Everyday Experiences of Water Insecurity: Insights from Underserved Areas of Accra, Ghana

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At least half of Accra's residents do not enjoy safe, secure, and affordable access to water on a regular basis. Focused on underserved communities in and around urban Accra, this essay highlights the meanings and importance of water insecurity for residents' daily lives. In particular, this essay extends beyond the well-established ways that the lack of safe and affordable access conditions poor public health outcomes, to a broader understanding of well-being informed by residents' own experiences of irregular and insecure access to water. This essay thus seeks to broaden understandings of water insecurity beyond the basic and minimum access required for daily needs, and to consider broader social-contextual dynamics, such as reported experiences of stress or conflict, that residents face daily in negotiating water insecurities.[1]

> The availability of water is a concern for some countries. But the scarcity at the heart of the global water crisis is rooted in power, poverty and inequality, not in physical availability.
>
> —United Nations Development Programme[2]

Based on biophysical characteristics, including average rainfall, most parts of Ghana generally would not be considered water stressed, though the situation is expected to intensify in the decades to come.[3] In 2010, Ghana halved the proportion of people without basic access to water, achieving the Millennium Development Goal (MDG) related to water access a full five years prior to the 2015 target date.[4] This was certainly an achievement worth noting given the importance of water security for public health, educational attainment, and other development goals.[5] Yet even given this context, water insecurity is a reality for many living in Ghana, including in and around the capital city of Accra.

That water security is vital for public health is undeniable. In fact, water insecurity and associated diarrheal disease remain the biggest contributors to death and ill-health across the globe, are critical to a range of public health issues such as the care of those sick with HIV/AIDS or other illness, and have been suggested to be key to the spread or intensity of outcomes associated with COVID-19 during the ongoing pandemic.[6] For Ghana, estimates suggest that up to 70 percent of the disease burden is linked to lack of access to safe water.[7] Even when available, people might nevertheless turn to unsafe sources if water is unaffordable, as occurred during the high-profile cholera outbreak in KwaZulu Natal, South Africa, in 2000.[8] Yet apart from the clear importance of water insecurity for bodily and public health, or linkages to other development goals, how else might water insecurity affect the lives and experiences of the nearly one billion people who live with this reality?

This essay focuses on this question with specific reference to the daily lived experiences of those navigating water insecurity in and around urban and peri-urban areas of Accra, Ghana. In so doing, the essay makes several contributions. First, the discussion allows us to consider the importance of water insecurity "beyond the pipe," attending to the complex social dynamics related to water insecurity that exceed common metrics regarding infrastructure, distance to a water source, or minimum daily water requirements. Second, the analysis highlights that water insecurity and stress are not only impending and anticipated realities associated with climate change but are *already* a part of the lived reality for many millions of people around the globe (as well as for approximately half of the residents of Accra). Third, building on recent discussions regarding the need to reframe water security to consider diverse aspects of well-being, and broader sociocontextual considerations, the essay focuses on the ways that water insecurity affects diverse aspects of everyday life and sociopolitical experience.[9] Attending to these aspects of well-being beyond bodily and public health, evidence provided documents social conflict, self-reported worry, lack of affordability, and diverse practices and negotiations required to secure water for household needs. These contributions, considering the experiences of water insecurity, how it connects to daily experiences and well-being, and how it invites us to attend to interactions and dynamics apart from fixed infrastructure and numbers of pipes and spigots, are all important reframings for ongoing policy and academic debates regarding how to extend safe and affordable water access to the poor and underserved communities, or how to engage communities more fully in water-related decision-making and governance.[10] This challenge is especially important given commitments to the human right to water by the United Nations,[11] as well as ongoing efforts related to the Sustainable Development Goals (notably SDG 6: "Ensure Access to Water and Sanitation For All" by 2030), in addition to the ongoing focus on participatory water governance (per the Dublin Principles and other policy goals).[12]

To begin, it is important to consider some of the ways that water insecurity is frequently assessed in policy contexts concerning efforts to achieve the Human Right to Water (HRW), the earlier MDGs, and the current SDGs (especially SDG 6). The standardized metrics that inform these efforts generally track the presence or absence of pipes, physical distance to access points, or basic quality parameters.[13] While important, this approach is limited. First, such metrics – such as whether an "improved" source exists or whether residents have access to a minimum of 40 or 50 liters per day – do not always give useful information as to whether the water is safe, reliable, or adequate for diverse users and their needs in varied cultural contexts.[14] Reliance on these metrics can in turn reinforce a focus on infrastructural and technocentric pathways to redress water insecurity: that is, build more connections or work to extend access in middle-income areas where residents might be more likely to pay for services. This is at times referred to as incentivizing the "low-hanging fruit": extending access for middle- and high-income areas and charting progress toward these targets, rather than extending access to those most in need, where building the infrastructure, or ensuring payment of bills, may be more intractable. Related to this, others have argued for the need to move away from country-level or population-wide averages to focus precisely on the most impoverished or most vulnerable.[15]

Some analysts have also emphasized the myriad ways that common indicators fall short, revealing little regarding whether water is safe, affordable, or delivered in a manner that is contextually appropriate. With respect to quality, an analysis of the water safety (defined as the likelihood that water is not contaminated) of 1,500 households in five selected low-income areas of Accra found that only 4.4 percent of residents had access to safe drinking water, quite a different number than the nearly 40 percent estimate according to the World Health Organization definition of "improved water."[16] As such, there is a clear need to investigate issues of water insecurity, or the uneven progress toward the HRW, in ways that attend to the patterns of insecurity, as well as issues of quality, affordability, or how that water insecurity is navigated, in addition to the specific meanings that communities or individuals might attach to that insecurity (in terms of its importance for livelihoods, cultural or spiritual practices, or embodied labors).

