
Refill PDW	*Average*	131.07	312.36	231.28	196.84	181.18	254.60
	Minimum	57.00	76.00	19.00	76.00	19.00	76.00
	Maximum	465.00	2128.00	570.00	1368.00	570.00	2128.00

Note: * in percentages, as share of total households ** in liters, per household per month.

In the sites we surveyed, PDW is used most commonly for drinking and cooking and the volume of PDW consumed per household per week ranges from between 19 L and 532 L. For households who only use PDW for drinking or cooking only (77.5% of all surveyed households), the range is between 38

to 57 L/week. This corresponds to two to three "gallons" (of 19 L each) of refill PDW/household/week, or 1.23 L/person/day to 1.85 L/person/day, using an average household size of four.

None of the surveyed households rely on PDW as their only water source (Table 3). PDW supply is combined with what the Government of Indonesia classifies as "improved domestic sources"—shallow groundwater or piped water supply. The equation of these sources as "improved" in terms of accessibility and safety is problematic, as noted by other researchers, as they still require treatment at point-of-use level before drinking.

Nastiti (2017) notes that despite the adjustments made within water and development goals in the SDGs, the Indonesian criteria for what constitutes an improved source has not changed very much since the MDGs—categories of improved versus unimproved are still associated with the type or source of water, rather than the quality of service provision [33] (p. 138). The Indonesian government specifies the "4K" criteria for improved sources in Indonesia (kuantitas or quantity, kualitas or quality, kontinuitas or continuity, keterjangkauan or accessibility), but the household survey instrument used to calculate the percentage of households with access to an "improved domestic source" asks households about the type of water source used, rather than laboratory measurements of the water quality of the source.

In Survey A, we found the majority of households accessing an improved domestic source through piped water, either directly or indirectly, consume PDW. Households who access groundwater as an improved domestic source were less likely to consume PDW.

Table 3. Household water combinations, in percentages (Survey A). (Source: Authors).

Source	Penjaringan	Gedong and Ciracas	Total
Piped water	10.59	3.85	6.88
Piped water + branded PDW	37.65	19.23	27.51
Piped water + refill PDW	4.71	15.38	10.58
Piped water + branded PDW + refill PDW	2.35	5.77	4.23
Piped water (total)	**55.29**	**44.23**	**49.21**
Nyelang water	7.06	0	3.17
Nyelang water + branded PDW	27.06	0	12.17
Nyelang water + refill PDW	9.41	0	4.23
Nyelang water + branded PDW + refill PDW	1.18	0	.52
Nyelang (total)	**44.71**	**0**	**20.11**
Piped water (direct + indirect)	**100**	**44.23**	**69.31**
Groundwater	0	18.27	10.05
Groundwater + branded PDW	0	26.92	14.81
Groundwater + refill PDW	0	7.69	4.23
Groundwater + branded PDW + refill PDW	0	0.96	0.52
Groundwater (total)	**0**	**53.85**	**29.63**
Piped water + groundwater	0	0.96	0.52
Piped water + groundwater + branded PDW	0	0.96	0.52

In survey A, almost 75% of households consuming PDW for drinking combined this with piped water (direct or indirect access) and 25% combined use of PDW with shallow groundwater (Table 4). This reflects the national trends noted by the World Bank in 2015; more households have physical access to piped water, but they are not drinking it. Examining the two research sites separately, we find that all PDW consuming households in Penjaringan access piped water as the improved domestic source, but only 55% of these households have a direct connection to piped water, while the rest resort to piped water from indirect connections (Nyelang). An indirect connection refers to buying piped water from neighbors with a direct connection to the piped water network. In Gedong and Ciracas, households combine PDW with both piped water and groundwater.

Table 4. Combinations of water sources from PDW-consuming households (percentages, Survey A). (Source: Authors)

Source	Penjaringan	Gedong and Ciracas	Total
Groundwater	0	46.25	24.67
Piped water (direct)	54.29	52.5	53.34
Piped water (indirect)	45.71	0	21.34
Groundwater + piped water (direct)	0	1.25	0.67

In Survey B, we found fewer households connected to piped water directly, with only slightly above one fourth of respondents reporting to have a direct piped-water connection, about half of which are in the Southern research site and half in the North. The overall pattern found in Survey A remains. Households in the South combine PDW with piped water or groundwater, while households in Penjaringan predominantly combine PDW with piped water accessed through indirect connections.

Comparing the findings between the northern and southern research sites, we see differences in PDW consumption according to the improved domestic source accessed. Survey A documents that for the 21% of households from Penjaringan, Gedong, and Ciracas who treat their improved domestic source for drinking instead of buying PDW, the majority of these households prefer groundwater. In Gedong and Ciracas, half of all PDW consumers (76.92%) combine it with piped water as an improved domestic source, and half with groundwater. The remaining 23.08% of households—those that do not consume PDW in Gedong or Ciracas—are overwhelmingly those drinking shallow groundwater (18.27% versus 3.85% for piped water). Where groundwater is available and viable, households not drinking PDW are more likely to rely on access to groundwater than on access to piped water. This contrasts with the trend we find in Penjaringan, where use of shallow groundwater is not possible because of its high salinity, so comparatively more households (82.35%) buy PDW than in the South, which they combine with piped water accessed directly (about 54%) or indirectly (about 46%, see Table 3). Residents not consuming PDW drink piped water, and are more likely to do so when accessed directly through an in-house or yard connection (10.59%) than accessed indirectly through neighbors (7.06%).

4.2. Explaining PDW Supply in Indonesia through an Analysis of the Individual

Using consumer analysis, or a public heath analysis of the individual, our survey results indicate PDW supply is the "choice" of the majority of low-income households in our research sites. If our results are interpreted through these explanatory frameworks, our findings could be investigated as to how they respond to preferences of individuals—taste, perceptions in water quality, perceptions in affordability, convenience. Indeed, research on PDW supply in Indonesia has explored the rationality of the choices made by households, investigating why and how it is perceived as better quality [26,37], more affordable [32], or more convenient [33]. However, we note that these analyses are all still power neutral, as choices are not explained as connected to societal relations.

The dominant understanding of PDW as an a-political consumer choice is reflected in our 2015 interview with a senior official from the National Development Planning Agency (BAPPENAS) responsible for water sector planning,

> "We haven't paid a lot of attention to refill water. That is because in Indonesia, households have more than one water source, so we focus on the domestic use. And if the households choose to fulfill their drinking water need through drinking refill water that's a choice, as long as they have enough water supply through an improved source. And, for Jakarta, this is mostly piped water."

As this statement indicates, the criteria currently used to determine whether or not PDW is a consumer choice—irrelevant for development planning—or a "necessity" (and therefore not a choice, and of relevance to inequalities) is access to an improved domestic source. As all the households

in our survey are considered to have access to an improved domestic source, their consumption of PDW is therefore understood as "consumer choice". These too are the conclusions from water sector development interventions when persistent use of PDW by low income urban households is observed following expansion in access to piped water [45,46]. Although there is concern over the water quality of refill PDW [4], the interpretation of PDW supply as a "consumer choice" in the Indonesian water and development sector has removed PDW supply from discussions over water access, and inequalities in access, except in cases where an improved domestic source is not available. This shapes the current development focus on increasing the percentage of population with physical access, without too much attention to the quality of access, as summarized in our interview on water sector development priorities with a World Bank water and sanitation specialist who explains,

> "At the moment in Indonesia it is more important to expand access for the people, so people at least have improved water and sanitation services. Whether it has to be potable or not . . . I think that's the second layer of priority."

What, then, is the problem with this explanation and the interventions is rationalizes? First, our survey results, and reviews of development interventions, suggest PDW does not go away with access to piped water. We find households do not consume PDW because of a lack of access to an improved domestic source, and consumption of PDW is more likely if they have access to piped water than if they rely on groundwater. The "choice" of PDW supply by low income households is therefore not a "temporary necessity" until access to piped water is provided. However, as we go on to show below, even with access to an "improved domestic source", the "choice" should be seen as an uneven one, shaped by social relations creating inequalities in access, and therefore relevant for a sector concerned with reducing inequalities in access.

4.3. Towards the Politics of PDW Consumption: Societal Processes and Social Relations

4.3.1. Inequalities within Access to Improved Piped Water Domestic Sources

The classification of piped water as an "improved domestic source" within the Government of Indonesia water and development monitoring framework conceals the heterogeneity of piped water services in Jakarta—continuity, reliability, and quality of water supply differs across the city. This heterogeneity is not a power neutral "gap in service provision", but is shaped by uneven social relations [14,17,18]. We focus here on how differences in access within the piped network affect choices for PDW, pointing to how inequalities in the quality of piped water services across the city affect equitable access to safe drinking water.

In previous research, we have documented how in the same survey population in Penjaringan, it is the richest households who are more likely to drink piped water, after point of use treatment, than the poorest households, even though all have some sort of connection to piped water [19]. Richer households are also more likely to have a formal, individual connection to the piped network, whereas poorest households were more likely to have access to the piped network through an indirect connection (*nyelang*) to a neighbors' connection [19]. These differences in access are relevant for PDW consumption, because they imply different per unit volume costs, and affect reliability and quality of piped water. The price per unit volume of water from an indirect connection is much higher than a formal connection (2.13 USD/m^3 for nyelang vs. 0.38 USD/m^3 for formal access) [47], and is less secure. In our conversations with residents in Penjaringan, they reported the price can vary depending on negotiation with one's neighbor, and fluctuates according to demand and supply. The reliability of water supply through an indirect connection also depends on the direct connection from neighbors, whose own reliability fluctuates. In 2015, 85% of households with piped connections in Penjaringan report less than 8 hours of service/day, and only one household had a full 24-hour connection (Survey B). This shows how poorer residents in Penjaringan have a lower level of access to piped water than do better off households, shaping their degree of reliance on—or influencing the rationality of their "choice" for—PDW for safe drinking water supply.

Maps of low water pressure and hours of continuous service reported by the Jakarta Water Supply Regulatory Board in 2014 [47] indicate poor performance over the majority of Jakarta, but most concentrated in the northern half (Figure 1), where sub-district Penjaringan is located. Our interview with the PT. PALYJA pro-poor service unit staff confirms what we heard from Penjaringan residents—the piped water provider will not add new connections to areas where water pressure cannot be guaranteed. Of course, the low, or negative, water pressure in the underground distribution pipes is also correlated with the quality of piped water, another difference shaping the consumption of PDW by low income residents. All residents in Penjaringan using pipe water rely on household water storage, providing opportunities for recontamination after treatment. Residents report frequent problems with the color of water (brown) and visible dissolved solids, as negative water pressure in a leaky underground distribution system results in infiltration of wastewater.

Differences in piped water pressure and implications for differences in piped water quality has been shown in other cities to shape choices for water treatment options, including PDW [10,33,48]. This is highly relevant for Jakarta, where differences in access within the piped network are significant, and 10% of the total number of piped connections are reported as "zero consumption" due to low water pressure [49]. Although the two private sector service providers for Jakarta state 60% of households have access to an improved source through piped water [49], this number is contested based on the quality of access provided. Our interview with a senior official in the Ministry of Public Works estimates a much lower service coverage of 39%, while civil society organizations say this is even lower, at 25% [50]. Both the senior government official and civil society reports highlight that not all areas covered by the piped network receive piped water supply; water pressure is low, and some areas of the network receive only intermittent, or no water supply [47].

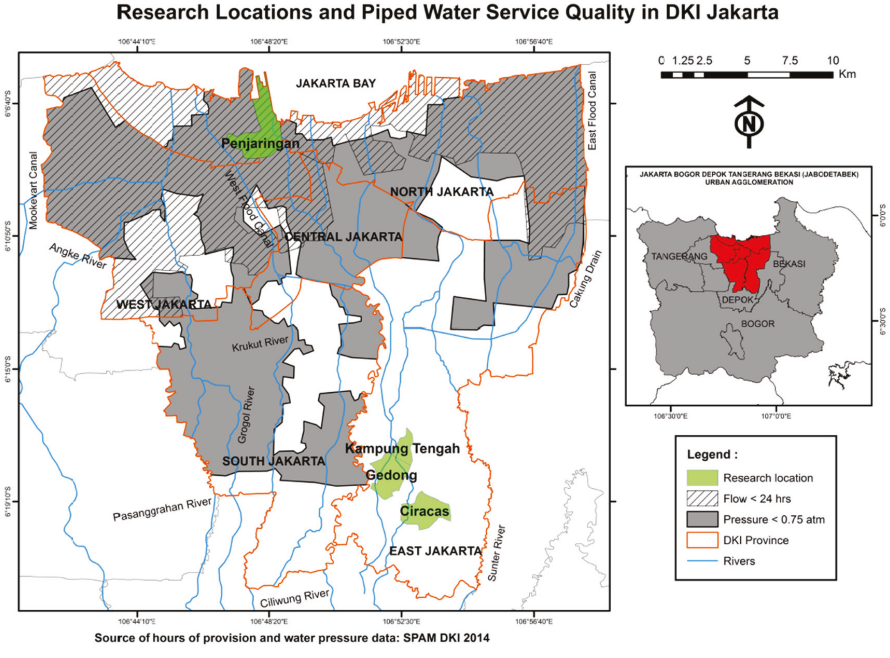

Figure 1. Research locations in North Jakarta (Penjaringan) and East Jakarta (Gedong, Kampung Tengah, Ciracas), and piped water service quality in DKI Jakarta. (Source: Authors)

The unevenness of piped water supply is not power neutral, as it reflects the unevenly experienced impacts of the privatization of water supply in Jakarta and institutional disincentives to serve the

poorer areas of the city under both public and private operation of the city's piped water supply [51], alongside historically produced socio-spatial inequalities in access to urban services [18]. The design of current urban water sector development interventions in Jakarta suggests uneven social relations still inform sector planning. Previous interventions in improving piped water quality in Jakarta suggest that where the quality of water from piped network will improve first will not be in low income areas. Limited initiatives on improving water quality by the private sector water providers have focused on elite areas of the city, where non-revenue water loss is low, and—perversely—groundwater quality is high (interview with PT. Aetra). Current sector documents identify priorities of flood defense as driving network improvements into areas of high value consumers, who are now abstracting deep groundwater from the contained aquifer [49]. Concerns of the sector regarding the rise in PDW, as discussed with World Bank employees and water service provider staff, are over the permanent loss of high value consumers of piped water, who help utilities to recover costs, rather than concerns with inequalities in access to safe water.

4.3.2. Inequalities within Access to Improved Groundwater Sources

Groundwater is the most commonly used improved domestic source across Jakarta: 64% of households report use of groundwater, and 24% of households use combinations of groundwater and piped water [2]. Similar to national trends [4], Jakarta achieved its Millennium Development Goal targets for increased access to an improved water source by classifying groundwater as 'improved'. However, like for piped water service, the quality and accessibility of groundwater is highly variable across the city. Our research results indicate how differences in access to shallow sub-surface water for drinking water are shaped by sets of social relations and societal processes, which produce the differently situated choices of individuals for securing safe drinking water.

In Penjaringan, the shallow sub-surface groundwater is saline, reflected in the almost universal use of piped water for domestic uses. In the southern areas of Jakarta, where shallow groundwater is not yet saline, it is likely to be contaminated with e-coli, given the absence of proper wastewater treatment systems in the majority of the city [4]. Fecal coliform can be removed through proper water treatment, such as boiling to provide safe drinking water, although issues of recontamination of stored water after boiling, or proper boiling time, affect safety [37].

In our household survey (Survey A), we find an equal number of the lowest income households in Gedong and Ciracas combine PDW with piped water compared with shallow groundwater. As for piped water, there are differences in access to groundwater; namely, differences in quality, which shape the degree of "choice" for PDW between population groups in Jakarta. First, there are large differences between the fecal and priority chemical contamination found in deep groundwater in the contained aquifer versus the shallow sub-surface groundwater flows. The National Development Planning Agency estimates that 45% of all groundwater in the shallow sub-surface is contaminated with fecal coliform [52], while the Provincial Environmental Management Agency doubles that estimate, putting it at 90% [53]. We did not conduct microbiological analysis of shallow groundwater, but we do know that low income urban settlements are much more likely to lack access to sanitation (56% of poorest urban households versus 90% of richest urban households) [4] (p. 40), and are more likely to lack access to sanitation providing proper wastewater treatment [4] (p. 15).

Monitoring of the deep groundwater flow system for Jakarta shows contaminated water from the shallow sub-surface does not percolate to the contained aquifer, except in the northern areas of the city, where the recharge system has reversed [54]. We also point to water quality analyses of deep groundwater in the nearby city of Bandung, where groundwater from a depth of 60 meters has the lowest counts of fecal coliform, compared to piped water and shallow groundwater [55]. The superior quality, and reliability, of deep groundwater goes some way to explaining why residents who can afford the high investment and operating costs choose groundwater over piped water. According to PALYJA staff, water supply providers still struggle to convert "key account holders", like commercial housing estates and shopping mall super blocks in central and southern Jakarta, to rely completely on

piped water, as they prefer to recycle the deep groundwater. Access to the best quality and most secure quantity of groundwater from the contained aquifer is based on affordability, as costs of drilling or operation are not subsidized, and are shaped by other social relations, as political connections enable the illegal use of deep groundwater in northern areas of the city where it is banned [56].

These differences in access to groundwater are produced through historical social inequalities, and are related to inequalities in access to piped water. Therefore, current inequalities in access shaping PDW consumption are produced through historical relationships between piped water, groundwater, and wastewater in the city [14]; "choices" for PDW supply are much more than a response to "temporary" inequalities. Thus, the degree of choice for PDW by individual residents of the city is not evenly distributed, but situated. Some residents have more "choice" due to processes and relations which go beyond their individual capacities, knowledge, and agency.

5. Discussion: More than Temporary Inequalities

In this article we have used the case of PDW consumption by low income residents in Jakarta to call attention to the politics currently absent from dominant understandings of this new form of supply. Reviewing existing research on PDW supply by consumer studies and public health, we have shown how approaching PDW through analyses of the individual making the "choice" to consume PDW removes questions of politics and power. This is the result of analytical frameworks, which disconnect choices for safe drinking water from the sociomaterial environments in which choices are made. In turn, this approach to understanding PDW supply curtails investigations into the unevenness of choices, and fails to recognize how impacts of PDW supply on inequalities are situated, with more ambiguous outcomes on access. More practically, for Jakarta, we have shown how this explanation fails to accurately identify who is consuming PDW, why, and for how long this might be the case.

In response, we have illustrated how a framework of situated UPE offers scope to (re)politicize dominant explanations for PDW supply. Specifically, UPE enables a theorization of PDW politics by tracing how uneven societal relations shape the uneven geographies of access and risk, within which individual "choices" are made. For Jakarta, we have illustrated how analyzing PDW through the politics of wider urban water distributions allows for recognition of how choices for how to secure safe drinking water are connected to other flows of water and power. Our analysis of how PDW supply is used in low income settlements, by whom, and in what combinations with other water sources, highlights the historical—not temporary—inequalities in water quantity and quality which PDW supply responds to, and points to the uneven social relations producing these conditions.

Understanding the politics of PDW supply is relevant for water and development sector interventions, especially those implemented under the mandate of SDG 6 to reduce inequalities in access. First, the sector must recognize that the relationship between PDW supply and inequalities in access is more complicated than current binary classifications of PDW as a consumer choice of the middle class, or as a temporary necessity of urban poor residents without access to piped water supply. Rather, the impact of PDW supply on access is situated, depending on the existing environmental inequalities within which it interacts. Reducing inequalities in access to safe water therefore requires interventions to redress power relations, going beyond the tendency to focus on, and leaving responsibility with, individuals.

Understanding the ambiguous impact of PDW supply on inequalities in access is important for Jakarta, but also for other cities where piped water quality has never been safe for drinking. In Indonesia, the current development focus on reducing inequalities by extending access to the network, rather than improving it, will not remove the necessity of PDW, or other treatment options, in the near future. This is especially true given suggestions of how increased supply of PDW is changing perceptions of roles and responsibilities of public water utilities to provide safe drinking water [26].

More broadly, the case of PDW supply in Jakarta underscores the significance of water quality in achieving water equity. PDW trends of increased consumption by low income residents in Indonesian

cities—and we suspect more globally—illuminate historical inequalities in access to different qualities of water. Ignoring water quality and the social relations which shape uneven geographies of access keeps the responsibility for "safe" water supply with the individual, not the state, and leaves the most responsibility for mitigating the poorest quality of water to those who can least afford it. The revision of the water and development indicators measuring access to water under the Sustainable Development Goals do now include criteria for water quality, and as a result have recognized PDW as a potentially improved source of safe drinking water [25]. The rise in PDW supply emphasizes the need to revisit classifications of improved water sources, and to implement this revision within the development monitoring frameworks of individual countries.

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water

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Article

The Legal Geographies of Water Claims: Seawater Desalination in Mining Regions in Chile

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Abstract: The use of desalination has been increasing in recent years. Although this is not a new technology, its use often proceeds within ill-defined and ambiguous legal, institutional, economic and political frameworks. This article addresses these considerations for the case of Chile, and offers an evaluation of legal ambiguities regarding differences between desalinated water and other freshwater sources and associated consequences. This discussion reviews court records and legal documents of two companies operating desalination plants, both of which have simultaneous rights granted for underground water exploitation: the water supply company in the Antofagasta Region and Candelaria mining company in the Atacama Region. The analysis shows that issues of ambiguity and gaps in the legal system have been exploited in ways that allow these entities to continue the use and consumption of mountain water. They do so by producing desalinated water, and by entering into water transfer and diversion contracts with the mining sector. These findings highlight the importance of undefined socio-legal terrain in terms of shifting hydro-geographies of mining territories, contributing conceptually to critical geographies of desalination, delineating the importance of legal geographies important for water governance, as well as empirically documenting the significance of this case to consider shifts for the mining sector and water technologies and uses in contemporary Chile.

Keywords: water; desalination; legal geography; mining; Chile

1. Introduction: Legal Geographies in New Water Technologies

> "Desalination has been identified as a secure source of water, which guarantees supply stability, avoiding the variability that natural resources present and the shortage in the basins of the northside of the country. For that reason, desalinated water is going to be used in those regions (...)".
>
> —Chilean National Strategy of Water Resources [1] (p. 35)

The use of desalination is often proposed as a solution for alleviating drinking water shortages associated with climate change, demographic growth, and attendant water scarcities [2,3]. These socio-environmental needs, coupled with a reduction of the economic cost (technological advances), are supporting the incremental expansion of desalination in many regions of the globe—in the early 1990s, less than 2500 plants were operating and currently there are more than 15,000 [4]. However, despite the promises associated with desalination, critical scholars are observing important socio-environmental drawbacks, such as brine disposal in the marine environment (hypersaline concentrate) and CO_2 emissions associated with the energy consumption required for processing, as well as pumping water from sea level to high elevations [5,6]. Regarding social impacts, studies are showing inequities related

to use and management of desalinated water e.g., often linked with price increases, and uneven water allocation, as well as changes in daily water practices [7,8].

Subsequent work moved beyond examining the effects of desalination, focusing more broadly on hydro-politics. For instance, contributions have highlighted how the technology is proposed for solving transboundary contestations and reducing interdependencies and asymmetrical relations between neighboring countries (e.g., Israel-Jordan, Singapore-Malaysia and United States of America-Mexico in the Colorado River) [9–11]. Such analyses have been critical to highlight environmental and spatial-political contestations associated with desalination promises, showing ways that water technologies play an agential role in shifting nature-society relations. Examples have highlighted such shifts in relation to the privatization of desalination (plants and ocean water), water commodification, and shifting configurations of water governance [2,3,12–14]. Within this body of work, it has been argued that desalination technologies have essentially reversed water flows (traditionally gravity sends water from mountain regions down to coastal areas and urban centers—a pathway that is inverted with desalination). As such, desalination technologies are shifting the socio, environmental, political and economic relations of water [15]. While these insights have been important, the coupling of desalination technologies and shifting water flows with legal spheres has received only cursory treatment, mainly from the perspective of property rights [11]. This article aims to expand the understanding of these linkages—offering a legal geographic analysis to broaden and deepen insights into how desalination is shifting hydro-geographies, water uses, and mining operations in contemporary Chile.

Anticipating the argument that water governance can be shaped by technology, as well as by legal frameworks and knowledges, the concept of the waterscape offers a useful starting point (Budds and Hinojosa [16]). These authors engage the waterscape concept to expand the boundaries of traditional spatial scales and the water's materiality (beyond the watershed), focusing attention on how water is co-produced by social power relations, expressed through e.g., infrastructure, institutions, rights, discourses, legal arenas and technologies. Closely tied with the notion of waterscapes is the broader hydro-social perspective–which involves understanding water flows as being co-produced by socio-economic power relations and technology/ water infrastructure [17]. This framework has become a necessary reference for commentators aiming to describe the relationship between water and society as mutually constitutive [18]. Among other linked contributions, political ecologists have worked to research, explicate, and analyze the ways in which customary patterns, forms of resistance, local knowledge and power imbalances are shaping water cycles [18]. Building upon this framework, legal geographers have analyzed water laws to better understand socio-environmental and socio-economic injustices produced through diverse legal discourses and the multiple overlapping legal frameworks that affect hydro-social systems (covering gaps, ambiguities and the pluralistic character of law) [19–23]. Moreover, critical legal geographers have recently argued that our current legal instruments are often not well adapted to shifting and emergent nature-society dynamics, e.g., artificial water and water requirements for non-humans (animal and plants) [20,24,25]. This work offers an analysis of power imbalances by considering the imposition of legal meanings and discourses over humans and non-humans [22,26,27]. Indeed, access to legal knowledge is often a tool, and one that only certain entities might have access, at the service of spatial-political interventions. The advantages of analyzing legal geographies and nature-society dynamics have been illustrated through the study of natural resources, such as oil, gas and water [19,20,27–29]. Such work has shed light on the multiscalar legal and political geographies, evidencing its effects on environmental governance and ecosystems.

Where does desalination fit in these debates? Despite the rapidly increasing development of desalination in recent years, this is not a new technology. March [30] has traced this technology back in time to sailing vessels employing solar distillation for long expeditions. Later, in 1791, he discusses that Thomas Jefferson reported advances in producing fresh water, and in 1872 there is documentation of the first solar distillation plant installed in Latin America, Chile. This expanding technology, however, is emerging as ever more important in the water landscape of different regions of the globe. Important for our purposes, it is also being implemented in contexts where the legal,

institutional, economic and political frameworks are ambiguous or even wholly undefined. Legal scholars, as well as critical geographers, have stressed such ambiguities, including those pertaining to water rights over the seas (if desalinated water is no longer seawater, does it cease to be public property?) and diverse water management strategies, e.g., privatization of desalination facilities and the water produced [2,10,11,31,32].

Our analysis offers insights as to how these ambiguities are being exploited in ways that allow for companies (those that produce desalinated water) to continue the use of mountain water. They do so through complex articulation with water markets in Chile [33], in ways that serve to shape new water geographies and associated socio-environmental concerns. Related to our intervention here, Rojas and Delpiano [34] (p. 123) have argued that in the Chilean case "there is an area or legal space of desalination, that has been replaced by sectorial regulations, which is generating a patchwork, rather than a legal order". For our purposes, it is important that legal loopholes exist notably for companies operating desalination plants, while having simultaneous and parallel water rights/uses granted for surface water and/or groundwater exploitation.

To advance discussions regarding specific political-legal formations that sustain desalination, and how these socio-legal couplings are reconfiguring hydro-geographies in Chile, we explore these concerns in two dimensions that have not yet been considered by desalination-legal studies: (1) how desalination intersects with existing water rights/uses, and (2) how desalinated water is considered to be equivalent and therefore a substitute for freshwater sources due to its particular characteristics (produced at any quantity and quality). Insights from legal documents and two legal cases are used: Sanitation Service Superintendent v. Council for Transparency 9347–2011; Aguas Antofagasta v. Council for Transparency 9368–2011 (they are companion cases and were litigated together); and, Environmental Superintendent v. Candelaria mining company 140–2016. The case study is important because Chile is likely to become the first country in which desalinated water use will be mandatory for the mining industry—in cases where the fresh water consumption exceeds a rate of 150 liters per second. At the present, the water consumption for the mining sector is composed of direct seawater/desalination; recirculated water, and; surface water and groundwater—either through water rights permits or purchases from third parties (i.e., municipalities, irrigators, water supply companies) [35].

Both projects analyzed in this paper, although differing in many ways (Aguas Antofagasta is the water supply company and Candelaria is a mining company), have some key similarities. For instance, both are not only located in mining territories, but also have water contracts with the mining sector. Water claims against both companies were raised by local organizations (social and public sector), but then, for different reasons, these legal processes were continued by organizations operating at national scales (NGOs and public sector). More importantly, legal discourses in both cases have been constructed in terms of justification for ongoing consumption of mountain aquifers. The analysis is not presented as a comparative study, but is intended to explain the political characteristics of both contexts in order to explore the complex and shifting socio-legal terrain and its interactions with the hydro-geographies of mining, while highlighting water access and quality in different parts of the country.

The outline of the article is as follows: The next section discusses how critical desalination studies can be enriched by engaging with legal geography literature, in order to illuminate gaps and ambiguities of the legal systems and broader legal-political frameworks that might have important implications for nature-society relations. After presenting the methodology, we examine the mining-water nexus in Chile, with special attention to the case study of two desalination plants operating in the Atacama and Antofagasta Regions. The following section explores the gaps of the water legal framework in Chile, both in terms of the desalination permitting process and when desalination intersects with the current water legal system (surface water and groundwater). The paper then turns to discussions of the understanding of new technologies in the legal water system. In the final remarks it is argued that new water technologies are still inserted into a legal system that has failed to recognized how

desalination can shape and be shaped by socio-natural dynamics. In particular, failure to distinguish desalinated water from other freshwater sources results in gaps and loopholes which are currently being exploited by the mining industry.

2. Socio-Legal Terrain in the Advance of Desalination

Desalination, as serving wider political agendas (e.g., by its coupling with economic development and socio-natural pressures) has recently been attracting research interest by critical scholars in geography and allied disciplines [2,10–12,14]. Such analyses served to highlight that desalination is proposed as a 'fix' for solving contestations that are threatening water governance (environmental and spatial-political) over different scalar relations (regional/national and transnational) [2,10–12,14]. By tracing these hydro-social relations, some scholars have also observed that political interactions over water have been reinforced by mutual collaborations through financial agreements, but also by leaving behind contestations and dependency on water transfers [9,10,14]. However, changes in power distribution are observed as shaping water governance and the privatization of oceans [9,10,14].

In these analyses, some scholars have reflected on the intersection of desalination's characteristics with legal and economic frameworks. One of the predominant assumptions is that certain pillars sustaining desalination (legal, environmental and economic, etc.), have contentious characteristics [2,12]. For example in Spain, where desalination was proposed as a 'fix' for urban socio-natural conflicts, it has been argued that desalination is unifying multiple and, sometimes, opposite interests, while at the same time highlighting major concerns, such as: the hegemonic role influencing developmental logics (tourism and agriculture), notions pertaining to legal rights over the seas (the free character of pumping seawater) and the multi-scalar strategies for financing desalination [2,12]. Some of these characteristics were early referred by Meerganz von Medeazza [31] as socially-induced factors, different from direct (i.e., brine and energy), but equally powerful in terms of their unplanned impacts from desalination. This means that in addition to the immediate impacts from the technology's uses, there are other implications derived from the ways that society made use of the technology and the water produced [31].

As a result of the combination of undefined 'techno-legal' frameworks and 'techno-political' characteristics (colocation with infrastructures that increase desalination profit), Williams [11] identifies opportunities for private capital to (re)configure the sphere of water governance. The author demonstrates that legalities are intersecting with desalination in three areas: (1) industrial land zoning and land rights, in terms of suitable locations for desalination and rights to extract water, (2) permitting processes for desalination infrastructure, and (3) new Public-Private Partnership laws for public utilities management. This approach is built on the idea that social relations are flowing through technological solutions, which ambiguous conditions (legal-political) have enabled, in order to transform water into a 'new' cooperative commodity [11].

A legal perspective pushes for consideration beyond conventional preoccupations of political ecologists (power, politics, inequities, ways of knowing and scale). These concerns are important, yet the analysis of power imbalances facilitated and created by legal-political maneuvers offers a new perspective for the understanding of socio-environmental-economic injustices. As Andrews and McCarthy [27] (p. 9) have argued "a political ecology that seeks to examine the full range of contestation over human–environment relationships may, in some contexts, need to devote more attention to the formal political and policy arena and specifically legal geographies". Indeed, legal geography offers to political ecology an important understanding of natural-social boundaries as defined by legal institutions and practices [20,36]. While legal knowledge ruling desalination has been covered mainly from water rights over the seas, notably, what appears to be less developed are the gaps and ambiguities of this legal system in accounting for and distinguishing desalination from other water types/sources. This is particularly important in cases where uses of desalination are intersecting with other water supply sources (mountain water, sewage water and recycled water), and where there is no effort to distinguish water coming from different sources. As we explore in Chile, these legal

loopholes, provide opportunities for ongoing exploitation and reconfigured hydro-geographies of the mining industry.

As such, we engage insights from Budds and Hinojosa [16] (p. 129) particularly emphasis whereby "supply-led technical solutions, proposed and constructed for mining, can significantly modify hydrological regimes and patterns and rules of access". We contend that changes in hydro-social cycles stem from, what we call, the legal coupling. We define this as the insertion of one legal framework into another in order to fill gaps (e.g., loopholes and unclear concepts) for the facilitation of legal-spatial outcomes. This is only one of many ways in which legal and regulatory structures can be changed, deployed and reinforced. Our work suggests that, in desalination, this is enabled by its intersection with broader water legal systems. We understand 'water legal system' as comprising Water Code and Sanitation Law. In doing so, the paper not only adds new dimensions to the discussions of desalination's legal features, but also, to the longstanding debate on 'modern water', wherein water is reduced to its chemical composition H_2O and the social contexts are abstracted [37].

Legal institutions and practices can reveal new definitions of water and, more broadly, approaches to water governance [38]. As such, "With water management being a globally contentious issue, understanding the various interpretations of water underpinning policy could facilitate a critical examination of the assumptions held by policy makers and the likely material outcomes for diverse stakeholders within and across jurisdictions" [38] (p. 170). Here, our emphasis is that legal interpretations of artificial water might expand the understanding of current socio-environmental outcomes. Defining desalinated water, from the perspectives of the public trust doctrine legal principle, and international legislation aiming to protect marine environmental impacts, became a key issue with legal scholars [32,39–41]. Examples of international norms are the United Nations Convention on the Law of the Sea (UNCLOS) and soft laws (the Montreal Guidelines, Agenda 21 and the Washington Declaration). By looking beyond how law responds to technologies in international/national commons, and instead to how socio-legal discourses can make, un-make and re-make spatial forms with corresponding legal spaces and vice-versa [26,36], the study aims to shed light on the complex socio-spatial order, of formal and informal legal instruments, as a product of social power arrangements [26,42–44]. In this sense, we situate our study in legal geography, where urban political ecology has been useful as a means to understand that water policies, environmental needs and social organizations are combining, which represents a (re)politicization of urban waterscapes that creates uneven socio-ecological conditions [12,45].

Focusing on water governance, legal geographer scholars have shown how local communities are challenging national legalities through communal norms of water management and local knowledge [21,23,43]. This is identified as producing plural hydro-social territories [21]. Recently, a less anthropogenic form of water governance is captured by reviewing court cases and the rights of nature 'rivers' to legal defense in court (rights recognized in many Constitutions e.g., Ecuador, Bolivia and Mexico City) [25]. Water requirements for non-humans (animal and plants) have also been proposed through a revision of watershed-scale drought plans, wherein ecological impacts were disclosed as primarily acknowledging impacts to fish [24]. Within this body of work, legal discourses have been highlighted by their particular power in the production of spaces: "The legal process demarcates the boundaries of water politics because the law determines who holds legitimate power to organize, distribute, and manage a region's physical water resources" [19] (p. 615). This means that legal discourses have additional power because the state has participated in their validation and, in its protection, has the force of law behind it [20,26]. Interestingly though, while these studies are quick to point out that these interactions are useful in gaining a better understanding of socio-environmental injustices, desalination technologies have scarcely been mentioned in water-society relations. This paper bridges legal geography with critical geography on desalination technologies. In doing so, it is suggested that it is firstly crucial to understand the existing water legal framework; to do so we use the case of Chile. In the next section we present the methodology used and describe the case study.

3. Methods

3.1. Data Sources and Collection

The research presented here is based on court records, bills and legal documents connected with two different companies operating desalination plants: Aguas Antofagasta S.A., which is the water supply company in the Antofagasta Region and Candelaria mining company in the Atacama Region. The status of the two plants is summarized in Table 1. These methods are complementing and expanding political ecology's methodological toolkit (often composed by field-based research) [27]. Therefore, as was argued by Andrews and McCarthy [27] (p. 9) this allows us "(...) to better understand the legal and political dynamics central to the case that may not be addressed by political ecology's conventional suite of methods". The analysis is not presented as a comparative study, but is intended rather to explain the constrained spaces in the institutional and legal framework of two similar contexts dependent on the mining industry.

Table 1. Companies operating desalination plants under study.

Companies / Desalination Plants		Approved Since	Capacity L/s	Investment (Millions USD)	Final User [1]
Aguas Antofagasta	Desal Tocopilla	2016	200	26	Potable water
	La Chimba	2001/2014 [2]	850	10	Potable water
	Sur Antofagasta	2012	1.000	120	Potable water
	Agua de Mar Antofagasta	2001	602	30	Potable water
Candelaria Mining	Candelaria	2011	300	270	Mining

[1] According to the environmental permit. [2] The plant has been functioning since 2003, but was expanded in 2014.

The data was collected from decisions gathered from the Appeal Court of Santiago (Sanitation Service Superintendence v. Council for Transparency 9347–2011; Aguas Antofagasta v. Council for Transparency 9368–2011) and the Environmental Tribunal (Environmental Superintendence v. Candelaria mining company 140–2016). Since the Law 20417/2010 was enacted, the Environmental Tribunal supplements the new Chilean environmental institutions with the authority to evaluate infractions of the environmental law. These documents are publicly available on each institution's website. Legal documents and bills were collected from websites of the National Congress Library -*Biblioteca del Congreso Nacional de Chile*- and National Congress. Data was triangulated with relevant information available in secondary sources, such as grey literature and newspaper articles covering the court cases.

All Court decisions include the following information: (a) identification of litigating parties (e.g., address and profession) and location of the conflict, (b) type of legal action and details of plaintiff and defendant arguments, (c) detailed description of arguments that, in the court's consideration, served as a basis for the decision, (d) legal references that support the decision, and (e) court decision and date of judgment. The emphasis on this method is oriented to get an interpretation of how law is experienced or 'lived' or, equally, 'law in action', which involves valuing diverse legal discourses of what is needed to achieve socio-natural and socio-economic justices [19]. Therefore, as Jepson [19] argues, the benefits are not only a better understanding of the law, but also the discourses applied to law to naturalize social power.

3.2. Data Analysis

To unpack legal records a coding framework was developed, which captures the following themes: actors involved, water legal system (desalination, surface and underground water), water consumption (underground and desalinated), water physical characteristics (underground and desalinated), and, final water users (underground and desalinated). The assignation of passages of text to one or multiple themes, allow for us to compare all of the different perspectives and opinions about a common theme. Through a consideration of space as a critical element, next to social perceptions of law, we are aiming to dive into the legal geographies [36,44] of new technologies.

This coding scheme allows us to conduct an analysis on the legal discourses about: (a) how desalination intersects the currently existing water legal framework, and (b) how desalinated water reaches parity with the characteristics (quantity and quality) of other water supply sources, making it available as a substitute for fresh water. This analysis enables the identification of gaps and failures in the water legal system, in cases where companies have multiple water sources granted by the state, and nexus with new water claims, which are involving desalination technologies. The next section provides a brief overview of the context of the mining-water nexus in Chile and dives into the context of both case studies. This is done in order to show the permanent interaction of the mining sector and water in Chile.

4. The Mining-Water Nexus in Chile: Water and More Water 'Desalination' for the Mining Sector

Potable water supply companies and mining industries being under the same ownership is not a new story in the mining-water nexus in Chile. During 1878, Tomas North 'the saltpeter king' owned major mining sites and the potable water company in the Iquique Region [46]. Later on (1904), the British investment was expanded to 'The Antofagasta and Bolivia Rail Way Company' and acquired the water supply company in Antofagasta. Back then water was already such a contested resource (between industries and human uses), that even the price of the water personally consumed by miners was deducted from their salaries [46].

The first solar distillation plant for mining uses—Las Salinas mine site (1872)—was also serving as a water provider for their employees. Later, other mining companies started utilizing seawater in their operations: Compañía Minera Tocopilla in 1987 and desalination plant 'Michilla' from Antofagasta Minerals in 1991 [47]. Since 2009, water used in copper mining has been increasingly obtained from ocean water [48]. Here, the geographical characteristic (high altitudes where mining sites are located) and distance from the coast are directly influencing the cost of desalinated water, therefore, while removing salt from seawater represents 51% (average 1.9 US$/m^3) of the total cost, the energy consumed by the pumping system represents 49% (2.6 US$/m^3) [35]. A different cost is associated with the desalination plant capital investment and volume of water treated (see Table 1). By numbers, while the cost of desalinated water represents 5.1 US$/m^3, freshwater is 1.6 US$/m^3 [49]. As a consequence, strategies for reducing pumping cost/energy have been explored. For example, the SWAP model (trading water sources)—which in essence means desalinated water for coastal cities and mountain water for mining—is proposed in many public documents, such as 'Water management and mining in Chile 2007' by the Chilean Copper Commission-COCHILCO, 'From copper to innovation: a technology roadmap 2015–2035' by Fundacion Chile, and even in declarations from public authorities (mining ministry) [50]. In other words, the cost of desalination is not connected with desalinated water users, but instead with geography and distance to the coast –close to the coast would be around 1 US$/m^3 and in high terrain this increases to between 8 US$/m^3 and 10 US$/m^3 [49]. The total water consumption in the mining sector is distributed in 4 areas, which in 2017 represented: concentrator plant (67%), hydrometallurgy (14%), smelting and refinery (4%) and others (e.g., services and mine site) (15%) [48].

The importance of mining in the Chilean economy has been raised through statements such as 'the Chilean Miracle' and 'the Chilean Wage' [51]. In 2016, mining contributed at the national level with 11.2% to the GDP—while the average over the las 10 years has been 14.9% [52]. At the regional level, in the same year, it represented 47% for Antofagasta and 28% for the Atacama Region. In the

Regional Strategies from both, Antofagasta (ERD 2009–2020) and Atacama (ERD 2007–2017), water scarcity is recognized, next to the importance of the mining sector and the encouragement of using desalinated water in place of freshwater.

In addition to water scarcity, and the law aiming to make mandatory the use of desalination for mining purposes, local communities are currently demanding desalination projects as partial compensation or as part of corporate social responsibility efforts e.g., Salamanca community with the Pelambres mining company [53]. The company (owned by Antofagasta plc. group) is planning to build a desalination plant to supply water for both mining and human consumption in the Salamanca community, Coquimbo Region. As we can see, this is the same configuration (mining companies adjusting their interest to potable water service) that arose years earlier when Saltpeter was extracted, and is the same that Aguas Antofagasta experienced, which in 2002 was part of the same Antofagasta plc. In 2015 the water supply company was sold to Colombian investment group EPM (*Empresas Publicas de Medellin*).

4.1. Aguas Antofagasta: Water Supply Company in the Antofagasta Region

Aguas Antofagasta (hereafter A.A.) is the water supplier company (responsible for everything from providing potable water through sanitation services) in the Antofagasta Region. The company acquired the water concession in 2003 through a 30-year contract from ex ESSAN S.A. (state-led company) –under which management, operation and investment are in the private arena. Aside from natural water sources, the company operates desalination plants. Mountain water is captured from the intersection of the Loa and San Pedro Rivers. According to DGA [54], the volume of water authorized for mountain water extractions for this company are: Lequena (550 L/s), Toconce (470 L/s) and Quinchamale (300 L/s). The Loa River's waters have been recognized by the WHO (World Health Organization) for having high concentration of arsenic, and because of this desalination is presented as an alternative for human consumption [8]. Although, since 1978 this situation has improved with water treatment plants [46].

According to the Environmental Impact System Evaluation-SEIA [55] the company has four desalination plants approved for providing potable water, although one of them, Aguas de Mar Antofagasta, is not yet functioning (Table 1). The A.A. website provides information about which communities are receiving desalinated water (Antofagasta, Taltal and Mejillones) and which ones are receiving mountain water, mainly from the Loa River (Antofagasta, Mejillones, Calama and Tocopilla) (see Figure 1). As was identified by Fragkou [8] (p. 77) "(this) is creating three qualitatively different parallel metabolisms of tap water within the same region (. . .) one part of the city is supplied with freshwater, another with desalinated water, and a third part with a mixture of these two".

In 2003, A.A. signed a commercial agreement with the mining company Doña Inés de Collahuasi (located in the Tarapacá Region-Northern from Antofagasta), which included water transfers from the Lequena sector -covering 500 L/s (see Figure 1). In December 2011, the project started its Environmental Impact Assessment (EIA) in order to get approvals for water transfers. This has led to social mobilizations (combining NGOs and local government representatives) claiming that those waters rights' uses were granted for providing potable water—ecological impacts and water as a common resource were highlighted as well [56]. Indeed, the deputy for the region, has stated: "In the region, and province, there is water scarcity, water sources are exhausted, therefore I think that it is absolutely inadequate, inconvenient and risky to trade potable water with a mining company" [57] (p. 1).

Despite water transfers to Collahuasi being canceled, similar freshwater contracts are benefiting several other mining companies, again, in circumstances where those waters where adjudicated to provide potable water services [56]—mining sites involved in those contracts are depicted in Figure 1. Two of the companies involved in the water contracts were under the same ownership as A.A.—until 2015 they belonged to the Antofagasta plc. group (El Tesoro and Esperanza) [56]. This means that the increasing water availability through desalination is strategically coupling with the mining industry, through allowing the continuity and allocation of freshwater for mining uses. As we show through

our case study, water supply companies are legally authorized to sell untreated water to private sectors, with the only requirement being to guarantee water provision for human consumption in the concession area —these contracts are endorsed by the Sanitation Service Law. Alongside this, desalinated water is allocated for human uses, while freshwater is freed for continued consumption for mining purposes.

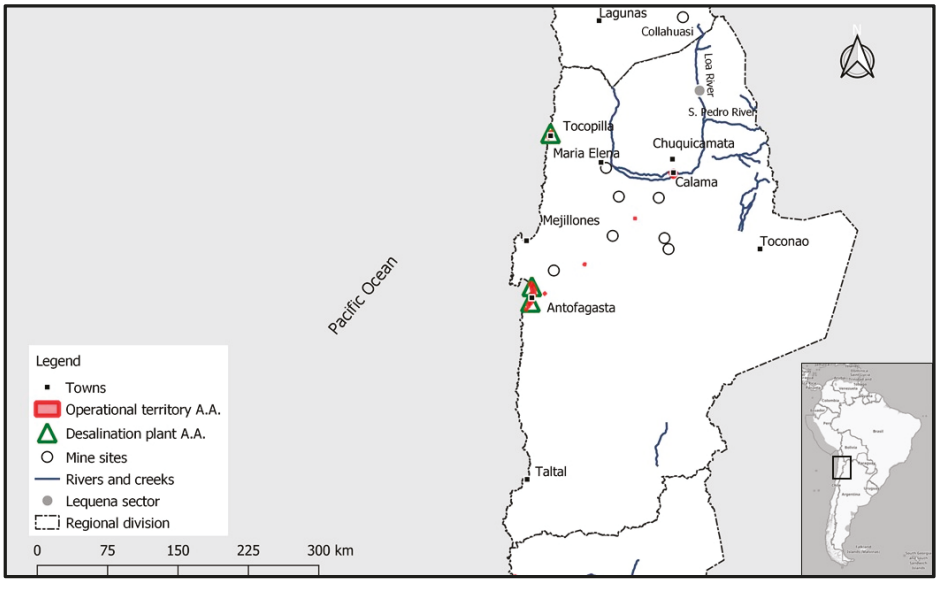

Figure 1. Aguas Antofagasta and mining companies involved in water contracts.

The water market in the region was identified by A.A. as composed of different actors, "on the one hand, mining companies, which are operating both as water consumers and suppliers through desalinated water or seawater without treatment and, on the other hand, water rights' holders, either by selling water rights or supplying freshwater to mining through water contracts. Finally, companies which operate sanitary services, such as Aguas Antofagasta, are participating either by selling freshwater from continental water sources, desalinated water or waste water" [58] (p. 6). Thus, the role of the mining industry is pivotal in framing different water uses and access in the region. Here, the state also plays an important role in deregulating markets, or even opening new venues, e.g., through water swaps.

The demand of public access to the contracts that A.A. signed with mining companies (data of water volumes and water sources), triggered the two companion legal cases under study. Main arguments used by A.A. for the denial of sharing those contracts were: (1) the right to develop private contracts with untreated water (according to the Sanitation Services Law), (2) the poor quality of freshwater (as compared to desalinated), which allows it to have contracts for private water provisions, and (3) the non-jurisdiction of the Sanitation Service Superintendence (hereafter SISS) in private contracts. These documents offer insights into the ambiguities of desalination and the different arguments used to maintain underground water rights' uses, highlighting the water legal framework's failure in accounting for this new technology.

In the final resolution, the Appeal Court determined that the content of these water contracts must be made open to the public [59]. This decision, as was mentioned by CIPER [60] (p. 1) is a "milestone in terms of transparency ... opens the door for the requirement of access to any document from private companies operating in a regulated sector by the state. In other words, it expands the

public boundary and citizen oversight". While this process is a successful story, the ambiguities of desalination remain a blurry arena in terms of its intersection with freshwater sources. The case of A.A., having simultaneous freshwater right uses and desalinated water permits, can provide insights into new techno-legal formations sustaining desalination and how this technology is shaping water governance in mining territories. Similar formations are experienced when mining companies have both water supply sources, as is the case of Candelaria.

4.2. Candelaria Mining in the Atacama Region

Candelaria is a Canadian mining company operating in the Atacama Region since 1995. The project is located about 20 km south of Copiapó city and comprises an open pit and underground mine extracting copper ore. The company also operates a desalination plant, which obtained its Environmental Qualification Resolution (RCA) in 2011 [61] (see Figure 2). In addition to this water source, Candelaria has been granted multiple underground water rights, both in Tierra Amarilla and Copiapó [62]. According to the Environmental Superintendent, the limit authorized for freshwater extractions is 300 L/s [63].

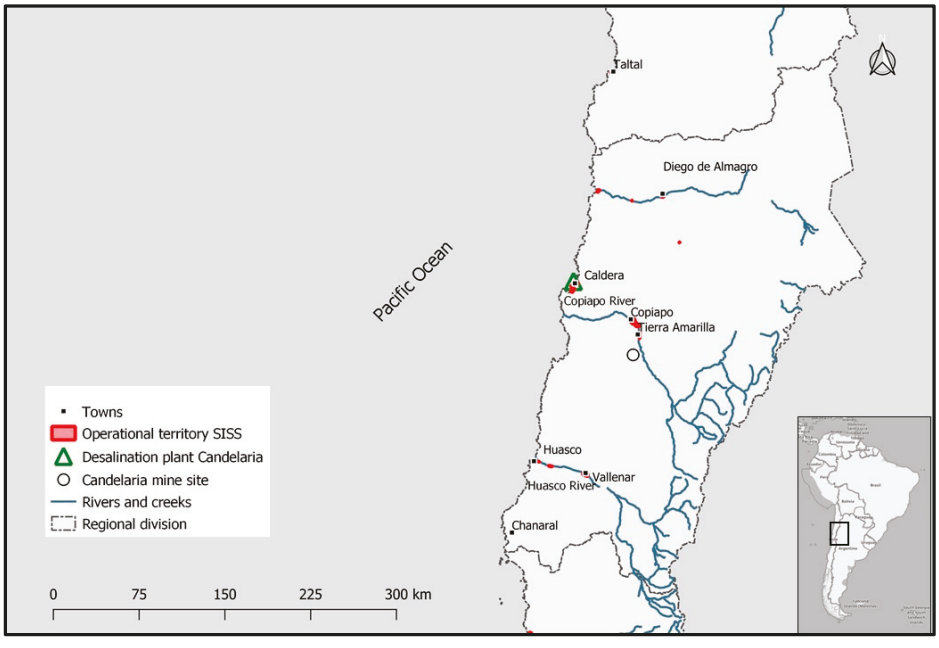

Figure 2. Desalination plant operated by Candelaria.

The Copiapó River watershed has been recognized for having, in general, a good quality—although the mining industry have influenced it with the presence of copper, iron and chromium [64]. The Copiapó and Huasco rivers are the main sources of potable water in the region and both are experiencing water deficits, affecting four communities out of the nine in the region (Copiapó, Tierra Amarilla, Caldera and Chañaral) [65]. In this vein, desalination represents a well-accepted alternative for the reduction of freshwater consumption.

Yet, in January 2014, the Environmental Tribunal received a complaint from the Municipality of Tierra Amarilla, against Candelaria, over environmental damage. Few days later, this complaint was retracted by the same lawyers acting on behalf of the Municipality. According to city councilors, the reason for this was the signing of a multimillion-dollar agreement, between the company and

the Municipality [66]. Despite this agreement, the Environmental Superintendent continued with a sanction process against Candelaria. One of the core arguments in this sanction was the company's non-reduction of natural freshwater consumption [63]. By numbers, over a span of 32 months, Candelaria was selling water to other mining companies (Minosal and CMP), while in 16 of those months water was sold at a rate of more than 50% of Candelaria's freshwater extraction volume -this includes 2013–2014 years, when the desalination plant was operational. Additionally, during the same time frame (years 2013–2014) their freshwater consumption limit was exceeded several times, by 18 L/s to 45 L/s [63].

The ruling references the different water strategies adopted by Candelaria—desalinated, recycled water and sewage water (purchase from the potable water supply company-Aguas Chañar S.A.) [67]. However, the court emphasizes that the company, in the EIA permit approval, acquired the formal commitment of diminishing water extractions (in the Copiapó River watershed) proportional to newly incorporated water sources [67]. The court also referred to Candelaria's water trading: "water deliveries to third parties, without considering its source, have evidenced that, during the months that water deliveries were produced, Candelaria mining had more water available than was needed for its process" [63] (p. 81). In other words, desalination is increasing water sources available for mining use, rather than reducing freshwater consumptions.

The court's final decision was to fine Candelaria with approximately US$ 4,254,473.613, confirming the excessive use and non-reduction of freshwater consumption—considering the alternative water sources integrated in their mining operation [67]. However, similar to the previous case (Aguas Antofagasta), the court does not further elaborate on the gaps and ambiguities of the current water legal systems in accounting for new water technologies and how legal frameworks might be used to continue with freshwater consumptions. The next section explores the legal loopholes that are allowing the pursuit of legal-coupling (desalination with broader water legal systems) in order to sustain their freshwater consumption and uses in Chile.

5. Water Legal Framework in Chile

> "Our legal framework has a lack of regulation (*desalination*), today we use maritime concessions, but they have a different purpose (. . .) Water scarcity and climate change will place Chile at a crossroads."
>
> —Alfonso De Urresti, Senator [68] (p. 1) (italics add by author)

Desalination projects are not new in Chile. However, with new water policies and legal frameworks aiming to confront water scarcity, this technology is likely to increase in the country. By the year 2015, Chile had 20 desalination plants already operating (11 in the mining sector, 8 for potable water and 1 for industrial use) and there are at least other 12 plants planned [35,69]. Nevertheless, to date, these projects have no clear or prescribed permitting process for desalination infrastructure [34,68,70]. Some gaps in the new water framework are identified by the Organization for Economic Cooperation and Development (OECD) [71] as: a) no current land-use planning strategy in relation to the coastline, and b) lack of regulation and institutions to oversee the management and use of the water produced through desalination technologies, etc. As this paper contends, additional gaps appear by paying attention to the intersection of desalination with the current water legal system. Firstly, it is not clear how desalination releases previously granted water rights/uses (surface water and groundwater), nor the final use that would be destined for those waters (e.g., ecosystem, human consumption, industries), and secondly, it is ambiguous how desalination water flows would be accounted for [72,73]. A core question here is: does desalinated water become groundwater, when its uses involve, for example, filling aquifers or reservoirs? [34] (p. 125).

Ongoing legislative changes, in countries such as Spain, are trying to cover some of these gaps by declaring desalinated water as a public property (since 2005), while in the US Supreme Court it is considered under the 'public goods inalienability' principle [74]. Nevertheless, for critical geographers

what remains in question is the management and use of desalination plants and the water produced. This practice has been open to contracts or licenses and, more recently, to forms of Public-Private Partnership e.g., in California and Singapore [10,11].

In Chile, legislative ambiguities and gaps have been somewhat addressed through broad legislation. For example, the right to use seawater has been coupled with maritime concessions — The Maritime Concessions Law DLF 340/1960 and the regulation 002/2005— which were created for non-consumptives uses of seawater (e.g., aquiculture), but not for consumptive uses (either of the natural seawater or the derived desalinated water) [34,72]. In other words, desalination projects are coupling their approvals with procedures stablished for seawater uses that were not framed in terms of technological uses and, more specially, for water extractions. Complementary regulation, although not strictly connected with desalination, is also used as a guideline for these projects e.g., coastline use and zoning (Inter-communal Regulatory Plan for coastline) and environmental permits (EIA) [72].

In the attempt to fix these gaps multiple draft bills are being debated at the Chilean Congress. Besides the draft bill that proposes to regulate desalinated water uses for mining projects [75] there are another two main proposals for this technology: (1) granting to the State the authorization for the construction and management of desalination plants [76] and, (2) regulating seawater uses for desalination [72]. From these documents, and the current legal system, key issues are inferred in desalination from the legal community (e.g., senators, deputies and lawyers). Here we identified three central contradictions.

5.1. Ownership

If desalinated water is no longer seawater, does it cease to be public property? The process of producing artificial water assumed as an extension of maritime concessions, has come with gaps and ambiguities, and one of them refers to ownership [72]. Referring to this, the senator Galilea mentions: "desalinated water through an industrial process isn't natural water, it is the outcome of an industrial process, and therefore telling a company, which is investing, that this is a national good of public interest, is a conceptual mistake" [68] (p. 1).

Further discussions over ownership are referring to water management. This means that even if it is agreed that seawater is in the public domain [34], due to its management, it is becoming amenable to private ownership (e.g., public-private partnerships) [72]. As Swyngedouw and Williams [12] have argued, the free pumping of seawater has already opened debates in terms of legal rights over the seas, and with privatization of the oceans this discussion is likely to increase.

5.2. Desalination Uses and Water Flows

"There is no public definition in terms of guidance and priorities for sea water uses (. . .)" [72] (p. 7). This declaration, made by a group of Senators, seeks to avoid the replication of current mistakes in the surface water and groundwater regimes, and instead prioritize water for human consumption and aquifer replenishment [72]. Furthermore, this new approach is also highlighting the need for a direct correlation between the purpose that was intended in the desalinated water concession, and the actual final use of that water [72]. This is important in cases where desalination is approved for mining or energy services but, at the same time, is delivered/diverted for communities' uses (see for example Compania Minera del Pacifico selling water to Caserones).

In addition to desalination uses, new concerns are raised over water flows: "To date there is a lack of regulation for water flows extraction and characteristics for specific uses" [34] (p. 120). In some cases, this is read as an economic imbalance between seawater users and surface water and groundwater users [34]. A different reading is expressed by Senator Muñoz, "if there is seawater in excess (that's why we emphasize establishing quantity and purpose), it may happen that free access to water results in that water being sold back to the state for human consumption (. . .)" [68] (p. 1).

5.3. Desalination and Granted Water Rights' Uses

Desalination is often bound to the idea of restricting legal water rights' uses and releasing water for human consumption and the ecosystem [72]. Nevertheless, the draft bill that regulates desalinated water for mining uses has ambiguities on how it would reach that goal [73]. The legal framework does not specify how desalinated water might be separated from the current water permits granted for surface water and groundwater uses [73]. Additional concerns refer to how desalination would release water right's uses and the final use that would be given to those waters [73]. In summary, there is no clear legal guidance in terms of distinguishing freshwater from desalinated water in scenarios where companies are simultaneously using both water sources. The draft bill reforming the Water Code attempts to address some of these issues by establishing that water for human consumption will have priority over other water right' uses (see draft bill 7543–12). Beyond these existing assessments, we identified in our case studies new ambiguities emerging in terms of how desalination reaches parity with other water supply sources.

In the following section, we show that legal gaps in the intersection of desalination with freshwater sources, have been addressed by a legal-coupling with the Water Code and Sanitation Services Law—with the main purpose of enabling the maintenance of groundwater consumption in support of the mining sector. Given that there is a move to make desalination mandatory, our case studies might offer insights about the role of desalination in mining territories.

6. Discussions in the Understanding of Desalinated Water in the Context of Water Law and Mining Regions in Chile

When desalination legalities started being discussed in the legal community, ambiguities and gaps were raised, mainly, in notions pertaining to its permitting process and the free access to seawater. These debates later evolved to value how desalination intersects with the current water legal system, for example, by considering water flows, water allocations (filling aquifers) and how alters previously granted water uses. In this section, we show that some of the loopholes of desalination have been somewhat addressed by wide water legal frameworks, such as the Water Code and Sanitation Services Law (both legacies of the Pinochet regime).

Here we will disclose that this legal-coupling is enabling the maintenance of consumption of groundwater in support of the mining sector. These issues are identified not only in the mining sector (Candelaria), but also in desalination for potable water services (Aguas Antofagasta). The case studies are revealing two gaps: (1) how desalination alters existing water rights, and (2) how desalination matches up against the purity and quantity of other freshwater sources. Implications of these ambiguities demonstrate the importance of legal and institutional frameworks for how desalination works, or fails to work, under its sustainable promise.

6.1. Desalination in Aguas Antofagasta: Changing Perspectives on Freshwater

Potable water uses of desalination, in addition to environmental permits, must function according to the Sanitation Services Law (1989) and the water quality regulation act (NCH 409/1.OS. 2005). This framework guarantees adequate sanitary services and recognizes desalination as part of them, "sea water will be admissible as a water supply source, through desalination" [77] (Article 15). Nevertheless, as we show, their primary focus on the high quality of desalinated water is affecting the perceptions of freshwater supply sources—at least from desalination plant operators. In other words, while this framework recognizes that desalination can be used to supply these services and must meet the strict potable water quality regulations, we contend, it is failing in: (1) prioritizing water supply sources, and (2) releasing water rights. Thus, desalination is allocated for potable water uses and freshwater consumption is maintained in support of mining industries.

6.1.1. Desalination and Water Supply Priorities

The laws' unique attention to water quality is exploited (by both the water supply company and the water state agency-SISS) to justify freshwater transactions with the mining sector, under the assumption that: freshwater has poorer quality in comparison with desalinated water [59]. Indeed, the artificial character of desalinated water, in terms of it being able to be produced at any quantity and quality—'designer water' [11] (p. 35)—is changing the perspective and priority uses of freshwater. The outcome has been to prioritize desalination for human consumption. The representative from OLCA (the Latin American Environmental Conflicts Observatory) observing this 'game changer' perspective of desalination, mentions: "50% of potable water in Antofagasta is provided by desalination, because in that region, and in particular in that city, mining is the main economic driver, and so they preferred to give fresh water to mining companies rather than to the population" [78]. In her recent study of social impacts of desalination, at the household level in the Antofagasta Region, Fragkou [8] has found that freshwater is perceived as having a higher quality by comparison with desalinated water. This means that between desalination operators and water consumers there are different perceptions of desalinated water quality.

With this in mind, in addition to what many legal scholars have found as a consequence of focusing solely on the regulation of the high quality of desalinated water e.g., ignoring environmental implications (such as cross-border pollution) [34,41], the A.A. case shows how the economic power involved in desalinated water management can prioritize uses of freshwater/desalinated water. As such, legal ambiguities in desalination are being maneuvered to determine water flows of desalinated water, as well as freshwater. In this sense, the use of the Sanitation Service law raises the issue of how water laws can handle the ambiguities of desalination.

6.1.2. Desalination and Water Rights

The legality of maintaining water rights uses for different purposes than potability treatment is rooted in the law that regulates tariffs in the water sector (DFL 70/1988). This law states [79] (Article 24) "if the provider (*public service company*) wants to supply non-mandatory services, it may freely determine payments or compensations with the interested parties" (italics by the author). As we can see, this prescription has failed to anticipate how desalination may increase water supply flows, how to tally them and how to prioritize final water users. Additional water volumes have resulted in A.A. now having 49 non-regulated customers, mainly mining companies [80]. Both A.A. and SISS refer to non-regulated costumers as private businesses, not regulated by the Superintendence of Sanitation Services-SISS, and therefore out of its control and jurisdiction [58].

The permissive right to provide non-mandatory services is used for facilitating economic development through the water network [59]. Their argument is that selling freshwater to mining companies is not regulated by the sanitation legal framework; instead, transactions are operating within the private space boundary. The price at which the freshwater is sold to mining companies varies in relation to water flows, distance, etc. For example, for 342,144 m^3/year (contract between A.A. and Cerro Dominador) the annual price is US$ 272,950.18 and for 1,399,680 m^3/year (contract between A.A. and Sierra Miranda) the annual price is US$ 3,343,402 (for a complete analysis of water contracts see González [81]). What is evident from these water transactions is that desalination operators can account for volumes of water rights granted (freshwater) as distinct from desalinated water flows, which is useful in terms of increasing, and accumulating, water sources and water private provision contracts. Major implications of these contracts are changes in urban water cycles -consuming desalinated water instead freshwater- and increases in water markets [8,33].

Additionally, the importance of connecting these services (non-regulated and regulated) relies on the price paid by the final customer [59]. Yet, as a community member has argued, there is a major issue "(. . .) those waters, were originally for Antofagasta and now, since they are desalinating, Aguas Antofagasta wants to sell them" [82] (p. 376). This suggests that what is at stake is the practice of the economic 'coupling' (keeping Usher's term) [10]–the mining sector sharing the infrastructure built for

sanitary services–with its further effects in determining not only water tariffs, but also water access and, more broadly, water flows.

Responses from the Council for Transparency privileged the public access to private water contracts (which might involve either freshwater or desalinated water), and this approach was confirmed by the Appeal Court of Santiago. The court made a landmark decision: the right to public information prevails over economic interest, especially when it affects sanitation services [59]. While legal authorities agreed that new water contracts could be forced to be open to the public arena, there was little consideration of how artificial water through desalination is enabling the emergence of new water contracts and water accumulation, and how it has been accounted for and prioritized in relation to freshwater. As Larson [41] argues, one of the greatest challenges of environmental law is to respond to emerging technologies. In line with this thinking, this case shows that, not only are environmental laws becoming outdated in relation to more recent technologies, but also water laws.

6.2. Desalination in Candelaria: Tailoring the Legalities of Water Flows

Strategies for reducing freshwater consumption, by Candelaria mining, include: recycled, sewage water and desalination. By numbers, the total water consumption for the 2014 year was 30,095 L/s [63]. Of that number, desalination represented 3837 L/s; sewage water 1272 L/s; freshwater 115 L/s, and; recirculated water 5195 L/s. In terms of calculating the limits of freshwater consumption, it is accounted as equivalent sewage water and desalinated water. Between 2013–2014 the freshwater limit was exceeded in 9 of the 12 months [63]. Thus, water solutions mobilised do not involve reductions of water exploitation, but sustain the mining extractive sector. Enabling this result, we contend, is the still unclear water legal system. The characteristics of the water model are broadly explained by Bauer [83] and Budds [84] in terms of economic and market features (e.g., property rights, minimum state intervention and the freedom to trade water rights). However, the contemporary practices of desalination are revealing new failures of this system. The paradox is that, while the Water Code explicitly excludes seawater, it is evident that desalinated water is altering major hydraulic infrastructures (such as reservoirs and water pipelines) [34]. As we will show, water reductions are usually read in connection with the EIA, however, ambiguities in the legal system are exploited in terms of 'tailoring' freshwater consumption. These strategies are covering: (1) how to account desalinated water flows, and (2) how desalination releases water rights.

6.2.1. Desalination and Water Flows

When Candelaria expanded its operation in 1997, the limit authorized for freshwater extraction was 300 L/s. In 2011, the same water exploitation (300 L/s) was approved for its desalination capacity, with a possibility of expansion (500 L/s) [67]. The EIA granted to Candelaria mining states "to the extent that Candelaria incorporates desalinated water, there is to be a proportional reduction in water extraction (. . .) Mountain water will still be used in case of emergencies (natural events) and operational contingencies" [67] (p. 83). Although the rule may seem straightforward, in practice desalination flows can be tricky to define. This brings up the issue of how desalination flows are intersecting and should be counted in relation to freshwater flows: annual average or monthly maximum flow [67]. These temporal scales meant that they can 'play' with monthly ratios of consumption between water supply sources.

These legal gaps have been addressed by the Water Code. This is inferred from Candelaria's statement when, accounting for water flows, argues: "this is related with groundwater rights grants in aquifers, wherein consumption levels are granted by annual volumes" [67] (p. 77). By this method annual tallies are allowing the mining company to 'play' with monthly ratios of consumption between water sources, and thus justify the partial reduction of freshwater consumption during certain periods of time.

According to the Environmental Superintendent a non-reduction of freshwater consumption occurred between the years 2000 and 2014—its desalination plant has been functioning since 2013 [67].

In this governmental institution there is a different understanding for counting water volumes: "it is not about increasing water sources, but reducing water extractions to the extent that they incorporate different water sources" [67] (p. 99). As such, they've accounted desalinated water by monthly volumes. While the court decision implies reduction of freshwater consumption, as we see, to date there are no clear guidelines in terms of how to account new water flows, nor specificity about final use that would be given to the released water and water rights granted.

6.2.2. Desalination and Water Rights

The Copiapó River watershed is well-known for being a zone of prohibition for new water exploitations. In fact, since 1993, there is legal resolution indicating that water sources in that watershed must be protected (DGA Resolution 193/1993) [67]. However, this resolution is not as straightforward as it seems at first glance. The legalities of water rights' uses are being exploited to sustain water consumption, and ambiguities of how desalination intersects with this water source doesn't seem to provide guidance on further reductions of freshwater consumption.

The legalities of maintaining water rights uses are claimed by Candelaria through using a legal-coupling with the Water Code: "it is a reality that fresh water extraction (...) has affected water levels (*Copiapó River*), nevertheless, it is a legitimate extraction that corresponds to granted water rights (*Water Code*). In consequence, it is not an illegal act" [67] (p. 91) (italics by the author). Effectively, neither the Water Code nor the desalination legal system have prevented this situation. In 2018, the court ruled that the 'legality' of an act can not be used to justify environmental damage [67]. Candelaria's argument is expanded, even further, by referring to water resource diminution as a result of the water legal framework; characterized by the overexploitation of water rights and weak institutional control [67]. This suggests that what is at stake is not simply the water management under the Water Code, but rather how desalination is intersecting and expanding this framework [33].

As the court ruled in this case, there is no discernable legal category which specifies how desalination intersects with other water sources and the release of water rights granted. As such, the mining company has exploited this loophole for the continuity of their freshwater uses. The ruling goes even further by acknowledging that more anthropogenic intervention is needed, in terms of new public policies and regulations to repair the environmental damage [67]. What is remarkable is that this measure is not counting desalination's uses and its socio-environmental implications in terms of increasing water consumption and accumulation, rather than securing water needs. These responses converge with the Aguas Antofagasta case by the acknowledgment of economic development being facilitated through the water network, as well as on avoiding ambiguities that are allowing the continuation of fresh water extraction in cases where desalination plants are operating.

7. Conclusions

The use of desalination is dramatically increasing worldwide [4]. Nevertheless, its legal and political dimensions have, only recently, begun to be evaluated, and concerns about ownership and management are attracting much interest [2,10,11,31,32]. In particular, while the technology is not new, it articulates uneasily with existing social and political frameworks. This in turn leads to legal loopholes, which are exploited by the ways in which society accesses legal knowledge and makes use of both the technology and the water produced. Legal gaps have been maneuvered through, for example, in both the USA and Singapore with new Public-Private Partnership laws for public utilities management, which in turn are offering opportunities for private capital to (re)configure the sphere of water governance [10,11]. As we see from the Chilean experience, legal loopholes are opening opportunities for the continuity of fresh water consumption to benefit the mining industry. As is shown in this paper, additional dimensions for the discussion of desalination's legal gaps are characterized by: (1) how desalination alters existing and parallel water rights/uses, and (2) how desalination reaches parity with the characteristics (quantity and quality) of other water supply sources. The particular attributes of desalination, being able to produce water at any quantity and quality,

must be taken into account in any critical analysis of the technology [11]. In this way, these cases build on existing critical studies in desalination, which have demonstrated that political formations sustaining the 'desalination factory' [11] (p. 35) are permeating in the logics of economic development and privatization of nature [2,10].

The case of desalination plants operating in mining regions in Chile highlights the fact that desalination (quantity and quality) is changing perspectives on other water supply sources. Legal geography pushes for consideration of how desalination legal frameworks intersect with the extant legal and political system in ways that provide a tool for spatial interventions. In this context, the articulation of this technology with existing water laws and legal practices, what we defined as legal-coupling, enables the continued use and consumption of mountain water in support of mining development. We note that in some cases, companies might have different and parallel water sources for their operations, which are often articulated and contested within the realm of formal law and policy. Broad discussions of Chilean desalination's legal framework show ambiguities not only in terms of the permitting process, but also in how this new water source is going to be accounted for in terms of other water sources' uses. Without a clear legal reference, ambiguities and gaps have since been somewhat addressed through broad legislation: The Maritime Concessions Law, Water Code and Sanitation Services Law. Thus, this analysis also complicates recent efforts and calls for making the use of desalinated water by mining companies mandatory. Here, we see that desalination is not necessarily tied to reductions of freshwater exploitation; ambiguous laws and geography (pumping water to high altitude levels) are exploited for changing water flows.

The paper highlights two main gaps in cases where companies operating desalination plants have simultaneous water rights/uses for underground water exploitation. Firstly, the laws' unique attention to water quality for potability, is being exploited to argued that freshwater doesn't meet the requirements for human consumption, whereas desalination can reach higher quality levels. Here we can see how water has been reduced to its chemical composition H_2O and abstracted from its social context [37]. It is, therefore, a 'game changer' for maintaining the use of freshwater in mining and reserving desalinated water for communities. Secondly, the laws' ambiguity over how to count desalination flows, allows the mining company to report only annual volumes. This means that they can 'play' with monthly ratios of consumption between water supply sources and, therefore, they can consume more freshwater during certain periods of time—having in this sense a partial reduction. In other words, the attention is towards augmenting water supplies. As we see, additional implications of these processes are that desalination plants' owners are able to have contracts as water suppliers for mining companies in the region.

Given that there is a movement to regulate desalination, it is important to investigate the role and issues that this technology is facing, both in terms of legal and geographical contexts. The Chilean case demonstrates the importance of both characteristics in how desalination works, or fails to work, in terms of socio-environmental implications. The paper's findings matter for the growing debates about desalination in both academia and by policy makers. On the policy side, the paper shows how legal discourses of nature are allowing maintenance or changes of spatial configurations and how they are articulated and contested through legal-coupling. Therefore, it highlights the importance of having clear rules about how desalination matches up against the purity and quantity of other fresh water sources and the pitfalls for releasing previously granted water rights/uses, while showing how water uses (desalinated and freshwater) are being prioritized. On the academic side, the paper expands debates on the dimensions of desalination's legal features and its implications for supporting economic development through changes in water consumption. Legal practices and legal knowledge are moving desalination critical analysis, towards the understanding of how natural-social boundaries are defined by legal institutions and practices [20,36]. Indeed, access to legal knowledge is often a tool at the service of spatial-political interventions.

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Article

Payment for Ecosystem Services and the Water-Energy-Food Nexus: Securing Resource Flows for the Affluent?

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Abstract: Payment for Ecosystem Services (PES) is not only a prominent, globally promoted policy to foster nature conservation, but also increasingly propagated as an innovative and self-sustaining governance instrument to support poverty alleviation and to guarantee water, food, and energy securities. In this paper, we evaluate a PES scheme from a multi-scalar and political-ecology perspective in order to reveal different power dynamics across the Water-Energy-Food (WEF) Nexus perspective. For this purpose, we analyze the PES scheme implemented in the Hidrosogamoso hydropower project in Colombia. The paper shows that actors' strongly divergent economic and political power is determinant in defining how and for whom the Nexus-related water, food, and energy securities are materialized. In this case, the PES scheme and its scalar politics, as fostered by the private/public hydropower alliance, are instrumental to guaranteeing water security for the hydropower scheme, which is a crucial building-block of Colombia's energy security discourse. For this, the water and food securities of the adjacent, less powerful communities are sacrificed. Examining the on-the-ground politics of WEF Nexus is key to understanding their impact on equitable and sustainable governance of water, energy, and food in the everyday lives of millions of resource users. We conclude that politicizing the Nexus can help to trace both the flows of resources and the flows of power.

Keywords: WEF Nexus; PES; scale politics; environmental justice; Latin America; Colombia

1. Introduction

Water, energy, and food production as well as governance systems are tightly interlinked. Energy production and regulations, for example, have an impact on water systems (e.g., increased water demand or alteration/pollution of water ecosystems) and food systems (e.g., competing for land in the case of biofuels or because of flooding areas for hydropower generation). These interlinkages are framed as the Water, Energy, and Food (WEF) Nexus, which is used to analyze interactions among these systems. The framework emphasizes the biophysical character of each system and how each system is influenced by, and interconnected to, the activities associated with the other systems. It also takes into account how different actors (e.g., users and regulators) and their different activities and vested interests (i.e., wealth creation, livelihood generation, economic growth, control) influence the governance of WEF systems [1]. In short, the Nexus approach aims to identify tradeoffs and synergies between water, energy, and food systems in order to internalize any social and environmental impacts at different scales and to guide cross-sectoral policies [2].

The politics within the Nexus, however, are a relatively understudied topic [3–8]. Allouche [9] explains that one paramount political aspect of the Nexus is how it commonly analyzes and targets interactions between systems at global or national levels but ignores day-to-day realities, needs, and priorities at local/regional level. Middleton et al. [10] further argue that if the Nexus is to support sustainable development and poverty reduction, it should engage more directly with the politics of it, for example, by identifying winners and losers in natural resource allocation and decision-making processes. Moreover, many studies have indicated the need for the Nexus framework to address the issue of environmental impacts in terms of environmental justice matters. These include benefits and burdens in the form of pollution, natural resource distribution, dispossession of ecosystem goods and services and depriving welfare in local communities by damming and transforming hydrosocial territories, recognition of local norms and governance frameworks, and the inclusion of marginalized and affected societal groups in the decision-making process [3,11,12]. As one example, Williams et al. [13] refer to the WEF Nexus as part of a broader trend towards integrated environmental governance, whereby previously 'externalized' ecosystem services (provided for free, without compensation) are commodified and 'internalized' apolitically into capital accumulation processes. The WEF Nexus is thus not an undisputed approach for framing socio-environmental problems and their solutions. Cairns and Krzywoszynska [14] say that it is a 'buzzword' that underplays how the workings of power crucially influence the outcomes of the proposed integration. In this sense, we will use the WEF Nexus approach not only to trace flows of resources but also to analyze flows of power and their resulting effects.

Many authors have presented Payment for Ecosystem Services (PES) as a market instrument that balances externalities among water, energy, and food, and therefore, the argument is that it may ideally complement, optimize, and materialize the WEF Nexus in everyday practice [15–19]. For example, PES requires a negotiation among water, food, or energy producers for developing mutually beneficial interactions between sectors that explicitly recognize the competing or complementary use of resources [20]. In this sense, PES creates a link between ecosystem service users ('buyers') and providers ('sellers') through new institutions and the provision of a framework of economic incentives [21]. In fact, PES is assumed to establish an arena for coordination and collaboration among stakeholders, where an economic transaction, that reflects their interests, helps in mitigating negative externalities and compensating positive externalities for the production of water, energy, and food [18,22]. Proponents therefore claim that PES facilitates and fosters greener economies, user participation, community empowerment, capacity building, and sound local-level governance [23,24]. Next, PES is appreciated for its assumed capacity to catalyze environmental investments by the private sector [25]. At the same time, a growing number of critical scholars have expressed skepticism over the environmental, social, and cultural benefits of PES [26–31]. An important element of such criticism has been the attention to politics and power relations through which nature becomes governed and how the ensuing modes of market-environmental governance produce new socio-ecological, often unequal, arrangements [32–34]. Extending analysis on PES in relation to the WEF Nexus, as we do in this paper, adds another dimension for critical scholarship on how the Nexus performs and what politics are inherent therein.

Hydropower development, the chief source of energy in Colombia [35], is strongly supported by the national government in order to guarantee the 'country's energy security'. Moreover, Colombia is one of the PES front-runners in Latin America [29,36,37], where hydropower and energy generation companies are increasingly investing in PES schemes. In this paper, we evaluate a PES scheme from a multi-scalar and political-ecology perspective in order to reveal different power dynamics and their associated outcomes across the WEF Nexus perspective. To do so, we will focus on upstream-downstream 'externalities' (in new-institutional theory and PES conceptualization, 'externalities' are defined as external uncompensated interdependencies that one economic agent generates on another due to the production or consumption of specific resources by the first agent. We use the concept of externalities for practical explanatory reasons, but consider that it does not capture the complexities of the social-environmental problems and the dramas generated on marginal communities. Furthermore, in this paper we use PES concepts such

as 'ecosystem services', 'externalities', 'buyers' and 'users', etc., in order to engage with its theory and claims, not because we agree with their epistemological meaning, institutional importance, scientific coherence, empirical functionality, political use, and moral ethics) as a problematic issue for coordination between ecosystem service buyers and ecosystem service users situated downstream. A PES scheme that seeks to conserve upstream forests in order to reduce sediment accumulation in the hydropower reservoir of the Hidrosogamoso hydropower plant located in the Department of Santander, Northeast Colombia is used as an illustration. At the same time, we use the case to analyze the WEF Nexus as a disputed approach for framing socio-environmental problems and their solutions.

2. Analyzing the Nexus and PES through a Political Ecology Lens

Political ecology understands environmental problems and its solutions as socially constructed and dependent on current and historical political-economic dynamics, e.g., [38,39]. It acknowledges how different actors, based on their interests, prioritize different resource management approaches by deploying their power positions and discourses affecting resource distribution, cultural recognition, and resource political participation of users as well as the day to day management of water, energy, and food resources [12,40,41]. Natural resource management and conservation initiatives thereby shape and constitute (material and discursive) struggles between different social actors seeking to gain and legitimize control over resources [11,29,42–44]. Different types of power shape these struggles: political power is illustrated, for example, by the political support certain actors' agendas receive from the government (an actor that is supposed to be neutral) or the differential access that actors have to influence legal and political decision-making. Likewise, control over material resources (e.g., land, water, infrastructure, financial resources) and means of production co-determines the economic power of the different actors. Next to the existing political and economic power relationships, the discursive modes of power by which PES interventions are legitimized and promoted in Colombia are considerable, see, e.g., [37].

These factors influence the importance that policy makers give to the different actors and how hydropower, PES, and Nexus policies are deployed in concrete interventions, e.g., [30,45–47]. The actors involved are also socio-politically differentiated in terms of the types of (divergently valued) knowledge and information they master, use, or represent. The ways in which power becomes manifest in hydropower, PES, and Nexus development tends to deeply reflect governmentality schemes as well as specific techniques and strategies by which societies and territories are rendered governable and disciplined [48]. Energy generation and water resource conservation are portrayed as key for the wellbeing of the Colombian population. These are issues that are assumed to have overall acceptance and express inclusionary notions of everyone sharing in progress. However, they commonly disregard what is happening to the communities affected by hydropower development. Subtly, they build on neoliberal governmentality, which refers to techniques of power that see market principles, forces and instruments as the natural regulating mechanisms for all interactions in human and non-human life [48].

In everyday natural resource governance and hydropower development, for instance, public-private sector alliances aim to shape the normative mind-set and obedient economic, political, and technological behavior of resource users and conservers. In this way, the WEF Nexus governance takes its case-particular, concrete character, and becomes configured both materially and discursively [12,49–51]. Furthermore, political ecology studies on PES have shown how power asymmetries among ecosystem service buyers and sellers are determinant and result in forcing participation and unjust arrangements for the less powerful [30,31]. They also manifest how the politics of scale become important in incorporating environmental subjects and their assets in uneven exchange relations—in practice, these scalar politics seek to bring resource security in particular for environmental service buyers [30,31,37]. Cohen and Bakker [52] (p. 132) explain that politics of scale occur in "a process of rescaling and reorganizing governance as a strategy of either internalizing or externalizing socio-environmental externalities, or both, and thereby displacing conflicts and crises,

often through the construction of (purportedly 'natural') ecological scales, which simultaneously depoliticize and repoliticize governance." Lebel et al. [53] thus argue for the need to examine how power plays are at work in order to consolidate specific (re)framings of scale—they define the way in which environmental problems are formulated and addressed through particular natural resource governance regimes. Swyngedouw [54] (p. 169) mentions that scaled places are "the embodiment of social relations of empowerment and disempowerment and the arena through and in which they operate." As we also make clear in this Colombian PES case, scale is therefore a strategic political instrument. As it re-establishes the territorial boundaries and strategies of governance and intervention, it includes or excludes actors from decision-making processes with respect to water resources management and control [53,55,56]. Therefore, Marston [57], Delaney and Leitner [58] and Harris [51] sustain that scale is not a given, external fact, but a cultural and political way of framing conceptions of reality. This has discursive and material consequences for those included and excluded from the scale framing.

In our case study, our political ecology approach helps us to analyze how humans and society in the Sogamoso River become governed technocratically through resource control instruments such as watershed PES. PES discourses and interventions are part of the vehicles that, consciously or not, are used in accumulation strategies, resulting in uneven expansion and dispossession [59,60]. Political ecology helps to contextualize these power asymmetries and scale politics, because the (ecological) scales to tackle the Sogamoso hydropower plant's environmental problems, presented as natural and apolitical, are socially constructed in a clever political process with strong material implications. Political ecology studies on the Nexus point out how current Nexus thinking inadequately conceptualizes the scalar politics of interconnections between resource sectors. Furthermore, studies suggest a naïve focus on technical and institutional 'solutions', where 'integration' is a panacea for unsustainable resource practices [13,61].

3. Materials and Methods

Data collection focused on how energy production generates 'externalities' that affect food and water systems considering the livelihood strategies and perspectives of the communities neighboring the Sogamoso hydropower plant, located on the Sogamoso River in Santander department, northwest Colombia. Our investigation was designed as an explorative case study research, focusing on the effects of energy production on water and food systems in a particular socio-natural space. The study takes a political ecology approach to better understand and analyze the implementation and effects of PES and the hydropower plant in relation to the WEF Nexus. Two phases of empirical data collections were conducted. The first phase took place in the period of November 2015 to January 2016 and provides the core data for our analysis. This phase focused on the socio-environmental impacts downstream of the dam. The second phase took place in the period January–March 2018 and adds complementary data of upstream socio-environmental impacts.