Here, I seek to investigate water insecurity beyond the pipe, that is, apart from the spigots, taps, and distance from homes that are typically tracked by these policy goals. Instead, I aim to consider what water insecurity means for people's daily lives. What meanings circulate related to water insecurity and the human right to water, especially as this is experienced unevenly in different locales? For the often estimated one-half of residents in and around Accra without access to the piped water network, what does this mean for how they navigate the complex landscape of insecurity, or how they relate to each other?

My conceptual framework understands water insecurity as much more than something that is important for our bodies, but that has broader relevance for our lives, including senses of self and community. As such, there is an imperative to attend to the ways that water insecurity, or the inequities associated with uneven implementation of the human right to water, is felt, embodied, lived, and invested with meaning. This approach is informed by critical discussions of the human right to water, analytical and policy debates regarding inequity and water governance, as well as recent discussions regarding everyday embodied experiences of water insecurity for households and individuals.[17] Approaching the HRW and water insecurity in this way also helps to foreground key issues regarding gender, caste, class, or other axes of difference and linked theories of equity and water justice.[18] As such, it is a critical component of efforts to repoliticize debates about water (in)security, including the context-specific implementation of the HRW and associated efforts to extend water access or engage communities in water governance.[19] Considering household water insecurity experiences, the approach seeks to address how lack of water access, quality, and reliability affects considerations important for individual and communal well-being, including senses of belonging or emotional welfare (most often experienced as the opposite: that is, feelings of marginality, exclusion, stress, or worry).[20] I provide a few starting points to consider also how lived experiences of water insecurity and variable access to basic services might impinge on other dimensions of sociopolitical lives. For instance, recent work highlights how water insecurity or relative inequities encroach on citizen subjectivities, community conflict, or shifting state-society dynamics.[21]
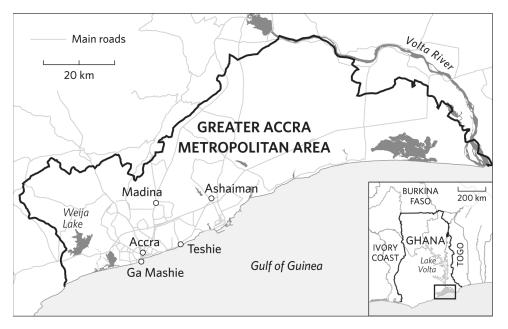
In the past decades, scholars have pushed for a more expansive theorization of what might be included in the idea of the "human right to water," moving beyond notions of basic access to water to include productive uses (such as for agriculture or livelihoods), involvement in decision-making over water-related concerns for affected communities, or broader recognition of the cultural, spiritual, and historical roles water might play for different communities (that is, particularly for Indigenous communities).[22] As several contributions to this issue of *Dædalus* highlight, recent work on water security has similarly emphasized the importance of relational conceptualization, moving beyond access and the physical resource to include broadened relational understandings of the capabilities and hydrosocial relations that give rise to water-related well-being, development, and justice.[23]

With such reconceptualization, water access is not necessarily the focus in and of itself, but rather attention should be given to broader and sustained hydrosocial processes that can enable water flows, quality, uses, and distribution in order to support well-being in line with notions of human capability, development, and flourishing.[24] As such, we can consider complex social and institutional or normative arrangements important for conditioning whether and how households

and individuals are able to secure access to safe and affordable water, particularly in times of scarcity.[25] These might include practices and norms related to water sharing, property rights, or familial and social networks that contribute to specific forms of water-related resilience and vulnerability (in line with social capital and social infrastructure discussions).[26] These issues are often as important, if not more so, than seasonality, changing precipitation patterns, or other concerns related to the physical availability of water.[27] And yet the threat of increasing variability and hydrological or meteorological scarcity due to climate change, among other factors, makes an understanding of these diverse aspects of water insecurity and resilience all the more apposite.[28] With the anticipated intensification and unpredictability of water stress across many regions of sub-Saharan Africa, and indeed across the globe, these social and cultural coping mechanisms, or attributes associated with resilience, will be key to mitigating the impact of these stressors and related catastrophic events (such as floods, drought, or storms).[29] Given that this reconceptualization focuses much more on the social and cultural context, rather than on water in a material or abstract sense, the reorientation toward a relational understanding of water security is also amenable to context-specific understandings of what might constitute justice, or specific ways that water might be meaningful for flourishing in a particular community.[30]

The following case study draws on a decade of multi-sited, multi-method (qualitative, quantitative, and community-based), and multi-investigator work on water access, narratives, and citizenship with a focus on the most underserved communities of Accra, Ghana. The data highlighted draw primarily on fieldwork conducted by the author and several scholars associated with the EDGES (Environment and Development: Gender, Equity, Sustainability) collaborative at the University of British Columbia, working with local research assistants with support from colleagues at the University of Ghana-Legon (similar research was also undertaken in Cape Town, South Africa).[31] All told, we conducted hundreds of interviews with residents, a dozen focus groups, feedback sessions with members of Local Water Boards, and two surveys (one involving 243 respondents in Ashaiman and Teshie conducted in 2012, and another involving 200 households in Ga Mashie and Madina, implemented in 2014), and produced a participatory video project on water and sanitation involving activists, local councilors, and residents in the coastal community of Teshie (see Figure 1).[32]

By way of background, it is important to note that the water system of urban Accra was privatized with a five-year contract granted to Aqua Vitens Rand Limited (AVRL) for the operation and management of Accra's water system from 2006–2011, a requirement of World Bank loan conditionalities. While the privatization of the system was stalled due to some initial corruption and considerable local resistance, it eventually went forward with the

Figure 1
Greater Accra Metropolitan Area

Source : Map produced by Eric Leinberger, University of British Columbia Cartography Lab.

agreement that the AVRL consortium would operate on a not-for-profit basis.[33] Nonetheless, the transfer raised significant concerns related to democracy, sovereignty, and transparency. In 2011, just days before our first fieldwork season in Accra, the Ghanaian government decided not to renew AVRL's contract, citing, among other reasons, failure to improve the situation of nonrevenue water, as well as criticisms related to not involving local NGOs and other stakeholders in decision-making (thus highlighting concerns of procedural justice and participatory governance).[34]

While newspaper headlines from the past several years have highlighted impending water crises in high-profile cases, such as that associated with "Day Zero" in Cape Town, concerns related to water insecurity are not new among residents and neighborhoods in Accra.[35] For them, and others across the globe, water insecurity is not only part of some anticipated future associated with climate change or rising populations, but is already a key part of their present reality. The situation of water and sanitation access across Ghana remains highly variable, despite the country-wide target of achieving "sustainable water and basic sanitation for all by 2025" (five years in advance of the SDG target). For all practical purposes,

this would mean that "*all people* living in Ghana have adequate, safe, affordable and reliable access to a basic level of water service, practice safe sanitation and hygiene and that water resources are sustainably managed."[36]

At present, however, different parts of the country (notably across rural-urban gradients), or various sections of the greater Accra region, remain uneven in terms of water and sanitation services, quality of water, or affordability. This variability is linked to income, location or geography, new migrant status, or home ownership, among other axes of inequality.[37] In part, variegated water access can be directly traced to legacies of infrastructure and development during the colonial period, histories that served to condition uneven infrastructure and water flows. It is clear that these patterns have persisted since independence, fueled in part by ongoing political instability. Indeed, the country has been unable to keep pace with migration to the city from rural areas or from nearby countries, or with its growing debt, among other challenges.[38] Policy scholar Kweku Ainuson indicates that two-thirds of low-income residents of Accra do not have access to piped water in their homes, compared to 12 percent among wealthier households.[39] The analysis by researchers Ayisha Mahama and colleagues in 2014 provided evidence that in Accra, the significant determinant of homeowners' access to improved drinking water was income, while education, income, and location of the household were significant for access to water for other domestic uses. Compared with recent migrants to the city, Indigenous people and people from mixed areas were less likely to have access to improved water for other domestic purposes (see our comparison between new migrant communities of Madina and Indigenous areas of Ga Mashie below).

Based on our survey conducted in 2012 in the Indigenous community of Teshie and the mixed new migrant community of Ashaiman (both underserved urban and peri-urban areas near Accra, see Figure 1), affordability, access, and quality remain key concerns.[40] Sixty-eight percent of our respondents across both settlements, for instance, suggested that they do not consider water to be "affordable." Linked with this, nearly half of respondents in Ashaiman and Teshie relied on water vendors or other intermediaries associated with increasing sachet water consumption.[41] Some research has estimated that poor or low-income households in Accra spend between 58 – 91 percent of their after-tax household income on water, often at least ten times more than their counterparts with access to piped systems as part of the municipal network.[42] Suggesting that this is a long-term persistent challenge, earlier work from the 1990s by Rudolf Amenga-Etego and Sara Grusky estimated that a significant proportion of residents in Accra lived on less than $1 per day, and may have paid as much as one-quarter of their income (or more) to meet daily water needs.[43]

Our follow-up qualitative research (in Teshie, Ashaiman, Madina, and Ga Mashie) also revealed the extent to which access to piped water networks does

not guarantee water security, whether due to irregular service (that is, linked to a rationing schedule that was long used to coordinate water delivery to varied parts of the city, given overall supply deficits), lack of access to storage facilities (especially among the relatively impoverished, who are unable to afford tanks and storage for the home), or in relation to quality and taste concerns (see the discussion below of hard water and taste concerns with newer water supplies to Teshie following the installation of a desalinization plant to serve that community).[44] In peri-urban migrant areas of Ashaiman and Madina on the outskirts of the city, for instance, the absence of any piped supply from the municipal system managed by GWCL (Ghana Water Company Limited, the entity responsible for water delivery to urban areas throughout the country) means that residents are paying for water to be trucked in by tanker, and as sachets, paying much more per unit compared with other parts of the city with more regular piped access.[45] Residents in various neighborhoods are forced to navigate creatively an ever-changing patchwork of sources to meet their daily needs, from boreholes to sachets, as well as water storage, often having to compromise water quality, spending significant time to seek out water, and/or paying a considerable portion of their income to secure this basic need.[46] For instance, one estimate suggests that residents in low-income and slum settlements of Accra who rely on vendors often pay up to eight times the regulated price for water.[47]