We conducted 34 semi-structured interviews with four focus groups. The first group was formed by people directly affected by the dam construction. This group includes downstream and upstream communities of the Hidrosogamoso project. The second group was formed by people participating in the PES scheme. The third group was formed by officials such as environmental authorities at national (e.g., Ministry of Environment) and regional level (i.e., Santander Environmental Authority (CAS) and the Eastern-Antioquia Environmental Authority (Cornare). The fourth group was formed by Non-governmental organizations: Censat Agua Viva, Fundación Natura and Compromiso, Corporación para el Desarrollo del Oriente. We focus on these groups in order to unravel the impacts of hydropower generation at local level and to understand how the hydropower company deploys conservation strategies that implicate food, water, and energy security.

Interview topics included the socio-environmental impacts caused by the dam construction, the compensations provided by the construction firm, ISAGEN, the role of the environmental NGOs and official entities. We also used secondary information sources that included project reports, videos, and other online sources. Information was analyzed with software coding, and the categories reflected

negative and positive externalities and their internalization or invisibilization in the political issues and compensation plans for the downstream communities.

4. The Hidrosogamoso Hydropower Plant in Santander, Colombia

In Colombia, hydropower generation represents almost 70% of the national energy production [35]. In 2015, there were seven large hydropower plants operating in Colombia, with a total effective capacity of 14,559 MW. The hydropower plant of Hidrosogamoso (820 MW) generates almost 10% of Colombia's electricity. Hidrosogamoso is owned by ISAGEN, a company that generates and markets electric power in Colombia. It has seven power plants with an installed capacity of 3032 MW of which 2732 MW is from six hydroelectric power plants, and 300 MW from a thermal power plant. In 2016, the Colombian government sold all its actions (57.6%) in ISAGEN (till then a government-owned company with private shareholders under the control of the Ministry of Mines and Energy), to Brookfield, a Canadian Company.

Hidrosogamoso is part of several large hydropower projects fostered by the Colombian government, supported by international financial institutes and the private sector. Arguments of public interest, clean development, mitigating climate change, energy security, and welfare—all boosting national economy—were deployed to legitimize it [62,63]. Several foreign enterprises participated in Hidrosogamoso's construction, such as Siemens from Germany that lent the machinery, Impregilo from Italy that operated the project, and the Banco Santander from Spain that lent capital for the project [62]. Powerful landlords connected to paramilitaries were also key actors to bargain with ISAGEN over the compensation for their flooded lands. Council members from local municipalities became important network alliance members during this negotiation, especially because they persuaded others to join in this process. Likewise, political campaigns were financed by ISAGEN and regional government and municipalities acted as promoters of the project, selling it as 'the dream of the region' [64].

The idea of using the waters of the Sogamoso river dates back to 1943, when Gerardo Streithorst Clausen proposed to use these flows for the industrial development of Bucaramanga in his engineering school thesis. It was only in the 1990s, when the country was suffering a deep energy crisis due to the effects of El Niño, that the government decided to approve the construction of the hydropower plant. In 2000, the environmental license was issued and in 2008 the project area was declared public utility. In 2008, the construction work started with roads and land removals. In April 2009, community members came forward to report that the update of the Environmental Impact Assessment in 2006, which the company presented as "negotiated with community members" (Community member, pers. comm., 14 December 2015), was neither a transparent process nor did it have consent from them: "*They only came to encourage the making of the dam*," a villager said, "*To tell us what they were going to do, how they were going to bring benefits to the people, training and work, they never came to ask us if we wanted the dam here, or if we agreed with what they were going to do.*"(Community member, pers. comm., 14 December 2015).

Throughout the construction process, ISAGEN requested different substantial changes in the environmental license to smoothen and benefit the work of the company. These included changes in ecological stream flow, biomass clearance, and untreated water discharge, electric transfer lines, road constructions, etc. In September 2011, there was a large protest by community members because of great fish mortality in the nearby creeks. In 2012, Miguel Angel Pabon, an environmental activist who supported the creation of the social movement called Rios Vivos, (a social movement struggling against the construction of Hidrosogamoso that later consolidated as a national social movement of communities for the defense of many rivers) disappeared, adding to the killing or disappearance of another 10 environmental activists struggling against the construction of the dam since 2010. In June 2014, the filling up of the dam's reservoir dried the river downstream completely for several days. In response, another wave of demonstrations arose in the downstream communities. Like all other arguments with Hidrosogamoso, the police repressed the demonstration brutally and violently. Despite all the drama for riparian communities and their associated social struggles, Hidrosogamoso was inaugurated in January 2015.

The Hidrosogamoso power scheme is located 30 km west of Bucaramanga (Santander Department's capital) and 285 km north of Bogotá. The power plant is 75 km upstream from where the Sogamoso river enters into the Magdalena River, and 62 km downstream from the confluence of the Suárez and Chicamocha Rivers [65]. The Hidrosogamoso dam is downstream of the Suárez river and El Ramo creek, among others (see Figure 1).

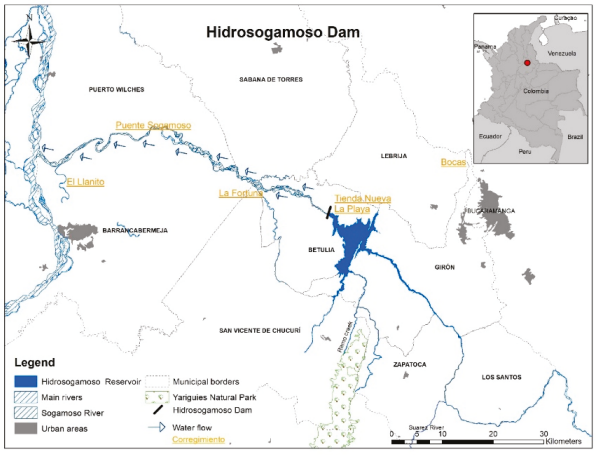

Figure 1. Location of the Hidrosogamoso power plant. Source: Reprinted with permission from PhD research Duarte-Abadía (in process).

Hidrosogamoso has an average capacity of 5056 GWh/year. Its project covers approximately 10,500 ha: 7000 ha are inundated by the reservoir, 300 ha are used for the construction works, 2300 ha for protection zones, and 900 ha determined as unstable areas [66]. The most affected municipalities according to INGETEC [66] are Girón, Betulia, Zapatoca, Los Santos, Lebrija, and San Vicente de Chucurí (see Figure 1).

The socioeconomic census carried out by INGETEC [66] reports that 283 families (1199 people) were displaced from their homes. The municipality of Betulia was the most affected with 166 families, then Giron with 72 families and Zapatoca with 30 families. The Environmental Impact Assessment estimated the following number of the affected population: 292,670 people actively working in the indirectly influenced area of the project, and 29,956 people (7010 families) living in the local area of the project. Downstream of the dam, there are 18,969 inhabitants (4810 families). Of these 2634 inhabitants (517 families) live on the affected shores of the river; another 1010 families have direct livelihood connections to the river through fishing and agriculture activities. The project´s Environmental Impact Assessment estimates that around 16,335 inhabitants (4293 families) in the downstream areas may be affected by the dam development's impacts (e.g., agriculture, fisheries, water pollution, sand extractors, and other water-based livelihoods).

5. Hidrosogamoso: Divergent Water, Energy, and Food Securities

5.1. Hydropower Policies and PES Scheme Development

ISAGEN has joined a pilot PES scheme paying land users for the protection of upstream forests. ISAGEN seeks to secure provision of water-related ecosystem services (e.g., reduction of sedimentation, streamflow regulation) to Hidrosogamoso by participating in this PES scheme.

The PES scheme supported by BanCO2 (BanCO2 is an environmental trust fund that offers financial services (i.e., bank accounts) to ecosystem services sellers and buyers). It counts with an Internet platform for tracking down the environmental transactions between environmental service

buyers and users, which started in 2015, pays 50 families (owning approximately 250 ha in total) located upstream of the dam (municipalities of San Vicente de Chucurí, Zapatoca and Betulia) for conserving natural forests upstream in the Ramo micro-watershed. Payment rates are USD$ 65 per month for each hectare. For areas with three or more hectares, payments are set at USD$ 195 per month [67]. Farmers are not allowed to use the land registered for PES while they are receiving payment, after that is up to the CAS to define if the land can be used again or not. Aside from the cash payment, capacity-building activities on sustainable forest use, ecotourism, and agroforestry are offered to the so called 'ecosystem service sellers' [67]: this group is comprised of rural families with livelihoods mainly based on cattle ranching and agricultural activities.

The intermediaries in this PES scheme are the regional environmental authority of Santander (CAS *Corporación Autónoma Regional de Santander*) and BanCO2. Buyers are ISAGEN and also CAS itself, thus, private and public actors. Payments are made to the farmers located upstream based on an agreement between the two parties. The financial resources that the ES buyers pay goes to a trust fund and is then transferred to the personal savings account of the farmers selling ES (each month, the latter receive an SMS message confirming that the payment has been completed). The coordinator of the program BanCO2 in Santander, who is also working at CAS, explained: "*The idea to implement PES arose after doing an inventory of the inhabitants who were living in ecosystems that are strategic for conservation. These families importantly suffer from unsatisfied basic needs; clearly this is due to the location where you are, good road ways are lacking, schools, and medical centers are far away. All this stimulates the bad use of natural resources. So BanCO2 seeks to satisfy the basic needs of those people while working on a process in which you explain to these inhabitants what they should do in order to make right use of the resources for strategic conservation*" (1 March 2018).

PES as a 'conservation measure' is financed by Hidrosogamoso's environmental damage compensation obligations. That is why BanCO2 has been labelled by Gómez and Echeverri [68] as a 'license to degrade the environment'. For example, they have to make an investment of at least 1% of the total investment of the hydropower plant for restoring, conserving, and monitoring the watershed where the water is taken from. Moreover, Hidrosogamoso is obliged to pay a 6% tax on the gross value of sales of energy. Vélez Gómez and Vélez Henao [69] have estimated that, in the case of the CAS and Corpoboyaca, (Corpoboyaca is the regional environmental authority that shares with CAS part of the Sogamoso River Basin) the transfers from hydropower generation to these two environmental authorities constitute half of these authorities' own financial resources. With regards to the environmental contributions of ISAGEN, during the opening ceremony of Hidrosogamoso (a venue where Santander's governor was also present), Colombian (ex-) president Juan Manuel Santos said that: "*The project is not only an engineering success, but also an environmental success* [as he explains, because of its environmental investments and its contribution to climate change mitigation] *where affected communities, were always taken into account and one can say that they are now much better-off than they were before*" [70]. Moreover, Angela Montoya (Head of the Colombian Association of Electric Energy Producers) explains that the energy generation sector is one of the greenest sectors in the Colombian economy, contributing to reduce climate change and to the conservation of forests, biodiversity, and watersheds [71].

In the media, the hydropower company constantly reiterates its huge contribution to sustainable water and ecosystem management and its involvement concerning mitigation and adaptation of climate change. It refers to how it generates clean energy, stabilizes the river's flow regime, and promotes the integrated management of sound water-energy-food systems through their various environmental programs [72,73].

5.2. What Happens around and Downstream of the Dam?

In 2015, while then president Santos was celebrating the opening of the Hidrosogamoso power plant, the communities from the localities of La Playa, El Puente, Marta, Tienda Nueva, and El Peaje in the municipality of Betulia were protesting outside. Their protest strongly contrasted with

the eloquence and celebration with which Hidrosogamoso was presented by its supporters to the international and national public [62].

The people of the Sogamoso River basin first heard about plans for the Hidrosogamoso when project designs and final decisions were already made. Only at that moment, ISAGEN explained to them in meetings in the nine municipalities that they would be affected. The meetings were supposed to fulfill the company's legal obligation to actively consult with communities affected by the project. However, community consultations amounted to little more than a series of presentations about the benefits of the project.

The dam construction, the filling of its reservoir and its operation all dramatically affected the economic and social activities of the communities surrounding and living downstream of the dam. According to INGETEC [66], the project had several indisputable, negative impacts on 4150 ha that were used for agricultural and pastoral production, and forests. Dam construction, reservoir flooding and ecological destruction in the area of direct project influence meant that 1020 ha of agricultural land were destroyed (283 ha of perennial crops such as cassava, corn and banana and 737 ha of permanent crops such as cocoa, citrus, avocado, and fruit trees). Next, nearly 3000 ha of pastures and 160 ha of forests were affected. These impacts on productive land translate into a decrease of 10,177 tons of agricultural products and 637 tons of livestock products, meaning an economic impact of approximately USD $2 million per year [66]. This decrease in agricultural production has a great local impact on income generation and food security.

Along with the agricultural and pastoral impacts, fishing was also greatly affected due to the decline of several fish species populations [62]. According to the fishermen, some of the reasons behind the fish decline include the dumping of waste materials from the dam construction process in the river and feeder streams, thereby contaminating the water, and the obstruction of fish passages by the dam, blocking them from reaching the upriver streams where they reproduce. Bargent [74] (p. 1) explains the resulting situation in one sector of the municipality of Betulia: "*Before the dam's construction, the overwhelming majority of La Playa's men worked as fishermen. Now most are unemployed or casually employed.*".

Before the construction of the dam in 2008, the livelihoods of the riparian communities were closely linked to the Sogamoso River system. Fishing, an activity mostly carried out by men, constituted the main source of income for the families. Women contributed by selling the day's catch in roadside stalls or cooking it for tourists that came to the region for visiting the culturally and ecologically rich riparian landscapes of the area. Besides fishing and tourism, agriculture and artisanal mining of sand were other important local economic activities. More than just economic activities, the river represented an important fiber sustaining and catalyzing a broad range of social and cultural relations [62]: "*The fishes come from the swamps, they come from there because the water warms up, they take different flows upstream. Fishes have their ways in which they feed, fatten, grow and wait until the level of the river rises, to return again to the swamps to put their eggs. The river uses its forces to drag the earth and so fertilize the land. This way it forms the islands where we grow our food, it brings us the stones that we collect to sell them, the river in its own way left to each of us its gifts. We know the river, we eat and live from the river, we are the river*" (Elder inhabitant from Río Sucio locality, in Sabana de Torres municipality, 15 October 2017).

Today, inhabitants feel that the river has changed, their close hydro-ecological and cultural-emotional relation has broken up. This is also reflected in the reduction of tourism downstream of the dam. Most of the tourists that used to come to the area to eat some of the fish delicacies cooked by the fisherwomen now go to a set of newly opened restaurants located around the Topocoro Lake (the dam's lake). Downstream of the dam the degraded beauty of the landscape and the poor water quality have made tourists turn to other locations for making weekend or extended visits. "*The flows of people have evaporated, because fishing practices are over and the river is dead*" (Fishermen association in Puerto Wilches municipality, 27 February 2018).

A very rough estimation by INGETEC [66] states that without counting fishermen and women, the Hidrosogamoso project ended up displacing 528 jobs that were dedicated to agricultural production:

"*Some female community members were employed as waitresses or cooks, men were employed for construction work. At the beginning we were happy with these temporary employment opportunities as we still had our other, real livelihood incomes from agricultural work and the river*" (Community member, pers. comm., 10 December 2015). However, soon, these few activities could not compensate all the jobs and livelihoods that were lost when the dam started to operate. A similar thing happened with the capacity-building activities that the company started to give to the communities. Although initially welcomed by the communities, a bitter taste remained: "*We realized that the handy-craft sessions were not useful as with the destruction of the river, less and less tourists started to come to whom we could sell them*" (Community member, pers. comm., 6 January 2016); "*We have our wall covered by titles. The issue is that we do not have the conditions to apply what we've learnt, we do not have land, capital, food, our best land was flooded. We do not have a place where to throw the net to catch fish*" (group interview in 'Rio Sucio, vereda La Mayor', downstream of the river, 17 October 2017). During the latter interview, the community explained that Sabana de Torres, Barrancacabermeja and Puerto Wilches municipalities were excluded from the area of influence of the dam construction. This means that they do not receive money from the company to be invested in municipal development plans to enhance their life conditions (see Law of Transferences: Law 1450, 2011, in which all energy companies must transfer economic resources to the municipalities located in the area of influence of the power station, as well, as to environmental authorities with jurisdiction in the dam area and the contributing basin). "*We do not form part of their action radius, but if you go to ISAGEN they would tell you that we are benefiting, they catalogue us as users and beneficiaries of the river*" (17 October 2017). Considered to be users of the river, the company only compensates them by providing capacity building events as mentioned before. According ISAGEN, from 2008 to 2014, 1430 families located downstream of the dam have received this kind of compensation [75].

5.3. What Happens Upstream of the Dam?

ISAGEN has invested in different conservation programs upstream of the dam with the aim to reduce the sedimentation process, but also to catch and ensure the entrance of fresh water. These programs have focused on Betulia, Zapatoca, San Vicente de Chucuri, municipalities that comprise the Ramo micro-watershed. This area is part of the 'strategic ecosystem' to conserve, and is located along the buffer area of the Yariguies National Park (see Figure 1). These conservation programs embrace the purchase of land to induce forest restoration and implement PES for this. To do so, the former ISAGEN transferred money to the National Parks Unit to buy farms located in these marginal mountain ranges which were affected by the armed conflict during the 1980s until the last decade. National Parks offered farmers to buy their farms since their livelihood activities do not correspond with the environmental norms of the 2005 National Park regulations in the Yariguies region. For many peasants, these rules and actions go against their land rights and life integrity: "*We agree to take care of nature, water, but we disagree with the way the National Parks imposes their rules, like displacing us, inserting terror and fear. For me they do not buy, for me it is a displacement because buying one hectare for 870 USD is like giving alms. In our case, we have 8 ha, they would give us 6960 USD. It doesn´t even give us the opportunity to buy one hectare and a half in the town*" (Farmer in Yariguies ridges, 22 January 2018) [76]. According to the chief of Yariguies National Park, around 4000 ha have been bought, corresponding to 73 farms (28 February18).

Next to this program for land appropriation there is a second program, of PES implementation. The Environmental Authority (CAS) approaches the community offering economic incentives to alter their livelihoods while they conserve. PES implementers consider that payments for conservation make farmers move from agricultural productive practices to alternative modes of earning income, not linked to actually working the land. PES payments began in 2015 and stopped in 2018. The ES sellers are being monitored by CAS to evaluate the effectiveness of the commitments and the results in terms of water quantity and quality.

Farmers' opinions are divided. Some families align with the project, others are skeptical about PES implementation. They prefer not to get involved in these schemes; others even left the program.

From the beginning they got upset because they could no longer work their plots as they wanted, not for farming nor for cattle-ranching: "*When they came (the CAS officials) they brought wires to fence some areas of my plot, I did not like it and I dropped out. I like to see my hens walking around freely. I know what and how I have to care without enclosure of my land. They came with measuring tape and as time goes by they may even leave you on the street*" (Farmer in the high mountains in Zapatoca (4 March 2018). Many farmers explained that when they receive payments for more than three years, they would no longer be allowed to work on their land again, see, for similar critiques [26–31,77]. Environmental law enforcement intensified with PES implementation and has increased control and restricted activities in these previously forgotten mountain ranges in the buffer area of the National Park. Those receiving PES can no longer use their plots in accordance with their own rules, knowledge, and agro-cultural histories.

ES sellers are reluctant to talk about PES, and they need to ask permission to CAS if they are going to give an interview about the topic to outsiders. In coordination with several environmental NGOs, CAS is in charge of vigilance and monitors if farmers obey the conservation rules. They also assume self-vigilance by the farmers, and what is more, they have even obliged the PES participants to police their neighbors: "*When the project finishes we hope that they value natural wealth and stop affecting the ecosystem. They signed a commitment letter in which they are required to inform us, when a neighbor is logging, hunting or making a bad use of natural resources. Then we will be in charge of investigating, and implementing the right sanctions.*" (Coordinator of the Program BanCo2 in CAS, 1 March 2018).

However, while the hydropower company is showcasing itself as a committed conservation actor and while conservationist NGOs echo this cynical claim, many farmers and inhabitants interviewed did not know much about the PES program. Community members did know, expressively, about the microclimate changes that were generated by the new, artificial Topocoro Lake. They manifested that these are reducing the yields from their cocoa, coffee, citrus, and avocado crops. The lake has increased humidity, and this has generated fungus in the crops: "*We noticed that in summer time the heat is unbearable and at night the cold is intense. However, the company wants to distract our perception through the installation of climate monitoring stations, they want us to believe that the climate has not changed. But we see the damage to our crops after the dam has been filled*" (teacher in the rural area of San Vicente de Chucuri, 15 February 2018). Other inhabitants, especially those who live in the La Estrella sector of Betula municipality, complain how they were disconnected from the urban centers due to the construction of the new roads that ISAGEN organized as a part of their socio-environmental program for compensations. For them, the services they aspire to cover their basic needs are now far away from their homes, and further away than ever.

6. Discussion: Politics of the Nexus

6.1. The PES-Hydropower Miracle: Strengthening (upstream) Its Water Security While Greenwashing (Downstream) Its Environmental Destruction

PES is presented as an important tool for building greener economies. PES funding comes from the legal obligation that companies have to compensate for environmental degradation. In actual reality, this environmental degradation means the loss fish biodiversity, impoverishment of water quality in the swamp systems and therefore the harsh disruption of fishermen communities' sociocultural relation to the river. Meanwhile, PES locks up upstream food production (and its related livelihoods) in order to secure the provision of water for hydropower production. Similar to other studies, e.g., [30,78–81] the results show that government and private actors financing upstream conservation via PES do so not to enhance distributive, political, and cultural justice, but to guarantee their access to water sources, secure permanent water flows, and control water decision-making for capital accumulation. As a deus ex machina solving a seemingly hopeless situation, this PES provides them with a conservation-friendly and poverty-alleviation aura that, simultaneously, enables to shift the focus from the hydropower plant's many negative externalities inflicted upon marginal communities further downstream (see Figure 2).

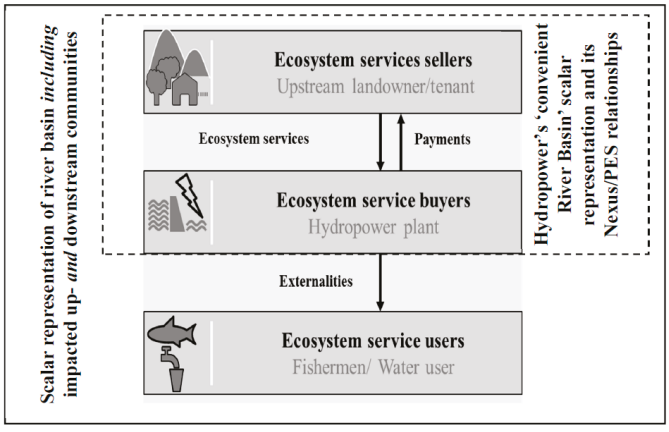

Figure 2. Hydropower-convenient and inconvenient scalar representations of 'River Basin' and their Nexus/ Payment for Ecosystem Services (PES) relationships. Source: based on Rodríguez-de-Francisco [82].

Our results confirm the claim made by Allouche [9] and Allouche et al., [3] that looking at the energy, water, and food linkages as a simple systems approach question, where biophysical optimization is the only variable, disregards day-to-day realities and local priorities and needs. The case further illustrates how ES buyers seek to achieve water security by paying other ecosystem service users, the potential 'ES sellers': those who can support the company's water security necessary for the production and selling of energy—no matter if that comes at the cost of upstream and downstream food security. PES contracts end up locking upstream lands for the water security of the hydropower company and, meanwhile, the impacts downstream of the hydropower plant are rendered invisible by the company's conservation credentials. By doing so, the large-scale hydropower energy generation in Sogamoso creates social and environmental externalities (e.g., food reduction) for riparian and neighboring communities. The hydropower public/private regime, rather than acknowledging these impacts, uses PES to present itself as a green player.

Despite these contradictions, the Colombian government heralds Hidrosogamoso as an illustrative example of environmental conservation and sustainability. Paradoxically, the market-environmentalist discourse allows for green washing by presenting ecosystem service markets and the possibility to offset environmental impacts as the solution to the problems that the market has created. Hidrosogamoso's market-environmentalist project rationality is presented as establishing the exemplary code of conduct. Thereto, it invokes modes of neoliberal governmentality [48,83–88] as the sole possibility to sustain the welfare and (energy) security of the population [89]. This market framing silences people's voices who experience environmental degradation as environmental injustice, and instead only refers to it as a mere economic conservation problem to be solved by market forces [77,86]. In practice, however, fishermen and peasant communities downstream are dispossessed from their ancestral livelihoods in order to foster the economic accumulation of the hydropower company; and upstream communities lose autonomy and control over their livelihood production, being severely restricted in their food security strategies. As a clear spatial-material and political-discursive strategy, upstream, the hydropower company invests in conservation to guarantee its water security, while green washing destruction and dispossession downstream and upstream. To understand the creation of negative externalities for communities around the hydropower plant, it is therefore important to consider politics of scale as well as the workings of overt and covert political and economic power.

6.2. Politics of Scale: The Power to Conveniently Define the Boundaries of 'River Basin' and 'Impact'

Different stakeholders have different interest in and concerns about the scale at which to tackle Nexus interactions. Williams et al. [13] mention that Nexus research has focused disproportionately on national or state level. Similarly, Cairns and Krzywoszynska [14] explain that while the Nexus' impacts are felt at a range of scales, the overall Nexus discourse is global in scope, both in terms of interlocutors and analytical focus. In our case, we observed that the narrative constructed by the hydropower company places emphasis on global, national, and PES-watershed. The global and national scales are deployed to discursively create sustainable development through clean energy generation. The company also uses their contribution to PES and the rationale of this instrument to highlight the link between environmental service sellers and buyers in a basin approach. Through this argumentation, the company reconstructs the river basin scale to an artificial one: one that starts from the headwater and finishes at the scheme's water works operated by the "environmental service buyers." This very particular techno-political decision on "the company's PES and Nexus-convenient" scale (see Figure 2), is presented as "natural" or as an "eco-scalar fix," following from "nature's intrinsic properties," and allowing the hydropower company to define the environmental issue to be solved, see also, [90]. Namely, they define climate change and upstream deforestation as the most important environmental issues to be tackled while reducing, at the same time, the visibility of the impacts of hydropower generation on the environment and the people dependent upon water resources further downstream—including the damages to the latter's food and water securities.

Brown and Purcell [91], Warner et al. [92], Hensengerth [93] and Hoogesteger et al. [94] draw attention to the fact that in a politicized environment, the river basin scale loses its connotation as a pre-given scalar unit that can be delineated by using territorial or ecological boundaries. In contrast, river basins and watersheds are contested hydrosocial territories [55,90] whose boundaries, contents, meanings, interlinkages, and definitions are fluid and dependent on the issue in question, and especially, on the power of the definer(s).

The government justifies Hidrosogamoso by shifting attention to the national scale with respect to energy security, and the global scale with respect to climate change mitigation. Without looking carefully at the multiple and diverse complexities and socioecological dramas at local scales, problems are dismissed under their alleged legality. The use of a very detailed scale (such as a PES) that reduces the river basin scale to the space between environmental service sellers and buyers, as well as a very broad scale (such as global for climate change), causes oversight of the local conflicts that energy generation creates and which are not addressed by PES. In this respect, when analyzing a certain Nexus situation, is important to acknowledge that WEF connections are complex and pervasive, and therefore call for trans-scalar approaches to comprehend their politics.

6.3. Power Asymmetries

The Nexus approach argues for the need to work towards a more coordinated and negotiated management and use of natural resources across all sectors and scales [1]. However, there are no blueprints explaining its optimization, or the specific balance of trade-offs and synergies. As such, this optimization is to be reached through political negotiation and coordination among interested groups representing water, energy, and food sectors, based on their stakes and the information readily available. As Boelens and Seemann [95], Zeitoun et al. [96] and Jepson et al. [97] elaborate, food, energy, and water security is inherently relational and political. Therefore, when there are intrinsic power asymmetries among the people negotiating, how fair can the results of such negotiations be?

The Hidrosogamoso case shows that power asymmetries can be so strong that powerful actors, like the hydropower company, only informs the communities about the construction of the plant, instead of negotiating with them [62,64]. Ardila Valderrama [98] also explains how the hydropower company has taken advantage of the blurry land property situation in the area in order to expel farmers from the territory. Next, she relates how the leaders of the social movement have been stigmatized and the social protest has been criminalized under the strong influence of those who wanted to push

the hydropower project forward. Hommes et al. [4], Middleton et al. [10], Warner et al. [99], among others, accurately show how major decisions around water, energy, and food (even more in projects where these sectors are strongly interlinked) are highly political, and take place within arenas of unequal power relations that often lack democratic checks and balances to enhance transparency and public participation.

The case also highlights how the Nexus is interpreted in such a way that it does not question the structural inequalities in the local and national economy, but rather reinforces them [100]. Such utilitarianist, unequal distribution can be seen in how the negative impacts of energy generation and conservation are pushed on to less powerful populations—the 'minorities' who live nearby while benefitting the far away 'majorities': in particular, the elite and industrial sectors [36,46,101,102].

Finally, the case of Hidrosogamoso illustrates how power plays are not restricted to monetary, legal and discursive techniques for achieving national energy security. Energy securitization also involves outright military and physical violence, as a way to keep resistance low. In fact, after the killing of several leaders of the social movement for the defense of the Sogamoso River, many of the members of this social movement have backed-off from defending their own rights [103,104].

6.4. There Are No Neutral Actors

Nexus is about balancing externalities among water, energy, and food systems. However, who is to create such balance? The Colombian government puts energy generation projects' development high on its political agenda (2010–2018): "The mining energy locomotive [supposed to pull Colombia's economy forward] is at full speed and we hope it continues that way" ((ex-)President Juan Manuel Santos, August 2011). Consequently, the expansion of large scale hydropower and biofuel projects was a priority for the government. Despite the social opposition, Santos had outspokenly supported the power plant: "Hidrosogamoso will give Colombia certainty with respect to energy provision" ((ex-)President Juan Manuel Santos, January 2015). In this case, the political power of the company is strong. To this respect, Hildyard et al. [105] highlight how the word "energy security" here is often a synonym for justifying energy enclosures such as water, food, and land dispossession and cultural alienation [see also 5]. Likewise, economic growth discourse is constantly deployed to justify the many violations against local communities [106] and environmental destruction [107].

Moreover, Duarte-Abadía et al. [62] have also shown how regional government and municipalities, instead of controlling the company, got out of their way. Instead of serving to defend their constituencies' interests they rather became facilitators and enforcers of the intervention—through legally biased decisions or violent practices.

7. Concluding Remarks

In this paper, we evaluated a PES scheme from a multi-scalar and political-ecology perspective in order to reveal and understand associated power asymmetries and outcomes across the Water-Energy-Food (WEF) Nexus perspective. We have shown how WEF and PES logics tend to draw a highly simplistic picture of the problems and solutions in the river basin, ignoring how power asymmetries mediate and how powerful actors utilize PES and the apolitical logic of the Nexus to support their goals. As a consequence, these policy concepts and strategies counteract the interests of those population groups with less economic and political clout, who are affected by the hydropower scheme, rather than supporting them. Our research thereby defies the discourse and policy strategies that see PES as an ideal instrument to materialize a political Nexus approach in practice. The Hidrosogamoso case illustrates how PES is made instrumental for the hydropower company in guaranteeing its own privileged access to water and highlighting its conservation efforts while, through scale politics, rendering its socio-environmental impacts invisible further downstream. Moreover, our results dispute the idea that governments are neutral actors seeking integration and a balance of externalities created by a project that is very close to their interest. In all contexts where unequal power structures, disputed resource access, rights and governance forms converge, resource

security (be this water, energy or food) is always an intrinsically political, plural and contested notion of diverging resource securities. Power asymmetries among actors play a fundamental role in the definition of which actors' resource securities are prioritized over others within the Nexus context, challenging integration.

As illustrated by the Hidrosogamoso case—mirroring everyday hydro-policy and intervention practice in most places around the world—it appears that the energy and water securities of the hydropower company and its political-economic allies are more important than the food and water securities (and the livelihoods) of the surrounding and downstream communities. Echoing Williams et al. [13], there is a sore necessity of developing a politicized progressive concept of WEF integration and PES, so that redistribution of resources, recognition of actors and political participation of less-powerful actors is put forward. Therefore, politicizing the Nexus can help to trace not just the flows of resources but, at once, the flows of economic, political, and cultural power.

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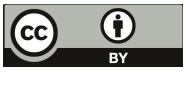

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Article

Disputing the 'National Interest': The Depoliticization and Repoliticization of the Belo Monte Dam, Brazil

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Abstract: The construction of a hydroelectric project transforms the watershed in which it is located, leading to a moment of contestation in which the scheme is challenged by opposition actors. This paper explores the interplay between pro- and anti-dam coalitions contesting the Belo Monte Dam in Brazil by discussing how each group inscribes the project with a particular resonance in policy. Drawing upon the work of Chantal Mouffe on agonism and Tania Murray Li on 'rendering technical', the subsequent discussion analyzes semi-structured interviews, questionnaires, and primary documents to explore how the storylines advanced by pro- and anti-dam actors contest the political character of Belo Monte. It is argued that within these storylines, Belo Monte's positioning within the 'national interest' represents a key site of the project's depoliticization and repoliticization—which are understood as the respective denial and illumination of the project's location within a wider terrain of political antagonism and conflict. Whilst pro-dam actors assert the apolitical character of the project by foregrounding it within depoliticized questions of economic benefits, anti-dam actors reground the project within a context of political corruption and the circumvention of dissent. With this paper providing evidence of how contests over dam construction are linked to the concealing and/or illumination of the project's political content, it is argued that the repoliticization of a project by a resistance movement can have consequences far beyond the immediate site of construction.

Keywords: Belo Monte; Brazil; dams; national interest; hydropower; depoliticization; repoliticization; energy policy

1. Introduction

Situated on the Volta Grande ('Big Bend') of the Xingu River in Pará state in the Brazilian Legal Amazon Region, Belo Monte, when completed, the Belo Monte Dam will become the fourth largest hydroelectric dam in the world. Its physical magnitude is clear—reportedly involving the excavation of over 240 million cubic meters of rock, soil, and sediment and the pouring of over three million cubic meters of concrete [1,2]. Yet, the significance of Belo Monte can also be seen in the extensive opposition staged against its planning and construction. Over 30 years, a multiactor, international coalition of nongovernmental organizations (NGOs), indigenous groups, and local communities has staged a prolonged campaign of opposition against the project. Within this 'moment of contestation' between pro- and anti-dam actors [3], both groupings have sought to locate the Belo Monte project within a wider context of both national politics and policy. This article, drawing on the analysis of public speeches, semi-structured interviews and questionnaires, and documents provided by both groupings, explores a key element of this contestation, namely the disputed positioning of Belo Monte within the notion of the 'national interest'. It is argued that these disputes over the 'national interest' represent a key site of contest over the project's relationship with the political, understood as the terrain upon which competing interests collide and contest differing visions of society. Adopting

a theoretical framework informed by Chantal Mouffe's work of agonism and Tania Murray Li's discussions of 'rendering technical', I argue that these debates are centered upon both the raising of the Belo Monte project above everyday politics and dissent and the attempted reversal of such a process. In discussing Belo Monte, proponents of the project present its construction as representing the 'national interest' in terms of the economic benefits that it is asserted to provide, with the dam perceived as necessary, urgent and beyond debate. In response to these claims, anti-dam criticism of the project seeks to reground its construction within a wider political context of vested interests and dissent, questioning the apolitical character asserted by the project's proponents by illuminating the role of corruption in its construction. In describing these storylines, this paper provides evidence of how the political—or apolitical—character of the project is rooted in a process of contestation over its location in everyday politics, antagonism, and conflict. Furthermore, it is asserted that, although Belo Monte will be built, the utility of anti-dam storylines of repoliticization extends beyond the site of this project's construction.

After detailing the methods adopted, this paper will assert the importance of pro- and anti-dam storylines in both consolidating and contesting the legitimacy of a dam project. Whilst pro-dam storylines have included a number of assertions, the analysis will focus on the positioning of Belo Monte within an asserted 'national interest'. After defining this role of the 'national interest', subsequent sections will characterize such assertions as a form of depoliticization—conceptualized in light of Mouffe's work on antagonism and Li's description of 'rendering technical'. However, it is asserted that such a process of depoliticization is reversible, with anti-dam actors able to forward alternative storylines that reconfigure pro-dam assertions and alter popular understandings of the project's construction. This paper explores such a process in relation to the construction of the Belo Monte project in Brazil. It details the interactions between pro- and anti-dam storylines and the contentious location of the project within a political terrain of corruption, economic development and the 'national interest'. Finally, conclusions are drawn.

2. Materials and Methods

The subsequent discussion is based on the analysis of

- 21 semi-structured interviews,
- 12 questionnaires, and
- 312 primary documents.

These materials were gathered between September 2016 and January 2018. The questionnaires and interviews analyzed are drawn primarily from local, national and international nongovernmental organizations (NGOs) publicly opposed to Belo Monte. In addition, interviews were also conducted with representatives of the Brazilian environment agency, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute of the Environment and Renewable Natural Resources, IBAMA), Fundação Nacional do Índio (the National Indian Foundation, FUNAI), the Ministério de Minas e Energia (Ministry of Mines and Energy, MME), and the Ministério Público Federal (Federal Public Ministry, MPF). These government agencies represent key actors in the planning, construction, and operations of dams in Brazil.

With the interviews and questionnaires primarily completed by anti-dam actors, discussions of the views, actions and storylines of pro-dam actors are based on the analysis of official speeches made by these actors. The settings for such texts included public political events, press conferences, or speeches made on the floor of the Brazilian Câmara dos Deputados (Chamber of Deputies, the lower house of the National Congress), accessible via the institution's transparency portal (http://www2.camara.leg.br/).

Additional documents included within the analysis have been disseminated by various organizations and groups, both in favor of and against Belo Monte. These include governmental sources, national and international civil society groups, domestic arms of international NGOs, and local campaigning groups. Adopting a method of discourse analysis, these materials are analyzed as

communicative devices, which are written and distributed to a specific, targeted audience and for a particular purpose. After the process of data collection and the transcription of interviews, I coded the data collected, detecting the links between the assertions of different actors and the concept of the 'national interest'. I subsequently used these links to define broader categories connected to the different storylines forwarded to either affirm or dispute the project's construction. All interviews, questionnaires, and primary source materials are referenced in the bibliography provided. (Notably, a number of the primary sources analyzed have been translated. Due to the challenges posed by such a process to the analysis of word choice and metaphor, the linguistic content of these sources is not directly analyzed. Instead, translated materials are analyzed to explore how the project is framed and located within the wider political terrain (i.e., via the development of links between Belo Monte and policies of economic development). Within this process, a variety of different storylines were detected. It is these that I outline below.

3. The Importance of Pro- and Anti-Dam Storylines

The construction of a dam is not an easy process—not only does earth have to be moved and concrete poured but the project must also be legitimized. With the construction of a large hydroelectric project transforming the watershed in which it is built, proponents of a dam must secure the consent or acquiescence of both local communities and wider activist networks. As a result, the planning and construction of the infrastructure is characterized by the contentious interaction between a project's proponents and opponents. Within this contest, both pro- and anti-dam actors work to locate the scheme within a wider terrain of demands and grievances to either endow it with increased legitimacy or strip such acceptability away.

The analysis of the discourses forwarded by respective pro- and anti-dam actors within this interplay provides researchers with the opportunity to analyze how both historical and contemporary hydropower projects are described in a certain way to locate them within a wider terrain of political or policy priorities. Scholarship has identified how pro-dam actors have endowed hydropower projects—and their consequences—with legitimacy by linking them to wider policies and popular demands. Examples include assertions of society's 'conquering' of nature, infrastructure as providing a techno-fix for social problems (such as water scarcity) [4,5], the relations between hydropower and statehood [6,7], and the characterization of dams as 'green', sustainable energy [8–11]. Assertions of the sustainability of contemporary dam projects provide a common storyline of legitimacy, with hydropower presented as providing clean, affordable energy that represents an alternative to fossil fuels [9,10,12,13]. However, this greening of hydropower is disputed, with recent studies highlighting the environmental impacts of the energy infrastructure—related to biodiversity loss [14,15], greenhouse gas emissions [16,17], and disrupted sediment flows [18]. In advancing these respective discourses, pro-dam actors locate a scheme within a wider social, political, or economic context—be it centered around economic growth, nationalism, or the consolidation of a certain political order. As a result, the project in question becomes inscribed with a wider political significance—endowing it with a further legitimacy.

However, unlike the infrastructure itself, the prescribed meaning of a dam is not fixed in place but remains open to reinvention and contestation. Anti-dam actors also engage in acts of discourse to present a dam project within a wider schema of resistance. Although contests over the infrastructure often encompass local concerns related to issues of the distribution of costs and benefits and the sovereignty of indigenous communities [19,20], actors opposed to a dam also incorporate additional discourses into their criticism of the project, transforming the dam projects into symbolic spaces of a wider political significance. For example, the Welsh resistance to the Tryweryn dam in the late-1950s linked the flooding of the small village of Capel Celyn to nationalist sentiments of the protection of Welsh culture and language and the subservience of the Welsh landscape to English interests [21,22]. Although unsuccessful, these assertions provided a strong counter-narrative to pro-dam storylines emphasizing the utilitarian value of the infrastructure [21].

The respective discourses forwarded by pro- and anti-dam groups can be understood as what Hajer describes as 'storylines', representing a trope or narrative that simplifies the meaning of social or physical phenomena [23]. A storyline is understood as an overarching body in which various discourses are combined into a coherent whole, with their respective complexity simplified and concealed [23]. These storylines are forwarded by discourse coalitions—defined as the collection of actors who utter a particular storyline, as well as the practices that conform to it—to legitimize positions or policies [24]. In the case of dam construction, these groupings are formed of pro- or anti-dam actors respectively, with each coalition presenting a number of storylines. For example, a pro-dam storyline may incorporate a variety of discourses including those related to nationalism, utilitarian notions of the greatest good for the greatest number and the importance of infrastructure, into a coherent storyline that is forwarded to legitimize a dam project. Although this storyline contains a range of demands and grievances, it is held together by what Hajer terms 'discursive affinity', in which previously-divergent discourses are fused by a similar way of conceptualizing the world [24].

The imposition and entrenchment of a storyline—that provides a means of understanding a project and its wider consequences—has a central role in the contentious interaction that surrounds the construction of a dam. These storylines are provided by both pro- and anti-dam actors, with each grouping locating a dam project within a wider narrative of problems, solutions, and impacts. The provision of storylines provides an important route for both groupings to inscribe a policy, process or project with a defined meaning—simplifying complex issues and debates into an accepted storyline that acts as "a catchy one-liner" that can legitimize a project, or strip such legitimacy away [23].

4. The 'National Interest' and Depoliticization

This article takes as its starting point one particular storyline forwarded by pro-dam actors to legitimize dam projects—that of the 'national interest'. This term—usually resonant in international diplomacy—can be understood as representing the best route forward, asserted by the government for the wider population of the state. The use of such a term implies the possibility of defining the needs and priorities of a state as a coherent, homogenous whole. At the subnational level, the 'national interest' functions as a rhetorical device designed to develop legitimacy and public support for a certain course of action [25]. These assertions of the 'national interest' can include references to the protection of the status quo (or 'security') or to national socioeconomic progress (or 'opportunity'). The securitization theory of international relations demonstrates that the description of an issue as one of 'security' acts to produce a state of emergency, invoking an existential threat [26]. A similar process occurs in the case of a storyline of 'opportunity', generating links between a policy or process and a wider popular image of national progress [27].

Previous scholarship has explored the links between dams and the consolidation of existing or emergent power structures, with the infrastructure located within a politicized context of state-building and nationalism [6,7,28–30]. For example, the Tarbela Dam in Pakistan represented a direct attempt by the central government to demonstrate and concretize its vision for a united post-independence nation [31]. Similarly, the positioning of the Rogun dam in Tajikistan within a sense of nationalist identity and patriotism allowed for the continued commitment to the project by the Tajik elite [7]. In both of these cases, the building of a dam was asserted by pro-dam actors as consolidating a new form of political rule in a fragmented state [7,31]. A similar process is currently taking place in contemporary Afghanistan; where large infrastructure projects are cast as necessary for socioeconomic development and political stability [32]. In locating hydroelectric schemes within wider policies of economic development, pro-dam actors foreground the respective projects within a wider storyline of what is good for the country—or what is in its interests, transforming the project into a central site of what is deemed the 'national interest' [8,33].

Pro-dam storylines of the 'national interest' not only function to inscribe a hydropower project with a particular meaning—casting it as a solution to certain challenges—but also act to redirect criticism of the project, restricting the possibilities of action available to anti-dam actors. This can be

seen in what Crow-Miller has labeled 'discourses of deflection' [34]. These storylines are forwarded to direct attention away from issues and outcomes that do not fit within the problems defined and solutions prescribed by pro-dam actors. For example, analyses of pro-dam storylines that present an infrastructure project as a solution to challenges of water scarcity have shown that such storylines both create a necessity of action [11,35] and restrict alternative routes forward [4,5]. Similarly, storylines of hydropower as a route to wider economic development present a vision of the benefits provided by the project, foregrounding it within a wider national interest of progress and opportunity [7]. For example, pro-dam actors supporting the construction of the Volta River Project in Ghana presented the population displacement caused by the dam as an opportunity, with the displaced sacrificing their "traditional homes in the interests of the nation" [36]. Such a storyline of opportunity—framed in relation to the asserted 'national interest'—deflected criticism of the project, based on population displacement, by foregrounding such impacts within a context of national progress, allowing for a further legitimacy of action.

Storylines of the national interest provide a route to control the policy agenda, allowing for the deflection of criticism, the restriction of alternatives and the consolidation of existing asymmetries of power [34,35,37]. Pro-dam actors forward storylines to not only frame a project in a particular light or related to a particular issue but to also discredit opposition networks, representing the discursive marginalization of alternative voices resisting the project in question [38,39]. For example, in the contest over the Sardar Sarovar dam in India's Narmada Valley, opposition networks were marginalized and trivialized by pro-dam actors' claims of the 'national interest', with activists labeled as 'youngsters', 'boys and girls', and 'eco-fundamentalists' to position them outside of the asserted interests of the Indian state and discredit their credentials as political opposition [40]. In making these statements, pro-dam actors forwarded storylines to delegitimize opposition actors, casting their grievances and demands as unacceptable or subversive. This transforms the contestation surrounding the project from a political struggle over a contested future to a simple binary of 'for/against', 'patriotic/treasonous', and 'good/evil' [41], with pro-dam actors locating opposition groups and alternative viewpoints as existing both beyond the 'national interest' and standing in the way of future progress.

In this light, pro-dam storylines both assert the importance of a project and delegitimize opposition networks by rendering a project or policy process as apolitical and separating legitimate from illegitimate actors, demands and grievances [41]. Tania Murray Li's concept of 'rendering technical' provides an important route to understanding how pro-dam storylines of the 'national interest' constitute this normative divide between the necessity of a hydroelectric dam and the illegitimate demands of anti-dam actors. Li argues that proponents of development projects and policies often present these plans in technical terms, restricting their political content. In doing so, the political character of a project is stripped away, with policy problems and their associated solutions defined as necessary, urgent, and apolitical [42]. As Li has argued "questions that are rendered technical are simultaneously rendered nonpolitical . . . (to) exclude the structure of political–economic relations from their diagnoses and prescriptions" [42]. It is this 'rendering technical' that removes projects from the terrain of political contestation—delegitimizing the dissent of those groups standing against their construction.

A pro-dam storyline of the 'national interest' provides a simplifying lens that presents dam projects as a technical and apolitical by configuring the normative divide between legitimate and illegitimate thinking, national progress and regressive activity and isolating the opposition network from the wider community, with anti-dam actors cast as existing outside or what is deemed 'the national interest'. This act of exclusion constitutes the depoliticization of the hydropower project, in which "legitimate and responsible actors' demands are distinguished from illegitimate, irresponsible actors and unrealistic and impossible demands" [41]. In advancing these depoliticizing storylines, powerful actors assert the need for agreement and consensus whilst concealing alternative interpretations and visions of a project's importance, as well as the political interests and identities that both argue for and benefit from its construction [43].

In applying this concept of depoliticization, I draw from the distinction between 'the political' and 'politics' proposed by Chantal Mouffe [44]. Within this reading, 'politics' refers to the numerous practices, institutions and acts of discourse that establish a certain order and organize and manage society. 'The political' refers to the occurrence of antagonism that is present in all society, with different social groups and interests competing to achieve the partial dominance of their own worldview within these practices and institutions [44,45]. This antagonism does not necessarily have a negative character but can instead be understood as essential to democratic politics [44–47]. A well-functioning democracy often requires a clash between adversaries possessing political positions that are recognized as legitimate—it is this recognition that allows for the transformation of antagonism into agonism, with opponents recognizing their adversarial relations but not as enemies [47]. For Mouffe, it is the persistent occurrence of this agonism that allows for the airing of political conflicts, social demands, and ideological contests of what society should be, or what is in a society's interests [44,46–48]. As Mouffe has argued, "political questions are not mere technical issues to be solved by experts. Proper political questions always involve decisions that require making a choice between conflicting alternatives" [46]. Within this reading, political disagreement is to be welcomed as it allows for the airing of competing grievances and demands. Yet, it is this agonistic character of the political that depoliticization limits, denying the legitimacy of alternative positions and storylines and the political character of dam projects. Such assertions can also be found in the work of Swyngedouw—drawing on the work of Jacques Rancière —on the post-politics of environmental policy and climate change, with such challenges often asserted as "to be dealt with through compromise, managerial and technical arrangement, and the production of consensus" [49,50].

However, this process of 'rendering technical' is reversible. As Li argues, communities and opposition groups—standing against development projects—can forward arguments of critique to puncture a technical discourse, providing it with "a challenge it cannot contain" and opening up a new front of struggle [42]. Political movements and outbursts of dissent act to forward and shape alternative understandings and trajectories [43], engaging in an act of reconfiguration that simultaneously challenges and modifies dominant pro-dam storylines. Groups and individuals opposed to a dam forward their own storylines of resistance to not only critique the project itself by illuminating its social and environmental impacts but to also challenge the pro-dam storylines of legitimacy. Whilst scholarship has explored how anti-dam actors contest the planning and construction of dams by forwarding storylines that illuminate the social and environmental impacts of respective schemes [20,51–53], it is important to interrogate how these resistance storylines simultaneously challenge and reconfigure dominant pro-dam narratives.

Whilst the state-based character of international relations may allow for the invoking of a unified interest of a state in diplomatic terms, the extent of differences within such a state challenge the potential entrenchment of a storyline of the national interest at the subnational level. The heterogeneity of society results in the national interest becoming subject to multiple definitions and constructions [54]. Whilst pro-dam actors may seek to legitimize a hydroelectric project by describing it as in the national interest, anti-dam actors may challenge such an assertion by illuminating the divergence of the project from the wider interests of the population. As a result, how a dam project is defined in relation to the 'national interest' becomes a key site on which the contest between pro- and anti-dam actors takes place.

The national interest is not a unified, agreed-upon concept and is, instead, subject to multiple, contesting definitions—allowing for anti-dam actors to appeal to additional understandings and storylines as a means to generate opposition against a dam project by challenging its location in the national interest. Anti-dam groups also forward storylines that illuminate the political meaning of the dam, focusing attention on the political interests pursuing its construction, highlighting disconnects between those impacted by a project and end-users of the energy generated and emphasizing calls for justice for those local communities affected [20,55,56]. This is evident in the actions of the Narmada Bachao Andolan (NBA), opposed to the Narmada dams in India, which engaged in a reconfiguration

of the pro-dam storyline of development that accompanied the project to illuminate its equivalence to the destruction of cultural heritage and the maldistribution of costs and benefits [40]. This alternative vision involved the reversal of a process of depoliticization to provide an alternative vision of the dam project in question and the interests underpinning its construction. I term this process 'repoliticization', understood as the adoption of storylines to reveal the competing interests that underpin environmental projects and articulating these within an alternative vision of society [41,57]. This process of rendering visible the political character of a project is in response to previous claims of 'national interest', resulting in the labeling of this process as 'repoliticization', rather than 'politicization'—which is understood as the activation of a political element of a project or policy that has not been previously denied. This process of repoliticization represents the generation of debate over alternative futures, reactivating the politico-ideological character of hydraulic infrastructure that is muted by storylines of depoliticization.

Although the opposition to the Narmada projects was ultimately unsuccessful—with the Sardar Sarovar dam officially opened in September 2017—the movement against it provides an important example of how anti-dam groups reconfigure dominant pro-dam storylines and alter the trajectory of hydropower projects elsewhere. The storyline forwarded to illuminate how hydropower projects impacted the local Adivasi community allowed for the growth of the anti-Narmada opposition network, with the movement formed of numerous interests at all levels that discussed the benefits and impacts of large development projects on a more general basis [58]. The advancing of this anti-dam storyline engaged in a direct critique of the notion of economic development forwarded to legitimize the dam, pressuring the World Bank—a key funder of hydropower projects—to establish an independent review to assess the impacts of the project. The significance of this process is evident in how the opposition to the Narmada project extended beyond the provincial and localized activism and came to represent a wider outpouring of dissent against hydropower. This is evident in how the NBA contributed to the World Commission on Dams 2000 report, with the impacts of the project providing evidence of the lack of cultural heritage studies and mitigation measures within 20th-century dam building [59]. In doing so, those opposed to the Narmada projects demonstrate how activism can repoliticize hydroelectric projects, elevating localized impacts into a terrain of national and international significance.

This study will explore how the links between hydropower and the 'national interest'—as asserted in pro-dam storylines—are not set in stone but are, instead, contested by anti-dam actors. In doing so, it explores how the 'national interest' provides a key site of the interplay between pro- and anti-dam groups contesting Belo Monte. Whilst pro-dam actors forward a storyline of the national interest to strip a hydropower project of its political meaning and implications, anti-dam groups seek to illuminate the context and controversy of its construction, as well the political interests pushing the project forward.

5. Belo Monte

The Belo Monte dam—due for completion in 2019—is projected to generate a maximum of 11,233 megawatts, to be distributed via high-capacity transmission lines over 2000 km to the southeast of Brazil, where the majority of national energy demand is based [60,61]. With the roots of its development found in the era of military dictatorship that ruled Brazil from 1964 to 1985, the planning and construction of the project has involved a prolonged, 30-year period of contestation between its proponents and opponents. A previous incarnation of the project—then named Kararaô—was met with an extensive opposition campaign, which forwarded a storyline of resistance based on the rights and territory of indigenous communities and environmental health [8,51]. This opposition culminated in the 1989 Altamira Gathering, with local indigenous communities forming a formidable anti-dam coalition with national and international organizations and celebrities to protest the project. In response to this opposition, Kararaô was removed from national energy plans in 1990. However, the project returned in the early-2000's as a key part of the national development policy agendas proposed by the government of the Partido dos Trabalhadores (Workers' Party, PT), led by Presidents

Luiz Inácio Lula da Silva (2003–2011) (herein Lula) and Dilma Rousseff (2011–2016) (herein Dilma). A new scheme—now named Belo Monte—was formally proposed by the government in 2005, receiving funding from the Brazilian development bank—Banco Nacional de Desenvolvimento Econômico e Social (National Bank for Economic and Social Development, BNDES). Additional supporters of Belo Monte include actors from the Ministério de Minas e Energia (Ministry of Mines and Energy, MME), regional and national energy companies (including the national utility Eletrobras and, the owner of Belo Monte, Norte Energia) and companies tasked with the project's construction. Lining up against Belo Monte was a multilevel coalition, including indigenous groups and local communities, regional and national nongovernmental organizations (NGOs), and international campaigning organization (such as Amazon Watch, International Rivers, and Greenpeace).

The contestation surrounding the Belo Monte dam provides a productive case for understanding the role of the political in the management of water and the infrastructure that governs it. The project is a constituent part of a wider developmentalist agenda, being funded as part of the Programa de Aceleração do Crescimento (Growth Acceleration Program, PAC)—a policy package representing significant spending on infrastructure in Brazil. At the time of its planning, it was one of at least 25 large hydroelectric projects planned to have been built in Brazil's Legal Amazon region [61]. As a result, it is tied to additional issues and priorities present on the political landscape, including economic development and energy security [8,51]. Whilst previous research has uncovered numerous pro-dam storylines forwarded to legitimize the Belo Monte project, including assertions of the project's sustainability and its role as a solution to issues of energy insecurity [8,12,62], this study focuses on a particular storyline—that of the national interest. It is argued that this storyline provides a significant site of contestation—with the role of the project in the political subject to dispute. Whilst pro-dam actors have forwarded storylines that depoliticize the project, anti-dam actors have sought to render visible the political connotations of Belo Monte by regrounding them within a wider context—distant from assertions of the 'national interest'. In doing so, these competing groupings provide a lens through which explore how the political elements of a water infrastructure project are not set in stone but are, instead open to contestation.

6. Pro-Dam Assertions of the 'National Interest'

Within the pro-dam storylines, the positioning of Belo Monte within 'national interest' is rooted in the political economy of the hydroelectricity to be generated by the project. Pro-dam actors in Brazil present the importance of Belo Monte as rooted in the economic benefits that it will stimulate, both for the local region and beyond. For example, in 2011, President Dilma Rousseff defined the scheme as a "fundamental undertaking for the development of the region and the country" [63]. In the same year, the then-Senator of Rio de Janeiro (2007–2014), Francisco Dornelles (Partido Progressista, PP), argued that "the construction of Belo Monte dam is of (the) greatest importance for the development of the country to sustain economic growth, (and) job creation" [64]. In making these statements, the pro-dam actors assert the links between the Belo Monte project and the economic future of the region, providing benefits for a diverse group of beneficiaries [8]. The Federal Deputy for Amazonas, Carlos Souza (Partido Progressista, PP) argued Brazil "need(s) the Belo Monte hydroelectric project so that this country can continue to grow" [65]. Within this storyline, Belo Monte represents a symbol of a shared future of economic development and an integral part of the Brazilian national interest—with the project presented as the only route forward [66].

In asserting the economic benefits to be stimulated by the Belo Monte project, pro-dam actors present the projects as apolitical, technical projects that are in the 'national interest' [8,33]. For example, José Carlos Aleluia, a former president (1987–1989) of the Companhia Hidrelétrica do São Francisco (São Francisco Hydroelectric Company, CHESF) and Federal Deputy for Bahia (Partido da Frente Liberal, PFL), labeled the project as "not a government project, (but) a project of the nation" [67]. In making this statement, Aleluia articulates equivalence between the Belo Monte project and the 'national interest', affirming that the dam represents a national effort towards energy security that

would provide benefits for the population across Brazil [67]. These allusions to a shared common future were repeated by a number of other pro-dam actors when discussing the Belo Monte project, with the project affirmed as providing shared benefits, widening the perceived beneficiaries of the energy provided [63,64,68].

This storyline of the national interest is forwarded by pro-dam actors to raise Belo Monte above the political, elevating it beyond the everyday politics of agonism and delegitimizing opposition actors. By presenting an equivalence between Belo Monte and a shared future, pro-dam actors, such as Aleuia, draw a division between those in support of the scheme (sharing in the common future) and those opposed to the project, existing both outside the defined 'national interest' and standing in its way. Anti-dam actors were described as holding Brazil back from the economic development promised by the Belo Monte dam. For example, Asdrubal Bentes, a Federal Deputy (Partido do Movimento Democrático Brasileiro, PMDB), argued in 2001 that potential resistance to the Belo Monte project represented an "intolerance from those who do not want to see this country develop (and to be) producing well-being for its people" [69]. In asserting such 'intolerance', Bentes distinguishes a divide between 'legitimate' and 'illegitimate' grievances and demands. The arguments of opposition groups become representative of the demands of those who, in the words of Bentes in a later speech "wish to derail our development, who want to stifle the Amazon and not allow us to make the most of our hydroelectric potential, to use our riches in favor of Brazilians" [70]. It is by forwarding such storylines that pro-dam actors cast opposition actors as existing outside of the legitimate order and exclude them from democratic debate, stripping the contest surrounding Belo Monte of its contentious character by marginalizing those campaigning against it.

A storyline of depoliticization is also evident in a 2010 speech made by President Lula in Altamira, the city nearest to Belo Monte's construction site. Within this address, Lula compared the opposition coalition to his personal experience protesting the Itaipu dam, arguing that his opposition was the result of a lack of information and awareness of the importance of such projects. He argued that:

> "The opposition (to Itaipu)—like these kids (those opposing Belo Monte)—for lack of information, used to say that an earthquake would happen, say that the Itaipu reservoir would cause an earthquake in the Itaipu region (and that) the weight of the water would change the Earth's axis". [71]

In making this comparison, Lula casts the opposition to Belo Monte as 'kids' who are naive and mistaken, highlighting what he perceives as their having a limited knowledge of the project and the problems that it is intended to solve [71]. Drawing on his own experience opposing Itaipu, Lula highlights that the contemporary opposition to Belo Monte will, with time, understand the importance of the project presenting an image of anti-dam actors as not only blocking the fulfillment of Brazil's national interest but doing so based on incomplete information and illegitimate grievances [8].

Within this pro-dam storyline of depoliticization, anti-dam groups are presented as voicing unfounded, reactionary, and illegitimate demands that should not hinder the construction of Belo Monte. As Francisco Dornelles argued in 2011, Brazil cannot "allow partial views of reality to prevail in the face of general interest" [64]. The storyline depoliticizes the contest surrounding Belo Monte, rendering its construction as a technical pursuit devoid of political content, with the opposition actors characterized as misguided, ignorant, and restricting Brazilian economic development.

Rendering Belo Monte Technical

A process of depoliticization is also evident in the pro-dam coalition's use of legal mechanisms to continue planning and construction of Belo Monte. Throughout the project's planning and construction, numerous legal challenges have attempted to secure the suspension or cancellations of the Belo Monte project. The Brazil state prosecutor, the Ministério Público Federal (MPF) referred 25 lawsuits against the Belo Monte project between 2001 and 2016—with these legal arguments voicing the grievances of local communities regarding a failure of Norte Energia to consult with and secure the consent of

local populations, the methodological flaws present in official Environmental Impact Assessments, and the challenges faced by Norte Energia in meeting a number of conditions for its license to build the project [72]. However, these legal challenges have been ultimately unsuccessful, with the construction of Belo Monte continuing.

A key factor in this persistence of the project can be found in the use of a legal mechanism that allows the judiciary to overthrow previously-made legal decisions in the name of the 'national interest'. This instrument—known as the Suspensões de Segurança ('Security Suspension')—dates back to the years of the military dictatorship and Law 4348/1964, which allowed for the suspension of judicial decisions—based on the criteria of if the act/decision could cause "serious damage to the health, safety, order, and public economy." The use of a Security Suspension allows for the overruling of court decisions—often based on securing individual and collective rights—to ensure the continuation of policies or completion of projects that are defined as being in the 'national interest'. The mechanism allows for a judge at a higher court (be it on the Federal Circuit or at the Brazilian Supreme Court) to overturn a decision made by a judge on a lower, more-local circuit. Such a decision to overturn must be based on the belief that the initial decision risks challenging the "health, safety, order, and public economy" of the Brazilian state and simultaneously restricts the right of appeal, allowing the project to continue without interruption [2].

In the case of Belo Monte, Security Suspensions have been used to overturn previous decisions that have called for the suspension of the project's construction [73]. With this judicial mechanism predicated on linking a decision to a defined 'national interest', the security suspensions represent a judicial resource appealed to by pro-dam actors to overturn legal decisions that suspend, delay or cancel Belo Monte's construction. The use of such a mechanism affirms the exceptionality of the project in question, suspending the legal rights of those affected whilst asserting the significant urgency of the project's completion. In doing so, the use of a Security Suspension not only provides a mechanism of legal intervention but also a significant means to redefine its position within the legal space itself, raising the project above both legal procedure (as evident in its restriction of the right of appeal) and the political (in its declaration of a project as being in the 'national interest') [73]. The importance of Belo Monte becomes located at the national level, with local communities impacted by the project unable to secure judicial redress against Norte Energia or the pro-dam actors calling for the dam's construction [73].

The use of Security Suspensions demonstrates the use of judicial resources to assert and reaffirm the exceptionality and significance of Belo Monte, whilst denying its political character. By rooting the construction of Belo Monte in the 'national interest', the use of Security Suspensions act to depoliticize the project, raising it above everyday judicial procedure. This is illustrative of Li's 'rendering technical', with alternative viewpoints—related to social and economic impacts or a failure to consult with local populations—cast aside and the hydroelectricity to be generated by Belo Monte presented as both urgent and necessary. This functions to strip the project of its political character, raising it above the terrain of the political and delegitimizing opposition. By defining Belo Monte as an integral part of the 'national interest', Brazilian judicial actors not only articulate the equivalence between a project and economic development but also exclude other elements (related to impacts or noneconomic costs and benefits, for example) to present the respective projects as technical, rather than political, decisions.

7. Illuminating the Political

With the pro-dam coalition forwarding storylines that foreground the construction of Belo Monte within the 'national interest', anti-dam groups challenge this equivalence by illuminating the political context in which Belo Monte has been planned and built. In discussing the project, anti-dam actors made direct reference to the assertions of the 'national interest' contained within the legitimizing storylines forwarded by the project's supporters. However, rather than merely challenging declarations of necessity and urgency, anti-dam actors at the regional, national, and international level sought to reconfigure the ties between Belo Monte and what is deemed to be in the 'national

interest'. In doing so, anti-dam actors rendered visible a wider context and controversy of the project's planning and construction, regrounding their opposition within criticism of political corruption and the circumvention of democracy. This represents a process of repoliticization, with anti-dam actors illuminating the political background and implications of Belo Monte to cast doubt on the project's role within the wider national interest.

When challenging the importance of Belo Monte to the 'national interest', anti-dam actors highlighted the personal and political commitment of a number of individual politicians—as well as the wider government of the Partido dos Trabalhadores (PT) [74–79]. Within this alternative storyline, the project was presented as equivalent to—and symbolic of—the wider policies and principles of the government of the PT and Presidents Lula Dilma Rousseff, who successively governed Brazil between 2003 and 2016 [74,75,77,80,81]. In forwarding such a storyline, anti-dam actors challenged the pro-dam storyline of the 'national interest', arguing that the projects, instead, represent the pursuit of the political and economic goals of a particular political group [74,75,77,82]. Within this anti-dam storyline, Belo Monte is presented as "the head carnival float for the party. The showcase to show that the party, the President (is) helping Brazil develop and so forth" [83]. As one interviewee based at the Brazilian arm of an international EO, argued, the announcement of hydropower projects coincided with election years:

> "When Lula wanted to (be) re-elect(ed), he launched the Madeira dams. When Dilma came, she launched Belo Monte. When they wanted the second term of Dilma, they built São Luiz do Tapajós. It was so weird. In twelve years, they had three big dams to launch exactly in the election year(s)". [75]

In making this statement, the interviewee highlights the links between the construction of a number of hydropower projects—including the Madeira river dams (completed in 2012) and the São Luiz do Tapajós (removed from energy plans in 2016)—and the electoral goals of the PT. This asserted link repoliticizes the respective projects by foregrounding them within the political, represented by the agonism of partisan politics and political elections. According to the anti-dam actor quoted above, the pro-dam storyline of economic benefits is asserted to generate popular support for the government building them, allowing continued electoral success [75].

In light of this deemed political and electoral importance of hydropower projects in Brazil, opposition groups highlighted the links between Belo Monte and the ambitions of the PT. Anti-dam actors defined the economic doctrine of the PT government as representative of a policy of 'development at all costs', with the aim of economic development pursued with limited concern for social or environmental impacts or dissent from local populations [74,75,78,79,81,84]. By emphasizing these links, anti-dam actors highlight how members of the PT government exerted political influence to ensure the realization of the Belo Monte project, regardless of its social and environmental impacts [74,77,85–87]. For example, anti-dam materials argued that political pressure was applied to technical staff in IBAMA, resulting in the construction of Belo Monte without adequate mitigative measures to address the impacts of construction [86–88]. In 2009, two senior officials at IBAMA—Sebastião Custódio Pires and Leozildo Tabajara da Silva Benjamin—resigned from their roles in the organization, complaining of high levels of political pressure to approve the Belo Monte project [88]. Two years later, IBAMA President Abelardo Bayma Azevedo also resigned for similar reasons [87]. Similarly, the prominent anti-dam activist Telma Monteiro accused Lula of ignoring information on Belo Monte's environmental impacts that have been provided by scientists and researchers [89]. An interviewee highlighted that members of the PT government had restricted the publication of a report that demonstrates how Belo Monte will be affected by the flow of the Xingu being reduced by future climate change [83]. In emphasizing these examples, anti-dam actors assert the political agency of pro-dam actors, with the proponents of Belo Monte asserted to be driving the projects forward with little attention paid to dissenting views.

A prominent example provided by anti-dam actors to highlight the pro-dam coalition's commitment to the Belo Monte project concerns the Brazilian response to the 2011 decision of the Inter-American Commission on Human Rights (IACHR) to request the suspension of Belo Monte's environmental licensing process, due to its effect on the indigenous populations of the region [74,77,90]. In response to this decision, the Brazilian government withdrew its candidate for a seat on the commission, withheld its annual payment from the Organization of American States and threatened to leave the organization entirely [91]. The IACHR rescinded the decision soon after. This episode is presented by opposition actors as indicative of the undemocratic context in which the projects were developed, with limited room for dissent and judicial appeal [74,80,92]. For example, one interviewee explained, "Belo Monte was a very important government decision. The government said "Belo Monte is a decision" and (this) never changed" [80]. In making this statement, the anti-dam actor illuminates the political commitment to the Belo Monte project, arguing that pro-dam actors pursued the project unilaterally, with limited opportunity for alternative voices.

When discussing this political commitment to the projects studied, numerous opposition materials referred to the words of Lula made at a 2009 meeting, in which he promised that "Belo Monte will not be shoved down anyone's throat" [93,94]. This statement has become a central narrative device in the resistance to the Belo Monte project, with anti-dam actors highlighting Lula's failure to keep his promise, despite the complaints of local communities [90]. For example, a letter to President Lula in 2010, organized by Amazon Watch and signed by numerous international NGOs, argued that:

> " . . . Regardless of these concerns from your fellow Brazilians and your earlier promises to them, we see that your government indeed intends to shove Belo Monte down the throats of the directly affected Indigenous and riverine communities in the Amazon". [82]

Within this statement, Lula's words become rearticulated to highlight how commitment to the Belo Monte projects by the governments of Lula and Dilma is representative of a 'steamroller' has neglected the social and environmental impacts of the project [81,83,93,95,96]. As one interviewee, an international journalist who had reported on Belo Monte, described "They basically rammed Belo Monte through, despite vast opposition within Brazil itself and from the international community" [97]. In arguing that the actions of pro-dam actors have restricted the agency of those opposed to Belo Monte, anti-dam actors challenge the use of Security Suspensions in the construction of the Belo Monte dam [76,81,83,90]. The use of these legal instruments to dismiss legal opposition is presented as evidence of the circumvention of democratic practice by a corrupt pro-dam coalition intent on building hydroelectric dams in the Brazilian Amazon [84]. For example, a respondent based at a Brazilian human rights organization labeled such judicial verdicts as a "political decision that neutralizes justice" that show "the limit of the democratic institutions (of Brazil)" [90]. Similarly, the Security Suspensions were presented by a representative of a nongovernmental organization that has written extensively on these mechanisms as "the manipulation of the justice system to legitimate a project of dubious legality" [84]. In making these statements, anti-dam actors present Belo Monte as representing the circumvention of democratic and legal norms and institutions in Brazil, with the judiciary reduced to a rubber-stamp of legitimacy for the pro-dam coalition and the opposition to Belo Monte having limited opportunity to reverse these decisions [72,74,96].

A 'Promiscuous' Relationship

The assertions of the importance of political interests in ensuring Belo Monte's construction was further developed by anti-dam actors to illuminate the alleged links between the dam and a wider corruption scandal that has dominated Brazilian politics in the years since 2014. This was in response to the high-profile Lava Jato ('Car Wash') investigation that exposed a culture of corruption at the center of Brazilian politics. This investigation started in 2014 as a probe into money laundering at the Posto da Torre (Tower Gas Station) in Brasília but soon widened to become an expansive anticorruption investigation into an intricate web of political and commercial corruption. The enquiry

uncovered an extensive scheme of corruption centered on the semi-public oil company, Petróleo Brasileiro S.A. (Petrobras), where executives were allegedly paid bribes to award contracts to favored construction companies. This money would be funneled to politicians, funding election campaigns that kept the governing coalition in power. The resultant investigation ensnared a number of Brazilian construction companies involved in the Consórcio Construtor Belo Monte (Belo Monte Construction Consortium, CCBM), including Odebrecht, Camargo Corrêa, and Andrade Gutierrez, as well as the political parties in government during the years of Lula and Dilma's presidencies, such as the PT, the Partido Progressista (Progressive Party, PP), and the Partido do Movimento Democrático Brasileiro (Brazilian Democratic Movement Party, PMDB).

In discussing Belo Monte, numerous anti-dam actors foregrounded the planning and construction of the dam within this wider context of corruption uncovered by the Lava Jato investigation [74,98,99]. These actors adopted a number of terms to describe the wider pro-dam coalition building Belo Monte. For example, a letter from anti-dam actors, congratulating Dilma on her election as President, argued that Belo Monte was being pushed forward by what is described as the 'relações promíscuas' ('promiscuous relationship') between political and commercial actors [100]. Although making no direct reference to the occurrence of corruption that was to be uncovered, by referencing an act of 'promiscuity' this letter—written in 2011—presents the nature of this relationship as both close and immoral [100]. Similarly, writing for International Rivers, Zachary Hurwitz coined the term 'hydro-mafia' [85]. This evokes a criminality in the actions of proponents of Belo Monte, with Hurwitz's use of the term alluding to the violent, covert and ruthless character of the pro-dam lobby.

Anti-dam actors presented this 'promiscuous relationship' as an explanatory factor for the construction of the Belo Monte project—with the dam presenting an opportunity for the alignment of the interests of the two groups and, with it, corruption [74,75,77,100]. For example, a representative at an international environmental organization (EO) described the project as a "situation that was ripe for corruption to reign, to flourish" [77]. The same interviewee later explained "this project was perhaps not only a source of corruption, it was perhaps built because of corruption. It was justified in their minds by the fact that vast quantities of public funds would fall into their coffers" [77]. Furthermore, an interviewee from an international EO argued that Belo Monte represented a corrupt exercise, designed to benefit a limited few: "the two ruling political parties, the PT and the PMDB were essentially splitting the tips, they're splitting the corruption benefits, revenues from the companies who were getting these enormous contracts in thanks for their having run the project forward" [77]. This statement positions the Belo Monte project within the political context of the corrupt practices uncovered by the Lava Jato investigation to assert that it is this corruption that led to the dam's construction. Furthermore, an article published by the anti-dam NGO, International Rivers argued:

> "As the investigations of Operation Lava Jato have revealed massive corruption within the Brazilian dam industry, the fundamental reasons for the federal government's obsession with destructive dam projects particularly during the administrations of Luis Inácio Lula da Silva and Dilma Rousseff—are becoming increasingly clear". [101]

In light of this perceived presence of corruption, anti-dam actors presented the use of Security Suspensions as "a scam in order to benefit the public power (defined as the Brazilian government), in alliance with the companies behind big projects" [79]. This statement highlights the belief of many in the opposition that these mechanisms both allowed and legitimized the corrupt relationship between Brazilian political actors and the construction sector evident in the Belo Monte project [77,79,83]. In presenting the links between the use of Security Suspensions and the Lava Jato investigation, anti-dam actors expand the alternative vision of the reasons behind the construction of the Belo Monte project, characterizing it as for the benefit of the few, rather than for the economic development of Brazil, as asserted in pro-dam storylines. As one interviewee at an international environmental organization argued, the use of Security Suspensions

> "Smacked as a pretense to run the project forward to the benefit of the companies who are building it, who are not investing in it. They are simply the ones earning the massive contracts and also the politicians who were making sure that this project (Belo Monte) moves forward by hook or by crook". [102]

Within this statement, the interviewee challenges the assertion of the 'national interest' present within the pro-dam storyline by highlighting the links between Belo Monte and the Lava Jato investigation. This functions to directly dismiss the arguments of 'national interest' that are present within the judicial decisions that suspended previous judgements against the Belo Monte project [77]. It is within the storyline of repoliticization that, as one interview explained, Belo Monte becomes presented "part of a political project that has the elite as the main actor that would benefit from these choices" [74]. Anti-dam actors argued that it is these benefits, shared between political and private actors that resulted in the construction of the project, regardless of the grievances and demands voiced by local communities and opposition groups [77,100–104]. For example, domestic resistance actors published a letter to Dilma Rousseff that argued that the closeness of this relationship has resulted in pro-dam actors neglecting the grievances and demands of the local communities impacted by the project [95].

In emphasizing the links between Belo Monte and corruption, anti-dam actors argue that the project's construction was not in the name of 'the national interest' but, instead represented the narrow interests of political and commercial actors engaged in corrupt behavior. The presentation of the links between Belo Monte and Lava Jato received increased coverage in both national and international media reporting of the Belo Monte project between 2015 and the time of writing [105–108]. Anti-dam actors argue that although they had reported on the potential of corruption in the Belo Monte project, it was not until the exposure of the scandal by the Lava Jato investigation that these concerns resonated with the wider Brazilian population. One interviewee based at a domestic human rights NGO explained, "We have been calling everybody's attention to that, but nobody heard that until the Lava Jato came and started to find out crimes and corruption" [74]. The exposure of this corruption constitutes a key site in the resistance against Belo Monte, allowing it to develop a wider resonance in a Brazilian society already protesting corruption. As the prominent journalist Leonardo Sakamoto argued, it was the exposure of this corruption that finally turned popular opinion against the Belo Monte project—with its role in the national interest discredited [109].

This analysis has demonstrated that the storylines forwarded by these resistance actors reconfigure dominant pro-dam storylines of the national interest by illuminating the relationship between the project and political interests and actors. Such a process of reconfiguration elevates local anti-dam actors to the terrain of antagonism that constitutes the political by outlining an alternative reading of hydraulic infrastructure and the drivers behind their construction. In doing so, the trajectory of contestation between pro- and anti-dam actors in Brazil is altered, with reconfigured storylines of the national interest weakened in their popular appeal. Rather than a technical, apolitical project in the 'national interest'—as described in the pro-dam storyline—Belo Monte is presented as both equivalent to and a result of the corruption scandal that dominated Brazilian politics at the time of its construction. A Federal Deputy interviewed, who has often been vocally critical of Belo Monte, argued that it was this corruption that led to a context in which "the environmental laws, human rights standards were being bulldozed to expedite this project" [102]. The economic benefits promised by pro-dam actors are rearticulated to represent a political commitment to the planning and construction of hydropower projects, regardless of their social and environmental consequences or the grievances of the local population. The illumination of the links between the projects studied and the commitment of Lula and Dilma highlights the significant political interests behind the dams and regrounds the resistance to them within the Mouffean political of competing interests and worldviews.

Although the Belo Monte project has been built and entered operations, this altered trajectory has consequences beyond the immediate site of its construction. This is evident in the suspension of an additional dam project in the Brazilian Legal Amazon Region. In 2016, the São Luiz do Tapajós

project—an 8040 MW hydroelectric dam—was removed from the environmental licensing process and energy plans. Whilst official sources asserted that this decision was in response to an uncertainty regarding the project's social and environmental impacts [110,111], anti-dam actors argued that the Lava Jato investigation, its prominence in national new cycles and the links between this corruption and Belo Monte provided a brake on future hydropower projects, such as the São Luiz do Tapajós scheme [77,78,98,99]. The logic underpinning this argument is that the exposure of the corruption related to the Belo Monte project led to the loss of the political capital held by the pro-dam coalition [112,113]. For example, a representative of a domestic EO argued that the Lava Jato scandal had left the pro-dam coalition on the back foot:

> "They (the pro-dam coalition) are unstructured, without money (and) in prison. There's no one. There's no money. Everything is broken. I think that's what explains the cancellation of the São Luiz do Tapajós (dam) is much more a political and economic situation than the environmental evaluation (IBAMA's decision) suggests". [80]

In making this statement, the interviewee asserts that the exposure of the corrupt relationship between politicians and commercial actors by the Lava Jato investigation has restricted the political commitment to hydroelectric projects—with the exposure of what Zachary Hurwitz described as a 'hydro-mafia' restricting the political capital available to be invested in such projects. For the interviewee above, the corruption scandal had exposed the impunity of the companies implicated, restricting their ability to be involved in large infrastructure projects in the future [80]. Although Belo Monte has been built, the significance of the anti-dam storylines forwarded to dispute its construction have a wide significance. Anti-dam actors locate the construction of Belo Monte and suspension of the São Luiz do Tapajós dam within a shared context, with the removal of the São Luiz do Tapajós project from the environmental licensing process traced to the exposure of this 'promiscuous relationship' [77,80]. This provides an example of how political struggles against dams have consequences that extend far beyond the immediate site of construction and contestation. As evident in the multilevel movement against the Narmada dams, the storylines of anti-dam groups can influence wider policies of dam construction. A similar process is evident in the case of Belo Monte—with the process of repoliticization extending beyond the immediate locality of Belo Monte's construction to provide a moment in which such a decision to archive the São Luiz do Tapajós dam was possible.

8. Conclusions

Although the social and environmental impacts of large hydroelectric dams have led to widespread criticism of the infrastructure, pro-dam actors continue to legitimize these projects by asserting the benefits associated with their construction. This article has explored one particular storyline of legitimacy, that of the 'national interest', in which the planning and construction of the Belo Monte project has been foregrounded within wider assertions of the economic development and shared benefits. These pro-dam assertions of the 'national interest' function to depoliticize Belo Monte, asserting it as an apolitical and technical project and raising it above the contestation and antagonism of everyday politics. In exploring these storylines, this article has demonstrated how Mouffean conceptions of the political provide a fruitful route to understanding how those proposing water infrastructure projects adopt certain storylines to restrict the potential of public dissent and disagreement. By linking a project to notions of economic development and wider benefits (such as the form of the energy generated), pro-dam actors positioned Belo Monte as a technical pursuit devoid of political character and beyond contention. However, this paper has also demonstrated how such depoliticizing storylines can be reversed, with the repoliticization of projects remaining a possibility for the opposition groups that seek to contest contemporary hydropower projects. In addressing the pro-dam assertions of the 'national interest', anti-dam actors in Brazil have illuminated the political and commercial interests behind the planning and construction of Belo Monte. In doing

so, anti-dam actors reground the project within a wider context of political interests, corruption scandals, and the circumvention of judicial redress. The forwarding of this storyline contests the 'rendering technical' of Belo Monte and reasserts the project's location within the political terrain of agonism. Belo Monte is rendered political, becoming tied to wider political processes and controversies. This recontextualization of the project functions to repoliticize its construction, rendering visible the numerous interests involved and discrediting claims of the project being above everyday politics.

Although Belo Monte will be built, and the Xingu River fragmented, the opposition movement against it demonstrates both how the 'national interest' remains both malleable and contestable and how anti-dam actors are able to alter the trajectory of wider patterns of dam construction. Whilst the political may be concealed in policies of infrastructure construction, it can also be illuminated—with the antagonism of dam construction never fully hidden and able to influence developments beyond its immediate site and impacts.

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Ebbs and Flows of Authority: Decentralization, Development and the Hydrosocial Cycle in Lesotho

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Abstract: Dominant development discourse holds that water scarcity reflects geophysical limitations, lack of infrastructure or lack of government provision. However, this paper outlines the ways in which scarcity can only be fully explained in the context of development, specifically, neoliberal economic policies and related notions of good governance. Water is Lesotho's primary natural resource, yet many of its inhabitants remain severely water insecure. Presently, decentralization and Integrated Water Resource Management (IWRM) are embraced in Lesotho as a philosophy and method to engage varied stakeholders and to empower community members. Using a water committee in Qalo, Lesotho as a case study, this paper explores the micro-politics of water governance. As individuals contest who is responsible for managing water resources for the village—by aligning themselves with traditional chiefs, elected officials, or neither—they transform or reinforce specific hydro-social configurations. While decentralized resource management aims to increase equity and local ownership over resources, as well as moderate the authority of traditional chiefs, water access is instead impacted by conflicts over management responsibility for water resources. Drawing on theories of political ecology and governmentality to extend recent scholarship on IWRM, this paper re-centers the political in water governance by situating local tensions within national policies and development agendas and demonstrating how scarcity is hydro-social.

Keywords: international development; decentralization; political ecology; integrated water resource management (IWRM); Lesotho; Africa

1. Introduction

A recent report by the Lesotho Global Water Partnership affirmed the country's commitment to the United Nation's (UN) Sustainable Development Goal to provide clean, accessible water [1]. To achieve this, Lesotho will recommit to the existing hydro-policy and more fully embrace Integrated Water Resource Management (IWRM, or Integrated Catchment Management (ICM)), an approach and philosophy of water resource management that engages myriad stakeholders in the provision of water.

Lesotho is one of the few countries to export water. Through the Lesotho Highlands Water Project (LHWP), Lesotho provides water to Gauteng Province, South Africa. Indeed, water is one of Lesotho's primary natural resources, with the water sector contributing 10% to the gross domestic product (GDP) [2]. Relatedly, water has been a major focus of Lesotho's development agenda and over three-quarters of Basotho, or the people of Lesotho, have access to a safely managed water source [3]. The availability of groundwater resources and safely managed sources is uneven, and Basotho, particularly in the lowlands, experience routine water insecurity [4]. According to dominant development discourse, water scarcity reflects geophysical limitations, lack of infrastructure or lack of government provision [5]. While such reasoning situates scarcity within its social context, i.e. through the failure of the government to provide water, scarcity is only fully explained through an examination of the micro-politics of water resource management in the context of larger development agendas, such as decentralization policy.

Lesotho remains a major recipient of donor funding, with such funding accounting for 14% of Lesotho's budget [6]. Along with financing, Lesotho has embraced the neoliberal development ideology touted by donor organizations, including pressures to politically decentralize natural resource management. Decentralization is a departure from the earlier economic liberalization found in structural adjustment programs (SAPs); instead, it frames development in the discourse of "good governance" and "empowerment" [7]. Decentralization is meant to promote equitable development in ways not realized by SAPs yet, we shall see that, at its core, decentralization policy reflects neoliberal economic development aims. According to development policies, water is a natural resource prime for exploitation. In villages throughout Lesotho, people do not have enough water and yet are expected to mitigate this scarcity through economic empowerment and self-sufficiency.

Using a case study of a water committee in the town of Qalo, Lesotho, I examine the hydro-social realities shaped through contestations over water management. While decentralized resource management aims to increase equity and local ownership over resources, as well as moderate the authority of traditional chiefs, it instead exacerbates scarcity as water governance breaks down due to political fractioning over responsibility for maintaining water resources. Given the political economic history of the country, alignment with either the chief or the local elected officials can reinforce or transform long-standing social relations.

The aim of this paper is to situate the forthcoming expansion of IWRM in Lesotho in larger decentralization and development policy. While IWRM aims to engender participation of varied stakeholders, its implementation occurs in the context of hydro-social relations shaped by these ongoing policies and the country's political economic history. Drawing on theories of political ecology and governmentality, I engage recent critiques of IWRM to outline how Lesotho's water governance not only transforms social relations, but manufactures scarcity as well. Using this case study, this research extends our understanding of water insecurity in Lesotho by bridging micro- and macro-politics to understand the multi-scalar construction of authority and the continued role of the state in the era of neoliberal decentralization policy. As the state rolls back provisions of resources such as water, tensions arise over management of water tanks and scarcity is exacerbated as tanks fall into disrepair.