Work in the Indigenous settlement of Ga Mashie (with piped infrastructural service) and Madina (off of the piped network at the time of the research in 2013) showed that 94 percent and 72 percent of survey respondents, respectively, experienced interruptions in water supply on a weekly basis, in part due to the rationing schedule, as well as gaps in vendor services.[48] Residents in these communities also highlighted quality and taste concerns (such as in Teshie). From the 2012 survey, we also learned that a majority of residents in Ghana disagree that it is easy to get water (64 percent), agree that they spent significant time accessing water (over 60 percent), and disagree that water is always available (72 percent).[49] Such examples provide further evidence of the need to look beyond the pipe or beyond common metrics focused on infrastructure or improved access to consider the ways that uneven water access and quality impinge on individual and community health, well-being, or experience.[50]

Encouragingly, it is noteworthy that Teshie (widely considered one of the most underserved locales in Accra) is now the beneficiary of a recent desalinization plant, adding considerably to the overall supply of water for the metropolitan area (though residents note taste and hardness concerns, as well as inadequate infrastructure to deal with the enhanced supply).[51] With this new technology and augmented supply, GWCL now suggests that demand for water in the metropolitan area no longer outstrips supply, noting that daily scarcity might be less likely in some areas of the city, lessening the need for rationing schedules that have long

been relied on by the city's water purveyors.[52] As of January 2018, however, the new desalinization plant was taken off-line due to disputes over the contract with the private companies managing the facility.[53] Together with the failures associated with the previous AVRL contract, this example raises concerns for water security given the reliance on the Public Private Partnerships (PPPs) that were engaged to build and operate the plant, considering the at times inherent incompatibilities between private interests and achievement of the HRW.[54] Recent evidence suggests that cut-offs and rationing nonetheless continue, which has been a particular concern during the COVID-19 pandemic.[55]

Apart from quality, affordability, reliance on vendors, and relationship to rationing, our collective work also sought to highlight meanings of water insecurity, how it is narrated in people's daily lives, how it reveals important emotional and affective realities, or what these daily negotiations mean for senses of citizenship, for community and sociopolitical dynamics, or for future resilience and vulnerability.[56] On meanings, being able to enjoy enhanced water security was associated by some broader notions of development or freedom. In Ashaiman, a community with many recent migrants from rural areas, as well as from Nigeria and other surrounding countries, the settlement is one of the fastest-growing areas of Accra. Located on the outskirts of the city and generally not connected to the municipal network, several residents noted that they would be "free" and "free from suffering" if they could have better access to water. One middle-aged woman in a newer area of the community noted a preference for enhanced government service provision "so we will be free."[57] Others also connected the issue to global gradients across the North and South in terms of who is able to enjoy such access, or not. As one resident commented in response to a question from the North American researcher about water in the community: we "would like our lives to be like Americans . . . as for water you don't have to suffer to get it. Am I lying?"[58]

This sense of freedom is likely linked with the considerable effort, and creativity, that is expended in the daily "chase" for water, as documented among those living without piped connections in Ashaiman. Work led by environmental studies scholar Megan Peloso in these neighborhoods highlights the innovative ways that people use to meet their daily needs through a host of mechanisms.[59] Even as there were clear disadvantages, including higher rates per unit compared with those who received water through the price-regulated municipal piped network, many residents also expressed distinct benefits of this flexible approach, such as avoiding large water-payment debts (given the monthly billing cycle of GWCL), being more careful with water usage since it does not flow freely, and being able to decide when to purchase water given fluctuating prices (though, arguably, this would not be required with the Public Utilities Regulatory Commission–regulat-

ed water pricing).[60] For instance, surrendering to the billing technology of water meters requires a great deal of trust because of the inability of residents to monitor or negotiate the usage and associated bills. The bill is issued, and one simply must pay. As a seventy-two-year-old man remarked: "If you have a meter, you cannot 'talk anything about that'…as in, if there is measurement, the assessment is done, your bill is given to you and you pay."[61] This was a significant concern for many because they felt that GWCL was not responsive (or present) in their community, and it was difficult to know how or where to raise concerns or to complain.[62] Indeed, overall lack of trust in the government was clear from our 2012 survey data, with 54 percent of respondents suggesting they do not trust the government.[63]

Regarding emotional and affective experiences of insecurity, 79 percent of our 2012 survey respondents said that they worry about water "sometimes" or "often," connecting water insecurity to stress and other aspects of mental well-being.[64] Other stressors included conflict in the home and in the community more generally. Data collected in underserved areas suggested that some might wait for water for up to eight hours or more, and that conflict often broke out in such lineups.[65] Others highlighted household and intracompound conflicts regarding who would pay significant water bills. For instance, data collected in 2014 by environmental studies scholar Elizabeth Dapaah in Ga Mashie and Madina showed that 68 percent of survey respondents reported fighting at water-collection points; in the Indigenous coastal community of Ga Mashie, 85 percent of respondents reported such conflict. Ironically, those in Ga Mashie – an area of the city with piped water access, presumably with high-quality water available at the lowest cost per unit through the network – nonetheless preferred to buy water daily from vendors, in part to avoid conflicts in residential compounds regarding bill payment. As one local leader in Ga Mashie expressed regarding the preference for water from vendors, as well as the fact that many households had been cut off from the system due to failure to pay bills, "in most compound houses there were conflicts on water management so they disconnect and they buy outside…people prefer buying from vendors so they have their peace."[66] In such instances, intracompound conflict, including difficulties determining who in an extended family should pay for what share of the water bill, had the effect of making many residents in Ga Mashie less water secure: they pay more for water on a per-unit basis than they would have if they had been able to access water through the network, and they are perhaps also more vulnerable to shortages and cut-offs during times of scarcity.

Given that many in Ga Mashie had piped connections, but those connections were not operational given billing or maintenance concerns, residents instead had to rely on complex social relationships with vendors, neighbors, and extended family to secure water.[67] For instance, complicated landlord-tenant relationships, or extended kin and familial groups, made some of these social networks

(and associated entitlements) fragile, rather than allowing those living in these neighborhoods to be more secure (as we might have otherwise anticipated given the presence of pipes and of demographically homogeneous populations with many extended kin networks). Drawing on an entitlements approach, the analysis demonstrates that even with pipes coming directly to their homes, households in Ga Mashie had higher senses of worry, stress, and community conflict in comparison with counterparts living in other areas of the city without piped connections, notably in the demographically mixed recent migrant community of Madina.[68] A lack of correspondence between local leaders' perceptions of water issues, and those of the residents in those communities aggravated by insecurity, along with topographic considerations, made the drilling of boreholes less possible in coastal areas of Ga Mashie. The counterintuitive result in Ga Mashie was that this ethnically homogenous community with piped infrastructure was in some ways likely to be more vulnerable and less resilient to acute water shortage compared with the mixed neighborhood of Madina (which lacked piped infrastructure but had more well-established vending relationships).

Examining issues related to engagement and water governance in other ways as well, we found limited evidence of resident involvement: among our 2012 respondents in Ghana, only 21 percent suggested they were engaged in community activities, beyond religious gatherings or sports. This number was only 12 percent among female respondents. Other work tested statistically whether senses of enfranchisement associated with water services, or senses of marginality associated with inaccessible or poor-quality water, was linked to community engagement.[69]

Results suggest that water access and quality are indeed significant predictors of community engagement, albeit in opposite directions (access has a negative relation and quality a positive one).[70] As water access improved, residents were less likely to be involved in the community. This was particularly true for men (whose responses drove the interaction), as women's engagement was not linked to variabilities of water access. Interestingly, the opposite was found for water quality: as water quality improved, residents were more likely to be involved in community governance (but in this case, it was female respondents who drove this overall trend). As such, for the Ghanaian respondents, men's probability of engagement diminished with water access (while for women it was relatively constant). Yet women's probability of engagement increased with water quality (while men remained relatively stable).[71] Of note, trust in government was also positively correlated with community engagement.

Participatory governance is important, not only for equity goals (involving people directly in decisions that affect them), but it is also often theorized as critical to fostering better adaptive governance and, as such, greater resilience in relation to climate change, water insecurity, or similar challenges.[72] In

Accra, as elsewhere, participation is promoted as a means to improve water security, water governance, and resilience in the face of climate change. For instance, the World Bank has highlighted "participation and engagement" as the key theme of an urban water project in Ghana, while the Global Water Partnership has emphasized the need to promote Water User Associations across the country.[73] As discussed by human geographers Cynthia Morinville and Leila Harris, Local Water Boards (LWBs) have been established in various parts of the city as mechanisms to promote participatory engagement in water-related decision-making, at times also taking on a direct role in water provision and infrastructural development. While the LWBs have some clear benefits – such as involving local youth, women, and others from the community in decision-making related to water and sanitation and facilitating communication between the communities and GWCL – there are also clear limitations of the model to date. One LWB chairperson noted:

> There is a lot of collaboration because they (GWCL) know us, we also know them. They call us, we call them. We have meetings concerning water related programs in the community. So for instance, when they were doing the pipe laying they had to disconnect a particular group line and these community members came here to complain to us. I also called GWCL to lodge the complaint and they came and rectified it.[74]

In terms of less desirable aspects of the LWBs, the analysis revealed shortcomings, including the fact that LWBs generally rely on volunteer labor and must navigate multiple levels of governance, a complex institutional landscape (such as international NGOs), and challenges associated with external influences (for instance, having to meet donor goals and timelines). Both the analysis of LWBs and consideration of participatory governance possibilities in Ashaiman (where no such institutional entity exists) emphasized the importance of informal mechanisms of community engagement, including those unsanctioned by, and potentially crowded out by, readily identifiable water institutions. For instance, several well-being-focused neighborhood groups already exist in Ashaiman. As such, it might be counterproductive to focus on building new water-related institutions (especially given time and resource considerations). Peloso and Harris thus argue that perhaps it is more suitable to consider the ways that water might be included under the broader remit of well-being, rather than endorsing a siloed approach in which water is seen as distinct from community concerns (reflecting and echoing broader debates regarding concepts such as hydrosocial relations in lieu of viewing water as separable from its social context, as with notions of modern water).[75]