1.1. The Political Geography of Lesotho

The Kingdom of Lesotho, an independent constitutional monarchy located within the country of South Africa, is the home to approximately two million people [4]. Lesotho is an ethnically homogenous country, with 99% of the population identifying as Sotho (individually Mosotho, plural Basotho).

Formerly known as Basutoland, Lesotho achieved independence from English rule in 1966. Historically, Lesotho was economically dependent on South Africa for employment. Lesotho's development policy focuses on poverty reduction through economic diversification of a market that, unfortunately, remains dependent on single industries—once employment in the South African mines supported the populace, while now the textile industry has emerged as the primary source of employment. However, with the tightening of the South African border, and the inability of the textile industry to elevate the country economically, Lesotho has had to look within its borders for opportunities for economic advancement. Whereas Lesotho once served as a labor reserve for the South African mines, the exploitation of human resources has been replaced by the extraction of natural resources such as water.

Lesotho remains one of the least developed countries globally, with 57% of the population living in poverty [4]. Intricately tied to Lesotho's socio-economic position is the HIV/AIDS epidemic. Lesotho has the second-highest prevalence of HIV in the world. This epidemic has had far-reaching effects on the economy of the country as 24% of the population lives with HIV [8].

1.2. The Political Hydrography of Lesotho

Through the LHWP, water from large dams in Lesotho is conveyed to Gauteng Province, South Africa, where it is used to bolster South Africa's globally competitive economy. Ironically, while water

fuels South African industry, people in rural Lesotho often see little benefit of this exchange. From the agreement with South Africa, Lesotho receives electricity, however; the capital Maseru primarily receives this benefit.

While one of the greatest natural resources in Lesotho is water [2], people experience occasional water supply and quality problems, with some adverse effects during severe droughts [9]. By 2025, Lesotho will be "water stressed"; that is, the Basotho will face frequent seasonal water supply quality problems, accentuated by occasional droughts [10]. In light of the importance of water as a natural resource, the World Bank examined Lesotho's vulnerability to climate change and notes that both domestic water needs and water transfers are vulnerable to climatic shifts in the coming decades [2].

Presently, Lesotho's Ministry of Water which is tasked with developing and monitoring water and sanitation policy and strategies as well as managing all water sector activities. The provision of rural water falls under the auspices of the Department of Rural Water Supply (DRWS) (however, at the time of this research, water sector activities did not have a stand-alone ministry). This provision includes mapping and construction of community water tanks and taps, although infrastructure construction and rehabilitation is often done by donor-funded projects, for example the Millennium Challenge Corporation (MCC) Compact. The management of the tanks and the provision of water, however, has been decentralized to local government authorities. Today, DRWS' mandate is "to build capacity and empower communities in the operation and maintenance of water supply systems" [11] and the exact configurations of authority are community-specific and may include community members, traditional authorities such as chiefs, locally-elected or appointed councilors or private sector providers. The exact roles of central and local authorities in the management of water resources was and remains disputed, and this will be discussed at length below.

2. Method

This paper is based on data collected in Lesotho between February and November 2011, during a mixed-method study examining the lived experience of water insecurity in three rural communities in the Maseru district of Lesotho. While these data were collected several years ago, by establishing the cultural politics of decentralization, they have immediate relevance to the planned expansion of IWRM. The case study presented in this paper is drawn from observations and interviews with twenty-six individuals, including the chief, and a group interview with members of a water committee from a community, Qalo, in the Maseru District of Lesotho. This research was conducted by a team comprised of the author and two Basotho research assistants. The larger study concerned the lived experience of water insecurity and a quantitative assessment of water insecurity, food insecurity, household illness and related psycho-emotional stress (the full methodology can be found in [9]).

Qalo offers a prime location in which to examine resource management, as Qalo was unique among the communities studied given that community members were reliant on sizeable water tanks for their water (see [12], for additional information on water sources in Qalo). Community members discussed the recent tensions in the local water committee in Qalo, and this committee is the focus of this discussion. These data were analyzed inductively with specific attention given to discussion over resource management and local authority.

2.1. Political Ecology and Governmentality: The Hydrosocial Construction of Lesotho's Water Resources

Water policy in Lesotho, and in Africa more broadly, has shifted from solely technical approaches to water management to ones that incorporate social relations, that is, the focus shifts from water management to water governance [13]. Understanding processual move to local water governance in Lesotho's development policy requires engaging the theoretical framework of political ecology. Political ecology, specifically the theorization of the hydro-social cycle, shifts the emphasis from the linkage between water and society, as iterated in IWRM policy, to the co-production of water and society [13]. The hydro-social cycle, in contrast to the hydrologic cycle in which water is entirely material, outlines "dialectical and relational processes" between the material and the social (p. 170).

This framework allows us to understand how water is created and culturally understood and how this in turn influences social relations. Political ecology brings the understanding that individual subjectivity is co-creative with the environment and situates power at the intersection of multiple registers of space and place [14]. When applied to Lesotho, specifically, we see the rendering of water as an economic resource and how it, in turn, actualizes certain forms of authority and economic relations.

Implicit and explicit in much of the scholarly literature concerning both water governance and development policy is Foucault's theorizations of governmentality, or the "art of governing" [15]. As power is relational, the power of the government is not centralized, but dispersed and contingent so that "a whole variety of authorities govern in different sites" (p. 85). Beginning with the understanding that the state can only exist in relation to the people governed, we now examine how this relationship changes in the face of international calls for smaller, less intrusive governments in resource management. In this regard, the state is criticized for interfering in people's lives and thus it is in the best interest of the people to become entrepreneurs without interference from the government. One such example of this is the prescription for ethical self-determination found in the "enterprise model" of development. As opposed to an interventionist state, the state was seen as a barrier to social and economic development [16]. This approach is evidenced in Lesotho, as development projects tasked with the construction of water infrastructure are ultimately aimed towards poverty alleviation, particularly for women [17]. Thus, the result is a "Brave Neo World", a world where neoliberalism is more than an economic policy; it is an art of governing and defines the relationships between people, the state, and development [18].

In his seminal research on Lesotho, Ferguson [19] brings development into a discussion of state power. Ferguson argues that by rendering development "neutral" or "anti-political," the expansion of bureaucratic power was hidden. This is not to say that the magnitude of the capabilities of the "state" was expanded, but rather that what was extended was the "extent and reach of a particular kind of exercise of power" (p. 274). Making explicit governmentality and anti-politics in this analysis is useful as it complicates the role of the state—or the role of many states, for example donor countries—in development policy and the process through which development is decidedly political yet hidden. Moreover, the participation of non-state actors, for example in water management, has "important implications for the nature of state power in relation to processes of water governance" [20] (p. 122).

Swyngedouw [21] discusses "governance-beyond-the-state" which has been promoted by state and international bodies to give private individuals and civil society a greater role in "governance" and to make development processes more inclusive (p. 1192). These new modes of government between the state and various non-state actors are new forms of governmentality, or conduct of conduct (ibid). This re-articulation takes place within the context of rising "neoliberal governmental rationality" and results in "Janus-faced" arrangements (p. 1193). These two-faced arrangements create new technologies of government, including new state and civil society relationships and understandings of authority, while simultaneously reinforcing the status quo. While Swyngedouw's work concerns Europe, his theorizations about how state power is simultaneously modified and reinforced has direct relevance to Lesotho given the new technologies of government outlined in decentralization and IWRM policy. Specifically, we see in Lesotho that state power is not always hidden through "anti-political" development, but rather the new technologies, or modalities, of governance bring the state in and out of focus as individuals recognize, or reject, the role of the state in decentralized service provision and water maintenance.

Together, political ecology and governmentality provide the necessary frameworks through which to view contestations of authority. Such contestations, while occurring at the local level, reflect long standing historical processes. Historically, Lesotho served as a "labor reserve" for the South African mines [22]. With miners increasingly retrenched from the mines, Lesotho has had to look within its own borders for exploitable resources. This process of *financialization* of nature evidenced in development policy, notably the water policy including IWRM [23]. According to recent documents linking water, energy, and food, the philosophical underpinning of approaches such as IWRM is that water is prime

for exploitation and sustainability requires global economic realignment. This process reflects larger trends in neoliberal development policy, but exactly how this is realized in Lesotho must be situated within Lesotho's larger development agenda and political economic history. In Lesotho, as elsewhere, there are competing governmentalities, related to tradition and authority, to local and global economic ties. Moreover, these new technologies of government (re)define both authority and hydrography.

While it is not within the scope of this paper to synthesize Lesotho's political ecological history with the political economy of health, it must be noted that the hydro-social relations in Lesotho cannot be divorced from the biosocial realities of the HIV/AIDS epidemic. Indeed, the topography of the HIV/AIDS epidemic is intimately tied to Lesotho's historical position as a labor reserve. While men often contracted HIV at the mines, women who remained in Lesotho, many without a means of survival, would often have multiple male partners (*bonyatsi*) to provide for their families while their husbands were away [24]. The demographic shifts due to the HIV/AIDS was predicted to directly contribute to water scarcity [10] and that water treaties, such as those between Lesotho and South Africa, must retain flexibility to account for both demographic and climatic shifts [25].

2.2. Integrated Water Resource Management in Lesotho

Most development policies favor IWRM, predicated on the assumption that "efficient, equitable and sustainable development and the management of the world's limited resources" requires local approaches "tailored to the individual circumstance of the country and local region" [26] (p. 4). IWRM links stakeholders and technical experts across sectors at the basin or catchment and national levels [27]. In Southern Africa, IWRM has been widely promoted by supranational governing bodies as well as multi- and bilateral donor organizations. However, the exact role of these organizations in IWRM implementation varies by country with donors exerting more influence in Zimbabwe than South Africa, for example [28].

While IWRM has been limited in implementation in Lesotho, it is slated for broad adoption in future hydro-policy. As discussed at length below, the implementation of IWRM must be situated within the larger context of decentralization as earlier decentralization policy has resulted in macro-and micro-political contestations within Lesotho. Decentralization will continue in tandem with IWRM, indeed, IWRM policy itself promotes decentralization. There is also overlap in the two approaches, notably the focus on neoliberal economic development. As IWRM is slated for expansion in Lesotho, scholarly critiques of IWRM are relevant here.

Critiques of IWRM highlight the inherent politics of implementation despite the fact that IWRM is framed as apolitical and technical [29]. Such policy can recreate "historically moulded axes of inequality" [22] (p. 397). Indeed, "the progressive policies and plans have failed to recognise the complex historical context, and the underlying inequalities in access to knowledge, power and resources" (p. 403). Mehta et al [29] hold that while IWRM stresses decentralization, these policies often result in the centralization of power. Moreover, these scholars stress that IWRM policies all too often neglect local social, gender and power relations. In Lesotho, the tensions over water are indeed tied to intersectional power relations and were neglected by earlier decentralization policy. While IWRM policy explicitly links players at multiple scales, the linkages between the state, local government and civil society under decentralization remain contested. The result, as we shall see, is not solely a centralization of power but new technologies of government that may or may not cement state authority over water resources.

2.3. "Water is the Source of Life": Economic Development and Water Resource Management

Lesotho's long- and short-term development goals were drafted in their Vision 2020 [30] policy document, with the strategic plan outlined in their National Strategic Development Plan 2012/13-2016/17. Major goals include a stable democracy, well-managed environment and strong economy. The Growth and Development Strategic Framework of the National Strategic Development Plan (NSDP) 2012/13 aims "Towards an accelerated and sustainable economic and social

transformation" of Lesotho [31]. To accomplish this, Lesotho is tasked with "radically transform[ing] its economy" in order to "define a future that is characterized by the capacity to produce goods and services for the regional, African and global markets" [31].

Water is governed as a natural resource prime for economic development. The importance of water for the country's survival is underscored in a statement by Lesotho's Minister of Finance and Development Planning, "Water is the source of life. Lesotho has always regarded it as its 'white gold' to support its people" [32]. Indeed, research in the Mohotlong District of the Highlands of Lesotho demonstrates how water has been mobilized for export through discourse that renders water inherently Sesotho [33]. The Government of Lesotho explicitly calls upon Sesotho, Sesotho refers to the language spoken in Lesotho and is used as an adjective to describe being of Lesotho, cultural identity in order to make water meaningful as an exploitable resource. Aside from notable exceptions—the MCC Compact that brought improved water to the rural areas for private sector development—in line with decentralization, much of the onus of development, including private sector development, falls on communities themselves.

2.3.1. Implementing Decentralization in Lesotho

At the urging of the British, decentralization was first attempted in the 1950s as a mechanism for British control and an attempt to limit the power of the Paramount Chief [34]. However, despite lasting only a decade, decentralization is written into the Constitution in the 1990s [35] and was again legislated in the Local Government Act in 1997 (although the Local Government Act was passed in 1997, elections were not held until 2005). The concept of decentralization can be found throughout all development policies such as Vision 2020 and the NSDP. Written into policy in 2014 in the National Decentralization Policy, the process of decentralization falls under the auspices of what is now the Ministry of Local Government, Chieftainship and Parliamentary Affairs (MoLGCPA).

The 2014 policy document identifies decentralization as a long-term strategy for empowering citizens, promoting equitable development, and protecting territorial integrity and security "since pre-colonial times" [36] (p. viii). However, despite historical attempts at decentralization and development, this new envisioning is held to be qualitatively superior than any previous attempts, even while it may reflect earlier thinking on participation. Indeed, a 2007 World Bank report predicts that community-driven development will succeed where decades of participatory approaches have failed [37].

Within decentralization is an explicit linkage of water resource management and economics. Vision 2020 strategizes targeting seven "pillars" of development: democracy, unity, peace, education and training, economic growth, management of the environment, and advancement in technology [30]. We see the influence of donors in shaping traditional authority through decentralization. As described by Mothetjoa Metsing, Deputy Prime Minister and Minister of Local Government, Chieftainship and Parliamentary Affairs, "The (decentralization) policy statements and strategic actions contained in this Policy therefore reflect the views and aspirations of the GoL's (Government of Lesotho's) priorities for decentralisation and *inputs from Lesotho's development partners*" (emphasis mine) [36] (p. viii). These development partners include donors such as the United States. This policy relies heavily on the discourse of participation and grassroots development yet is explicitly linked to neoliberal economic development as the policy is designed to provide guidance for "deepening and widening the economic and social benefits of democracy to all citizens" [36] (p. x).

There is similarly an explicit focus on cost-effectiveness, "(d)ecentralisation has potential to address issues of local development concern (such as energy, rural roads, public health, water, etc.) in a cost-effective way, primarily because of its focus on local development" [36] (p. 7). Local officials are being asked to leverage their own revenues, not just for maintenance but to fund new projects as well. Presumably, the money will come from the community members who will then receive the benefit of the project. This devolution of responsibility, or *responsibilization* [38], is couched in the pervasive discourse of "ownership", such as "its potential to increase ownership of development projects, in areas

like food security, micro enterprises, water supply, public health and community security" [31] (p. 28). Indeed, development workers interviewed during this research described how community members would contribute labor for development projects. For example, they would collect stones for the provisioning of water catchments or would participate in the construction of latrines.

Decentralization of water resources was planned for 2008, with the maintenance of the water supply in villages to be managed by the Community Councils and the safety of the water supply to be managed by local health officers [37]. Despite being touted as the panacea for the ills of participatory development, decentralization has been historically fraught. Indeed, as noted succinctly in the World Bank report regarding decentralization, "The relationship between councilors and chiefs is the most complex issue encountered" [37] (p. 16). Indeed, when this research was conducted in 2011, the local government and the chiefs were still negotiating their roles. Thus, water resource management must be understood in light of the changing role of the chief and the maneuvering for the legitimacy of authority at the local level. It is within this context that IWRM, with its doctrine of decentralization, is being rolled out.

2.3.2. Decentralization and IWRM

The "Roadmap" to IWRM was completed by the Ministry of Natural Resources, Water Commission in 2006 (since then, a document drafting the development of integrated catchment management plans was completed in 2013 and for the Orange-Senqu River Basin in 2014) [39]. This Roadmap includes baselines of "the natural, socio-economic and institutional sub-systems" and how they interrelate with and impact resource management. It also includes objective assessments of water availability in Lesotho as well as how this policy will intersect with their Vision 2020, outlined previously. Finally, the IWRM policy explicitly states that a goal is to "minimize necessary investment in measures by GoL" and embrace decentralization [27]. Indeed, as the IWRM policy was being finalized, decentralization of water resources was well underway. How exactly the Basotho are to marshal scarce resources such as water is contested as newly elected village councils and local chiefs vie for limited power as the state rolls back its provisions of services. To secure control over water resources, individuals in this schema must align themselves with more powerful individuals, or as the case may be, reject association with them in defiance of what is perceived as encroachment into village life.

2.3.3. *Morena Ke Morena Ke Sechaba* (The Chief is a Chief because of His Nation): The Role of the Chief in Decentralization

Since the recognition of Lesotho as a country by the Cape Colony in 1834, colonial powers have attempted to transform the role of the chief to best serve their needs. For the first 50 years, Lesotho was under varying degrees of control by the Cape Colony whereby both chiefs and British colonial authorities presumably ruled Basutoland in tandem. In 1884, Lesotho returned to direct Imperial British rule; however, the British relied increasingly on Basotho chiefs to maintain colonial authority [34]. The British set a chiefly council called *Borena* (kings) or *Bakoena* (crocodile, the totemic symbol of the ruling clan) that was later formalized into the Basutoland National Council in 1903. However, in 1935, a reported stated that the British were not active enough in countering indigenous authority. As a result, two government proclamations were issued effectively reducing the power of the chiefs in Lesotho and Basutoland was governed under indirect British rule until independence on 4 October 1966 [34].

Since independence, the role of the chief in Basotho society has been continuously contested. The platforms of the political parties established at independence focused heavily on the role of the chief in contemporary society. The Basutoland Congress Party (BCP)—the rival political party with the most power leading up to the time of independence—split because some members thought chiefs to be archaic and antithetical to independence. The Local Government Act of 1997 sought to balance the power of the chiefs by establishing local councils in which all positions are elected and

the number of chiefs in each council is limited to two. Not surprisingly, tension remains between chiefs and non-chiefs serving on the councils. As in many former colonies, a strict class hierarchy, in this case a chiefly aristocracy, was created and encouraged and its effects can still be seen today. As Laurence Juma [40] (p. 96) holds, "In the context of power relations, much of what the colonial systems had started was not dismantled by the arrival of independence and, whereas the players may have shifted, the power relations remained the same." Following research in the Lesotho highlands, David Turkon [41] noted, "one of the most salient features of social life that I have encountered is antagonistic feelings that pervade neighborly relations" and explains these findings by situating these antagonistic social relations in larger political and economic process (p. 82). He argues that the varying political factions that have attempted to gain foothold in the Bakoena-dominant political arena has resulted in contested national politics that have 'percolated' down into remote village life. In short, class divisions that were fostered by colonial powers have been exacerbated by Lesotho's position in the local and global economy and by political entities grappling for purchase in the government by promulgating a very specific form of economic development.

In addition to foregrounding economic development in the policy, there is explicit engagement with notions of modernity—in contrast to traditional rule, such as by chiefs—by asserting that the District Councils will eventually have "the full range of powers commonly associated with modern local authorities" [37] (p. 11). Development, according to this discourse, includes the spread of modern democratic processes. However, in its official policy document outlining decentralization, the Government of Lesotho maintains that the chieftaincy " ... remains the fulcrum of Basotho nationalism and governance despite shifts in power balance" [36] (p. 6). It is not as simple as the chief representing tradition or the people. As we saw previously, the chiefs were at one point an extension of the state, and represented a certain class faction of Basotho. Indeed, this purportedly wholly Basotho tradition had ties to not only Cape Colony, but to larger colonializing powers in Europe. That said, the chief has come to represent to the people an incorruptible national image, epitomized in the reverence of the first king of Lesotho, Moshoeshoe I, and the Basotho who resisted colonialization. Despite the ties of chiefs to governmental politics throughout Basotho history, according to policy discourse, chiefs are now non-governmental or "anti-political" in their traditionalism. The local councils and elected officials, while purportedly now closer to the people in a decentralized state, are still seen as clearly governmental given that the creation of local governments was done at the behest of the centralized government and development donors.

The chief is imagined in contrast to the modern state, in which politicians are viewed as working in their own self-interest. Chiefs are considered the fathers of the village and the villagers are his children. Explicit in this metaphor is that the chief, as father, is responsible for his children's welfare and health. Chiefly authority is derived from those ruled and are there to represent the people. As noted by political scientist J. Michael Williams [42] in his study of the role of the chief in post-apartheid South Africa, "For example, one obvious difference is that while post-apartheid institutions are premised on the twin principles of majority rule and free and fair elections, the chieftaincy is based on decision making though consensus and on the hereditary right to rule" (p. 3). He furthers, "For many living in the rural areas, it is the idea of the chieftaincy itself, even more so than its individual leaders, that provides a sense of unity and harmony" (p. 219). Indeed, this notion is not without historical precedence. Historically, *pitsos* were protected space, where people could even dissent against the government or a chief [34]. However, while reverence for the historical role of the chief is evident in the discourse, the role of the chief in modern-day society is complex. We shall see these tensions between the chief, the community and the locally elected councilors over the maintenance of water resources.

2.4. Management of Water Tanks in Qalo: The Co-Creation of Authority and Scarcity

One could imagine that the availability of community tanks in Qalo would reduce the water insecurity compared to communities that were reliant on taps from smaller tanks, or those reliant on natural springs. While it was certainly the case that fewer respondents reported ever being

without water—comparatively, only a quarter of Qalo residents compared to almost half in a different community reported ever having no water—participants routinely talked about the scarcity of their water, mentioning that the tanks were regularly empty or they would have to wait in long queues for the little water that was there. In short, residents reported less severe water insecurity than villagers elsewhere in Lesotho, but that they still experienced water scarcity was surprising given the availability of such large communal water tanks. What is most salient regarding the availability of water in Qalo is that three respondents stood out from the rest when they stated that they found no issues concerning water availability or access. They attributed the lack of problems to the fact that it was a rainy year and that a water committee fixed the tanks when they are broken. This contradicted other participants who did not mention a water committee in relation to community water management. Indeed, the research team routinely heard about tanks not being maintained.

In light of pervasive water scarcity, several questions emerged: Who comprises this water committee? Why is it their responsibility to fix the tanks in the first place? If they don't fix the tanks, who does? Why would community members seemingly exacerbate water insecurity by allowing the tanks to fall into disrepair?

2.5. Case Study: Authority and Community Water Governance in Qalo

To better understand the water committee, and the reticence of some community members to discuss it, the chief of Qalo was approached and asked if there was indeed a committee and if she could elaborate on its role and functions. The chief confirmed that there was a committee and stated that the members were supposed to take care of the water tanks when there was a problem, but that they did not. She added that the committee members were "worthless." She reported that when she talks to the committee, they are not willing to help: "They expect something in return; they want to get paid even though they volunteered." Because of this, the chief chooses to bypass the committee and ask for help from people with whom she is comfortable working. She, and others in the community, described the tanks having been fixed or cleaned by good Samaritans. However, not one of our respondents reported having ever cleaned the tanks.

Respondents gave varied reasons for this lack of maintenance—it was the responsibility of the committee, the tanks never required it, it was never the respondent's turn. To underscore the effect of the HIV/AIDS epidemic, one participant explained how the person responsible for training others to maintain the tanks had suddenly died without passing on their knowledge.

"They Took Away Our Responsibility": Conflict in Water Resource Management

Three research participants informed the researchers that maintenance of water tanks was the responsibility of the village water committee. When the research team spoke to people in the community, however, no one could even agree if there was a water committee, let alone of whom it was comprised. However, one particularly knowledgeable village member said that the water committee has existed since the 1980s and that it was very functional. As he described in an interview, community members contributed money to a bank account, and the committee went to the Water and Sanitation Authority (then WASA, now WASCO—Water and Sewerage Company) to ask about a standpipe. The money was given to the chief and when WASA showed up the money was gone, it had been "squandered" he said. This report of money theft and mismanagement of funds was common, and while I cannot speak to the veracity of these claims, this case will demonstrate that the situation is more complicated than money squandering alone.

Eventually, names of the members of the water committee were given to the research team and a time was set to meet with them. However, at the meeting, there were several more people present, including a group of four women. Despite the difficulty in identifying the committee members initially, this was not a clandestine meeting. One man recounted how the community tanks had been built, and the history of who was responsible for their maintenance. He recalled that the tanks had been built in 1991 or 1992, but there had been a committee before this who were instrumental in their construction.

According to the man telling the story, DRWS was to train people in the village in maintenance and three men were selected from outside the committee, as the committee was comprised primarily of women, except for this man. If there was a breakage, the person would report the breakage to him and he would alert the chief. Since then, he continued, DRWS had not come back and the people who were trained had not passed on their knowledge to others, and now no one knew how to fix the tanks. The problem, however, was not that the knowledge had been lost, but that the chiefs at the time were neglecting their duty. He emphasized, "Above all, the responsibility of maintenance falls on the chief as the leader of the people" he said. That chief disagreed, however, asserting that "Every committee member had the responsibility, too." Here we see the first disagreement over who is responsible once DRWS did not return. The committee member felt that it was the chief's responsibility, but the chief felt everyone on the committee should be responsible for continued maintenance of the water tanks.

According to the committee, the entire village was responsible for routine cleaning. They would hold a *pitso* and then people would volunteer to clean the inside of the tanks which might have accumulated sediment or algae. This respondent further claimed that the tanks were being cleaned at the time this research was conducted, but this was done by a volunteer from the village. The water committee respondent said the committee used to meet often when the committee was properly functioning but recently they have not been meeting at all. "How long has it not been properly functioning?" I asked. "Six years back" he said, "the committee stopped functioning with the introduction of local government." At this point the four women who had been sitting behind me erupted in complaints against the local counselor. "They took away our responsibility!" they said, continuing, "They aren't willing to work with us!" According to this man and these women, the local counselors had usurped their power and took the treasury for the water committee with them.

In the event of a problem, people in Qalo were less likely to feel comfortable approaching elected officials than a chief or a local committee member. I asked one respondent who was complaining about the water insecurity in his community why he did not contact DRWS himself and he responded incredulously, "Who am I to approach DRWS?" He obviously felt he lacked the status needed to approach a government office. Furthermore, a few people who were comfortable discussing politics with me during interviews explained their lack of faith in politics. "Politicians are troublesome," said one young man. As we saw, the committee stopped working in reaction to the appointment of a locally elected official tasked with taking over the roles of the committee. Whereas once the committee had functioned under the authority of the chief—but with relative autonomy—they now ceased to recognize the authority of the new locally elected official. When people reject such responsibility, their small gesture reflects a larger reaction to changing government roles as Lesotho attempts to embrace fully "modern" governance.

We see here that the chief believed the committee was responsible for the maintenance of the tanks and should not be paid for this maintenance. This stands in contrast to the committee's beliefs as well as the dominant policy discourse that water is an economic good and should be managed thusly. The committee held that the community was responsible for the maintenance and that if it was solely the responsibility of the committee that they should be recompensed for their time. The committee similarly argued that they should be financially responsible for the tanks and not the local councilors, whom they felt took their treasury money unjustly. Not to overstate one individual's response, but it is nonetheless telling that one respondent felt that DRWS is responsible for the tanks and that they are decidedly political. When DRWS decentralized authority, the responsibility was to fall primarily with the councilor with input from the chief. However, individuals with whom we spoke felt that ultimately the responsibility for the tanks falls to the chief, although this was occasionally gendered and the fact that the chief was a woman was given as a reason for the mismanagement of the tanks.

3. Discussion

In thinking of how water flows from Lesotho into South Africa and how water flows within communities, we begin with the understanding that such flows are both physical and cultural, both

literal and figurative. With water flows ideas and discourse about who is entitled to access, and, relatedly, specific assemblages of power over who makes those decisions. Moreover, when water is unavailable, we similarly see political processes at play. Specifically, we see how national policies about the decentralization of the government and the role of the chief in modern Lesotho are being realized in the communities. Where tasks such as the maintenance of community water tanks were once the responsibility of the chief and the committees he or she would form, they are now purportedly the responsibility of the local councils. Not all community members felt this to be just—particularly the former water committee members—and there was disagreement over who was, in fact, now responsible. Some village members claimed the old system was still working while some said there was no maintenance being done at all. To better understand this confusion over responsibility, I begin with the premise that the ongoing negotiation over resources is multi-scale process and that by relying on discourses about tradition and modernity, individuals align themselves with either elected officials or chiefs to achieve their aims. These political alignments, in turn, create a scarcity that is, at least partially, manufactured. Additionally, scarcity is mediated by the demographic shifts caused by the HIV/AIDS epidemic. We shall now further explore the processes through which power and scarcity are realized.

To return to Lesotho policy, the three pillars of development are democracy, economic growth and management of the environment. As we have already seen, environmental management has been suggested as prime for exploitation at the local level. That a community committee—and then a local council—was charged with the maintenance of its water supply reflects a very specific belief in the role of the state in providing for the needs of its people. Indeed, while touted as a way for civil society to self-realize its potential through participation, this responsibilization works in the interest of the state.

According to Williams [42], the symbolic and moral force of the chieftaincy is not just that it is posited vis-à-vis an inefficient state, rather, there are multiple sources of legitimacy occurring at the national and local levels. He found that, " ... even though both the democratic state institutions and the chieftaincy want to exercise exclusive social control in the rural areas, the reality is that neither is able to do so completely" (p. 19). Indeed, this is the case in rural Lesotho. From the conversation with the former water committee, it emerged that community members were resentful of the chief for not having maintained control of the water committee—and its scant capital—in the face of decentralization. Furthermore, our interviews revealed that certain people in the village aligned themselves with the chief while others rejected her authority. Ethnographic evidence from elsewhere in Lesotho showed that chiefs can be viewed as self-serving and prone to bribe-taking [43] and that the ability of the chiefs to control the spread of information meant that not all village members had the same access to participation and chiefs could and would exclude individuals [44]. Indeed, the chief told us that she worked only with those village members she selected.

As Ferguson [19] argued, development works within the aims of the state and knotted bureaucratic power together. That decentralization has ameliorated bureaucracy is debatable, and with the inception of local committees and the positioning of new local officials, chiefs vie for legitimacy and power. Through these contestations the local water committee rejects the authority of the local council yet assumes their discourse about the economic importance of water. With the committee no longer under her authority, she must seek out individuals in the community to assist with cleaning and fixing the tanks. According to the participants in this research, the local councils, and the resultant committees formed, are decidedly governmental. Who chooses to and is able to align themselves with the government or with the chief is based on their positionality within the community and within Lesotho.

As individuals may have no mechanism to address perceived social inequality with the state—as was evidenced by the respondent who reported they could not approach DRWS on their own—his only recourse is to embrace individualism counter to the cultural ideal. Non-participation in collectives such as water committees may reflect a rejection of state- and development-imposed ideas about modernity and the responsibilities of civil society. It also reflects one's class position in the community.

Given that chiefs come from the select historical lineage of the Bakoena, one's alignment with a chief cements their authority and marks that person as a higher class or evidences a patronage relationship.

Here we see the art of state governance, the conduct of conduct: by rejecting the authority of elected local councils and either rejecting or recognizing the authority of the chief over natural resources, community members engage the state in novel ways. Individuals may reject responsibilization of resource management and yet embrace some aspects of neoliberal development ideology. Decentralization policy states that communities should work together collectively to raise their own funds for the tanks through democratic processes resulting in empowered individuals. First, the committee, that is ostensibly the target of the economic and democratic policy agendas, seem to reject the state and its ideology of decentralized local authority yet they embrace select neoliberal ideas, such as water is an economic resource, and demand payment for their participation in tank maintenance.

Second, while select individuals may have volunteered to clean and maintain the tanks, on the whole, a new committee did not spontaneous form; there was no obvious collective action over water. For those who align with the chief we see an apparent embrace of traditional authority—that the chief should manage the water when the government stops. Ironically, however, the few "good Samaritans" who did step up to clean the tanks enacted the development ideals of self-empowerment. Chiefs are not divorced from state authority even though they're described as "traditional" in policy. In Lesotho, the chiefs have always served as an extension of the state, with an ambivalent relationship that ebbs and flows over time. Their authority comes from the people, as the adage goes, yet many chiefs represent a chiefly aristocracy. Community members are, thus, not rejecting the state or the state's development policies regarding decentralization: they are just engaging the state differently through different channels. Whether the chief or the local councils ultimately manage the water resources, ostensibly with community participation, the state is present; there are just different modalities of state power. However, it is not simply a centralization of power. Rather than a knot of power, a new tapestry has been woven, from which people pull various strings, connected to the state in myriad ways.

It is important to note that women are primary users of water and several showed up to the meeting with the researchers to voice their opinions about the perceived usurping of responsibility. This case study also took place in a village with a woman chief and a man as the district counselor. Alignment with either the chief or the new system of water management may be in response to this and may reflect the social positionality of the committee or community members, including their gender. Presently, too, more women are becoming chiefs. While the numbers have changed, not all attitudes towards women in leadership have accordingly changed. Older villagers, particularly some older men, had a problem with the chief being a woman. They felt that if she were a man she would be a stronger leader and would accomplish more. Thus, chiefly power that was perhaps weakened by the presence of locally elected councils may be blamed on her inability to lead as a woman as we saw one respondent argue.

Finally, it must be noted that the reported lack of tank maintenance in Qalo is also the result of the structural reality of the HIV/AIDS epidemic. The committee did not stop outright with the inception of the locally elected councils. I asked about the remaining committee members and the water committee respondent mentioned that he was one of the three last remaining members of the committee. "What happened to the remaining members?" I asked. "They passed away" he replied. The HIV/AIDS epidemic dramatically changed the demographic profile of Lesotho; the population curve was hollowed as the epidemic killed mainly adults – those would have managed water tanks. Thus, one cannot discount the impact the HIV/AIDS epidemic in shaping participation and the realization of democratic processes. This, too, is immediately tied to class and gender and the fact that the epidemic renders certain individuals at greater risk than others.

Indeed, the HIV/AIDS epidemic is discussed in IWRM policy documents noting the drastic demographic changes as well as changing environmental usage, "the poorer the people get, the more they rely on the environment to sustain their livelihoods. Degradation of the environment again causes impact on the water resource, for example through pollution, erosion etc." [21] (p. 51).

The policy document goes on to discuss the impact of the epidemic on service delivery. We see this with the water committee: as individuals died their roles were often not refilled or they died before passing on their knowledge. Thus, we see here that the scarcity of water in Qalo is complicated by the HIV/AIDS epidemic.

Local water scarcity is created—at least in part—through the collapse of water management committees and the tensions between various authorities and community members. As tanks are not repaired or maintained community members are unable to use them. In direct contrast to the development ideology that water is a resource that should be used to develop business, for example the use of surplus water to grow vegetables, few if any respondents reported marshalling water as an economic resource. Even as several tanks were not able to be used, the community nonetheless had others which could be drawn from. Elsewhere I have discussed that women were disinclined to use water sources for business. They preferred to use the water to fulfil household responsibilities [13]. In this instance, water is a material through which to realize authority and assert political allegiance rather than to support neoliberal notions of entrepreneurship. The fact remains, though, that clear collective management of water sources was not happening in Qalo. As such, water availability and authority are co-created through participation in the water committee.

IWRM is meant to situate water governance within existing social relations. However, scholars have well demonstrated that within hydro-social relations we see power through water not just power over water (c.f., [45]); water governance is not situated within social relations, they are co-creative. This research engages this theory by linking scalar dynamics and by emphasizing the importance in understanding community-level micro-politics. On the one hand, micro-politics in Lesotho link to larger political processes, for example the fact that chiefs are part of a chiefly class created, in large part, by colonial authorities. Critics have argued that IWRM can reinforce specific power relations but by engaging political ecology, we see that through the contestations over IWRM and decentralization, new social relations, for example between the chief and committees she was once had authority over, are created. Moreover, even micro-politics are importantly political since they engender scarcity when community organizations cannot maintain the water sources. However, the micro-politics also occur in the context of shifting gender roles and the HIV/AIDS epidemic. Thus, this research extends political ecology by showing that the political economic forces shaping the HIV epidemic are similarly shaping hydro-social relations and that such relations are ultimately hydro-biosocial. The foregrounding of the body in hydro-social relations is an important avenue for future research in the political ecology of health.

In sum, we see at the community-level that certain hydro-social configurations result from the circulations and flows of neoliberal development ideology through the handing over of control of water resources to local councils and their committees. However, many still afford the local chief much authority and prefer that the maintenance of tanks fall under her control. Who aligns with either the local council, the chief, or neither depends on their relative power and aims – the embrace of tradition or modernity is complicated by one's social position. Thus, the role of the chief in Lesotho or the successful acceptance of decentralization writ large is contingent on local micro-politics. The effect of decentralization can both weaken and strengthen the authority of the chief depending on local factions and political configurations.

Several limitations should be considered in the interpretation of these finding. These findings are drawn from limited interviews with community members willing to discuss the politics associated with the water committee. They may not be generalizable to all communities or all committees in Lesotho. In addition, an important contrast would be communities in which committees are sustainable, thus speaking more broadly to literature on common pool resources [46–48] and to resistance and place-making [49].

4. Conclusions

In Lesotho, the management of water resources was decentralized from Maseru to local communities. The 2007 World Bank report asserts that the idea of decentralization was "received by even the remotest populations with great enthusiasm" [32] (p. 7). The enthusiasm likely stemmed from the same distrust of government officials that was encountered in this research. Democratic processes, such as *pitsos*, are familiar to *Basotho*. Participation is not a novel concept, and is at the core of the continued reverence of the idea of the chieftaincy—the chief is the chief because of his people.

From the outside one could posit that the water committee is not functioning because of misappropriation of funds or interpersonal conflict. While those may be compelling reasons for certain individuals, we also see a complicated mix of national and local politics circulating through Qalo all within the structural reality of the HIV/AIDS epidemic. Water as an ecological resource is created through long standing and recent political relations. One example of the specific social relations creating a waterscape is the Qalo water committee presented here. Choosing not to participate in supporting the community's water committee may be the result of disinterest or individualism in the face of poverty, but it can also be a stand against the encroaching power of the local councils or a reaction against a woman chief. People living in rural Lesotho are aware of the continued hand of the state in decentralization and are bristling at what they see as less power and not more power. Furthermore, some people align themselves with the chief, while others prefer to dissent by supporting neither the chief nor the local councils and would rather let the tanks fall into disrepair. People can subtly employ or hide the power they do have. We also cannot ignore the reality that this committee is not functioning, at least in part, because of the mortality due to a disease that is exacerbated by poverty and social inequality.

Historically, the chieftaincy and the state were linked through indirect rule and the establishment of the Bakoena. While chiefs represent resistance to the state they are often an extension of it. Similarly, as Ferguson [15] notes, decentralization can often have centralizing effects. Where once some of the chiefs remained more or less autonomous, with the inception of locally elected councils, the government becomes more effectively entrenched in the rural areas. Whereas decentralization was once explicitly political—it was an attempt to minimize the power of certain Paramount Chiefs—now it is seemingly "anti-political" [15] and touted as modern and community-driven. Decentralization is meant to put the government in the hands of the people, and it does but not in the way it is written. As neither chiefs nor locally elected officials are anti-political, decentralization brings with it a vying for legitimacy and power that brings the state in and out of focus. The state ebbs and flows in communities far removed from Maseru, the capital. While the metaphorical bureaucratic knot may be tighter, strands reach the rural areas in new ways.

While the Vision 2020 and IWRM policies posit that water is a natural resource primed for exploitation, we see here that water—and scarcity—are inherently political. Policies that link water to social relations miss the role that water is playing in creating local power structures but also how authority is defined. In Qalo, notions of authority are being transformed via participation in—or rejection of—the water committee. Moreover, such rejection may represent contestation the self-empowerment ideology promulgated my neoliberal development policy, and, thus, a rejection of the state's devolution of responsibility to communities.

Finally, we can expand our view to the global scale. The seeming collapse of the water committee in Qalo illustrates the implementation of international and national policies about resource management in a neoliberal economic environment and how the application of these policies disseminates broader democratic ideals about good governance. The success or failure of local committees to marshal their resources will necessarily inform future development policies, which then circulate regionally and globally. This highlights the importance of re-centering politics in our understanding water management. Decentralization is slated to continue apace and with the embrace of IWRM, we must fully understand the co-creative effects of water scarcity and authority.

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Article

'Social Control' and the Politics of Public Participation in Water Remunicipalization, Cochabamba, Bolivia

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Abstract: During the Water War in 2000, residents of Cochabamba, Bolivia, famously mobilized against water privatization and gained back public control of the city's water utility. Nearly two decades later, the water movement's vision of democratic water provision under the participatory management of 'social control' remains largely unfulfilled. This paper points to the difficulties in rebuilding a strong public water service in Cochabamba, focusing on the different—and often incompatible—understandings and interpretations of public participation. Addressing the concept's malleability to a spectrum of ideologies, this paper builds a typology of different kinds of participation according to their intentionality, outcomes, tools, and practices. Applying this framework to the water politics in Bolivia serves to untangle competing perspectives of participation, uncover whose interests are served, and which groups are included or excluded from access to water and decision-making. This analysis reveals how transformative participation has failed to take hold within the municipal service provider in Cochabamba.

Keywords: social control; participation; water governance; remunicipalization; Cochabamba; Bolivia

1. Introduction

The trend of water remunicipalization in several cities around the world demonstrates the enthusiasm for, and viability of, public alternatives for water service delivery [1,2]. The Water War of 2000 in Cochabamba, Bolivia, is a globally celebrated example of citizens mobilizing against water privatization. The short-lived water privatization attempt in Cochabamba unequivocally failed, rendering this water management model untenable in the foreseeable future, both legally and in the collective conscious. The city's water company SEMAPA returned to public hands under control of the municipal government, however, attempts to overhaul the company and democratize water management have been largely unsuccessful. As a result, the city of Cochabamba continues to suffer a prolonged water crisis; nearly two decades since the Water War, access to water and sanitation remains uneven and chaotic amid cycles of severe drought. SEMAPA users in the north and center of the city face chronic water shortages primarily due to an obsolete distribution network. The most marginalized populations in the southern zone of Cochabamba are largely not directly connected to the municipal service, and rely on autonomous, self-governed small-scale water providers. Given the difficulty of acquiring water, these peri-urban communities report higher incidences of pollution and water-borne illnesses [3].

Remunicipalization literature is shifting the discussion away from the anti-privatization debates and towards building greater conceptual and empirical understanding of public alternatives [3–5]. Informed by doctoral fieldwork conducted in Bolivia, this paper seeks to build on the growing literature of remunicipalization with an analysis of the efforts to rebuild public water services in Cochabamba. During the 2000 mobilization in Cochabamba, the water movement shared a vision of democratic water provision, framed by demands for 'social control'(or *control social*). In the Bolivian context, social control emerged from popular struggles for greater democratic participation, and refers to a set of

practices generated by citizens that integrate public participation (*participación*) in the management of public goods [6]. For the water activists, strong social control within the service provider could ensure that water is not simply a means for economic profit or state control, but a public good that is essential for life and accessible to all. Demands for social control in Cochabamba's water management thus revolved around mechanisms for democratic participation including local stewardship and community engagement in the water provider's operations.

To understand the obstacles in realizing a progressive public vision of water delivery, the concept of participation serves as a starting point of analysis. This paper builds a typology of different forms of participation, broadly categorizing participation into three main types: reformative, transformative, and nominal participation. Separating the conceptualization, intended outcomes, and practices of each form of participation helps to shed light into the processes through which political power is exerted by varying actors.

This paper then applies this framework to the case of Cochabamba's water remunicipalization. I contend that the difficulty in rebuilding a strong public water service in Cochabamba partially stems from different—and often incompatible—understandings and interpretations of these concepts of public participation. Whose interests are served, which groups are included or excluded from access to water is tied to the question of public control over natural resources.

2. Typology of Participation: Reformative, Transformative, and Nominal Participation

The notion of public participation is now ubiquitous among development perspectives and policy. A "warmly persuasive word" [7] (p. 58), participation has been heavily promoted and adopted in different circles over the past three decades. Difficulty in articulating a straightforward definition arises precisely because public participation is not a "single phenomenon" [8] (p. 34). A review of the international literature demonstrates its widespread use, yet does not offer a consistent typology due to the concept's malleability to a spectrum of ideologies [9]. To lend conceptual clarity, I highlight the different uses of participation, and how these differences manifest themselves in terms of intent. Specificity about the meanings and practices of participation helps to adequately identify competing perspectives of public participation in water governance.

Broadly, public participation can be defined as engaging a wider cross-section of people or organizations in decision-making and/or implementation of policy and services, alongside controlling groups, presenting a shift away from exclusive or top-down processes. To examine participation, I utilize Cohen and Uphoff's concept of asking: participation by whom, for what, and in what [8]. These questions lead to definitions that diverge dramatically into two overarching conceptualizations based on intentionality: participation as transformative, intended to create a radical shift in social, economic, and institutional norms, and participation as reformative, intended to modify decision-making processes without significantly changing the broader structures and ideologies of (market-based) power. A third form of participation exists that will be labeled as nominal; that is, a manipulation of the ideas and language of either forms above in order to gain consent and legitimacy. The following section will review the conceptualization, intended outcome, actors, and key tools and practices of these forms of participation, before applying the framework to the water sector in Cochabamba, Bolivia.

2.1. Reformative Participation

The early 1990s marked the beginning of the "participatory turn" [10] when participation became firmly established in mainstream development circles, commonly defined as "the process by which stakeholders influence and share control over priority setting, policy making, resource allocations, and/or program implementation" [11] (p. 237). The United Nations incorporated popular participation into a wide range of its programs, seeing it as "the organized efforts to increase control over resources and regulative institutions in given situations, on the part of groups and movements hitherto excluded from such control" [9] (p. 5).

The label of reformative participation is apt as participation is envisioned as a way to improve development in the face of partial market failure. These are partial failures in the sense that markets are seen to have brought about massive positive change to the developing world but missed important segments and sectors of society for a variety of reasons—one of which is identified as an imbalance of voice on the part of the poor. The persisting problems of inequity and poverty were attributed to traditional development practices of donor agencies 'delivering' development solutions through large-scale, top-down government-initiated programs. Re-orienting policies towards poverty reduction via 'primary stakeholder participation' presented a way to address these asymmetries while remaining faithful to the dominant market-oriented development paradigm. Greater involvement of the poor and marginalized in the policies that affect their lives would permit local people's knowledge to be at the center of development planning, thus serving to ameliorate inequities and perceptions of injustice [12,13]. This approach emphasizes the importance of local knowledge, shifting power towards "lowers" (the stakeholders) while the "uppers" (i.e., development experts) relinquish their professional prejudices and become facilitators of local knowledge [12]. The primary stakeholders are individuals ascribed as "agents of development", and their "empowerment," the increased ability for individuals to pursue individual and collective goals, stems from increased participation in the free market economy [14,15]. Importantly, however, people's empowerment does not shift the prevailing structural order or undermine the market economy [13].

Greater participation is seen as a way to enhance the market because it results in a better flow of information, more accountability, and greater competition. Participation can improve the flow of information from the "demand side" which results in greater market efficiency and effectiveness [14]. Popular participation will contribute input that form more "demand-driven" policies so that agencies can "re-orient towards the customers" [15]. In other words, it makes the corporations (aid agencies) more accountable to its customers (the poor). In turn, greater participation and accountability enhances market-based strategies by acting as a check and balance to the monopolization of power that exacerbates inequalities as greater interaction with markets help indicate where improvements are needed, and accordingly diminish practices that limit competition such as collusion or price fixing. Crucially, the market is seen to produce opportunities, and participation is a way for disadvantaged groups to access these opportunities. Inclusion of 'the poor' in the market through micro-credit or micro-financing schemes provides ways to create more economic activity and generate an environment conducive to an entrepreneurial class.

Proponents of this model of participation view any increased participation as an improvement. However, accepting as a forgone conclusion that macroeconomic stability and liberalizing markets are essential precludes any discussion of these that might occur as a result of participation. The outcome of development interventions would improve by strengthening their legitimacy through local participation rather than initiatives based solely on expert-knowledge. Funding community level participatory projects through non-governmental organizations (NGOs) was viewed as beneficial or useful as governments could pass off social services to NGOs, and so-called project "transaction costs" to volunteer labor from within a community [5]. Encouraging self-management supported the disengagement with the interventionist state. Increasingly, a project's "effectiveness" and "sustainability" became linked to local participation [15].

In these invited spaces, World Bank supported policies and projects have a better chance of performing well as participants have a stake in the project, often in the form of shared ownership. This dynamic is key to understanding the reformative nature of participation. People are granted agency but within prescribed parameters. The intended outcome of reformative participation is to modify development, to correct imbalances, increase opportunities for access that will ultimately enhance the market. Poverty reduction remains the focus, yet participatory practices do not question or confront the structural causes of poverty. Reformative participation adheres to the belief that poverty can be eradicated through market-oriented economic growth.

2.2. Transformative Participation

A second broad category of participation can be conceptualized as transformative, given that its principle objective is to utilize participation as a way to dramatically transform the cultural, political, and/or economic structures that reproduce poverty and marginalization. Early proponents of participation, such as Brazilian educator Paulo Freire, sought to challenge patterns of dominance through empowerment [16]. Waddington and Mohan equate empowerment to developing a personal political literacy, building consciousness and confidence to exercise agency [17]. This personal development can initiate larger processes of bottom-up group mobilization around collective experiences of marginalized groups that seek to challenge hegemonic order and market structures. Transformative participation often occurs in autonomous "invented spaces" of participation [18] to organize and undertake collective grassroots actions and tactics intended to resist existing structures [19]. Transformative participation can also take place in invited spaces where larger structural shift in state-policy making can occur. Here, the act of participation is transformative if it implies a transfer of power.

While some critics have grown disillusioned with participation due to the conflated understandings of the concept and ensuing problematic results [20], others see a resurgence of the potential transformative possibility of participation through critical reflection [21–26]. Participation can contribute to a lasting social change when it is not used as a quick fix or technical solution [18]. Locating participation in "radical politics of social transformation" reaffirms the concept's counter-hegemonic roots [23] (p. 79). Mohan and Hickey propose to reposition participation within "radical politics of development" by reframing participation that merges facets of liberal citizenship, as in formal rights and political channels, with a civic republican approach based on citizens' collective engagement in decision-making [24] (p. 251). They outline the following conditions for transformative participation: (1) form part of a broader political and radical project; (2) move beyond the confines of particular interventions and participate in 'underlying process of development' towards social change (e.g., inviting citizens to engage with core state activities); and (3) secure citizenship participation in order to "progressively alter the processes of inclusion that operate within particular communities, and which govern the opportunities for individuals and groups to claim their rights to participation and resources".

The goal of transformative participation is to radically transform a situation to create meaningful social and economic change through empowerment by participation of those excluded from economic or political processes. White argues that "participation as empowerment is that the practical experience of being involved in considering options, making decisions, and taking collective action to fight injustice is itself transformative" [16] (p. 68). The process of transformative participation seeks to exert control over decision-making, sharing knowledge and skills, and the redistribution of power, resources, and benefits [25]. While the goal is a structural transformation, the experience of reversing an injustice (or attempting to) is also viewed as meaningful and transformative in and of itself [16].

As it is typically understood as a movement "from below" to transform existing structures, the main actors of transformative participation are those making demands, the voice of the oppressed or dispossessed; citizens that are excluded from political and economic processes, who are often organized in community organizations, and social movements. This includes people who organize, mobilize, and make demands, and negotiate for greater participation at the decision-making level. Governments are also involved in civil society engagement through social reforms, the redistribution of wealth, and by opening spaces for political participation. NGOs sometimes act as advocates for transformative participation and can be important allies in creating spaces for negotiating demands [16] (p. 2). Practices and examples of transformative participation include, amongst others, participatory action research, mobilization and social movements, and participatory governance.

2.3. Nominal Participation

Worth noting is a third category of participation employed by various entities that cuts across ideologies. Nominal participation is a problematic type of participation insofar as it is typically used

to legitimize a project or policy rather than seeking genuine input or alternative ideas. Whereas advocates of reformative participation believe that certain participatory practices will lead to market improvements, nominal participation can be considered a "performance of participation" [26], as the intent is to reinforce the standing social order. The disingenuous intent of nominal participation is veiled by the haziness surrounding the concept and the prevalent notion that any form of participation should be cultivated. Essentially, nominal participation is a repurposing of the concept of participation, or as Brown (2004) states, "the co-optation of faddish language in the service of the status quo [27] (p. 249).

As with reformative participation, spaces of participation are "invited spaces" [28] that occur at official venues where agendas are carefully circumscribed by external agents in a way that curtails public engagement. Here, meaningful participation is not fostered as questions and discussions are discouraged resulting in a one-way flow of superficial information to citizens from officials or authorities; participation is promoted only in appearance. This kind of empty participation legitimates decisions taken by 'power holders' because it appears as though all stakeholders' voices were considered [29], yet these meetings merely amount to "displays of participation" [16].

The intended outcome of nominal participation can be to reinforce the status quo of power dynamics, gain legitimacy, and appease parts of the population. Participation is used to depoliticize activities and enlist community members' support for specific projects and practices [30]. The bureaucratic mechanisms of nominal participation serve to reproduce social order, state authority, and industry practices, while social inequalities remain obscured. On the other hand, poorly operationalized participation or lack of capacity to foster participation of the reformative or transformative kind can also lead to nominal participation.

Different state actors across the ideological spectrum exploit participatory practices towards their own ends: often to gain access to funding, participatory practices must be included. Main actors are political parties and state representatives at all levels, NGOs that fail to incorporate participatory practices properly, and public or private companies whose official participatory mechanisms are largely hollow. Practices include community development, consultation and informing.

The realities on the ground are such that participatory practices do not fit neatly into these categories, thus the typology of reformative, transformative, and nominal participation laid out above serves as a heuristic reference point for deciphering different types of participation. The framework nevertheless helps shed light on different understandings of participation and the tensions created by them. There appears to be a broad consensus that participation is important, particularly within public institutions, yet the lack of clarity surrounding the meaning of participation, and the inherent tensions between different perspectives, contributes to the confusion of what participation should be.

3. 'Social Control' and Participation in Cochabamba's Water Sector

Applying the participation framework to the water sector in Cochabamba, Bolivia, reveals that the outcomes of participation can differ from intents, and that conflicting forms of participation have created tensions among water users, policy makers, and activists in the city. The period of privatization of Cochabamba's water services is a prominent example of reformative participation. More transformative forms of participation can be observed in the water movement that culminated in the Water War of 2000 that rejected privatization and demanded water services be returned to the public sphere. The historically important concept of social control adopted by the water movement this time centered around the demand and the resolve to democratize the water system through greater citizen involvement in governance [31] (See Cielo (2009) for historical context and experiences of social control in Bolivia [32]). The Water War can be understood as a catalyst for broader change in Bolivia, sparking further resource wars (Gas Wars of 2003 and 2005) and a shift to the left with the election of current president, Evo Morales, and the Movement Towards Socialism (MAS) party in December 2005, assuming office in January 2006 [33]. Morales responded to the water sector demands with the formal recognition of the Right to Water and the recognition of the traditional model of *usos*

y costumbres or 'uses and customs'. New state institutions dedicated to water management at the national level incorporated mechanisms of participation and social control. I argue that although these formal mechanisms were based on the demands for transformative participation that grew out of popular unrest, they have resulted in nominal participatory practices that have served to work against meaningful change. The attention paid to social control in the formal water sector has been rhetorical, with contradictions between official discourse and practice.

The participatory efforts implemented in Cochabamba's municipal water company, SEMAPA, did not transfer decision-making control to the population, thereby maintaining the power imbalance between marginalized users and management in municipal services. The institutionalization of participation and social control has not resulted in a progressive municipal service.

3.1. Water Privatization and Reformative Participation

The privatization of Cochabamba's water utility formed part of the wave of neoliberal restructuring in Bolivia that applied market logic to purportedly improve inefficiencies in public services. By the 1990s, privatization was a precondition to borrowing from major financial donors [34]. In 1996, the World Bank threatened to deny $600 million in debt relief in the Bolivian government did not privatize the water sector [35]. At the time, popular participation mechanisms had been introduced through the Law of Popular Participation, in part to provide the supposed social stability needed to attract private investors [36]. As such, the participation sought under water privatization can be understood as reformative, with the intent to use participation as a tool to expand market access. In line with neoliberal pro-poor policies, people participate as customers in a 'transition' from poverty.

In a city of close to half a million residents, Cochabamba's water company, SEMAPA, was critically over-capacity and viewed as a textbook example of the public sector's inability to properly administer basic services. The first bidding process was unsuccessful and the second, two years later under President Hugo Banzer's administration, produced a sole bidder. The concession contract was signed under the Bechtel consortium, *Aguas del Tunari*, on 3 September 1999. *Aguas del Tunari* did not take over operation until November 1999, when the Potable Water and Sanitation Law 2029 passed. The law eliminated basic service subsidies and enforced the commercialization of water and the privatization of municipal water systems [36,37]. *Aguas del Tunari* had the right to seize water sources in their concession zone, which included the water sources used by the various small-scale systems in Cochabamba's peripheral Southern Zone, and the irrigating farmers' sources in surrounding rural areas. The communities reliant upon small-scale water systems, as well as irrigating farmers were the first to mobilize against privatization, to rescind the contract and reverse the law that granted monopoly rights on water sources traditionally used in a collective way [38].

The scale of the irrigation networks in the Cochabamba Valley and the complexity involved in expanding the city's water system to encompass the self-managed water systems of the periphery only became clear to *Aguas del Tunari* after the contract was signed (Anonymous Interlocutor, Interview, 2014). The costs of the projected expansion were offloaded onto the urban residents connected to the service, and as a result user fees skyrocketed to unaffordable levels. Different sectors thus united against privatization, forming a movement to reaffirm social control of water systems, demonstrating how neoliberal reformative participation failed to provide the stability expected through the Law of Popular Participation.

3.2. The Water War and 'Social Control' as Counter-Narrative

The privatization of Cochabamba's water services provoked a broad mobilization of Cochabamba residents that took to the streets for several months of protest, culminating in eight days of intense confrontation in early April 2000 (For extensive accounts of the Water War events see Olivera and Lewis 2004 [39], Crespo et al. 2001 [40], Shultz 2008 [41]; see Bustamante et al. 2005 [38], and Laurie 2011 [42] for gendered analysis). These events, known as Cochabamba's Water War, are commonly upheld as a model of successful anti-privatization mobilization, as the private contract for the city's

water was rescinded. The demands for social control made during the Water War were conceived as a way to widen the scope of democratic control over public services and the use of resources. Motivated by the lack of transparency during the privatization process, social control of water management became part of the counter-narrative to the reformative participation of the neoliberal order.

The main demand emerging from the Water War mobilization was the democratization of decision-making in water management. The implementation of social control provided an alternative to privatization, as well as a remedy to the problems of previous state models of water management. Through participation and collective action via *La Coordinadora* (The Coalition for Water and Life), a coalition of rural and urban residents, the citizens of Cochabamba managed to oust a major multinational from their city; participation would be a demand to move towards positive changes in the newly reinstated SEMAPA. According to Oscar Olivera, one of the key organizers of the anti-privatization protests, the Water War was about achieving universal access and adequate sanitation services and to ensure that unaffordable tariff increases would not re-occur. Control of water management was a political demand that would be achieved by gaining control over the decisions that affect people's livelihoods, making public participation a fundamental issue (Anonymous Informant, Interview, 2014).

During the Water War, the concept of *usos y costumbres* was championed as an alternative to the privatization model. According to *usos y costumbres*, water governance is decided among the people through mutually-agreed upon arrangements, based on peoples' needs rather than profit motives. This emphasis on people-centered governance offers an example of a transformative participation model. Garande and Dagg reference Micherner's argument that people-centered participation empowers people or community when there is collective consciousness-raising, "enhanced(d) local management capacity," and greater "confidence in Indigenous potential" [43] (p. 420), [44]. *Usos y costumbres*, grounded in Andean principles of reciprocity and redistribution [45], can be based on Indigenous traditions even when community members might not explicitly identify as Indigenous (Lazar and other scholars on Andean identity explain the transience of Indigenous identity, often used in strategic ways [46]). Here the empowerment lies in the fact that community members are involved in the decision-making process through participatory assemblies and the democratic selection of leaders. Although not without flaws, the emphasis on transformative participation found among self-governed systems in the Southern Zone provided a model of water governance that Cochabambinos could uphold.

Returning to the idea that communities felt ownership over their existing water systems, they were outraged that a private company could expropriate the systems and the water sources that belonged to them. This points to Cleaver's [47] (p. 51) distinction between autonomy as an "expression of agency" or a "necessity imposed by constraint." Initially, the self-governed systems were formed due to the lack of municipal services (constraint), but following the threat of privatization, the emphasis on protecting autonomy and upholding traditional water rights that emerged can be understood as a demonstration of agency. This is evidenced by the formation of ASICA-Sur, now known as ASICA-SUDD-EPSAS (Association of Community Water Systems of the South), an umbrella network of water committees in the periphery, or Southern Zone, of the city. The protection of these systems (especially against the threat of privatization) became an important point of mobilization, as they provided an alternative to market-driven forms of water governance.

These three ideas—that water cannot be commercialized, public participation and social control is critical, and defense of *usos y costumbres*—formed the basis for the water movement's vision for the restructuring of SEMAPA:

> Of course there are many problems to be faced; however, the challenge accepted in April by the population as a whole, and by *La Coordinadora* especially, is to consolidate a company of potable water and sewage that maintains its public character, under control of the population and moreover, that is efficient, that has the capacity to improve and expand its services, and whose operation is transparent. To achieve this goal it is necessary to consolidate a management model in SEMAPA that facilitates the active participation of the

> organized population in the design of general policies and decision-making, and what's more, that permits the audit of company activities by grassroots organizations (*La Coordinadora* proposal, 2000).

La Coordinadora made these explicit calls for social control with the expectation that these measures could solve, or at the least help address, the various problems within SEMAPA that predated—and made the company a target for—privatization, however, this vision faced pushback from the outset.

3.3. Nominal Participation Normalized

Nineteen years after the Water War, SEMAPA bears the tagline "clear and transparent." Public participation and social control are operationalized via bi-annual *Audiencia publica de rendición de cuentas*, a public accountability hearing. These meetings are structured as an hour-long presentation followed by a fifteen-minute question and answer period, organized by SEMAPA's Transparency Unit. During one meeting, the room was half full: the majority in attendance were SEMAPA workers complying with their work obligations, and 14 members of the public, who were mostly community representatives. Available records from previous and subsequent meetings denote the same poor attendance rate. In later discussions with community leaders—*dirigentes*, heads of water committees and cooperatives in the Southern Zone—many were unaware of the meeting dates and had not received the letter of invitation. Instead, they lamented the lack of communication from SEMAPA.

Aside from the poor promotion of the meeting, the scheduling is problematic. Held mid-morning on a Wednesday, the busiest market day of the week after Saturday, the meeting time conflicts with most work schedules. Further, SEMAPA's headquarters are located in uptown Cochabamba, which typically requires a one-hour commute from the Southern districts, depending on traffic. Location and timing present accessibility challenges. Additionally, public records of meeting minutes are not shared widely. The meeting itself consisted of an information session of mission statements, overviews of the year's projects, and general financial information presented by various SEMAPA managers, who occasionally stopped to answer their cell phones. For the question and answer session, the attendees were not given the floor; rather, questions were submitted on paper to be read out by a SEMAPA representative. The different managers answered the questions, often deflecting problems, and quickly moved on to the next question without leaving time for deliberation or discussion. There were a total of eight questions that were answered within twelve minutes. This is the heft of the current mechanism for social control and public participation.

These meetings do not amount to the robust public engagement called for during the Water War of 2000. Far from observing meaningful exchange, the mechanisms in place today reflect nominal participation, promoted in rhetoric only. Here, decision-making is contained to exclusive circles, and participation is a display of public meetings whereby the water utility can claim they are fulfilling their obligation to public participation and social control. The following two sections will explore the power dynamics that prevented transformative participation from taking hold in SEMAPA, and SEMAPA's institutional inertia as continued corruption and political influence plagued the company.

The final section demonstrates how nominal participation has become normalized in formal spaces of the Bolivian water sector at the municipal, departmental, and national levels. As the 'party of social movements,' MAS buttressed a discourse of participation and social control, signaling a shift towards transformative participation. However, the party's actions have led to the fragmentation of social movements, the reproduction of clientelist relations and restricted access to higher-level decision-making spaces.

3.3.1. Defining the "New" SEMAPA: Early Divides

Directly following the Water War, SEMAPA reverted to an autonomous decentralized public utility. The conservative national government of Hugo Banzer was in power, but the task to rebuild SEMAPA occurred at the local level, with the New Republic Force (NFR) party in the mayor's office [48].

SEMAPA was headed by a Board of Directors that consisted of municipal officials. The population of Cochabamba was dissatisfied with this return to the former state model that had been riddled with problems. Moreover, they were distrustful of this Board because of their involvement in the utility's privatization—they had not only endorsed the concession contract but also supported *Aguas del Tunari* in claiming economic losses for the breach of contract and forceful exit from Bolivia [49] (p. 34).

Eager to establish an alternative model of water management, *La Coordinadora* remained active following the Water War, holding consultations and workshops to put together a proposal for SEMAPA's restructuring. *La Coordinadora* understood social control as a way to improve the public entity so it would not be a target for privatization [50]. The push towards democratizing public services was important for all sectors of the population, even those not connected to the municipal network, because it is linked to struggles over natural resources [51]. *La Coordinadora*'s initial proposal called to dissolve state property and replace the utility structures as common property (*La Coordinadora* proposal document). However, the idea of SEMAPA as common property was viewed as too radical and *La Coordinadora* members preemptively modified the proposal to be more palatable. The second proposal was penned by the College of Professionals of Cochabamba, a group composed of professionals across 17 fields that had been involved in some way in the Water War. This group had strong ties to the mayor's office and their proposal included input from SEMAPA workers [49]. Finally, a third proposal was presented by a *junta vecinal*, a neighborhood council that was also aligned with the municipality.

The differentiating factor between the three proposals is the amount and type of participation. *La Coordinadora*'s proposal exemplifies a model of water management, often referred to locally as 'public-social,' that would place decisions about the water utility directly in the citizen representatives' control. With six social representatives, the 'public' would hold majority vote holders in the Board of Directors that would be held accountable through public assemblies. The other two proposals conceived public participation quite differently, placing SEMAPA firmly under government control, with social representatives being a minority on the Board of Directors. This composition allowed for spaces of civil society input, but not the final decision. According to my earlier categorization of participation, these state-led spaces do not automatically preclude transformative participation, but in Cochabamba it is often tied to a paternalistic view of social control that persists today, as exemplified by this quote from a former manager at SEMAPA:

> (Participation) is a way to administer the state that I do not agree with much (. . .) I consider this country one that has not reached maturity of First World countries of hundreds or thousands of years of democracy. Are you going to consult an immature [country], what decision will it take? One example, I have three children, who are now grown, but when they were younger [I'd ask] what would they like to eat today? One will say chicken, the other hamburgers, and the other will say 'I want ice cream.' But ice cream is not nourishment. Second, I cannot cook three different things, and third, my budget does not allow it, I only have enough for eggs and rice. So why ask? (Former General Manager of SEMAPA, Interview, 2014).

In other words, technical experts are seen in this model to be better suited to address water issues than the average citizen. Here, the 'technical problem' of water scarcity requires 'technical solutions,' where public input is not valued.

A new statute for SEMAPA was approved on 25 October 2001. In the end, the outcome of the citizens' directory was a much less radical version than envisioned by *La Coordinadora*. The composition of the board was three citizen representatives from different districts of Cochabamba, two representatives from the municipal government, one from the College of Professionals, and one union representative. With a minority of citizen representatives serving on the Board of Directors, the participatory criteria of 'inclusion' was fulfilled, but not that of 'control.'

Several factors contribute to the inability of the water movement to achieve its initial demands for transformative participation. By the time discussions around restructuring SEMAPA with social control

were solidifying, a year after the Water War, *La Coordinadora* had lost mobilization power [49]. It had waned because actors were preoccupied with different regional and national movements. Several of the informal leaders of *La Coordinadora* were beginning to shift their commitment away from water issues, in order position themselves politically to align with MAS (Anonymous Interlocutor, Interview, 2014). With decreased numbers, maintaining pressure on the municipality to achieve demands proved difficult [52]. *La Coordinadora* fostered unity during the Water War by identifying a common enemy, the privatization of water services, which allowed people to band together regardless of socio-economic standing. The distinct motivations people had for joining the Water War protests—protecting water sources, guarding autonomous water systems, and fighting against rising tariffs—did not translate to a consensus going forward in the restructuring of SEMAPA. *La Coordinadora*'s initial ideas were viewed as too radical and were thus tempered in order to achieve a modicum of social control in the utility's management [53].

The challenges in rebuilding SEMAPA following the Water War reflect the elite resistance to restructuring and transformative participation, particularly by actors within the municipal government who wanted to preserve SEMAPA as a source of political capital [52]. SEMAPA's workers' union formed an unlikely alliance with the local elite. The union's leadership aligned itself with SEMAPA's administration's stance on maintaining the previous management model [47,49]. The workers lobbied to preserve their role of relative power within SEMAPA and were in favor of limiting the number of citizen representatives on SEMAPA's Board of Directors, and consequently, the extent to which the company's restructuring could lead to significant and meaningful participation [48].

Wainwright points out the importance of examining the organization of labor and human relations to see how the relationships can contribute to democratizing public institutions. She argues that relations between labor and management are "decisive to the flows of information, knowledge, and problem solving among staff and between staff and users," and that the "combination is vital to achieving the goals, the measurements and the dynamics of a different kind of economic logic" [50] (p. 88). Despite the terse history of cooperation between management, workers, and users, there have been instances of worker-led, management supported collaboration. However, in the crucial moments following the Water War, *La Coordinadora* could not rely on the full support of SEMAPA workers, a considerable blow to the water movement.

While *La Coordinadora's* initial ideas did not materialize they did manage to ensure some mechanisms of social control within SEMAPA. They pushed to include a "vigilance and social control unit" within the company, with the function of investigating instances of corruption, and to track inefficiencies. The unit was meant to be independent and consist of SEMAPA workers and civil society [48] (p. 125). This unit took years to approve, and was eventually established as the "Transparency Unit," mandated by the Ministry of Transparency, to deal with the complaints that correspond to SEMAPA. *La Coordinadora* was also able to secure the statute for citizen representatives to be approved by the Board of Directors [49].

3.3.2. Institutional Inertia

The limited mechanisms for social control of citizen representatives faced problems from the first elections of a new SEMAPA Board of Directors. These were held in April 2002, the same year as the national general elections. People were not as motivated about water issues as they had been two years previous, however, and more importantly, most were preoccupied with the larger elections. With minimal publicity, the mayor sent last minute notice of the SEMAPA representatives' elections, to be held before the Departmental electoral court [36]. Moreover, voters were identified through a database of ELFEC users (the electric utility *Empresa de Luz y Fuerza*), limiting the vote to one per family (the person whose name appears on the bill), thereby circumventing the participation of tenants who do not pay the bill directly [36]. Even with this low voter turnout (3.6% of eligible voters) the elections were contested due to the disorganized voting stations, and accounts abound of people being told

where to mark the ballot by SEMAPA workers and those administering the vote. Recall elections were held, but subsequent elections have remained problematic [36] (p. 48).

Once holding positions, the citizen representatives received little to no training on how to communicate with the public, or methods to evaluate SEMAPA's plans and operations. Graver still was the ability of other members of the Board of Directors to politically influence the citizen representatives. Due to their marginalized position of minority vote, citizen representatives often limited themselves to petitioning for improvements in their sector of the city alone. Other times, they would vote in favor of the Board in exchange for positions at SEMAPA for friends and family [36]. At worst, citizen representatives were directly offered financial compensation in exchange for their vote, or silence regarding corruption (Former citizen representative, Interview, 2014).

By 2010, the positions of citizen representatives of the Board of Directors quietly dissolved. SEMAPA was no longer holding elections for these posts and no one protested (Anonymous Interlocutor, Interview, 2014). People lost faith in the ability of citizen representatives to change the internal dynamics of SEMAPA. In short, it was a failed experiment because it did not provide a strong voice for the public, as decision-making power was not transferred to the citizens of Cochabamba. The momentum of the water movement had weakened, and with diminished social pressure, SEMAPA returned to the status quo prior to privatization, a vehicle for corruption and political gain, ultimately having adverse effects on network improvements and expansions. Institutional instability was linked to the high turnover rate of General Managers in SEMAPA. Appointed by the mayor, General Managers typically serve one to two years heading the company, though some periods have seen up to five changes in General Manager in one year (Former citizen representative, Interview, 2014).

The 'overstaffing' of SEMAPA is a point of contention among most people interviewed that work in the water sector (outside of the company) and citizens of Cochabamba. Accounts of corruption included inflating the quantity of materials necessary for a particular project and writing off equipment and supplies that never arrived. These repeated scandals diminished SEMAPA's chances for securing funding from international financial institutions that were already reluctant to invest in public companies [48]. Once funds were invested, the instability of the company led to repeated cancellation of financing from the Inter-American Development Bank (Anonymous Interlocutor, Interview, 2014).

In the construction of municipal water projects, the lack of strong participatory mechanisms in SEMAPA have been detrimental to increasing water provision in the city. One of the few successfully completed major infrastructure projects was the "Improvement of Potable Water System of Southeast Zone of Cochabamba City," commonly known as the JICA project, as it was funded by the Japanese International Cooperation Agency which has worked in Bolivia for over three decades. The application for the project was first sent to JICA in 2004, and the project was completed in 2010. The goal was to provide water to 22 communities in the Southern Zone of Cochabamba, which would benefit an estimated 50,000 inhabitants, with the expansion of a water treatment facility, the construction of adduction and impulsion lines, the construction of a principle distribution network, and materials for secondary networks that would connect communities to the main network. SEMAPA carried out the project with financial support from JICA. Construction began without public engagement on the project and faced its first obstacle when the community surrounding the initially identified treatment facility blocked its expansion because they did not construction disruptions in neighborhood. SEMAPA thus shifted course to expand a different existing treatment facility, Aranjuez, situated this time in the North of the city. Once more, without employing participatory mechanisms, the project faced yet another obstacle. The water source for the Aranjuez facility is located in a nearby community that lies outside of SEMAPA's jurisdiction; its inhabitants with usufruct rights did not permit the increased water use sought by SEMAPA.

This lack of public participation resulted in the current state of the project: newly built infrastructure, but without water. When Evo Morales arrived to inaugurate the project (in October 2011), he opened the tap and water did flow freely, but without a consistent water source the network is working at 10% capacity, accelerating pipe decay (SEMAPA worker, Interview, 2014). Rather

than serving the neediest population of Cochabamba in the Southern Zone, the treatment facility improvements have however benefited the residents of the Aranjuez district, one of the wealthiest neighborhoods in the city in the North Zone.

Certain measures of public participation in SEMAPA were introduced via the central government. As of 2011, SEMAPA has been required to comply with the nation-wide community development initiative known as DESCOM (*Desarrollo Comunitario y Fortalecimiento Institutional*—Community Development and Institutional Capacity Building), part of a requirement of most externally funded projects that need to meet the standards for the international Technical Economic Social and Environmental Assessment. In SEMAPA, DESCOM consists of hosting workshops with communities, water committees and cooperatives, on various water provision related topics, for example tariffs or network maintenance. Externally hired consultants typically run the workshops (SEMAPA worker, Interview, 2014). However, as one SEMAPA employee explained, in practice, little attention is paid to the social aspect of the assessment and projects. Often excluding community members from water projects, citizens do not learn how to use the service or receive training on network maintenance. Contracts for water provision between a community and SEMAPA often go unsigned, or SEMAPA would not receive payment for services, ultimately resulting in unused water systems. The national guides are based on previous DESCOM guides elaborated by the Inter-American Development Bank, which clearly state that the beneficiaries of the projects are co-responsible for the project planning, execution, and evaluation. It is, however, difficult to determine the success of DESCOM beyond these guidelines and whether it fosters participation deeper than a consultation process. SEMAPA workers noted that DESCOM is even more complicated in a dense urban setting:

> We didn't have a person to do this work (of DESCOM). So the engineers finally started the work and said "(the pipe) will pass here" and the people were opposed, there were blockades and strikes, they set fire to machinery, they sequestered the engineers for a full day. (. . .) Everything was paralyzed, and the work did not start again until they explained it was the only option, the only way. In the end, the only way was to enter by force, with the police, with the mayor, with public force (SEMAPA worker, Interview, 2014).

This conflict in the Southern Zone, which occurred in late 2013, is not uncommon when SEMAPA enters a neighborhood, with no prior warning or explanation, to install piping that would serve a different neighborhood. At other times, burst pipes or damaged sewage systems are left unattended for months. Across my interviews with members of water committees and cooperatives in the Southern Zone it was clear that collaboration and communication between the Cochabamba population and SEMAPA is badly wanting.

3.3.3. MAS and the Rhetoric of 'Social Control'

Optimism and expectations for improvements in the water and sanitation sector rose dramatically after the election of Evo Morales and the MAS government in 2005. The new government championed social control and participation in official discourse and policy while formalizing it in the water sector. The language utilized throughout legal and policy documents upholds public participation in governance and can be interpreted on the surface as transformative, but as this section illustrates, public participation is contained in state sanctioned spaces with little facilitation of participation in higher-level decision-making. Only organizations and social movements that are not perceived as a threat to MAS are invited to take part, resulting in a more nominal form of participation.

Morales ran on a platform of Indigenous rights, dignity, and sovereignty—a clear break from the colonial and racist regimes of the past [54]. He also presented a shift from neoliberalism, predicated on the promise of nationalizing key industries and redistributing wealth through social programs for the most marginalized. A key principle of the MAS government is the Indigenous concept of *vivir bien*, or 'good living', defined as "encounter and progress through diversity and 'inter-culturality,' harmony with nature, social and fraternal life, national sovereignty in all field[s] and internal accumulation

with quality of life" [55]. The concept is tied to Indigenous dignity and frames MAS' Water for All plan wherein water, and access to water, is fundamental to life, based on integrated water resources management that is sustainable and participatory [55].

MAS positioned themselves, and projected themselves internationally, as defenders of *Pachamama*, Mother Earth. Morales' successful lobbying efforts led to the ratification of United Nations Resolution (64/292) in July 2010 that expands the United Nations Declaration of Human Rights to recognize the Right to Water. The fundamental Right to Water was also an important part of the new Bolivian Constitution, putting the onus of guaranteeing access to water on the state, and shifting "ownership" of water sources to public (read state) property, granting the state "exclusive authority" over water resources [56] (Article 298, II). At the same time, the formal recognition of traditional and customary uses of water under Bolivia law and the creation of official licenses or registries for small-scale water providers became a large focus of water sector reform. The new potable water law (no. 2066) now created licenses for large providers such as municipalities (e.g., SEMAPA) and water committees, whether Indigenous communities, peasant unions, or neighborhood associations, which would need to be registered as an EPSA (*Entidad prestador de sanamiento y agua*—water and sanitation provider). The changes in legislation were significant as they signaled a shift in the dominant neoliberal model of water commercialization, and provided protection against the threat of privatization [57].

Another of Morales' first presidential acts was the creation of a national water authority. The Water Ministry encompassed vice-ministries responsible for policy, planning and projects in the areas potable water and basic sanitation, irrigation and water resources, environment and climate change (the current iteration is the Ministry of Mother Nature and Water, under which fall the Vice Ministry of Potable Water and Basic Sanitation, the Vice Ministry of Water resources and Irrigation, and the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development). Notably, prominent figures in the anti-privatization water struggles were appointed as minister and vice-ministers, including Luis Sánchez Gómez, appointed as Vice-Minister of Basic Services in 2006, and Rene Orellana, appointed as Minister of Water in 2008. These types of appointments are how MAS projects its stance as a 'party of social movements'.

Under the umbrella of the Water Ministry, MAS established several corresponding agencies, including the Fiscal and Social Control Authority (AAPS). AAPS is the entity responsible for creating a registry of the EPSAs in order to regulate water services. The process involves providing a registry or license that provides legal recognition to the EPSAs, offering jurisdictional security to the water service provider by registering the water source. The purported goal is to provide the EPSA protection against expropriation and operational support to strengthen the systems. Ideally, registering water sources and their uses helps avoid conflicts between communities, and importantly, creates a database of the existing water systems (AAPS Director, Interview, 2014). For the smaller, community-run EPSAs, registration came with the expectation of some form of benefits from the government. Importantly, for many communities the EPSA title delivered a guarantee of their system's autonomy, and thereby maintaining social control over their own water governance.

The fate of Cochabamba's small-scale community-run systems, or EPSAs, present a point of contention in the discussion of the potential expansion of SEMAPA's infrastructure [58]. Particularly, the registration of EPSAs calls attention to questions of jurisdiction and zones of responsibility. The new legislation eliminated these zones, and through registries and licenses has granted small-scale systems jurisdiction over their water services, making them equal to SEMAPA before the law. This complicates planning and the expansion of SEMAPA into zones already serviced by smaller systems. Cases of parallel projects, competition and conflict between municipalities and communities over infrastructure and treatment facilities are common in the Department of Cochabamba.

Water committees and cooperatives in Cochabamba have engaged in a series of "multi-scalar strategies" to preserve their own systems [59], including registering as EPSAs, as noted above. Conversely, other water committees and cooperatives maintained that the registration process is a threat to their autonomy. This reluctance to register as EPSAs possibly stems from the distrust that state

institutions are acting in communities' interest. A viewpoint held by many within institutions is that the sources do not actually belong to the communities, that the state is the regulator of water resources and their exploitation. As a water activist explained, the new legislation for diminishing the power of communities is a process that favors the state: "those who seek access to water are increasingly forced to the state, the laws, the courts" (Anonymous Interlocutor, Interview, 2014). Where disputes were previously settled between communities through uses and customs, several state agencies are now set to intervene. Further, Seemann faults the legislation for idealizing community harmony [56]. Echoing Perreault's [60] argument, Seemann acknowledges that inclusive water governance can be beneficial for communal water rights yet rather than leveling the playing field, participating in the liberal justice system excludes communities unable to record their water consumption through uses and customs: "formal recognition of local hydrosocial territories necessarily implies the non-recognition and illegalization of a variety of non-formalized hydrosocial territories" [61] (p. 169). Seemann concludes that MAS' approach forms a "disciplinary water governance" as the formalization of the water sector can obscure inequalities in access to resources [54].

The potential for registries and licenses to heighten inequality must be evaluated against the material impact of EPSAs recognition. As of 2014, according to information provided by AAPS, 46 EPSAs had registered in Cochabamba. Many water committees expressed frustrations over the minimal assistance received—obtaining formal recognition had not changed much. Without regulation over drilling wells, or analysis of water samples, AAPS functions as an outlet for complaints or conflicts that are not resolved within communities, to the point above that the formalization of the water sector has created a certain dependence on the state. A change in interactions with the state is observed in the way social movements and communities increasingly place demands upon MAS rather than seek their own solutions or alternatives, as had been done previously. Returning to participation, the EPSA registration process demonstrates the limited space for citizen participation. In an institution that purports to practice social control, AAPS fails to implement mechanisms for transformative participation thereby excluding many communities' interests. Whether simply lack of capacity or commitment to foster spaces of participation, the public's demands are often overlooked. This has important consequences for sector funding, and detrimental impacts for services for groups not aligned with the government.

The policies and projects under the government's "Water for All" campaign seek to prioritize districts that lack access to water with a heavy focus on rural areas and irrigation programs. The Vice Minister of Water (at the time) proclaimed universal access for 99% of Bolivians would be achieved by 2020 (Vice Minister of Water, Interview, 2014). However, the national figures are more modest, according to the 2012 census, 80.8% have water access nationally, and in Cochabamba the figures are 68.7% for water and 54% for basic sanitation [62]. Of the basic sanitation number, 54.6% consists of piped sewage systems, while 45.4% consist of alternatives such as septic tanks and cesspits [62]. Further, the national statistics can be misleading because they focus on infrastructure, ignoring other criteria of quality, quantity and continuity of services [63]. The national government projects focused on water and sanitation have had mixed outcomes. In reference to one of the largest projects under the Water for All campaign is *Mi Agua*, several reports outline subpar construction of these projects, hastily executed to demonstrate results in order to garner favor with voters or reward support (NGO worker, Interview, 2014).

This kind of exchange is not unique to the MAS government. Lazar depicts the historical norms of patronage politics in Bolivia; what is distinct in the MAS regime is the position the party takes as the voice social movements [46]. The critique leveled from the left charges Morales of co-opting social movements. As Regalsky [64] (p. 47) explains, the push for political reform and Indigenous recognition in fact "subordinated [groups] to the state," reinforced the party system, thereby demobilizing the movements due to loss of leadership and neutralizing the critical lens (Anonymous Interlocutor, Interview, 2014). Hierarchical clientelist relations between the political party and voters are reproduced,

yet more obscured under the MAS government. This limits social movements' abilities to work beyond the frameworks proposed by MAS.

In the water sector, this dynamic has led groups to align themselves with MAS' position specifically to gain funding. The most notable example in the Cochabamba context is ASICA-SUDD-EPSAS' wavering position regarding the autonomy of water committees. ASICA-SUDD-EPSAS is the umbrella organization representing many small-scale water systems of the Southern Zone. At its inception, in 2004, the organization's stance was a defense of these water systems against dispossession by foreign capital. ASICA-SUDD-EPSAS was open to working jointly with SEMAPA on the administration of water and sanitation services, yet was steadfast about maintaining their autonomy [65]. Influenced by the political climate, today the organization's position has shifted to align with the conception of EPSAs existing within an overarching municipal system, viewing the small-scale systems as unsustainable. They no longer fully uphold the community management alternative (NGO worker, Interview, 2014). Being less critical of MAS was a tactic to gain technical or financial assistance to help maintain the systems, at the cost of the association's ability to organize independently from the state. Paradoxically, any benefits received from aligning with MAS have not necessarily translated to advantages for the water committees of the Southern Zone. Instead, the organization is fragmented and no longer presents a strong unified front. ASICA-SUDD-EPSAS has weakened substantially, especially since the loss of funding from international donors.

Once numerous in the Cochabamba Valley, the presence of internationally-funded NGOs appears to be on the wane. Since the controversy surrounding TIPNIS (*Territorio Indígena y Parque Nacional Isiboro Sécure*), there is an increasingly contentious relationship between MAS and NGOs critical of the government's extractivist policies that contradict their position as champions for the environment, Indigenous populations [66]. The Trans-Oceanic Highway, a joint infrastructure mega-project between Bolivia, Brazil, and Peru, consists of a large-scale highway across the Isiboro Sécure National Park TIPNIS affecting over sixty Indigenous communities. NGOs highly critical of the road for its environmental impact on the Amazonian rainforest and the displacement of Indigenous communities were reproached and threatened by MAS, and in one case expelled from the country (see McNeish [33] and Achtenburg [62] for further reading).

In May 2015, Morales issued Decree 2366, opening natural protected areas to mining and oil extraction. A month later, the President threatened to expel "imperialist" NGOs that challenge the decree [67]. On the other hand, as Spronk points out, the basic funding structure for the water and sanitation sector in Bolivia is unchanged since the neoliberal era, reliant on external funding from international cooperation [68]. The Minister of Finance reported 8.427 million bolivianos assigned to water and sanitation projects since 2006, when MAS took office nationally [69]. However, this is not a sizable investment compared to the general upward trend of the GDP (USD 33.94 billion in 2016 at time of the Finance Minister's statement) due to the rise in commodities exports [70]. Public spending is devoted to more visible and popular construction projects, for example bridges, paving roads, plazas, and soccer fields. For many in Cochabamba, this means large water and sewage infrastructure projects remain dependent upon external donors, making local control over water services vulnerable to their conditionalities. But for the water committees and cooperatives in the Southern Zone facing financial constraints, there is less direct support from international cooperation and greater reliance on funding allocated through government institutions, while the crisis of unequal access to water persists.

Despite abolishing the private contract and the strong anti-privatization sentiment that followed the Water War, water commodification is still present in Bolivia today, further undermining the establishment of a strong public participatory alternative. In fact, while the Constitution outlines that the state is responsible for guaranteeing access to water, it does make reference to mixed water providers, which could include a private profit seeking component [68]. Free market ideology is difficult to extinguish. The ongoing presence of the private sale of water in Cochabamba underscores the argument that the shift to "post-neoliberalism" is not categorical [71]. Private water sales are a

product of the weaknesses of Cochabamba's public system, but they also provide a crutch for inaction on the part of government.

4. Conclusions

Social control and public participation were key components of MAS' 'process of change' that codified social control as a right and included direct citizen participation in the new Constitution. This paper posits that although these formal mechanisms were based on the claims for transformative participation that grew out of popular unrest, the mechanisms have resulted in nominal participatory practices that have served to work against meaningful change, de-radicalizing social movements in the process [55]. Similarly, the contradictions between official discourse and practice in the water governance reveal how formalized mechanisms of social control in the water sector have largely been rhetorical.

The complex case of the hard-fought public water services in Cochabamba illustrates the challenges of remunicipalization as the public state-led entity did not deliver on the expectation of social control in water management. As a result, some associate the remunicipalization process with the regression to procedural, inadequate and opaque government administration, and a kind of government intervention in the management of the water commons. This paper argues that from the outset, competing views of social control and participation have complicated the process of rebuilding SEMAPA after the failure of privatization. The focus here on participation reveals the political processes of decision-making among the various actors in the contested realm of water governance in Cochabamba. Water activists fighting for more progressive and equitable public water services faced resistance from powerful actors within the municipality and service provider eager to maintain influence within SEMAPA.

Public participation has been identified as a key principle of public alternatives to privatization. This paper has attempted to provide conceptual clarity to participation by creating a typology of reformative, transformative, and nominal participation. Adopting this lens of participation to analyze other instances of remunicipalization around the world could be a useful exercise to build a comparative guide, without negating local contexts. In turn, documenting cases where public participation has been more successfully integrated into models of water delivery, or other types of public services, could provide useful strategies for Cochabamba.

The contribution of the in-depth case study of remunicipalization, with input from multiple actors across the Bolivian water sector, can serve to inform the remunicipalization movement, and continue to push the discussion beyond anti-privatization debates. Understanding what leads to mixed results of remunicipalization is crucial to strengthening public alternatives [3]. Analyzing how water services have been rebuilt in a post-privatization context identifies the impediments and pathways towards building a successful public water provider.

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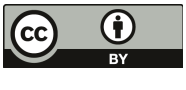

water

MDPI

Article

The User and the Association: Neglecting Household Irrigation as Neglecting Household Well-Being in the Creation of Water Users' Associations in the Republic of Tajikistan

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Abstract: Development initiatives often cite Water Users' Associations (WUAs) as fundamental to water governance reform or the broad process of decentralizing responsibilities for management, supply and delivery. But the label of "WUA" indicates little about those who take on these duties as association members, suggesting all who use water in pursuit of life or livelihood are eligible to participate and benefit through collective action. Grounded in the belief that participatory projects can equitably empower and distribute resources, the enthusiastic introduction of WUAs continues despite critique that anticipated outcomes are overstated. Since borders opened to neoliberal development institutions in the 1990s, WUAs have been created throughout post-Soviet Central Asia. Yet, there has been limited reflection on how associations' design and operation interact with physical or social structures to effect resource access across diverse groups. Drawing on fieldwork in Tajikistan, I demonstrate how WUAs reproduce exclusionary outcomes by requiring members to possess farmland in turn threatening rural food security. Held by a minority, farmland dedicated to commercial production stands in contrast to ubiquitous kitchen gardens, where crops sown for self-consumption form a buffer against hunger in the wake of labor migration and income inconsistency. Households' inability to become members undermines their claim to water and voice in decision-making, ultimately constraining access to irrigation and a robust harvest.

Keywords: water management; irrigation; kitchen gardens; participatory development; Water Users' Associations; Central Asia; Tajikistan

1. Introduction

Project plans and reports drafted over the last several decades by development institutions and donor agencies are peppered with references to Water Users' Associations (WUAs) as key components of rural water governance reform—their creation framed as an opportunity to transfer responsibility for local water management, supply and delivery from government bodies to those who directly engage with the resource as users. But beyond a shared requisite for water, the organizational label of "Water Users' Association" indicates very little about the qualities of would-be members, suggesting an inclusive design wherein all those who use water in pursuit of life or livelihood are eligible to participate and benefit through collective action. Grounded in dominant development theory and a belief in the ability of participatory, locally-based projects to empower without exception and equitably distribute resources, the enthusiastic introduction of WUAs has continued despite a rich body of literature arguing that these anticipated outcomes often fail to manifest [1–12]. The continued popularity of "participatory" natural resource management organizations signals that even with decades of critique, this area of study should not be seen as saturated but rather as warranting sustained attention to the variegated ways projects may perpetuate uneven power relations across the globe.

In Central Asia, WUA creation has taken place rapidly since the fall of the Soviet Union in 1991 as financially and administratively stressed governments opened their borders to neoliberal development institutions. Yet, there has been little critical reflection as to how WUA project design and operation have interacted with physical infrastructure or structures of power to affect resource access across social groups. Central Asia's location on the periphery of various constructed blocs—Eurasia and South Asia, the Islamic World and the West, the chaos of failed states and stability of democracy—has been mirrored in its treatment by academia as of peripheral concern. With respect to water governance, studies that do attend to the region focus on macro-level changes in surface-water availability or large-scale dam building in relation to the threat of interstate conflict or the boon of economic growth, with limited attention to the experiences of communities or household water users (See Nozilakhon Mukhamedova and Kai Wegerich (2014) for an exception to this trend [13]). This is not a call for regional studies within water governance literature, but rather recognition that insight may come from diverse locales and multiple scales of inquiry. In what follows, I examine the social relations produced when a mainstream strategy for contemporary water reform interacts with the physical and social structures of past systems of water governance, in this case a Soviet socialist one.

Drawing on evidence from the Central Asian Republic of Tajikistan, I demonstrate how WUAs created by development actors produce exclusion by limiting membership to those who possess farmland, leaving kitchen garden cultivators without a formal basis for engagement. In so doing, these institutions may inadvertently threaten rural food security. Dedicated to commercial production and held by a minority of rural households, farm plots stand in contrast to kitchen gardens, which, sown with diverse crops for self-consumption and held ubiquitously, act as buffers against hunger in the wake of labor migration and income inconsistency. The potential for kitchen gardens to continue in this function is, however, dependent on good environmental conditions and access to agricultural inputs—water, via surface level canals, being central among these. Restricting WUA membership to those with farmland shapes the local politics of water governance such that households who only cultivate kitchen gardens are not afforded a formal voice in decision-making and their claim to water is undermined. With policy informing practice, the rhetorical subordination of kitchen garden irrigation to that of farm plot irrigation has the potential to reduce household access to water, placing new constraints on rural food security and opportunities to improve family wellbeing—the antithesis of development actors' stated intent.

Connections between the receipt of adequate and timely irrigation water and rural households' access to nutritious food are clear, especially in Tajikistan's arid landscapes. Literature on water governance and WUAs in particular, does not, however, consistently integrate an analysis of how the politics of irrigation management affect household ability to secure sustenance, either through the cultivation of crops for self-consumption or through the sale of crops and the purchase of food. While analyses of water management institutions in abstract or divorced from their practical implications, do have value, they fail to fully account for the reverberations that shifts in water governance have through society. With an analysis of the relationship between household-level agriculture and WUA operation in Tajikistan, I demonstrate the importance of attending to the micro-politics of water governance in examinations of food security and in reverse, the importance of attending to issues of food security in understanding lived-experiences under different forms of water governance.

While directly in response to local conditions, international actors' decision to establish WUAs in Tajikistan cannot be understood in isolation from broader trends in development theory. After a discussion of research methods in section two, the third section of this paper traces the call for community-based organizations as an alternative to the state in managing natural resources, including water and how this call was translated by development actors into the construction of WUAs in agrarian communities. Turning to Tajikistan, the fourth section reviews recent political and economic changes that simultaneously increased the number of households reliant on kitchen gardens for adequate food access and degraded water delivery infrastructure and management capacity, such that

the crop cultivation became more tenuous. After discussing WUAs' justification as responses to the new challenges in water management, I examine the treatment of kitchen garden cultivators in legal frameworks as well as how their inclusion is presented and practiced by different actors. The fifth section draws in literature on community-based natural resource management as well as empirical data to highlight the potential consequences of formally excluding kitchen garden cultivators from WUAs, with respect to community power relations and household access to water as well as rural food security, by extension. The sixth section provides a conclusion.

2. Methods

The information presented in the fourth and fifth sections of this article is based on fieldwork conducted in Tajikistan in 2017, contextualized by my work in the country over the last decade. In 2017, I focused on how water access for kitchen gardens was presented on paper, through an analysis of national water law and in practice, through interviews with WUA officials and rural residents. Fieldwork was concentrated in the southern province of Khatlon (See Figure 1), the nation's most productive agricultural region, famous for cotton, wheat, melon, tomatoes, cucumbers and other warm weather crops. Despite this abundance, the province also features high rates of food insecurity and was selected as a target site for the U.S. Government's Feed the Future (FtF) initiative, with projects organized by the United States Agency for International Development (USAID). USAID has been the driving force behind WUA creation in Tajikistan since the 1990s, supporting the creation of 60 WUAs in the last 13 years, most recently under the FtF.

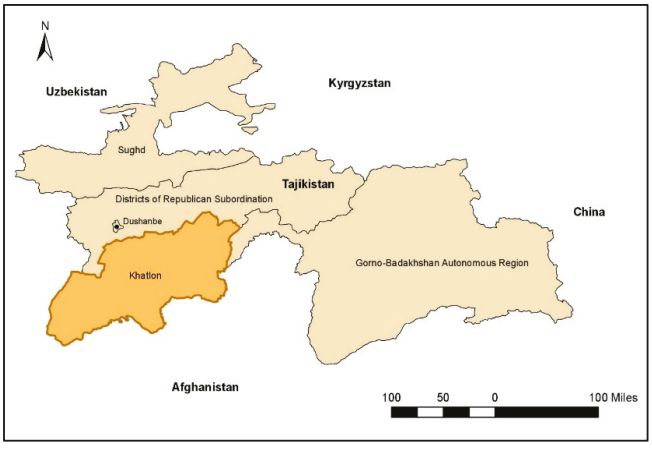

Figure 1. Provinces of Tajikistan.

There are four primary types of agricultural land in Khatlon: *kooperativi istehsoli* (agricultural cooperatives), which are similar in size (300 hectares or more) and structure to Soviet-era collective farms; *dehqon* (privately held) farms covering one or more hectares of land; *zamini presidenti* (presidential plots), parcels of land between 0.03 and 0.4 hectares that were distributed to families by presidential decree; and kitchen gardens, which are under one hectare in size (see Figure 2). Among these land types, *dehqon* farms, kitchen gardens and presidential plots are most prevalent. In this study, I focus on the relationship between kitchen gardens and WUAs, setting aside presidential plots and referencing *dehqon* plots only as a basis for comparison. Presidential plots are significantly less common than kitchen gardens and when they are held by families, are less frequently used to cultivate food that will be consumed by the household. Often far from irrigation canals or living quarters, these plots are instead sown with animal fodder that can grow with rainwater alone. As a result,

WUA impacts on kitchen gardens, as opposed to presidential plots, will have a more direct bearing on household welfare.

Figure 2. Kitchen garden in Nosiri Khusrav district, Tajikistan.

Within Khatlon, qualitative data were collected from the southwestern district of Nosiri Khusrav (see Figure 3), which is one of the 12 districts included as FtF 'Zones of Influence'. With no major industrial activity or urban centers, the population in Nosiri Khusrav is primarily dependent on agriculture for their livelihood. Groundwater (and the electricity needed to pump it) is out of reach for most families, either due to finances or geography and the cultivation of both farms and kitchen gardens is almost entirely reliant on surface-water irrigation. There are five WUAs in Nosiri Khusrav, all of which were created by USAID. With jurisdiction over hydrological territories stretching across three sub-districts, collectively, leaders of these WUAs count an estimated 6667 families within their area of service provision (see Table 1). Interviews were completed with water users in two villages within each of the five WUAs service areas, with the exception of WUA 5, in which case only one village was visited. To maintain respondent anonymity, village names and locations are not provided.

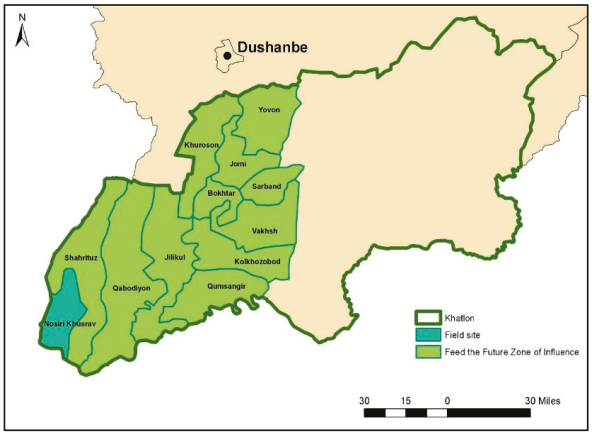

Figure 3. Districts of Khatlon Province, Tajikistan.

Table 1. Water User Association (WUA) Coverage.

					Kitchen Gardens		*Dehqon* Farms	
WUA	**Established**	**Villages**	**Households**	**Population**	**Number**	**Hectares**	**Number**	**Hectares**
1	2013	6	759	3279	759	235	198	1971
2	2014	3	756	3780 *	756	370	89	486
3	2013	4	1568	7841	1568	52	134	1132
4	2013	12	2984	11,800	2984	1008	525	1500
5	2014	5	600 *	3000 *	600 *	120	550 *	1300

This information was collected from WUA leaders. One asterisk (*) indicates that WUA staff did not know or could not access this number and so provided an estimate. Land size represents total holding rather than cultivatable land.

In total, individuals from 40 households that do not possess a *dehqon* farm and seven individuals who do possess a *dehqon* farm were interviewed. Households and farmers draw irrigation water from shared surface water canals systems; tertiary canals are flanked by *dehqon* farms, followed by a village, followed by more farms and so on. Access to and control of resources often differs along gender lines. In seeking interviewees, I did not, however, target by gender; instead, speaking with whomever was most comfortable discussing kitchen garden cultivation. In Tajikistan, as in the rest of the world, space is gendered, with the bounds of public and private space traditionally accorded to men and women, respectively. As they are located within or near household compounds, women are associated with kitchen garden cultivation and indeed they are generally more involved with the kitchen garden than other agricultural plots. Men, however, may also be actively engaged in cultivation. Rather than rigid, the division of labor on kitchen gardens and within household units more broadly, is responsive to changing socio-economic conditions, including the age and health of family members, labor migration, war and conflict, and employment opportunities. Of the 40 households interviewed, I spoke with 18 women, three from female-headed households and 22 men, all of whom were from male-headed households. Among *dehqon* farmers, two were female and all were from male-headed households. I also conducted interviews with five individuals from or affiliated with USAID, two lawyers focused on consumer rights, land and water law, three representatives from local NGOs as well as three government employees in Tajikistan.

3. Reframing the Role of Waters Users in Governance

Access to water depends not only on its presence in a locale but also the physical infrastructure and social institutions that control this presence and by extension, shape its relations of power. Far from static, these relations evolve in response to changing global and local discourses and material conditions. The section that follows focuses on the transition in mainstream understandings of the function of a resource user in the process of governance from that of a reckless consumer to a relevant collaborator and the translation of this perspective into the development of participatory management models that in application, often failed to match their rhetorical framing as inclusive. Already the subject of much scholarly analysis, I review this history in order to locate WUAs within it, focusing on how these institutions embody an understanding of water users not only as collaborators but also as farmers. With this framing, those who depend on water for other uses, including kitchen garden cultivation, are made invisible in local water governance.

3.1. Calling for User Participation

Building on calls to give "voice to the voiceless", in the 1970s non-governmental and governmental organizations alike sought to reform the "expert" oriented development practices that dominated the sector by incorporating the knowledge and skills of "target" or "beneficiary" populations [14]. Associated with an extensive list of benefits, participatory development was argued to bring about more inclusive and transparent decision-making, facilitate creative problem solving, result in project designs better suited to local conditions and promote long-term investment in project institutions [15].

The absence of local participation in the research, planning and implementation of past development activities was seen as a key reason why anticipated outcomes had not materialized and zeal for overturning the norms of established theory grew throughout the 1980s and 1990s [14–16].

Participatory development arose from a sense of frustration with ineffectual development practices and marked "a protest against the existing orthodoxy" [17] (p. 7). But within a relatively brief period, it created its own orthodoxy [2,6,9]. In the late 1990s, the development community experienced a transition from what Irene Guijt and Meera Kaul Shah call a "participation boom" to a "participation imperative" as the term came to represent good or sustainable development and was closely associated with the language of democracy building [14,17]. The movement of participatory development from a radical intervention to a "best practice" is illustrated through its adoption by increasingly powerful neoliberal institutions. In 1996, the World Bank published their first Participation Sourcebook, admitting that reliance on an "external expert stance" had been (and some would argue still is) at the heart of their programs, yet they were now committed to a "participatory stance", in which "stakeholders influence and share control over development initiatives and the decisions and resources which affect them" [18] (p. xi).

The turn towards participatory development had significant implications for natural resource management, as conventional theories held that communities' interests inherently conflicted with rational resource use. The inability of state-centric, expert-led approaches to radically improve management prompted a re-examination of communities' interaction with their environment and research from the 1960s onwards demonstrated that "users have the potential and, under some conditions, the motives and means to act collectively" and self-regulate their resource use [19] (p. 92). Scholarship on common property management reinforced calls by indigenous populations to recognize the value of local resource governance, forming a coalition of actors that advocated for the transfer of control to communities. Increasingly the target of these groups' ire, in the 1980s the World Bank, among others, began promoting the rescaling and redistribution of resource governance responsibilities, such that state control was decentralized, and users took on a greater role in service and resource delivery [20]. A key element of structural adjustment policies, these transfers were argued to be more cost efficient, as "clients became involved in the production of their own services" [21] (p. 3). This rationale signals that while community-based resource management was intended to overturn established hegemonies, it did little to disrupt the neoliberal narratives that placed faith in the power of market-based incentives and privatized control to bring about effective governance. Decentralization has been critiqued as a rhetorical façade for business-as-usual, wherein external actors maintain primary control for project design and implementation under the banner of flexible, responsive approaches driven by local populations [21]. Regardless, the practice of devolving state control to communities is now common across thematic areas of intervention [10].

In the water sector, state-driven "hydraulic missions" that centered on technical fixes and the construction of large-scale infrastructure were critiqued for undermining poverty alleviation efforts, recognized as having negatively impacted surrounding ecosystems and decreased water quality or quantity for local communities [3,4,22]. In response, development actors sought to decentralize water governance through the creation of community-based water management organizations in rural and particularly agrarian, communities. Intended to increase water access for users, these organizations were based in the belief that local knowledge and the existence of communal understanding could be leveraged to create institutions that were responsive to users' needs, able to successfully implement agreed upon actions and resolve conflict as well as sustain practices over the long term [4,11]. As Karen Bakker writes, because "water is a flow resource whose use and health are most deeply impacted at the community level, protection of ecological and public health will only occur if communities are mobilized and enabled to govern their own resources" [23] (p. 441).

In 1976, enthusiasm for participatory, decentralized water resource management was put into practice in the Philippines as the Ford Foundation worked with the National Irrigation Authority to incorporate users into governance structures [24]. The transfer of small-scale canal operation

and maintenance from government authorities to farmer associations, resulted in increased water access, equity of water supply, crop yields and household income according to follow-up studies [18]. Considered "the first and best documented nationwide program to build participation as a cornerstone of irrigation policy" [18] (p. 222), the reported success of this approach in the Philippines was quickly echoed by studies of similar state-to-farmer irrigation management transfers in Indonesia, Nepal and Sri Lanka, establishing faith in WUA creation as a replicable method by which poorly performing, centralized irrigation management systems could be reformed to strengthen rural livelihoods [25].

Specifically, WUAs were envisioned as a response to the failure of large canal projects to adequately attend to the flow of water to farmers' fields [26] (p. 79). Robert Hunt explains that in these projects, "direct bureaucratic responsibility ends at the outlet to the distributary canal . . . Between the outlet and the farmer's field is a physical and social space for which neither the farmer nor the bureaucracy takes direct responsibility" [26] (p. 79). Development agencies and policymakers sought to clarify management procedures for this in-between space by increasing farmer involvement and fostering a sense of collective responsibility through WUA creation [26]. While local water management schemes have existed for centuries, WUAs differ from more traditional grassroots groups in that they are generally initiated by development organizations in collaboration with government authorities and incorporated into legal frameworks. Describing the guiding ethos behind WUAs, Hunt writes "if the farmers would only participate . . . then the ditches would be constructed, the water would be allocated and most important of all, the maintenance would be done. Then water allocation would be optimized, food production would be maximized and the capital investment would be more efficient and effective" [26] (p. 79). As Hunt suggests, WUAs were also presented as an opportunity to cut the high-costs of centralized irrigation management, an attractive possibility for fiscally challenged governments and the international lending institutions that backed them. While irrigation was previously fully funded or subsidized by the state, with the introduction of WUAs, governments were encouraged by development actors to introduce or increase water user service fees. Collected by the WUA, these fees were expected to improve the cost efficiency of irrigation, covering operation, maintenance and repair. Confidence in this outcome was bolstered by evidence from Philippines which showed that by 1993, the cost of maintenance had decreased by 60 percent and personnel costs dropped by 44 percent [18].

In the last three decades, the popularity of WUAs as an intervention has accelerated, with rhetoric supporting WUA formation moving beyond pragmatic accounts of fiscal crises and the need to fill administrative gaps to include grander goals of improving food and livelihood security and empowering local communities—a veritable panacea for water governance and rural development alike. For example, in Sri Lanka, WUA activities were argued to have positive "flow on" effects for household income and food security [27]. Similarly, FtF publications have argued that WUAs play a central role in reducing hunger and malnutrition [28]. Going forward, academic analyses that directly respond to claims regarding the effects of these institutions on food security and rural livelihoods will be essential to understanding the politics of water governance in an era when concerns over "water wars" and "food crises" compete for attention in media headlines.

With participation framed as a form of empowerment, fostering women's engagement in water management, in particular, is promoted as a way to support "female emancipation" [5] (p. 598). Democratic decision-making has similarly become associated with WUAs, as project designs outline the election of group leaders, thematic sub-committees and meetings where all members have an equal opportunity to voice their thoughts [29]. Development actors envision that this experience with democratic procedures will then inspire civic engagement at a larger scale [27]. As the list of virtues associated with WUAs has grown, so too have the intended participants and beneficiaries, increasing from those described by Hunt, farm-level irrigators, to include agrarian households and communities more broadly. Yet, the extent to which WUAs' institutional designs reflect this shift in intention is questionable.

3.2. Designing for User Participation

In their provocatively titled book *Participation: The New Tyranny?*, Bill Cooke and Uma Kothari pose the question "do group decisions lead to participatory decisions that reinforce the positions or the interests of the powerful?" [30] (p. 7). This query has been the subject of significant scrutiny in which scholars, extending the object of study to group activities as well as decisions, have critically argued that community-based resource management projects often result in elite capture or the exclusion of certain segments of society from resource control or access, namely women and poor households [2,4,5,7,12,31]. Nicholas Hildyard and colleagues aptly reflect the tenor of these critiques when they state that "far from unsettling oppressive relations, what passes for participation frequently serves to sustain and reinforce inequitable economic, political and social structures" [8] (p. 56). This point is stressed not to disparage all participatory approaches but rather to highlight that by the 2000s academic enthusiasm for this model was tempered by growing recognition that its capacity to empower across social groups and ensure equitable resource distribution was overstated, often masking underlying inequalities provoked or exacerbated by project design and operation.

Awareness of the potential for these projects to create or reinforce inequity among "beneficiary" populations was not, however, limited to academia. Cooke and Kothari note that their "conversations with practitioners . . . were often characterized by mildly humorous cynicism, with which tales were told of participatory processes undertaken ritualistically, which had turned out to be manipulative or which had in fact harmed those who were supposed to be empowered" [30] (p. 1). Despite this recognition, the implementation and monitoring of participatory approaches has suffered from persistent inattention to communities' social dynamics as well as to the complexity of identity and livelihood strategies [5]. WUAs are no exception to this trend and while community consultations may nominally take place, association design is generally directed by development practitioners and is thus guided by perceptions of water use held by individuals external to the community in question. Across locales, scholars have observed that WUA designs are "donor induced" and implemented in a "top-down" manner [1,25,29,32].

WUA design inherently requires the formal demarcation of individuals in the community per their "relationship" with the organization, including who is and is not a member [33]. Though this process is often surprisingly opaque, over time "water user" has emerged as synonymous with an individual who cultivates their own irrigated farmland [26]. This meaning comes despite the reality that water sources are often simultaneously used for drinking, cleaning, watering animals, making bricks, milling and of course, household plot irrigation. Overlooking heterogeneity in target sites, notions of 'water user as farmer' are written into legal code and association rulings, which, dictating the practical terms of service, effectively curb the ability of WUAs to self-correct and account for diverse needs. In a comparative study of WUA legal frameworks in Colombia, India, Mexico, Nepal, the Philippines and Turkey, Salman Salman found that "most bylaws restrict membership of the WUA to the registered landowners in the hydraulic unit who are engaged on a full-time basis in farming" [34] (p. 8). A review of other scholarly publications and grey literature similarly indicate that WUA membership requirements most often limit eligibility to landowners or managers [32,35–39].

In this way, while WUAs were introduced as part of a broader movement to increase users' control over natural resources, control was in fact turned over to a *particular user*, farmers. This phenomenon is most clearly seen through membership eligibility stipulations, which are reflective of and contribute to a single-use mandate to serve farm-level irrigators, demonstrating limited consideration of the complexity of water-use landscapes in rural areas. As the livelihood strategies and resource uses of communities are in constant motion—responding to changing local and global conditions—the impacts of this false equivalency of water user and farmer require critical evaluation. It is with this in mind that I turn to Tajikistan, exploring the dual transformations in (1) rural life, as the kitchen garden became key to survival and (2) water management, as WUAs were introduced. While these are local changes, in drawing a connection between these two phenomena I seek to signal the need

globally for greater consideration of how water management institutions interact with and respond to the dynamism of hydrologic and social landscapes.

4. Rewriting Rural Water Governance in Tajikistan

In 1924, the territory of what is today Tajikistan was incorporated into the Union of Soviet Socialist Republics (USSR) after which resource governance within its borders occurred according to the logic of the central Soviet government. During this time, modes of resources governance were left relatively unaffected by global shifts in development theory, but, following the dissolution of the USSR, this changed. On 9 September 1991, Tajikistan became independent and forces directing the management of natural resources began to shift as bi-lateral and multi-lateral agencies entered the country bringing promises of a better future through participatory development and decentralized resource control. WUAs were introduced in the late 1990s, soon after the end of a violent seven-year civil war that left the country, still reeling from the abrupt collapse of the Soviet Union, with deep socio-economic challenges. To ground the introduction of WUAs spatially and temporally, the following section explores the dynamics of irrigated agriculture and water management in the run up to and after Tajikistan's independence.

4.1. Irrigated Agriculture in the Advent and Aftermath of Independence

Forming a part of the Soviet Union's southern border, the Tajik Soviet Socialist Republic saw little industrialization and was principally organized around cotton cultivation [39]. To serve this objective, the USSR embarked on its own hydraulic mission in the 1920s, investing heavily in the construction of canals and pump stations across Central Asia, with existing irrigation systems seen as "tortuous" and the people unable to "properly care for their land" [40] (p. 460). After construction, irrigation system maintenance and operation were centralized. Primary control lay with the Ministry of Irrigation and Water Management whose policies were executed through administrative branches at the provincial level [37]. Provincial officials, in turn, worked with district irrigation offices to operate and maintain primary and secondary canals [37]. Flowing through secondary canals, water was then diverted to large collectivized farms, classified as *sovkhoz* (state-run) or *kolkhoz* (collectively-run), where it was managed by an "irrigation professional" who answered to the farm leader [41]. As they sent water to these farms, they also diverted it to villages, where it traveled through *juibors* (smaller scale earthen or cement canals) to kitchen gardens. Kitchen gardens have been grown in the area that is today Tajikistan for well over the last two centuries and their status as individual property was preserved during the Soviet period [42]. Ubiquitous among households in Nosiri Khusrav, respondents shared an understanding that kitchen garden cultivation during the Soviet Union was largely optional, rather than a necessity, as food prices were low, wages sufficient and shelves in stores were stocked with goods.

Reliance on kitchen gardens for food increased during the latter half of the Soviet period and into independence, as agricultural wages in Central Asia fell from 70 percent above the USSR average in 1958 to below the average by the end of the 1980s, and alternative income earning opportunities became scare [43]. After independence, a civil war ran from 1992 to 1997, plunging the economy into further turmoil. These changes went hand in hand with reduced access to food in markets, as prices rose, and the availability of some goods dropped. William Rowe, citing the World Food Program, writes that by 2000, 88% of people in Tajikistan had changed their diet, eating less diverse foods and fewer total calories [42]. The consumption of basic staples similarly fell, including meat, cooking oil, milk and potatoes, with only wheat consumption increasing as bread replaced more expensive foodstuffs [42]. One respondent from Nosiri Khusrav lamented that "Before, when we worked on the *kolkhoz*, we got a salary and it would sustain us from month to month. At that time one person could provide for a family of ten people but now ten people cannot even provide for one person."

While more households were turning to their kitchen garden plots to provide regular access to fruits and vegetables, cultivation simultaneously became more difficult as access to water declined

throughout the 1990s and into the 2000s. This was, in part, a result of budget shortfalls. From 1991 to 2002, funding for irrigation systems dropped from USD 72 million to just USD 6.5 million and only five to six percent of all needed investments in infrastructure repair and maintenance were made [37,44]. Violent conflict contributed to the neglect of irrigation systems and the loss of equipment needed for infrastructure repairs, with excavators and pumps sold-off or privatized during the upheaval. In Nosiri Khusrav, insufficient maintenance left canals filled with weeds, mud and stagnant water, increasing soil salinity in some areas. With good soil and sufficient water, kitchen gardens may be cultivated up to three times a year in this region. But under present conditions, many households can only crop once. A *raisi mahalla* (village leader) explained, "here my dear, we cultivate things with a lot of hope and prayer."

In the 1990s, the country's 354 *kolkhoz* farms and 348 *sovkhoz* farms were closed and land was redistributed to form over 10,000 *dehqon* farms (privatized farms) [45]. While these new farms have opened up new economic opportunities, they are held by a minority of rural households. A 2016 survey found that just 14 percent of households in Khatlon possessed a *dehqon* farm, yet 99 percent had a kitchen garden [46]. Kitchen garden cultivation is an important coping strategy for rural families in the wake of high food prices and low wages, yet the potential for these plots to continue to support household access to nutritious food is threatened by the condition of post-independence water delivery. This was highlighted by an elderly respondent in Nosiri Khusrav, who, standing in her kitchen garden of just under a hectare explained,

> "Now it is really difficult for our family. If there were any benefit from our garden, I would say that [this plot could support us] but there is no water [flowing to the house]. I try to irrigate using a pump [in my yard] but it does not have much power, so it doesn't work well. Instead, I fill a large bucket with water and pour it into this apparatus," she said, pointing to a small backpack pesticide sprayer. "I spray the water by hand. People who work the land, their hearts burn when their plants do not receive water. What else can I do? I have to act to make sure the crops do not dry up."

We walked through her garden, stepping over unripe tomatoes that had dropped off the shriveled vines.

> "Look here, everything has dried up. I could only salvage a little harvest . . . When there is no food a person feels the weight of her family on her shoulders. If we had everything, I would not have grown old so fast. Look how old I have become because of the shortages we face. I am always thinking; how will we make food? We don't have potatoes, we don't have tomatoes . . . "

Gesturing at her daughter-in-law holding a baby in the doorway, her voice choked up,

> "Look my grandson is crying, he has no clothes! If there was water I would sell [these crops] and we would have new clothes. My clothes and worn are threadbare. I am ashamed to wear them anymore. Just now I put this old party dress on when you came through the gate. If you don't believe me, I will show you."

Her situation is extreme but also far from unique. Above all, households in Norisi Khusrav reported that their water access is irregular. The availability of water early in the season allows households to sow seeds but as in the case above, later in growth cycle the intervals between water deliveries are often too great for the young plants to bare. A young man from another village recounted that until four years ago his family was able to successfully grow onions and potatoes for sale as well as other vegetables for their own consumption on their 0.10-hectare kitchen garden. "But now," he said "we can't. We get water for three or four days in a row, then our access is cut for nine or ten days." With summer temperature hovering around 110 °F, none of his crops can survive long without water.

Seeming to wilt himself as he looked at his dried-up garden, Firuz explained that before they only went to the market for oil and rice, the rest of their food needs satisfied by their small plot. But now, his brother has migrated abroad in search of paying work to keep up with their bills at the local grocer.

4.2. WUAs as an Intervention in "Chaos"

In 1999, the World Bank authorized a loan of USD 6.5 million to rehabilitate irrigation infrastructure and create nine WUAs in Tajikistan, the first such associations to be organized in the country [47]. Following this precedent, other development agencies, including the Swiss Development Corporation, the Deutsche Gesellschaft für Internationale Zusammenarbeit, the Asian Development Bank, Helvetas International and USAID followed suit, creating more than 400 WUAs in less than two decades. In line with the impetus for community-based water management creation globally, these WUAs were envisioned as a means to (1) fill an administrative gap, (2) improve cost efficiency and (3) facilitate more responsive services by leveraging local knowledge and participation.

4.2.1. Administrative Fix

Land reform and the creation of thousands of new farms caused profound challenges for water delivery as the division of administrative duties did not undergo reconfiguration [37,48]. Changing little from the Soviet model, water governance occurred hierarchically after independence. Policy directives passed down from the Ministry to regional and then district offices, who were also responsible for managing primary and secondary canal systems. During the Soviet period, water would at this point be directed to tertiary canals and distributed to the *kolkhoz* or *sovkhoz* and villages by the farm's irrigation specialist. But with the breakup of collective farms, this position was eliminated, leaving *dehqon* farms and kitchen gardens without a clear service provider. Composed of water users jointly responsibility for infrastructure maintenance and operation, WUAs were intended to fill this "institutional vacuum" and ensure that water delivery is timely, adequate and equitable [41] (p. 238).

4.2.2. Cost Efficiency

Under the Soviet Union payment for irrigation water was resolved by collective farm leaders in cooperation with state authorities, meaning costs were not borne (directly) by households. But with the dissolution of collective farms and the creation of *dehqon* farms, payment practices required change. In 1996, a tariff on water supply was introduced, yet this failed to alleviate budget shortfalls [44]. Since this time, the cost of water services for users have increased by at least threefold; however, USAID asserts that the rate is still too low to fully fund the operation and maintenance of irrigation systems—a commitment Tajikistan made to the World Bank [49]. Irrigation authorities face difficulty collecting the fees from users, aggravating financial woes. The reported ability of WUAs in other contexts to act as cost efficient partners that can facilitate fee collection was a key rationale for the World Bank in introducing the institutions to Tajikistan [50].

4.2.3. Participation and Coordination

A central element of the World Bank's participatory approach to agricultural development in Tajikistan, WUA introduction is linked with fostering local engagement and its myriad benefits. A USAID implementing partner wrote that associations have "fostered community participation" and "serve as the face of the community to district government officials regarding water management issues" [51]. In connection, "good governance" is inspired and "community development" supported, as "water users working together along irrigation canals build and share critical knowledge on water-borne diseases, food preservation and children's nutrition [and] the associations also provide opportunities for women's participation and leadership" [52,53]. Theoretically translating to better water access and more robust harvests, WUA creation is also presented as an intervention in Tajikistan's persistent challenges with hunger and malnutrition, as indicated by its inclusion under the FtF program.

4.3. Household Incorporation

Jenniver Sehring argues that most donors design WUAs in Tajikistan in a top-down process with "a rather unreflected, idealized notion of the 'village community'" [37] (p. 35). This is apparent in so far as WUA legal frameworks fail to account for the diversity of rural water users, advancing farmers as *the* water user. Of principle concern, is the deliniation of who WUAs should serve as laid out in the 2006 Law of the Republic of Tajikistan on WUAs. Section 2, Chapter 7, Article 43 of this law explains that WUAs "are created with the purpose to . . . ensure fair, effective and timely distribution of water to *dehqon* farms" [54]. Suggesting that kitchen gardens were not considered during drafting, there is no mention of them in this clause or the law in its entirety. The absence of any reference to kitchen gardens would appear to leave WUAs' responsibility with regard to incorporating their cultivators as members open to interpretation. But local lawyers concluded that strictly speaking, this law prohibits households that only possess kitchen gardens from membership in the associations and denies them the right to request water for these plots from the WUA. As such, households that do not possess *dehqon* farmland—most rural households in Tajikistan—are afforded no formal voice in water management decision-making processes. Legal rulings, however, also exist outside of their physical manifestation as information that is processed, presented and put into practice by different actors.

4.3.1. Government

A lower-level government employee who coordinates WUA requests for water, confirmed that to her knowledge only farm managers can be association members but this understanding was not universal. Two higher level officials from agencies that work with WUAs, expressed confidence that the law allows households who only possess kitchen gardens to join associations as full members. One went on, however, to suggest that while they *can* be members, they *should not* be members as technically kitchen gardens should irrigate their plots with piped drinking water, not the water that flows through canals to *dehqon* farms. Yet, lacking adequate infrastructure for water delivery, piped drinking water does not generally flow to rural households and is more frequently provided through a spigot in a central village location, if provided at all. Recognizing the practical challenges in accessing drinking water, he went on to acknowledge that in practice, more than 90 percent of households rely on the flow of water down canals to irrigate their kitchen gardens. His statement on water sourcing, in combination with the discord among officials' regarding the law, further indicates that the question of kitchen gardens' legal access to adequate water has not been a priority.

4.3.2. USAID

An agricultural extension specialist for the USAID Tajikistan Agriculture and Water Activity (TAWA), articulated that the legal framework is not the only barrier to ensuring that WUAs effectively meet the irrigation needs of kitchen gardens. He explains, "when a representative of the association comes and asks a household to pay water service fees for their kitchen garden it is just 10 Tajikistani Somoni (TJS) or 20 TJS but for a *dehqon* farm, they must pay 2000 TJS or 20,000 TJS" because the service fee is determined by land size. His comments highlight that in comparison to households, WUAs have more financial incentive to ensure that *dehqon* farmers receive adequate water. *Dehqon* farmers who sign agreements with the WUA also pay membership fees, which as non-members, are not paid by households. A water specialist for TAWA reinforced this narrative but clarified that if the project timeline is extended, he hopes to support the formal incorporation of households into WUAs. Doing so, he believes, would have the dual benefit of providing the associations with more financial support and allowing households to formally call on WUA assistance for dispute resolution or infrastructure repair.

While project staff may influence implementation, they are acting within a framework established by USAID. An agricultural specialist for USAID Tajikistan indicated that in his tenure there had been little if any discussion of household irrigation needs at the agency and a presumption that *dehqon* farmers are the most important, if not the only, "water user" to be considered with regard to WUAs.

This understanding is reflected in how USAID organizes its agricultural initiatives as under TAWA and preceding projects, the "water component" is separated from the "kitchen garden component." In a conversation with Doug Vermillion, an independent consultant who worked with USAID to design a water sector support strategy for Tajikistan, he lamented the agency's tendency to "fixate" on farmers and view the amount water used by kitchen gardens as inconsequential. But he argues that using the volume of water required as a measure of importance is misguided, for while kitchen gardens use a relatively small amount of water, its availability is directly tied to household wellbeing. An extension officer for TAWA similarly argued that the significance of kitchen gardens, not only for households but the economy in general, is often underestimated. Over the last decade, remittances have made up between half and one-third of Tajikistan's gross domestic product but he estimates that if the monetary value of kitchen garden cultivation was calculated it would exceed this amount.

> "Why? Because kitchen gardens [if they are adequately irrigated and provide a good harvest] save households so much money . . . They can get everything that is necessary for life by cultivating their land. They can buy food if they want but the amount of money sent by household labor migrants is generally not enough to buy quantities of produce that match those harvested from kitchen gardens."

4.3.3. WUA Leadership

Four out of five WUA leaders, felt that, in principle, they could legally incorporate kitchen garden irrigators as members. However, in practice, only one had taken steps to do so, signing agreements with households who have plots over 0.5 hectares in size (a move which, according to legal interpretations above, seems in conflict with the law). WUA leaders expressed that while they would like to incorporate households as members, they doubted their organizational capacity to do so. One chairman explained, "for example, we know that this guy, who has 0.4-hectares of kitchen garden land and he has problems getting water, sometimes he has water, sometimes he doesn't have water. But if he had a membership contract, we would know exactly when we should provide him with water according to exactly what hour." But he said to sign contracts and collect membership fees from the more than 1500 households in his territory is beyond the ability of the WUAs' three staff as they are already struggling to work effectively with *dehqon* farms. Several WUA chairmen noted that when their organizations were first established, they were told to only work with *dehqon* farmers, a directive that now seems shortsighted as other users, kitchen garden cultivators key among them, also draw water from the canals they are tasked with managing.

4.3.4. Households

Household responses as to whether or not they were a member of a WUA varied, though most said they did not *think* they were. I emphasize *think* as there was considerable uncertainty among households in answering this question, with many unsure as to what the WUA was or what constituted membership. Regardless of membership status, most households felt WUAs functioned primarily to serve *dehqon* farms, not kitchen gardens. One *raisi mahalla* said that although he only has a kitchen garden, he did sign a membership contract with the WUA. But now he wants out, saying, "at first I did not understand what the WUA was. Now I understand that there is no benefit for us." Another *raisi mahalla* located within a different associations' territory noted with frustration that "the WUA should pay more attention to the villagers. There are only five to six *dehqon* farms but there are more than 600 households (in his village). Now there are more conflicts. They give them [*dehqon* farmers] water first, before the households, so then they don't give us much water." As suggested by this *raisi mahalla*, an understanding of *dehqon* farmers as primary water users—a notion advanced through legal doctrine and reinforced by the inaction of government and development agencies—has material consequences. These consequences will be explored in the following section.

5. Undermining the Initiative: Consequences of Household Exclusion from WUAs

Globally, scholars have documented that limitations on the ability of certain resource users to inform and participate in the activities of community-based management organizations have produced or aggravated uneven access to needed natural resources and in connection reinforced social and economic inequality. In Tajikistan, the full effects of household exclusion from WUAs are yet unclear, as all the WUAs in Nosiri Khusrav were constructed within the last six years and thus few have brought about dramatic changes in their service territories. However, this does not preclude the possibility that these organizations may bring hardship and division in the future. Households already face water shortages, the reasons for which are diverse but rather than ameliorate these challenges, I argue in this final section that a failure to include all resource users in WUAs can further reduce household access to irrigation, as they are denied an opportunity to formally engage in decision-making processes and deepen community division. Such outcomes, if they come to pass, are antithetical to the objectives of WUA creation—undermining the notion that rural water management will be transformed to increase the equitable supply of water, the size of harvests and food availability.

5.1. Coming Together and Creating Division

Fundamentally, the creation of formalized divisions within a resource user community along the lines of organizational membership sets the stage for dispossession, as the claims of one group, "members," to the resource are valorized over other that of another group, "non-members." As discussed earlier, within a WUA service area, this division is generally determined by a requirement that members be farm managers. Viewing this membership stipulation in connection with Edella Schlager and Elinor Ostrom's five categories of natural resource rights—access, withdrawal, management, exclusion and alienation—brings its consequences into sharper focus [55]. Even if their access water is initially preserved, as non-members, households without farmland are vulnerable to the loss of future access because they lack a formal right to (1) exclusion or the ability to dictate who can access the resource, (2) alienation or the ability to sell or lease access rights and (3) management, which includes the ability to define patterns of withdrawal and [55] (p. 10). As kitchen gardens tend to feature greater crop diversity than farm plots, the inability of their cultivators to formally articulate and protect their needs during the scheduling of water withdrawals elevates concerns that water will not be received at the right time or in the right quantity.

Empirically affirming this dynamic, Leila Harris writes that when water user groups were formed in southeastern Turkey, water delivery was scheduled to align with the needs of members—farmers, who primarily grew cotton [56]. Meanwhile the irrigation requirements of household vegetable plots went unaccounted for as the women who tended these plots were non-members [56]. In this way, group design threatened households' food security. But, Harris notes, "it is not only that women are excluded from user group activities but that women, the landless and other segments of the population are codified as 'different' or more or less 'appropriate' as farmers with respect to ongoing negotiations of water user groups" [56] (p. 95). Restricting membership to farmers legitimates and advances an understanding that their water use and in connection, their cultivation, is of principle importance in the community. This practice fortifies notions that "productive" water uses, being those that generate income, such as commercial agriculture and industry, take precedence over "domestic" uses of water, conceived of as household consumption, cleaning, food preparation and hygiene but may also include kitchen gardening [57].

"Domestic" uses of water are traditionally carried out by women. As such, when the design of a water management organization, like a WUA, favors or focuses exclusively on "productive" uses of water, women's claims to water are repudiated and the value of their labor in the domestic sphere denigrated relative to that of men engaged in farm-level cultivation. Moreover, conceptions of irrigation management as a masculine activity are reinforced, obscuring women's role in this process. Analyzing WUA design goes some way in supporting Margreet Zwarteveen's call to move beyond the identification of inclusion or exclusion and "to explain the 'absence' or 'invisibility' of women from

irrigation and politics" by considering the ways in which diverse, culturally and historically specific structures often lead to a connotation and configuration of irrigation as male-dominated [58] (p. 127).

While the exclusion of kitchen garden cultivators from WUAs does have gendered implications, at its most basic level, those who are ineligible for membership are *households without farmland*. When a household does not possess farmland, male family members frequently assist or act as the primary cultivator of garden plots, meaning, membership restrictions can divide a community not only along the lines of gender but also land tenure. While acknowledging the importance of gender relations, Andrea Cornwall warns that an examination of this area alone may generate essentializing, simplistic conclusions of "woman-as-victim" and "man-as-problem" [6] (p. 1326). Harris signals the importance of attending to both gender and land tenure in her analysis of water user groups in Turkey [56]. As members were required to have a land holding of four or more hectares and few women have land titles, they were underrepresented in user groups [56]. Group members were thus overwhelmingly men; but also *landed* and therein elite, relatively speaking. With high rates of landlessness in the area, Harris estimates that "70 percent of the adult population is barred from meaningful participation" in the group, despite their dependence on water it manages [56] (p. 192). A policy whereby only farm managers can become members reinforces their elite status in the community, leaving households that only possess a kitchen garden marginalized with regard to access to water and importantly, information.

If a significant portion of the community is precluded from formally engaging in organization activities, access to information becomes uneven, as those with farmland are, in theory, provided exclusive opportunities to learn about the technical and administrative procedures governing irrigation via their membership. In addition to disadvantaging non-members, an uneven distribution of information can threaten WUAs' ability to function effectively, as they require users' respect of agreed-upon practices for water withdrawal, fee payment and maintenance regardless of membership. Goldin highlights how inequity in information can subvert trust—the foundation of community-based natural resource management [59]. She writes:

> Knowledge is a pillar for participation and poor people are unable to take control over their environment and to participate in decisions to improve the quality of their lives without knowledge about the resources on which they depend. The absence of knowledge, the unequal power relationships between water users and the inhibition of agency, frustrate the process of participation because the production of trust is inhibited and feelings of shame, that aggravate issues of social exclusion and negate social agency, are activated. [59] (p. 197)

Goldin recounts how one water user she spoke with in South Africa was unfamiliar with the terminology used in a group discussion but because he was paralyzed by the fear of shame or ridicule, he remained silent and was unable to substantively engage [59]. The connection between unequal access to information, shame and silence operates in a "vicious cycle" [59] (p. 204), that extends beyond the sphere of the organization and resource use to strengthen the hold of elite groups on information and perpetuate the exclusion of poor or marginalized populations in society more broadly. Quoted by Goldin, the water user explained,

> "shame is about being hungry. I know shame, when I am inside the committee I will just say yes until I learn and they will not know how poor or ignorant I am. It is a terrible thing when you feel hollow inside. Hunger can make you feel this and not knowing anything can make you feel this." [59] (p. 208)

His quote highlights the irony that an organization established to increase water access and crop yields can in fact produce hunger—both physically, as seen in the proceeding section when access to water is curtailed and intellectually, when access to information is unevenly distributed.

5.2. "Water for [the] Life [of the Farmer]"

In 2005, Tajikistan's government launched the International Decade "Water for Life" in collaboration with the United Nations to attract support for water governance reform globally and within their own borders. While it was intended to embody the ethos of national water development, when the phrase "water for life" is viewed in the context of WUA membership policies, it begs a correction. For households living within the jurisdiction of a WUA, the phrase would more accurately read "water for the life of farmers"—in both a literal and rhetorical sense. Currently, the exclusionary nature of WUA membership does not appear to be the locus of significant challenges in water access for households. However, I question the extent to which this outcome is temporary and subject to change as both the intensity of WUA involvement in water management and overall climatic aridity increases with time. Households already express a sense that farm plots and the individuals who possess them, are treated as superior with regard to water access, a trend that WUA membership policies are only likely to exacerbate.

5.2.1. "They Do Not Give Any Water to the Village"

The control of water management organizations by commercial farmers often means irrigation schedules are designed for cash crops—patterns of water delivery that are unlikely to satisfy the needs of the diverse crop cultivation that characterizes kitchen garden agriculture. In Nosiri Khusrav, respondents argued that this has already come to pass, as the irrigation of cotton and rice is privileged to the detriment of kitchen garden cultivation. As WUAs become more established in the district, this is unlikely to change.

In Tajikistan, the irrigation season is set to begin around mid-March for both households and *dehqon* farms. From this point, water is expected to flow through canals until November, after which they are closed again for winter. While frigid temperatures preclude most large-scale cultivation, household need for water to cultivate winter crops continues. No water in canals from November to March brings further stress in villages without piped drinking water, as it means households lack water for drinking, cleaning and their animals. Most respondents reported adequate water access for their kitchen garden and household needs in early spring and late fall but that between these two periods challenges abounded. Households consistently described shortages during May, June, July, August and into September, months crucial for crop growth and when temperatures are at their peak. While the specific causes of water shortages in different vary and may have a great deal to do with the condition of infrastructure, because of the seasonality of their reduced water access, many respondents attributed this phenomenon to the water use practices of those with whom they share the canal—*dehqon* farms.

As noted before, *dehqon* farms in Nosiri Khusrav principally grow cotton. Planted in March, the most critical period for irrigating cotton falls between May and August. Summer "is really tough for us . . . because the cotton is flowering. If we don't give them water on time, they fall off and the whole harvest will just fall away," a farmer explained. When asked if households ever ask him, as a *dehqon* farmer, to release water to the village during this period, he replied

> "Yes, this has happened a lot . . . After talking with them [the WUA] . . . we say alright, one week, one time it is necessary for us to give water to the community . . . In the night, poor people [villagers], we give them water . . . but just two or three people use up the water and the rest just have to stay [without]. They fight and mobilize to try get water. I think we don't give them enough . . . The poor households, those people with kitchen gardens, it is really difficult for them. But giving water to *dehqon* farms is ultimately more important because we have to irrigate a lot of hectares of land and we sign contracts and give cotton and other products."

An understanding that during the summer, irrigation water is used first and foremost for farm-level cultivation was echoed by households throughout Nosiri Khusrav. "The *deqhon* farmers take water and they do not give water to the village," one woman said, "the people [in the village]

pay the tax [water service fee] but we don't have [enough] water . . . when our crops dry up, we have to buy food. Sometimes we work in Russia to earn money, no one works for the government or gets a salary. We do work for the *dehqon* farmers but we just get cotton stalks [to burn as fuel] and for picking cotton we get just 0.4 TJS per kilo (approximately 0.05 USD)." Her neighbor confirmed this practice, expressing similar frustration that households contribute both monetarily and in labor to the upkeep of the irrigation system yet see less benefit. "The people do not have as much rights as them," she explained, "during the day, four *dehqon* farmers [from her village] take the water, they don't give us any. Then when it's time to clean the *joibor*, only one person from the *dehqon* farm comes. But the villagers, they all come." Exasperated with inequity in water division, another woman bemoaned that, "farms and households should have an equal right to water. They all have to survive." As *dehqon* farm managers are currently the only rural residents eligible for membership in WUAs, a hierarchy of water use that favors farm-level cotton cultivation over household cultivation is unlikely to change. Rather, as WUAs become more active and gain better technical control of the process of water delivery through the repair of canal systems and water gates, the position of kitchen garden irrigation as of secondary consideration is likely to become ingrained in association practice, translating to inferior water access.

Differentiated temporally throughout the year, farm and household access to water also differs across the span of 24 h. Throughout Nosiri Khusrav, water is usually provided to farms during the day, then in theory, is sent down village canals at night. One woman relayed that, "until six o'clock the *dehqons* take water and after six o'clock the people [receive water] but how can women go out at six in the evening and get water?" With male out-migration pervasive in rural areas and an overall feminization of agriculture in Tajikistan, gendered barriers to water access warrant significant consideration [60]. The chairman of the WUA that covers her village said that the timing of water distribution does not present any difficulties for households. "We watch over them and if their husbands are not there we give them water in the daytime. If they are a laborer we also give it to them in the day, if they are a boss with workers we give it to them in the night," he explained. The logistical potential of such distribution aside, a farmer in his territory I met later in the day noted that he had been up all night irrigating his plot, as he preferred to distribute water when it was cooler to minimize evaporation. This leaves doubt as to whether households' access to water is protected even during their allotted time.

5.2.2. "The Voices of the Household Mean Nothing"

"In the Soviet Union, there was one *rais* (leader), now they are everywhere!" explained one woman with a laugh. Her statement references the shift that occurred with land reform, as the area surrounding her village transitioned from being managed by one man, the head of a large collective farm, to being managed by hundreds of *dehqon* farmers. Farm leaders, particularly those cultivating cotton, commanded respect during the Soviet period and reverence for the position has carried on post-independence. Yet, as the position has changed from being held by one individual across many villages to being held by many individuals within each village, ingrained notions of farm leaders' privileged social status have created challenges for water management. An employee of the Land Reclamation and Irrigation Authority explained that she often struggles to work with *dehqon* farmers because they see themselves as exceptional and not bound by irrigation policies established. She tells all her employees not to call them *rais* but instead use the polite term for older brother (*aka*) or older sister (*apa*) so they can begin discussions on more equal footing. Affirming the rationale behind this practice, the engineer of one WUA explained that a belief in the primacy of *dehqon* farmers over other cultivators and community members has manifest in a social hierarchy.

> "People do not know enough. In their minds *dehqon* farmers are above everyone. People don't know the law, if they did, they would see that whatever the difference between *dehqon* farms and kitchen gardens, they have the same rights" . . . ."There is no law that says *dehqon* farmers have a higher status. They should have the same position [as kitchen gardens]. [But]

> the *dehqon* farmers think this way and the households with kitchen gardens also think this way, that they are lower and the *dehqon* farmers are higher."

His claim is evidenced by households' perceptions of local power relations, as almost all the villagers I spoke with felt that the voices of *dehqon* farmers receive greater respect. "Here," one woman explained, "the voices of the household mean nothing. They [*dehqon* farmers] grow cotton and watermelons. They are rich, so their rights are given more importance than ours." The role of wealth, be it in the form of cash or land, in informing the social status of *dehqon* farmers and in relation, households, was frequently referenced by interviewees. For example, another woman commented,

> "you can't say anything about it [inequity of water access]. Right now, is the era of the wealthy, if you have money, you can speak . . . .We came here because we have five children and there was not enough room in the house of my husband's parents. But here, there is no water, no school, no doctor, no one asks after your condition, no one asks how you are doing. Here, there is just the flies that bite at our faces."

As discussed earlier in regard to water access, many households rejected the notion that the secondary concern given their plots by water management officials was natural or inherent. Challenging what he feels is the dominant approach to assigning the two plots value, a male householder stated,

> "*dehqon* farms have a higher position in our area but kitchen gardens should be higher, because on these ten *sotiq* [one *sotiq* is equal to 0.01 hectares] you can grow everything. On the *dehqon* farms it is just onions and cotton. On the kitchen garden everything is grown, vegetables, fruit trees—these are essential to life."

Acknowledging the uneven power dynamics at work, one WUA staff explained that "I provide kitchen gardens with irrigation assistance first, because *dehqon* farms have money, they have other opportunities. They can easily access water themselves. I give water to the kitchen gardens first but in general, the claims of *dehqon* farms receive priority." While individuals like him may choose to actively counter the privilege afforded to *dehqon* farmers, because WUAs formally divide the community into members and non-members based on the possession of farmland, as a whole, these institutions discursively reaffirm farmers' prestige.

Due to a perceived connection between women and kitchen garden cultivation, by only extending membership to *dehqon* farms, WUAs also inadvertently signal that women's work in kitchen gardens is of less significance, reinforcing patriarchal gender norms. In response to widespread male outmigration, women are also taking on significant responsibility for farm plot irrigation. While most women described farm-level irrigation as a burden rather than an opportunity because of the physical toll and time it extracts, they nevertheless saw their ability to work in this area as a necessity. However, historically a male-dominated activity, many women felt they lacked vital technical knowledge of water system operations and administration. As just over 13 percent of *dehqon* farm managers are women and thus may formally participate in the WUA, the vast majority of rural women are left without the opportunity to formally join in the shared learning and networking that is thought to follow from active engagement with community-based institutions [13]. In effect, knowledge of the irrigation system and by extension, the ability to change when and where water flows thus becomes concentrated in an elite, male segment of the rural communities, reinforcing a social hierarchy that marginalizes poor households and women's control of natural resources. This outcome is diametrically opposed to the inclusive decision-making that WUAs were intended to advance.

6. Conclusions

Donors have committed to funding 91 percent of the budget for the Water Sector Reforms Program of the Republic of Tajikistan for 2016–2025, a figure which affords them significant sway over the

way it unfolds [61]. WUAs, as one component of this program, are rewriting the management of water at the local level. Presumed to bring about an increase in water access, crop yields and food availability through activities that are grounded in the self-expressed needs of community members, I question the likelihood of this outcome. Highlighted by scholars globally, the way that the community is understood by development organizations is often problematic, tending towards a vision of a socially and economically homogenous group. Informing project design, this blurry image of rural life neglects underlying divergence in resource use and livelihood strategies, resulting in exclusionary outcomes that contradict the initiatives' inclusive intentions. As non-members, households that only possess kitchen gardens are quite literally without a "seat at the table" when decisions are made by the WUA. This leaves their ability to formally access water and attendant chance of a successful harvest, tenuous and dependent on appeals to farmers within their community. The logical basis for community-based natural resource management may suggest that this is not a significant concern, as mutual understanding and shared interests within the community will assure that resource distribution satisfies the needs of all users. This article challenges this notion, highlighting how stratification within a community can inform the distribution of power within an organization, with significant bearing on an individual's ability to access and use water as required by their livelihood strategies.

Control of local irrigation systems has been vested in *dehqon* farmers via their exclusive ability to become members of the WUA. As such, association practices, including the scheduling of water delivery, are likely to become more closely attuned to the needs of farm plots and specific crops like cotton. The water requirements of kitchen gardens differ considerably from those of *dehqon* farms, meaning the emergence or aggravation of challenges in accessing adequate water for households is probable. Yet the ability of households to rely on WUA support in coping with these shortages is similarly deterred by their status as non-members. In this way, WUAs have the potential to widen cleavages in society, as individuals with farmland gain increased command of community affairs, while those without farmland are subject to increased marginalization. Instead of subverting the existing social order to increase the equity of water delivery and accessibility and support the cultivation of food crops among food insecure households, WUAs then reinforce a social order that favors elite male farmers and valorizes the cultivation of commodities like cotton, rather than valuing the potential of kitchen gardens to feed communities.

Ruth Meinzen-Dick writes that in the search for panaceas in water governance, policy narratives, even those based on research,

> "promote a particular institutional approach has too often ignored the evidence on shortcomings of the proposed approach and the conditions under which that type of institution is likely to function poorly or well. Donor agencies and policy makers are attracted to the simplicity of an apparently successful model that offers a recipe for application elsewhere. Something that may have functioned well in one part of the Philippines, Mexico or Chile is promoted in sweeping reforms applied to large areas that have very different resource systems, governance systems, resource units and users." [25] (p. 15204)

To this list, I would add very different "strategies for ensuring adequate food and nutrition." Taking seriously the ways that households access food, must be an essential part of analyses of water governance structures and the policy prescriptions that lead from them, lest reduced food security become a "shortcoming" of future interventions in irrigation management.

While WUAs are based in a development ideal that has been the subject of decades of critique, they nevertheless remain a popular intervention among bi-lateral and multi-lateral agencies. Tajikistan is not the only and not likely the last country that will see these associations presented as an opportunity to overcome costly and ineffectual state-centric water governance, rural water shortages, poor harvests or a lack of civil engagement. This reality demands continued engagement with past scholarship, refining and advancing these arguments to excavate the way that current interventions produce

inequality in decision-making and resources access. Analyses should not, however, end here but follow through to the consequences of such inequality, particularly with regard to food security, bridging literatures to develop a fuller understanding of how changes in the politics of water governance reverberate in all aspects of community life.

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Abbreviations

FtF	Feed the Future, U.S. Government's global hunger and food security initiative
TAWA	USAID Tajikistan Agriculture and Water Activity
TJS	Tajikistani Somoni, national currency
USAID	United States Agency for International Development
USSR	United Soviet Socialist Republics
WUA	Water User Association

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Article

The Flexible Governance of Water in Cairo's Informal Areas

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Abstract: This article explores the relationship between informality and water infrastructure in informal areas in Egypt. I apply three concepts drawn from the wider literatures on state power and governance: Topological power, flexible governing, and the "statization" of urban space. I find that infrastructure has functioned as one of the main instruments through which the state is produced or "effected" in the daily lives of residents. Due to this, examining the governance of water infrastructure in informal areas exposes the Egyptian state's "flexibility" and the uneven nature of its power. I argue that this flexibility is a result of the ad hoc nature of power in governance and the uneven quality of the state's authority and reach. This flexibility creates a waterscape constituted by overlapping infrastructures, practices, and actors, making traditional binaries such as public–private and formal–informal meaningless. However, I find that in Egypt's post-Arab-Spring era, the state has been seeking ways to effect its presence more strongly within informal areas, and one of the ways in which it has been doing so is by incorporating "informal" users into the "formal" public water supply and allowing/forcing them to pay for water. I argue that this accommodation of informality is a way to increase the statization of informal areas, while also charging them for water usage. In this way, I find that the state's flexibility allows it to benefit from informality without having to actually "formalise" the neighbourhoods themselves or address the underlying causes of why they are labelled as informal.

Keywords: water; infrastructure; informality; Cairo; Egypt; power; governance

1. Introduction

> "We (the GCWWC) are in charge of everything related to drinking water in Cairo. Nobody can get water without going through us first. As for those in the ashwa'eyat who steal water, they have only two options: either payment or incarceration". (Interview, Greater Cairo Water and Wastewater Company—GCWWC official, 2014)

> "A few years ago some of us tried approaching the water company but they would just say insha'allah (English: God willing) and not do anything. So we figured out other ways to get water. It was only after the Caritas organisation got involved that the water company actually began connecting us". (Interview, Haggana male resident, 2014)

The above two quotations describe two very different perspectives on water provision in Cairo, Egypt. The first is from a department head within the Greater Cairo Water and Wastewater Company (GCWWC), and the second is from a resident of Ezbet El-Haggana, an area in Cairo designated by the state as "unplanned". The term "unplanned" is used in Egypt's legal code to refer to neighbourhoods that were not planned by the state. A sub-category of unplanned areas is "unsafe areas", which refers to small percentage of unplanned areas that pose health or safety risks to their residents. When the water company official made these comments to me, he also explained that although the GCWWC is

a company, it is still a state institution and thus has the authority and means to retrieve the money owed to it by the "thieves in the ashwa'eyat" ("ashwa'eyat" is the colloquial term used in Egypt to refer to informal areas). The second quotation illustrates the reality of water provision on the ground: That although the GCWWC is the main provider of water, it is only after residents mobilised local organisations that the water company took action. The quotations contrast the image of state institutions that believe (or wish to portray) that they are in control of urban planning and governance, against the reality of the day-to-day governing of urban affairs, which is much more ad hoc and uneven.

In this article, I inquire about what the Egyptian state has achieved in terms of governing water infrastructure in informal areas. Many analyses of water provision in Egypt take a more "top-down" perspective, focusing on the different aspects of water governance. Contrarily, I adopt a perspective that focuses instead on the "bottom-up" assemblage of services as a fragmented, almost accidental process. I therefore focus less on governance through policies, plans, and legal decrees and more on the daily reality of informal areas and how their residents experience access to water on a regular basis. I adopt here a broad understanding of governance as the different ways in which government actors—whether individuals or institutions—try to intervene in urban affairs with the purported aim of changing or improving conditions. This definition of governance adopts a more state-centric perspective than some of the more mainstream definitions (e.g., Bakker, 2003 [1]) that depict a more pluralistic process. Bakker (2003) defines governance as "the process by which stakeholders articulate their interests, their input is absorbed, decisions are taken and implemented, and decision-makers are held accountable". Contrarily, my view of governance as a process carried out almost exclusively by the state is in line with the experiences of many countries under heavily centralised and/or authoritarian regimes. I focus specifically on access to drinking water in Ezbet El-Haggana (hereafter referred to simply as Haggana)—an unplanned neighbourhood in the eastern part of Cairo, Egypt—while situating the analysis within the governance of water in informal areas more broadly.

To conduct the analysis in this research, I employ two main conceptual tools. Firstly, I reflect on the claim by Desai (2012) [2] that the Indian state governs its informal areas "flexibly" by employing practices that contradict official discourse. I also explore the claim by Mahadevia (2011) [3] that such contradictions are part of a deliberate plan by the state to confuse citizens. I examine the application of these ideas to the Egyptian case by looking into the "flexibility" of how water is governed in Haggana. Secondly, I draw on wider discussions of power in governance by Collier (2009) [4], Griffin (2012) [5], and Allen (2016) [6], particularly their conceptualisation of power in governance as topological, contingent, and necessarily uneven. I relate this notion to infrastructure by arguing that we need to distinguish between our analyses of infrastructure as a subject or instrument of power, and of infrastructure as an object of power through governance interventions or development efforts. By doing this we remove any conceptual contradiction between depicting infrastructure as an effective instrument of state power and an object of government interventions that can exhibit the truly contingent nature of power in governance, as I do in this article. In other words, infrastructure is not only a materialisation of state governance policies and practices, but it also a manifestation of the state itself and its power.

In doing this, I situate this article within ongoing scholarly debates on informality within the urban waterscape, and its relationship to access and governance. In this regard, there are two main bodies of literature that I draw from. The first is scholarship on the relationship between informality and infrastructure in urban areas, and how this relationship affects peoples' experience with accessing resources. The second is the body of research by political ecologists focused on the relationship between nature, infrastructure, and the state.

A number of analyses of infrastructure have examined how people experience infrastructure within informal areas, and have offered invaluable insights into the workings of cities, resources, and politics in everyday life. The objects of these studies have ranged from specific forms of infrastructure such as water, sanitation, and electricity networks (e.g., Ranganathan, 2014 [7]; Desai, McFarlane and Graham, 2015 [8]; Silver, 2015 [9]), to specific components of those infrastructures such as meters (e.g.,

Loftus, 2006 [10]; von Schnitzler, 2016 [11]; Baptista, 2016 [12]). For example, Graham, Desai, and McFarlane (2013) [13] demonstrate how certain discourses around city water shortages and water theft have been mobilised to demonise informal areas as spaces that must be reproduced in order to protect Mumbai's image as a global city. Bjorkman (2014) [14] shows how water infrastructure in a Mumbai slum has become imbricated with residents' ability to navigate a constantly changing waterscape. The local waterscapes described by the author differ so much from neighbourhood to neighbourhood, that it is not sufficient to have "knowledge of water flows in a particular moment" [14], but it is rather necessary to have social networks within the neighbourhood that guarantee the constant flow of updated information regarding water flows. These social networks enable residents to make strategic choices regarding what actions to take, in light of risks associated with water cut-offs, water pressure changes, and police raids to remove illegal connections. Anand (2011) [15], looking at water in informal areas in Mumbai, argues that water pressure functions as a political tool shaping inequitable access to water, by allowing high water pressure in elite areas and limiting water pressure in poorer areas. Truelove (2016) [16] examines a state-led initiative to provide water to a slum settlement in Delhi and finds that a variety of political assemblages between state and non-state actors are involved in the everyday regulation and governance of water. McFarlane (2008) [17] finds in analysing Mumbai that a state-led sanitation project was partially aimed at disrupting existing clientelistic networks around sanitation that reflected voting patterns along religious and ethnic lines.

In reference to the contested nature of the state in water governance, Ahlers et al. (2014) [18] highlight the notion of "negotiated statehood" to understand the role of the state, particularly with regards to informality in the urban waterscape. The notion of the negotiated state provides a frame for understanding the multifarious nature of the urban waterscape and its overlapping practices that cannot be categorised as formal or informal. It calls for understanding that state bodies are not the only actors that hold the power to make "binding decisions on members of society" [18], but rather that shaping the urban waterscape is a contested process that often results in "hybrid arrangements" [18]. In viewing the state this way, it becomes clear that the state has different "capacities and limitations at different operating scales" [18]. In light of this discussion, Ahlers et al. (2014) [18] call on scholars to widen the scope of debates around informality and infrastructure, in order to benefit from other disciplines and bodies of literature. For example, drawing on ideas from fields such as political geography and state theory could provide innovative insights into how we can understand the way the state operates in informal areas.

The employment of insights from other disciplines in analyses of access to resources is something many political ecologists have engaged with, especially in recent years. Debates around what questions of nature can tell us about the state and power have provided valuable insights into understanding the issues around access to water raised in this article. For example, Meehan and Molden (2015) [19] argue against anthropocentric conceptions of the state, arguing instead that "stateness" is created through the mobilisation of power and the "spatial arrangements of humans and non-humans" (p. 443). Furthermore, one of the main roles of modern states is to make nature legible (per Scott, 1998 [20]) so that it can be incorporated into the capitalist system. In a similar vein, Loftus (2018) [21], drawing on Harris (2012) [22] and Meehan (2014) [23], explains that such an understanding of the state enables us to de-fetishise it and understand it more as a relation that is produced through practice. He therefore argues that water and its infrastructure serve to produce and consolidate the effect of the state, and may either reify or disrupt state-society boundaries. Harris (2017) [24], drawing on Meehan (2013) [25] and Grundy-Warr et al. (2015) [26], claims that the material conditions of natural resources (such as their topography), as well as their associated infrastructure, are "crucial to map and speak to the uneven geography of state power". Such an understanding enables us to see the contested state of infrastructure in informal areas as a reflection of the contested nature of the state itself—or, in other words, the state's incompleteness (Kelly-Richards and Banister, 2017 [27]). Similarly, Rodina and Harris (2017) [28] show that studying infrastructure in marginalised neighbourhoods can shed light on how the effect of the state is experienced in uneven ways both spatially and socially. They

examine access to water in a marginalised neighbourhood on the outskirts of Cape Town, and find that the process of formalising housing and access to water has been accompanied with a discourse that promotes payment for water as part of the "expectations associated with individuated responsible citizenship" (p. 346). To sum up, the above contributions, and this body of literature in general, shows the importance of understanding the state as an effect that is produced through concrete things such as infrastructure and the way in which infrastructure manipulates spaces and lives. Through this process, the state comes into being, but it always incomplete and contested, and its power is always uneven. In other words, infrastructure acts as a reflection of differentiated and uneven state's relations within a given population/space.

More broadly, this article speaks to the importance of a holistic understanding of water access when addressing issues of water resources. For example, given Egypt's status as a water-scarce country, many studies focus on debates around sharing the Nile waters between Egypt and other Nile countries, and Egypt's national share of freshwater. This is, of course, an important and necessary debate. However it is also crucial to understand that access to potable water in many countries tends to be an issue of inequitable distribution of water within different spaces of a single country or city. Nevertheless, debates around national shares of freshwater are often mobilised to justify spatially unequal distribution of potable water, and this has been a common trope in the discourse used by Egyptian government authorities to the media. These issues, while pertinent, are unfortunately outside the scope of this study, but important to keep in mind nonetheless.

Ultimately, my intention is not for this research to advocate for a specific policy such as the formalisation of informal infrastructure or the adoption of different payment schemes for informal users. Rather, my hope is that this research can advocate for the importance of producing policies based on politics from the ground-up—policies that take into consideration local histories and the multiplicity of forces, actors, and relations that shape the urban landscape.

2. Methods

The research presented here is based on qualitative fieldwork I conducted in Ezbet El-Haggana, as well as interviews I conducted with government officials, in addition to secondary data analysis. The field research began with pilot interviews in late 2013, and then officially began in early 2014 and extended until late 2015, with some follow-up visits in 2016. The fieldwork in Haggana was based on merging oral history techniques (focused on the history of water access in the area) within unstructured in-depth interviews.

I applied the oral history technique using an "infrastructure biography" method. I based this infrastructure biography method on the "house biography" method developed by Blunt (2008) [29] and used by Ascensao (2015) [30]. The method utilises ethnographic methods to collect historical and contemporary data. This approach is used to "tell stories of particular dwellings and their inhabitants over time and reveal the ways in which a house itself, and domestic life within it, are intimately bound up with wider social, economic and political processes" (Blunt, 2008, p. 551) [29]. This method is implemented by visiting the house of the interviewee and asking the resident to tell the life story or oral history of their home (Ascensao, 2015) [30]. Applying this to infrastructure, I asked residents to show me their water meters and taps and tell me the life story of how these came to be. The end result is what can be considered a type of micro-history (Ascensao, 2015) [30] of each interviewee's at-home water infrastructure. The combined micro-histories of household infrastructures collectively enabled me to construct an infrastructural history of an informal area. This, in turn, contributes to the overarching goal of understanding how the urban waterscape is constituted, governed, and contested in informal areas.

In order to reach residents, I relied on a combination of purposive and snowball sampling. The purposive sampling was done through a local non-governmental organisation (NGO) that was assisting me with my research (which has requested to remain anonymous), and I chose to target homeowners since they are the ones responsible for installing water infrastructure. The snowball sampling was

achieved through my personal relationships with certain residents who then introduced me to their neighbours and friends. Overall, I conducted 44 interviews with Haggana residents (14 male, 30 female), four interviews with staff members of various non-governmental organisations (NGOs) and community based organisations (CBOs) operating in Haggana, nine interviews with government officials, and six interviews with academics and urban experts.

In addition to the interviews, I also gathered information from residents through a community workshop I co-organised in 2014. The workshop consisted of 17 residents (eight male and seven female) from different backgrounds (including five college students, three elderly residents, three teachers, one researcher, four NGO staff, and one headmaster of a local school). It began with an open discussion on the purpose of the workshop and the issues that would be discussed. The participants were then divided into four groups, and each group engaged in a mapping exercise to produce a map of Haggana from their perspective, highlighting the most important sites and services within the area. During this group activity I posed questions to the different participants about the state of water infrastructure in the neighbourhood as a whole, and in their homes specifically. The workshop then concluded with an open discussion with the whole group, which revolved around a number of topics including infrastructure and water. I organised this workshop as part of TADAMUN: The Cairo Urban Solidarity Initiative, with which I was working at the time, and integrated questions relevant to my research. This was done with the assistance of the aforementioned local NGO who assisted in reaching out to residents and who also kindly offered us the use of their premises. The workshop was recorded by the TADAMUN initiative and partially documented on the TADAMUN website (The documentation of the workshop can be accessed at http://www.tadamun.co/?post_type=voice&p=5229&lang=en&lang=en#.XNftX5Mzbq0), while I documented in writing the responses to the additional questions I posed.

3. A Note on Informality

Prior to providing contextual background about the neighbourhood discussed in the remainder of this article, it is important to provide a brief overview of the ongoing debate around how to conceptualise informality, as well as the nature of how the Egyptian state deals with informal areas.

Though much of the policy-oriented literature speaks of the formal and the informal as two easily distinguishable sectors, in reality informality is much less tangible, and what seem to be formal and informal often overlap. Due to the complex and multifarious nature of the informal, theoretical discussions of informality have burgeoned over the past several decades, and many voices have called for a dismissal of the formal-informal binary in favour of a formal–informal continuum. For example, Beneria and Roldan (1987) [31] stress that dualistic divisions between the formal and in the formal lead to "conceptual problems and shortcomings", claiming that in reality the two overlap in various ways. This division, according to the authors, is an artificial one. Similarly, Portes (1983) [32] encourages the perspective that rejects dualistic understandings of a formal–informal divide and instead highlights the overlaps between different ways of acting within a single economy. Roy (2005) [33] explains that rather than being part of a binary, informality should rather be seen as an entanglement of relationships that connect various spaces together. It should thus be understood as a mode of urbanisation that is never entirely separate from formal urbanisation. McFarlane (2012) [34] expands on the above conceptualisations to understand informality as a form of urban practice. He describes the relationship between formality and informality as a "meshwork" (p. 101) of varying practices that is not a pre-existing fixed category but is rather always in formation. From this perspective, actors within the city are constantly moving between formal and informal activities. McFarlane thus views the formal–informal divide as a tool that is "deployed by states as an organisational device that allows particular domains and forms of intervention (e.g., around resource allocation, service provision, or statistical monitoring)" (p. 91).

Building on this, I conceptualise informality as primarily a discourse employed by the state to exert its power by casting certain spaces/populations as legitimate and others as illegitimate. In the words of Ahlers et al. (2014) [18], "formality and informality are fluid concepts that say more about the

authority to legitimate certain practices than describe the condition of that particular practice" (p. 2). An important point in this understanding is that informality should not be seen as something that exists outside of the state, but rather something partially produced by state practices. The understanding of informality as a discursive practice of legitimising and delegitimising highlights the ways in which states can manipulate and mobilise the categories of informal and illegal to permit or criminalise different practices (Cheng, 2014 [35]; Misra, 2014 [36]; Kooy, 2014 [37]). For example, Cheng (2014) [35] finds that informal water vendors in Manila were incorporated into the water utility's operation in certain parts of the city, and in these areas the water vendors are accepted as part of the formal public service. In other parts of the city where the vendors have not been asked to partner with the utility, they are still considered informal. Similarly, Kooy (2014) [37] shows how informal practices Jakarta's urban water supply was framed as opposing the state-promoted modern infrastructural ideal. This discourse of delegitimisation was part of a major international development project that ultimately resulted in the introduction of the private sector into Jakarta's urban water supply. Such examples show how contradictory discourses around informality are often mobilised in order to serve different political agendas. Thus, informality cannot be simply defined as everything that lies beyond the state's influence (Ahlers et al., 2014) [18] but is rather produced by and intimately tied to the state's regulatory practices. Informal areas are informal not because they are poor or do not have proper tenure documents (many homes in upscale areas lack proper tenure documents but are not labelled by the state as informal). Rather, they are informal because the state designates them as such. City-dwellers engage in informal practices throughout the city and across the socioeconomic spectrum, but certain practices are labelled as informal while others are not. This does not mean that the formal-informal binary does not exist, but rather that creating this binary is one of the discursive tools employed by modern states to manipulate and control space and the populations that inhabit it.

This conceptual overview is crucial in order to understand the awkward place that informal areas occupy within Egypt's legal and governance systems. For example, in Egypt one can easily come across an apartment that has been inhabited informally (through an uncertified sale or rental agreement) within a formal building, or a building that has been built informally (without a building license) on a formally registered piece of land. Alternatively, the land may be state-owned land that residents squatted upon, and thus the entire neighbourhood is considered informal. In other words, there are various scales of informality that often overlap, making it difficult to be conceptually robust when discussing the formal-informal divide.

Furthermore, although residents of informal areas are often portrayed as people who are living illegally, Egypt's legal code does not criminalise them. On the contrary, the Universal Building Law (Law 119/2008) states that informal areas should be upgraded as needed, and that only unsafe areas should be demolished. Moreover, several decrees have been issued over the past decades mandating that utility companies connect illegal buildings to the public utility networks and/or find ways to charge them for their usage. During the 1990s many informal areas were incorporated within the local urban administration system that divides cities into municipalities (known in Egypt as hayy) and sub-districts (known in Egypt as shiaakha). The result of this is that even though a neighbourhood, such as the Ezbet El-Haggana area discussed below, may be designated by the state as informal and have no officially recognised tenure documents, it is still represented in neighbourhood-level elected bodies, and receives part of the local development budgets that are allocated to the municipalities. Thus, informal areas in Egypt are simultaneously pathologised and demonised in mainstream discourse, while also being included in public service-provision and upgrading schemes.

4. Background

Today around 60% of Egypt's population live in areas designated as "unplanned" by the Informal Settlement Development Facility (ISDF). Ezbet El-Haggana is an unplanned area on state-owned desert land, lying at the eastern edge of Cairo along the Cairo-Suez desert highway (see Figure 1). It is also

known by the name "Kilo 4.5", Ezbet El-Haggana is in the eastern part of Cairo governorate, Haggana today constitutes a sub-district (shiaakha) of the East Madinat Nasr (EMN) municipality.

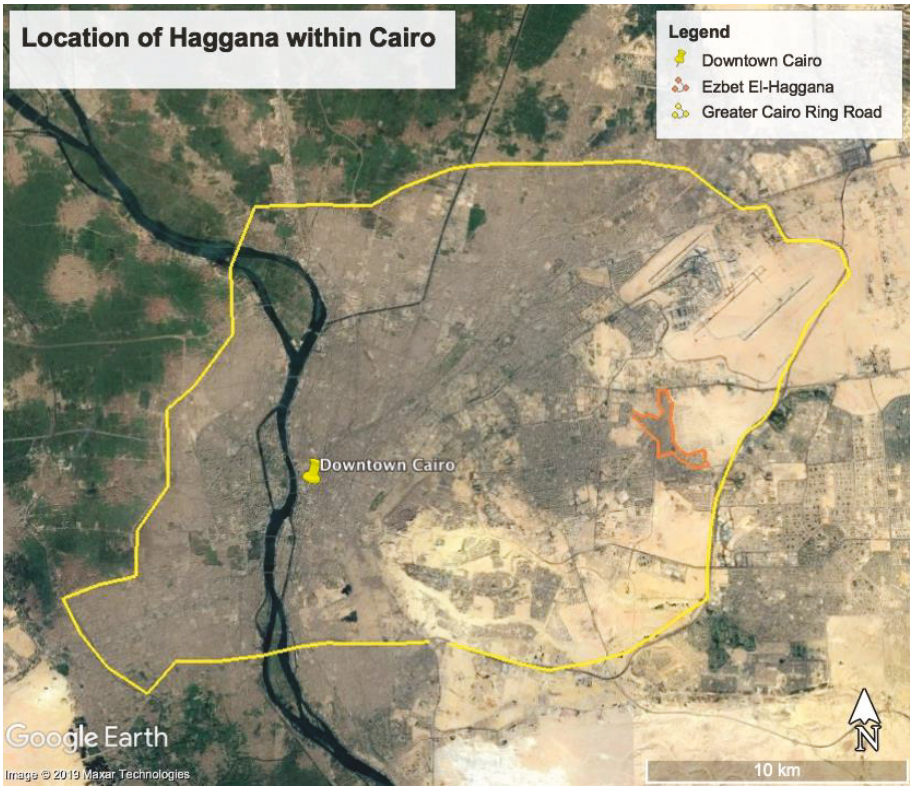

Figure 1. The borders of Cairo, encompassing the borders of East Nasr City, encompassing the borders of Ezbet El-Haggana. Source: Author.

Ezbet El-Haggana is one of the 14 informal areas that have full water network service, and the neighbourhood also has a wastewater network (Cairo Governorate, 2013) [38]. Haggana constitutes 58% of the total number of people in East Madinat Nasr (EMN) who are outside the public water network, 14% of those in EMN who rely on a tap outside their building, and 27% of those in EMN who rely on a tap inside their building but outside their housing unit (CAPMAS, 2006) [39].

Estimates of the population size of Ezbet El-Haggana vary widely, as is the case with most informal areas in Egypt. The 2017 national census estimates the neighbourhood's population to be around 39,432 (CAPMAS, 2017) [40], but many claim that this is grossly underestimated. For example, local NGO Al-Shihab Institution for Comprehensive Development estimates the population to be close to one million inhabitants. The neighbourhood developed on a piece of vacant state-owned desert land in Eastern Cairo in the 1960s. The name "Kilo 4.5" emerged because the main entrance to Haggana lies on the Cairo-Suez highway at a point that used to be 4.5 km from the city. The name "Ezbet El-Haggana" derived from the original function of the area as a settlement for the families of the Egyptian army's camel corps, which is the translation of the word Haggana. The camel corps soldiers were allowed to build homes for their families in the neighbourhood, and eventually, during the construction of the adjacent Madinat Nasr district during the 1960s, Haggana became attractive to construction workers that came from across Egypt to find work in Madinat Nasr. As informal Cairo boomed during the

1970s in the wake of then-president Sadat's "open-door" policy, so did the population of Haggana, which became a haven for lower-income families coming from Upper Egyptian villages in search for better living opportunities in the nation's capital. Today, the area is a lively residential neighbourhood that hosts people from a wide range of income groups. Data on income levels are, unfortunately, not publicly available at the local level, but all residents I spoke with during the course of this research referred to certain parts of Haggana being more expensive areas that host wealthier families, especially the area near Haggana's main entrance on the Cairo-Suez highway.

Despite the existence of some upper-income families, the area as a whole fairs worse than the rest of the EMN municipality, which it is part of. For example, the Central Agency for Public Mobilisation and Statistics (CAPMAS) estimates Haggana's poverty rate at 10% while it estimates East Madinat Nasr's poverty rate to be 2.5% (CAPMAS, 2013) [41].