All told, our 2012 survey also suggested that there is not, at present, much in the way of broad participation in water governance, even as many respondents suggested that they might be interested in being more involved. Eighty-six percent of respondents in the survey mentioned that they had never participated in water management groups or committees, and nearly all said "no such committees"

exist, even as we were aware of at least one LWB in Teshie at the time. However, 57 percent of respondents suggested that they "wish they could participate more in community meetings," with 67 percent agreeing that they feel that they have something to offer. It is possible that there is recognition among residents regarding the importance of participation, even as there might be constraints or little in the way of opportunities for such engagement.

Even with some progress on bulk water supply, or extending access to some impoverished neighborhoods, there are, nonetheless, profound and lasting concerns related to daily experiences of water insecurity, how water shortages differentially affect households and communities, and how those with limited financial or social resources might be less able to navigate these circumstances. And while there might be interest in enhanced engagement in governance, there appear to be significant obstacles to doing so.

W hat do insights related to the everyday lived realities of water insecurity suggest for broad debates regarding the human right to water and its uneven implementation, among other efforts to overcome water insecurity? How might this aid ongoing efforts to extend water access to underserved communities, or to engage these communities more meaningfully in water governance?

To respond to these questions, we can consider the practical ways that difficulties addressing monthly bill payments in large compound households represent a barrier for residents, leading them to pay more for water on a per-unit basis, and potentially worsening their vulnerability in moments of water-related stress. Recall that residents with piped infrastructure (for example, in Ga Mashie) were nonetheless vulnerable to affordability and quality concerns, and highlighted significant conflict over water and other issues that affected their daily lives. Evidence from Ga Mashie and Madina also showed that water-sharing is practiced, a phenomenon that has recently been documented as significant globally, with the potential to help communities navigate water stress, disaster events, and similar conditions.[76] From Ashaiman, we learned that residents prefer some aspects of the informal water landscape and have existing community governance practices that should likely not be supplanted with formal water governance institutions imposed by external actors. Without familiarity with these day-to-day realities, we might miss opportunities to strengthen some beneficial social practices, or in turn might aggravate aspects of the contextual realities that contribute to lack of access to safe and affordable water for all. Attention to lived realities and how people navigate these complexities supports the argument that solutions for communities must transcend technical factors to include a range of social, institutional, natural, and infrastructural considerations.[77]

The discussion of everyday realities of water insecurity in urban Accra also lends force to the argument that we need to highlight equity more fully in discussions regarding water infrastructure, or goals such as the Human Right to Water. How water insecurity is experienced will necessarily differ depending on social context, including caste, class, gender, and a host of other considerations. Aspects of water insecurity experienced in Accra help to attend to the socially and contextually specific responses to ongoing water challenges, and give weight to the claim made by ecologist Flora Lu and colleagues that "despite the gravity of the water crisis, our theoretical and analytical models do not adequately explain inequitable water access and distribution, nor how equity might be achieved."[78] While affordability is especially of concern for lower-income households, we need to continue to unpack equity dimensions related to ethnicity and gender that explain patterns of water insecurity – or its uneven outcomes. Accomplishing this requires careful and sustained engagement with debates of justice, fairness, and ethics.[79]

Attending more adequately to the social, contextual, and everyday dimensions of water insecurity shows that relationships, norms, and other practices are of critical importance. As the work in Ashaiman and Ga Mashie illustrate, it is necessary to consider the advantages and disadvantages of various forms of water provision, given their complex articulation with other social and institutional factors. Notably, in Ashaiman at present, access to the piped network is not viewed as being singularly advantageous, since there are clear perceived disadvantages (such as avoiding large bills or concerns regarding the unresponsiveness of GWCL to community needs). In Ga Mashie, the presence of pipes is insufficient to ensure water security; complex socioconflictual dynamics and hydrosocial vulnerabilities remain. Indeed, these concerns are particularly acute in moments of water stress. All told, it is important to provide water and associated infrastructure in ways that remain attentive to these realities.

As Peloso and colleagues note:

> We must at once keep a focus on longer term goals of universal, safe and affordable water access, while acknowledging that a myopic and singular focus on connectivity to a centralized utility service oversimplifies the complex experience of water insecurity for millions of residents across the globe. Achieving the goal of universal water access necessitates that we fundamentally rethink our understanding of water as a material.…Doing so reorients our focus from water pipes and infrastructure to the social relationships that are necessarily entangled with water access and security.[80]

If we add to this work the challenge of more effectively engaging marginalized communities in water governance, it is clear there is much more to do.

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ENDNOTES

[1] Elements of this discussion have been reproduced from previously published works, with permission, including excerpts from Leila Harris, "Equity and Justice : Water Access in Underserved Areas of Accra, Ghana," in *L'accès à l'eau en Afrique : vulnérabilités, exclusions, résiliences et nouvelles solidarités*, ed. David Blanchon and Barbara Casciarri (Nanterre, France : Presses Universitaires de Paris Ouest, 2020), 199–212.