> "I came here in 1995 and it was like a desert. It had a very bad reputation. I never left the house alone, and even with my husband I wouldn't walk outside after dark. It was almost empty, there were very few people here, the only area that was a bit lively was around the 4.5 entrance. There was no water or electricity, we had to fill jerry cans from a standpipe and carry them home, and we had to use gas lamps to light our homes. It wasn't safe at all, I was scared to walk out of my home alone, there were many thieves, they could break into your home. 4.5 was known as the place where all the thieves in Egypt lived. Today it is so much better, it is almost like a normal neighbourhood now. The area today is well-inhabited, and there are many good people living here. I can walk around and feel safe because the people around here know me. There are good buildings now, which attracted decent people. Now you find rich people and poor people and all different backgrounds in Haggana". (Interview, Haggana female resident, 2015)

Furthermore, although Haggana is almost always referred to as a single neighbourhood by the media, it is actually quite internally diverse. Residents refer to smaller communities within the area, such as the 4.5 entrance area, which hosts the wealthier families that originally settled the land, the Masakin El-Shorouk area with recently constructed residential towers hosting young families (considered one of the nicer parts of Haggana), the Daght Al-Aaly area situated under high-voltage electrical cables (arguably the poorest and most stigmatised part of Haggana), and the Tabba area, which hosts refugees from Sudan, Somalia, and Syria (Tadamun, 2015 [42]). Around 10% of the population's residents are Christian, largely from the Upper Egyptian governorate of Al-Minya, while the majority are Muslim (Tadamun, 2015 [42]).

> "My area is a good area with good people, but further up you will find the area has attracted strange people, especially under the electricity cables, that is the worst part of 4.5. And I hear that if you go up near the Tabba area you will find the place with lots of refugees, but I have never been there". (Interview 3, Haggana female resident, 2015)

Since Haggana became a "shiaakha" (the lowest urban spatial division in Egypt) in the 1990s, there has been a member of the Local Popular Council (LPC) that represents the neighbourhood (according to Egypt's local administration law, all urban municipalities have a Local Popular Council that is made up of representatives of the district, and is tasked with overseeing local development efforts). The LPC is the only form of elected local government, and the representatives of Haggana often engaged in aggressive campaigning and vote-buying. Members of parliament (MPs) have also played an important role in the area, mostly in past elections, especially during the late 1990s and early 2000s. This campaigning largely revolved around access to services, as Haggana had been marginalised from basic services due to its status as an informal area. This theme is explored in more depth in the following section.

5. Results

5.1. The Early Development of Haggana's Water Landscape

> "When I first moved here in 1978, we relied on two public standpipes for water, which were installed by the army. We would fill up our jerry cans and carry the water on our backs. But soon local strongmen (Arabic: Baltagia) took hold of these standpipes and would only allow us to take water if we would also carry water to their houses. We refused and tried to find an alternative, which we soon found when we arranged cement-carrier trucks to fill up their containers with water and transport it throughout Haggana and sell it to us. But soon the baltagia demanded that we pay for the water. I had to purchase water and the barrel lasted me only a few hours. We had to carry the water long distances, and my girls had to skip school to help me with that. When the water vendors came to Haggana in the 1980s that gave us another option to purchase a jerry can from them but it later became very expensive. Then in the 1990s there was a parliament member called Thuraya Lubna who started connecting parts of the area to the water network during election times. She would walk through the Ezba and ask people to vote for her and help us get water in our homes. She helped some of us hire a plumber and tap into the water mains nearby, even though the municipality had told us this is illegal. But in other parts of Haggana there was still no water, until El-Sallab started running for elections and he connected some others parts to the network. In 2000 the governor visited the Ezba and said water would be installed everywhere and that the connections we installed ourselves would be demolished and replaced with government pipes. We were happy about this because the network Labna helped us install was weak and the quality was not good. So we went to the municipality to see when this would happen, but they told us that 4.5 is illegal and full of thieves and will never get water. After the governor visited we kept waiting for the water company to install pipes in our street but it didn't happen, so we continued to rely on our own pipes. Finally around 2006–2007 we finally saw the water company in the Ezba digging pipes, but they didn't demolish our self-installed pipes, they just put theirs next to ours. We were also happy about this because sometimes the water would cut off from the government pipes, so we would switch to our old pipes and sometimes they would work. But they only did this in part of the Ezba, they were very slow. I got connected to the government pipes in 2007, but my mother in law didn't get connected until 2013 because the company took so many years to reach her area. She lives in a different part of the Ezba and she was not in the path of Labna or El-Sallab. But even though I had government pipes since 2007 the company came back recently to make sure everyone signs a contract with the company and gets a meter. They told us our connections were illegal, even though they are the ones that installed it! The meters were expensive so not everybody purchased one, and I did not purchase one, and when the meter-reader came to the Ezba he would just write down any number and we would have to pay it! So I finally got a meter a few months ago, but even after that sometimes the meter-reader does not come regularly and that makes me wonder from where they got the amount written on my water bill if nobody came to even read the meter". (Interview, Haggana female resident, 2014)

When Ezbet El-Haggana was first settled by the camel corps soldiers before the 1950s, water was delivered on a daily basis via trucks sent by the armed forces to fill water tanks inside homes. This constituted Haggana's first form of water infrastructure (Community workshop, Haggana residents, 2015; Interview, Haggana-based NGO manager, 2014). Through the information I gathered from the accounts of residents, I managed to construct a history of the process Haggana underwent to reach the water infrastructural landscape it has today.

Although the armed forces discontinued its delivery of water during the 1960s, they had already allowed the camel corps soldiers to build homes for their families in Haggana. Therefore, knowing that there were already several families living in the area, the armed forces built two public standpipes

at the northern and southern edges of Haggana. These standpipes constituted Haggana's second form of water infrastructure. As Haggana's population surged through the 1970s and as its area expanded, it became a common occurrence to see physical altercations around the water standpipes due to overcrowding and long lines (Interview, Haggana-based NGO researcher, 2015; Interview, Haggana female residents, 2015). It was not long before some enterprising individuals saw the opportunity to make money, and informal water vendors appeared in the area. According to the interviewees, the choice between walking long distances carrying heavy jerry cans of water or purchasing overpriced water from a vendor was not always an easy decision. In the words of one respondent:

> "The water vendor was expensive, so most days I would try to get water from the standpipe, but it was far from my house and always crowded, and my back would hurt from carrying the jerry can, so some days I would just buy from the vendor". (Interview, Haggana female resident, 2015)

Over time, the water vendors came to represent a type of water mafia. The vendors took advantage of the fact that most residents were located far from the standpipes, and regularly increased their prices. To avoid the need to rely on vendors, some of the better-off residents installed taps within their homes, which were illegally connected to the standpipes. Those who did this were mostly clustered in the 4.5 entrance area, partly because of their closer proximity to the standpipes, and partly because many of the wealthier residents resided in this area (Interview, Haggana-based NGO researcher, 2015). However, eventually, local strongmen established control over the public standpipes and were charging people a fee to use them. As one resident explained, "initially we would get water through individual efforts, and we had to pay a monthly fee to the baltagy (strongman) who had control over the valve" (Interview, Haggana female resident, 2014). This water mafia made up yet another piece of the infrastructural landscape of water in Haggana.

Some residents informed me that they approached the municipality and the Cairo water authority to ask that the pipes adjacent to Haggana be extended to its main streets. The response from both entities was that not only were they ineligible to receive services due to their illegal occupation of the land, but that the area did not even exist on the government maps (Interview, Haggana male resident, 2014; Interview, Haggana male resident, 2015). Thus, Haggana remained dependent on standpipes and water vendors.

5.2. The Clientelisation of Informality

As Haggana entered the 1990s, accessing basic services like water and electricity had begun to depart from the chaos of the preceding decade, characterised by repeated physical altercations between residents and individual ad hoc solutions, and instead was moving towards a more systematised approach that revolved around obtaining access through certain powerful and well-connected individuals (Interview, Haggana-based NGO researcher, 2015).

After Haggana's conversion into an administrative sub-district, residents were required to elect a representative on Nasr City's LPC. This became a vehicle for vote buying, clientelism, and corruption. Those running for office used their connections and political clout to extend the water, wastewater, and electricity networks to Haggana, despite any disapproval on the part of municipal governance. MPs running to for the Madinat Nasr seat became notorious during the 1990s and 2000s for trying to obtain votes in exchange for community services (Interview, Haggana-based NGO manager, 2014). The services they relied on the most to achieve this were water and electricity. Through their involvement in local politics and their relationships with governmental authorities and development organisations, individuals running for local office became one of the main channels through which residents obtained water infrastructure in Haggana (Community workshop, Haggana, 2014). Politicians campaigned heavily in certain parts of Haggana, and despite the fact that the Cairo governorate had issued a decree in 1991 highlighting Madinat Nasr's water shortages and decreeing that no new buildings should be built without the approval of the water utility, these politicians routinely promised (and

delivered) connections to the water network in exchange for votes. Through this process, large portions of Haggana's residents were able to connect to the water network and receive in-home connections through the process of vote selling (Community workshop, Haggana residents, 2014).

Thuraya Labna, an MP representing Madinat Nasr in the 1987–1990 and 1995–2000 parliaments, promised residents that despite the district's water situation, she would ensure they all gained access to water, sanitation, and electricity, if they voted for her (Community workshop, Haggana, 2014). As part of her campaign, she began installing informal connections to connect some homes to the public network. Several of the residents I interviewed recalled that the first time they had in-home running water was through the connections installed by Labna's campaign.

> "Thuraya Labna was a good woman, she would walk all around Haggana asking people to vote for her, and she is the one who helped me get water in my house, before that my wife would have to walk every day to the standpipe". (Interview, Haggana male resident, 2015)

> "I had to purchase water and the barrel cost EGP 1.5 and lasted me one-to-two hours, and it was not even clean water; then around 15 years ago there was a parliament member called Thuraya Lubna who started connecting parts of the area to the water network during election times". (Interview, Haggana male resident, 2014)

This process was replicated by Mostafa El-Sallab, another parliamentary candidate, when he ran for parliament in the 2002 and 2005 elections (Community workshop, Haggana, 2014). As was the case with Labna, throughout both of his campaigns El-Sallab connected certain parts of Haggana to the water network. When he was campaigning in 2005, El-Sallab made a similar promise to connect all homes to electricity during the elections, and even distributed application forms to residents (Masoud and Muawwad, 2007) [43]; Community workshop, Haggana residents, 2014). As one resident stated when speaking about Mostafa El-Sallab,

> "When I moved here in 1998 there wasn't any water and we purchased jerry cans for 50 piasters, and we suffered a lot in carrying the water. Now the water is good and we don't have to purchase, thanks to El-Sallab. El-Sallab did a lot of work in connecting parts of the Ezba to water, he helped us get government pipes". (Interview, Haggana female resident, 2014)

According to the residents I spoke with, the water connections provided by these politicians did not specifically target wealthier parts of Haggana or more powerful community members. Although many of the more powerful community members were well-connected to the politicians, they acted as vehicles to help the politicians reach the main constituency that could provide them with votes. Thus, local politicians and their clientelistic vote-buying politics constituted a central part of Haggana's infrastructural water landscape during the 1990s and 2000s. What is clear from the actions of every MP that has run for the Madinat Nasr seat is that informality was exploited by ruling party politicians as a way to gain votes, thus leading to a so-called "clientelisation of society" (Dorman, 2007) [44]. In the words of Dorman (2009, p. 430) [45]:

> "While officials did rebuff bottom-up demands for servicing, the long-term trend has been for areas to receive local connections eventually—usually the result of a clientelistic micropolitics whereby informal communities cultivate ties to state officials and the latter use services (or at least the promise thereof) as means of cultivating support".

5.3. Self-Help Infrastructure

In 2000, thanks to pressure from the local politicians representing Haggana, the Cairo governorate issued a decree mandating that Haggana be physically upgraded, including officially connecting the area to the public utility networks (Decree 925/2000). Thus, in 2002 the Cairo water authority finally announced it was developing a plan to connect Haggana to the water network in five stages

(Interview, GCWWC official, 2014). They began at the area's northern edge and proceeded inward, installing piping that was connected to the nearby water mains. At a certain point, the water authority ceased digging and moved to the area's southern edge and proceeded inward from there (Interview, Haggana-based NGO manager, 2014). Thus, large areas in the middle of Haggana fell through the cracks and did not receive water access for years. In addition, the process proceeded incredibly slowly, as many of the employees of the water authority remained resistant to the idea of connecting an informal area to water (Interview, GCWWC official, 2015).

> "The governor visited the area once around 2000 and said water would be installed everywhere, but when we went to the municipality we were told that 4.5 is illegal and doesn't appear on their map". (Interview, Haggana male resident, 2014)

Even in the parts of Haggana that the water authority had reached, there were no legal or regulatory provisions at the time that allowed residents without proof of tenure to legally apply for a water connection. Thus, many continued to rely on informal water sources. Ultimately, despite the fact that public utilities were, on paper, connected to Haggana in the early 2000s, the reality is that most people continue to lack access because of the high cost of installing a home connection, the widespread poverty in the area, and the lack of proof of tenure (Interview, Haggana-based NGO manager, 2014).

The implementation by the water authority took place at such a slow pace that many of the residents who had not received connections through politicians decided to pool their resources together to construct informal connections to their streets and homes (Community workshop, Haggana residents, 2014) (see Figure 2). During the mid-2000s, several local community based organisations (CBOs), especially in Haggana's southern region, implemented projects to collect money from residents and hire plumbers to illegally tap into the nearest water mains. They hired plumbers to install 4-inch pipes down certain main streets in Haggana connecting them to the water main and to install smaller pipes connecting the side streets (Interview, Haggana-based CBO staff, 2014). Usually these projects tended to encompass the offices of the CBO along with the homes within the vicinity of the CBO, thereby spreading the cost of the plumber and pipes. To ensure that government officials did not interfere with the process, the project leaders bribed security and municipal authorities (Interview, Haggana-based CBO staff, 2014). One such initiative, documented by Bremer and Bhuiyan (2014) [46] and Wahby (2013) [47], shows that the CBO members also bribed a parliamentary member who wanted to claim that the project was his own, as well as the local strongmen who had taken control of the standpipes and did not want to lose their opportunity for profit (Bremer and Bhuiyan, 2014) [46].

> "Water entered my home in 2009, before that we used to purchase jerry cans. Some other people would buy a water tank, which was around 35 pounds, but only a few people could afford that. We had to carry the water long distances. My girls had to leave school to help me with that". (Interview, Haggana female resident, 2014)

The cost incurred by each family to connect to this "self-help piping" (Wahby, 2013) [47] was much lower than what residents had to pay the water company for an in-home connection. As mentioned above, many middle and southern parts of Haggana were not connected until 2012–2015, so the households in those areas continued to rely on this informal system until the water company finally arrived to connect them. The water company did not remove the informal system when it installed its own pipes, and for many years residents used the informal piping as a backup measure for when the formal system suffered from outages (Interview, Haggana-based NGO manager, 2014; Community workshop, Haggana, 2014). Several of such projects were carried out by different CBOs, such as the Al-Muiz CBO run by the locally well-known figure Samir Anwar, known for his active campaigning for candidates during parliamentary and LPC elections (Interview, Haggana-based NGO manager, 2014; Community workshop, Haggana, 2014).

Figure 2. Self-built infrastructure. Source: Author.

The slow process of connecting Haggana to the water network continued to be stalled due to multiple conflicts between the residents and the company over the company's desire to charge high arrears for the water residents had been "stealing" (Interview, GCWWC official, 2014) over the years. The standoff was finally resolved when a local NGO received a grant and organised local water committees from Haggana's residents to advocate for their right to water through meetings with the water company and local officials. The committee was also responsible for negotiating with the local strongmen controlling the standpipes and obstructing the installation of infrastructure. The NGO also mobilised funds to cover some of the costs of the branch connections, home connections, and water meters for residents who could not afford them (Interview, Haggana-based NGO manager, 2014).

Thus, by the late 2000s the area's water infrastructural landscape could be characterised as quite variegated. Some households had a formal in-home connection to the water network, while other households were in close proximity to the sub-mains but could not afford an in-home connection and so relied on water from their neighbours. Yet other residents were on streets where no sub-mains had been installed, and thus relied on informal water vendors. Such a variegated waterscape is still characteristic of many informal areas today as explained by a Cairo governorate official discussing the situation of water in Cairo's informal areas:

> "The situation in informal areas is very complicated. One of the issues we are dealing with is that when we ask the question: 'What is the service level in this area?', there is no straightforward answer. There are some areas with water in the middle, some areas with a network, some areas with an informal network, some areas with a public main at the edge, and some areas with no water at all". (Interview, Cairo governorate official, 2015)

Part of the reason for the slow pace of implementing the water authority's plan to connect Haggana has been resistance on the part of the responsible executive agencies and officials. Many officials within state institutions and municipalities often resisted connecting informal areas to utility networks because they perceived informal dwellers as thieves. For this reason, even when there was a legal mandate to connect informal areas to public networks, such decisions took years to implement due to resistance on the part of responsible executive agencies. For example, even though the Cairo governor issued

Decree 925 in 2000 mandating that Haggana be upgraded and connected to public utility networks, the residents I spoke with dated the earliest connection to 2008 (Interview 23, Haggana male resident, 2015). In fact, an official within the GCWWC confirmed that many of the company staff continued to believe informal areas should not be connected to the water network, even though they understand this is now the new policy (Interview 42, GCWWC official, 2015).

5.4. Post-Arab-Spring: Accommodating Informality

When the Egyptian uprising erupted in January 2011, all installation of the public water network in Haggana halted and by the time I conducted my preliminary fieldwork in 2013 there were still areas in the south of Haggana that had not been connected to the formal network and were still dependent on informal means. Many residents shared home-based water taps, such that every two neighbours would purchase a single connection together to ease the financial burden, and some of those who obtained a home connection also installed a public standpipe in front of their home to help those less fortunate. Even among those who had been connected by the water company, many continued to rely on their old self-built informal systems during water outages (Community workshop, Haggana residents, 2014). In 2012, residents in Haggana's southern part staged a road sit-in to demand water because they had still not been connected to the public network (Wahby, 2013) [47]. When I visited Haggana again in 2014 many households in the southernmost part of Haggana continued to rely on informal connections, as the water company had not yet begun to dig pipes in that area.

Since Egypt's current president El-Sisi came to power in 2014, there has been an increased focus on what I describe as "accommodating informality". The water company has been changing its strategy by looking at ways to collect payments from the many illegal connections that exist in informal areas. To achieve this it has adopted various mechanisms to charge non-metered users who have illegally tapped into the network, such as charging arbitrary sums or introducing temporary meters that depend on prepaid scratch cards. Many GCWWC officials have repeatedly complained about the toll that illegal water connections in the ashwa'eyat have taken on the company's finances. It is within this context that we can understand why one senior official of the GCWWC stated in 2011 that the company's priority was to focus on the ashwa'eyat (Mounir, 2011) [48]. In doing this, the water company is taking a cue from the electricity company, which has been pioneering such mechanisms. After the surge in informal housing that took place in the wake of the 2011 revolution, the water and electricity companies complained of unprecedented strain being placed on the networks that were not built to serve the population sizes that were using them. They also complained of a surge in theft costing the companies millions of pounds. In the words of one official, "we have suffered a lot at the hands of the ashwa'eyat who cost the company millions because of the water they steal" (Interview 8, GCWWC official, 2014). In 2014, the head of the water company stated that there were over 800,000 illegal connections nation-wide, costing the company over EGP 4.2 million every month (Al-Gumhuriya, 2014) [49].

To address this, the water company has introduced provisions within its application procedures to regularise informal connections, labelled as "wasalat khelsa", which literally translates to stealth connections. The paperwork for regularisation is similar to that required for applying for a new connection, which is a copy of the building ownership contract, a copy of the national ID, and a copy of the building license. However, the difference is that if someone is unable to provide a building license or official contract for the housing unit, the company will accept instead an electricity bill that displays the applicant's address (Interview 42, GCWWC official, 2015). One company official informed me that the company has sent trucks to several informal areas to encourage people to apply for meters on the spot, and the company is now simplifying its procedures even further to require less paperwork, to make it easier for anyone to apply (Interview 42, GCWWC official, 2015). The residents with whom I spoke indicated that many are now in the process of obtaining formal contracts with the water company to be fully metered and charged for their consumption. An official within the Cairo Water Company told me that it was necessary for the company to do this because there were millions

of people living in these areas stealing water and they needed to find a way to charge them (Interview 8, GCWWC official, 2014).

The electricity companies have made similar complaints about the increase in illegal connections since 2011. Thus, they have formally institutionalised the temporary prepaid meter known as 'addad cody. The company has stated that such meters are to be used by illegal buildings that cannot apply for a formal connection but should in no way be considered a form of proof of tenure (Ramadan, 2016) [50]. The water company has stated that it will follow the model of the electricity company and purchase 6.2 million temporary prepaid meters to contribute towards their cost recovery efforts, as this was a necessary measure to recover these costs until the state decides to deal with these "transgressors". The spokesperson affirmed that these meters are given a number and not any name or contract, that they are not to be considered proof of ownership or tenure, and that if the municipality decides to demolish these homes they should demolish the meters along with them (Al-Gumhuriya, 2014) [49].

By 2016, when I conducted additional fieldwork across Haggana's various neighbourhoods, I could not find anyone who did not have in-home access to water from the public network, and most of those I spoke with had water meters, meaning that their access was considered formal by the water company. However, every single one of the residents I spoke with informed me that they were embroiled in constant disputes with the company over alleged arbitrary charges and arrears. Within this context, one can understand why Haggana has been witnessing such a change in the way the Cairo Water Company interacts with them. After spending years trying to obtain water in their areas, and facing resistance and accusations of illegality from officials, Haggana's residents are today finding encouragement from the water company to apply for meters and legalise their connections (Community workshop 1, Haggana, 2014), and to pay the arrears they supposedly owe. The developments described above are taking place within a broader context of increased state attention given to informal areas with the renewed presidential interest in making a mark on the "ashwa'eyat problem" (as stated in the national constitution of 2014), especially ashwa'eyat in Cairo.

6. Discussion

The historical examination of Haggana's access to water highlights a highly variegated and complex water infrastructural landscape. Government statements to the media frame this complicated process in terms that make it seem as though the water authorities simply realised a need for water and filled it. It neglects to mention the multiple methods that residents had to resort to in order to obtain water, including vote selling to local politicians, taking part in self-help projects, and participating in donor-driven NGO projects. It also neglects the almost tug-of-war nature of the relationship between the residents and the authorities responsible for providing water, one that involved lawsuits, sit-ins, and resistance constantly exhibited by officials despite higher-level decrees establishing Haggana's right to water. This account of water infrastructure in Ezbet El-Haggana highlights a number of points in regards to informality and governance in the urban waterscape.

6.1. Infrastructure and the State as Mutually Constitutive

The analysis of water governance in Haggana highlights the mutually constitutive nature between infrastructure and state power. Griffin (2012) [5] provides an overview of the different theorisations of power in governance, ranging from the multi-level perspective of power as hierarchically nested within different tiers of the state, to the pluralistic conceptions of network governance theorists, to the more dialectical theories of relational power through structurally-determined resources and finally governmentality inspired perspectives that power is felt "immanently and everywhere" and is determined by different definitions of truth. The most common theorisation of the nature of power in governance theory has been a conception of power as locatable in the central state and extended outwards over a specific territory or downwards throughout a governmental hierarchy.

The account I presented above creates a very different picture. While it is true that the state had immense power in terms of access to resources and decision-making authority, and manipulated these

quite well in many situations, the extent to which it was able to diffuse this power to the executive levels of government produced far more uneven outcomes. Within the context of Egypt, there is no other actor that can rival the state in terms of the authority to impose decisions and manipulate the nation's resources (land, budgets, natural resources, the military, the police, etc.). For example, the ability to issue a decree to build a new water station and then directly contract a certain authority to construct it is something only the state has the power to do. The state is also virtually the sole governing authority, as there is very limited decentralisation in governance in Egypt. This makes the state very successful at conducting "shows of force" such as infrastructural mega-projects and national events. However, this type of power does not necessarily translate into the ability to manipulate circumstances at the local level. This is similar to the argument made by Dorman (2007, p. 103) [44] who looks at the Egyptian state in informal Cairo and distinguishes between the authoritarian power of the state, and its "infrastructural capacity". He argues there is a "pronounced affinity between authoritarianism, non-interventionism, and state incompetence more generally". In a somewhat similar vein, I find that while the Egyptian state has successfully de-legitimised certain spaces within the city be labelling them as "ashwa'eyat", "informal", or "unplanned", its ability to intervene in these areas has been less effective. For decades it was not the state that provided water to residents, but rather a host of other actors including water vendors, local politicians, and NGOs/CBOs. Examining the governance of water infrastructure in informal areas exposes the "flexibility" in how the Egyptian state governs infrastructure. However, I argue that this flexibility is not deliberate, nor is it a result of the unique difficulties of managing infrastructure in informal areas, but rather a result of the ad hoc nature of power in governance and the uneven quality of the state's authority and reach.

This understanding of power relates to arguments by Griffin (2012) [5], drawing on Allen (2011) [51], that "the mere existence of a located concentration of resources or decision-making authority does not guarantee that its deployment will be successful or go un-resisted" (Griffin, 2012, p. 214) [5]. The analysis presented above shows that despite changes in Egypt's legal and policy frameworks with regards to informal areas to public infrastructure, it was over a decade before these changes materialised on the ground. This, I argued, was not due to a deliberate decision by the state to delay infrastructure in informal areas, but rather to the uneven nature of its power, despite it being virtually the sole authority in Egypt. A distinction, therefore, must be made between "latent" power [5] and actual ability to affect change. Drawing on Allen's (2016) [6] "topological" approach to power, I viewed power as spatially contingent, and a relational effect of the practices and interactions of actors, rather than a pre-existing locatable capacity. Allen (2011) [51] argues that actors "make their leverage and presence felt through certain practices of proximity and reach" (p. 290). It is the ability of central states to "reach into the politics of local areas" that can translate the type of discursive power often exhibited by states in their ability to label certain practices/spaces as informal or illegal, into the power in governance that was found to be lacking in this article. The effects of power are, therefore, "always provisional and there are no guarantees that authority at the centre will prevail" (Griffin, 2012, p. 217; citing Allen, 2011) [5,51]. This relates to the fact that the state is an effect produced through practice, and thus it is necessarily always spatially uneven (Painter, 2006) [52].

Thus, states must rely on other means to exert their power. Mitchell (1991) [53] describes how modern state-making relies on the internalisation of regulatory practices into daily life, with the curious result that the public imaginary of the state increasingly turns into a mythical external structure. This internalisation takes place through quotidian practices such as "the organised partitioning of space, the regular distribution of bodies, exact timing, [and] the coordination of movement" [53] (p. 82). In other words, the apparent distinction between state and society is a product of certain practices and processes of regulation. The modern nation-state functions largely through creating the appearance that it is a structure external to and encompassing of society. In the context of urban governance, the mundane practices of socio-spatial regulation, such as urban plans, zoning laws, land use regulations, allocation of basic services, administrative spatial divisions, and boundaries, or essentially anything determining what citizens can and cannot do in a given urban area, correspond to the state effect

that Mitchell (1991) [53] describes. Indeed, as Scott (1998) [20] illustrates, states invest a great deal of time and effort into developing rules, regulations, and procedures, that together ensure that states are "imagined in some ways rather than others" (Ferguson and Gupta, 2002, p. 984) [54].

Understanding state power in such a way means that the state does not only act upon infrastructure, but also acts through it by using it as a means to intervene in and exert control over local areas. In other words, states manipulate infrastructure, but infrastructure is also constitutive of state power. Meehan (2012) [55] argues that infrastructure has the capacity of delineating and delimiting the power of the state. I build on Meehan's conception of infrastructure as a producer or delimiter of state power, but further view it as a manifestation of the state itself and its limits. More "spectacular" forms of infrastructure, such as roads, bridges, and infrastructural mega-projects in general, have been used by the state to enact and bolster its political power. While more subtle forms of infrastructure, especially water supply, have also been deployed discursively as markers of modernity and progress, the intricacies of their everyday management have enabled them to expose the state's limited power to effect real change in people's lives. This has resulted in an apparent "flexibility" in how the state governs informal areas, and by extension how water infrastructure within these areas is governed. Water infrastructure can therefore be seen as an assemblage of material infrastructure, social relations, and discourses, that come together in an almost accidental manner that reflects the uneven and "flexible" nature of state power.

6.2. Flexibility and the Statization of the Informal Waterscape

Such a conceptualisation of state power can help us understand the often self-contradictory practices of state authorities in governing informal areas. Desai (2012) [2] argues that the governing of informal areas in India is "flexible", a term I used earlier in this article. She highlights the disconnect between state policies and pronouncements towards the inclusion of informal dwellers as rights-bearing citizens and the actual practices of agencies that continue to exclude residents of informal areas. In her discussion, Desai (2012) [2] draws on Mahadevia's (2011) [3] description of a "paradigm of deliberate confusion" where states adopt contradictory policies in an attempt to cater to opposing political agendas by different interest groups (e.g., informal dwellers, capitalists, etc.). States may therefore adopt policies that directly harm the urban poor, while also targeting the urban poor through urban upgrading programs. The inconsistency in urban policy serves the interests of the state by "allowing policy to swing in the direction from where the pressure is coming". I highlight in this article a similar flexibility and self-contradictory practice by the state in Cairo's informal areas, especially with regards to the governance of infrastructure—though I differ in my portrayal of a state that has the power to deliberately confuse, as I argue in the previous section that the state does this despite itself, because the very nature of its power is effective in some ways but limited in others.

This flexibility renders common dichotomies such as public/private and formal/informal meaningless as the resultant waterscape is one of overlapping infrastructures, practices, and actors. The combination of plumbers, pipes, CBOs, resident cooperation, and clientelistic state-society relations, created a mix of social and physical infrastructure. Haggana's waterscape was an "archipelago" (Bakker, 2003) [56] of various combinations across the formality–informality spectrum. This is consistent with the claim by Ahlers et al. (2014) [18] that the urban waterscape often incorporates multiple overlapping service delivery mechanisms and activities that "vary according to the degree to which they are formal or informal".

However, the findings presented in Section 5.4 show that the post-2014 era has been witnessing a shift in the role of the state vis-à-vis informality in the urban waterscape. The "archipelago" nature of Haggana's pre-2014 waterscape is slowly disappearing. As detailed above, state authorities, and especially the water company, have been employing different measures to incorporate residents of informal areas into the official public water supply regime, a phenomenon I describe as accommodating informality. Such developments have led to what can be described as an increased "statization"—a term I borrow from Painter (2006) [52]—of informal areas. This term is based on the argument that

everyday life is permeated by the effect of the state (which he refers to using the term "stateness") through "prosaic" manifestations, including the mundane bureaucratic requirements of daily life such as filing papers, or paying for services. This conceptualisation builds on work by Mitchell (1991) [53] who depicts the state as an effect produced by real practices with material consequences—practices that include, among many other things, the "meticulous organisation of space" (p. 92). The process of the infiltration of such state-effecting practices into everyday life is what Painter (2006) [52] describes as the process of "statization". Infrastructure is often intimately tied to the degree to which different areas/spaces are statized. As argued by Harris (2012) [22], the manipulation of natural resources through infrastructure "can be understood as part and parcel of what enables the boundary between state and society to appear" (p. 26).

The findings presented above show that informal areas have been witnessing increased statization as state authorities have been exploring ways to accommodate informality in the urban waterscape. Egyptian utility companies are turning towards ways to accommodate water users that had previously been shunned as informal. However, while these residents are being allowed to formally connect to the public network, the neighbourhoods themselves remain in a state of ambiguous—if not ambivalent—legality. Residents of unplanned areas are, on the one hand, being treated as clients who must pay for services just as all other citizens do. On the other hand, they continue to be portrayed as illegal occupants who have encroached on state land. The state's flexibility in governing informal areas allows it to benefit from informality without having to deal with the many systemic issues underlying it.

7. Conclusions

In the above article I interrogated the role of the state in governing informality in the urban waterscape in Cairo, Egypt. Inspired by the call by Ahlers et al. (2014) [18] to apply insights from wider bodies of literature to water service delivery, I focused on the bottom-up assemblage of water infrastructure in the informal area of Ezbet El-Haggana, employing the concepts of topological power (Allen, 2011 [51]; Griffin, 2012 [5]), flexible governance (Desai, 2012 [2]), and conceptualisations of the state as an effect produced in practice (Mitchell, 1991 [53]; Harris, 2012 [22]).

Another purpose of this analysis was to illuminate the rich details of what it has entailed over the past few decades to access water in informal areas in Cairo, while also exploring how this has been changing in the last few years after the political upheaval of the Arab Spring. Examining the history of water infrastructure in the neighbourhood, I found that the process of accessing water began initially as an ad hoc process of fetching water from standpipes and purchasing from water vendors, and later developed into a system of vote selling to local politicians in exchange for the installation of infrastructure. This is a process that officials were fully participant in, yet when it came to installing infrastructure legally and formally, officials within the responsible institutions objected and obstructed the process for many years. Informality, in effect, guaranteed a certain system of benefits for local politicians and Haggana's elite. Until the late 2000s, Haggana's waterscape was characterised by an overlap of various infrastructure systems—a meshwork of formal, informal, public, and private.

One starting point I addressed in this article is the recognition that binaries such as formal–informal and public–private are quite meaningless in this context. This discourse of binaries must be analysed while remaining cognizant of the benefits it allows the Egyptian state. Ahlers et al. (2014) [18] highlight the importance of understanding how states engage in "governance through authority and legitimacy creation". Applying labels such as informal and illegal is a way for the state to manipulate spaces and lives, and create the impression of a powerful external structure that masks the reality of the state's unevenness. The manipulation of discourses and imaginaries around infrastructure renders many injustices invisible, and sometimes even denied. It allows the state to benefit from its ad hoc nature while continuing to maintain its image as a powerful external structure. To maintain this image, the Egyptian state has often relied on the manipulation of discourses, but it has also heavily relied on infrastructure. It has done this through creating "shows-of-force" such as the construction of roads

and bridges, and the announcement of national mega-projects. In other words, infrastructure has functioned as one of the main instruments through which the state is produced or "affected" in the daily lives of residents.

However, infrastructure is both a delimiter and manifestation of the state. Due to this, examining the governance of water infrastructure in informal areas exposes the Egyptian state's "flexibility" and the uneven nature of its power. This flexibility is a result of the ad hoc nature of power in governance and the uneven quality of the state's authority and reach. In the post-Arab-Spring era, the Egyptian state has been adopting more aggressive policies to combat informality, even if this is through finding non-traditional ways of accommodating informal practices and incorporating them into the legal system. The state has been seeking ways to affect its presence more strongly within informal areas, and one of the ways in which it has been doing so is by incorporating "informal" users into the "formal" public water supply and allowing/forcing them to pay for water. This accommodation of informality is a way to increase the statization of informal areas, while also charging them for water usage. In this way, I find that the state's flexibility allows it to benefit from informality without having to actually "formalise" the neighbourhoods themselves or address the underlying causes of why they are labelled as informal.

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water

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Unmapped Water Access: Locating the Role of Religion in Access to Municipal Water Supply in Ahmedabad

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Abstract: Poor access to municipal water in Ahmedabad's Muslim areas has been tied to the difficulties of implementing a planning mechanism called the town planning scheme, which, in turn, have been premised on widespread illegal constructions that have developed across these sites. Residents, local politicians, and activists associate this causal explanation offered by engineers and planners for poor water access with a deliberate state-led intent to discriminate against them on the basis of religion. Using this causal association as a methodological entry-point, I examine through this paper how religious difference mediates decision-making and outcomes embodied by technical plans. Demonstrating how the uneven implementation of plans is not always a state-driven exercise as is often imagined, but instead a culmination of intense mediations between influential state and non-state actors with varying interests, I offer the following insights on water governance for sites divided by religion: (a) Negotiations driven by discourses on religious difference are a powerful force influencing the formulation of plans facilitating water access. However, these negotiations and plans are, simultaneously, also vulnerable to other political, legal, and economic pressures. Water governance across such sites thus often unfolds in an unstable landscape of unmapping and mapping; (b) influential legal actors from both majority and minority communities exert pressures obstructing the formulation and implementation of technical plans. The production of observable unmapped water access in minority areas thus, in reality, might not be contained within neat divides such as religion or illegality, but instead be a culmination of shifting interests, contestations, and negotiations confounding such categories; (c) institutionalized planning practices implicated in the intentional production of unmapping in such contexts might instead simply be discursive categories around which uneven water access coalesces.

Keywords: water politics; religious difference; infrastructure; governance; planning; practices of mediation; urban India

1. Introduction

> " … The corporation has sanctioned T.P Scheme 84(B) for our area and through the implementation of this scheme, pucca (see Supplementary Materials 1) roads, street lights, and drinking water from the Narmada have been provided in a large part of the area. Despite being part of this same T.P. Scheme, only our area with Muslim population (sic) has been discriminated against by not providing us the basic services due to us through the implementation of the T.P. This is illegal and is in violation of our basic rights … We have been deprived of clean drinking water by this biased treatment. This step of the municipal corporation is inappropriate, unreasonable, illegal, and clearly unconstitutional."
>
> - Letter by Sarkhej residents to Ahmedabad Municipal Corporation, 10 November 2015 (see Supplementary Materials 2)

> "Every time we ask them to build infrastructure, they give some excuse or the other. Like the T.P. is not final yet, it is at this stage, that stage, etc … Call it our misfortune."
>
> - Municipal Councillor, Makhtampura Ward; Interview, 5 September 2017

In September 2017, I met with a municipal councilor at the hot, dusty construction site of a new water distribution station in Ahmedabad, a city in western India, where I had been conducting research on political conflicts over municipal water distribution. In meeting him, I had hoped to understand the role of urban wards, the smallest administrative units in Indian cities, in influencing local residents' access to municipal water. His despair captured in the second quote above—of being given "some excuse or the other" in response to demands for infrastructure—came towards the end of our conversation. By this point, he had already talked at some length about the many institutional practices, which in his view, were complicit in producing selectively poor access to basic services such as water for Ahmedabad's Muslim areas. One such practice implicated in the production of exclusion by both quotes is the town planning scheme (or T.P. Scheme, as referred to in the first quote), a planning process followed in Ahmedabad entailing the pooling and reconstitution of land for building urban infrastructure. In contrast to the land acquisition method (employing the principle of eminent domain) widely practiced in other parts of India, the town planning scheme (TPS from here on) process is praised for being participatory, democratic, and equitable (for landowners), financially and politically strategic (for city planning agencies), and efficient at rapidly fulfilling infrastructure needs in general [1]. In Makhtampura and Sarkhej, two of Ahmedabad's largest Muslim areas however, the TPS is held complicit in these areas being left deliberately unmapped, i.e., for the planning and building of infrastructures providing access to basic services remaining largely missing. While the opening quotes are two examples embodying such implications, the sentiment is found widely echoed in other public interest litigations and media reports, as well as by local residents, officials, and politicians. These allegations suggest that the uneven implementation of the planning process in the city's Muslim areas is an instantiation of the state deliberately and religiously discriminating against these areas in a direct and causal way.

Critical theoretical and empirical work in contexts of observable uneven governance however has complicated the location of state-led intentionality in institutionalized planning processes. Planning in India has famously been described as "the relationship between the published plan and unmapped territory" [2] (p. 81). Urban governance here, according to Ananya Roy's powerful formulation, operates as much through an "'unmapping' of cities" as it does through more widely recognized governing technologies such as "visibility, counting, mapping, and enumerating" [2] (p. 81). The suggestion that acts of "deregulation" (an intentional lack of regulation maintained by the state) and "unmapping" (deliberate planning practices of not mapping) [2] (p. 83) are central to the implementation of planning mechanisms such as land use controls, eminent domain, masterplans, and so on (see also, [3]) lends nuance to the understanding of mapping as an instantiation of political power [4] (p. 90). If mapping is to be understood as a central tool with which to govern and control territories, so should unmapping. Indeed, this conception of unmapping as a deliberate state-directed strategy of denying access seems to provide a straightforward explanation for the opening quotes above. However, more recent empirical work in Indian cities has destabilized not only the prescription of intentionality to unmapping without a closer understanding of how and why the unmapped situation came to be, but also the notion that unmapping is a state-led exercise. Lisa Björkman [5], for instance, shows how the unmapping of Mumbai's water networks, far from being a deliberate hegemonic act of the state, was instead an inadvertent consequence of numerous technical, technological, and material planning efforts to map and govern; efforts mediated by a host of formal and informal actors. The location of state-directed intentionality within observable unmapped conditions in Indian cities, thus, remains hotly debated. How then, might the direct and causal way in which the TPS is implicated in the deliberate production of unmapping in Ahmedabad's Muslim areas hold up against this understanding?

With governance being widely understood as processes "of decision making … structured by institutions (laws, rules, norms, and customs) and shaped by ideological preferences" [6] (p. 44) and

in light of the above discussion of unmapping in relation to governance in Indian cities, how might observable unmapped access to municipal water in Ahmedabad's Muslim areas be better understood? What insights might this case offer for water governance in cities divided by religion?

The need to ask these questions is premised in concerns around political implications of direct and causal ways of examining, understanding, and explaining environmental justice in contexts of deep socio-economic differences. Pulido [7] for instance, problematizes reductive ways of defining, identifying, and theorizing environmental racism for obscuring a deeper understanding of how race comes together with other socio-political and economic forces to constitute oppressive situations. She insists, instead, on the need to deconstruct discourses and assumptions constituting a monolithic understanding of racism in order to "move to a more meaningful and nuanced understanding of what environmental racism is, how it is produced, and how an anti-racist and left movement can develop" [7] (p. 144). This inquiry into unmapped water access in Ahmedabad's Muslim areas is driven by similar worries. Reductive ways of associating uneven governance across these sites with state-led intentionality to discriminate on the basis of religion obscures how, in reality, religion comes together with socio-economic and political forces to constitute observable unmapped water access. This propensity, on the one hand, runs the risk of reproducing rhetoric, which is problematic in itself in reinforcing wider monolithic understandings of communities (see [8] for more on this). In relation, and on the other hand, it also allows easy explanations for cited impossibilities and inaction escape unchallenged, and thwarts possibilities of any meaningful change.

That religion and ethnicity influence the ability of communities to access housing and basic services is well recognized (see Supplementary Materials 3) [9–13]. Cities, as a result of their densities, networks, and the political and economic gains they stand to offer, have been noted for being predominant sites of enactment for such differential access [14] (p. 212), [10] (pp. 11–15). With visibly stark differences between urban infrastructure and housing across its Hindu and Muslim areas, the city of Ahmedabad presents itself as one such site. The spatial reproduction of Ahmedabad's religious cleavages has, in recent years, earned the city titles such as "shock city" [15], "riot city" [16], and "communalized city" [17]. Indeed, much has been written about the Muslim marginalization that Ahmedabad has witnessed, in particular since the 2002 Hindu–Muslim riots. Some of this scholarship has focused on the violence of the riots and the displacement, resettlement, formation of "ghettos", and persistent poor living conditions that have followed [18–20]. Neera Chandhoke, for instance, talks about how "in Ahmedabad, Muslim ghettos—and there is no other kind of ghetto in the city—are typed by other residents as mini-Pakistans, and the road between these sadly impoverished and denuded localities and other areas is construed as the 'border'" [19] (p. 2). Another set of studies have located the production of a socio-spatially divided Ahmedabad with evidently under-served Muslim areas within broader city-wide processes of socio-economic and political disenfranchisement of vulnerable groups in the city [16,17,21–23]. All of this work points to the politics of Hindutva in the production of Ahmedabad as a city divided along religious lines and descriptively highlights the observably poor access to urban infrastructure in these areas. Less, however, is known about the micro-politics animating the processes and practices governing access to basic services in these parts of the city. Calling into question uncomplicated implications of the TPS in the production of Ahmedabad's religiously differentiated access to municipal water supply, this is the gap I hope to fill through this paper.

Engineers, planners, and local politicians I spoke to bemoaned the inability to build roads for laying trunk infrastructure and the unavailability of plots for building water distribution stations (WDSs from here on) as the two biggest obstructions in getting municipal water to Makhtampura and Sarkhej. This impasse, in turn, is attributed to widespread illegal constructions and encroachments in these areas, which ostensibly have made it extremely difficult to plan, map, or govern these sites. According to these officials, the planning and building of infrastructures for providing basic services to many of these areas is deadlocked as a practical consequence of such illegalities. Planning neighboring Hindu areas on the other hand, presumably because of the lack of ubiquitous illegalities, is cited as being easier. As a consequence, and in contrast to the city's Muslim areas, its Hindu parts present

themselves as being significantly better networked, with water access being one site, across which differences are noted and contested.

Water access is produced through the deployment of a complex set of infrastructures that are not only physical and material things in themselves, but also constitutive of relations, desires, and promises [24]. In Mumbai for instance, Björkman [5] (p. 13) describes how " ... a water distribution main laid with much pomp and show by a politician in the run-up to an election might work as much to demonstrate a political aspirant's capacity to mobilize the apparatus of the state as it does to improve water supply to a neighbourhood". Yet, symbolic desires cannot take physical form without putting to work a range of material, physical, and bureaucratic processes. So, on the one hand, while the intentionality behind producing water access might lie in political desires of a specific kind, on the other hand, the material and physical work of producing access unfolds through institutionalized technical procedures as well as spatio-temporally specific conditions such as legalities, regulations, already existing infrastructures, what place is upstream or downstream from another, up-network or down-network, and so on. Water infrastructures, thus, operate equally across symbolic, practical, and technical registers, with access to water being mediated by physical, material, technical, technological, bureaucratic, ideological, and political processes at multiple levels [25].

Back in Ahmedabad however, the uncomplicated implication of planning processes, such as the TPS (and the development plan, as subsequent sections illustrate), in producing unmapped water access in the city's Muslim neighborhoods occludes a deeper understanding of how processes and relationships unfold across multiple registers to influence access. An inquiry into the physical, material, technical, technological, bureaucratic, ideological, and political processes that have produced unmapped water access at these sites remains missing. Questioning the causal explanations presented by allegations suggesting the deliberate complicity of planning processes in producing religiously unmapped water access, I use these implications instead as methodological entry points for explicating the relationships and negotiations embodied by planning propositions influencing water access across these sites. How, in the formulation and/or implementation of planning processes such as the TPS, does differentiated water access come into being? How, in relation to these processes, might the role of religion be better understood?

This essay draws on 24 months of qualitative research in Ahmedabad, between 2016 and 2018. It draws on insights from interviews and dialogues including those with residents, community organizations, NGO officials, ward councillors (politicians), municipal engineers and bureaucrats, planners, builders, formal and informal business owners, and academics as well as on legal, official, and media documents (see Supplementary Materials 4 for details on my methodological approach [26,27]). I begin by reviewing relevant theoretical and empirical work on water governance and access to resources in postcolonial contexts to set up a framework for deconstructing the implication of planning in producing unmapped water access in the city's Muslim areas. I then offer an overview of municipal water supply in Ahmedabad, followed by a closer look at how this unfolds in the two administrative units examined. Following this, I turn to specific physical and infrastructural planning processes and investigate their technical roles in governing access to municipal water across Makhtampura and Sarkhej alongside narratives from key actors on the formulation and implementation of these plans. My intent here is to make visible the particulars of whether and how religious difference influences practices of mediation at various points of water governance. The municipal water supply networks in Ahmedabad's Muslim areas indeed present an instantiation of unmapped water access. However, I argue that an uncomplicated implication of planning processes such as the TPS, in intentionally producing this context, obstructs a closer understanding of how such unmapping comes into being in reality. Using this premise to direct my inquiry, I show how the process of encrypting decisions within planning is a site of intense mediation between actors with varying interests located across the blurry state–non-state boundaries. Though animated by ideological preferences relating to religious differences, this process is simultaneously also vulnerable to economic, legal, and political pressures exerted by a heterogeneous set of actors across the religious divide. The account that

follows, while offering an instantiation of the multiples pressures that culminate in water governance unfolding across unstable landscapes of unmapping and mapping, thus, also complicates conventional understandings of majority–minority relations in influencing access to basic services.

2. Water Governance and Access

From a broader environmental resource governance perspective, water governance has been understood as the many "institutional arrangements, spatial scales, organizational structures and social actors involved in making decisions" [28] (p. 236), [29] regarding water resources, the flow of water, who gets to access how much water, through what mechanisms, and so on. Institutional practices produced through a codification of spatio-temporally specific sociopolitical struggles have been located as constituents of governance and determinants of access to resources such as water [30] (pp. 759–760). According to this formulation, "(b)y defining what is economically, technologically, and politically possible at particular moments", institutional practices lend "coherence and stability" to processes of water governance [30] (pp. 759–760). Institutional arrangements and practices, however, need to be understood as much in terms of objectives they ostensibly are set up to achieve, as well as practical consequences they end up producing. This inquiry, in turn, cannot be adequately conducted without, on the one hand, calling into question the ideological basis and definition of needs that such arrangements and practices are premised upon, and on the other, examining aspects of everyday life that mediate the implementation of codified institutional practices.

Regional water governance in western India, for instance, involves the institutionalization of arrangements enacted through the building of water infrastructures such as large dams ostensibly to mitigate water scarcity in the region. However, the condition of water scarcity that these practices have been predicated upon has itself been called into question with the argument that as opposed to being a natural condition, scarcity is often socially constructed and mediated by myriad socio-political interests [31–33]. In other words, as Rittel and Webber assert in their seminal work on "dilemmas" that plague planning propositions, "(t)he choice of explanation determines the nature of the problem's resolution" [34] (p. 6). The need then is to prise open naturalized conditions upon which institutional practices determining water governance are founded. Furthermore, as has been noted by Grindle and Thomas [35], the journey of a planning proposition from formulation to implementation is not linear, but rather interactive, with actors with diverse interests intervening, mediating, and influencing what gets practically implemented. Indeed, as has been demonstrated by empirical work in cities like Mumbai and Bangalore, the everyday work of producing water access—laying pipes, installing connections, and so on—is often determined by site- and time-specific socio-political and hydraulic conditions [36–38], and often the logics directing such work are not in alignment with the abstract planning logics determining how water supply planning and distribution is "conceptualized, materialized and institutionalized" [36] (p. 278). While institutional practices might well be instantiations of dominant power and interests at the time of codification, their implementation is animated by knowledge and authority serving numerous other socio-political and hydraulic interests.

This latter work, in pointing at the need to examine how codified institutional practices shaping water governance are mediated by various kinds of actors in socio-politically specific everyday scenarios, also calls for a disaggregated understanding of forces that influence water access. Water governance has been problematized for over two decades now through critiques of the widespread privatization and commoditization of water that have followed urbanization, globalization, and the growing neoliberal imagination [6,39,40]. Other work has probed water governance using analytical departure points as diverse as context-specific property rights and water rights systems [32,41], attempts at territorial consolidation [42], the violent building of dams to support urbanization [43], the role of caste on the ability to access water [44], and even the relationship between social norms around caste-related access to water to homicides [45]. Notwithstanding the diversity in their points of departure, these studies have powerfully emphasized the need for water governance to be understood through lenses of power relations, social justice, and rights [28,46]. However, for a disaggregated,

relational, and politicized understanding of water governance in postcolonial contexts, it is recent work on the everyday mediation of water access by a host of social actors across urban India that holds specific relevance to this paper.

Calling for examining water governance in terms of the conceptual "disembedding" of land and water infrastructures from socio-economic, legal, political, and hydraulic networks in which they are in reality entangled [5], this work highlights the role of myriad social actors—water mafias, water tanker operators, plumbers, local councillors, water department engineers, to name a few—in mediating water access in Indian cities [33,36,38,47]. Building on broader accounts examining the role of "the intermediary", "the middleman", "the fixer" [48], "the hustler", "the hard man", and "the wheeler-dealer" [49] (p. 15), this scholarship shows how everyday knowledge and authority are constituted, exercised, experienced, and narrated in relation to water governance in India. It instantiates broader assertions on how the Indian state cannot be thought of as a homogenous, predetermined, static entity [50] capable of exercising power on its own [51]. On the one hand, attempts at governing require the state to enlist the support of actors who would, by conventional understandings of the state, be considered non-state [52]. On the other hand, and as a consequence, actions construed and constructed as governance and typically thought to be state directed, are in reality not contained within the ambit of formal government institutions [51]. Instead, governance is posited as "the amalgamated result of the exercise of power by a variety of local institutions and the imposition of external institutions, conjugated with the idea of a state" [51] (p. 686); the state-idea being constituted by qualities, actions, authority, etc., generally associated with government institutions [53] (p. 69). As a result, in postcolonial societies with histories of highly fragmented and distributed knowledge, power, and authority, claims made by governments of being able to exercise "effective legal sovereignty over a territory and its population" are recognized for being particularly tenuous [54] (p. 297).

Accounts of water governance and access in Indian cities have unpacked relationships that residents have with "urban specialists" such as those mentioned above, who "by virtue of their reputation, skills and imputed connections provide services, connectivity and knowledge to ordinary dwellers in slums and popular neighborhoods" [54] (p. 16). In addition, and on the other hand, accounts of "informal sovereigns" talk about influential individuals who, operationalizing the same set of advantages, embody and exert discretionary powers to reward or punish illegalities, make exceptions contravening law, and so on [54] (p. 306). With water shortages increasingly cutting across class lines and legal statuses [55] (p. 499), access to municipal water supply in Indian cities is mediated by actors such as these for a spectrum of interests: From immediate to long-term profit-making or ensuring 'good business', demonstrating influence over the state apparatus, making evident the ability to offer social protection, lobbying for political interests, to managing their professional reputations [38] (p. 91). Back in Ahmedabad, it would be impossible to understand the role of institutionalized planning mechanisms vis-à-vis observable unmapped water access in the city's Muslim areas in any meaningful way without inquiring into the interests of influential individuals and the everyday knowledge and authority exercised by them in mediating the formulation and implementation of plans influencing water governance.

In advancing a 'theory of access,' Ribot and Peluso define access as " ... the ability to benefit from things—including material objects, persons, institutions and symbols" [56] (p. 153) and make the case for focusing on the ability to benefit from a resource rather than the right to do so. Their formulation presents an alternative to a rights-based, property-centric view. Legally enshrined individual rights, Ribot and Peluso point out, constitute only one set of relationships among many defining access. The ability to benefit from a resource is influenced as much by social relationships and factors such as ideological and discursive manipulations, relations of production and exchange, socially and legally forbidden acts such as theft, corruption, and so on, as by property. In other words, analyzing access requires a close examination of the diverse socio-economic, political, and material powers embodied by institutions, people, processes, and relationships that might influence the ability of people to benefit from a resource [56]. The rubric offered by this 'theory of access' is meant to help carry out an access

analysis, defined as "the process of identifying and mapping mechanisms by which access is gained, maintained, and controlled" [56] (p. 160). For the access analysis that this paper intends to engage with, two other terms defining access relations become important; control and maintenance, i.e., relations that control the access of others to a resource, as opposed to relations that maintain their access to a resource. It is important to mention here that while the different kinds of powers embodied by these categories might echo the stance of political economy on relations between capital and labor, the narrow confines of 'class' are discarded here, and control and maintenance are understood in terms of a broader set of powers that influence the ability to benefit from a resource [56] (p. 159). I turn next to the analytical possibilities these categories offer in probing how religious difference manifests in both control to and maintenance of access to municipal water supply, and locating the role of technical planning processes in influencing these relations.

3. Municipal Water Supply in Ahmedabad

Ahmedabad's history of piped municipal water supply is over a century old, dating back to 1891, with several water infrastructure projects having been built over the years to meet the city's growing needs (see [57] for more on this). Before waters from the Narmada river were brought to Ahmedabad 16-odd years ago as a result of the construction of the highly contested and contentious Sardar Sarovar Project, the city depended primarily on its groundwater reserves along with non-perennial surface water sourced from the Sabarmati river. Since 2002 however, it has grown increasingly reliant on Narmada as its primary source of water [58]. Currently, about 75% of Ahmedabad's total municipally supplied water is reportedly surface water from the Narmada (see Supplementary Materials 5).

Access to municipally supplied Narmada waters is much sought after across Ahmedabad for multiple reasons such as rapidly depleting groundwater levels in drought-prone Gujarat, and Sabarmati waters being non-perennial and having become insufficient; (see [57] for more on this), and indeed, there are numerous accounts describing the revelry in the city when these waters were first brought here (see Supplementary Materials 6 for an example). One much-celebrated consequence of an increasing dependence on Narmada waters for the city's municipal water supply has been a decreased dependence of the Ahmedabad Municipal Corporation (AMC from here on) on groundwater. According to an official document, until the year 2000, 61% of the city's municipally supplied water was groundwater, while by 2010, this had reduced to 10% [57,58]. This reduced drawing of groundwater by the AMC for municipal supplies is, however, often conflated with a general decrease in the use of groundwater. For instance, one proactive disclosure by AMC's water projects department claims that the use of groundwater in Ahmedabad would be completely stopped by 2009–2010, which would mean better health for the city's residents (see Supplementary Materials 9) [59] (p. 36),. Recent data on groundwater levels, however, belie such projections. Statistics from the Central Groundwater Board show that groundwater levels across Ahmedabad have continued to fall rapidly, not unlike the rest of Gujarat [60] (p. 2). The incongruence between AMC's projections and CGWB's findings can be attributed to two facts. First, most middle-income and higher-income neighborhoods in Ahmedabad, despite having legal access to municipal water, continue to draw unchecked amounts of groundwater from their private individual or shared borewells. Water consumption in these neighborhoods is much above the 140 lpcd that the municipal water supplied by the AMC provides for, and the gap between this need and the municipal supply is met by privately drawn unaccounted-for groundwater. Second, households that are unable to access municipally supplied water (legally or illegally) resort to drawing water from the ground, from shared or private borewells, if they have the means to. Simply put, the municipal corporation, having decreased its reliance on groundwater, needs to be disentangled from larger assumptions around the decrease in groundwater use across the city. This, in turn, calls into question the rationale behind bringing Narmada waters to Ahmedabad to begin with, and the logic of the Sardar Sarovar Dam and the Narmada Pipeline Project in extension (see [61] for more on this).

As far as municipal water supply within Ahmedabad is concerned, according to the AMC [58] (p. 11), municipal water supply in the city is directed from source to homes in the following way: (a) Source to (b) treatment plant to (c) trunk mains to (d) local water distribution stations (WDS from here on) and underground tanks to (e) residences. Moments constituting the establishment of water supply from each of these points to the next then become moments of "controlling access"; moments of limiting or facilitating access to municipal water. While the flow of municipal water from source to treatment plant influences the city more broadly, the laying down of trunk mains, building of WDSs and getting water to them, and then getting water to people's homes from the WDSs through distribution networks are locality- or neighborhood-specific issues.

4. Getting Municipal Water to Makhtampura and Sarkhej

Makhtampura and Sarkhej wards lie in the southern and south-western parts of the city, are occupied predominantly by Muslims, and are administrative units corresponding to the area that much of the scholarship on Ahmedabad's Muslim community has called Juhapura ([16] for instance). According to estimates by respective Municipal Councillors in 2018, about 95% of the population in Makhtampura ward and 50% of the population in Sarkhej ward is Muslim (see Supplementary Materials 7). Neighborhoods constituting current day Makhtampura and Sarkhej wards were included within AMC limits in 2006 as part of a larger process of expanding the city's municipal limits and incorporating a total of 259.16 sq. kms. of land from the Ahmedabad Urban Development Authority (AUDA) into the AMC. Prior to their incorporation within the AMC, these neighborhoods were part of villages, and were governed by administrative bodies called 'gram panchayats'.

The inclusion of an area within the AMC brings with it an important implication in relation to water access: the possibility of accessing Narmada waters, which, as mentioned above, are much more desirable than the groundwater that most villages and municipalities outside of AMC limits depend on. Getting municipally supplied water to flow through an area once it is incorporated with city limits requires the planning and laying of trunk mains and local WDSs, which offer neighborhood-level storage capacity, and then the building of these infrastructures. These processes, in turn, require land and roads to be identified, acquired, and developed by the municipal corporation.

Land for building urban infrastructure in Ahmedabad is made available through a two-stage planning process called the development plan (DP)–town planning scheme (TPS) mechanism and is governed by the Gujarat Town Planning and Urban Development Act (GTPUD Act), 1976. The DP is a metropolitan land-use plan revised roughly every decade by the Ahmedabad Urban Development Authority (AUDA) and serves purportedly as a "*comprehensive strategic document for the development of the city*" [1] (p. 194). The process of drafting a DP involves the identification of lands on the city's periphery where urban expansion is deemed likely, followed by the definition of uses for these lands and their rezoning based on population estimates and other projections and needs. As municipal city boundaries expand, lands rezoned from agricultural to other uses by the DP are divided into smaller areas, typically of 100–200 hectares, and detailed plans in the form of TPSs are drawn for them by relevant agencies, i.e., the AMC and AUDA [1,62,63]. The process of developing these plans involves pooling land from land owners, estimating physical and social infrastructure (roads, water distribution stations and networks, sewage plants, schools, hospitals, etc.) that might be required for the rezoned uses, deducting and reserving lands for building this infrastructure, reconstituting plots, and returning them to landowners [1] (pp. 194–198). In addition, land is also deducted during the pooling and reconstitution process towards building land banks of AUDA and AMC. This reserve land is set aside for auctioning, and sold to meet financial needs of the relevant development agency (for details of financial transactions between land-owners and the planning agency involved in this process, see [1] (pp. 198–202), [62] (p. 160). One problem associated with the supply of water and other basic services through TPSs relates to the fact that the TPS mechanism deals only with landowners; it does not engage with informal settlers. This is further complicated by the fact that the 'landowners' in question have sometimes been found to be land assemblers and speculators who might have acquired agricultural

land by forging documents, coercion and so on. The high level of discretion with which local planning officers prioritise the implementation of specific TPS as well as significant levels of corruption in the planning office are yet other issues to contend with [62] (pp. 169–172)).

The abstract planning logics driving the DP–TPS process, thus, technically influence urban water governance and control access to municipal water supply by: (a) Determining land use and zoning and typically also rezoning from agricultural to other uses, followed by (b) proposing and implementing a TPS, which includes pooling and reconstituting plots to identify and reserve lands for building roads (which would carry the trunk infrastructure and other water pipelines) and water distribution stations (WDS), and (c) defining and laying down water networks to supply municipal water from the WDSs to people's homes.

5. "There Are No Plots!"

Municipal authorities I spoke with, from both planning and engineering departments alike, cited the inability to build roads and the unavailability of plots for building WDSs as the two biggest obstructions in getting municipal water to many parts of Makhtampura. To understand this claim of "there are no plots!", it is necessary to discuss the urban history of the area.

Makhtampura started urbanizing in 1973 when flood victims—low-income Hindus and Muslims—from informal settlements along the Sabarmati riverbanks were resettled to a municipal colony here called Sankalit Nagar, built by the AMC, Housing and Urban Development Corporation (HUDCO), and a city-based NGO called the Ahmedabad Study Action Group (ASAG) [16] (p. 69). More low-income Muslim families from the walled city and eastern Ahmedabad moved and settled here after the 1985 riots and again after the 1992 riots. After the 2002 riots, even middle-class and wealthier Muslims started moving here from mixed neighborhoods of the city in search of safety in numbers [16] (p. 69). With this rapidly growing Muslim population, Hindu families moved out of the area. The current (2018) population of Makhtampura is pegged at over 400,000 by the local Councillor.

The sudden influx of people to the area meant that Makhtampura, which was for the most part zoned for agricultural use at the time, went through what might be thought of as a housing crisis. With large numbers of Muslims wanting to live here, a significant share of the post-2002 housing in Makhtampura was hurriedly built on agricultural land either bought legally and subdivided illegally, i.e., subdivided before the area was zoned for residential use, or on agricultural land subdivided after being illegally bought or forcefully captured. These subdivisions were then built upon and sold using quasi-legal documents. Consequently, much of the low-income as well as middle-income housing in the area got built under diverse conditions of illegality before the area had been zoned, planned, or equipped with infrastructure that could support basic services for a large population.

The incorporation of the area within AMC limits in 2006 has meant that people living here are now liable to pay property taxes to the AMC. In total, 30% of these taxes go towards paying for water and sanitation infrastructure. It is important to note that the AMC's collection of property tax is delinked from the legal tenure status of properties [63] (p. 5), i.e., all properties that fall within AMC limits are charged a municipal property tax. Indeed, the collection of property taxes from informal settlements by the AMC has been understood as a way of increasing tenure security of residents in such areas [63] (p. 5). For residents living in Makhtampura, having become liable to pay municipal property taxes post-2006 has also implied being able to, in turn, hold the municipal corporation liable for providing basic services, including access to municipal water supply. Actually, making municipal water access possible, however, necessitates the planning of water infrastructures—such as determining networks, laying pipelines, building WDSs—by the AMC, which, in turn, requires the corporation to take possession of roads and plots that these infrastructures can be reserved for and built on. It is this context that the planners and engineers draw on while claiming that "there are no plots" to build WDSs, nor roads to lay water pipelines.

When I asked a senior ward official at Makhtampura about this claimed lack of plots and roads to facilitate access to municipal water supply, he was visibly perturbed. While conceding that identifying

and developing plots and roads within the densely constructed areas was problematic, he drew my attention to the large stretches of land to the south of Makhtampura and Sarkhej wards on the revised Development Plan (see Figure 1) designated in part for use as "general agricultural zone" and in part reserved for "sewage treatment plants". "Agricultural zone means no residential development can be done (sic). TP can also not be done (sic) and so piped municipal water supply is not possible..." he complained.

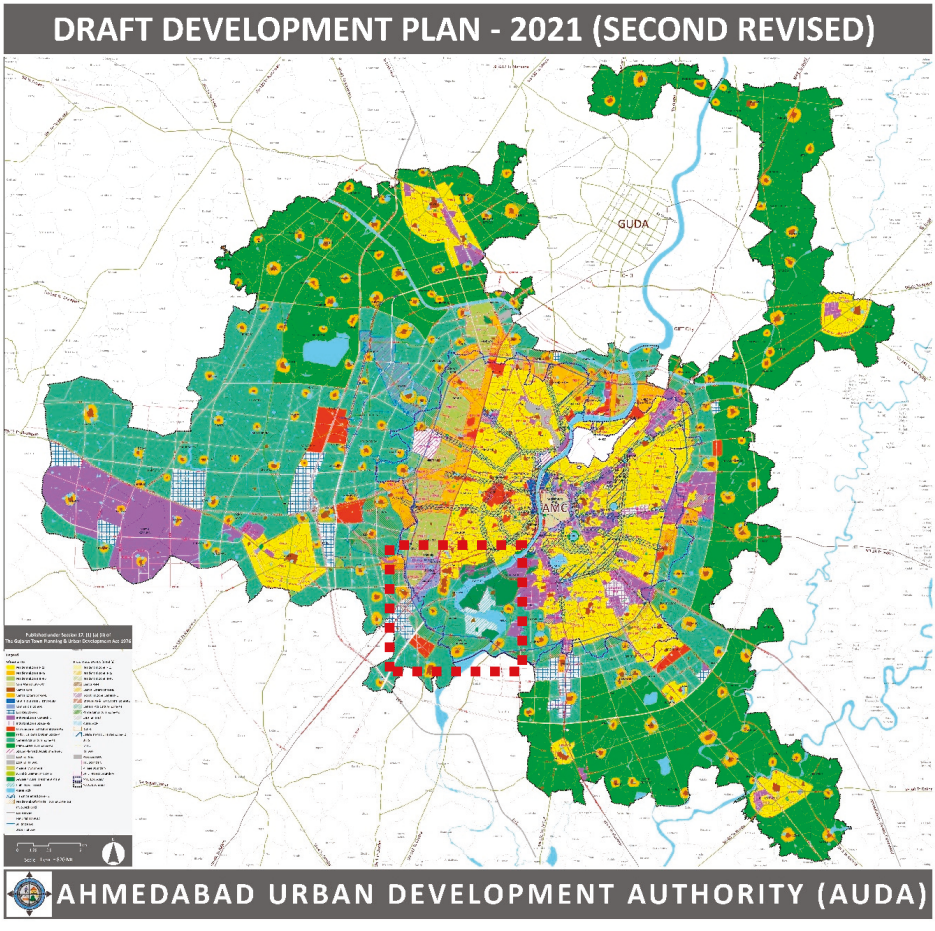

Figure 1. Development Plan, 2021, Ahmedabad Urban Development Authority: Source, AUDA. Accessible online at http://www.auda.org.in/RDP/.

A comparison of the most recent DP (for 2021, Figure 1) with the earlier DP (for 2011) shows that lands zoned for sewage treatment plants and agricultural use now, were also zoned so earlier. However, these lands are adjacent to another set of agricultural lands further west, along the corporation's periphery, which have been rezoned in the most recent DP. The zoning of agricultural lands in Makhtampura has not changed; in fact, the ward official's quarrel, echoed by the councilor, is that the zoning of agricultural lands in Makhtampura and Sarkhej has remained the same when instead it needed to have been changed in order for this planning process to attend adequately to existing infrastructural needs.

The selective possibilities presented by the DP in rezoning agricultural lands further to the corporation's periphery while maintaining zoning for lands in Makhtampura and Sarkhej, in the face of complaints by planning and engineering officials about the "lack of plots" are not lost on the ward official or councillor. On the one hand, the proposition of TPSs as well as a promised access to municipal water supply and other basic services are made possible along the periphery of the corporation limits through the rezoning of those agricultural lands for affordable housing. On the other hand, agricultural lands within Makhtampura and Sarkhej wards—wards that desperately need infrastructure for basic services and have repeatedly been denied it, ostensibly for lack of land—continue to remain zoned as before. In the words of the ward official, "How can they say there are no plots when there is so much agricultural land in the wards? They can change the zoning of that land and build public infrastructure. If they want."

Indeed, in addition to rezoning, there are a few planning mechanisms that can be implemented for re-thinking the use of agricultural lands in Makhtampura (as they have been in other parts of the city) to more sensitively accommodate the community's needs. One such instance is the 'overlay zone' category. In the general development control regulations (GDCR) published under the GTPUD Act, an overlay zone is defined as "an additional zone . . . with different set (sic) of development regulations over an established/existing base zone to regulate development in such a zone to achieve a specific set of goals defined in the Development Plan" [64] (p. 21). In other words, areas zoned using this mechanism can benefit from uses prescribed for the base zone as well as the overlay zone. The transit zone defined across the city is one such overlay zone, as is the residential affordable housing zone. The need for making exceptions for these two zones, and indeed the 'will' to do so, can be found in the introductory sentences of the note on the highlights of the DP, which celebrate the economic benefits that these two zones will offer in terms of floor area as a result of the high-density development made possible here [65]. The complaint of the senior ward engineer then is that, in contrast to revisions to the DP that cater to needs for developing transit and housing infrastructures in adjoining areas, in Makhtampura, despite the shortage of plots to build infrastructure for municipal water supply, no such exceptions have been made. It is in this context that he expresses distress for the widely circulating notion of "there are no plots!"

6. Selective and Uneven Planning?

The TPS process, as mentioned earlier, deals only with land owners and not occupiers [62] (pp. 169–172). Given the large number of illegal constructions in Makhtampura, using the TPS mechanism to build roads for laying trunk infrastructure and acquiring plots to build WDSs here has ostensibly (according to local politicians and engineers) been fraught with difficulties. The challenge in implementing the TPS process to acquire and reserve lands for planning and building physical and social infrastructure in areas with large amounts of informal construction has also been noted in a neighboring Muslim area called Dani Limda [63] (p. 18). But as the authors show in this case, Ahmedabad's planning authorities are indeed capable of going to quite some lengths to accommodate existing informal constructions (such as changing ratios where allocation of open space is concerned) and make changes to otherwise standard planning norms to map and build basic services. While there must undoubtedly be a specific set of reasons for the AMC to have made exceptions to plan and map infrastructure networks in Dani Limda, a closer look at negotiations between land owners and public authorities in Makhtampura and Sarkhej sheds light on the forces influencing what is mapped and left unmapped on the TPSs here.

One Hindu builder who owns a large share of land within the TPS that much of Makhtampura is also part of, animatedly told me about the protracted negotiations he had carried out with AUDA from 2008 to 2010 to convince the planning authority of the need to not let a major road (meant to carry trunk infrastructure) pass through his land and connect with "the minority community". Disallowing such a thoroughfare, in his opinion, while being necessary in the "interest of communal harmony", was also required because building it would "lower the value of property". Through negotiations

that he claimed cost him dearly in money as well as lands that he agreed to hand over to AUDA, he eventually procured development permission for his land based on a masterplan that protected both of his interests cited above. Accounting for the thus passed masterplan, and in agreement with his analysis that a connecting thoroughfare should be disallowed, he recounted, AUDA "had kept a buffer zone" between the Muslim area and his lands. In 2011 however, the AMC took over from AUDA as the planning authority for this area and proposed a draft TPS. The propositions of this TPS, he told me with visibly growing aggravation, disregarded the agreement that he had earlier struck with AUDA over not building this thoroughfare.

Regarded by residents who have bought homes in housing constructed by him as being an honest, liberal man, the builder's concerns seem grounded in a close understanding of the sentiments of his clientele. As one resident of the housing built by him, pointing at the high barbed wire fencing all along the roughly 4.5 feet walls of the society told me, "there are safety issues. We are right next to this (Muslim) area right? We need to be extra careful. Who knows when there might be trouble!" While barbed wire fencing mounted on compound walls is a phenomenon not limited to the city's Muslim areas (indeed this is noticeable across the city), the reason cited here, of being "right next to this (Muslim) area" is important in understanding the sentiments held and reproduced by residents of the Hindu society. Another resident, less concerned with so-called "safety issues," pointed out how being located next to the Muslim area had meant that very few Gujaratis had bought apartments in the society. This housing has primarily been bought by young, working, non-Gujarati professionals, since they "don't have that history"; the history in reference being that of the widespread Hindu–Muslim violence that Ahmedabad witnessed during the 2002 riots. Being desirable for a limited set of investors has in turn limited the real estate values of this housing.

This is the emotional and economic context that the builder seems to be drawing on while voicing his concerns for maintaining communal harmony as well as protecting real estate values and asserting his insistence on disallowing the thoroughfare. While his concerns relating to religion might well have been a key interest determining the earlier situation of unmapped water access in the neighboring Muslim areas, his concerns themselves are tied up in fears of violence expressed by his clients and echoed broadly across the city. These fears (and in turn, his negotiations with the planning authority) are tied to the builder's economic fears of reduced property values, making it problematic to assign all liability for the production of unmapped water access to religious difference alone.

The question then arising is: Why did the AMC in the proposed Draft TPS change decisions that the builder had received approval from AUDA on? An enthusiastic retired planner familiar with the area reminded me of a High Court judgement in 2010 (Nadeem vs. State: available online at https://indiankanoon.org/doc/1444997/) which ordered the AMC to "immediately and forthwith provide clean, hygienic and regular supply of drinking water and sewage facilities" to this area. At a hearing earlier that year, the AMC had been asked to present responses to the lack of drinking water and drainage infrastructures here. Presumably—the judgement implies—the AMC had responded by submitting to the court that a certain set of water infrastructures would be built by 2012. The road that the builder did not want built was critical to the construction of the now-promised WDS and trunk infrastructures. The AMC taking over as planning authority for the area and (re-)mapping the road while drafting the TPS also meant a (re-)mapping of earlier unmapped water infrastructures and municipal water access in the area. Negotiations animating what remains unmapped or gets mapped then are tied up in pressures exerted not only by influential individuals but also by public authorities such as the judiciary on formal institutional bodies, and interests driving such variegated pressures are often divergent as this case demonstrates. The process of encrypting decisions in planning propositions thus, far from being a stable one, is fraught with decision-making culminating from clashing interests.

On the one hand, this account points at the highly unstable landscape of shifting power, interests, and negotiations between influential actors (in this case, formal planning authorities, builders and legal landholders, and the judiciary) across which unmapped and mapped access to municipal water unfolds. In cities like Ahmedabad, while concerns relating to religion constitute one set of variables

producing this instability, economic interests attached to real estate values, as well as legal and political interests such as heeding directives of the judiciary, constitute other powerful factors animating this landscape. On the other hand, this is also an account of an influential actor, despite having incurred various in-kind and financial costs, being left hung out to dry as a result of instabilities arising from changes in pressures and interests among government institutions. While theoretical and empirical accounts have shown that attempts to govern often involve the state enlisting non-state actors [51], this account demonstrates how powerful non-state actors enlist the state in protecting their own interests. In divided cities, narratives related to religious difference could well be found animating and influencing such processes of enlisting support. However, the extent or success of this influence cannot be thought of as pre-defined or stable but instead as vulnerable to other interests and pressures.

Further complicating this context is the story is of legal Muslim landholders in the area not agreeing to propositions in drafted TPSs because of economic losses (or lower economic gains) the implementation of these planning decisions might imply for them. The TPS allows planning authorities to deduct up to 40% land from individual landholdings through the process of pooling and reconstitution and return the remaining land to landowners. As one influential Muslim builder explained to me, progress on the implementation of most TPSs in Makhtampura is currently at a standstill because the spatial assignment of reconstituted land parcels has not been acceptable to many landowners. In his words, "if your earlier plot was along a 30 mt road, and (after reconstitution) they relocate you along a 12 mt road, nobody is going to tolerate that! That's when you contest it." The disadvantage produced by such re-allocations is that of reduced profit. Road widths relate directly to permissible building heights and use; on wider roads, taller buildings can be built on the same plot size, and building uses can also be more diverse (see Supplementary Materials 8). Re-allocated plots on narrower roads directly affect economic interests leading to contestations, in this case between Muslim legal landowners and the planning authorities. The process of finalizing plots and roads for building water infrastructures, thus, in reality, is also tied up in legal disputes arising from such disagreements.

The instance of Muslim landowners obstructing the implementation of TPSs complicates frequently repeated allegations (such as those presented by the opening quotes of this paper) holding the TPS responsible for the production of unmapped water access based on religious difference. It shows how observable unmapped access to municipal water might well be a result of powerful non-state actors of the same religious identity obstructing the implementation of planning propositions for protecting their personal economic interests. This account then adds nuance to accounts of poor water access in Muslim areas of Indian cities (such as [33]) which assert the role of local (Muslim) influential actors in challenging uneven water access and making the state accessible. In Ahmedabad too, a number of local influential Muslim actors such as Haji Mirza, a councilor from Makhtampura, have indeed played an important role in facilitating municipal water access in the area by filing public interest litigations at the Gujarat High Court which in turn have influenced judicial directives on building water infrastructures, as well as rallying for basic services with the corporation. However, there are other equally influential Muslim actors whose economic interests are at loggerheads with the implementation of plans required for building water infrastructures in currently underserved areas and who have ended up obstructing municipal water access. This situation is not peculiar to Muslim parts of the city. Legal landholders from across Ahmedabad routinely enter into contestations with planning authorities in relation to TPS propositions for protecting their economic interests. In Ahmedabad's Muslim areas however, the easily accessible explanation of ubiquitous illegalities and the direct and causal implication of TPSs (and in relation of the state) for deliberately unmapping water access on account of religion, occludes the micro-politics that in reality animate this context.

This account renders unstable the conflation of the complaint that "there are no plots", or indeed that there are no roads, and the consequent deadlock in implementing TPSs, with illegal constructions in Makhtampura and Sarkhej. As demonstrated above, it might indeed be demands and pressures by legal land owners—both Hindu and Muslim—preventing the construction of roads and, in turn, the building of water infrastructures. Extending Gupta's assertion on corruption—that "the phenomena

of corruption cannot be grasped apart from, or in isolation from, narratives of corruption" [66] (p. 6)—I argue that the TPSs in Makhtampura and Sarkhej being suspended in animation cannot be understood in isolation from discourses, interests, and negotiations that lead to such a phenomenon coming into being. The implementation of the DP and the TPS controls—makes possible, or obstructs—the laying of trunk infrastructure and the construction of WDSs, which in turn, determines the ability or inability of a neighborhood to legally receive municipal water supply. However, the process of encrypting decisions within plans is itself a site of intense and volatile mediation unfolding across blurred boundaries of legality and illegality between actors with varying interests.

7. In Conclusion: "The Main Reason You Know, Is Political"

Developing a closer understanding of ideologies, practices, and interests animating contexts of unmapped water access in sites divided by religious difference is important since this, in turn, has implications on how the issue of problematic water access in minority areas is further addressed. In other words, if unmapped water access in divided landscapes needs to be challenged, the definition of how it comes into being is critical. This calls for the need to pay close attention to discourses and pressures mediating how an area is mapped or unmapped. Presenting an inquiry of this nature, the account of uneven water access offered here is illustrative of how decisions embodied by technical plans need to be understood as a culmination of intense mediations between influential state and non-state actors with varying interests. In divided cities like Ahmedabad, while mediations driven by discourses on religious difference might well be a powerful force influencing the formulation of plans and facilitating access to municipal water, these plans are simultaneously also vulnerable to other political, legal, and economic pressures. Water governance as a result unfolds in an unstable landscape of unmapping and mapping, with religious difference being only one variable influencing the instability.

Much of the work on access to housing and basic services in cities of the south divided by religion, insightful and instructive in its own right, has organized its inquiries across two broad registers; (1) vis-à-vis the instrumental role of religious organizations in providing these [67,68], and (2) as majoritarian groups exerting control over land and resources [13,69]. However, majority and minority groups are often thought to be divergent but homogenous in themselves, operating from ideals and interests contained neatly within confines of religious identity. The account of uneven water access in Ahmedabad's Muslim areas complicates such assumptions and shows how contestations and negotiations influencing observable unmapped conditions in divided cities might in reality be operating across religious divides. In other words, while a city might present stark physical divisions based on religion, and indeed religion might have been the basis for such divisions to have come into being historically, pressures influencing the reproduction of spatial and infrastructural differences over time might not be aligned along religious divides alone. While the Hindu builder's earlier efforts had likely influenced the persistence of unmapping in Makhtampura and Sarkhej, it is now contestations by Muslim builders and landowners constituting pressures leading to observable unmapped municipal water access. Though the former negotiations were indeed animated by emotional and economic concerns relating to religious differences, prevailing contestations are founded on economic interests of protecting real estate values and ensuring profit-maximization.

Through this inquiry, I have sought to make visible mediations constituting the backdrop for planning propositions in divided cities becoming formulated and implemented (or not implemented) in specific ways. For engineers and planners, the oft-reproduced rhetoric of illegal constructions that have developed post-2002 as a result of the sudden and large influx of Muslims to Makhtampura and Sarkhej has become an easy way of explaining away the uneven implementation of TPSs here. The impossibility of implementing TPSs, in turn, has become the official, further-reproduced explanation for observable unmapped water access. As this account suggests however, it might well be social, political, and economic concerns by legal landowners leading to the uneven implementation of TPSs. Accepting direct causality between planning propositions and observable unmapped water access

in minority areas and locating intentionality wholly (and only) in state-led actions occludes the micro-politics that, in reality, animate this context and prevents a more informed approach to where change might need to be located to facilitate better water access for minority communities.

For water governance in divided cities such as Ahmedabad then, this account points at the need to challenge uncomplicated implications of planning mechanisms in producing unmapped water access based on religious difference alone. Contributing to work destabilizing the notion of planning as a technical, static, pre-determined practice, I suggest instead the need to investigate the entanglement of planning processes with economic, social, legal, and political interests of influential actors from both minority and majority groups, and from varying locations across the blurry state–non-state boundary. Institutionalized planning practices, such as the TPS in this case, might simply be discursive categories around which uneven water access coalesces. As a veteran planner closely familiar with the area told me: "the main reason you know, is political".

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water

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Article

Anishinabek Women's Nibi Giikendaaswin (Water Knowledge)

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Abstract: This paper springs from conversations and my life experiences with Anishinabek Elders and practitioners, which includes my understanding of my life journey in re-searching for Anishinabe qwe (woman) giikendaaswin (knowledge, information, and the synthesis of our personal teachings). Anishinabek women have giikendaaswin about nibi (water) that can transform nibi (water) governance. Re-searching for giikendaaswin is directly linked to inclusive decision-making. This paper describes how Anishinabek understand and construct giikendaaswin based on Anishinabek ontology and epistemology, which includes nibi (water) giikendaaswin. This supports what Anishinabek know, how we come to know, how we know it to be true, and ultimately why we seek giikendaaswin.

Keywords: Anishinabek; nibi (water); women; governance; giikendaaswin

Nibi is one of the Anishinabek words used for the waters. It is a general word referring to all waters, including lakes, rivers, streams, rain, etc., but each individual body of water including rain has another word in Anishinabemowin (Anishinabek language). Nibi is, therefore, considered to encompass all waters and many scholars now use the term "waters" to stress the importance of the different types of water. I use the term "nibi" and "nibi governance" when specifically referring to Anishinabek giikendaaswin and use the word "water" and "water governance" when used for referencing; however, I also use "waters" to stress the understanding of the different types of water.

1. Introduction

Some scholars question Anishinabek giikendaaswin (knowledge) as a stand-alone science [1] and its validity. Anishinabek peoples have lived on the lands for thousands of years, acquiring giikendaaswin and governing themselves based on their own giikendaswin. "Indigenous peoples are the original researchers of these territories" [2]. Smith (1999) explains that the "development of western, rational, scientific knowledge was connected with colonialism and the 'discovery' of the Indigenous Others by Europeans" [3]. Similarly, Battiste (2002) indicated that knowledge production from the west constitutes a form of imperialism that disregards and erases other types of knowledge [4]. Attempting to erase the knowledge of other peoples has implications of not knowing the best sustainable practices for nibi. Kimmerer (2013) refers to western science being asleep at the wheel as rivers are contaminated [5] and, if we honestly do a brief inventory, the world is on the verge of collapse due to several factors including decision-making in nibi governance. Many activists, scientists, and Anishinabek peoples observe that water governance in Canada is in a state of crisis [6].

Anishinabek giikendaaswin can also be referred to as traditional ecological knowledge (TEK). Extensive literature was written on Indigenous knowledge since the 1980s [1]. This type of knowledge is cumulative, holistic, experiential, and dynamic. McGregor (2013) stated that it is fundamentally about relationships which includes all our ancestors, all living things, the spirit world, and those yet to come [7]. Relationships with and responsibilities to nibi are important in nibi governance. Here, I argue for responsibility-based governance based on Anishinabek giikendaaswin which is

about relationships and responsibilities. Kermoal and Altamirano-Jimenez (2016) explained that knowledge can be interrelated with territory, kinship, identity, governance, economy, and education [1]. They further elaborated that this knowledge can be crucial in managing natural resources, but it is imperative to avoid and essentialize stereotypical pan-Indigenous ways of knowing, as Anishinabek have a unique set of giikendaaswin situated to their sense of place [1]. Anishinabek Elders pursue giikendaaswin as lifelong learning willing to share for the protection of nibi. Absolon (2011) explained that "Indigenous knowledge occupies itself with the past, the present, and the future" [8], which covers the lifelong journey of learning. Indigenous knowledge comes from ancestral teachings and is as old as life; if one can listen to all life, it can transport us across planes of existence [8]. Understanding the past conditions of nibi will assist with the present to bring us into a healthy nibi future. Bell (2013) stated that Indigenous knowledge embodies the principles of sustainability [9]. Truly being sustainable is imperative for those yet unborn.

Current colonial laws for nibi are failing all peoples and nibi itself by ignoring the giikendaaswin of Anishinabe peoples. In a conversation with Elder Willie Pine, he shared giikendaaswin about nibi, about a time when he remembered being able to dip a cup into the Mississaugi River and the in-land lakes to get a drink of nibi, but today that is not so as nibi is sick. The Water Declaration of the Anishinaabek, Mushkegowuk, and Onkwehonwe in Ontario has a section on the conditions of the waters, stating how the different lakes, rivers, oceans, and streams are poisoned by "foreign economic values" violating "our sacred laws given by the Creator" [10]. The interests of capital by corporations weaponized water causing contamination [11]. Bakker et al. (2018) discussed the historical inequalities related to accessing water and how Canada's fragmented systems of water governance contributed to increased risks in water supply systems [12]. Indigenous Elders across Ontario stated that there are several reasons why Indigenous knowledge is not included or implemented in environmental decision-making. These reasons range from the lack of meaningful consultation, the fact that different knowledge systems do not necessarily align, and from the lack of trust in providing Indigenous knowledge as it was misused in the past. This lack of implementing Indigenous knowledge into environmental decision-making caused challenges and gaps in water governance [13]. Simms et al. (2016) examined the imposition of colonial governance frameworks excluding Indigenous peoples and their knowledge in water governance [14]. They concluded that existing colonial governance is fragmented, excludes Indigenous laws and knowledge, is entrenched in colonial approaches, and lacks the capacity and funding for First Nation participation [14].

There is currently a lack of gender balance in water policies, strategies, and governance. Anderson et al. (2013) suggested the current approaches discount Indigenous women, ignoring a "valuable perspective on water that could help to identify new ways of managing water . . . " [15]. The continuous ignoring of Anishinabek women is embedded in colonialism, is historic, and persists today. Todd (2016) explained the barriers linked to colonialism such as the "Euro-American" institutions that bequeath the "Euro-Western" systems and people rather than Indigenous women [16]. The historic disregard for Anishinabek women's knowledge stems from the original settlers "exploring" the lands, which were observations and experiences of European men whose interactions were based on their cultural views of gender resonating the role of women in European societies [3]. These observations and experiences by white explorers displaced Anishinabek women by trying to erase their giikendaaswin systems and legal and political realities. Many Anishinabek women are re-establishing their relationships with and responsibilities to nibi through various means such as the Water Walks, Idle No More, and water ceremonies. An Elder once told me that it is the women who will make the necessary changes to stop the destruction to nibi and the lands, but will it be too late?

The intent of this paper is to provide my understanding of Anishinabek women's nibi governance through the lens of Anishinabek ontology and epistemology. In minobimadazwin (the good life), everything is connected. Elders in ceremony explained that giikendaaswin is all encompassing of knowledge of how to live based on beliefs, following instructions, and constantly participating in the search for minobimadazwin. There is no divide between ontology and epistemology; in fact, trying

to explain these terms to Elders or language speakers is the cause of much discussion and humor. Contrasting the Anishinabek understanding of ontology and epistemology, Yates et al. (2015) described ontology as the nature of being simply, meaning that what you believe and how you live those beliefs is the way of being [17]. Meyer (2004) stated that epistemology is studying knowledge and is the way of knowing [18]. My understanding from ceremony, Anishinabek Elders, and practitioners is that the way of knowing is the way of being. These definitions divide my understanding of what it means to be Anishinabe qwe in searching for minobimadazwin; thus, I hereafter hyphenate both words in an attempt to articulate what I am conveying. This understanding is my own pedagogy, which is based on sources of giikendaaswin from Anishinabek Elders, practitioners, ceremony, literature, my family, and my infancy understanding of Anishinabemowin (Ojibway language). The insights are my reflections based on my understandings.

In particular, I convey my understandings of Anishinabek ontology-epistemology utilizing Anishinabek Elders', ceremony, scholars', and practitioners' giikendaaswin to reinforce what I have come to understand from my own pedagogy. I engage and construct nibi giikendaaswin based on Anishinabek nibi ontology-epistemology by first providing a brief background and explaining what nibi is from an Anishinabek women's perspective, re-affirming the need for collaboration on nibi governance as, in many instances, Anishinabek women's giikendaaswin is not being utilized in current water decision-making regimes. Secondly, I explain what nibi governance means and the role of Anishinabek women in nibi governance, including the importance of understanding the responsibilities with and relationships to nibi that come with nibi giikendaaswin. I articulate how that responsibility to and relationship with nibi includes sharing what we understand in a respectful way, which can contribute to nibi management policies in nibi management strategies. I conclude with how space needs to be created for Anishinabek giikendaaswin focusing on responsibility-based governance.

This goal will provide insight into humanity's relationship with nibi from an Anishinabek perspective allowing Anishinbek ontology-epistemology concepts to re-emerge. The conveyance of Anishinabek perspectives on nibi will highlight Anishinabek nibi giikendaaswin, contrasting the politics of nibi and nibi governance of colonialism and the settler understanding of nibi.

2. Indigenous Research Methods and Positionality

My positionality drives my personal interest, and my being, as an Anishinabe qwe from the Great Lakes territory and, as such, I can only speak from my understandings as an Anishinabe qwe perspective situated in a specific space. I interchangeably use Indigenous and Anishinabek as, at a global scale, people are familiar with Indigenous, but will understand that Anishinabek is one Nation of the many Indigenous Nations.

Anishinabek ontology-epistemology has protocols based on minobimadziwin (the good life). "Indigenous research is often guided by the knowledge found within. Aboriginal epistemology (the ways of knowing our reality) honors our inner being as the place where Spirit lives, our dreams reside, and our heart beats" [8]. In following Anishianbek protocols guided by the spirit within, I went to St Mary's river making an offering and asking, what is nibi governance, and how can I articulate to others my understanding of nibi governance based on Anishinabek giikendaaswin. I was reminded of the numerous ways of acquiring giikendaaswin: direct observation and experiential learning; storytelling; ceremony; learning from Elders; and vision and dreams. This re-affirmed that giikendaaswin is a "lived knowledge" and cannot be separated from "human experience and action" [19–22]. Peacock (2013) stated that "oral stories are among humankind's oldest way of teaching" [20]; thus, I look at the stories as a source of giikendaaswin for this paper. This provided me with the reminder to utilize several giikendaaswin sources, because learning from ceremony also connects us to our ancestors and spirit helpers providing "opportunities to become seekers of sacred and traditional knowledge" [23], and providing an offering is ceremony. Elders are those that acquired wisdom and are primary teachers of giikendaaswin [21], and I can utilize their giikendaaswin when speaking for nibi. Geniusz (2009) and Johnston (1982) explained that Anishinabek peoples sought

vision for giikendaaswin and guidance throughout their lives [22,24] and, when I made the offering, this was a form of seeking guidance and giikendaaswin. However, Absolon (2011) warned that, often, Anishinabek methodologies are not perceived as valid sources of knowledge within the western science world and, therefore, may not be taken seriously [8]. To counter the possibility of not being taken seriously, books, literature, and journal articles are used throughout as sources of giikendaaswin. This allows me to be in two worlds gathering giikendaaswin from all sources, providing my insight into nibi ontology-epistemology and nibi governance.

3. Anishinabe Women's Role in Water Governance

Men and women often engage in different activities utilizing different relatives (known as resources in the colonial context) and, therefore, have specific giikendaaswin. Anishinabek women have a special relationship with the waters since women have life-giving powers [25]. Kermoal and Altamirano-Jimenez (2016) state that women could provide a unique and valuable perspective in the water crisis [1]. Women have a specific relationship with and responsibility to nibi.

I participated in several Mother Earth Water Walks and was the co-lead for the Four Directions Water Walk for the northern direction in 2011. The Water Walks are led by Anishinabe Grandmother Josephine Mandamin with the intent of teaching others the importance of nibi. The Walks began with Lake Superior in 2003 and covered each Great Lake and St Lawrence, routinely covering distances of over 1000 km [7]. The goals of the Walks are to raise awareness of nibi and to change the perception of nibi as resources to spiritual entities. This movement is led by women who are fulfilling their roles to and responsibilities with the waters by engaging people to raise awareness of the spiritual and cultural significance of the waters [7]. These Walks inspired many other Anishinabek women in different communities who coordinated similar events of their own in their communities, re-establishing their relationships with and responsibilities to nibi.

Through the Water Walks and nibi ceremonies I gained a better understanding of my relationship and responsibilities to nibi as an Anishinabe qwe. I also learned of my relationship with nibi in hosting nibi gatherings for the Chiefs of Ontario. It was explained how women have the primary role in responsibilities to nibi due to our relationship of carrying a child in water in our wombs. Cave and McKay (2016) stated that "Indigenous women share a sacred connection to the spirit of the water through their role as child-bearers and have particular responsibilities to protect and nurture water" [26]. Anderson (2010) reiterated women's responsibilities to nibi and that women are known to be "carriers of water" [27]. The Water Declaration of the Anishinabek, Mushegowuk, and Onkwehonwe in Ontario states that "the Anishinabek, Mushegowuk, and Onkwehonwe women are keepers of the waters, as women bring babies into the world carried on the breaking of the water" [10]. The Water Walks raised this awareness of women's special relationship with nibi and responsibilities to nibi. Craft (2014) and Anderson (2010) quoted Elders who reiterate that women have a special connection to the waters as women have the ability to give birth through the waters, and McGregor (2001) also reiterated the responsibility women have to the waters by sharing information about the "Akii Kwe: Anishinabe women who speak for the water" [6,27,28]. The Chiefs of Ontario Report on the First Nations Water Policy Forum (2008) has several quotes from participants stating that women have a special responsibility to nibi and are the "water keepers" [29]. There is no denying women's special relationships with nibi. This special relationship that women have with nibi needs to be transmitted to the world, as more women are picking up their responsibilities to and re-establishing their relationships with nibi, with regards to how nibi governance can be transformed to better protect nibi.

The grandmothers in Anderson's (2010) paper reiterate the relationship and the connections to the sky world, and discuss women's responsibilities for the waters [27]. Anderson et al. (2013) summarized several interviews with 11 grandmothers sharing knowledge on the waters, including the importance of ceremony reiterating women's special relationship with and responsibilities to the waters [15]. Anishinabek women's giikendaaswin can provide a different insight into nibi decision-making related to responsible nibi governance through relationship-based nibi governance.

Regardless of all the regulations, policies, and agreements made under the current colonial water governance systems, nibi is contaminated. With so many agreements in place, one would think that nibi would be protected, and contamination would cease, but unfortunately that is not the case. I would suggest that part of the problem is the mindset of "water-dependent natural resources", because does this mean that humans are also water-dependent natural resources? Western science views nibi as a natural resource versus the Anishinabek view that water is life with a spirit. Von der Porten et al. (2016) explained how the two different knowledge systems have seemingly different human value systems and comparing them is "almost self-defeating" [13]. From the teachings I learned and from understanding that nibi is life, these two different knowledge systems do not mix, as they are like oil and nibi. It is apparent that there needs to be true collaboration on nibi decision-making with the two mindsets coming together to find feasible solutions for managing the inappropriate human behaviors toward nibi, including the need to have Anishinbek women contributing to nibi management policies in nibi governance.

4. What is Nibi (Water)?

The Oxford Dictionary (2004) defines water as "a colorless transparent odorless tasteless liquid compound of oxygen and hydrogen" [30]. Settler cultures are less attentive to the relationship between humans and water, and mainstream society typically sees water as a resource or a commodity [31,32], in stark contrast to its treatment in Anishinabek nibi governance. Linton (2010) explained that "H_2O consists of an oxide of hydrogen H_2O or $(H_2O)_x$ in the proportion of two atoms of hydrogen to one atom of oxygen, and is an odorless, tasteless . . . " [33]. Linton (2010) also discussed "modern water" as the dominant way of knowing and relating to water, made known as an abstract measurable quantity by reducing it to a unit—H_2O [33]. These definitions and understandings flow against Anishinabe giikendaaswin, as nibi is alive with responsibilities to life. This is the basic difference between colonial ontology and Anishinabe ontology-epistemology as Blackstock (2001) explained: "water is a meditative medium, a purifier, a source of power, and most importantly has a spirit" [34]. McGregor (2001) reiterated that "water is life" and is considered "a living-entity" [6]. Several articles also stated that water is life, water is sacred, and water is alive with a spirit [19,26–29,34–40]. This difference in understanding what nibi is is the basis of how different peoples manage, understand, and exist with nibi. Yazzie and Baldy (2018) reiterated that water is not a resource to be used by corporations but is a relative [11]. Anishinabek peoples believe that we humans are the baby of Creation with all other beings being alive and our teachers and relatives. In ceremony, I am often reminded that we are all related and everything is alive. There is a need for regenerating the waters' relations, confirming that water is a relative to Indigenous peoples [39] and is alive with a spirit. The colonial understanding of what "water" is is opposite to what Anishinabek understand in allowing nibi to manage itself as opposed to the arrogance of thinking humans can manage other beings such as nibi.

The degradation of water around the world is a pressing issue. Pal Kaur from India in his letter to the Water Voices from around the World stated that water is threatened due to industrialization, urbanization, and widespread deforestation (as cited in Marks, 2007). High Chief Vaasiliifiti Moelagi Jackson of Samoa in his letter to the Water Voices from around the World shared his view on the destruction of the waters with a specific focus on water issues on his island (as cited in Marks, 2007). The TEK Elders along the North Shore of Lake Huron stated numerous times over several years that nibi is contaminated. The United Nations recognized the conditions of the waters by declaring an "international decade of action in 2005" [39]. We know the conditions of nibi, we know the conditions are based on human activities, and we certainly have the ability to change our behaviors toward nibi, but the question remains whether we are willing to change in time to allow nibi to heal, allowing nibi to govern itself by living its responsibility in supporting all life.

Anishinaabek peoples have unique relationships with and understandings of nibi. Anishinaabek peoples are often the first to take notice of the degradation of the waters, and the first to suffer from it due to their close relationships with the waters [6,28,29]. Many Indigenous worldviews treat the

waters as both providing the source for all life and having a spirit, not something to be owned or acquired [28]. During my participation in numerous nibi ceremonies, Mother Earth Water Walks, and nibi gatherings, I heard Elders repeatedly teach about the healing powers of nibi, and women's responsibilities in decision-making for nibi. Academic research corroborates the healing powers of the waters [6,28]. Muru-Lanning (2016) referred to water as a gift with curative powers [41]. This unique relationship with and the understandings of nibi are as old as the Anishinbek peoples' existence on Turtle Island (known as Canada, the United States, and Mexico).

Anishinabek peoples believe nibi has healing powers. Nibi is "an important source of healing" and "during times of difficulty is the time to get healing from the water" [28]. I understand that nibi is regarded as "sacred" and is a "powerful medicine" with "life-giving properties" [23,27,41]. Nibi is simply not just a chemical compound from an Anishinabek ontology. Elders say that, when you are "weighed down with a lot of grief, life is becoming unmanageable, or you are going through a lot of pain, our grandmother and auntie and my mother would say go to the water" [34]. I learned through participating in nibi ceremonies, the Water Walks, and discussing nibi issues with Elders, the Anishinabe protocols and teachings about nibi including how the waters have "curative powers" [27,40], acting as medicine. Blackstock (2001) reinforced that water "heals, inspires, and prophesies" [34]. Understanding that nibi has healing powers will promote more respect for nibi in nibi decision-making.

The waters have knowledge that is passed on as "even water can communicate" [6]. Noori (2013) explained how Elder Andrew Medler explained "how water was a source of information for the Anishinaabeg" [42]. If we can understand how nibi is a source of information, the way we interact with nibi will change. McGregor (2011) also referred to water as a "relative" [25]. Nibi can teach us how to improve decision-making if we choose to listen to it communicating to us. Elders also stated "let it teach us" referring to allowing nibi to teach us [27]. Anderson (2010) shared that Maria Campbell explained how water was a teacher in her life and to look to the water for teachings [27]. If we can view nibi as one of our teachers, we should be able to allow nibi to manage itself.

From an Anishinabe ontology-epistemology, each body of nibi has its own personality and is linked to different nibi spirits. "Bodies of water are considered to have their own unique personalities" [26]. Since Anishinabek giikendaaswin is based on place, collaborating with Ansihinabek peoples is key for sound nibi decision-making. "Each of those Great Lakes we walked around has a reputation, a personality" [43]. Drawing on these can be the basis for utilizing Anishinabek peoples in nibi decision-making. Anishinabek peoples who live near nibi, in the watershed, have knowledge to share that will be more inclusive of nibi decision-making.

Nelson (2013) explained that Anishinabe are "water people" and, since "water is considered a sacred element in life", it must, therefore, be "cherished as an essential relative, elder, and teacher" [44]. Wong (2013) referred to stream knowledge not being lost [45], which can still assist the world in understanding our responsibilities to nibi. Christian (2013) explained the "kin-centric perspective" by Ardith Walkem as the Indigenous perspective of all life being related to one another [45]. These relationships with nibi as nibi people, where nibi is considered sacred, and nibi is a relative, need to be front and center in all that we do, especially managing our behaviors toward nibi.

It is very clear that nibi is life, but the power of nibi as a life-giving force and a life-taking force needs to be understood. Anderson (2010) shared that the "powers of water can be more dangerous, for, according to the grandmothers, water can offer all types of messages and energies" [27]. Elder Mary Louie (cited in Blackstock, 2001) explained that if you do not make offerings to the waters, they can take you. It is more than just understanding nibi power, it is also respecting the power through offerings. I canoe and kayak rivers and lakes and was taught by Elders to always make an offering before being on nibi. This display of respect is reciprocal to the power of nibi which then provides safe passage. One component of the Water Walks was to make an offering at each body of nibi we walked beside or crossed to show our respect for nibi living their responsibilities providing us with life. It is about being reciprocal in acknowledging nibi governance. Blackstock's (2001) paper

explained that you have to communicate with the waters from the heart and that the waters have feelings [34]. Acknowledging nibi through reciprocity by making an offering is understanding that nibi governs itself.

Elder Peter Atkinson (cited in Craft, 2014) explained that the waters have a spirit and are looked after by the spirit. Nelson (2013) explained that "Mishipizhu has always been a guardian of the waters and a keeper of balance between the water spirits, land creatures, and sky beings" [44]. Anderson (2010) discussed the significance of the waters as a spirit and the importance of honoring this spirit [27]. It is our responsibility to honor and feast these spirits for living their responsibilities in caring for nibi. It is about a reciprocal relationship. Anderson (2010) further explained how the relationship with the waters has to do with "kinship, reciprocity, and caregiving . . . " [27] and the understanding that the waters have a spirit can lead to "how relationships can be established between water and other entities" [27]. These responsibilities to nibi do not rest on Anishinabek peoples alone. Elder Mary Thomas in Blackstock's (2001) work stated "You cannot live without the waters—your body is two-thirds water" [34]. Every human and being on this planet requires nibi to survive, so it is incumbent as humans to acknowledge this relationship and live our responsibility of gratitude to nibi for life. Regional Chief Angus Toulouse in his closing remarks at the First Nations Water Policy Forum documented in the Report reminded everyone that "the future of water is our most precious gift that sustains us all—Indigenous and settlers . . . " [29]. The book Water Voices from Around the World has letters from peoples from all around the world about the waters and many declare that the waters are a responsibility of all people [39]. It has always been every human's responsibility to respect nibi by not destroying it. Collaboration with all peoples is needed to produce a reformed understanding of Anishinabek ontology-epistemology.

5. What is Anishinabek Ontology-Epistemology?

Searching for giikendaaswin is not a new concept to Anishinaabe peoples. Johnson (2010) illuminated that, traditionally, the older generation passed on its knowledge to the younger generation in many different forms [46] and that stories were "primary vessels of knowledge" [47]. Anishinabek ontology-epistemology is searching for giikendaaswin and can only come through the nuance of relationships and responsibilities. To be Anishinabek is a way of searching, a way of living, and is "deeply embedded in narrative acts of intention, perspective, and community making" [48]. Since epistemology is the study of knowledge, Meyer (2003) explained that Hawaiian epistemology is the cultural or traditional practice of knowledge based on sources found in her territory [18]. Hawaiian people are Indigenous to their territory and, thus, have the knowledge of their territory based on their culture and traditional practices including knowledge passed through generations from living on the lands and waters. This is the same for Anishinabek peoples, which means ontology-epistemology becomes the knowledge of place by a peoples' living on the lands and having relationships with and responsibilities to everything around them, including nibi. Meyer (2003) confirmed this by stating the idea of lifestyles, place, home, people, visions, and lands educates, which opens a doorway to consciousness and awareness of who people are [18].

Anishinabek giikendaaswin is considered a gift based on "reciprocity, respect, relationships, responsibility, and reflection" [5,9,21,48]. Re-searching for gikendaaswin is living ontology-epistemology through various means of Anishinabek acquisition. Anishinabek acquisition comes in many forms and arises from "multiple sources, such as direct observation, experiential learning, learning from Elders, storytelling, ceremonies, contact with non-human entities, and through visions and dreams" [5,22]. I was told that akinomaage means to draw giikendaaswin from all that is around us—the sun, the moon, the animals, the waves, the winds, the plants, and the stars. Waindubence explained at a sunrise ceremony that giikendaaswin comes from the land, stories, and ceremony, and is based on love and compassion. He explained that your name and clan provide giikendaaswin, but it is about human behaviors, relationships, laws, and actions; it is all encompassing of life and life's experiences. Nbwaakaawin is the word for wisdom, as it takes nbwaakaawin and

zaagidwin (love) to apply giikendaaswin. "When you listen, you become aware. That is for your head. When you hear, you awaken. That is for your heart. When you feel, it becomes part of you. That is for your spirit . . . it is so you learn to listen with your whole being. That is how you learn" [49]. Again, the understanding of "doing" is what we learn from; therefore, one must participate [18] and to turn giikendaaswin for nbwaakaawin, the heart is needed. Zaagidwin is love from the heart, meaning giikendaaswin can give true power when one learns to truly listen, participate, and act, and this is nbwaakaawin. This power gained is not based on colonial mindsets of gain and control, it is based on Anishinabek principles of minobimaadziwin (living a good life). Kermoal and Altamirano-Jimenez (2016) stated that Indigenous knowledge "is not fragmented into silos or categories; rather, ontologies, epistemologies, and experiences are interwoven into this system" [1] with minobimaadziwin being the goal. Anishinabek ontology-epistemology cannot be separated.

Searching for giikendaaswin is "full body, full mind"—it is the spiritual, physical, mental, and social [18]. To search is studying and learning, and is commonly coined as research in western academia. Re-search or searching is not new to Anishinabek peoples as Elders speak of the lifelong journey of learning. Absolon (2011) reiterated that "Indigenous peoples have always had means of seeking and accessing knowledge" [8]. Elder Linda Toulouse explained to me that Ndod-ne-aah-non chi-kendaaswin (I am searching for knowledge) is what all Anishinabek did and many continue to do. Dumont (2006) explained in Indigenous Intelligence that re-searching is more than just seeking giikendaaswin, it is "the intelligence of the mind, the intelligence of the heart, the intelligence of the body, the intelligence of the soul, and the intelligence of the spirit" [50]. Colonialism may have changed how we are taught giikendaaswin, how we understand giikendaaswin, how we share giikendaaswin, and how we experience giikendaaswin, but with Anishinabek re-searching their responsibilities, listening to Elders, participating in ceremonies, and the resilience of Anishinabek peoples, people are "returning to ourselves" to find giikendaaswin [22]. Anishinabek ontology-epistemology is all encompassing, reaching far beyond the typical colonial way of obtaining giikendaaswin through academic institutions. Anishinabek research methods are numerous, being as old as the peoples themselves.

6. What Is Water Governance?

Nibi governance and nibi-related decision-making is not a new concept to Anishinabek peoples, including Anishinabek women. Anishinabek Elders state that we are the waters, water is life, and the waters have a spirit [7,23,27,28,34]. Anishinabek governance is based on relationships with and responsibilities to all life which includes nibi governance. Elders state that there is "no separation between water and human beings, as we are water, and water is us; if we respect water, we are respecting ourselves" [23]. If we harm the waters, we harm ourselves. This is the basis of nibi governance from Anishinabe ontology-epistemology.

When you ask an Elder what nibi governance is, they will most likely look at you strangely, chuckle, and say I do not know. When you explain that nibi governance is "generally referred to as decision-making processes through which water is managed" [25], they will smile and provide an answer typically beginning with nibi is life. In Blackstock's (2001) article, the Elders reiterate by explaining what water is from an Indigenous perspective including the spiritual perspective [34]. They will talk about the conditions of nibi, how this affects their health and why this happened. In Joe's (2012) model for water governance, the Elders discuss the value of a watershed, cultural water use, principles guiding water use, changes to the waters, and key concerns [37]. Nibi governance to Anishinabek peoples is all encompassing, considering how nibi is treated, including the spiritual relationships and how nibi should be treated, i.e., relationship governance.

Many Elders discuss the other beings that are part of nibi governance as they are responsible for nibi. Blackstock (2001) explained that the waters have a strong spirit, which can be gentle or powerful, forgiving or angry [2]. In ceremony, we are told that everything, all life has a responsibility to each other. McGregor (2012) explained how the water purifies the earth in the re-Creation story as people

are not living their responsibilities, and harmony and balance are disrupting how the water-beings play an integral role in restoring life [3]. Maintaining balance and harmony through good relationships is nibi governance.

In all the conversations, articles, and books I read with a specific focus on nibi, the theme of how humans behave is dominant in how humans make decisions to govern nibi. Nibi already knows how to govern itself, and it lives its responsibilities to life; it is about how humans govern their relationships and selves to nibi that should the primary focus. McGregor described the Indigenous realities in relation to the waters and concluded that "water is a living spiritual being with its own responsibilities to fulfil" [25]. Often in ceremony, the Elders talk about how humans are the baby of Creation with responsibilities to all those who give their lives so we can survive, which means we govern our own behaviors allowing all other beings to govern themselves. Learning to understand and live this is wisdom and is being humble in knowing you can and should only govern yourself.

7. Implications of Nibi Governance

Control, pollution, and dispossession of lands and nibi were common tactics used by colonization to conquer Anishinabe peoples. Bakker et al. (2018) explained that creating reserves was a strategy to remove Indigenous peoples from the lands [12]. Absolon (2011) stated that "colonialism attempts to eradicate every aspect of who we are" [8], which also means an attack on our giikendaaswin systems by aiming to integrate Anishinabek into mainstream society. These attempts have dire consequences for Anishinabek peoples, as many have forgotten who they are; however, many Anishinabek peoples are returning to the lodge, learning from our Ancestors, the lands, the ceremonies, and the Elders, providing resurgence in understanding who we are, what our responsibilities are, what are relationships mean. This resurgence is providing opportunities for collaboration on nibi governance by utilizing knowledge systems from two worldviews.

The Chiefs of Ontario coordinated several meetings in relation to nibi with First Nation Elders, technical staff, and Chiefs, and the outcome of these meetings was the Water Declaration of the Anishinabe, Muskegowuk, and Onkwehonwe in Ontario. There is a section in the Declaration dedicated to the conditions of nibi with 11 points reiterating that nibi is contaminated and all life is affected by this contamination [10]. The Declaration also states that the contamination of nibi is due to the "intervention of non-Indigenous people" [10]. This intervention on nibi is not allowing nibi to live its responsibilities. It is obvious there are two different mindsets about nibi. Indigenous peoples all over the world believe water is life. The colonial mindset believes nibi is a resource to be used and wasted based on human needs alone. In order to stop the destruction of nibi, it is necessary for current nibi decision-makers to stop making decisions based on the colonial mindset and to ask Anishinabek women what needs to be done.

Christian (2013) discussed how it is imperative for all people to literally track the waters, as this is what will bring us to an understanding of how each of us is connected to one another and to the waters to which we belong [45]. Anderson (2010) shared the grandmothers' statements that "we are water, and we need water to stay alive" [27]. It is apparent that all life depends on nibi, but nibi does not depend on human existence. If humans were eradicated from this Earth, all life would continue to function and live their responsibilities; if nibi disappeared or simply stopped living its responsibilities, human life would perish. Reconnecting to nibi provides a better understanding that we are all connected to nibi, allowing for a better understanding of how to share nibi with all life.

The current government regulations and laws allow nibi to be poisoned, which is in direct conflict with Anishinabek Nibi giikendaaswin. Bakker et al. (2018) explained that regulatory injustices affecting water security for Indigenous peoples is due to competing jurisdictional priorities between different levels of governments [12]. Elders shared stories of water contamination and how this affected the health of their peoples [27]. Anishinabek women are willing to share their giikendaaswin based on their relationship with and responsibilities to nibi to find solutions to the current nibi crisis. Anderson et al. (2013) provided a solution to the current water management strategies by stating "understanding

Aboriginal women's perspectives is critical in the formulation of water management strategies . . . because women are considered the holders of 'water knowledge' and assume a primary role in the protection of water resources" [15]. McGregor's section of the Chiefs of Ontario Submission to the Walkerton Inquiry discussed the spirituality of water, the importance of Aboriginal water knowledge, and how the colonial system oppressed Aboriginal knowledge through broken treaties, environmental injustices, residential schools, and dominant policies; she provided examples of Anishinabe women who speak for the waters and how Aboriginal peoples are willing to share their knowledge as solutions to reform water management policies and strategies [6]. Muru-Lanning (2016) outlined various ways for a new system of water management which respects the Indigenous peoples of the area and provides an understanding of how the waters are ancestral [40]. Barlow, in her letter to Water Voices from Around the World, discussed that "water will be nature's gift to humanity to show us the ways of peace" (as cited in Marks, 2007, p. 29). Scholars more recently discussed what meaningful collaboration for water governance looks like by identifying opportunities for reform and water justice, and offering practical solutions to inform collaborative water governance [12–14,36]. Telling governments and nibi decision-makers to utilize Anishinbek women's giikendaaswin is not new, the question becomes when will the space be created to collaborate on nibi governance?

Nibi can govern itself; it is the human behavior toward nibi that needs to be governed. I have come to understand from teachings and ceremony that nibi will continue to flow and live its responsibilities in governing itself. Anderson (2010) shared the grandmothers' statements that "we are water, and we need water to stay alive" [27]. With humans relying on nibi, there is a demand to refocus our understanding of human's responsibilities to and relationships with nibi. In ceremony, we are told that everything out there knows its responsibilities; it is us humans that have forgotten our responsibilities; however, as we return to the lodge, our responsibilities are being picked up and acted upon. Our relationships with nibi are being renewed, which provides opportunities for collaboration and better water decision-making.

8. Conclusions

It is obvious there are two different ontologies and epistemologies, i.e., worldviews, toward nibi and nibi governance. Indigenous peoples all over the world believe water is life. The colonial worldview is based on water being a resource to be used and managed based on their human needs alone. McGregor (2001) stated that the waters are "viewed as a natural resource rather than a gift from the Creator" [6]. The colonial mindset allows nibi to be poisoned with the arrogance that it is infinite and can be treated with another poison so that it is fit for human consumption. The Water Declaration of the Anishinaabek, Mushkegowuk, and Onkwehonwe in Ontario has a section on the conditions of the waters, stating how the waters are poisoned by "foreign economic values" violating the "sacred laws given by the Creator" [10]. In fact, there are several Declarations from around the world that asserted Indigenous views and giikdendaaswin about the waters, all referring to the immediate need for Indigenous peoples and their giikendaaswin systems to be included in water governance. McGregor (2011) discussed how Anishinabek peoples regard western water management approaches to be lacking by themselves to address the challenges the world, countries, cities, and communities are facing [25]. Anishinabek peoples provided Nibi Declarations, scholarly articles, and actions to express their concerns on the lack of nibi decision-making and the state of nibi; however, is the non-Indigenous world ready to read, to understand, listen, and participate to truly stop the destructive behaviors toward nibi? Will a space be created to collaborate?

Anishinabek peoples sustained themselves and nibi for thousands of years. Travers (2016) reiterated that Anishinabek peoples had sound stewardship over the Great Lakes [51]. There is a need for respect for different cultures, to be mindful of our actions toward the waters, and to rebuild and acknowledge the Indigenous perspectives on the waters [44]. Christian explained what cultural interface is and the conscious efforts that will be needed to welcome Indigenous people's knowledge providing reform for water decision-making [44]. In too many instances, water governance is primarily based on one dominant culture, not allowing for collaboration from multiple perspectives

and knowledge systems. If intellectual space for Anishinabek knowledge is made, opportunities to collaborate on water issues can be solved [1]. Von der Porten (2018) explained that, despite "30 years of grappling with the question of integration", little changed; thus, it might be wise for non-Indigenous environmental practitioners to find ways to support Indigenous peoples in making decisions about their territories [13], which includes nibi decision-making. True, meaningful collaboration with Anishinabek women's knowledge systems will be a new and different way for nibi-related decision-making.

Our relationships need to be reciprocal in all that we do; we need to be grateful and "check our own behavior (not manage the behavior of our relatives through such paradigms as natural resource management)" [51]. Doerfler (2013) explained that we have to "remember our responsibilities to both our ancestors and to future generations; learning about our past and acting accordingly is an act of survivance" [52]. When a person can listen to the lands, this provides "visceral, hands-on, embodied experiences of a reality not made by human thought"; some people refer to these experiences as "ecoliteracy" [52]. Nibi governance for Anishinabek peoples is about listening to nibi, and living our responsibilities to and maintaining our relationships with nibi, which provides another way for nibi governance.

Anishinabek women have specific giikendaaswin stemming from their relationships with and responsibilities to nibi. Anishinabek women have special connections to nibi through their roles as child-bearers, and the giikendaaswin that Anishinabek women have can provide a different insight into nibi decision-making relating to responsible nibi governance through a governance of our relationship with nibi. Regardless of the attempts to erase this giikendaaswin, Anishinabek women through zaagidwin maintained these relationships and responsibilities and are willing to share to transform nibi governance.

The waters are a common ancestor to all humanity and all life. Maru-Lanning (2016) stated that Tupuna Awa literally means "river with ancestral power" [40]. There is a movement to educate all peoples of nibi as a commons. Barlow (2001) promoted the waters as a commons; "it belongs to everyone and to no one exclusively and must be passed on to future generations in sufficient volume and quality" [31]. Nibi as our common ancestor requires all humanity to re-learn their responsibilities to and re-establish their relationships with nibi by understanding that "water means life" to everything and every being. Rakhmonov in his letter to Water Voices from around the World stated that dealing with the water issue will "benefit people the world over" reiterating the fact that water is needed by all humanity and all humanity must come together to preserve the waters for future generations (as cited in Marks, 2007, p. 9).

In order to re-center the political view in new and different ways in relation to nibi decision-making, uses, and management, Anishinabek women need to be involved in collaboration with other cultures. An educational reform is needed to inform people of the Anishinabek ways of living with nibi, which will contribute to the future of how nibi is regarded and governed. The understanding of Anishinabek ways of living with nibi is old, but will be "new" to many current water decision-making regimes. It is urgent that the "new" understandings of politics and governance in relation to nibi be accepted, as nibi is not infinite; rather, nibi is needed for all life to sustain itself, and we are nibi.

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Article

Indigenous Processes of Consent: Repoliticizing Water Governance through Legal Pluralism

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Abstract: While international instruments and a few state governments endorse the "free, prior and informed consent" of Indigenous peoples in decision-making about the water in their traditional territories, most state water governance regimes do not recognize Indigenous water rights and responsibilities. Applying a political ecology lens to the settler colonialism of water governance exposes the continued depoliticizing personality of natural resources decision-making and reveals water as an abstract, static resource in law and governance processes. Most plainly, these decision-making processes inadequately consider environmental flows or cumulative effects and are at odds with both Indigenous governance and social-ecological approaches to watershed management. Using the example of groundwater licensing in British Columbia, Canada as reinforcing colonialism in water governance, this article examines how First Nations are asserting Indigenous rights in response to natural resource decision-making. Both within and outside of colonial governance processes they are establishing administrative and governance structures that express their water laws and jurisdiction. These structures include the Syilx, Nadleh Wut'en and Stellat'en creating standards for water, the Tsleil-Waututh and Stk'emlúpsemc te Secwépemc community assessments of proposed pipeline and mining facilities, and the First Nations of the Nicola Valley planning process based on their own legal traditions. Where provincial and federal environmental governance has failed, Indigenous communities are repoliticizing colonial decision-making processes to shift jurisdiction towards Indigenous processes that institutionalize responsibilities for and relationships with water.

Keywords: water governance; politics; law; decision-making processes; governmentalities; UNDRIP; free; prior and informed consent; FPIC; groundwater; environmental flows; environmental assessment

1. Introduction

Conflicts between nation state governments and Indigenous peoples often manifest as disputes over water governance [1–4]. Two recent and high profile examples from North America that have attracted international attention are the clashes over approval of pipelines across the traditional territories of multiple Indigenous communities. The Standing Rock Sioux, whose reservation spans North and South Dakota in the United States, oppose the Dakota Access Pipeline in multiple fora, including through occupation of the pipeline route [5] and in court [6]. In Canada, the Tsleil-Waututh and other First Nations along the Trans Mountain pipeline route between the provinces of Alberta and British Columbia have opposed the twinning of the pipeline due to potential impacts on the environment [7], and specifically water [8], also challenging federal government approval of the environmental assessment in court [9].

In both of these conflicts the nation state governments—at the federal, state or provincial levels—maintain that they consulted with the Indigenous communities through state-initiated processes such as environmental assessment. In turn, the Indigenous communities articulate the governance standard as one of "free, prior and informed consent", a component of the United Nations Declaration on the

Rights of Indigenous Peoples (the UN Declaration or UNDRIP) [10], that reflects Indigenous people's laws and water governance responsibilities that predate colonization. These tensions about Indigenous sovereignty and the right to a healthy ecology manifest as issues of consultation and consent: The state depoliticizes decisions about water by directing them into administrative processes like environmental assessment while Indigenous communities are repoliticizing water governance by creating evaluation processes that reflect their own legal traditions and standards.

The framework of settler colonialism—the way that colonization occurs across a geographic landscape through the control of land and people [11]—channels Indigenous rights challenges to decision-making about the environment into state-based administrative and legal processes. These processes define how Indigenous peoples can interact with water governance by a state or government within their traditional watersheds and establish the boundaries or scope of the conversation. State processes, such as environmental impact assessment, may mandate consultation with members of Indigenous communities about the potential impacts of a proposed project on their ways of life, but is typically limited to evaluating the project apparatus and not cumulative or broader watershed impacts. More fundamentally, state-prescribed environmental and natural resource decision-making processes do not provide a fora within which Indigenous communities can address the method of governance itself, and how their own laws, governance practices and rights are expressed.

Participation in state consultation processes creates legitimacy in, and reliance on, those activities that serves to depoliticize the decisions at issue [12,13]. Problems with the scope and scale of governance are channeled through narrowly-defined administrative practices, which validates the process of decision-making while controlling the means by which opposition to a project is expressed [14]. In effect, consultation can channel and dissipate dissent, thus depoliticizing these processes and rendering them administrative exercises rather than addressing the underlying issues about who is making decisions and has authority to govern a watershed. To repoliticize, therefore, is to break out of state-sanctioned consultation processes to challenge the very basis of decision-making. It is to affirm the complex, multiscalar and political nature of environmental governance. In Mouffe's view, debate in the public sphere and a consideration of alternatives are required elements of repoliticization [15] (p. 147). Therefore, the term repoliticizing in this context refers to Indigenous communities rejecting state processes and creating their own interventions in a public way to shift the authority for and jurisdiction over water governance.

Water governance scholars are increasingly exploring the necessity of including traditional knowledge and values in water governance, and identify the importance of enriching ontological understandings about water and socio-ecological relationships in decision-making about water [16] (pp. 216–217) [17–19]. However, the focus on using traditional knowledge and values as inputs to governance processes can uncritically accede to state frameworks of decision-making [20,21]. Von der Porten et al. caution against using Indigenous knowledge systems as an input into Eurocentric decision-making processes [22]. Water governance conflicts cannot be resolved by greater consideration of traditional knowledge or Indigenous worldviews without addressing the locus of decision-making and attending to its depoliticizing tendencies.

Indigenous opposition to environmental decision-making is a challenge to the settler colonial basis of water governance and the state's assertion of authority to make unilateral decisions about traditional territories [23,24]. While the state may take note of customary or Indigenous water rights, colonial water laws—enacted by the various levels of governments of nation states—are presumed to have authority [25–27]. In this context, Indigenous peoples are restating their inherent legal and governance authority [28–30]. This authority predates settler law and, in many places, continues to operate but at a scale and with a level of transparency that is not obvious to public and state processes [28,31].

Indigenous laws are place-based [23] (p. 202) and take as their starting point a healthy environment [16] (p. 15). Borrows links the reconciliation between state and Indigenous peoples with reconciling with the

earth [32]. Indigenous laws and perspectives embody a concern for the integrity of the entire connected environment [33,34], not just a small portion of a watershed where a project is located.

These statements of Indigenous jurisdiction and calls for ecological governance occur contemporarily in the context of the UN Declaration or UNDRIP, which sets out principles for redressing the structures of colonization and lifting up inherent Indigenous jurisdiction. However, one standard, that of free prior and informed consent, is the element of the UN Declaration that Indigenous peoples have adopted most strongly as the basis for state-involved activities on their traditional territories (Article 32).

Both Indigenous peoples and some colonial governments have committed to implementing the UN Declaration. The Government of Canada removed its permanent objector status to the UNDRIP in 2016 [35,36]. In addition, the Province of British Columbia supported the adoption of the UN Declaration in 2017 [37], and expressions of this commitment began emerging soon after [38]. For example, the provincial government is requiring companies with aquaculture licenses to obtain the consent of First Nations in whose traditional territories fin fish net pen facilities operate before the province will renew licenses that expire in 2021 [39].

While the principle of free, prior and informed consent has received significant attention [40–43], scholars and others have not deeply addressed its governance implications in legally pluralistic contexts where Indigenous legal orders operate alongside or in priority to state legal systems [44–48]. Even in the Arctic, where modern land claims establish co-management structures that incorporate collaborative or consensus decision-making [49,50], decisions are often application-driven in response to development proposals.

The purpose of this article is to highlight contemporary disjunctures between state water governance processes that reinforce settler colonialism and Indigenous legal processes that incorporate free, prior and informed consent. While state governments may adopt the language of free, prior and informed consent, they continue to use the same administrative processes of consultation that depoliticize water governance. In contrast, Indigenous communities are repoliticizing decisions that affect watershed health and are establishing their own processes of consent as appropriate expressions of the UN Declaration in practice.

Within the context of fragmented water governance in Canada, the example of the new groundwater licensing regime in British Columbia, an extension of settler colonial jurisdiction, is contrasted with Indigenous initiatives that circumvent state-initiated and narrowly defined water and natural resource governance processes. Relying on their own laws and procedures, Indigenous communities are repoliticizing water governance by using the principle of free, prior and informed consent to reject proposals for natural resources development and create their own water management and governance frameworks based on Indigenous legal traditions. I use the term Indigenous in this article as meaning the peoples who governed across territories before European settlers arrived in what is now known as the nation state of Canada. Canada's constitution defines "aboriginal peoples of Canada" as Indian, Inuit and Metis peoples [51] (s 35), and that term, therefore, arises from state or colonial law. The terms state or colonial law refer to provincial and federal Canadian law, which is in contrast to the Indigenous law and legal orders of the Indigenous peoples across Canada. Finally, the term First Nation refers to the political organizations that represent groups of Indigenous peoples in their interactions with the state.

2. Fractured Governance

As with many countries around the world [16,52], the settler colonialism critique maps onto the political ecology of water governance in Canada. While settler colonialism is the process by which Europeans took over territory and attempted to replace Indigenous peoples [53], political ecology focuses on the economic, political and social forces that significantly determine ecological outcomes [54,55]. Not solely a matter of science, ecosystem health depends on power over decision-making and control over the activities in a watershed, where scale is important [56] and links to decolonization are beginning [57]. The political ecology of water governance, therefore, addresses the confluence of relationships, or "hydrosocial

territories" [58], that exert power and influence decisions about water. The critique of settler colonialism and the political ecology of water both highlight structures of inequality: who has control over decision making and the ecological outcomes of those decisions, particularly in relation to Indigenous communities who rely on and have a relationship with specific waterbodies.

In Canada, water governance has focused almost exclusively on authorizing water use, with little attention given to the underlying ecological conditions of watersheds [59]. This pro-diversion bias manifests in "little to nothing being done on EFN" [environmental flow needs] [60] (p. iii), both in terms of scientific understanding and enforceable regulation [61,62]. The lack of science on watershed function has resulted in over-allocation in some areas and no ability in law to retract or amend existing licensed allocations [63]. There is little adaptive capacity in water licensing regimes in Canada [64], which provincial governments are just starting to address [63,65].

The absence of a nuanced ecological context makes environmental governance an exercise in reinforcing the pro-diversion focus of water law. Decision-making occurs when a project or application triggers an evaluation of potential impacts. There are no fora through which to address cumulative effects on a watershed scale or changing ecological conditions. Governance manifests as administrative allocation decisions that lack oversight of their systemic ecological and legal implications, with this critique being more pronounced regarding water use for oil and gas activities [66–68].

These ecologically inadequate water governance regimes map onto settler colonialism in two primary ways that serve to further depoliticize decisions about water. The first relates to the connection between healthy ecological systems, particularly hydrological, and the conditions necessary for the exercise of aboriginal rights and Indigenous laws. The ability to practice aboriginal rights such as fishing, hunting and gathering are predicated on functioning ecosystems. Absent an aboriginal right to water that secures the underlying ecological basis of other aboriginal rights, those other rights are subject to erosion at a watershed scale when natural resource-specific decision-making occurs on a case-by-case basis.

The second obvious way that the political ecology of water governance in Canada maps onto settler colonialism is the depoliticization of governance through the framework of aboriginal rights. Since 1982, the Canadian Constitution has "recognized and affirmed" aboriginal and treaty rights [69] (s 35). Courts have interpreted the purpose of this recognition as the "reconciliation of the preexistence of Aboriginal societies with the sovereignty of the Crown" [70] (para 31) [71] (para 186]. However, 35 years of jurisprudence has evolved the practice of reconciliation between state governments and First Nations into one largely of procedural consultation and not substantive outcomes. While courts adjure that reconciliation should occur through negotiated settlements [71] (para 186), its daily framework is one of the Crown or state having a duty to "consult and accommodate" First Nations [72] (paras 20–35), [73] (paras 54, 63). The federal and provincial governments must justify activities that infringe aboriginal rights [74] (para 1109), [75] (para 119).

Most of the contemporary court decisions on aboriginal rights are limited to asking whether or not the Crown has fulfilled its procedural duty to consult and accommodate, and accept impacts on or infringement of aboriginal rights as justified [76–78]. Accommodation often takes the form of economic accommodation through impact benefit agreements [79,80], and provincial jurisdiction for land and water governance is relatively unconstrained [81,82] (para 50) except in a few unique areas such as the Tsilhqot'in Nation's aboriginal title lands [75,83] on the island archipelago of Haida Gwaii [84], or in the north [49].

The critique of aboriginal rights as a procedural framework for reconciliation spans from legal to Indigenous resurgence scholars. Evaluating how Canadian courts have developed the jurisprudence of aboriginal rights, Borrows notes their constrained interpretation of the historic evolution of aboriginal rights and how it is out of step with other areas of constitutional law [85] (pp. 129–131). Scholars' advocating sovereignty identify the "neocolonial politics of reconciliation" [86] (p. 110) as deepening settler colonialism [87] (p. 43), including through channeling dissent into consultation processes [29] (pp. 204–209).

While consultation is clearly not consent [88], there is no court identified nor proactive statutory acknowledgement of Indigenous water rights in Canada [89]. Likewise, historic and modern treaties either do not address water rights or governance, or fit treaty rights to water into the state allocation system [63]. This is in contrast to the United States where, since 1908, courts have recognized federal Indian reserved water rights with a priority date based on the creation of land reservations for tribes [90,91], even if they have not resulted in the availability of sufficient useable water for those communities [92]. Modernized water laws in Canada, such as the new *Water Sustainability Act* (WSA) in British Columbia, continue to assert state ownership and governance authority in the "property in and right to use" fresh water [93] (s 5).

In this context, water governance conflicts escalate as consultation on water license applications or environmental assessments are the only fora through which to address concerns about cumulative effects, lack of environmental data, or aboriginal rights [94,95]. The public and political concept of free, prior and informed consent has not infiltrated these administrative processes. A contemporary manifestation of these characterizing weaknesses of water governance regimes in Canada—lack of meaningful ecological baseline for water use and failure to acknowledge Indigenous rights to water—is the recent groundwater licensing exercise in British Columbia.

3. Example: Groundwater Licensing Under the *Water Sustainability Act*

British Columbia became one of the last jurisdictions in North America to mandate groundwater licensing in 2016 when it brought the WSA into force by enacting the *Groundwater Protection Regulation* [93] (s 219), [96]. The context for groundwater regulation in the most westernmost province in Canada is one of insufficient groundwater data such that scientists have inferred aquifer vulnerability using a "conservative approximation of groundwater use" because most volumes are unreported [62] (pp. 4–5, 41–43). Even with this conservative approach, Forstner et al. estimated that almost 20% of aquifers are stressed, most of which lie in the driest and most populous regions of the province with concentrated agricultural and other groundwater uses (p. 74). At the same time, while the provincial environmental flow needs policy contemplates groundwater, it does not assist decision-makers with evaluating aquifer impacts [97] (p. 6).

The strengths of the WSA are its linking ecological systems through law, in this case requiring the consideration of impacts to surface water in watercourses and connected groundwater in aquifers. There is also benefit to overriding the blunt common law "right of capture" regime - which ties virtually unrestricted groundwater use to overlying property rights - with more specific statutory regulation [98] (pp. 367–8). However, the province chose to insert existing groundwater use into the historic surface water licensing system and give priority to groundwater licenses based on the date of the first use of water. This approach reinforces colonialism in water governance. The state did not acknowledge Indigenous interests in water and governance of their traditional territories, and First Nations are still consigned to the "consultation and accommodation" processes. As this consultation occurs on a license-by-license basis, there is no forum in which each First Nation can address cumulative impacts or water governance.

As a starting point, the WSA confirmed the pre-existing surface water license regime that relies on historic licensing to determine priority for water use amongst users. Called prior allocation, the "first in time, first in right" (FITFIR) regime pin points the seniority of water use as of the date the province granted a license (s 22). As with other FITFIR regimes around the world, more senior water license holders with older rights can continue to use their allocation of water in times of shortage and more junior water rights holders on the same system must cut back or cease taking water. The most senior water rights holder can continue to use their full allocation in law, subject to the WSA, regulations, and conditions in the license or administrative orders (s 8).

Acknowledging the connection between surface and groundwater (see, for example, sections 15 on environmental flows, 22 relating to seniority of water rights, or 46 dealing with introducing foreign matter into a stream), the WSA establishes the legal structure for the complex task of inserting

existing and new non-domestic groundwater uses into the FITFIR system that had previously only applied to the taking of surface water. Making it an offence to divert water from an aquifer without a license [s 6(1)], the WSA permits those who are currently using groundwater to continue to do so but requires them to apply for a license when told to (s 140) while exempting domestic users from obtaining a license [s 6(4)]. Thus, when the provincial government brought the *Water Sustainability Regulation* into force in 2016, it directed all non-domestic users to apply for groundwater licenses by 2019 [99] [s 55(1)], which gave them 3 years to apply for a license. A decision-maker may direct that an applicant for a groundwater license give notice to the affected license holders, riparian owners and landowners [93] (s 13). The WSA does not specify any process for First Nations.

The WSA explicitly acknowledges the difference between existing groundwater use and new groundwater use by mandating that decision-makers consider the impact of groundwater licensing decisions on surface water and environmental flow needs for new licenses where an aquifer is hydrologically connected to surface water (s 15). However, the *Water Sustainability Regulation* exempts existing groundwater user applicants from that same scrutiny [s 55(4)]. The WSA also protects existing groundwater uses by requiring provincial decision-makers to consider an application even where regulations designate an aquifer as having insufficient water in it [s 135(3(b)].

The final piece of the groundwater licensing regime's unique treatment of existing groundwater users establishes a license priority based on the time of first use. Existing non-domestic groundwater users obtain a license with a date of priority that is the "person's date of first use in relation to the diversion and use of water from the aquifer" [99] [s 55(5)], [93] [s 14(3)]. The new law inserts existing groundwater users into the FITFIR surface water license priority regime. In effect, groundwater users will take precedent over both surface and groundwater users if they started using water earlier than other licensees.

Accepting, as-of-right, existing groundwater use into the provincial water license system raises several water governance issues. For existing surface water licensees, they could be faced with being junior to new groundwater licensees, and thus, have a lower priority position in times of water shortage. From a more systemic perspective, the provincial government is assuming that existing groundwater use is sustainable and that aquifers can supply existing users at current rates. There is no cumulative effects analysis for the water balance in a watershed or in an aquifer.

From the perspective of Indigenous communities, this approach in provincial law to maintaining historic groundwater use and granting groundwater licenses without evaluating cumulative effects or ecological capacity undermines a meaningful evaluation of potential infringement of aboriginal rights and fails to meet any free, prior and informed consent yardstick. In addition, administrative consultation and accommodation with First Nations' pursuant to aboriginal rights occurs on a license-by-license basis, which also avoids systemic challenge to the water governance weaknesses of the groundwater licensing process. Consultation involves the provincial government sending First Nations a groundwater license application, background information and an aquifer classification sheet that may be 20 years old. Based on this information, a First Nation is asked to evaluate whether that particular license will have an impact on their aboriginal rights. Absent an accurate definition of environmental flows and a basic understanding of the interaction between surface waters upon which fish rely and aquifer recharge, as well as a cumulative effects framework for analysis, it is not possible to determine that any groundwater license, as applied for, will not adversely affect aboriginal rights.

Perhaps more fundamentally, the WSA does not acknowledge aboriginal rights to water or provide enhanced government-like status to Indigenous communities over stakeholders or affected parties in water governance. The current manifestation of water governance through the groundwater licensing process echoes the criticisms leveled at the water law reform process. First Nations and First Nations' organizations continually pointed to the need for meaningful engagement and consultation on the legislative proposal for the WSA and underscored that short timelines for providing input do not build effective partnerships for governing the province together [100,101]. First Nation leadership organizations reiterated their call for a framework, such as a memorandum of understanding, through

which First Nations and the province could work together on a government-to-government basis to acknowledge aboriginal rights and title to water in BC, and address the flawed provincial assertion of jurisdiction over water while working towards reconciling responsibilities for water, including groundwater [102–104]. First Nations clearly identified their role in water governance in a legally pluralistic state:

> Furthermore, the Province must not assume that it has sole jurisdiction over water, nor that it is the sole authority to delegate management of the water in our traditional territory. Water issues transcend jurisdictional boundaries and are not the responsibility of just one governing body. Despite our prior submission stating that First Nations must be in full partnership with other jurisdictions with an interest in water governance, this approach still continues to be ignored. [105]

Scholarly analysis of the provincial government's multi-stage consultation process on the WSA concluded that the public consultation model used was incapable of addressing the specific concerns of Indigenous communities and privileged existing rights holders [106]. Even if the provincial government was not willing to acknowledge the unique status of Indigenous communities within a prior allocation water regime, First Nations governmental standing within the Canadian state warrants treatment within the WSA as a government-to-government relationship that is qualitatively different than any other water user or stakeholder. While the WSA offers the potential to create new relationships through delegated authority [s 126(c-d)], none of the creative water governance tools in the Act are aimed at Indigenous-Crown or -state affairs.

The experience of these conditions of water governance for Indigenous communities in BC—the disconnect between ecological conditions and real-time decision-making, and continued treatment as a quasi-stakeholder that is consulted on an application-by-application or license-by-license basis without acknowledgement in state law addressing natural resources—has contributed to Indigenous communities renewing their assertions of authority over their lands and waters in their traditional territories in new ways. They are redefining political and governance processes by declaring their own Indigenous laws that mandate ecological and procedural outcomes. They are inserting new governance processes into state administrative activities beyond the narrow mandate of "consultation and accommodation" that serve to repoliticize water governance using the language of consent. They are embracing free, prior and informed consent as an international standard against which they hold Canadian governments, and are, therefore, repoliticizing consultation by adhering to consent as ongoing collaborative governance processes and not a one-time action.

4. Repoliticizing Water Governance Authority

The lack of substance to aboriginal rights and the continued systemic ignorance of Indigenous rights to water—including through groundwater licensing in BC—has contributed to First Nations' adoption of the language of the UNDRIP and free, prior and informed consent. Moving beyond the state-based language of aboriginal rights, Indigenous communities are repoliticizing environmental assessment" and license allocation, which are, fundamentally, water governance decisions. First Nations are asserting Indigenous rights in response to natural resource decision-making. Both within and outside of the colonial governance processes, they are establishing administrative and governance structures that express their water sovereignty and laws and repoliticize the legitimacy of state natural resources decision-making. These structures include environmental flow regulations, community assessments of proposed mining and pipeline facilities, and watershed planning. While taking different approaches, these activities are intended to move these First Nations towards watershed governance processes that incorporate free, prior and informed consent parallel to colonial laws.

The first approach to repoliticizing water governance involves declarations of Indigenous law. First Nations are repositioning their authority beyond state-defined aboriginal rights by relying on the UN Declaration and their own Indigenous legal traditions to declare their expectations for behaviour

and responsive action within their traditional territories. The Okanagan Nation Alliance adopted the Syilx Nation Siwɬkw (water) Declaration in 2014 as a statement of their water law [107]. Similar in principle to the Lakota creation story that identifies *Mni Woc'oni* (water of life) and internationalized by the Standing Rock Sioux action to stop a pipeline through their territory in 2018 as "water is life" [108], the Siwɬkw (water) Declaration locates water as a relation and as life, recognizing water as the connector of relationships, health and resilience. This places the Syilx people in a position of having duties and responsibilities to ensure siwɬkw can maintain all of these relationships (pp. 1–2). The Siwɬkw (water) Declaration also points to mismanagement of water by state government, such as overallocation of water through licensing (p. 3), and asserts jurisdiction over the territory:

> The Syilx Nation governs our lands and siwɬkw. Any external process for any proposed use of siwɬkw or lands within our homelands must be premised on our unextinguished Syilx Aboriginal Title and Rights, which includes the right to decide how the lands, siwɬkw and resources of our Territory will be used. Any activities within and around our siwɬkw will be lead by the Syilx Nation and carried out with the participation of Syilx Nation members in accordance with Syilx laws, customs and practices ... The provincial and federal governments do not have jurisdiction or ownership of lands and resources within Syilx Territory. (p. 5)

An application of the Siwɬkw (water) Declaration is the Syilx Nation (as represented through the Okanagan Nation Alliance) project with the Okanagan Basin Water Board and provincial government to define environmental flow needs and critical flows for 19 streams in the Okanagan watershed [109]. In addition to developing new methodologies for environmental flows in the watershed [110,111], the intent is to establish environmental flow needs and critical flows parameters that the provincial government will use in drought management and water licensing decisions [109].

Another example of the application of Indigenous laws is the Yinka Dene 'Uza'hné (hereditary chiefs) of the Nadleh Wut'en and Stellat'en First Nations stating their water laws in their own language and then translating those legal principles into water management policies [112,113]. Proclaimed as "the first aboriginal water management regime" [114], the management policies, as "expression of our living governance and laws" [115] (p. 1), set water quality and quantity parameters for activities in the traditional territories of the Nadleh Wut'en and Stellat'en First Nations. In operation for only two years, staff of these First Nations confirm that the provincial government has taken the standards into account in forestry decisions and incorporated them into permits for mining activities [116]. The background information to the policies indicates that proponents and the provincial government will need to obtain the consent of the Nadleh Wut'en and Stellat'en First Nations, with consent including agreeing to be bound by the policies [114].

The second approach First Nations are taking to repoliticize water governance is by using Indigenous laws and procedures to review projects proposed in their traditional territories. Rather than responding to colonial administrative processes such as environmental assessment, First Nations are evaluating large-scale natural resource projects through their own processes and a lens of free, prior and informed consent. The Tsleil-Waututh Nation adopted a Stewardship Policy in 2009 as part of its "initiatives to restore and rebuild our stewardship role" [117]. Based on Coast Salish legal principles [118] (p. 52), the Stewardship Policy provides direction for governments and proponents on meaningful consultation, the purpose of which is to achieve informed consent (pp. 6, 11). The Tsleil-Waututh Nation used the Stewardship Policy as a framework through which to conduct its own environmental assessment of the Trans Mountain pipeline expansion proposal. This process included evaluating the potential negative impact of the project on natural and cultural resources and, if those impacts did not exceed "Tsleil-Waututh legal limits" [118] (p. 50), then assessing the project's community benefits. In rejecting the proposed project, the Tsleil-Waututh concluded, in part, that:

> . . . if implemented without Tsleil-Waututh consent, the proposal denies Tsleil-Waututh and our future generations control over a critical decision about our territory, in violation of Tsleil-Waututh law. [118] (p. 86)

Similarly, the Stk'emlúpsemc te Secwépemc Nation undertook a community assessment of a mine proposed for their territory. The process involved the Nation exercising its own Indigenous environmental governance by establishing a community assessment panel composed of elected Chiefs and councilors, as well as 26 elders, youth and individuals appointed by families [119]. Based on Secwépemc laws and governance structures, the assessment methods used the principle of "walking on two legs" that relied on both Secwépemc and Western knowledge [119] (p. 3). The assessment report opens with the statement "the Stk'emlúpsemc te Secwépemc Nation (SSN) does not give its free, prior and informed consent to the development of lands and resources at Pipsell (Jacko Lake and Area) for the purposes of the Ajax Mine Project" [119] (p. 1).

The final approach that First Nations are using to repoliticize water governance is taking a collaborative approach to establishing frameworks for comprehensive watershed governance. The Cowichan Watershed Board is a unique partnership between Cowichan Tribes and the regional government to address governance issues, including salmon survival, drought, and flooding and water quality, at a watershed scale in collaboration with other agencies and stakeholders. Working through the Cowichan Basin Water Management Plan and targets for ecological function, the Board recently adopted the Cowichan Tribes principle of *Nutsamatkwsyaay'ustthqa'* ("we come together as a whole to work together to be strong as partners for the watershed") as one of its guiding principles [120] (p. 8). Another example is five First Nations of the Nicola Valley—the Coldwater, Lower Nicola, Nooaitch, Shackan, and Upper Nicola Bands—signing a memorandum of understanding (MOU) with the Province of BC in 2018 committing to undertake a pilot project on watershed management [121]. Notably, the parties acknowledge this MOU as a "government-to-government partnership to develop and pilot a governance structure to sustainably manage water resources within the Nicola Watershed" [121] (p. 2).

The agreement reads as an expression of dual jurisdiction where the Province of BC, a state or colonial government, recognizes the inherent jurisdiction of the First Nations "arising from their respective legal traditions and governance systems" [121] (p. 2). The First Nations view the "new water collaborative governance approaches" as a first step towards reconciliation between their legal jurisdiction and authority, and state jurisdiction (p. 4). The MOU goals contemplate working within three legal traditions—two Indigenous (Nlaka'pamux and Syilx) and one colonial or state (provincial) —to develop and recommend a governance approach for sustainable water management. The MOU identifies a variety of legislative approaches that may inform the government-to-government relationship, but points to Nlaka'pamux and Syilx laws informing those state legal tools (pp. 5–6). Finally, the parties to the MOU also commit to implementing UNDRIP (p. 2).

In repoliticizing water governance, First Nations are bypassing the restrictive framework of consultation and accommodation afforded by aboriginal rights in Canada and asserting their Indigenous laws, rights and governance processes in multiple ways. The Syilx, Nadleh Wut'en and Stellat'en Nations are translating their laws into a Western scientific framework that can interact with state water governance while also repoliticizing provincial government decisions about licenses and authorizations. The repoliticization occurs through establishing publicly accountable parameters for provincial decision-making where the Indigenous communities develop or co-create the framework based on their own laws. As an expression of legal pluralism, the sole authority for environmental flow needs or water quality does not rest with the First Nation or the provincial government, but is accessible to and embedded in hybridized Indigenous-colonial watershed processes.

Repoliticization is also occurring through the practice of Indigenous governance and legal processes in response to proposed natural resource development projects. The Tsleil-Waututh and Stk'emlúpsemc te Secwépemc Nations rejected the state's environmental assessments in favor of their own community assessment processes carried out pursuant to their governance and legal

authority as Coast Salish and Secwépemc peoples. Rather than providing input as a stakeholder to the environmental assessment process or providing a response to a consultation request from state governments, the Nations publicly declared that they did not give their free, prior and informed consent to the proposed projects [122,123]. They relied on international norms for consent and heightened the transparency in the decision-making processes by making their assessments a matter of public debate.

Finally, five Nicola First Nations are repoliticizing water governance by embedding their own laws and expectations about consent in joint water governance processes with the provincial government. They have shifted the jurisdictional foundation upon which a watershed pilot project rests to one that includes both Indigenous and colonial authorities, with a commitment to creating a governance structure to address sustainable water management. This approach clearly surpasses the "consultation and accommodation" framework required under Canadian law and embeds free, prior and informed consent as an implementation goal.

5. Conclusions

Free prior and informed consent is being used as rhetoric and a depoliticizing practice by nation state governments, but is also as a tangible standard by which First Nations are repoliticizing decisions about their territories. In a global context, this repoliticization of water governance by Indigenous peoples is occurring across many spatial and temporal scales. In the United States, Tribes continue to expand the scope of Indian reserved water rights in the context of federal and state law. For example, the case of *Agua Caliente Band of Cahuilla Indians v Coachella Valley Water District* confirmed that the Tribe has federal reserved groundwater rights and a right to use that groundwater that takes precedence over the state's water allocation regime [124]. At the same time, the Standing Rock movement initiated by the Standing Rock Sioux in opposition to the Dakota Access Pipeline is a declaration of free, prior and informed consent and the broader demand for a role for Indigenous communities in water governance. In New Zealand and pursuant to the Treaty of Waitangi created in 1840, a modern expression of that treaty relationship is seen in the legal personhood status awarded to the Whanganui River [125]. The River has its own legal representation in water governance processes as an ancestor of the Maori iwi (Indigenous community).

The language of free, prior and informed consent has provided Indigenous communities in Canada with a common international standard through which they can address failures in water governance such as inadequate attention to ecological conditions like environmental flows and exclusion of Indigenous rights to water. First Nations are adopting free, prior and informed consent as a framework through which to evaluate proposals using their own legal and governance processes. Not only do these Indigenous legal processes repoliticize decisions about water on Indigenous terms, but also transform water governance by integrating Indigenous methodologies [126].

These three types of examples from British Columbia could be labeled by what Yates et al. identify as *ontological conjunctures* where water governance embraces multiple water ontologies [18]. In performance, these expressions of Indigenous law and legal processes challenge state worldviews and practices that manifest as administrative tasks in natural resource decision-making and create space for debate about water governance. They also repoliticize water governance by publicly asserting locally legitimate processes and results. Importantly, Indigenous peoples use these approaches as more than simply stakeholders or "hydrocitizens", which are people living in relation to water [127]. They act as Coast Salish or Secwépemc or Carrier citizens whose laws direct them to take responsibility for the health of their ecosystems for future generations.

While consent is incorporated into Indigenous-lead administrative processes (Nadleh Wut'en and Stellat'en) and evaluation of mining and pipeline proposals (Stk'emlúpsemc te Secwépemc and Tsleil-Waututh), state governments have not incorporated free, prior and informed consent into regular consultation and decision-making processes. The groundwater licensing regime in BC is a clear example of the disjuncture between the state's commitment to free, prior and informed consent and ongoing administrative and legal procedures that continue in the settler colonial tradition.

To overcome the potential for free, prior and informed consent to act as a depoliticizing force, it requires forethought by Indigenous communities about how their Indigenous laws can establish both substantive and procedural standards for activities within their territories and waters. The provincial government's incorporation of the Nadleh Wut'en and Stellat'en First Nations' water quality standards into state permitting processes and the Nicola Bands concurrent Indigenous laws' process for developing a water sustainability plan offers some possibility for the convergence of diverse water ontologies and legal processes.

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Review

Spatio-Temporality and Tribal Water Quality Governance in the United States

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Abstract: Hydrosocial spatio-temporalities—aspects of water belonging to space, time, or space-time—are central to water governance, providing a framework upon which overall hydrosocial relations are constructed, and are fundamental to the establishment of values and central to socio-cultural-political relationships. Moreover, spatio-temporal conceptions may differ among diverse governing entities and across scales, creating "variability" through ontological pluralism, as well as power asymmetries embedded in cultural bias. This paper explores spatio-temporal conceptions related to water quality governance, an aspect of water governance often biased toward technical and scientific space-time conceptions. We offer examples of different aspects of spatio-temporality in water quality issues among Tribes in the United States, highlighting several themes, including spatiotemporal cycles, technological mediation, and interrelationship and fluidity. Finally, we suggest that because water is part of a dynamic network of space-times, water quality may be best governed through more holistic practices that recognize tribal sovereignty and hydrosocial variability.

Keywords: water quality; Indigenous water; spatio-temporal; hydrosocial; water governance

1. Introduction

This paper explores spatio-temporal conceptions related to tribal water quality governance. Our discussion opens with two water contamination incidents involving the Navajo Nation and the Mohawk community of Akwesasne in order to draw attention to the "watery networks" in which tribal water quality governance is embedded [1,2], as well as ontological differences and the inherently political, colonial, and decolonizing processes associated with these networks [3–8]. We then examine spatio-temporality in tribal water quality governance by focusing on three themes: spatio-temporal cycles, technological mediation, and interrelationship and fluidity paired with related water quality examples involving the Nez Perce Tribe, Miccosukee Tribe, and Isleta Pueblo. We conclude by revisiting the original Navajo Nation example, suggesting that tribal water governance discussions, and even broader water governance literature, may benefit from applying a spatio-temporal lens. Boelens [9], notes that "water is the symbolic and material power linking time, space and place." Linton and Budds [1] write that water and society "make and remake each other over space and time." While space and time are central to hydrosocial discussions, spatio-temporalities themselves have received little explicit attention.

1.1. Tribal Water Quality Governance

On 5 August 2015, an Environmental Protection Agency (EPA) contractor accidentally released pressurized water above an old mine adit, spilling 300 million gallons of contaminated mine materials into Cement Creek, which flowed downstream into the Animas River [10,11]. La Plata County, Colorado, declared a state of emergency as the Animas River turned yellow and acidic with heightened levels of copper, manganese, zinc, lead, mercury, and arsenic [11,12]. Flowing at one to two miles per hour, contaminated water from the Animas emptied into the San Juan River in the state of New Mexico and reached the Navajo Nation, which declared a state of emergency on 12 August, stating that the incident was, "causing unknown health risks to our people, and water used by the Navajo people for irrigation, livestock and free roaming animals, disturbing the Navajo way of life" [13]. Navajo Nation President Russell Begaye issued a public service announcement warning affected chapters (local government units) to refrain from drinking or diverting water from the river, irrigating, and feeding it to livestock and pets [14]. Begaye threatened to sue Gold King Mine and the EPA on August 8th [15]. On 19 August, the EPA declared that water quality in the San Juan River had returned to pre-event conditions and was again usable for irrigation [16]. However, citing concerns over heavy metals settling in river sediments, President Begaye refused to lift irrigation restrictions. The Navajo Nation's Shiprock Chapter announced it would close canals for a year, despite the costs and efforts of hauling water, and the likelihood of losing crops [17,18]. On 21 August, President Begaye allegedly ordered police to confiscate 16,000 tanks of water delivered to communities to alleviate water shortages because of water contamination in the tanks [19,20]. He additionally advised Navajo people not to sign Standard Form No. 95, allegedly distributed by the EPA, regarding the waiving of claims for damages and injuries [21]. "I am furious," Begaye stated, and a local farmer noted, "We can't be compensated for all the prayers that was given to that water of life" [18].

This incident underscores how water, through its inherent dynamism, is connective within networks of governing entities, including tribal governments, the federal government (particularly the EPA), state governments, local governments, and the judiciary [22]. In this particular case, the U.S. EPA, the Navajo Nation executive branch, Navajo chapters, and the judiciary are connected in water quality governance networks. Such interconnectivities between governing entities—what Dennison terms "colonial entanglements" [23]—characterize water governance. Networks of water governance vary across cultural and physical geographies [24], between distinct water rights doctrines [25], and as a result of different treaties [26,27] and water settlements [22]; yet the common implication is that tribal water governance is not isolated, but rather connected to other governments through complex "watery" networks. Such networks are within, and produce, what Kevin Bruyneel calls a "third space of sovereignty," in which tribal governance "resides neither simply inside nor outside the American political system but rather on these very boundaries, exposing both the practices and contingencies of American colonial rule" [28]. Diver argues that water quality governance represents a productive "third space of sovereignty" for Tribes because networks connect the gains made by Tribes to other entities. As such, tribal water quality governance is both a territorial governance strategy and an extra-territorial strategy [29].

In the U.S., one significant network associated with tribal water quality governance relates to the Clean Water Act's (CWA) Treatment in a manner similar to a State (TAS) provision [29–36]. TAS was first applied to the CWA through 1987 amendments, in which Congress acknowledged the capacity of tribal governments in water quality planning, monitoring, and implementation, such that federally-recognized Tribes may now apply for and receive TAS. The EPA, a federal regulatory agency, determines TAS status and approves standards and other water quality control measures, just as they do for state governments. Currently, only 60 federally-recognized Tribes have been approved to administer their own water-quality standards program, and 44 Tribes have had their water quality standards accepted, or fewer than ten percent of eligible Tribes [37–39]. The Navajo Nation has TAS status and received approval to administer a water quality standards program in 2006, the same year that EPA approved its water quality standards [37].

Significantly, definitions of water quality, methods of determining water quality, and responses to water degradation are not always shared [6,24,40]. As the incident above described, President Begaye refused to lift water restrictions for the Navajo Nation when the EPA announced that water quality had returned to pre-event levels, and even local Navajo chapters did not respond homogeneously to contamination concerns. Such acute water contamination, often resulting from industrial, mining, urban, or agricultural pollution, raises complicated proprietary and regulatory issues for tribal governments and Indigenous groups vis-à-vis federal, state, and local governments [33]. Tribal governments are forced to maneuver ways to resolve the impacts of such pollution, while simultaneously exercising jurisdictional influence, both on and off the reservation [22,30,35,41].

We offer a second case to illustrate the significance of political organization and ontological differences within the complex networks that imbricate tribal governments and Indigenous organizations. In 1958, New York Power Authority and Ontario Power Generation jointly constructed the Robert Moses-Robert H. Saunders Power Dam [42]. Low-cost hydropower generated by this dam supported industry development, including General Motors (1958), Reynolds Metals (1959), and Dominion Tar and Chemical (1961), located upstream and upwind of the Mohawk community of Akwesasne [40,43]. These industrial facilities produced significant amounts of contamination, including polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), phenols, and volatile organic compounds (VOCs) [43,44]. In 1986, the Health Service for the St. Regis Mohawk Tribe issued fish consumption advisories [40], and in later studies between the Akwesasne community and the State University of New York (SUNY), Albany identified contaminants passing from water to fish to humans [40,45–47]. A number of tribal governments and Indigenous organizations strategized ways to combat pollution, including the Mohawk Council of Akwesasne and the St. Regis Mohawk Tribe, the Akwesasne Task Force on the Environment, the Mother's Milk Project, the Traditional Mohawk Nation Council of Chiefs, and the leadership of Mohawk scientists in the Saint Lawrence River Institute [43]. Moreover, some members of this network emphasize not just water quality as determined by measurement and assessment of water in a particular place at a particular time, but by the level of disruption in the moral relationships that create the fabric of Mohawk societies [48,49]. For example, Arquette et al., emphasize, "When considering true risk, social and cultural impacts must be included with toxicologic and ecologic factors" [50]. Arquette, Cole and the Akwesasne Task Force on the Environment write, "The scientific view is that specific forms of damage have resulted from the accumulated harm caused by the damming of the river and its resulting industrialization. Our view is that as a consequence of these actions, the reciprocal relationships between human beings and non-human nations have been negatively affected" [51]. Elizabeth Hoover describes both physical and cultural health consequences of breaking the relationship between fish, "whose duty it is to cleanse the water and offer themselves as food", and humans, "whose role it is to respectfully harvest these fish" [40]. Moreover, contamination spreads beyond just water and fish as pollutants are absorbed in medicinal plants, which in turn leads to traditional health care providers not recommending these as natural remedies [52]. Inextricable linkages between human health and environmental health—viewing the quality of water and quality of life as related—call attention to fundamentally different ontologies associated with water quality governance networks. For example, while the EPA has been active in site remediation and fish consumption advisories, both Hoover [40] and Arquette et al. [50] call for more nuanced approaches to risk assessment with greater emphasis on cultural context and less emphasis on streamlined techno-scientific analysis. In addition, from a political standpoint, this example shows how tribal governance of water quality is embedded in colonial processes (such as industrial development), along with efforts to decolonize [3–8].

1.2. Space and Time in Indigenous Ontologies

Space and time, and their connection as space-time, create a fundamental fabric of reality, as well as a practical concern of daily life. Conceptions of time and space are diverse among Indigenous groups and perhaps impossible to thoroughly represent or interpret through a different language and culture. Regardless, we offer a few rough sketches from scholarly literature. Northern Arapaho space-time is a "four-stage-four-direction order that synthesizes linear and circular motion within the same space-time" [53]. Aymara people use the word nayra (eye/front/sight) as an expression for the past, and qhipa (back/behind) for the future, and thus gesture forward when referring to the past and backward when referring to the future [54]. Residents of the eastern Australian Aboriginal community Pormpuraaw use directional terms (North/South/East/West) instead of what English-speakers refer to as right or left and time progressions are represented from east to west, as an English timeline would move from left to right [55]. The Yupno of mountainous Papua New Guinea conceive of the past as downhill, the present as located with a speaker, and the future as uphill in a non-linear temporality, reflecting the local topography [56]. Like the Yupno spatio-temporal constructs, some chronologies do not track time as a linear flow of the past, present, or future [57]. The Anishinaabemowin (Neshnabémwen) expression aanikoobijigan (yankobjegen) means both ancestor and descendant, so the speaker is linked simultaneously to future and past generations through spiraling time [58]. Finally, in Maori, the words space and time are the same [59].

Several Indigenous scholars emphasize that altering such fundamental conceptions of space-time is a critical component of Euro-American colonization processes. With regard to time, Vine Deloria [60] wrote, "It is debatable which factor was most important in the destruction of tribal ceremonial life: The prohibition of . . . traditional rituals . . . or the introduction of white man's system of keeping time." Regarding space, Linda Tuhiwai Smith [59] emphasizes, " . . . indigenous world view, the land and the people, have been radically transformed in the spatial image of the West. In other words, indigenous space has been colonized." The collision/combination of Euro-American and Indigenous space-times has resulted in hybrids, desynchronizations, divergence, resistance, evolution, and adaptation [61] or spatio-temporal colonial entanglement [23,62]. These dynamic space-times are central—and often invisible—to governance dynamics, associated with networks that connect tribal governance processes to "a more comprehensive universe that entails critical values and potencies in which governance is grounded" [63].

2. Spatio-Temporal Themes in Water Governance Literature

2.1. Spatio-Temporality in Tribal Water Quality Governance

Focusing on spatio-temporality, we have identified three central themes through which to examine tribal water quality governance: Spatio-temporal cycles, technological mediation, and interrelationship and fluidity. In the following discussion, we describe each theme and then connect the theme to a tribal water quality governance example. We continue to draw on these examples to illustrate governance networks, ontological pluralism, political colonial processes, and decolonization using a spatio-temporal lens.

2.2. Spatio-Temporal Cycles

Cycle is defined most generally as a series of regularly repeated events, though the term carries disciplinary nuances [64]. In Earth sciences, "cycle" refers to processes of movement and transformation; for example, the Oxford Dictionary of Geology and Earth Sciences defines the hydrologic cycle as "the flow of water in various states through the terrestrial and atmospheric environments" [65]. Linton, and others [66–69] examine the historical roots of this term, note its limitations, and use the term "hydrosocial cycle" to acknowledge and emphasize the importance of social processes in dimensions of water. Linton and Budds define the "hydrosocial cycle" as "a socio-natural process by which water and society make and remake each other over space and

time" [66]. The following discussion embeds itself in this broader context, in which combined social and physical processes shape, and are shaped by, the flow of water [69] in cyclic or repeated ways over space and/or time.

Cycling may take place on large or small spatio-temporal scales [70,71] and involve synchronous or asynchronous patterns in social relationships with water [72,73]. This cycling may involve annual processes such as, for example, toxic contaminants in streams that cycle seasonally [71] or increased water temperatures related to anthropogenic climate change, which affect fisheries [74]. Governance processes, rather than bio-physical processes, may also drive cycling, such as those involving environmental impact statement procedures as dictated by the U.S. National Environmental Policy Act (NEPA) [75] or judicial appeals processes [76]. More pointedly, cycles may circulate within networks of socio-natural systems with ontological and political dimensions. We offer the following tribal water quality example involving mining impact on water quality and the Nez Perce Tribe.

Water Quality Governance Example: Stibnite Gold Project and the Nez Perce Tribe

In September 2016, Midas Gold submitted a plan proposing new mining and milling activities in a historical mining district of West Central Idaho. "The Stibnite Gold Project" involves National Forest System lands, and specifically, the Payette National Forest, within an area open to mineral extraction under the General Mining Act of 1872. The project aims to extract four to five million ounces of gold and 100–200 million pounds of antimony over an approximate 20-year construction and operations period [77].

On 9 October 2018, the Nez Perce Tribal Executive Committee passed a resolution formally opposing the Stibnite Project [78]. The Tribe expressed concern about the environmental and cultural impacts of mining operations, including the effects of a proposed open pit mine, 100 million tons of toxic mine tailings, and 350 million tons of waste rock to be stored at the site in perpetuity. The site, which has been intermittently mined since 1902, is located in the Nez Perce aboriginal territory, where the Tribe maintains treaty rights ensuring tribal use of usual and accustomed places [79–81]. The South Fork of the Salmon River, downstream of the mine, supports a culturally significant salmon fishery; the Tribe spends over 2.5 million dollars each year on hatchery supplementation, fishery research, and watershed restoration in that area to support salmon populations impacted by prior mining practices [78,81].

A comparison of the Nez Perce Tribal Executive Committee resolution to oppose the Stibnite Gold Mine [78] and Midas Gold's Stibnite Gold Project Plan of Restoration and Operations [77] illustrates several examples of spatio-temporal cycles associated with mining and water quality. First, the Tribe links proposed Stibnite activities to disruption in cyclic patterns associated with networks that sustain water quality-salmon-Nez Perce relationships. Salmon and water quality are both critical to Nez Perce culture. As a medicine, water flushes toxicity from stream systems, animals, and people; and cold, clean, high altitude water (which characterizes water at the Stibnite site) is valued over lower elevation warmer waters, in part because it supports salmon, which are central to Nez Perce ideological and material foundations [79,82]. Nez Perce people have maintained traditional fishing cycles—and governance that ensures the continuance of these cycles—for generations, with regard to fish harvests of tribal members [79], for example, and the development of multi-million dollar fisheries programs [81]. In a whitepaper developed to increase knowledge about the Tribe's interests and activities in and around the Stibnite Gold Project area, the Tribe emphasizes mining threats to water quality and salmon [81]:

> [The Tribe has] installed nine fish passage projects . . . and decommissioned 180 miles of road to reduce sediment levels . . . detrimental to listed fish species. Renewed mining activities such as the Stibnite Gold Project, however, could undermine the gains in fisheries and habitat improvements vital to the Tribe by negatively affecting . . . watersheds through increased sedimentation to streams (mining activities, increased traffic adjacent to streams), potential fuel and chemical spills, and decreased water quality resulting from mineral exploration.

Moreover, the Nez Perce Tribe suggests that proposed mining activity is directly connected to historic cycles of negative cultural and water quality impacts; the corporate project could be the next in a series of broken promises. For example, the tribal resolution references mining boom-bust cycles affecting local economies and water quality, including repeated incidents in which gold mining resulted in disastrous consequences for the Tribe:

> Gold mining has left a legacy of destruction and contamination and boom and bust economies, the scars of which are still visible throughout the Tribe's aboriginal territory, the American west, and world; and . . . gold mining within the Tribe's aboriginal territory has specifically led to the diminishment of the Tribe's Reservation in the Treaty of 1863; the armed clash between the Nez Perce and the U.S. Army; and the diminishment of the Tribe's Treaty-reserved natural resources, including the extirpation of Spring/Summer Chinook salmon in the upper East Fork South Fork Salmon River in the 1940s.

Finally, temporal cycles differ between Midas Gold's plan and the Nez Perce resolution. Midas Gold outlines three time-cycles: Three years of construction and development, 12 to 15 years of operation, and two to three years of reclamation and closure. In contrast, the Nez Perce Tribe views the mining operation as one in a series of resource extractive events since Euro-American settlement, negatively impacting water quality and fisheries. In short, because of their connection to place, Nez Perce governance cycles are much longer than the mining company's, based on many generations' prior experiences, as well as critical socioecological cycles that will sustain the Tribe and water quality for many generations to come.

In sum, *spatio-temporal cycles*, or repeated processes over space and/or time in tribal water quality governance, are illustrated in this example through the disturbance of cyclic patterns that sustain water quality-salmon-Nez Perce relationships, boom-bust cycles affecting local economies and water quality, and different conceptions of spatio-temporal cycles related to project planning and water quality risk.

2.3. Technological Mediation

Hydrosocial spatio-temporalities are influenced—intentionally and unintentionally—by the application of scientific knowledge and practices to water. We refer to this as *technological mediation*. As Leslie Head suggests, human communities are dependent on distant water flows, but also "pipes, pumps, weirs, and web-based financial transfer instruments", along with other technologies that mediate "human-water relations in various ways and across both space and time" [72]. Such technological mediation may involve water quality through monitoring regimes that assess certain parameters in particular places over time [83]; water infrastructure including dams, diversions, treatment facilities, and irrigation equipment [69,84–87]; and a range of technologies that are not specifically water-oriented, but influence water governance [72,88]. As such, technologies that Tribes contend with (each in their own fashion) serve to mediate power relations, inform cultural histories [87], and reconfigure space and time, as they restructure "watery" networks.

Water Quality Governance Example: The Miccosukee

The Miccosukee Tribe of Indians (or simply, the Miccosukee) became a federally recognized Tribe in 1962. In 1994, the Miccosukee received TAS status under the CWA and in 1999, the EPA approved their water quality standards. Given that Miccosukee homelands are in close proximity to the City of Miami, Florida, the Tribe has been active in initiatives designed to protect water quality, wildlife, and tree islands of the Everglades. In addition to reservation lands in and around the Everglades, the Miccosukee Tribe has a perpetual lease to lands within Water Conservation Area 3A, deep within the Everglades. Tribal members hunt, fish, and gather materials in these areas, engage in religious planting and harvesting on tree islands, and operate a recreational business for visitors to the Everglades [89]. As Carden observes, tribal members rely "upon the integrity of Everglades ecosystem to support its religion, culture, and economic survival" [89].

The Miccosukee Environmental Protection Agency supports a dedicated Water Resources Department (Miccosukee WRD) that addresses water flows and water quality as a key aspect of Everglades restoration. This tribal initiative is especially challenging due to the multiple layers of water control technologies deployed and operated at various times by different government entities, each designed to manage waters of the Everglades. For example, the Central and South Florida (C&SF) Project is a particularly intricate and aggressive system of water control operated by the U.S. Army Corps of Engineers composed of dams, gates, canals, levees, and pumping stations, designed to control water flows over 16,000 square miles so as to serve the various needs of a residential area to the east, an agricultural area to the south, and the Everglades National Park, but not the needs of the Miccosukee [90]. As a result of this and other water control systems, it is clear that the "watery" networks the Miccosukee are involved in are strongly mediated by a variety of technologies.