[2] United Nations Development Programme, *Beyond Scarcity : Power, Poverty, and the Global Water Crisis. Human Development Report* 2006 (New York : United Nations Development Programme, 2006), 2, http://hdr.undp.org/en/content/human-development-report-2006.

[3] Emmanuel Obuobie, Kwabena Kankam-Yeboah, Barnabas Amisigo, et al., "Assessment of Vulnerability of River Basins in Ghana to Water Stress Conditions under Climate Change," *Journal of Water and Climate Change* 3 (4) (2012) : 276–286.

[4] Of note, progress toward achievement of the MDGs was uneven across regions, with failures to achieve the goal in parts of Africa and Asia, as well as variability between the rich and the poor, and between urban and rural areas, all concerns that highlight equity challenges associated with the uneven implementation of the HRW and similar goals. See Ayisha Matuamo Mahama, Kwabena Asomanin Anaman, and Isaac Osei-Akoto, "Factors Influencing Householders' Access to Improved Water in Low-Income Urban Areas of Accra, Ghana," *Journal of Water and Health* 12 (2) (2014) : 318–331. See Births and Deaths Registry, Ministry of Local Government and Rural Development, "Ghana–Ghana Annual Statistical Report on Births and Deaths–2013, Second Round" (Accra : Ministry of Local Government and Rural Development, 2014), https://www2.statsghana.gov.gh/nada/index.php/catalog/86 (accessed April 7, 2021).

[5] Julie Livingston, "Water Scarcity & Health in Urban Africa," *Dædalus* 150 (4) (Fall 2021).

[6] Justin Stoler, Joshua Miller, Alexandra Brewis, et al., "Household Water Insecurity Will Complicate the Ongoing COVID-19 Response : Evidence from 29 Sites in 23 Low- and Middle-Income Countries," *International Journal of Hygiene and Environmental Health* 234 (2021) : 113715.

[7] Rudolf Nsorwine Amenga-Etego and Sara Grusky, "The New Face of Conditionalities : The World Bank and Water Privatization in Ghana," in *The Age of Commodity : Water Privatization in Southern Africa*, ed. David McDonald and Greg Ruiters (London and Sterling, Va. : Earthscan, 2005), 275–290.

[8] Patrick Bond and Jackie Dugard, "Water, Human Rights and Social Conflict : South African Experiences," *Law, Social Justice and Global Development Journal* 11 (2008) : 1–21.

[9] See Wendy Jepson, Jessica Budds, Laura Eichelberger, et al., "Advancing Human Capabilities for Water Security : A Relational Approach," *Water Security* 1 (2017) : 46–52.

[10] Ibid.; and Farhana Sultana, "Suffering for Water, Suffering from Water: Emotional Geographies of Resource Access, Control and Conflict," *Geoforum* 42 (2) (2011): 163–172.

[11] "On 28 July 2010, through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights. The Resolution calls upon States and international organisations to provide financial resources, help capacity-building and technology transfer to help countries, in particular developing countries, to provide safe, clean, accessible and affordable drinking water and sanitation for all." United Nations Department of Economic and Social Affairs, "The Human Right to Water and Sanitation," https://www.un.org/waterforlife decade/human_right_to_water.shtml (last updated May 29, 2014). See also Heinz Klug, "Between Principles & Power: Water Law Principles & the Governance of Water in Post-Apartheid South Africa," *Dædalus* 150 (4) (Fall 2021).

[12] "The Dublin Statement on Water and Sustainable Development," International Conference on Water and the Environment, January 31, 1992, Dublin, Ireland, available from United Nations Documents, http://www.un-documents.net/h2o-dub .htm (accessed April 6, 2021).

[13] Mahama et al., "Factors Influencing Householders' Access to Improved Water in Low-Income Urban Areas of Accra, Ghana."

[14] "Improved sources" generally include tap water in a dwelling, public standposts, boreholes, tubewells, protected wells and springs, rainwater, packaged water including bottled water or sachets, or delivered water from tanker trucks and small carts. Their recent methods also include safe management parameters. See WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene, "Facility Types," https://washdata.org/monitoring/methods/facility-types (accessed April 12, 2021); and Mahama et al., "Factors Influencing Householders' Access to Improved Water in Low-Income Urban Areas of Accra, Ghana."

[15] Naila Kabeer, *Reversed Realities: Gender Hierarchies in Development Thought* (London and New York: Verso, 1994); and Amartya Sen, "Welfare, Preference and Freedom," *Journal of Econometrics* 50 (1) (1991): 15–29.

[16] Mahama et al., "Factors Influencing Householders' Access to Improved Water in Low-Income Urban Areas of Accra, Ghana."