In an effort to improve the impact of these highly modified aspects of the Everglades' flow regime, the Miccosukee WRD has deployed its own technological mediation by addressing the hydroperiod, water depth, flow volume, and velocity in ways that couple with their water quality management initiatives [91] and which differ from other governments' efforts. With this end in mind, the Tribe recently asserted its opposition to a proposed Florida transportation and recreation project [92]. The Tribe looks to both the past and the future in developing approaches to address flow regime modifications that change the spatialities of water and land within the Everglades. In so doing, the Miccosukee both counter and deploy technologies to spatially and temporally re-orient "watery" networks.

Because water quality is important to the Tribe, the Miccosukee have actively resisted technologies that may contaminate the waters of the Everglades and litigation has become a significant dimension of their tribal water quality governance. The Miccosukee Tribe has instigated or been an intervenor in many different cases related to water quality and environmental issues in the Everglades, including cases that started in 1988, 1994, 1998, 2002, and 2004, many of which continued for years [93]. For example, a 1998 case, which resulted in a 2004 U.S. Supreme Court decision in favor of the Miccosukee, concerned a pumping system operated by the South Florida Water Management District (the District). The Miccosukee sought to require the District to be regulated under a CWA National Pollution Discharge Elimination System (NPDES) permit for conveying waters laden with high levels of phosphorus and other contaminants into the Everglades, [89]. The District argued that the Everglades are one—a singular water—denying any change to spatial boundaries and thus arguing that regulation was rendered irrelevant. Conversely, the Miccosukee successfully argued that water quality differences resulted in a different set of spatialities in which boundaries were created by differences in water quality [93]. This litigation, along with other court battles, underscore another strategy for tribal water quality governance, one that effectively changes the spatial orientation of a "watery" network through technological mediation. In so doing, the Miccosukee open up a "third space of sovereignty."

2.4. Interrelationship and Fluidity

Interrelationship and fluidity are two related and significant spatio-temporal themes. *Interrelationship* refers to the interdependence of all beings, or interconnectivity created by, and inherent in, water—socially and materially [94]; or as McGregor [95] writes, "when one considers water, one must consider all that water supports and all that supports water". As a value commonly referenced in Indigenous water governance literature, this interrelationship is often contrasted with the more fragmented Euro-American categorization of water (e.g., surface water, groundwater) or hierarchical positioning (e.g., tiered uses such as municipal, industrial, recreational) [41,94,96]. Similar terms, such as "complex connectivity" [97] and "holism" [95], convey related concepts, recognizing reciprocity between people and water. Time and space are fundamental to this web of "co-becoming" [98] as water circulates across space and over time as an interconnected whole [95].

If *interrelationship* is the web of connectivity, *fluidity* is the movement within the interconnected relationships, which contributes to the constitution of the web itself. *Fluidity* is the capacity to flow,

is not settled or stable, and is likely to change [64]. By means of this motion, water transports materials through both space and time and across scales in movements " . . . as fleeting as the tiny capillary shifts through which water crosses a plant membrane, or as literally glacial as the accumulation of meltwater in underground aquifers" [99]. Metaphorically, this fluidity reflects constant motion in adaptive relationships between Tribes and water over space and through time [100].

Water Quality Governance Example: Isleta Pueblo

The nineteen Pueblos in New Mexico have a unique relationship with the U.S. because of their history with Spain and then Mexico; the fact that they own their land—their lands are not held in trust by the U.S.; and the fact that no Pueblo has signed a treaty with the U.S. These factors, plus traditions and governance structures that differ politically and culturally between each Pueblo, lead to unique governance networks [25]. Amidst these networks, Pueblos are entitled to the same benefits as other Tribes under the CWA. As such, the Isleta Pueblo was the first Pueblo or Tribe to receive TAS status on 13 October 1992 and the EPA approved the Pueblo's water quality standards on 24 December of that same year [37]. Since the Isleta Pueblo (population 3725) is located on the Rio Grande River, five miles downstream from the City of Albuquerque (population 545,852) [101] and from one of the city's wastewater treatment plants discharges into the Rio Grande, the EPA revised a permit to the City so that its effluent met both the State standards and new Pueblo's standards, which were more stringent than those of the State [102,103].

Notably, and as part of their water quality standards, the Isleta Pueblo designated ceremonial uses as a primary contact use, and specified related standards for a number of pollutants, including *Escherichia coli (E. coli),* bacteria, algae, organic contaminants, heavy metals, and total inorganic nitrogen [104]. Of particular concern were high arsenic and ammonia concentrations, resulting from wells tapping aquifers with a high arsenic content [102].

The City of Albuquerque filed a motion for summary judgment on 11 June 1993 in the District Court of New Mexico, charging that EPA misinterpreted two provisions of the CWA, failed to provide a mechanism to resolve unreasonable consequences arising when a Tribe and State oppose different standards on a water body, and that the standards lacked rational scientific basis [103]. Notable in its questions was that ceremonial use violated the Constitution by imposing a mandate aiding tribal religion at the expense of the City [102]. The District Court upheld the EPA's approval of Isleta Pueblo standards and the Tenth Circuit affirmed the District Court; the U.S. Supreme Court declined to hear the case and Isleta water quality standards held.

Several aspects of interconnection and fluidity are evident in this case. First, not only does water connect Tribes to distant upstream and downstream relationships through waterways themselves [72]; Tribes are also connected to governance networks that include, for example, regional and national EPA offices; district, state, regional, and federal courts; and tribal offices across the region, with hubs in Washington, DC, Denver, Santa Fe, along the Rio Grande, and beyond. These networks are constituted through fluid relationships in at least three ways. First, very literally, sewage from the City of Albuquerque is treated in a wastewater treatment plant that discharges effluent flowing downstream. Through its fluidity, the activities involved in water treatment are connected to the activities of Isleta Pueblo residents, including their ceremonial uses of water. Yet the motions and activities upstream are also affected by downstream users; the City of Albuquerque's discharge activities changed as the result of Isleta's governance imposing restrictions upstream. Upstream and downstream communities thus affect one another through fluid motions that connect the entire hydrosocial system. Second, fluidity includes the courts passing decisions up and down a judicial hierarchy, and through networks of federal, state, tribal, and local governing entities. Finally, fluidity moves between scales. The movements of water across plant membranes are connected to the 10th Circuit Court of Appeals in Denver; plumbing pipes in Albuquerque homes are connected to Rio Grande cottonwoods. Interrelationships are hydrosocial in the sense that their fluid movements contribute to the constitution of the governance itself.

3. Conclusions

Water both creates, and is created by, dynamic networks of space-time. Likewise, tribal water quality governance is constituted through and reconstitutes spatio-temporalites. In this paper, we have explored how spatio-temporal cycles, technological mediation, interrelationship, and fluidity illustrate the dynamism of spatio-temporality in tribal water quality governance, but also demonstrate how spatio-temporality may provide a lens through which to examine nuances of water governance itself.

Spatio-temporal cycles illustrate the role played by regularly repeated processes over space and/or time in tribal water quality governance. *Technological mediation* underscores how technologies both facilitate and impede tribal water quality governance through modifying flow regimes, influencing the spatial and/or temporal orientation of values associated with water quality, and recreating or reinforcing temporal and/or spatial boundaries that constrain water quality governance options. *Interrelationship* illustrates the interconnected networks of water governance, with *fluid* movement through waterways themselves, but also through federal, tribal, state, and local governance assemblages; up and down judicial hierarchies; and across scales, from osmotic membranes to transportation pipes to ceremonial practices and courts.

Moreover, these categories are cast within networks and are not exclusionary; spatio-temporal cycles are embedded in technological mediation, just as an interrelationship facilitates fluid movements. Tribal water quality governance is thus composed of spatio-temporal hybrids, desynchronizations, divergence, resistance, evolution, and adaptation among governing groups [61]. Gibbs [105,106] uses the term "variability" to describe the dynamism of the physical, social, cultural, and ontological qualities of water, which incorporate diversity, change, and complexity. "Spatio-temporal variability" is thus an apt term to illustrate the complexities of space and time in tribal water quality governance. Tribes simultaneously use technical and scientific space-times to, for example, establish water quality standards, operate dams, and manage fisheries operations, while simultaneously governing in what Hatfield et al., [57] define as "Indian time" or an orientation to other environmental phenomena in relationship to appropriate behavior and action. The Nez Perce Tribe, for example, manages streams to maintain reciprocal relationships with salmon through highly technical fisheries and water quality sampling operations. The Miccosukee Tribe, whose members continue to hunt, fish, gather, plant, and harvest on tree islands, works on water quality governance and to improve water inflows in the Everglades, both through countering water infrastructure development and strategically deploying infrastructure and technology in their own right. The Isleta Pueblo sets water quality standards that meet their Tribe's designated uses according to TAS protocol under the CWA.

In conclusion, we return to the Gold King Mine Spill. Diné scholar Teresa Montoya reflects on the incident a year later through a photo essay composed of text coupled with images along the spill path between Silverton, Colorado, and Shiprock, New Mexico [20]. She illustrates *interrelationship* and *fluidity* over space and through time by connecting Diné people with both the literal path of contaminants, and policies that divorced Indigenous peoples of the region from their homelands and waters to allow mining to take place. She depicts this interconnectivity through images of community members gathering along the San Juan River to begin a nine-mile second annual Gold King Mine Spill Resilience Walk, an old water tank along the San Juan decorated with Diné figures and the words "water is life," and an image of water flowing through mineral stained rock from acid mine drainage near Silverton. "There have been spills before," she writes, citing Navajo community concerns over repeated *cycles* of upstream contamination, including uranium and vanadium from the 1960s that disrupted Diné-water relationships, including those involving cycles of daily sustenance over many generations. An image depicts a uranium mill site warning sign advising humans and animals not to drink water. She remembers tracking the Gold King mine contamination moving downstream, first on social media, and then into the San Juan River, where "one by one, irrigation gates were shuttered for Diné communities." Simultaneously, "environmental organizations, universities, and tribal agencies assembled teams to sample the soil and water" as various *technologies* were employed to *mediate* potential contamination, as well as assess contamination. Connecting *cycles*, *technological*

mediation, and *interrelationship* and *fluidity* in one sentence, she writes, "the spill revealed as much about the present fissures in bureaucracy and jurisdiction as it did about the fragmentation of Indigenous territories that first occurred when the mines were built."

Amidst networks that extend across multi-jurisdictional decisions, a spatio-temporal lens may help illustrate such fissures. For example, a spatio-temporal lens may reveal cycles of space and time that circulate in parallel to the ontologies upon which water quality governance is premised. Recognizing how particular technologies that mediate water quality governance associate with space and time configurations may enable the restructuring of power relations to facilitate a "third space of sovereignty." Finally, a spatio-temporal lens may make the interconnections and fluidity that characterize water quality governance networks apparent. In sum, a spatio-temporal lens may facilitate more holistic practices that recognize hydrosocial variability and tribal self-determination.

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water

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Article

Water is Medicine: Reimagining Water Security through Tr'ondëk Hwëch'in Relationships to Treated and Traditional Water Sources in Yukon, Canada

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Abstract: There is growing acknowledgement that the material dimensions of water security alone are inadequate; we also need to engage with a broader set of hydrosocial relationships. Indeed, more holistic approaches are needed to explain Indigenous peoples' relationships to water including the use of traditional water sources such as mountain creeks and springs. In this paper, we seek to reimagine water security through a case study of Tr'ondëk Hwëch'in's relationships to both treated and traditional water sources throughout the First Nation's traditional territory in Yukon, Canada. Through community-based research including interviews with Elders and other community members, we examine the importance of traditional water sources for meeting important health requirements including physical, spiritual and cultural wellbeing. This intervention contributes to ongoing debates about what it means to secure safe and affordable water in three key ways: First, we argue that Indigenous water relations invite a shift towards more a holistic understanding of water security; second, we contend that settler colonial politics should be understood as a root cause of water insecurity; finally, we explore how Two-Eyed Seeing can be applied as an alternative to the 'integration' of Western scientific and Indigenous approaches to drinking water.

Keywords: community-based research; drinking water; hydrosocial; Indigenous knowledge; settler colonialism; political ontology; risk; Two-Eyed Seeing; Yukon; Canada; water security

1. Introduction

> It just runs so clear. And it just filters...It must have its own filter because we never get sick from it. We believe that is good water to drink and a lot of us go up. Sometimes we make a water run and make sure that people have some at home, too. It just seems like here I don't like drinking water from the tap because I am so used to really good water...We used to have good water in Dawson. Now I can taste the chlorine in it, and I don't like chlorine. (Angie Joseph Rear (2015), Tr'ondëk Hwëch'in Elder)

Water security is a matter of global importance. Defining this complex and often contested concept has been also been attempted from within many conceptual domains, and assessing security has occurred at multiple spatial scales [1–4]. Research and policy with Indigenous peoples also frequently address water security [5–10]. In part, this focus stems from the recognition that

Indigenous communities often experience a disproportionate burden of water insecurity compared to non-Indigenous populations [10–15].

Many Indigenous peoples continue to rely on traditional water sources, as they have for millennia [5,7–10,16–19]. These sources vary between communities but tend to include "raw" or untreated water sources such as springs, creeks, and ponds throughout their traditional territories, which have been used for millennia. Reflecting broader trends in the literature, research on water security for Indigenous peoples tends to focus on the material dimensions of household water security including parameters such as water access, quantity, quality and affordability [20]. More specifically, a number of studies examine the microbiological and chemical quality and risk of treated and untreated water sources [8,16,21,22]. Others have assessed the implications of water scarcity [5,9], water access including distance travelled to water sources or seasonal barriers to access [5,7,9] and affordability related to the cost of water itself or the fuel needed to travel to distant sources [5,7,9].

While the above contributions highlight the importance of the material dimensions of water security, greater attention to the significance of the consistent patterns of traditional water use is needed [10]. As indicated by the opening quote by Elder and former Chief, Angie Joseph-Rear—also one of the authors of this paper—for the Tr'ondëk Hwëch'in (TH) traditional water sources remain in continual use. This is even the case when treated water is abundant, of good quality according to Western scientific health risk assessments, and in many cases, arguably offers greater convenience (e.g., treated water piped directly to homes) [7,21]. Against this backdrop, we identify the need to reframe water security to better account for the complexities of Indigenous peoples' relationships to water through the use and value of traditional water sources. As recent works have highlighted, the "non-material" dimensions of water security including emotional, affective, relational and spiritual relationships to water need to be considered alongside material dimensions such as water access, quality and use [17,23–27]. Encouraging a shift from a narrow and so strictly material definition of water security, Jepson and others (2017) note the need to "reorient the concept of water security away from a utilitarian focus on material water and towards a critical approach based on water-society relations" [20] (p. 50). In this framing, water security is less about obtaining water and more about fostering a wider set of hydro-social relations to promote well-being—highlighting the complex and patterned relations through which water is accessed, used, managed and manipulated; and the social and political dynamics and processes in which these relations are embedded [28].

In this paper, we engage a hydrosocial approach to rearticulate a framework for Indigenous water security that is consistent with Indigenous peoples' relationships to water. Based on a case study of the use of traditional and treated sources of drinking water by TH citizens, in Yukon, Canada, we contribute to the water security literature in three key ways: First, we argue that Indigenous water relations, based on reciprocal responsibilities to water as a living entity, invite a shift towards a more holistic understanding of water security; second, we argue that politics are central to understanding water security where settler-colonialism must be understood as a root cause of water insecurity; finally, we explore how Two-Eyed Seeing can be applied to engage with the differences and similarities between Western scientific and Indigenous approaches to health and risk, while remaining cognizant of the ontological and epistemological politics, or differences in ways of being and knowing, respectively. These differences, we argue, underpin misunderstanding and so effect Indigenous sovereignty and authority as people seek to follow their own traditions. To develop these points, and before moving to our case study, we outline a theoretical framework for understanding water security according to Indigenous water relations.

Theoretical Framework: Reimagining Water Security according to Indigenous Water Relations

Water security frameworks must be reimagined to reflect Indigenous water relationships more fully [10,29]. Indigenous peoples rely on water to meet their material needs (e.g., as a source of drinking water, as habitat for medicinal plants, fish, and animals, as a travel route in multiple seasons), but water is not merely valued as a material substance. While Indigenous relationships to water are highly

diverse, they tend to express and understand water as a living entity with agency or "spirit" to which Indigenous peoples have reciprocal responsibilities; a perspective which sharply contrasts with settler views of water as a 'resource' available for human use and extraction [30–36]. For instance, Wilson and Inkster (2018) examine how Yukon First Nations' (including TH) invocations of the need to "respect water" make clear the complex connectivity between the material and non-material dimensions of water where water is understood as "a living entity, with the 'person-like' quality of agency referred to as 'spirit.' From this perspective, water not only enables human life by meeting physical needs, but water *is* life or alive" [36] (p. 9). In other words, all aspects of Indigenous water relations are informed by relational ontologies and epistemologies that are not easily characterized by a dualistic lens that separates the material from non-material dimensions of water, and humans from other than human relatives such as water [34,37]. These relationships to water are multifaceted, structured by protocols, and encompass practices and knowledge about the relationships between humans and the other-than-human world that are the basis of Indigenous systems of governance and law [31,32,38,39].

Water security frameworks based on material understandings alone fail to account for the complexity of Indigenous water relationships. This parallels critiques of conventional health risk assessments, which continue to focus on the physical dimensions of health to the exclusion of many other sources of exposure and harm that impact the social, cultural, psychological and spiritual health of Indigenous peoples [40–42]. Such aspects are interlinked with physical health and involve dimensions that many Indigenous peoples consider to be of equal or greater importance [43,44]. For instance, using a case study of the forced relocation of traditional riverbed communities from river basin settlements on the Narmada River to a resettlement site on the plains in Malu, Gujarat, Mehta (2013) shows that a focus on the material dimensions of water alone did not account for the dramatic impacts on well-being brought about by changing relationships, access and control over water [17]. Focusing on the material dimensions of water alone can thus erase, and even contribute to dramatic losses to identity, health, knowledge and traditions associated with Indigenous ways of life [44–46]. In this instance, the contamination of a traditional water source not only physically restricts access to these water sources, but also prevents Indigenous peoples from meeting reciprocal obligations to water, resulting in relational losses with material and non-material implications for identity, spirituality, and culture.

Indigenous peoples frequently identify historical and ongoing settler colonialism as the most important factor affecting their well-being [47,48]. Settler colonialism refers to a form of colonialism in which colonizers dispossess Indigenous peoples of their land for settlement and resource development. Dispossession is initially carried out through physical force, but a variety of technologies are used to maintain this state (e.g., maps, numbers, and law). Both are legitimated, justified and reinforced through mechanisms including policy, ideology, and discourse about identity [49]. Although both colonialism and settler colonialism are based on domination by an external power, only settler colonialism seeks to replace Indigenous peoples with a settler society [50]. As such, settler colonial governance structures constrain Indigenous peoples' ability to maintain relationships to the lands and waters within their territories, which are fundamental to sustaining material needs as well as for identity formation and enacting physical, communal and spiritual relationships [18,36,51–53]. Indigenous scholars have described settler colonial domination as violence that disrupts relationships between Indigenous peoples and the more than human world [54–56]. Tuck and Yang (2012) discuss how "the disruption of Indigenous relationships to land represents a profound epistemic, ontological, cosmological violence" [54] (p. 5). Thus, settler colonialism impacts water security not only through initiating material loss (e.g., the impacts of resources development on water quality), but also has political ontological implications (e.g., the imposition of systems of governance based on settler understandings of water as a resource rather than as a living relation impacts the social-sociocultural and spiritual connections with water). In the same vein, Mushkegowuk (Swampy Cree) scholar Michelle Daigle (2018) highlights the need to situate "drinking water issues [for Indigenous peoples] within structural colonial legacies and continuities such as the Canadian government's ongoing

disinvestment in infrastructure within Indigenous communities" [52] (p. 162). Thus, any approach to water security for Indigenous peoples must acknowledge settler colonialism as a root cause. Further, the social, cultural, psychological, and spiritual health of Indigenous peoples is not often accounted for in assessments because they can be more difficult to characterize and measure [45,46]. Their exclusion is also highly political because a truly holistic assessment that includes colonialism would reveal that water insecurity cannot be addressed through technical solutions alone, but requires the transformation of broader governance structures in order to acknowledge Indigenous water rights, responsibilities and authorities [18,31,57].

We therefore propose here a conceptual model for Indigenous water security that goes beyond a focus on the material dimensions of water security (e.g., water quality, quantity, access and affordability) to account for Indigenous water relations in a broader sense including agency and self-determination, identity, traditional use, knowledge transmission and more (Figure 1). We build on similar frameworks related to water security for Indigenous peoples in North America and the Global South [10,17,58]. First, Latchmore and others (2018) develop a multi-dimensional framework that contributes to conceptualizing Indigenous water security in a number of ways. Indeed, they note fundamental interconnections between physical, social, economic and health and wellbeing for Indigenous water security. Toward this end, "spiritual and cultural uses," as well as "health and wellbeing" are counted among the many elements of importance for Indigenous water security. Furthermore, they acknowledge the influence of broader scale political processes on water security by noting the role of water governance, rights and responsibilities [10]. Second, based on a case study of freshwater systems in Nunavut, Canada, Medeiros and others (2017) develop a framework for water security in the Canadian North. While they develop understandings of the biophysical dimensions of water security given various drivers of environmental change (e.g., climate change and legacy contamination of water sources), they also note the importance of Indigenous Knowledge, and local control and decision-making for water security given the legacy of colonialism and present movements toward Indigenous self-governance and self-determination [59]. Third, Mehta and Punja (2007) engage a well-being framework to illustrate the implications of material, symbolic and cultural values of water for the water security of different social actors for varying social, political and economic purposes [58]. Through a concentric circle model, they highlight the ways that water security policy interventions often focus on material dimensions of water and well-being, while neglecting local and Indigenous peoples' subjective and intangible understandings of well-being (see also [17]). Our framework builds on and contributes to this literature by rearticulating water security according to Indigenous water ontologies and epistemologies. While we separate the material from non-material dimensions of water security we do so for conceptual ease and do not intend to reinforce a false dichotomy between nature and culture. In developing and applying this framework we show that not only are material and non-material dimensions of water security linked but they are complexly connected in ways that are shaped by broader social and political processes including settler colonialism. In the section that follows, we also advance this reimagined water security framework using a case study of TH relationships to traditional and treated water sources.

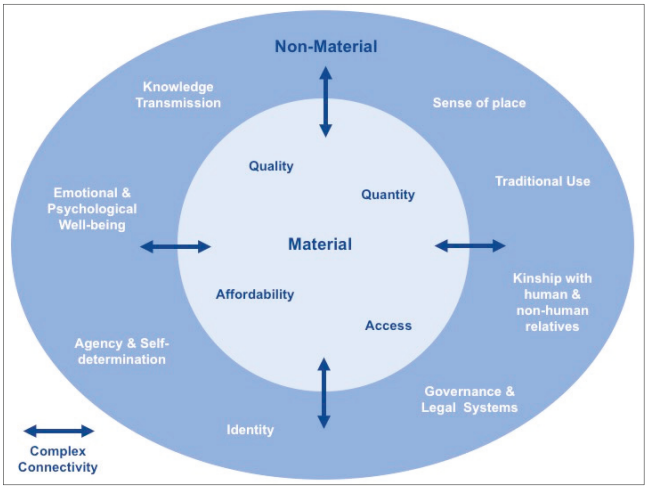

Figure 1. This diagram rearticulates water security according to Indigenous water relations based on holistic understandings of the complex connections between material and non-material dimensions of water. While we separate the material from non-material dimensions of water security we do so for conceptual ease and do not intend to reinforce a false dichotomy between nature and culture and the tangible and intangible dimensions of water.

2. Research Setting

Tr'ondëk Hwëch'in (TH) is one of 14 Yukon First Nations. The First Nation's current citizenship is comprised of roughly: 1100 descendants of the Hän-speaking people, who have lived along the Yukon River for millennia; and a diverse mix of families descended from Gwich'in, Northern Tutchone, and other language groups [60]. The name Tr'ondëk Hwëch'in, tells the story of TH's ancestral occupation of the site at the mouth of the Klondike River, where Dawson City, Yukon is located today. In the Hän language Tr'o refers to the hammer rocks used to drive the salmon weir stakes into the mouth of the river, ndëk means "river," and Hwëch'in means "people" [61]. The people of TH engaged in harvesting—moving throughout their vast territory following seasonal patterns for harvesting fish, animals and plants including salmon, large game such as moose and caribou, and berries, which included spending much of the year at the confluence of the Klondike and Yukon Rivers at a site called Tr'ochëk [61].

The TH have faced massive social changes over the past century [61] that include dramatic shifts in legal and governance arrangements in the territory [62]. After more than 30 years of negotiations, beginning in 1973, TH signed land claim (1998) and self-government (1998) agreements [63,64]. Through their land claim agreement, the First Nation agreed to retain Aboriginal rights and title to Settlement lands, which represent less than 10% (2590 km^2) of the lands within their traditional territory in exchange for partnership in the governance of all lands and waters in Yukon (Figure 2). Despite the rights and authorities acknowledged in these agreements, full implementation of co-governance arrangements in relation to water has yet to be realized [65]. Regardless of these changes, TH citizens continue to maintain complex relationships to the waters throughout their Traditional Territory, which includes the use of traditional water sources.

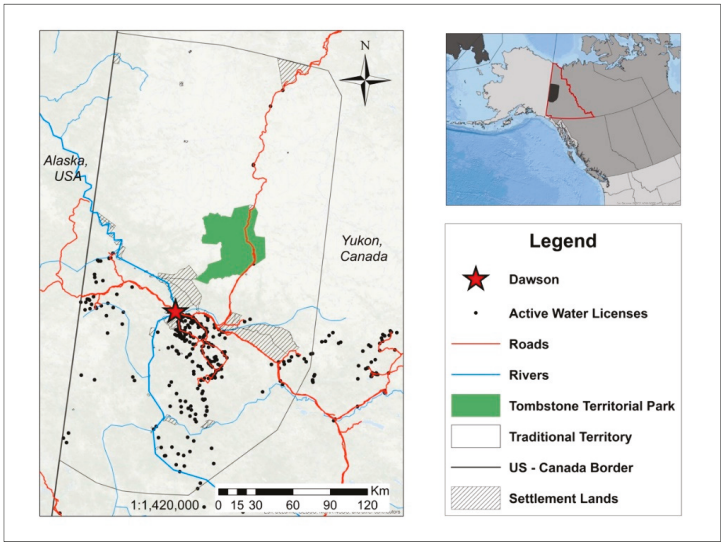

Figure 2. Map of the Tr'ondëk Hwëch'in (TH) Traditional Territory illustrates the spatial distribution of Settlement Lands, active water licenses, and protected areas. Map produced by the lead author.

Treated drinking water is supplied to TH citizens by Dawson City's drinking water system. This water source, drawn from three wells near the junction of the Klondike and Yukon Rivers, was recently designated as groundwater under the direct influence of surface water (GUDI) [66]. Treated water is piped to the majority of TH citizens' homes. A small portion of homes receives trucked water delivery, while a few have private wells. Drinking water in Yukon is governed under the Drinking Water Regulation of the Yukon Public Health and Safety Act (2009) [67]. According to existing assessments based on Western scientific approaches, the TH experience a high level of water security compared to other First Nations across Canada given that First Nations' drinking water crises are pressing and severe across the country [68]. Many First Nations do not have access to safe drinking water, and are frequently under Boil Water Advisories, and, in more severe cases, "Do not consume" or "Do not use" advisories are resulting in impacts on physical health (i.e., high incidence of illnesses associated with water-borne disease) [11,15,69–71]. We acknowledge the importance of studies of water security and insecurity for First Nations who have do not have access to "safe" water by any measure. At the same time, we view this case study of TH water relationships as useful for rearticulating water security frameworks according to more holistic understandings of health and relationships to water.

3. Research Methods and Positionality

This paper is co-authored paper by academic and community researchers. Three of us, Wilson, Harris, and Satterfield, are scholars of settler origin. Two of the authors of this paper are affiliated with TH. The lead author has been collaborating with TH since 2012. Throughout this partnership, the lead author worked closely with staff from the TH Heritage Department including co-authors Joseph-Rear and Beaumont. All work reported here is based on community-based research conducted in partnership with TH between 2012 and 2017.

Community-based research focuses on topics of real importance to communities, involves community members in all phases of the research process, and seeks to advance positive and locally-desired social change [72]. Given the decidedly negative histories of research involving university researchers and Indigenous peoples [73–75], community-based research must be developed in a way that aims to "decolonize" conventional research relationships [76]. Towards that end,

Indigenous peoples are developing their own protocols to protect their communities and knowledge systems, all of which build on the core principles of Indigenous research methodologies including respect, responsibility, reciprocity, and relevance (the "four Rs") [77,78]. We aim to conduct research in a way that lives up to these principles and the ethical standards set by these protocols including TH's own protocols.

All of the interviews were conducted by the lead author between 2012 and 2015 in Dawson City, Yukon. This includes interviews conducted as part of a community-based research project with the Yukon River Inter-Tribal Watershed Council (YRITWC). Working closely with the TH government and staff from their Heritage Department, 11 Elders, and four other knowledge holders were recruited to participate in interviews. Elders were given honoraria to acknowledge the time and knowledge they shared. In 2012, Wilson and employees from the YRITWC held a focus group with seven people (two Elders and five TH staff members), which identified 26 water-based sites of concern to TH citizens. Water quality monitoring was conducted in the fall of 2012 and 2013 at five of these sites—including two of the traditional water sources that are central to this paper. Baseline water quality samples were collected for each of the five sites following the USGS protocols employed by the YRITWC within the Indigenous Observation Network. Depending on the site, additional parameters such as metals, nutrients, bacteria and hydrocarbons were analyzed [79,80].

Using the names of Elders and other experts can be understood as a form of citation. However, with two exceptions, the names of Elders are not used in this work. Interviews were transcribed and thematically coded using NVivo. In 2017, research results were shared with and validated by TH through sharing plain language reports and discussing the contents of these reports during three community presentations in 2013, 2014 and 2017. Finally, all interview audio and transcriptions were returned to the TH archives for future use at their discretion. This research was approved by the UBC Behavioural Ethics Review Board (BREB Cert # H13-02577).

We identify three main limitations to our methodologies. First, water security was not the specific focus of these interviews. However, the themes arising from interviews with citizens of TH related to water use and relationships to traditional and treated water sources revealed insights relevant to water security. Second, while four younger TH citizens were interviewed, this study was not specifically designed to investigate intergenerational differences. Future studies could highlight these themes more explicitly by engaging purposive sampling stratified across multiple generations. Third, water quality sampling was conducted in 2012 and 2013 at a variety of water sources of importance including several sources identified as traditional drinking water sources. Future research could include a more systematic and longitudinal approach to sampling traditional drinking water sources in order to understand the differences between sources and to track changes across seasons and years.

4. Results

4.1. Chuu: Tr'ondëk Hwëch'in Relationships to Water

Interviews with TH Elders reveal complex relations to water, linked in many ways to dynamic harvesting and livelihood practices within their traditional territory. Elders described numerous ways that the people of TH use and relate to water or *Chuu,* in the Hän language, including as habitat for fish, plants and animals; for swimming and transportation in the winter and summer; for drinking water and other domestic uses including washing and cooking. For example, one Elder stated, "The water heals you. Without the water, you'll just die like that. Water is a healer. If it weren't for water, we wouldn't be living here." When asked about the importance of water, another Elder expanded on this understanding, adding that water is fundamental to the TH way of life:

> You know the creeks and all, it keeps us going, water. As long as it's healthy water. So every creek, for years, the old people used to always get water. It's a source of clean water so it's part of our life, you know. It's a traditional way. [. . .] Land too, we think about land too, to

> make sure. A lot of people tell me, 'how come you don't mine gold?' I tell them, 'we think about the land and the water and make sure it's pure to drink.' It's part of life, our ways.

In other words, water is not only important to maintain "life," but a "way of life." Relationships to water involve a lot more than physical access but are linked to broader understandings of water security and health that include socio-cultural and spiritual relationships.

Relationships to water are informed by reciprocal obligations that go beyond simplistic understandings of the need for material access to highlight the broader hydrosocial relations to support Indigenous understandings of health. "Respect" is foundational to TH understandings of the world and their position within it including relationships to other humans and more-than-human beings including water [36]. In an archival interview from 1993, Elder Percy Henry described the relational ontologies that are fundamental to this way of life. He said, "Keep your land clean, keep your animal, that's your friend. You look after them; they'll look after you. You look after your water, land, trees, you look after it, respect it. That's our spirituality. Respect your fellow men, all these elder will tell you" [61] (p. 60). While there is no single word or phrase in the Hän language for the word "respect," it is frequently used to refer to a range of beliefs, values and practices that illuminates the ontologies that are fundamental to TH understandings of the world and relationships to water. Based on research with TH and three other Yukon First Nations (Carcross/Tagish, Kluane, and White River First Nations), Wilson and Inkster (2018) highlight how Yukon First Nation calls to "respect water" "make clear that water is not just seen as a material element that makes life possible, rather for Yukon First Nations, water is a living entity, with the 'person-like' quality of agency referred to as 'spirit.' From this perspective water not only enables human life by meeting physical needs, but water is life or alive" [36] (p. 9). In the Hän ontology (ways of being) and epistemology (ways of knowing), water has many roles: water is alive or has "spirit"; water is a relative; water is a teacher; water is a healer, and; is at times considered medicine. Illustrating this perspective, Elder and former Chief, Percy Henry shared a story about a "spring" (most likely a hot spring) that conveyed these understandings of water as linked to the need to respect water:

> . . . There's a little spring come outta rock and it got power, that water. So people go up there, just sick and they give it something and they drink it or have a little bath and it's good. And this Indian here [. . .] he went there, and he said, "that isn't medicine." Then that water quit. Been running for millions a' year and he quit. See? Things like that you have to respect it. (Archival interview 2012)

While Percy is not specifically referring to "drinking water," the teachings he shared are important for framing understandings of water security for the TH. Indeed, his description of respect and story about the spring not only highlights TH water relations, including understandings of water as a living entity that has agency, but also links respect to other principles that animate their relational ontology and epistemology including Relationality, Responsibility and Reciprocity: Relationality refers to the idea that Indigenous peoples are fundamentally rooted in their relationships [75,81,82]. Responsibility and Reciprocity are also fundamental to understanding Indigenous concepts of Respect. Humans have a responsibility to follow specific protocols or rules for behavior in relation to water [18,34,51,53,83]. Reciprocity is about engaging with water according to protocols to ensure mutual survival. In other words, if you take care of the water, it will take care of you. These protocols and the oral traditions that inform them are the basis for Indigenous water laws that have existed for millennia [31,38,39,84,85]. As conveyed by the story above, water has agency and actively participates in relationships across the human and non-human world. The individual in the story above broke protocol by stating that they did not believe that the spring water was medicine. The spring stopped running as a consequence of this disrespect. Therefore, it ceased to "take care" of people because the healing properties of the water were no longer available. TH relationships to water or Chuu are foundational to understanding the perspectives about treated and traditional water sources elaborated in the sections that follow.

4.1.1. Treated Water Sources

Only one interview participant specifically expressed a positive perspective of treated water originating from the municipal supply in Dawson City, Yukon. Conversely, interview participants shared a general distrust of treated drinking water sources and a distaste for chlorinated water. For example, one Elder, conveyed a particularly strong distrust of the treated drinking water, including attributions of chronic disease. When asked why they do not drink the tap water they answered,

> Because I don't know what's in the water and I don't know if that's making so many people sick. Because, you know, cancer. You know you hear more about cancer than you ever did before. Of course, I know there's all kinds of other things but that's. Yah, because you just don't know what's in it.

Other Elders noted that they experienced more immediate and negative health impacts after drinking the tap water. For example, Elder Percy Henry said, "You see, if I drink tap water one day I'll be sick and get pain. So that's why I can't drink it." While many (seven) interviewees reported that they regularly drink the treated tap water, the majority stated that they do not like the tap water, and several (four) stated that they only consume this water after filtering, or in one case after boiling the water to get rid of impurities.

We found that an aversion to chlorinated water was a prevailing reason cited for disliking and/or avoiding of tap water. It was also referenced as sharply different and lesser than water from preferred traditional sources including creeks. For instance, one Elder stated,

> No, we got tap water, but I don't drink it because it's got that stuff inside and I'm so used to creek water. If I drink that water like for tea or something, I get it in my mouth, and it stays in my mouth for a while. What do you call it, chlorine? It stays in my mouth for a while, maybe three days or so. I could taste it because I am always drinking water from creeks.

Two individuals stated that they prefer to drink bottled water; the majority of Elders expressed a preference for traditional water sources over treated water sources.

4.1.2. Traditional Water Sources

The use of traditional water sources is widespread among the citizens of TH. Ten out of 11 of the Elders interviewed stated that they currently drink water from traditional water sources. Seven specific sources of drinking water were identified. We identify water sources by type rather than by name or specific location out of respect for the sensitivity of these sources and their importance to the people of TH. These sources included sites on the Yukon River, two other large rivers (Klondike and Blackstone Rivers), three smaller creeks and one spring. Some of these drinking water sources were only used while on the land at fish camp or hunting camp. However, one of the creeks mentioned is used year-round by the majority of Elders interviewed (eight out of 11). Its use is not merely as a matter of convenience as its access is difficult—through a family camp, located about a one-hour drive from downtown Dawson. The TH Heritage Department actively gathers water from this creek and distributes it to Elders. As Angie Joseph Rear stated in 2012,

> Here we are in Dawson City. Water is very important. I think as a human, we are in need of it and what's more important is the environment of the water. Like, right now, I think a lot of us would go up the Dempster [Highway] and get water from [a particular creek]. Even our department does that. I work for the Heritage Department with TH.

Several Elders noted that they would get a ride out to this creek with the Heritage Department to collect water. For example, one Elder stated, "well, if I taste the chlorine. No, I don't drink it. I go out, I get a ride out to [that creek] and get water there. Not just one jug. You get four or five jugs just for tea and coffee. I cook with it. You get used to life like that." In the section that follows, we describe the Indigenous knowledge of water quality shared by interview participants, before returning to the broader questions relevant to water security in the conclusion.

4.2. Indigenous Knowledge of Water Quality: How Do You Know If It Is Safe?

Indigenous knowledge of water informs TH understandings of the nature of "safe" or "healthy" drinking water. We define Indigenous knowledge as "a constantly evolving body of information, which originated generations ago and is built upon daily; [. . .] any definition of traditional knowledge will not be static and must be given room to expand and change" [86]. Indeed, the value of Indigenous knowledge for observing and responding to changes in water quality, quantity and/or flows is widely acknowledged [70,87–89].

We asked the Elders how they determine traditional water sources are safe for human consumption. Our findings indicate that Elders prefer certain organoleptic properties (i.e., sensorial information from taste, odor, color and turbidity), and these properties are in part used to tell if the water is safe for consumption (Table 1). The water should be clear and free of sediments. Elders referred to this as "White Water." It should have no smell. One Elder said, "if it smells like mossy or you know a funny smell, then you know, I wouldn't drink it." The water should also be "running" ("The water I drink is the water that runs") and there should be no moss or anything growing on the rocks. Similarly, they noted that it should taste good and "fresh." When asked how they know the water is safe, one Elder stated "We could see it. We could taste it. And it's different from tap water because that water is fresh, and you could taste the difference between town water and out there." Another Elder said, "You would taste the difference immediately, yourself, if you had that [creek] water and actually I just got containers all ready to go again and pick some more water up." This water was also considered to make "good tea." The tea stays red unlike tea made with tap water, which would "blacken-up your cup" or has a "black scum" on it.

Table 1. Summary of indicators used by TH Elders to determine if traditional drinking water sources are safe for human consumption.

Indicator	Description
Sensorial Properties	
Color	Water should be clear with no color (e.g., tap water can be grayish or yellow).
Turbidity	The term "White Water" refers to clear water that you could see through. This means that water with limited turbidity is desirable.
Running Water	Water should be fast flowing and not stagnant.
Nothing Growing	No moss or plants should be growing on the rocks.
No animals in vicinity	There should be no animals around to contaminate the water. Ducks swimming in water can be a sign that it is not contaminated.
Makes Good Tea	Water should make red tea. Bad water makes black tea that leaves stains in your cup.
Odor	There should be no smell.
Taste	It should have a "fresh" taste. It should taste "good." It should not taste like chlorine.
Prior Knowledge and Use	
Prior Use	The water source has been used by many generations.
Knowledge of sources of contamination	There should be nothing above the water source in the watershed (e.g., no outhouses, septic fields, or resource extraction).
Water Quality Testing	Several Elders noted that they would like water quality sampling to be conducted at the water sources they use.

Prior use also informs the assessment of the safety of a water source, specifically, when people have used it for a long time, and nobody has become ill. As one Elder put it in relation to one particular source,

> Us, we drink that since we were little kids. We were raised up drinking that water. Then, every summer we go down there. We still drink it. Some people, well, they still bring water from town for people.

Similar to other sources we have discussed, the site this Elder mentions has been used for many generations. In such examples, knowledge of the water source and the surrounding area is key and contributes to the assessment. The Elders noted there should be nothing above the water source in the watershed (e.g., no outhouses, no septic tanks, no resource extraction). In this vein, one Elder said, "Well, we know what's above the creek or what's not above the creek. Like no one's in there. You know and it's coming out of the mountains, in between like this, in a valley. So, we know." Furthermore, while the presence of animals (e.g., ducks) can be a sign that the water is not contaminated by other sources (e.g., mining), it is important that no animals are present to contaminate the water source.

Conventionally, Western scientific approaches to drinking water quality assess the untreated or "raw" water sources used by the TH as unsafe because there is no way to ensure these sources are free of microbial contaminants [12,90]. In 2012 and 2013, TH and the YRITWC conducted water quality sampling as part of a community-based monitoring initiative. Grab samples were collected at two traditional water sources, including a mountain creek the majority of Elders use on a regular basis. Bacteriological tests for *Escherichia coli* (*E. coli*) and total coliform bacteria were conducted both years [79,80]. In September 2012 and 2013, *E. coli* was less than 1 per 100 mL at both traditional water sources. Total coliforms varied between sites and across years: at one lesser used traditional water source, total coliform bacteria were 5 per 100 mL in 2012 and 16 per 100 mL in 2013, while at the main traditional water source these were found to be 5 per 100 mL both years. According to the Federal-Provincial-Territorial Committee on Health and the Environment, there should be no detectable *E. coli* and or total coliform bacteria per 100 mL [90]. The minimal levels of microbial content in these two traditional water sources suggest that even according to Western scientific assessments, the risk of contracting waterborne diseases, at least at the time of sampling, was minimal. This does not negate the vulnerability of these water sources to environmental change including seasonal fluctuations in the microbial content of a water source [9], contamination from resource development (e.g., extensive placer mining), or changes to water quality, quantity or flows resulting from climate change [91]. For instance, two of the traditional water sources identified are no longer used because they are considered to have been contaminated by extensive placer mining. The majority of traditional water sources presently used by TH citizens are located in the northern portion of their territory where mining activity is limited (Figure 2). For example, several of the sources are located in protected areas such as Tombstone Territorial Park. In the section that follows, we highlight key implications of these findings for reimagining water security according to Indigenous water relations.

5. Discussion and Conclusions

In this paper, we seek to reconceptualize water security in ways that respectfully engage Indigenous water relations. It is therefore not the purpose of this paper to evaluate the validity of the knowledge shared by our interview participants. Instead, we highlight the multidimensional material and non-material socio-cultural relationships to water maintained by Indigenous peoples, or what we call Indigenous water relations, that must be included in water security assessments. Toward this end, we present a case study of TH relationships to treated and traditional water sources based on interviews with Elders and several other community members. We find that TH Elders have a strong preference for traditional water sources because the use of these sources is considered healthier than treated drinking water and connects them to a way of life that has been passed down through generations. Western scientific approaches to water security fail to incorporate the importance of the use of traditional water sources because they focus on an overly narrow understanding of water health, which is confined to physical expressions alone. To better understand the complex interrelationships between physical, spiritual and cultural health and wellbeing for Indigenous peoples we take up calls within existing water security literature to reorientation of water security away from a sole focus on the material dimensions of water towards an approach that considers the importance of a broader set of hydrosocial relations [17,20]. In doing so we contribute to the water security literature in three key ways:

First, we find that a radical shift in water security framings is needed to respectfully engage Indigenous water relations including ontologies, epistemologies and governance systems that center on understandings of water as a living entity to which they have reciprocal responsibilities; a perspective which differs substantially from settler understandings of water as a resource [31,32,34,36]. Where Indigenous water relations are considered 'cultural constructions' or 'perceptions' reinforcing the overarching tendency to treat Indigenous epistemologies and ontologies as symbolic rather than literal [92,93]. For example, two studies examine water security for Indigenous peoples in Arctic and sub-Artic contexts in important ways that extend beyond the material. To explain the preference for traditional water sources Goldhar and others (2013) incorporate "preferences," with attributes such as desirability, perception, and values, as a dimension of water security "to create space for consumption practices and preferences of drinking water that may differ from those currently assumed by the norms of water security discourse" [7] (p. 463). Similarly, Eichelberger (2017) explores the cultural dimensions of water insecurity in the Yupik village of Newtok, Alaska where residents rely on a combination of treated and traditional water sources. She notes, "daily practices around water access and use vary by season and availability of treated water and are shaped by cultural constructions and risk perceptions related to particular water sources and contamination" [5]. Both papers push the boundaries of mainstream water security frameworks beyond the material dimensions of water as they seek to include Indigenous peoples' relations to traditional water sources but fail to take seriously Indigenous understandings of water as a living entity. As Anishinaabe scholar Deborah McGregor (2009) states, environmental justice for Indigenous peoples is about "justice for all beings of Creation, not only because threats to their existence threaten ours but because from an Aboriginal perspective justice among beings of creation is life affirming" [94] (p. 27). Thus, reframing water security to account for Indigenous understandings of water as a living entity not only allows for better assessment of impacts to Indigenous peoples but considering the reciprocal relationships between Indigenous peoples and water also decenters the role of humans. From this perspective, we understand water insecurity as something that interferes with Indigenous peoples' ability to fulfill their responsibilities to water (e.g., the need to "respect water"). Conversely, water insecurity also impedes water from fulfilling its duties to Indigenous peoples (e.g., as a relative, a teacher, a healer etc.) [34,94]. Such a shift requires consideration of what it would mean for water security frameworks to "take seriously the possibility and politics of a multiplicity of water-related worlds, highlighting multiple water realities and ways of being-with-water, not just different perceptions of knowledge systems tied to water's (singular) material existence" [37] (p. 2). The consumption of water from traditional sources also contributes to health by facilitating the continuation of a broader set of water relations that are part of a "way of life" that has been handed down through generations. A direct connection to water as a living entity also connects people to the land—where relationships to water and land are the language of all past and ongoing practices of ancestors and the community and not just individuals. Maintaining those connections is essential to fulfilling reciprocal responsibilities, and maintaining associated identities, and is thus basic to water as a living entity.

Second, our case study highlights the ways that settler-colonial politics and histories shape assessments of water security. We understand settler colonialism as a key driver of water insecurity as it contributes to loss or contamination of traditional water sources in the form of unsustainable resource use, global environmental change, and other drivers of change [18,52,56,95,96]. Furthermore, political inequalities created by settler colonialism also drive what is identified as a risk to drinking water. According to Tansey (2004), context (e.g., the social divisions and hierarchies around which people are organized) drives what is identified as a risk, wherein the definition of risk itself is intimately linked to issues of power [97]. Risk attributions thus shed light on who is in charge and who is liable: "[r]isk becomes politicized not simply because it is a threat to life but because it is a threat to ways of life" [97] (p. 29). Our research shows significant differences between the way TH Elders understand water—as a living entity rather than as a resource—and the risks associated with chlorination. While chlorination is justified according to Western scientific assessments of risk, adding chemicals, such

as chlorine to water may be understood as unsafe not only because of an overall attitude towards chlorine but because such an action is disrespectful to the spirit of water itself [98].

We consider ontological politics as fundamentally contributing to differing assessments of the microbial and chemical risk associated with the consumption of treated and traditional water sources. Blaser (2009) defines ontological politics as "the conflicts that ensue as different worlds or ontologies strive to sustain their own existence as they interact and mingle with each other" [99] (p. 877). Similarly, it has been argued elsewhere [37], different answers to the question of what is "safe" or "healthy" water is often rooted in ontological differences. Indigenous water ontologies, which understand water as a living entity, can be seen in distinction to settler views of water, which draw upon a 'treatment ontology.' In the latter exists the assumption that it is possible to break water down water into constituent parts (or merely H_2O) and remove (or eradicate) some parts. In this way, a "treatment ontology" undermines or clashes with Indigenous water ontologies because in imagining water as a mere resource, it disregards the possibility of water as a living entity.

Elsewhere, authors have expressed concern that distrust of chlorinated tap water can lead Indigenous communities to use "high-risk" water sources [7,16,21]. However, assessments of sources as "high-risk" tend to ignore Indigenous peoples' views of water and health (and their measures of quality and safety noted above). In other cases, the very idea of what is safe and what is being protected is challenged. Donatuto and others (2008), for example, examine the ways colonial health risk assessments fail to explain the Swinomish Tribal Community's continued consumption of seafood despite knowledge that the seafood is contaminated [100]. This is in large part because these assessments fail to account for the spiritual and cultural importance of these foods or what they refer to as 'the feeding of the soul'. According to the Swinomish assessment of risk, spiritual or cultural health considerations outweighed concerns over risks to physical health (see also [43]). In our case study, a 'treatment ontology' fails to acknowledge that water is a spirited and living entity toward which Indigenous people hold relational obligations. As a result, it fails to explain why Elders continue to consume traditional water sources regardless of Western scientific assessments of risk.

Third, we find that Two-Eyed Seeing can be applied to productively engage with the differences and similarities in approaches to water security. The concept of "Two-Eyed Seeing" (translated from Etuaptmumk) was first articulated by Mi'kmaq Elder Albert Marshall in 2004 [101]. As Martin (2012) states, "Western scientific approaches to health research often ignore or undermine alternative ways of knowing, preferring to focus on the pursuit of objective, detached research that can uncover the 'truth' about a particular topic" [102] (p. 30). In contrast, Two-Eyed Seeing represents a call to the research community to see the strengths of Indigenous knowledge (one eye) on equal terms as the Western scientific knowledge (one eye), and to learn how to use both eyes to answer pressing research questions in more holistic ways.

Ultimately, Two-Eyed Seeing encourages a useful re-articulation of water security frameworks, which engage Indigenous water relationships, and so also involve forms of cooperation that recognize multiple types of social, political and ecological limits while simultaneously prioritizing the authority of Indigenous peoples [77,103–105]. Such an approach is required to overcome the trend towards "integration" of these knowledge systems in ways that reproduce colonial injustices. By this, we mean the "integration" of Indigenous Knowledge in a solely instrumental manner, whereby no challenge to Western scientific convention is launched or considered [106,107]. Furthermore, many researchers and decision-makers are dismissive of Indigenous Knowledge and frequently assume that Western knowledge is needed to validate Indigenous knowledge [92,108]. This does not mean we should discard Western science. Indeed, Castleden and others (2017) find that there are "instances where such approaches are working, where integrative Indigenous and Western knowledges have come together in respectful and responsible ways to challenge colonial policies and practices in the context of water research and management" [103] (p. 74). That said, moving beyond problematic approaches to "integration" are key to more completely and holistically redefining water security, wherein the *conjunctures* and *disjunctures* between systems are revealed [37]. This involves prioritizing a multiplicity

of hydrosocial relations in ways that stress the importance of articulating and re-affirming Indigenous water laws, customs and knowledge [35,36]. For instance, the results of water quality sampling at times converge or coincide with Indigenous Knowledge of water. Indeed, preliminary water quality sampling for microbial parameters conducted at two of TH's traditional water sources showed the minimal presence of both *E. coli* and total coliforms [21]. Convergence or divergence between these knowledge systems aside, respecting Indigenous authority to determine their own health practices means that the mere presence of microbial content should not automatically result in a recommendation suggesting that this water is no longer consumed. Rather, we believe that Western science can be engaged to inform decision-making without disrespecting the authority of Indigenous peoples to maintain their own health practices.

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water

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Article

"We Don't Drink the Water Here": The Reproduction of Undrinkable Water for First Nations in Canada

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Abstract: First Nation communities in Canada are disproportionately plagued by undrinkable water and insufficient household sanitation. In addition, water resource management in First Nation communities has long been a technocratic and scientific mission controlled by state-led authorities. There has been limited engagement of First Nations in decision-making around water management and water governance. As such, problems associated with access to drinkable water and household sanitation are commonly positioned as hydrological or environmental problems (flood or drought) to be fixed by technical and engineering solutions. This apolitical reading has been criticized for not addressing the root cause of the First Nation water problem, but instead, of reproducing it. In this paper, an approach using political ecology will tease out key factors contributing to the current water problem in many First Nation communities. Using case study research set in source water protection planning, this paper explains how persistent colonial practices of the state continue to reproduce undrinkable water and insufficient household sanitation. Solutions to this 'water problem' require greater attention to First Nations water governance capacity and structures.

Keywords: first nations; Canada; political ecology; colonization; water politics

1. Introduction

"We are not the country we thought we were"—Gord Downie [1]

Whether you have drinkable household water in Canada depends largely on who you are. If you are First Nation living 'on reserve', you have a significantly greater chance of having undrinkable water [2]. In 2011, a nation-wide survey of water and wastewater conditions classified 30% of First Nation water systems as high risk for contamination [3]. More recently, in 2016, 134 water systems in 85 First Nation communities across Canada were reported to be under a boil water advisory [4]. Approximately one in eight First Nation communities is under a boil water advisory issued by the public health regulator at any one time. Nationally, boil water advisories are 2.5 times more frequent for First Nation communities than for non-First Nation communities [5,6]. From a human health perspective, the number of water-borne infections in First Nations communities is an alarming 26 times higher than the Canadian national average [5,7].

While these statistics are frequently reported in popular media, much less attention is given to the causes of these contamination events. Tracing the origin of these events requires some reflection on the impacts of colonization on Indigenous people in what became Canada. It is here where we depart from a First Nation 'water problem' discourse and instead engage in a critical examination of causal factors, tied to political and institutional arrangements [8–12]. We acknowledge the efforts of national organizations, such as the Assembly of First Nations, regional First Nation non-governmental organizations and Tribal Councils that collectively work to improve water quality in communities.

Similarly, we acknowledge the dedication and often heroic efforts of First Nation water treatment plant operators who maintain drinking water services despite poor raw water quality, infrastructure challenges, and often inadequate federal funding [13].

Indigenous peoples have lived on Turtle Island (North America) for thousands of years, from time immemorial [14]. To this we suggest that the cause of the current 'water problem' is rooted in settler-colonial expansion over the past one hundred and fifty years [15–18]. In other words, the current water problem faced by many First Nations in Canada would not exist without the conditions that caused the water problem. We frame our argument not as a 'water problem' but rather, as a 'political problem' attached to historical injustices.

Colonialism in Canada, and its support institutions, including state laws restricting Indigenous people's movement over the land, limitations on cultural and social practices, introduction of residential schools, as well as the 'Indian Reservation' system of forced settlement, to name a few, have recently been described as 'cultural genocide' [19]. Patrick Wolfe described the relationship between genocide and settler colonialism as one rooted in a logic of elimination, where invasion seeks "dissolution of native societies" through relocation and dispossession, while simultaneously "erect[ing] a new colonial society on the expropriated land base" [19]. Put differently by Wolfe, "elimination is an organization principal of settler-colonial society rather than a one-off (and super-seded) occurrence" [19] (p. 388).

Vestiges of colonialism, stemming from the *Indian Act*, remain in place today and include an array of government controls and institutional mechanisms. Territoriality drives settler colonialism, which must be recognized as a structure instead of characterized as an event. Institutions and laws perpetuate settler colonialism, reproducing the social relations and inequalities that are at the root of many 'water problems'. The purpose of our paper is to frame Indigenous water issues in terms of 'the political', where disagreements over fundamental values and interpretation drive deliberation over joint action in the environment. In order to do so, we recognize the calls for recognition of Indigenous self-determination, consent, and nation-to-nation dialogue evident within academia, and national First Nations organizations, such as the Assembly of First Nations [20–23], as well as in global discourses around human rights [24–30].

Prior research on Indigenous participation in water governance and management on the prairies emphasizes improvements in the development, implementation, and evaluation of watershed plans and planning [31–33]. As part of the socio-political aspects of water, contestation and reflexivity in public debate in water governance have been given some attention, but this is exclusively focused on state-based water institutions and Western norms of deliberation [34]. Recent methodological innovations in research on Indigenous peoples' 'water problems' offers promise for future investigations into household water insecurity on- and off-reserves [35,36]. Household water insecurity includes both quantitative and socio-cultural aspects of water security, such that quality, quantity, reliability, and affordability are consider alongside with entitlements and human capabilities, social and cultural dynamics, as well as political institutions and processes [35]. Entitlements are "relations that legitimize ownership claims or use rights, through trade, production, labor, inheritance, or transfer," while human capabilities encompass the "broader impacts of water insecurity on human wellbeing" [35] (p. 4). Wilson et al. [37] encourage the adoption and adaptation of the household water insecurity approach to Canadian studies of Indigenous peoples 'water problems' by ensuring that the framework "reflect[s] Indigenous water relationships more fully" [37] (p. 2).

Building on the literature briefly outlined above, we ask: what roles do political structures and institutions have in the continued exclusion of Indigenous peoples from water governance in Canada? We seek answers to this question by critically assessing the integration of Indigenous peoples into state-based water governance and planning in the Canadian Prairie.

The paper will begin by describing how a theoretical approach from political ecology may present alternative discourses to the First Nations 'water problem'.

We then situate our research by first discussing colonial water governance, present the results from multiple case studies of First Nations source water protection plans, and link those results to

the neglected political aspects of water governance that operate to reproduce the 'water problem'. Methodologically, we refer to the four dominant narratives presented by Robbins [38] to describe the political ecological conditions under which the 'water problem' has manifest.

2. Political Ecology

Political ecology is defined as "the analytic focus on factors that shape relations of power among human groups that influence relations between these and diverse aspects of their environments" [39] (p. 205). The perspective from political ecology has been employed more commonly in 'Third World' or research to provide insight into, and explanation for, environmental degradation resulting from uneven power relations operating between different actors [40–43]. Political ecology offers an alternative to the more popular accounts of the environmental crisis traditionally nested in inappropriate technology, overpopulation, or poor land use management [44].

Here, we turn to political ecology as a means of exploring relations of power between the federal government and First Nations in Canada. The Government of Canada has both a fiduciary responsibility and constitutional responsibility to First Nations. Included under those responsibilities is the provision of water. We seek to explore how relations of power may reproduce the 'water problem' experienced by many First Nations in Canada.

Methodologically, McCarthy [45] has argued for a continued presence of 'extended fieldwork using intensive case studies and ethnographic techniques' in First World political ecology as a means of 'discovering the Third World within'. That is, a political ecology analysis can be applied to 'developed' nations, revealing that uneven development and power relations are not exclusive to the 'Global South' or other developing countries. Landscape narratives, inclusion, and discourses of environmental change are used to facilitate dispossession of land and resources from Indigenous peoples in the Global North as in the South [46]. In response to this call to turn the political ecology analysis back on ourselves, we report on multiple case studies from the Canadian Prairie region. Robbins [38] identifies four dominant narratives contained within the field of political ecology (see Table 1). In this paper, we assess the applicability of these dominant narratives to the water problem in First Nations.

Table 1. Dominant narratives in political ecology. Redrawn from Robbins (2004) [19].

Narrative	What is Explained?	Relevance
1. Degradation and marginalization	Environmental change: why and how?	Land degradation, long blamed on marginal people, put in its larger political and economic context
2. Environmental conflict	Environmental access: who and why?	Environmental conflicts part of larger gendered, classed, and raced struggle
3. Conservation and control	Conservation failures and political/economic exclusion: why and how?	Usually viewed as benign, environmental conservation shown to have pernicious effects
4. Environmental identity and social movement	Social upheaval: who, where, and how?	Political and social struggles are shown to be linked to basic issues of livelihood and environmental protection

2.1. Dominant Narratives in Political Ecology

We turn to the four dominant narratives described in Robbins [38], which will be used to interpret the results of the research. Below, we briefly describe the narratives and return to them in the discussion.

The land degradation and marginalization narrative borrows from the political economy tool kit to explain land degradation in terms of exclusion, marginalization and exploitation, where one person's (or state's) accumulation is another person's (state's) degradation. Where local, traditional production systems become usurped by state intervention or regional and global market shifts, rules of resource access, and control undergo change [38]. Such conditions may lead to exploitation of the land in a quest

to produce surplus capital for outside interests. The colonization process holds closely to this model. Such exploitation, as the narrative goes, leads to local poverty and continued exploitation and land degradation. When viewed from outside, the cause of land degradation is more commonly blamed on the Indigenous (First Nation) land occupants—not on external (yet invisible) capital accumulation forces. For example, many First Nation communities in the Prairies are impacted by adjacent and upstream developments, such as agriculture or oil and gas extraction activities. These activities rarely provide material or financial benefit to the impacted communities.

The second narrative, environmental conflict, is concerned with conflicts that evolve between resource user groups that results from increasing resource pressures caused by land (or water) enclosures or appropriation by state authorities, private firms or social elites [38]. An important aspect of this narrative is that environmental conflicts may surface when local groups secure local control of collective resources at the expense of others, including those from outside the local community. For example, private managed forest tenures in parts of Canada prioritize private timber harvesting over residential homeowner rights leading to neighbourhood conflicts. Environmental conflicts are not seen to be at the core of the Indigenous water problems described in this paper, although there are First Nations in Canada who have come in to conflict with the state over resource management, including water [47–49].

The third narrative, conservation and control, argues that the struggle over local control of resources by regional, national, or global authorities erroneously characterize local production practices as unsustainable. Subsequently, these same state authorities organize to preserve the environment under the mantra of 'conservation'. The control and management of these areas by the state, according to this narrative, removes opportunities for local production practices creating conflict over resource access leading to poverty and the possibility of environmental degradation through over-harvesting on an imposed limited land base. For example, the designation of park status over resource lands by the state to the exclusion of all other uses such as the expansion of a water reservoir may lead to conflict over future water security. While an important explanatory narrative from within political ecology, we do not see land and water conservation and control as being germane to the Indigenous water problem in Canada.

The fourth, and final, narrative from Robbins [38], environmental identity and social movement, suggests that changes in environmental management regimes and environmental conditions create opportunities for local groups to join together politically. As a result, powerful national and even global political and economic forces become themselves the target of coordinated local opposition. For example, the Canadian federal government's purchase of Trans Mountain Pipeline brought together disparate groups in opposition to pipeline expansion and the perceived conflict of interest of government becoming both pipeline owner and federal regulator. Again, the Indigenous water problem is not well aligned with any specific environmental identity or social movement.

Based on the brief, preceding overview of the four narratives of political ecology, we position this paper in the context of the first narrative, degradation and marginalization, to best describe the political economic conditions that most closely align with the Indigenous water problem described in this paper.

In the section that follows we provide an overview of colonial water governance in Canada as context to better understand First Nation engagement in water management decision-making today.

2.2. The Politics of Colonial Water Governance in Canada

In order to understand the drivers of inequality, we ground our research on the experiences of Indigenous people's household water insecurity, by focusing on access to water and sanitation. We begin by asserting that the institutions and processes of resource governance in Canada (forestry, water, minerals, wildlife, and land) are the mechanisms by which inequity in access to water are reproduced.

The Canadian Prairie, the geographic boundary of this research, is wholly contained within numbered Treaty agreements forged between the Indigenous land occupants represented by hereditary

leaders and European newcomer society represented by the British Crown. The purpose of the 'Numbered' Treaties, most signed between 1870 and 1890, was to establish peaceful, trustful relations between the British Crown, later Canada, and the Indigenous occupants, later known as First Nation people. The Treaty agreement included resource sharing and the protection of land- (and water-) based rights of First Nations, though there is disagreement between settler and Indigenous interpretations of the intent and meaning of the treaties. With Treaties came the establishment of 'lands reserved for the Indians', held in trust and managed by the federal government. Viewed in terms of territoriality, the Numbered Treaties were "a continuation and intensification of the re-territorialization that ensued at the end of the 19th century with the passing of the Constitution Act in 186 and the Indian Act in 1876" [18] (pp. 164–165).

Because of these Treaties as well as legislation following the establishment of the Dominion of Canada (i.e., *the Indian Act* 1876), Reserve lands and First Nations members are considered the responsibility of the federal government. This presents itself now as an attempt to bring "Indigenous political orders . . . [of these areas] under the regime of settler governance" [18] (p. 164). The *Natural Resources Transfer Act* (1930) transferred administrative responsibility for lands and resources to the provinces of Canada. This transfer adds significant complexity when it comes to the Federal government fulfilling its Treaty obligations in terms of resource sharing, land rights, and water rights. In essence, provincial interests over resources, including land and water, is entrenched in the Canadian Constitution privileging provincial rights to resources over those of Indigenous peoples.

Claims of land ownership in North America are a mixture of *Terra Nullius*, and either occupancy/possession or through conversion to a 'productive' agricultural status [50]. In essence, the state claims that the signing of the Numbered Treaties extinguished Indigenous title to land in exchange for specific, negotiated benefits. Indigenous peoples maintain that this is an unjust and unilateral interpretation of the treaty relationship [18,51] and that Indigenous sovereignty and title persist. A narrative of cession resulted in the expansion of Dominion territory, or from the Indigenous perspective, widespread dispossession. As it claimed territory, the state established laws to allocate, distribute, and regulate land and water. Agricultural settlement has been particularly pernicious in its eliminative logic, according to Patrick Wolfe, with agricultural territoriality "ceaselessly . . . eat[ing] into Indigenous territory, a primitive accumulation that turns native flora and fauna into a dwindling resource and curtails the reproduction of Indigenous modes of production" [19] (p. 395).

The concepts of property and ownership granted to the European settlers were imposed upon First Nations and the land, and these concepts introduce the notion of 'rights' to land and water, and rights to maximize income from ownership of land, water, or any resources with which they are associated; state regulation of 'land as property' is achieved through land use planning and regulations [52,53]. Such rights of ownership, and even the possibility of ownership, were foreign to Indigenous peoples, who held their relationship with the land and surrounding environs in a fundamentally different way based on communal sharing and reciprocity [54]. Indigenous social relations have become "effectively fixed and hierarchized . . . within the social relations of capitalist ownership and production . . . premised on dominant discourses associated with Western private property regimes and jurisdiction [sic] sovereignty" [52] (p. 98).

In Canada, provinces are delegated authority to regulate land use on private and Crown (public) lands, with further delegation of that authority given to municipal governments. The federal government retains control over, and responsibility for, reserve lands—with delegation and devolution taking place where First Nations governments have signed tri-partite agreements between the province and the federal government. Contemporary and historical practices in land and water use planning at the provincial (and municipal) level resulted in the exclusion of Indigenous voices, as reserve lands were deemed to be a 'federal' issue, and thus those lands are/were simply ignored as extra-jurisdictional [53].

Changes in land tenure since colonization and settlement are, as we will show, fundamental to contemporary Indigenous 'water problems'. Although the federal and provincial governments lay claim to sovereign authority over and jurisdiction to allocate and regulate water and land, Indigenous

peoples maintain that their inherent rights to and in land were not extinguished by treaties [51,55,56]. Thus, First Nations contest the sovereign authority claimed by the state, and resist or otherwise attempt to influence the hegemonic activities of the state. They do so by litigating against the government for trespassing on Indigenous rights [57], participating in institutional processes [47,58,59], as well as educating themselves and others about treaty-based relationships [60], Indigenous rights [50,61], and Indigenous world views [62–65].

2.3. Political Ecology and Colonialism in Canada

To knit together the concepts of political ecology and colonialism in the Canadian context, we emphasize processes that dispossess and privatize lands and resources otherwise claimed by Indigenous peoples. These processes have roots in a history of patriarchal and ethnocentric narratives of Indigenous difference, implemented through government policy [66]. Diverse works draw specific attention to the link between political economies of the Canadian settler-state and contemporary Indigenous issues including law [67,68], rights [8,50,61,69–74], and participation in resource science and decision-making in traditional territories [75–78]. Historically, dispossession included relocation of communities, exclusion from newly designated private and Crown 'property', and non-recognition within systems of resource management and development. Contemporary primitive accumulation is achieved through non-violent dispossession and displacement, achieved through the trade of land title and rights through the depoliticized processes of land claims. Closely following dispossession is a degradation of Indigenous culture by way of incremental losses in wildlife habitat and biodiversity.

Settler-colonialism in Canada has been described as "territorially acquisitive in perpetuity" [79] to the degree that Indigenous groups will "frame their interests in proprietorial terms because their cultural objections to … [internal] colonialism are unheard within a political context that champions property as the harbinger of social good" [46]. Adopting these notions of 'property' and 'possession' signifies a profound departure from traditional Indigenous perspectives on relations between people, and between people and the world around them [54,78]. Colonialism becomes a mechanism by which a liberal-democratic form of capitalism (including European notions of 'property' and relational ethics) becomes the normative framework through which people are governed and resources exploited [80]. For Indigenous scholar Glen Coulthard, the colonial relationship in Canada is not one of interdependence, where nation-states will 'recognize' and incorporate "sub-state national groups...into their territorial and jurisdictional boundaries" but is instead one where the master colonial/settler state "does not require recognition from the previously self-determining communities upon which its territorial, economic, and social infrastructure is constituted" [79]. The terms of recognition become an extension from within the colonial state's framework, "structurally circumscrib[ing] the terms and content of the recognition it [is] willing to make available" through state-based processes [79] (p. 66). For example, Indigenous environmental rights are often specific, constrained, and subject to infringement by government if it is 'in the public interest' [81–83], an interest which is often framed broadly to mask the uneven burdens experienced by rural and remote Indigenous communities [84,85]. The outcomes of setting limits on and justifying government infringement of Indigenous rights to environmental resources appear to be resistance, resurgence, and (potentially) revolt [47–49,86–88] as well as stagnation of Indigenous economies and attempts to control cultural reproduction [81,89]. Individual indigenous rights to resources, such as fish, are not of the same class as communal rights. Individual rights typically exclude commercial access, limiting the ability of indigenous individuals to participate in resource market economies. See Brian Slattery [81] for more information on Aboriginal and Treaty rights. Indigenous water rights are claimed yet denied [8].

Within the Canadian landscape exists a diversity of treaty-based relationships between distinct communities of Indigenous peoples and the Crown. As mentioned above, we focus here on a subset of the Numbered Treaties, where the political and legal context is significantly different from the realities experienced in British Columbia, the northern territories, or even eastern Canada [90]. Settlement across the prairies is associated with drastic and dramatic changes in land use and land cover; it is

considered an agricultural region of great importance to national production. Most river systems flow north, whereas most settlement and development has occurred in the south; large scale hydro-electric development has altered waterscapes across Canada, often to the detriment of rural and Indigenous populations, as well as wildlife [84,85].

The amount of landscape disturbance and change in the southern portions of Canada exceeds that of most mid-latitude and northern portions. For most provinces, Crown lands are concentrated in the northern sections, often in association with forestry. Provinces lay claim to jurisdiction over forests as resources, although Indigenous peoples are engaged in consultations over certain aspects of forest management [91,92]. In southern portions of the province, land tenure is predominantly private ownership, excepting areas zoned as provincial reserves or conservation areas which are held in public trust. In recent years, the number of farms in this agricultural region has been decreasing, while the size of farms has been increasing. Seed and machine technology, as well as inexpensive debt and global markets supported by cheap oil, has driven much of the change evident in the landscape. Much of that change involves a homogenization of the landscapes to support highly efficient mono-culture crop production at sufficient economies of scale.

With the predominance of private land ownership in the southern treaty areas, there is less opportunity for Indigenous peoples to engage in the landscape-scale decisions that alter their local environments and traditional territories. One of the greatest land alterations on the Prairie is wetland drainage by farmers. The Prairie region is characterized by extremely flat land with poor overland drainage. This is an area of non-contributing drainage to streamflow, the Prairie pothole region, where farers risk losing arable land to spring thaw and summer rains. As a result, unauthorized and often illegal drainage ditches channel water across the region in a cross-hatch of narrow canals. Wetland drainage is extensive and poorly regulated; where regulations exist, they may not be enforced. The province of Manitoba, for example, has a long history of drainage in its central and southern extents in the provision of significant financial, technical, and engineering support in establishing and maintaining a drainage system to support agriculture. While it did facilitate farming activities, ultimately it created significant political tension and social conflict over the rights of upstream property owners to drain water from their lands, and the rights of downstream or low-land property owners to not be inundated [93]. In the prairie region, "[f]arming practices, such as drainage and wetland removal, are changing the landscape and the ecological services that it provides" [94], reducing wildlife habitat, displacing wildlife, and changing surface water flows in terms of volume, timing, and chemistry. As more and more isolated wetland 'potholes' are connected to creeks and streams, downstream flooding is increasing in frequency and degree of damage [95].

Analyses of these intra- and inter-provincial conflicts over landscape and waterscape change are often couched in terms of rights-holders and property, whether the Crown is claiming control of the beds of water bodies and shorelines, or private landowners decry a right to farm and develop their lands without government interference. Only the government, however, is obliged to engage Indigenous peoples when planning a development that might affect Aboriginal and Treaty rights [96,97]. Large-scale development projects proposed by private or corporate owners often require government approval, and these would also require some level of engagement by government, though swings in popular government can and do lead to changes in the classification of projects and their subsequent requirements for engagement [98–100]. Turning again to agriculture in the prairies, the use of farm equipment to dig ditches and reshape wetlands on private property typically occurs on a small scale, but as projects distributed across a watershed, the continued connection of isolated wetlands to stream networks over time has created cumulative effects equivalent to a large-scale project. This tactic has avoided any requirement for environmental oversight, such as an environmental impact assessment and, therefore, has not taken into consideration 'public good'.

In summary, the federal government has historically controlled resource development and land use on lands reserved for Indigenous peoples without their participation and largely without their input. Decisions related to land and water management on reserved lands are typically evaluated

strictly against administrative criteria, and even then the criteria used change over time, according to the whims of program managers [101]. Local knowledge holders, as well as Indigenous perspectives on appropriate relations with the land, have long been ignored. This has created substandard housing, poor drinking water systems and crumbling infrastructure that is too expensive for Indigenous communities to maintain representing just some of the more substantive outcomes. Broad scale landscape change has also altered Indigenous use of and access to clean water. Drainage and wetland destruction has impaired natural hydrologic processes. Not only is the water unfit to drink on many reserves, but many traditional water sources used by Indigenous peoples throughout their territories are also unsafe to drink [5,102–106].

3. Methods

3.1. Study Area

This research engaged with six First Nation communities (four of Cree culture, one Saulteaux/Ojibway, and one Blackfoot) all located in the Canadian prairie region. This region has a history of human occupation spanning thousands of years before European contact. Seasonal settlements and trap lines, buffalo hunting, ceremonies, food and medicine gathering, economic trade, and cultural practices grounded Indigenous peoples to water, land, and the spirit world in this region. The communities represent different tribal histories and regions, and thus are in different treaty relationships with the Crown; the Treaty areas are shown in Figure 1. An objective of this research was to identify local risks to drinking water sources in each community in order to a apply a political ecology lens to help understand the true source of these risks.

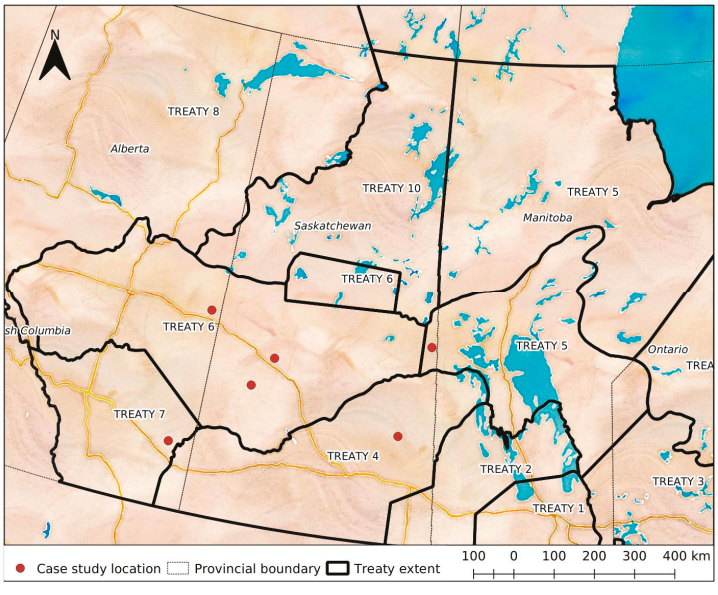

Figure 1. Approximate study locations. Sources: Global Forest Watch Canada (treaty), Natural Resources Canada (provinces).

3.2. Source Water Protection

Source water is untreated water from groundwater or surface water sources that supplies drinking water for human consumption. Source water protection (SWP) is a vital first step in the protection of water supplies, often referred to as the first step in the multi-barrier approach to safe drinking

water [107]. SWP planning offers a means of addressing land management problems in order to protect drinking water quality [108]. The SWP planning process used in the study areas adopted a five-stage planning framework (Figure 2) [109]. This planning framework represents a structured, rational planning approach for the specific purpose of supporting First Nations with drinking-water protection.

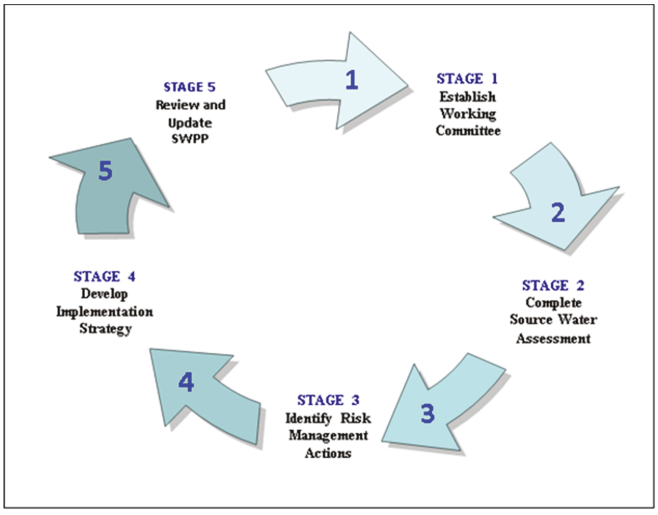

Figure 2. Source Water Protection Planning framework, redrawn from [42].

3.3. Data Collection

Each community became a partner in a source water protection planning exercise with university researchers. This engagement was voluntary and at the request of the First Nation. The lead author facilitated most meetings using the source water protection planning framework shown in Figure 2. The planning framework provided a degree of structure to the planning process, but also remained flexible to the needs and specific interests of each community. The five-stage planning process began with identification of a working committee of community members, each with knowledge of local conditions affecting water quality and quantity. Members at each working committee included a mix of community elected officials, administrators, water treatment plant operators, Elders, and other members from the First Nation.

3.4. Statement of Positionality

In a colonial context, especially one with significant marginalization of Indigenous peoples, research conducted with Indigenous communities is power-laden. Research institutions have not always engaged with Indigenous peoples ethically [110,111]. As non-Indigenous researchers, we recognize that there are uneven power relations embedded between researcher and the people and communities with which we work. Given that settler-colonialism is a process, not an event, we recognize our participation in the institutions and systems that reproduce colonial relationships.

The lead author (Baijius) is currently involved in community-based research on Indigenous engagement and water governance issues in Manitoba. The second author (Patrick) has researched and facilitated the development of numerous on-reserve source water protection plans for First Nations across Alberta and Saskatchewan over the last decade. Sharing an interest in small and remote drinking water systems, the authors have worked together on community-based water issues since 2013, and Indigenous water issues since 2015. Our intent is to advance discussions of water governance, planning, and management by linking our experience to theory. We acknowledge that it is through the

individual relationships with community members, and by way of respectful research partnerships with the communities, that our work is possible.

Although our research is community-based with Indigenous peoples, we make no claims to be the 'voice' of First Nation communities.

4. Results

The planning process ranked the risk level of each reported threat to source water. These risks were categorized as high, medium, or low, based on a quantitative value produced using a risk-ranking matrix that combined likelihood of an event multiplied by the consequence of the event. For the purposes of this paper, only the highest ranked risks to source water are shown (Table 2). The results indicate a pattern in the perceived highest risks from all six communities.

Table 2. High risk issues within selected prairie First Nations.

Treaty 6	Treaty 6	Treaty 7	Treaty 5	Treaty 6	Treaty 4
Landfill	Household water cisterns	Diesel spillage	Septic tank 'Shoot outs'	Sewage lagoons	Vulnerable community well
Cisterns	Industrial drilling	Illegal dump sites	Agricultural land	Private wells	Septic tank 'shoot-outs'
Abandoned wells	Transport hazardous goods	Livestock close to wells	Septic fields	Cisterns	Abandoned wells
Flooding	Septic 'shoot outs'	Abandoned vehicles	Sewage lagoons	Abandoned wells	Illegal dumpsites
Septic shoot-outs		Cisterns	Cisterns	Septic shoot-outs	Cisterns

The most commonly reported risk to drinkable water was the household water cistern. The household water cistern is a form of water infrastructure widely used in many First Nation communities, consisting of a large tank, upwards of 500 imperial gallons, with the purpose of holding drinkable water for on-demand household consumption. The cisterns are typically of concrete construction and located either in the crawlspace of the home, or buried in ground and adjacent to the home (see Figure 3). The process for household water delivery to the cistern begins at the water treatment plant where a water truck is filled with potable water. The truck then drives through the community delivering water to each household cistern. This is done on a continuous basis in many communities, as most cisterns are filled on a weekly basis.

Figure 3. Cistern cap, intact but unlocked. Photo credit: R. Patrick.

The dispersed, rural settlement pattern of First Nation communities often requires multiple trucks to be in operation at any one time, and on a full-time basis. Depending on the tank capacity of a water truck, normally only four cisterns can be filled from a single truck-load of water. As a result of water

demand and limited time for truck maintenance, water truck tanks are not always disinfected resulting in potential contamination of the treated drinking water [104,106]. Additionally, many water cisterns were reported to be aging and in very poor condition. Winter freeze-thaw events causing ground heave imparts a structural toll on these concrete cisterns. Cracked and broken tanks have allowed contaminate entry in the form of organics, rodents, and snakes.

Annual cistern cleaning and maintenance will extend the lifetime of cisterns, but ultimately their replacement will be necessary, only to have the current problems repeated. The past and present system of water treatment, delivery and household storage in water cisterns merely reproduces the current water problem. In the majority of the study communities, water originating from cisterns was not consumed. The high cost of water treatment and delivery in these situations is not met with increased water security. In one community from Treaty 6, the cost of water delivery alone was over one million dollars annually. In that community, residents did not drink the cistern water due to fears of contamination based on prior skin infections and enteric illnesses.

While the federal government designed, built and funded this system of water delivery it is the responsibility of the First Nation to operate the system. These communities were never involved in decisions regarding the design of their water distribution system. Many communities would prefer a piped water distribution system, similar to municipal service structures in non-First Nation communities. Given the dispersed, large acreage settlement pattern of the case study communities, a piped distribution system would be cost prohibitive to the First Nation. While the federal government will invest millions to build improved water treatment facilities, the system that delivers and stores that same water remains costly and a source of contamination.

Risk-Ranking Results

The second most frequently reported risk to source water was the common method of household sewage disposal known as "shoot-outs". This method of sewage disposal consists of piped sewage from a home being deposited on the land surface in a backyard area. Working committee participants voiced concern over the potential for sewage contamination of the groundwater supply originating from these "shoot-outs". This becomes an even greater problem when considering the cumulative impact of numerous "shoot-outs" in a community. In all but one study area the source of community drinking water was from groundwater supplies. Seasonal flooding exacerbated by extreme weather events and autumn snow melt increases household and community vulnerability to sewage contamination of community groundwater supplies. Where homes are on individual wells the risk of contamination is even more acute. This method of household sewage disposal further exemplifies inadequate 'on-reserve" infrastructure development provided by the federal government at the time of housing approval from the federal government. A more common and preferred method of sewage disposal was piped sewage to sewage lagoons.

The third most frequently reported risk to source water supply was community landfills. All landfills were visually inspected during this research project and were found to consist of either open excavation pits or surface deposition areas (see Figure 4).

In both forms, either excavation pits or surface deposition, there was no evidence of an impermeable membrane to protect against groundwater contamination. In addition, flood water, rainwater and snow melt help to mobilize contaminants into nearby waterbodies or into groundwater supply. Climate change and extreme weather events will only exacerbate this situation. Wind-blown material presented a negative aesthetic to the community and may also increase the spread of contaminant material potentially impacting source water quality. Once a landfill site is at capacity a new location is selected and the same method of disposal is practiced. Waste reduction, recycling, and composting is not required by the federal government. Again, agencies of the federal government promoted and funded this method of solid waste disposal to be developed.

Figure 4. Landfill on First Nation in Treaty 6 territory. Photo credit: R. Patrick.

5. Discussion and Conclusions

The results from six community-based source water protection planning processes illustrate the high degree of human exposure to water contamination in First Nation communities. We view this exposure not as the product of under-capacity or dis-interest from the communities, but rather as the product of colonial structures of the state [18,19]. As 'occupants' of federal land, First Nations have historically been excluded from decision-making and land use planning practices of the federal state. In the absence of community control, outdated infrastructure is maintained at high costs, and inappropriate land use practices—including household water service, household sewage disposal and community landfill construction—continue despite negative health and ecological implications. Some First Nations have begun to assert their jurisdiction through the development of comprehensive community plans in the prairie region and elsewhere in Canada, and by developing land management regimes that are harmonized with federal and provincial approaches. In other words, the eliminative logic of settler-colonialism continues to restrict Indigenous governance to state frameworks [19].

Returning to our theoretical approach, we draw attention to the 'political ecology' of First Nation community infrastructure design. We suggest here that the exclusion of First Nations from participation in critical decision-making around household potable water delivery, household waste water disposal and solid waste landfills reproduces environmental problems, including undrinkable water in many First Nation communities. This power imbalance, constitutionally entrenched and legally enforced through the *Indian Act 1876*, continues to reproduce undrinkable water. Without addressing this colonial governance structure, no amount of money, technological wizardry, or scientific savvy will overcome these relational deficiencies. As a result, the notion of a "First Nation water problem" has become common discourse for both popular media and elected officials.

The water problem discourse masks the "political" roots of disparities in access to clean water and a safe environment [11,37].

(Re)introducing the political into water through a political ecology approach has helped to reveal power differentials operating between First Nations and state actors [21,112,113]. This political reading of the Indigenous water crisis illustrates the inability, and exclusion, of First Nations to participate democratically in securing, protecting and distributing drinkable water within their Nations and their households [114,115]. In the words of Loftus [113], by avoiding any discussion of the 'politics' of drinkable water access, we run the risk of environmental determinism, where poor water quality is perceived as the result of one's birthplace or identity. This finding has currency in a relational approach to water security that emphasizes human capabilities, such that the emphasis has been on jurisdiction and techno-scientific solutions, rather than on flourishing and wellbeing [35,36]. The application of the household water insecurity approach in research on Indigenous engagement in prairie water

governance may offer significant insights, if meaningfully adapted to the community and regional context [37].

We highlight the validity of the land degradation and marginalization narrative found in Robbins [20] as a useful explanatory tool to better understand past and present political conditions responsible for the reproduction of the Indigenous water crisis in Canada today. The narrative of degradation and marginalization contains the twin conditions of 'exclusion and injustice' that best describe the historical context and present day impact relative to the persistent water problems faced by many First Nations in this 'developed' country, Canada. The exclusion of Indigenous people from land and water decision-making has led to a proliferation of 'water problems', where Indigenous communities and households experience issues at a higher rate than non-Indigenous households. This constitutes contemporary water injustice. Exclusion from decision-making is an on-going process that started with settlement and agriculture, and is driven by settler-colonialism's eliminative logic [19]: occlusion of Indigenous claims to jurisdiction over traditional territory, and reduction of Indigenous voice to wards 'represented' by agents of the Federal government have reshaped waterscapes and landscapes across Canada. Lands and waters are degraded, Indigenous modes of production restricted, and Indigenous communities and Nations marginalized by multiple mechanisms and processes within settler-colonialism.

The application of this narrative broadens the theoretical reach of political ecology to describe the exclusion of Indigenous participation in land and water-based decision making via the instruments of colonization. While the importance of power relations in its many forms runs deep in the field of political ecology we see opportunity here to explain the First Nation water problem as a political problem and an outcome of settler-colonialism. The purposeful exclusion of a group from decision-making and the resultant environmental injustices offer an important explanatory tool from within political ecology.

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Article

Whose Rules? A Water Justice Critique of the OECD's 12 Principles on Water Governance

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Abstract: The article constructively critiques the Organization for Economic Cooperation and Development's (OECD) 12 Principles on Water Governance (the OECD Principles). The human rights standard, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), provided the foundation for conceptualizing Indigenous water rights. The analysis used a modification of Zwarteveen and Boelens' 2014 framework of the four echelons of water contestation. The analysis indicates that the OECD Principles assume state authority over water governance, make invisible Indigenous peoples' own water governance systems and perpetuate the discourses of water colonialism. Drawing on Indigenous peoples' water declarations, the Anishinaabe 'Seven Grandfathers' as water governance principles and Haudenosaunee examples, we demonstrate that the OECD Principles privilege certain understandings of water over others, reinforcing the dominant discourses of water as a resource and water governance based on extractive relationships with water. Reconciling the OECD Principles with UNDRIP's human rights standard promotes Indigenous water justice. One option is to develop a reinterpretation of the OECD Principles. A second, potentially more substantive option is to review and reform the OECD Principles. A reform might consider adding a new dimension, 'water justice,' to the OECD Principles. Before reinterpretation or reform can occur, broader input is needed, and inclusion of Indigenous peoples into that process.

Keywords: First Nations; OECD; water governance; water justice; water colonialism; UNDRIP; UN Declaration on the Rights of Indigenous Peoples

1. Introduction

In 2007, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) became the international standard for Indigenous peoples' rights [1]. UNDRIP provides a framework, based on the principle of self-determination, for understanding Indigenous water justice [2]. The implication for water management is that Indigenous peoples have the right to manage and use their waters and lands according to their own systems of water governance.

Unfortunately, the water sector has been slow to respond to the implications of UNDRIP. Settler state water governance systems at all scales have failed Indigenous peoples [3]. Settler state institutions tend to exclude, override or ignore Indigenous peoples' water governance. This process of systematic exclusion, based on colonial imperialism, has been termed 'water colonialism' [2].

A growing literature documents and theorizes Indigenous water (in)justice. Much of the analysis in the literature is based on the scale of settler states/Indigenous peoples. Fewer analyses consider international water governance standards and guidelines. One of these guidelines is the Organization for Economic Co-operation and Development (OECD)'s 12 Principles on Water Governance, referred to here as the 'OECD Principles'.

The impact of non-binding international guidelines, like the OECD Principles, on actual water governance practices can be disputed. These guidelines, nonetheless, have a role in shaping water governance discourse. If we accept that the role of the OECD Principles is to provide a robust, internationally accepted framework for water governance, then the potential impact of the OECD Principles on Indigenous water justice must be fully considered.

Using a framework based on Zwarteveen & Boelens' four echelons of water contestation [4], we provide a critique of the OECD Principles. Our constructive critique explores some of the underlying tensions between the discourses of the OECD Principles and the examples of Indigenous peoples' water governance. Based on this critique, potential pathways are discussed and options are explored for reform.

Given the diversity of Indigenous peoples, we did not wish to generalize on what Indigenous peoples' water governance is or is not. Nevertheless, the underlying ontological foundations of water governance are worth examining in relation to water colonialism. In order to make comparisons as part of the critique, we draw on a number of examples, including: The Great Lakes Anishinaabe 'Seven Grandfathers' as water governance principles, the Haudenosaunee Confederacy (Six Nations) Great Law of Peace as governance principles, the Ontario Water Declaration, the Assembly of First Nations' National Water Declaration, the Fitzroy Declaration, the Garma Declaration, and the Kyoto Indigenous Peoples' Water Declaration.

Through this article, 'water' and 'waters' refer to freshwater only. Sea or offshore water rights are not discussed here. Water is connected within the landscape, so when we refer to 'water,' this includes groundwater and springs, as well as larger water bodies and rivers.

As noted in the Australia and New Zealand Indigenous Principles for Water Quality, the 'land, sky, water and its people are inseparable' [5]. But, a separation of land and water is embedded in many systems of water governance and management. Indeed, it is the basis on denying many Indigenous peoples their water rights, even if land rights are recognized. The artificial separation of land and water governance is preserved here for cohesiveness across our critique.

Throughout most of this article 'rights' and 'Indigenous water rights' are meant in the broad sense: Economic, social, cultural, political or other rights to water. When referring to a formal, state recognized right to take a volume of water, such as a water license, water allocation, or water property right, we use the term 'water entitlement'.

2. Background

It is a truism that water crises are crises of governance. It follows that one of the solutions to water crisis is 'good' or 'best practice' governance. These ostensibly neutral terms describe systems that are shaped by politics, power and economic interests. Perreault notes that 'the vagueness and malleability of the term may serve to obscure political interest and ideological positions, as in the World Bank's formulaic calls for 'good governance', a position that is surely hard to argue with. After all, who wants bad governance?' [6]. Engaging critically with the politics of 'good governance' makes visible the contested claims about who governs, what constitutes 'good' governance, and the claims to water itself.

2.1. The OECD 12 Principles on Water Governance

The Organization for Economic Cooperation and Development's 12 Principles on Water Governance is a framework described by the OECD as, 'must-do for governments to design and implement effective, efficient, and inclusive water policies' [7]. The principles are intended to improve the 'water governance cycle', from policy conception to implementation, based around three dimensions: 'Effectiveness', 'efficiency', and 'trust and engagement'. Table 1 below lists the Principles. The OECD Principles are accompanied by an assessment tool containing indicators for each principle [8]. The OECD Principles are included within the OECD Council Recommendation on Water [9].

Table 1. The 3 dimensions of the OECD 12 Principles on Water Governance.

Dimension	Principle #	Principle
Effectiveness	Principle 1	Clear roles and responsibilities
	Principle 2	Appropriate scales within basin systems
	Principle 3	Policy coherence
	Principle 4	Capacity
Efficiency	Principle 5	Data and information
	Principle 6	Financing
	Principle 7	Regulatory frameworks
	Principle 8	Innovative governance
Trust & engagement	Principle 9	Integrity and transparency
	Principle 10	Stakeholder engagement
	Principle 11	Trade-offs across users, rural and urban areas, and generations
	Principle 12	Monitoring and evaluation

Source: OECD [10].

The OECD Principles are presented as a neutral and flexible tool. The principles do not distinguish between water management functions, uses or ownership [10]. They are non-binding and non-prescriptive. This is appropriate because there is no 'one-size-fits-all' approach to water policy. Documentation about the OECD Principles emphasizes the importance of contextual factors and place-based needs [11].

The development of the OECD Principles is consistent with the OECD's mission to 'promote policies that will improve the economic and social wellbeing of people around the world' [12]. The OECD evolved from the Organization for European Economic Cooperation (OEEC), which was formed in 1948 to enhance European cooperation after World War II [13]. Canada and the USA joined the OEEC in 1960, extending the membership beyond Europe and creating the OECD. Canada and the USA, along with Australia and New Zealand (also OECD members) are often linked due to their history of British settler colonialism. These countries voted against UNDRIP in 2007, although all four later reversed their position. The OECD's mission, combined with its membership, form the backdrop on which the OECD Principles were formed.

The OECD Principles were developed through the Water Governance Initiative (WGI), initiated in 2013 by the OECD [14]. The WGI has a role in the 'global water governance agenda' and reports helping 'shape national reform agenda and strategic plans (e.g., Mexico's new National Water Law)' [15]. The WGI contributed to several international water documents, such as the Lisbon Charter [16]. Although the WGI does not have decision-making authority, its advisory network shares information between a range of experts, policy makers, and practitioners.

To develop the OECD Principles, more than 100 participants were involved from the public, private and not-for-profit sectors. The WGI's final Principles were adopted by the OECD Regional Development Committee in 2015. A Global Coalition for Good Water Governance was convened of parties that endorsed the OECD Principles [14].

The OECD Principles are now endorsed by more than 170 entities, including 41 countries. Endorsement is a commitment to using the Principles, disseminating the Principles, and reporting back to the OECD.

Despite their growing acceptance and use, it is difficult to evaluate the extent to which the OECD Principles have directly impacted or improved practices. In 2018, the OECD surveyed the Global Coalition for Good Water Governance: 80% of the 85 respondents reported using the OECD Principles to inform policy or make other decisions; 42% reported using the OECD Principles to assess water governance in particular contexts; and 25% said the Principles were used to guide practices in their own organizations [14]. But, only 28% reported using the Principles as a 'package.' Other respondents reported that individual Principles were used, depending on the context. The report does not provide

a breakdown of results by sector, so it is unclear how the relative uptake by government compares to the private sector, for example.

The literature contains several examples of the OECD Principles being used as an analytical and auditing tool. The OECD Principles were used to compare water governance policies across six countries [17], to discuss changes in France's water governance [18], and assess the Dutch Flood Protection Program [19]. A key conclusion of the Dutch assessment was the importance of focusing on actual practices, not only on the overarching governance processes. These studies indicate the OECD Principles' analytical utility.

2.2. Indigenous Water Justice and Water Colonialism

Settler states have tended to claim authority over water, excluding and obscuring Indigenous peoples' systems of water governance. The claiming of waters by states, as part of the claiming of land and other resources, is an intrinsic and ongoing part of colonization [3,20]. Following Robison et al., we use the terminology of 'Indigenous water (in)justice' and 'water colonialism' [2].

Water colonialism manifests in many ways. These include, but are not limited to, dispossession, denial or erasure of Indigenous peoples' management and water diversion [21], pollution of water as a result of the state's activities, destruction of water places, and inadequate drinking water and sanitation service delivery. The literature contains detailed discussions of water colonialism's processes and impacts. For example, Phare's discussion of First Nations water rights in Canada [22] and many more, such as [2,3,20].

Indigenous peoples continue to assert their sovereignty and rights to water, and to uphold their responsibilities to water. Working with creativity and strength, Indigenous peoples are using diverse strategies such as advocacy [22], nation building [23], policy development [24], teaching and sharing, practicing love for water [25], forming new governance frameworks [26], community-based water monitoring [27], developing new policy concepts such as 'cultural flows' [28] and more.

Despite Indigenous peoples' advocacy at national and international levels, states have avoided formalising Indigenous peoples' rights to water. The lack of formal rights have perpetuated what Gupta et al. describe as the 'legal and legitimate expropriation of the lands, waters, ecosystems and minerals' [29].

2.3. UNDRIP

This section reviews UNDRIP with attention to the water governance implications. Echoing Robison et al., this paper used UNDRIP as the 'normative backbone' of our conceptualization of Indigenous water rights and justice [2].

UNDRIP is a human rights standard. It is the most comprehensive [29] and most significant recent recognition of Indigenous peoples' rights by international law [30]. UNDRIP is often cited in discussions of Indigenous water justice and water rights. Examples include Jackson, Marshall, Taylor et al. and Askew et al. [3,20,24,31]. The Garma Declaration, the Mary River Statement, and the Assembly of First Nations National Water Declaration are examples of Indigenous peoples'/First Nations' water declarations that reference UNDRIP [22,32,33].

UNDRIP recognizes the inherent right of Indigenous peoples to self-determination. Drafted and negotiated by Indigenous people, UNDRIP was endorsed by the General Assembly in 2007, with a majority of 144 states voting in favor [34]. At the time of the vote, Australia, Canada, New Zealand and the United States voted against the UNDRIP, later reversing their position to support the UNDRIP. All countries that endorse the OECD 12 Principles on Water Governance also support UNDRIP, except for Colombia, which was one of the 11 states that abstained from the UNDRIP vote. Countries' endorsement of UNDRIP and the OECD Principles are listed in Appendix A.

As a Declaration, rather than a Convention, UNDRIP is not legally binding under international law. Regardless, states which voted to support UNDRIP have indicated a commitment to uphold the rights within it. In some jurisdictions, the courts have started to refer to UNDRIP obligations [35]. In Canada,

Bill C-262, 'An Act to ensure the laws of Canada are in harmony with the United Nations Declaration on the Rights of Indigenous Peoples,' recently passed by the House of Commons [36]. The bill requires Senate approval before coming into force. Similarly, the government of British Columbia recently committed to being 'the first province in Canada to introduce legislation to implement UNDRIP' [37]. Given the constitutional division of powers in Canada in relation to water governance, legitimizing UNDRIP in federal and provincial legislation is essential.

UNDRIP is considered to have played a 'very significant role in reshaping domestic legislation' [35]. Nevertheless, implementation is not without its challenges. The ten year review of UNDRIP indicated that, although progress has been made, implementation is not yet complete [38]. In practice, the implementation of UNDRIP has been selective, with states strategically endorsing only those norms which align with their interests [39], and exploiting any legal ambiguity by 'rule shopping' [29].

UNDRIP declares that Indigenous peoples have the right to self-determination [1]. As affirmed by Article 3 of UNDRIP, Indigenous peoples have the right to 'freely determine their political status and freely pursue their economic, social and cultural development'. Article 5 declares that Indigenous peoples have the right to maintain their distinct institutions, such as political and legal institutions. Article 25 of UNDRIP states that Indigenous peoples have the right to maintain their spiritual relationship with their lands and waters. Further, Articles 26 states that Indigenous peoples have the right to 'own, use, develop and control' their lands and resources, such as water. Indigenous peoples have the right to determine how their land and resources will be developed. According to Article 32, states must consult with Indigenous peoples and obtain their free, prior and informed consent, operating in good faith, prior to approving any project that would affect Indigenous peoples' water, land or other resources [1].

Noting that UNDRIP's references to 'lands, territories and resources' are interpreted to include water [31], Indigenous peoples' rights to water are substantial. Indigenous peoples have the right to their own water laws, systems of water governance, and institutions, consistent with their own frameworks for water management. They have the right to maintain their spiritual relationships to water. Indigenous peoples have the right to decide if and how water resources will be developed or used. In many cases, the practical details of implementing UNDRIP are yet to be determined. Even the nature of 'free prior and informed consent,' and whether it implies a right to veto, is debated [31].

Indigenous peoples' right to govern water according to their own laws and institutions has profound implications for state water governance. UNDRIP calls for, in effect, the decolonization of water. Decolonization (i.e., the undoing of colonization) leads to material, meaningful outcomes: Repatriation of land and water. State power is potentially reduced and decentralized. Decentralization of power is one of the main threats to state water bureaucracies [40]. Perhaps by no coincidence, the debates about UNDRIP were of 'unprecedented length' compared to other UN human rights standard-setting processes, revealing the 'deeply entrenched normative and political tensions arising from the recognition of Indigenous peoples' rights' [35]. As Tuck & Yang note, decolonization is 'unsettling' and uneasy [41]. Ultimately, UNDRIP challenges states' claims of water decision-making authority.

2.4. Disambiguation: UNDRIP and the Human Right to Water

Indigenous water justice is a human rights issue. However, it is distinct from the 'human right to water' (HRW) and to sanitation [42]. In the dominant discourse, HRW refers to basic domestic water needs i.e., water for drinking, personal sanitation, clothes washing, food preparation, and household hygiene. The UN defines the HRW as 'access to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use'. The right to sanitation is defined as the right to 'physical and affordable access to sanitation, in all spheres of life, that is safe, hygienic, secure, and socially and culturally acceptable and that provides privacy and ensures dignity'. The UN has suggested a nominal volume of water to satisfy the HRW of 50 L–100 L per person, per day [43]. The dominant interpretation of HRW has de-politicised the concept's grassroots environmental justice origins, veiling

power asymmetries and making the HRW appear to lack political content [44]. This depoliticization reproduces contested narratives about human rights and development [45]. Nevertheless, HRW continues to have value [46] and has been used to achieve a range of water access and equity goals [47].

The concept of the HRW differs from UNDRIP, as a water rights framework, in several ways. The HRW recognizes that all persons need water for life, health and dignity. Every individual has the right to water and the right to sanitation. By contrast, Indigenous water rights are collective rights that affirm Indigenous peoples are equal to all other peoples. To put it another way, the HRW can be imagined as the 'minimum' right to water and sanitation, which is distinct from subsistence rights, and also from the 'maximum,' or multi-level, rights of Indigenous peoples [29]. Another difference is that the HRW does not define the institutional structures that provide water access [6,48], whereas Indigenous water rights based on UNDRIP support self-determination via Indigenous peoples' institutions and laws. Finally, the HRW is 'abstract' in the sense that it is universal and not connected to accessing a specific water resource [49], which differs from Indigenous water rights that are located within place and history.

In sum, UNDRIP and the HRW can be viewed as two human rights standards that sit side-by-side, corresponding to connected, but different aspects of water.

2.5. Indigenous Peoples' Water Governance Principles: Examples

Indigenous people's water governance systems are central to achieving Indigenous water justice. It is relevant to consider the differences, if any, between the OECD Principles and Indigenous peoples' water governance approaches.

A definitive comparison is not possible because Indigenous peoples' water governance systems are heterogeneous. Furthermore, asserting a strict dichotomy between, say, 'Western' and 'Indigenous' approaches obscures diversity [31]. However, it is possible to consider specific Indigenous water governance frameworks and compare these to the OECD Principles. Here are some Canadian First Nations examples and a brief overview of some prominent Indigenous international water declarations.

The fundamental belief that water is a sacred gift is shared among Indigenous peoples in Canada. More recently, it has been codified in Indigenous political declarations that assert inherent jurisdictional authority over water, as responsibilities and obligations given by the Creator. The Assembly of First Nations National Water Declaration is a resolution of over 600 First Nations Chiefs from across Canada, that establishes an overarching framework or statement of collective water principles, grounded in an Indigenous worldview [32]. It calls for active engagement in water governance within traditional territories and treaty lands, including Indigenous customs, traditions and practices. This declaration calls upon settler state governments to 'recognize, support and affirm all First Nation Water declarations', and in doing so, reinforces other instruments, such as the provincial level Ontario Water Declaration of the Anishinaabek, Mushkegowuk and Onkwehonwe [50]. The declarations are political instruments that reaffirm constitutionally-protected inherent rights within settler states. They support First Nations actions to apply, at the local level, their own laws and governance systems, which are intricately connected to land, water and place.

For the Anishinaabek, much of whose traditional territories lie in present day Ontario, Canada, the Seven Grandfathers teachings are among the most scared laws. Considered to be spiritual gifts sent by the Creator, the Grandfathers are the original instructions for how to maintain balance and harmony with all of creation, and a way to fulfill sacred responsibilities to the Creator. Maintaining scared relationships is important to ensure the sustainability of creation's gifts. Applied to water, the seven principles of respect, wisdom, love, bravery, honesty, humility and truth, provide a path to water security [51]. They impart a moral code or decision-making framework for managing appropriate human relationships with natural systems.

The Great Lakes Anishinaabe Seven Grandfathers and Water Governance Principles are [51]:

- Truth—to recognize the work of the creator in all things

Value water in all its forms and all its uses

• Humility—to know that each of us is part of creation and that all people are equal
Equity of all people, equity of nature, nature's rights to water
• Respect—to take care of all things the Creator has given on Mother Earth
Respect water and all of nature, and one another's views and ways
• Wisdom—to seek and share knowledge
Use water wisely and consider all forms of knowledge
• Honesty—to speak right of things–not to lie, cheat or deceive
Accountability and transparency of actions, decision-making and motives
• Love—to care and help one another
Commitment to collaboration and shared benefits
• Bravery—to be ready to face all things that are hard to do
Address immediate problems and address new conflicts from resistance to change. Shortest/quickest route is not always the best path for sustainability [51].

Similarly, the Haudenosaunee or Six Nations Confederacy of the great lakes region, are governed by Haudenosaunee law, which provides principles for responsible governance—governance founded on the understanding that all creation is interconnected and each entity has a sacred responsibility to fulfil, including water. By fulfilling responsibility, the sacred balance is achieved, and the gifts of creation will continue to provide for all.

The Haudenosaunee Constitution, known as the Great Law of Peace, is considered the 'law of the land', and at its core are three basic principles: peace, power (unity) and righteousness [52], and like the Anishinaabek, this refers to all relations, including land and water. As well, the Haudenosaunee Creation Story offers fundamental teachings on the interconnectedness between all living and non-living entities, and arguably are early origins for what we now call integrative management and ecosystem-based approaches.

Paramount is the Thanksgiving Address, or the 'words of thanksgiving,' that begin and end Haudenosaunee political and social events. Through this oral ceremony important values are shared and transmitted. Systematically giving thanks establishes a collective mind and spirit, and reinforces principles of respect, responsibility, and reciprocity. Equally relevant to water, is the Dish with One Spoon principle. Codified in Indigenous wampum, the teaching is a reminder of 'the collective responsibility of the people to share equally' [52]. Wampum beads are sea shells strung together to create intricate patterns with sacred and symbolic meaning. Wampum are used for official purposes and ceremonies, and narrate history, traditions or law. Early Haudenosaunee—Settler relations were often codified in wampum which were exchanged as formal agreements considered historic treaty within Indigenous law [53]. The wampum provides foundational principles for what is considered collaborative governance in current discourse. In sum, these represent only a selection of the many teachings, considered law, that illustrate how the Haudenosaunee govern their interactions with water.

Managing relationships with water through Indigenous laws, practices and beliefs, emphasizes a highly ecological or environmental approach to Indigenous water governance. But it is also important to acknowledge that Indigenous peoples face current water needs and challenges common to other populations of society. Colonialism, Western water institutions, and contemporary lifestyles have created competing social, political and economic demands for water, that in some cases have altered the spiritual relationship with water. In Canada, where Western water governance dominates, many Indigenous communities struggle for sufficient quantities of quality water to meet their basic livelihood needs [54]. Some lack potable drinking water, and water treatment facilities and infrastructure are inadequate, and human and financial capital are limited [55]. In addition to ensuring domestic needs are met, Indigenous peoples also assert rights to water and a role in governance for purposes of navigation and travel, irrigation, environmental protection, commercial and industrial activities, and hydro-electricity [56]. Traditional water laws, values and spirituality, within a contemporary context, highlight the importance of water governance to enable Indigenous inherent responsibilities for water, while empowering Indigenous peoples to address a diversity of water uses for current and future needs.

Some of the concepts described above are also reflected by Indigenous people's international water declarations, the Garma and Kyoto Declarations. Both declarations articulate Indigenous frameworks for water and strongly advocate for Indigenous rights. The Garma Declaration was developed Indigenous water experts in 2008, following discussions about how to protect Indigenous interests in water and traditional knowledge. The Garma Declaration asserts that water is a spirit: 'Indigenous peoples internationally share cultural and customary responsibilities to fresh water . . . Water is not a commodity. Water is a spirit that has a right to be treated as an ecological entity, with its own inherent right to exist' [22]. The Kyoto Declaration from the 2003 World Water Forum is an action plan for water, declaring Indigenous peoples as caretakers, with rights and responsibilities to defend and protect water. The preface describes Indigenous peoples' relationship to water and their right to self-determination. It states that Indigenous peoples 'recognize, honor and respect water as sacred and sustaining of all life' [57].

This section provides a few reference points related to Indigenous peoples' water governance. The Haudenosaunee and Anishinaabe examples illustrate specific traditions that inform current practice, such as the water security framework based on the Anishinaabe Seven Grandfathers. The Ontario Water Declaration and National Water Declaration apply foundational principles to contemporary water challenges. The international declarations, Garma and Kyoto, assert some global commonalities in both Indigenous understandings of water and in the struggle against water colonialism.

2.6. Strategies for Indigenous Water Justice

Numerous solutions, strategies and mechanisms for promoting Indigenous water justice have been proposed. As mentioned previously, Indigenous peoples use a wide variety of strategies and practices to assert their rights. Much of the academic literature focuses on changes that states could or should make. These range from small changes, such as increasing Indigenous participation in state water management consultations, to complete overhauls of the ontological foundations of water governance. Examples of mechanisms include: Legislation, constitutional protection for collective rights, negotiated settlements or agreements, supporting Indigenous institutions/bodies that govern water, market mechanisms, and conferring legal personhood on rivers [30].

Some of the options are complimentary, some are mutually exclusive. Drawbacks and benefits need consideration based on contextual factors [30]. The merits of legal personhood for rivers, for example, are hotly debated. After the landmark legal precedent of Whanganui [58], there have been calls for other rivers around the world to also be given legal personhood. Nevertheless, legal scholars are concerned that, in certain contexts, the mechanism might weaken, not strengthen, Indigenous rights [59].

In addition, several frameworks have been proposed for conceptualizing the multi-dimensional issue of Indigenous water justice. The analytical model of 'representation, recognition and redistribution', proposed by Fraser [60], has been applied to Indigenous water justice [3,61]. Robison et al. discuss the themes of 'Indigenous water rights' and 'political partnership' and propose three intertwined dimensions of self-determination: socioeconomic, cultural and political self-determination [2]. Zwarteveen and Boelens propose four echelons of contestation for water: Resource access, rules, authority and discourses [4]. Water justice may also be considered through the lens of environmental justice literature [46].

Despite the array of proposed solutions and frameworks, water colonialism remains a systemic issue, perpetuated at multiple levels. This paper focuses on water colonialism in one arena: An international discourse about water governance, embodied by the OECD Principles.

3. Four Echelons of Water Contestation: Resources (or Relationships/Responsibilities), Rules, Authority and Discourses

Several frameworks could provide a water justice analysis of the OECD Principles. In this article, we use Zwarteveen and Boelens' framework for water contestation [4]. The framework identifies four

echelons of water struggles: Resources, rules, authority and discourses. These echelons are interrelated and shape each other. For example, the dominant discourse will shape the water management rules, that will in turn effect who can access water resources.

We deviate from the work of Zwarteveen and Boelens by adding 'relationships/responsibilities' to the 'resource' echelon. The variation highlights responsibilities to water and UNDRIP rights to maintain the spiritual relationships. The variation to the 'resource' echelon avoids a narrow view of water access that is synonymous with extractive use only.

The modified framework of water contestation is:

- Resource (or relationships/responsibilities) echelon:

Distribution of the *resource*: Who has access to water and for what purposes? What (non-resource) relationships to water are valued?

- Rules echelon:

Whose *rules*, norms and laws determine water management, distribution and allocation, and the mechanisms to acquire rights?

- Authority echelon:

Who has the *authority* to make decisions and enforce rights?

- Discourses echelon:

Whose *discourses* are used to articulate water problems and solutions?

3.1. Analysis

Using the four echelons of water contestation as the analytical framework, several documents were examined: The OECD Principles on Water Governance [10], OECD Council Recommendation on Water [9], the OECD Water Governance Indicator Framework [8], and Implementing the OECD Principles on Water Governance: Indicator Framework and Evolving Practices [14]. The documents were firstly searched for references to Indigenous peoples and UNDRIP. The key themes across each of the four echelons were then examined. The themes are summarized in Table 2 below.

Table 2. Water contestation themes in the reviewed documents about the OECD Principles.

Echelon of Contestation	Themes
Discourses	HRW present in documents, UNDRIP absent. Water as an inert resource.
Authority	Authority for water is assumed to be the signatory state. Water conflicts are presented as cross-sectoral, rather than a direct contestation of the state's authority.
Rules	Rules are made by the signatory state, with input from stakeholders. 'Indigenous people' are 'underrepresented stakeholders' to be engaged in state policy design, but are not conceptualized as central policy actors.
Resources & relationships/responsibilities	Water allocation is 'non-discriminatory' and 'responsive to the customary practices of traditional communities' but these are not defined. Indigenous communities are presented as a 'vulnerable group' who need to be considered in relation to water service access. Human relationship to water is extractive.

3.2. Discourses

In the documents reviewed, discussions of Indigenous peoples' water issues are sparse. Indigenous water justice, and the relationship between Indigenous peoples' water governance and state water governance, are not discussed in the documents. None of the documents mentioned UNDRIP. A list of policy domains relevant to water included finance, land use, forestry, urban development, energy production, climate change mitigation and adaptation, mining, agriculture, transport, infrastructures [9]. The list had no items related to Indigenous peoples or water tenure. Another list of 'binding, and non-binding, water-related international or supranational frameworks and regulations' and 'soft law'

within the Indicator document [8], includes many items, including the sustainable development goals, but not UNDRIP.

The omissions suggest that Indigenous water justice is not considered a salient water governance issue. The HRW, in contrast, is referenced in all four documents. As noted earlier, HRW has been de-politicized and its meaning has come to support the dominant discourse, whereas UNDRIP challenges this discourse.

3.3. Authority

Throughout the documents, a signatory state is presented as the decision-making authority and regulator of water. Conflict management is conceptualized as a regulation and enforcement issue, presumably for the signatory state to preside over. Conflict is suggested to arise from different cross-sectoral strategies (Principle 3) or 'trade-offs' between users (Principle 11), rather than from contested claims about the primary authority.

'Indigenous' appears only once in the indicator framework's text [8]. Across the four documents, the terms 'Indigenous communities' or 'indigenous people' were used, but there are no references to Indigenous peoples in plural i.e., as distinct and diverse peoples. Indigenous peoples are referred to as 'under-represented stakeholders', to be engaged in state processes [10], or as a 'vulnerable' group in water service delivery [14]. Indigenous peoples were not listed in an example of stakeholders that could comprise a 'minimum level of representation' [8]. The sample stakeholder diagram, on page 12 of the Indicator framework, depicts 6 categories of stakeholders [8]. This example daigram places water users at the centre, followed by policy actors. 'Indigenous communities' are listed on the outer edge of the diagram within the 'underrepresented actors' category of stakeholders.

Many Indigenous people do not see themselves as 'mere' stakeholders in the water management processes run by states [62]. As clause 9 of the Kyoto Declaration explains, Indigenous peoples 'have the right to self-determination, we have the right to freely exercise full authority and control of our natural resources including water. We also refer to our right of permanent sovereignty over our resources, including water' [57].

The homogenization of Indigenous peoples can be seen within the 51 case studies 'evolving practices on water governance' on the OECD website [63]. The only Indigenous case study was submitted by an Aboriginal organization from Australia, Madjulla Inc. The case study, Practice #41, described the Fitzroy River Declaration, a negotiated agreement between the Indigenous peoples of the Fitzroy River catchment (i.e., watershed) in Western Australia to create a governance framework, based on Indigenous laws [63]. The case study indicates that the Fitzroy Declaration was formed by a coalition of Indigenous peoples within the catchment. A summary within the OECD implementation report, however, says the Declaration was developed by 'an indigenous community'(singular) [14]. The OECD implementation report later refers to 'joint management between the government and aboriginal communities'. The Fitzroy River Declaration itself refers to joint management between the Traditional Owner groups i.e., between the Indigenous peoples [64]. The OECD implementation report's commentary focuses on stakeholder engagement. In contrast, an environmental law commentary on the Fitzroy Declaration recognized it as a negotiated agreement combining Indigenous laws and 'rights of nature,' and an Australian first [26]. The varied interpretations of this case study illustrate that agency and authority can be diminished by frameworks that see Indigenous peoples as one stakeholder among many, rather than as distinct peoples with sovereign rights and their own legal systems.

3.4. Rules

As demonstrated in the previous sections, the OECD Principles are based on the assumption that signatory states have the authority for water policy and regulation. Under this assumption, stakeholders have input into the rules, but the signatory state government makes the decisions.

The OECD Principles do not prescribe specific rules. The overarching governance framework is based on three dimensions: Efficiency, effectiveness and stakeholder engagement. In contrast, the

Anishinaabe Seven Grandfathers framework is based around respect, wisdom, love, bravery, honesty, humility and truth. This is just one example, but it illustrates the difference between the OECD Principles and an Indigenous approach. Conversely, parallels might be drawn between integrated water resources management (OECD Principle 2) and, for example, Haudenosaunee approaches based on interconnections of all living things.

This suggests that the OECD Principles present two problematic issues: *Who* makes the rules and, to a certain extent, *what* overarching principles are used to determine those rules.

3.5. Resources and Relationships to Water

The OECD Principles frame water as a resource to be managed by the water sector. Water is presented as inert, not alive nor imbued with spiritual significance. Under this framing, the relationship of humans to water is extractive. The OECD Principles dimension of trust and engagement pertains to relationships between people, excluding the relationship between humans and water. By contrast, the Anishinabek Seven Grandfather's principles provide a water security framework that values water in all forms and uses [51]. The moral code, based on respect, wisdom, love, bravery, honesty, humility and truth is applied to the relationship between humans and water.

Access to water is addressed by OECD Principle 11, 'encourage water governance frameworks that help manage trade-offs across water users, rural and urban areas, and generations'. In some of the documents, 'customary water rights' [14] and 'customary practices' [9] are referred to, but are not defined, or elaborated in relation to water entitlement distribution outcomes. The indicators refer to equity, and managing trade-offs in a way that is non-discriminatory, transparent and evidence based. However, the interpretation of equity alters radically when Indigenous peoples are framed as having sovereign rights, rather than being 'underrepresented' stakeholders.

Although this paper has not foregrounded water service provision, access to clean drinking water is a vital concern. The OECD indicator document does make specific, albeit brief, mention of water service delivery to Indigenous communities.

4. Discussion

The OECD Principles say that they are rooted in broader 'good governance' principles: Legitimacy, transparency, accountability, human rights, rule of law and inclusiveness [10]. Participation, dialogue and human rights are emphasized. Human rights are represented by the HRW, but an essential human rights standard is missing: UNDRIP. By not explicitly referring to Indigenous water rights, they are rendered invisible. Similarly, the Sustainable Development Goals have been criticised for not explicitly and meaningfully including Indigenous peoples in the main text [65].

The analysis suggests that the OECD Principles reflect the dominant discourse about water that privileges settler states' claims and legitimizes water colonialism. Currently, the OECD Principles place Indigenous peoples on the outer edge of water governance, as underrepresented stakeholders not policy actors. This view is problematic. Progressing Indigenous water justice outcomes requires that the relationship between states and Indigenous peoples to be reconceptualized. This relationship needs to go beyond 'stakeholder engagement' or the HRW focus of water service provision to consider Indigenous peoples' right to self-determination and water sovereignty. The Ngarrindjeri people, for example, use nation building approaches based on agreement making with the Australian government [23]. The shifts from 'underrepresented stakeholders' to nations, and from 'engagement' to leader-to-leader negotiations, immediately reframes Indigenous peoples' roles in water governance.

The OECD Principles' focus on inclusivity is not backed up with a basis for justice. In particular, there is an underlying assumption that each stakeholders' decision-making rights are more or less equivalent. This ignores history and disrespects Indigenous peoples' unique rights. Namely, Indigenous peoples have rights and interests described in UNDRIP, which 'derive from their political, economic and social structures and from their cultures, spiritual traditions, histories and philosophies, especially their rights to their lands, territories and resources' [34].

The exclusion of Indigenous water justice and UNDRIP cannot be dismissed as simply oversights. It is a manifestation of ideological positions about water and political interests. Implementing UNDRIP necessarily changes the discourse about authority for water, sovereignty, and the relationships between Indigenous peoples, water and states.

Like any tool, the utilization of the OECD Principles depends on who wields it and for what purpose. As a global framework for good water governance, the OECD Principles can be used for leverage and to establish legitimacy. In the Fitzroy River Declaration example, a coalition of Indigenous peoples agreed to unite to form a governance body, using a framework consistent with the OECD Principles. The Aboriginal organisation, which submitted the case study, provided an interpretation of the OECD Principles as compatible with Indigenous water governance and law. This reflects the intent of the OECD Principles to be a flexible framework. It is significant that the interpretation of the OECD Principles, to suit an Indigenous context, was then reframed by the subsequent OECD report in a way that subtly reduced Indigenous agency. This highlights the tensions between Indigenous peoples' claims and state claims about who has control over water decision making. Reinterpretations of the OECD Principles are possible but, in this case, the Indigenous narrative was somewhat effaced.

The OECD Principles' underlying assumptions about water as an inert resource further enforce state power. The OECD Principles focus on the relationships between people (water users, stakeholders, government etc.) to the exclusion of relationships between people and water. This framing is consistent with technocratic discourses that present the human relationship to water as one of production and consumption [6]. Central to dominant discourses is the 'hydraulic mission' to control and use 'every drop' of water, expanding state power [66]. The examples of Indigenous water governance principles presented earlier frame water differently: As a spirit, ancestor or family member, requiring reciprocity and respect. The Seven Grandfather's framework contains the principle to 'Respect water and all of nature'. Power and control are central to competing discourses about the relationships between humans and water.

4.1. Reinterpreting or Reforming the OECD Prinicples

We propose reconciling the OECD Principles with UNDRIP. The imperative to harmonise water governance and human rights approaches is particularly strong for the OECD countries with an ongoing history of water colonialism, such as Canada or Australia. Integrating Indigenous water justice into the OECD Principles requires more than inserting 'UNDRIP' into the text. Signposting the relevance of UNDRIP would be a start, but it would not address the problematic assumptions embedded in the OECD Principles. We suggest a reinterpretation or a reform.

Reinterpreting or reforming the OECD Principles based on UNDRIP could benefit states as well as Indigenous peoples. Some pragmatic arguments for implementing UNDRIP include: the cost of reputational risks if human rights obligations are not met, the relatively lower costs of resolving conflict through peaceful negotiation compared to force, and the benefits to society of Indigenous peoples' knowledge and culture, such as environmental conservation practices [38].

Reinterpreting the OECD Principles might mean developing supplementary materials for a water governance audience about UNDRIP implementation. Promoting awareness of UNDRIP is consistent with UNDRIPs 2017 review that recommended capacity building and a communications strategy [38]. Both international guidance and interpretations of UNDRIP for specific jurisdictions could be helpful. For example, 'Between law and action: Assessing the State of Knowledge on Indigenous Law, UNDRIP and Free, Prior and Informed Consent with reference to Fresh Water Resources' discusses UNDRIP and Canadian water law [31]. The advantage of a reinterpretation is that it could sit alongside the existing OECD Principles. Given the significant amount of work that went into developing the current OECD Principles, reinterpretation might be the easier option.

Reform is potentially more powerful than reinterpretation because it provides an opportunity to revisit the underlying assumptions and then make a coherent set of changes across the OECD Principles. Reform could result in greater consistency than reinterpreting the existing Principles.

4.2. A New 'Water Justice' Dimension for the OECD Principles?

What would reformed OECD Principles look like? An initial proposal is to add a 'water justice' dimension to the existing OECD Principles' dimensions of efficiency, effectiveness and trust/engagement. The 'water justice' dimension could have a corresponding set of water governance principles and indicators. The new principles might explicitly refer to UNDRIP implementation.

'Water justice' is a broad term. The proposed new dimension could encompass environmental justice issues, as well as Indigenous water justice more specifically. There is also the opportunity to consider water governance frameworks, based on reciprocity in relationships between people and water: Justice *for* water itself.

If the OECD Principles are reinterpreted or reformed with a clear Indigenous water justice objective, it would need to be directed by Indigenous people, and be based on input from Indigenous peoples. A first step could be to initiate a dialogue about the potential of reforming the OECD Principles to advance Indigenous water justice. A group of Indigenous water governance specialists could be invited to lead a review of the OECD Principles and discuss the option of reform.

5. Conclusions

In their current form, the OECD Principles delegitimize Indigenous water justice. International water governance frameworks for good governance need to be consistent not just with vague, unchallenging notions of 'human rights' but also with the specific rights and norms of UNDRIP.

Contestation for water plays out in multiple ways. Access to water resources and water entitlements is only one aspect, albeit a significant one. In this paper, we referred to four echelons of contestation: resources, rules, authority and discourses, noting that enacting relationships to water is a primary consideration beyond material access within the 'resources' echelon. The analysis across these echelons suggests that the OECD principles miss opportunities to advance Indigenous water justice. Furthermore, documentation about the OECD principles is based on dominant discourses that privilege states' control of water and understandings of water. These discourses render 'invisible' Indigenous peoples as self-determining peoples, and alternative understandings of water, such as those with a foundation of reciprocity and respect for water.

Water governance principles need to critically engage with issues of power and to ask, whose rules define water decision making? This could involve reconciling international water frameworks like the OECD principles with the human rights standards of UNDRIP. It could be possible to reinterpret, reform or even to reimagine the OECD Principles and embed an Indigenous water justice framework. Aligning international discourses about water with human rights standards might help shift discussions at the nation-state level.

We have focused on the OECD Principles as one global arena where the politics of water play out. As noted by the UN's Permanent Forum on Indigenous Issues, implementation of UNDRIP happens at all levels. The work of Indigenous peoples themselves is crucial and there are no one-size-fits-all solutions [38].

With those caveats, we put forward a proposal to reinterpret or reform the OECD Principles, providing for consideration the idea of adding a 'water justice' dimension to the OECD principles.

Water access equity is central to water justice, but so too are issues of identity and relationships. Boelens et al. suggest that the 'struggle for control over water is a struggle for existence, and a struggle to define what existence means' [67]. McGregor describes the Anishinaabek concept of *zaagidowin* (or "love") as central to achieving water justice within the Anishinaabek framework. *Zaagidowin* can be understood as the legal principle for achieving well-being, or *Mnaamodzawin*. In order to achieve water justice, *Mnaamodzawin* needs to be realized, 'not only for people, but for the waters as well' [25].

Working towards water justice provides scope to reimagine and rebuild relationships. This includes our relationships to water, and between coloniser states and Indigenous peoples. Coming together for water could also help rebuild the relationships between Indigenous peoples that have

been strained and fractured by colonisation [68]. Our initial examination of the OECD principles and Indigenous water justice is a first step only. We invite others to continue this water justice journey.

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Appendix A

Table A1. UNDRIP signatories and countries endorsing the OECD principles.

Supports UNDRIP	Endorses the OECD Principles	Country/State	Total
YES Voted to support UNDRIP	NO Has not endorsed the OECD Principles	Afghanistan; Albania; Algeria; Andorra; Angola; Antigua and Barbuda; Argentina; Armenia; Bahamas; Bahrain; Barbados; Belarus; Belize; Benin; Bolivia; Bosnia and Herzegovina; Botswana; Brunei Darussalam; Bulgaria; Burkina Faso; Cambodia; Cameroon; Cape Verde; Central African Republic; Chad; Comoros; Congo; Costa Rica; Cote Ivoire; Croatia; Cuba; Cyprus; Democratic People's Republic Of Korea; Democratic Republic Of The Congo; Djibouti; Dominica; Dominican Republic; Ecuador; Egypt; El Salvador; Equatorial Guinea; Eritrea; Ethiopia; Fiji; Gabon; Gambia; Ghana; Grenada; Guatemala; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; India; Indonesia; Iran; Islamic Republic Of Iraq; Jamaica; Jordan; The Republic Of Kazakhstan; Republic Of Kiribati; Kuwait; Kyrgyzstan; Lao People's Democratic Republic; Lebanon; Lesotho; Liberia; Libyan Arab Jamahiriya; Liechtenstein; Lithuania; Madagascar; Malawi; Malaysia; Maldives; Mali; Malta; Marshall Islands; Mauritania; Mauritius; Micronesia; Federated States Of Moldova; Monaco; Mongolia; Montenegro; Mozambique; Myanmar; Namibia; Republic Of Nauru; Nepal; Nicaragua; Niger; Oman; Pakistan; Palau; Panama; Papua New Guinea; Paraguay; Philippines; Qatar; Rwanda; Saint Kitts And Nevis; Saint Lucia; Saint Vincent And The Grenadines; San Marino; Sao Tome And Principe; Saudi Arabia; Senegal; Serbia; Seychelles; Sierra Leone; Singapore; Solomon; Islands Somalia; Sri Lanka; Sudan; Suriname; Swaziland; Syrian Arab Republic; Tajikistan; Thailand; The Former Yugoslav; Republic Of Macedonia Timor-Leste; Togo; Kingdom Of Tonga; Trinidad And Tobago; Tunisia; Turkmenistan; Tuvalu; Uganda; United Arab Emirates; United Republic Of Tanzania; Uruguay; Uzbekistan; Vanuatu; Bolivarian Republic Of .Venezuela; Vietnam; Yemen; Zambia; Zimbabwe	92
YES Voted to support UNDRIP	YES Endorsed the OECD Principles	[OECD countries] Australia*; Austria; Belgium; Canada*; Chile; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Israel; Italy; Japan; Latvia; Luxemburg; Republic of Korea; Mexico; Netherlands; New Zealand*; Norway; Poland; Portugal; Slovakia; Slovenia; Spain; Sweden; Switzerland; Turkey; United Kingdom; United States* [Non-OECD countries] Brazil; China; Morocco; Peru; Romania; South Africa *[Australia, Canada, New Zealand and the United States initially voted against UNDRIP but later reversed the decision]	41
NO Abstained from vote	YES Endorsed the OECD Principles	Colombia	1
NO Abstained from vote	NO Has not endorsed the OECD Principles	Azerbaijan; Bangladesh; Bhutan; Burundi; Georgia; Kenya; Nigeria; Russian Federation; Samoa; Ukraine	10

Data sources: UNDRIP endorsement [34]; OECD endorsement [11].

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Article

I Want to Tell You a Story: How Narrative Water Ethics Contributes to Re-theorizing Water Politics

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Abstract: This paper explores potential contributions of narrative ethics to the re-theorization of the political in water governance, particularly seeking to rectify concerns regarding when water is excluded from cultural contexts and issues of power and dominance are ignored. Against this background, this paper argues for a re-theorization of the political in water governance, understood as the way in which diverse ideas about possible and desirable human-water relationships and just configurations for their institutionalization are negotiated in society. Theorization is conceived as the concretization of reality rather than its abstraction. Narrative ethics deals with the narrative structure of moral action and the significance of narrations for moral action. It occupies a middle ground and mediates between descriptive ethics that describe moral practices, and prescriptive ethics that substantiate binding norms. A distinguishing feature is its focus on people's experiences and their praxis. Narrative water ethics is thus able to recognize the multitude of real and possible human-water relationships, to grasp people's entanglement in their water stories, to examine moral issues in their cultural contexts, and, finally, to develop locally adapted notions of good water governance.

Keywords: water ethics; narrative ethics; water justice; orientation knowledge; water governance

1. Introduction

This paper explores the ways in which ethical engagement with narratives—i.e., the narrative structure of human-water relationships and the significance of narratives for understanding these relationships—can help us to better grasp the genuinely political in water and overcome existing reductionist forms of water governance.

1.1. Water Governance and the Political

Water governance is an ambivalent concept. In a way, there cannot be no water governance if governance implies those social mechanisms by which collective decisions about water are made and institutionally implemented. In this sense, even abstaining from collectively addressing a problem area (such as water) is already a governance decision [1]. Hence, as an analytical category, the governance perspective asks whether and how institutions are able to deal with the tasks assigned to them [2–5]. Academic and political discourses often link this perspective to the search for good water governance [6–9]. In a historical perspective, the concept of governance has been contrasted with that of management [6,9,10]. Here, the latter is regarded as the prototype of steering and planning by state bureaucracies, whose projects, including large infrastructure projects such as dams, canals or sewage systems, were more often than not implemented top-down, in complete disregard of local conditions [10]. Governance, by contrast, was introduced as a broadening of perspective with regard to scales, sectors, the actors involved in political processes, and policy networks [5]. As opposed to water

management, which aimed for efficiency, water governance represented the search for legitimacy [9,11]. Meanwhile, the governance approach came under criticism because existing forms of water governance did not lead to the anticipated or promised socially just and ecologically tolerable solutions [10,12–17]. In addition, conceptions of good governance are based on particular notions of the (morally) Good that often hide behind a technocratic world view and are hardly ever the subject of ethical reflection or public discussion [6,11,18–20].

In contrast, other concepts have been suggested that stress the social nature of water, such as the hydrosocial cycle, socio-natures or waterscapes [17,21–31]. They emphasize the manifold cultural references to and ontological understandings of water and argue for a shift towards the political in water, a dimension marginalized in current forms of water governance. Consequently, this dimension needs to be made visible and productive in order to contribute to the development of just policies and political institutions [20,32–36]. This paper follows the notion of 'the political' that Eric Swyngedouw characterizes as the "contested public terrain where different imaginings of possible socio-ecological orders compete over the symbolic and material institutionalization of these visions. Indeed, the terrain of struggle over political-ecological futures—a terrain that makes visible and perceptible the heterogeneous views and desires that cut through the social body—and how to achieve this is precisely what constitutes the terrain of 'the political'." [37]. So, a key claim of this paper is that the question of the political in water governance is not about a re-politicization of a previously apolitical field, but rather about consistently confronting the always present political and searching for the public dispute over which present and future water worlds we want to share [11,17,32,37]. At this level of abstraction, the paper does not yet have to deal with specific understandings of the political, e.g., agonism vs. antagonism [38].

1.2. Re-theorizing the Political with Narrative Ethics

The approach to re-theorizing the political in water governance put forward in this paper draws on ancient Greek understandings of theory. The verb *theôrein* means 'to look at,' 'to observe,' 'to see,' or 'to contemplate' [39–41]. Thus, in contrast to its use in modern science, the noun *theôria* refers to the observation, spectatorship, and contemplation of reality—and not its abstraction [40,42]. From early on, this definition provoked debates about the conceptual relationship between theory and practice (*praxis*). In this reading, theory reflects social practice, but is not itself this practice. In re-theorizing the political in water governance, the paper concerns itself not with abstraction, but with concretization by linking concepts of water governance with life-worlds. In so doing, it introduces 'narrative ethics', which combines the morally important category of experience with reflected action and identity formation [43,44]. This paper understands ethics as the academic discipline that reflects on morals, i.e., the practiced beliefs about what people or groups consider desirable or what they feel obliged to do. Thus, morals are the subject area of ethics [45–47]. Narrative ethics addresses hermeneutical questions of moral practices. It draws on many intellectual sources, including Charles Taylor, Paul Ricœur, Martha Nussbaum, and Judith Butler [43,48]. In this paper, I refer to the version of narrative ethics developed by Dietmar Mieth [43,44,48] and influenced by him, Hille Haker [46,47,49], Marcus Düwell [50], Regina Ammicht-Quinn [51,52], and Walter Lesch [53].

Within the academic dispute on what constitutes an appropriate reflection on questions of the good life and the right actions, narrative ethics positions itself in a specific—mediating—way in-between prescriptive forms of normative ethics on the one hand and thick descriptions of the cultural and social sciences on the other [46,53,54]: "Narrative ethics is not descriptive ethics because it is a component of the value-oriented debate about the good life, and it is not prescriptive ethics either because it does not itself become a discourse of reasoning, even though it provides the hermeneutic framework conditions for the normative question of moral reasoning, provided that this is related to historical situations and transcends the formal discourse of reasoning." [47].

With a narrative water ethics, this paper provides a conceptual lens to make visible and contemplate the political in water governance. It adds a crucial dimension to water governance:

reflecting and settling upon the aims of contextualized and situated governance approaches [2,55]. So, narrative water ethics aims to improve actual water practices, which first of all need to acknowledge that there are 'multiple ontologies of water', as Julian Yates and colleagues point out [28]. In doing so, narrative water ethics draws on the potential of narratives "in creating an alternative space for ecological imagination" [56,57]. As such, it is well suited to better observe, concretize and contemplate certain aspects of the political in water governance, such as context, agency, contestation or values and norms. By dealing with stories, i.e., the narrative structuring of experiences and actions, narrative water ethics contributes critically and constructively to re-theorizing the political in water. Its critical perspective problematizes existing moral systems and storytelling itself, while its constructive perspective aims to provide orientation for water action and to influence the debate on historically situated issues about the good life and the right action [46,47,56,58]. So, this paper argues for the potentials of an analytical perspective and does not present empirical results. It proposes an approach or method with a view to achieving more reflective water practices, rather than a specific moral approach to how people should act with regard to their waters [43,59]. Thus, the paper's other key claim is that engaging with the narrative structure of human-water relationships enhances debates on the good life and increases the reflexivity of people's deliberations on possible and desirable water futures and policies [46,55].

This paper first addresses aspects of the current critique of water governance and, in this context, explains why the re-theorization of the political in water is necessary (Section 2). It then presents narrative ethics, as a promising way to recapture the political aspects of water (Section 3). Finally, it discusses various facets of what this re-theorization implies for water governance in terms of both contemplation and concretization (Section 4).

2. Reductionist Water Governance

The desideratum to re-theorize the political in water governance originates from descriptions of a dual deficit. First, since Rene Descartes, the project of modernity has increasingly produced governance approaches that build on and reinforce the separation of nature and culture and, in this context, the exclusion and objectification of water. As a result, water became an issue that needed to be—and could be—mastered by technoscientific means and was thus removed from its social and cultural contexts. This led to injustices through the deprivation of rights and the destruction of the environment [12,16,60–63]. Second, governance approaches tended to focus on issues of action coordination and to a lesser degree on underlying political problems, related values and norms and affected actors [3,4,55,64,65]. Ultimately, this led to the de-politicization of water and its handling by technoscientific and managerial means—even though water is a paradigmatic wicked problem that is imbricated with social controversy and needs constant political renegotiations of potential solution paths [15,66,67].

2.1. Excluding Water

Researchers from the critical social sciences and the humanities have consistently drawn attention to the dialectical relationships of people and societies to their waters [14,21–23,29,42,68–71]. On this reading, water is appropriated symbolically and culturally in various ways and thus acquires its meaning through the social and cultural circumstances in which it performs its roles while simultaneously shaping the identities of the people who interact with it. In this respect, water is "a product of historically sedimented social actions, institutions, struggles and discourses, which in turn help shape the social relations though which it is produced and enacted" [12]. Corresponding research is interested in hydrosocial cycles, i.e., the "socio-natural process[es] by which water and society make and remake each other over space and time" [22].

Since early modernity, however, reductionist notions of water have prevailed. They tend to reduce water, in all its rich cultural and social manifestations to a single universal substance, represented by the molecule H_2O, which circulates in the water cycle and whose graphic representations do not

typically feature humans or societies. This truncated conceptual perspective on water was described by Jamie Linton as the main characteristic of 'modern water' [21]. European Modernity turned water into the alien Other, an object that could be conceptually excluded from and mastered by Culture [16,71]. Capitalist appropriation reduced it to a resource that was supposed to float freely in order to maintain global markets [72–75]. Eventually, the technoscientific 'hydraulic mission' turned water into a technical matter beyond all politics, as Ronaldo Munck explains: "Across the water sector there is an abiding belief in science, technology, and engineering as drivers of progress. One need only add the right mix of private and state investment and generate the right attitude among the population for success to be achieved" [10]. These conceptions of water have repeatedly been criticized and dismissed. For instance, Hartmut Böhme strongly pleads against the suppression of the religious, philosophical, aesthetic and phantasmatic dimensions of water. In his view, the mythopoetic history of water has not been overcome by excluding it from what is privileged as rational knowledge within the water sector. Detaching water from its cultural embedding ultimately made way for blind and ruthless exploitation, water waste and environmental destruction [16]. The many current environmental devastations and social injustices show that the technoscientific use of water by no means produces morally and politically neutral water.

Social science studies have consistently shown that even though water has been made a contextless resource, it has not become value-free [21,22,26,28,68,72–74,76]. This focus emerges clearly from the distinction introduced by Karen Bakker who distinguishes between H_2O and water: "Whereas H_2O circulates through the hydrological cycle, water as a resource circulates through the hydrosocial cycle—a complex network of pipes, water law, meters, quality standards, garden hoses, consumers, leaking taps, as well as rain-fall, evaporation, and runoff" [74]. The normativities associated with water are built into and effective in these systems. While this comes as no surprise to scholars in the social sciences and humanities, it has become increasingly obscured in the thinking of many in the water sector [10,17,76]. Precisely because "every political project embodies a process of socio-environmental transformation and every socio-environmental project reflects and materializes a particular political vision," Eric Swyngedouw reminds us, "water is inherently political, and therefore contentious, and subject to all manner of tensions, conflicts, and social struggles over its appropriation, transformation, and distribution, with socio-ecologically unevenly partitioned consequences" [77]. This implies that the political in water governance must be made visible and reflected in terms of its power and normative structures.

2.2. The Problem of Water Governance

As an analytical category, gover*nance* was distinguished from govern*ment* [3,12,64,65]. The plausibility of this shift rested on the partial failure of earlier models promoting political steering by the state. With regard to water governance, Munck refers to the era of developmentalism [7], which assumed that there was a single path to modernity that all countries would have to follow and which mainly focused on large infrastructure projects. For many reasons, this model reached the limits of its capacities, but also failed to meet its normative standards (e.g., marginalization, corruption, environmental destruction). In contrast, the governance approach provided an alternative model that promised to do justice to the complexities of political realities and to take further actors and scales into account when coordinating political action [78,79]. Political rule was no longer just steering, but rather negotiating in networks and political structures that could also emerge spontaneously according to the requirements of the problem at hand [10,65].

Consequently, governance approaches focused on action coordination, regulatory structures, and their impact on actors. Yet, by doing so, they appeared to sideline insights of the sociology of domination and thus constitutive elements of the political: the contentious definition of political problems, the normative orientation and political action of the actors involved as well as the explicit debate on political goals [4,5,55,80,81]. Furthermore, governance approaches remained ambivalent regarding their normative foundations. For instance, Renate Mayntz points to a 'common good bias',

i.e., the tacit assumption that governance promotes the common good [2,4,55]. Whether or not this is the case, however, is an empirical question and cannot simply be presumed. In addition, Ellen Immergut elaborated on the extent to which different governance modes rest on specific normative foundations. They are based on preconditions that have political consequences and are hence never merely neutral political instruments [82]. Concepts such as 'good water governance' or 'meta-governance of water' are aware of this ethical dilemma by proposing either evaluative criteria or a further steering structure [6,8]. However, in this way they simply shift the burden of justification to values that come from specific social contexts and would in turn need to be justified ethically, or to a forum that would then have to be able to resolve political disputes over problem descriptions, values and norms, and the distribution of power. This problem became particularly visible in good water governance approaches which, more often than not, left underlying understandings of the morally Good implicit [6,11]. In addition, organizations such as the World Bank or policy programs such as Integrated Water Resources Management or the Water Energy Food Security Nexus promoted specific Western ideas of the Good behind a technocratic veil [6,10,11,83]. So, what should be controversial questions about values, norms and political aims takes the guise of mere questions of management, often combined with a constructed urgency to act quickly in order to avert various water crises [18,27,62]. This implies that water governance approaches need a reflective dimension that is able to meet moral challenges that are part and parcel of the political.

2.3. The Wicked Problem of Water

In the early 1990s, neoliberal water governance emerged fusing the notion of modern water with the deliberate disregard of issues of power and dominance in particularly extreme ways [12,26,78,79]. While the first reduced water to a contextless resource in the hands of technocrats who supplied it to capitalist exploitation, the latter left the search for political goals to self-organization processes of which it could not really say how they could lead to just solutions, but which at least knew no democratically legitimized actor of political steering that would set moral limits to market forces. Both trends are symptomatic of a broader de-politicization of public concerns and of the crises of the sciences faced with these concerns. This is particularly problematic as the search for morally acceptable paths of shaping water-human relationships deals with 'wicked problems' [61,66,67], i.e., complex and unique situations for which there is neither a simple nor a single (correct) solution. Because of the complexities and cognitive uncertainties of wicked problems, social solutions cannot be judged by the standards of true or untrue, but only of better or worse. In this sense, solutions to wicked problems are always of a political nature because they are intimately related questions of how water-human relationships in a certain location should and can be shaped at a certain time—according to affected citizens' notions of the good life and the right actions in relation to their water. Due to dynamics within hydrosocial cycles or waterscapes, these relationships will never be finally settled, but must always be socially renegotiated and ethically justified.

In order to respond to wicked problems, waiting for scientific consensus is neither necessary, possible (due to complexities and uncertainties), nor desirable (in political terms) [61,67]. The technological side of things is often not the obstacle; sufficient knowledge and experience exists on how to build water infrastructures [15,84]. However, there are often different legitimate perspectives on a problem and conflicting ideas about possible futures. According to Alice Benessia and colleagues, reducing water to a mere technoscientific issue raises serious democratic challenges because the underlying logic leads to the search for solutions "within the shared and implicit cultural frame of modernity, according to which waiting for the unequivocal and certain opinion of science is a fundamental requirement for legitimate and responsible action. This means giving up our agency as members of civil society and, most importantly, it implies a continuous procrastination, because the future is, in fact, irreducibly indeterminate and intrinsically complex" [61].

Against this background, it becomes evident why the de-politicization of water has become such a problem. The ability to grapple with the political in water contexts is a prerequisite for political

action in the first place [15,37,57,66,85]. These contexts are ambivalent and resistant, which implies that they are characterized by uncertain facts, diverse worldviews, and controversial values and norms. Thus, they cannot be reduced to simple formulas, which in turn would serve as the basis for undisputed water governance. So, citizens need to understand how they are entangled with their water at certain times and in certain places (i.e., context). They can gain this understanding by engaging with their own stories and symbolic orders that deal with the historical contingencies of their relationship to water. They can also become aware that these relationships can be shaped in dispute and that the future is thus open. According to Swyngedouw, the re-politicization of water means that "it is important to foreground division and exclusion, and to emphasize 'the political act' and a fidelity to a political truth procedure that necessitates taking sides while aspiring to universalization. The latter refers to a politicizing process whereby everybody is invited in (although by no means all will accept the invitation)" [37]. The re-politicization of water raises the question of political power, with a view to the transformation of real orders and the search for new symbolic orders. These new orders foster meaningful political actions and social institutions to support them [37,38]. This implies that, alongside scientific knowledge, other forms of knowledge can also become relevant for policy-making [61,86]. However, this cannot be about putting "science side-by-side with so-called 'local', 'traditional', or 'folk' knowledge in an implicitly hierarchical interdisciplinary pool [...], but, instead, to confront the more ambitious challenge of encouraging the emergence of new kinds of *hybrid* knowledge and practice–a synthesis beyond the individual parts–through extended participatory processes" (italics in original) [61].

3. Narrative Water Ethics

The theoretical re-conception of the political in water governance requires an understanding of the spatial and temporal dimensions of water, i.e., its context [15,17]. This includes (but is not limited to) the abilities to acknowledge people's experiences with their waters (beyond H_2O), to perceive the plurality of different (contentious) cultural perspectives on water and the values and norms associated with it, and, finally, to argue or quarrel about these values and norms. Academic ethics generally regards the systematic exploration of values and norms, as expressed in different moral systems, and the orientation towards reasoned action as its central tasks [36,54,87]. This also applies to water ethics [19,88–90]. In narrative ethics, an approach within application-oriented ethics comes into focus that explicitly regards itself as contextual ethics and claims a place between the exact description of moral contexts of action and the prescription of rules of action. Narrative ethics deals with the narrative structure of actions and the significance of narratives for actions [47,54].

3.1. Ethics and Morals

This paper distinguishes between ethics and morals. The academic literature uses both terms in different ways. This is not really a problem as their scope and meaning have repeatedly changed in the history of philosophy. For the purpose of this paper, it is not necessary to retrace their complex and ambivalent genealogy [36,87]. It is important, though, that it becomes clear how they will be used subsequently. In line with current moral-philosophical literature [36,54,87], I understand morals as the entirety of convictions held by individuals or communities about which aims are desirable ('the good life') or how they ought to act ('right actions'). Consequently, morals relate to the evaluation of actions by asking how we can live truly successful lives or what we are obligated to do [45,91,92]. As attitudes, motives, intuitions, norms, or institutions relate to actions in one way or another, they are subject to morals too. From morals, I distinguish ethics understood as the systematic reflection on the reasons why we ought to act in a particular way. Generally speaking, morals do not question their own justification; rather, they are simply lived. In contrast, ethics asks for reasons of validity. In daily life, people do this all the time. Academic ethics moves beyond this lifeworld reflection in a more systematic and methodical way [45–47].

3.2. The Ethical Relevance of Narrations

Narrative ethics argues that forms of ethics focusing on discursivity and argumentation remain incomplete and cannot do justice to the complexities of moral questions within social contexts. As such, it does not reject normative ethics' search for claims to the validity of the reasons for our actions [47,54]. Yet narrative ethics insists that this alone cannot be enough, because this kind of ethical reflection lacks the "historical and life-world depth of focus" [46]—or, in other words, context. Thus, narrative ethics insists that narration is a necessary form of addressing moral questions.

Narratives refer to people's experiences [43,47,53,54]. However, they do not simply depict these experiences in a quasi-photorealistic way, but rather create or produce them in the first place. According to Haker, events or the experienced in general become experience by being reflexively reworked. In this respect, narrations play a central role by not only representing and articulating events, but also ordering and interpreting them through their structure. Experiences are not simply shaped by narrations; they also become accessible through them. Narrations configure events and event elements into units of significance that are directed at someone and designed to convey meaning [46]. Thus, narrations are a medium for jointly exploring reality and making it communicatively available. In this vein, narrations reflect systems of values and norms, but are also a medium in which moral conflicts are staged [46,47,93,94]. They tell what is actually the case in a certain social context, and in what way moral conflicts are treated and, perhaps, resolved. Since such narratives also deal with good or right actions in social spaces, they are constitutive for the formation of the political [93,95]. As such, narratives deal with and lend legitimacy to public action [56,57,94].

In this respect, it becomes clear that daily actions are always narratively structured in that they are geared towards goals, have a temporal structure, refer to action contexts, and involve other actors [46,47,93,94]: "actions and attitudes only become significant by means of their connection to the biographies or life histories that, in turn, remain incomprehensible without their historical, cultural and social contexts. Both dimensions can thus be viewed as 'con-texts' for the quasi-text of the action itself" [47]. Actions thus reveal what a person or a group wants to be and how their intentions and actions have been shaped (or disciplined) by these contexts. In this vein, actors are always 'relatively autonomous' or as Haker explains: "Speaking of a narrative identity means reflecting upon the reflexive structure of identity and the entanglement of the self in stories. What is impossible, then, is to regard the moral self as an atomistic, individualistic, sovereign self–although it is not possible to rule out autonomy altogether." [47].

Re-theorizing the political involves the perception of various morally charged perspectives on the world and the recognition and handling of emerging value conflicts. For an ethics that intends to confront precisely these tasks, engagement with narrativity is crucial for three reasons [46]. First, ethics must recognize that and to what extent moral practice is linked to the experiences of people acting in specific situations. Ethics refers to moral practice by reflecting on and analyzing the actions of people and social institutions: "Theory and practice are necessarily intertwined in ethics, and thus a reflection on the narrative structure of practice is inevitable" (own translation) [46]. Second, ethics has to deal with the fragile status of judging [44,46,59], because not only moral action needs ethical justification, but also ethical judgment, insofar as it is itself an action. Dealing with conflicts of norms and values in contested contexts is a complex matter of judging individual action(s) as well as the actor(s) involved [46,47,93]. Moral judgments are not simply argumentative in nature, referring to the good life or the right actions; they are also interpretations of action situations. Thus, they are prone to error in two respects: they can draw false normative conclusions or misinterpret a context of action. Narrative ethics thus raises awareness that moral judgements make interpretations about both individual actions and the contexts of action: Such judgements refer to the subjects of action, whose motives and backgrounds they can never know completely, and to situations that need to be interpreted, but could always be interpreted differently. Third, ethical theories come from somewhere, i.e., they have a pedigree in space and time that needs to be recognized so that it does not become a blind spot of ethical judgement. They have to be self-critical about their own implicit narratives.

In summary, for the examination of narrativity, this implies that stories can change according to context and perspective, but above all in the light of new experiences. Hence, both the generation of meaning and the awareness of the contingency of this meaning produced qua narration are crucial for understanding social contexts and the contested notions of the good life and the right actions.

3.3. Fictional Narratives

Works of fiction represent a particular kind of narrative [46,47,54,96]. Like real-life narratives, they represent events and experiences and thereby constitute them. As compositions, both kinds of narrations also have a rhetorical intention. However, they differ insofar as lifeworld narratives are (mainly) committed to reality, while in fictional narratives—from stories, radio plays and movies to modern forms of serial narrations provided by streaming services—actors, contexts, and moral conflicts are a function of aesthetics. As works of art, they enjoy artistic freedom and are not obliged to be a truthful representation of reality. At the same time, they have the potential, for example through their narrative strategies, to depict the complexities of reality and the plurality of perspectives and voices more appropriately than reports, or to unsettle their recipients' perspectives on reality and encourage criticism. With regard to fictional stories, narrative ethics questions both the moral conflicts at the narrative level and how this fictional reality is shaped by narration. In this sense, fictions always portray a different reality (in a format designed to be appealing), while repeatedly throwing recipients back on their role as interpretive observers of that reality. In doing so, narrations can also intensify the view of recipients for different readings of their own lifeworld [96,97]. Examples of fictional water narratives will be discussed below.

3.4. Constituting Moral Judgements in Contexts

It is evident from the preceding that ethics, as the critical analysis of morals and the constitution of moral judgements, cannot be reduced to a deductive sequence from principle to norm to judgement [98,99]. Mieth emphasizes that although moral norms can be subsumed under an ethical principle, they cannot be derived directly from this principle. In the academic literature, there is often the misconception that moral judgements can be deduced from a universal criterion. Yet, for Mieth, formulating judgments about how we should act always involves the ability to recognize and explain existing norms and values and relate them to one another, the perception and interpretation of action contexts, as well as experience and a combinatoric sense that brings together statements with normative and evaluative character and a descriptive character in a moral judgment. For this purpose, he proposes a conductive and iterative method that includes the following components [44,98]:

- Hermeneutics of preconceptions: When dealing with moral questions, we never take a 'view from nowhere'; in other words, we all have our preconceptions and prejudices. Yet, while this is inevitable, we can learn to perceive these biases and reduce their influence to a reflected and tolerable level when dealing with a contested situation.
- Knowledge of the relevant facts: When describing and reconstructing politically controversial situations, there are always statements that either require empirical verification (or falsification) or could be verified (or falsified).
- Knowledge of ethically relevant meanings and corresponding valuation judgments: Within scientific knowledge (production) and lifeworld discourses there are evaluative and prescriptive statements that can be reconstructed and whose justification has to be examined.
- Rationalization of alternatives: Potential alternative judgements about the relevance and preference of knowledge and expertise as well as meanings, value orientations and obligations need to be brought into the best possible state of argumentation.
- Weighing up priorities: Seeking possible ethically sound and jointly acceptable courses of action requires the development of criteria against which priorities can be weighed. This should be

seen as an iterative process, because further values and new facts can lead to new relevance and different judgements.

This conductive method builds on the practical syllogism that combines empirical-descriptive and prescriptive premises in the constitution of moral judgements [44,54,98,100–102]. At the same time, it highlights the fact that the analysis of narratives always has to do with moral judgements and thus with the intimate relationship between described facts and events and the values and norms that give these facts and events their meaning and relevance. So when confronting controversial political situations, we also have to be aware of what is controversial in the first place: the factual basis, the value basis, or the ways they are combined. Against this background, narrative ethics can be considered an analytical tool, because it pays attention to what we encounter in controversial political situations, and at the same time provides a constructive method for identifying ethically reflected and collectively responsible paths of action [46,93–97].

4. Narrative Water Ethics and the Re-Theorization of the Political

The function of narrative water ethics can be illustrated by the sentence: 'I want to tell you a story!' A speaker-subject (individual, collective) wishes to communicate and asks or demands the attention of a listener-subject. The latter is confronted with the narrator's (counter-)story, i.e., he or she needs to deal with the narratively composed world of experience of this other subject and behave critically towards it. It is the active confrontation with this Other, whose right to speak is respected, and the search for a joint *inter-esse*, which according to Hannah Arendt emerges between them and is shared by them [103]. In this sense, narratives draw attention to ethically exposed contexts, encourage discussion with them, and challenge listeners to develop their own attitudes. In particular with regard to socio-natures, narratives are able to express the manifold aspects of emotionally charged human-environment relationships. Beyond that, they have the potential to give a voice to non-human nature and to make its material effectiveness visible and comprehensible [56,58,95,104]. Consequently, speaker- and listener-subjects establish among themselves what is actually the case.

Narrative water ethics thus understood refers to concrete persons, actions, geographies, institutions, as well as value and norm systems and explores how these are all entangled in water stories [15,16,43]. In doing so, we would not do justice to the depth of water as a reservoir of cultural meanings if the analysis of these stories were to refer solely to literature, and in particular high literature [13,16,28,70,71,105], as Böhme cautions: "The symbolic use of water has a formative effect in superstition as well as in creation theology, in fountain culture as well as in baptism, in myth and poetry, in adventure novels as well as in the sailor's yarn, in folk-literary traditions as well as meta-poetological narratives, in spontaneous dream images as in artificial water landscapes, in water music as in fairy tales, in temple rituals and horticulture, in magic as in psychoanalysis, in sagas about water monsters as in sacred texts about the dwelling of God in water" (own translation) [16]. Innumerable narrative formats thus deal with water; and often, water and its metaphors structure our ways of thinking in the first place [42,106,107]. If we engage with narrative entanglements of people with their waters, we need to become aware of this ontological plurality—in particular, if we aim to make it productive for better water governance [28].

4.1. Connecting to People's Experiences with Waters

Narrative water ethics recognizes people's experiences with their waters and their desire to share these experiences. Two examples working with narrative formats and narratives will be highlighted hereafter. One is the project "The Reasons", a format for public storytelling, which was developed by a British research project aimed at bringing citizens of the Fenlands district in Cambridgeshire (England) into conversation about possible shared water landscapes [108]. The Fenlands are partly below sea level and require complex water management (even without the challenge of climate change). The Reasons format is based on a traditional Italian dispute resolution mechanism that resembles a court scene and has formalized roles. This format was adapted to the British context and modified

to the extent that the focus was no longer on resolving a conflict but on starting a joint thinking process, the result of which was the development of polyphonic narratives and the creation of water as a shared *inter-esse*. Another example is quantitative story-telling [109]. This is a systematic approach in the tradition of post-normal science that investigates the role of socially constructed ignorance in evidence-based policymaking [110–112]. It focuses on other legitimate narratives besides the traditional scientific perspective and integrating different representations of knowledge for decision-making. For instance, the EU project MAGIC applies this perspective to narratives on future water security [113]. The project succeeds in anticipating possible water futures and in identifying and excluding unrealistic narratives as technoscientific fantasies [109,114,115].

Both projects work in different ways with narratives and the idea that narratives are key to understanding multiple water worlds. Beyond what they have achieved so far, engaging with narrative ethics allows them to systematize emergent moral issues and grasp the normative implications of narratives more consistently. Both projects thus open up public discourse on possible and desirable water futures. On a more fundamental level, narrative water ethics can supplement social analyses by making visible the point of view from which criticism is expressed—be it in the case of unjust narratives of water security in the Water Energy Food Security Nexus [18] or racist symbolizations and institutional configurations of water infrastructures [10,76].

4.2. Experiencing Otherness and Complexity

Narrative ethics takes on an additional critical function by providing spaces for experiences of otherness and complexity. Literature is particularly capable of achieving this. In the following, some literary texts will be highlighted as examples. Their selection is contingent and other examples could also be chosen to make the point. Different authors invite us to take alternative views of water and in this vein turn familiar images of political geography on their heads. A well-known example is Roger Deakin's *Waterlog* (2000), in which he reports on his experiences of swimming through all the British waters and thereby encourages a new perspective on the role of water and water bodies in public life [116]. In *The Old Ways* (2012), Robert Macfarlane invites us to think about the seas of Northern Europe (the Atlantic Ocean, the Baltic Sea, the North Sea) as land and the land as water. In this way, he is able to reveal centuries-old connections between people, regions, and cultural spaces, which through a land-based political geography were previously marginalized and thus literally vanished from view: "The sea has become the land, in that it is now the usual medium of transit: not a barrier but corridor." [117]. For these people and regions, water is their *inter-esse* in many ways. Both texts encourage recipients to think in alternatives about and through water and to engage with water's agency.

A more profound reflection on our water worlds today might also begin by dealing with texts from historical eras, which are very alien to us [118]. Stefan Hofer-Krucker Valderrama, for example, deals with a text by the Swiss author Jeremias Gotthelf [119]. As pastor of the village of Lützelflüh, Gotthelf was an eyewitness to the historic flood disaster of 1837 in the Swiss Emmental valley. He deals with his traumatic experiences in "Die Wassernot im Emmental" ("Water Disaster in the Emmental Valley", own translation), which Hofer-Krucker Valderrama describes as a hybrid narrative. This text is particularly interesting because it appears on the surface to be a typical penal theological text in which a Protestant pastor views the floods as punishment for people's sins. Hofer-Krucker Valderrama, however, shows how Gotthelf ingeniously unites and correlates different forms of knowledge that are crucial for the perception, the descriptive, narrative and documenting representation, as well as the interpretation and classification of such an event. In addition to eyewitness accounts, Gotthelf's own observations and biblical references, the text also incorporates geographical knowledge, knowledge of road and bridge construction, and regional myths relating to the natural world, such as the Legend of the Emmen Serpent. The text thus achieves a high degree of complexity and polyphony in that different forms of knowledge interact, overlap, complement and contradict each other. Gotthelf's seemingly simple religious narrative reveals moral fault lines around the appropriate forms of possible, better

water worlds and their institutional configurations. Traditional views interfere with emerging notions of social and political responsibility for preventing such disasters and mitigating their consequences.

Ancient myths and their persistence into the present day can challenge dominant narratives about water worlds and invite us to engage with experiences of otherness and social distortions in human-water relationships. A particularly appealing example of this is the Dutch *water-wolf*. This is an animalization, i.e., the description of non-living phenomena such as geographical characteristics using traits assigned to certain animals, in this case the wolf. The geological phenomenon is from the Netherlands and refers "to the tendency of lakes in low lying peaty land, sometimes previously worn-down by men digging peat for fuel, to enlarge or expand by flooding, thus eroding the lake shores, and potentially causing harm to infrastructure or death" [120]. A particular case is the Haarlemmermeer, which today is a polder in the southwest of Amsterdam. Around 1500, poorly constructed dikes and the extraction of peat led to four lakes at this location being combined into one—the Haarlemmermeer. At the time, it was the largest lake in the Netherlands. Its subsequent expansion resulted in the destruction of several villages and threatened to flood the cities of Leiden and Amsterdam, prompting the Dutch government to undertake to drain the lake in the mid-nineteenth century.

Figure 1 shows the battle of the Dutch lion against the frightening water-wolf. Draining the lake finally eliminated the hazards of flooding and created new land in the densely populated Netherlands. However, comparable to the extinction of the wolf in order to 'free' Europe's landscapes for large-scale sheep farming, the extinction of the water-wolf is a narrative of the victory of industrial man over water, as is reported, for instance, on the website of Cruquius Museum dedicated to the draining of the Haarlemmermeer: It "tells about the age-old Dutch battle against the water. The reclamation of Haarlemmermeer by means of steam power marked the breakthrough of the Industrial Revolution in the Netherlands" [121]. Meanwhile, this narrative conceals the considerable human suffering and strife caused by the fact that the people who lived off and with water (fishermen, traders, ferrymen) lost their livelihoods. The story of the water-wolf is thus a story told by victors. Against this backdrop, the narrative confronts us with a problematic narrative agency, while familiarizing us with moral complexities, as changes in hydrosocial cycles are politically and morally never neutral [23]. In this respect, the water-wolf invites us on the content level, to confront complex socio-ethical conflicts and on the formal level, to engage with the narratives of industrial modernity. The fact that Schiphol Airport, Europe's third busiest airport, is located in Haarlemmermeer adds a special note to this example. In the face of rising sea levels due to climate change, the Netherlands are once again facing an upheaval of its hydrosocial cycles. Just as the real wolf is returning to Central Europe, the water-wolf might also be making a comeback. Thus, an old myth might be resurrected—and thereby trigger an old political debate about desirable water worlds.

The narratives that are constitutive for water research and determine how water is appropriately studied constitute another interesting and significant object for narrative water ethics. The emergence of 'modern water' [21,22] can be regarded as such an example in case. Jeremy Schmidt contradicts Linton's narrative tracing the emergence of modern water from a specific historical U.S. context, which thus establishes a specific problem description and research agenda [122–124]. Schmidt, in contrast, puts forward the notion of 'normal water', i.e., "a program for bringing water's social and evolutionary possibilities into the service of liberal forms of life" [123]. Against the background of this controversy, narrative water ethics can take on different perspectives. It could examine how both authors first construct the moral situation of their respective narratives, each of which deals with how people organize relationships with their water. Second, the question arises as to how these narratives developed into reference points for researchers that contain statements about good and correct water research and thus define inclusion and exclusion relationships. Third, these stories produce moral claims for alternative water policies. Finally, water ethics may have a mediating role, as it seems that both authors share the view of water's social embedding, despite differences in the interpretation of the historical situation. This case reveals that and how narrative ethics is also an ethics of science (cf. also the examples in Section 4.1).

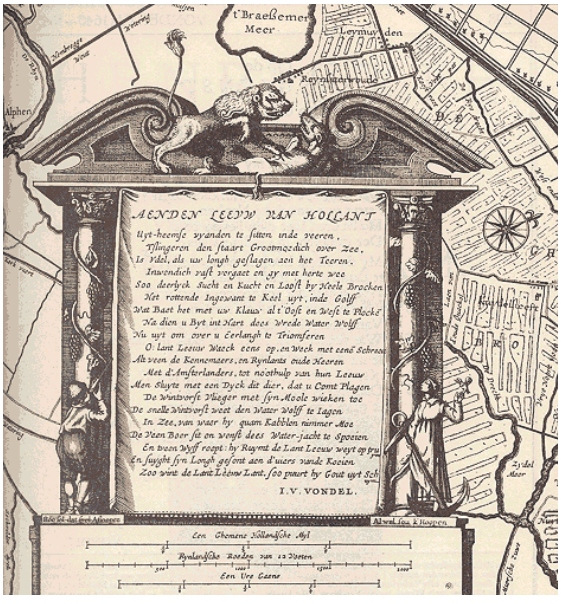

Figure 1. The battle of the Dutch lion against the water-wolf as an allegory of the battle of the Dutch against the water [120].

The previous reflections explored from a critical perspective the contributions of narrative ethics to substantiating the political in water. It has been illustrated that narratives (a) draw attention to conflicts of values and norms and invite recipients to take a stand; (b) create space for experiences of otherness and contrast that create an awareness that reality could always be different and that a multitude of legitimate other (non-human) perspectives exists; and (c) can be open to conflicting perspectives and forms of knowledge. Narrative ethics can thus sensitize us to water contexts and the ways in which people are entangled in and motivated by their water histories [56,118]. However, the considerations so far are not intended to convey the impression that the 'moral of history' could be directly translated into political practice [16,28,118]. This would probably be just as naïve and unrealistic as the idea that narratives could be used to steer politics to a precise point [94]. Rather, it is about developing competences, attitudes and critical perspectives.

4.3. Guiding Water Governance

Inspired by the conductive method, narrative ethics intends to instruct social action that captures multiple worldviews and permits contextually specific political courses of action. As such, narrative water ethics can substantially contribute to Bakker's recommendation for good water governance [125]. She suggests that local policy-makers should decide for themselves what good water governance means for their communities and make this process of setting criteria as inclusive and democratic as possible. She thus proposes the creation of contextually adapted criteria, which should emerge from an inclusive process and subsequently orient the actions of political actors. A key feature of this proposal is that it explicitly addresses the responsibility of the political system. The conductive method provides a heuristic to the process proposed by Bakker, for it helps municipalities and communities to identify the facts, values and norms—and the interdependencies between them—that are relevant to their water relations. Narrative ethics listens to and recognizes the stories of people's entanglements with their water and helps them to identify their own relevance criteria for water governance. In this regard, narrative water ethics promotes a 'value-reflexive governance of water'. In contrast to good governance, this perspective develops the awareness of which and whose values

are actually in the political discourse or which ones are missing; what particular values mean and how this meaning changes when these values come into contact with other values; and, finally, how this value hermeneutics can be translated into political courses of action within the framework of justice [11,19,32]. Since value debates are low-threshold entries into ethical debates and inherently associated with experiences that have led to these values, such water governance invites everyone to participate in the debate [37]. These locally adapted understandings of water governance are far better equipped to make the political in water governance visible and concrete, i.e., by inviting everyone to disagree about the multitude of legitimate perspectives on possible and desirable water futures. In this understanding, there is a thin universal ethical claim behind this approach [126].

5. Grasping the Political in Water Governance

This paper elaborated how narrative water ethics contributes to re-theorizing the political in water governance by making the inherent political visible, concrete and productive for social deliberations. It advanced two claims. First, the question of the political in water governance is not about a re-politicization of a previously apolitical field, but rather about consistently confronting the always present political and searching for public debates over present and future water worlds. Second, engaging with the narrative structure of human-water relationships enhances these debates and supports the reflexivity of people's deliberations on possible and desirable water futures. To this end, the paper suggested using the potential of narrative ethics for water governance. In particular, the paper was concerned with recognizing water stories as the structured experience of people with their own waters and grasping their content (interpretations of reality, norms, and value systems). These stories have the ability to represent complex situations and contradictions by integrating and composing different worldviews. This results in hybridized forms of knowledge that enable people to reflect on their relationship to their waters and act together to create their water worlds.

This paper presented a conceptual proposal whose potentials need to be developed in different directions. One might ask how narrative water ethics extends existing research questions and political options for action or opens up new ones. The approach also needs to be further elaborated with regard to the question of how it relates to conceptions of the political [38]. Probably, an approach emphasizing the value of plural perspectives on water worlds is closer to agonistic than to antagonistic conceptions. Another theoretical challenge relates to the subjects narrative ethics envisages, for each theory has an implicit understanding of actors and appropriate actions [65,79]. In this respect, McNay accuses radical democratic or narrative political theories of a "socially weightless mode of theorizing that forecloses a developed account of social power" and of ignoring "patterns and particularities of the lived reality of oppression" [127]. This criticism goes deep. However, narrative ethics is well aware of this problem and can make it its task to mediate in this respect [128]. There are ethical challenges, too, because narrative ethics is an explicitly contextual approach. The ethical questions dealt with in this context would have to be related to universal debates such as the human right to water or water justice [12,32,126]. In this respect, there are mutual reservations between relativistic and universalistic ethical approaches [129–131]. Narrative ethics is able to mediate between contextual approaches and notions of a thin universalism. Finally, there remains the broad question of which formats can be used to integrate narrative water ethics into deliberations on which possible and desirable water futures certain governance approaches should be oriented to [131].

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