[17] See, for example, Farhana Sultana and Alex Loftus, *The Right to Water: Politics, Governance and Social Struggles*, 1st ed. (New York and Abingdon.: Oxon, Earthscan, 2012); Oriol Miroso and Leila Harris, "Human Right to Water: Contemporary Challenges and Contours of a Global Debate," *Antipode* 44 (3) (2012): 932–949; Karen Bakker, "The Commons Versus the Commodity: After Globalization, Anti-Privatization and the Human Right to Water in the Global South," *Antipode* (2007): 430–455; HWISE Network, "Household Water Insecurity Experiences (HWISE)–Research Coordination Network (RCN)," *HWISE Network*, https://hwise-rcn.org/ (accessed April 7, 2021); Sultana, "Suffering for Water"; Leila Harris, "Hegemonic Waters and Rethinking Natures Otherwise," in *Practicing Feminist Political Ecologies: Moving Beyond the "Green Economy,"* ed. Wendy Harcourt and Ingrid Nelson (London: Zed Books, 2015), 157–181; Lucy Rodina, "Human Right to Water in Khayelitsha, South Africa–Lessons from a 'Lived Experiences' Perspective," *Geoforum* 72 (2016): 58–66; and Alex Loftus, "Water (In)Security: Securing the Right to Water," *The Geographical Journal* 181 (4) (2015): 350–356.

[18] Flora Lu, Constanza Ocampo-Raederb, and Ben Crow, "Equitable Water Governance : Future Directions in the Understanding and Analysis of Water Inequities in the Global South," *Water International* 39 (2) (2014) : 129–142 ; and Rutgerd Boelens, Tom Perreault, and Jeroen Vos, *Water Justice* (Cambridge : Cambridge University Press, 2018).

[19] Loftus, "Water (In)Security" ; and Sultana and Loftus, *The Right to Water*.

[20] Jepson et al., "Advancing Human Capabilities for Water Security" ; Sultana, "Suffering for Water" ; and Amber Wutich and Kathleen Ragsdale, "Water Insecurity and Emotional Distress : Coping with Supply, Access, and Seasonal Variability of Water in a Bolivian Squatter Settlement," *Social Science & Medicine* 67 (12) (2008) : 2116–2125.

[21] Leila Harris, "Assessing States : Water Service Delivery and Evolving State-Society Relations in Accra, Ghana and Cape Town, South Africa," *Politics and Space : Environment and Planning C* 38 (2) (2020) : 290–311.

[22] Matthew Goff and Ben Crow, "What Is Water Equity ? The Unfortunate Consequences of a Global Focus on 'Drinking Water,'" *Water International* 39 (2) (2014) : 159–171 ; Jaime Linton, "The Human Right to What ? Water, Rights, Humans, and the Relation of Things," in *The Right to Water*, ed. Sultana and Loftus, 45–60 ; Nandita Singh, "Indigenous Water Management Systems : Interpreting Symbolic Dimensions in Common Property Resource Regimes," *Society and Natural Resources* 19 (2006) : 357–366 ; and Nicole Wilson, "Indigenous Water Governance : Insights from the Hydrosocial Relations of the Koyukon Athabascan Village of Ruby, Alaska," *Geoforum* 57 (2014) : 1–11.

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[24] See also Boelens et al., *Water Justice*.

[25] See, for example, Elizabeth Dapaah and Leila Harris, "Framing Community Entitlements to Water in Accra, Ghana : A Complex Reality," *Geoforum* 82 (2017) : 26–39 ; Lyla Mehta, "Water and Human Development," *World Development* 59 (2014) : 59–69 ; and Amber Wutich and Alexandra Brewis, "Food, Water, and Scarcity : Toward a Broader Anthropology of Resource Insecurity," *Current Anthropology* 55 (2014) : 444–468.

[26] Asher Rosinger, Alexandra Brewis, Amber Wutich, et al., "Water Borrowing Is Consistently Practiced Globally and Is Associated with Water-Related System Failures across Diverse Environments," *Global Environmental Change : Human and Policy Dimensions* 64 (2020) : 102148 ; Justin Stoler, Alexandra Brewis, Leila M. Harris, et al., "Household Water Sharing : A Missing Link in International Health," *International Health* 11 (3) (2019) : 163–165 ; AbduMaliq Simone, "People as Infrastructure : Intersecting Fragments in Johannesburg," *Public Culture* 16 (2004) : 407–429 ; and Nan Lin, *Social Capital : A Theory of Social Structure and Action* (Cambridge : Cambridge University Press, 2001).

[27] Mehta, "Water and Human Development."

[28] Allen Isaacman and Muchaparara Musemwa, "Water Security in Africa in the Age of Global Climate Change," *Dædalus* 150 (4) (Fall 2021).

[29] Malin Falkenmark, "Adapting to Climate Change : Towards Societal Water Security in Dry-Climate Countries," *International Journal of Water Resources Development* 29 (2) (2013) :

123–136 ; and Paul C. D. Milly, Julio Betancourt, Malin Falkenmark, et al., "Stationarity Is Dead : Whither Water Management ?" *Science* 319 (5863) (2008) : 573–574.

30 Tom Perreault, "What Kind of Governance for What Kind of Equity ? Towards a Theorization of Justice in Water Governance," *Water International* 39 (2) (2014) : 233–245 ; Leila Harris, Lucy Rodina, and Cynthia Morinville, "Revisiting the Human Right to Water from an Environmental Justice Lens," *Politics, Groups & Identities* 3 (4) (2015) : 660–665 ; Boelens et al., *Water Justice* ; and Wendy Jepson, Amber Wutich, and Leila Harris, "Water-Security Capabilities and the Human Right to Water," in *Water Politics : Governance, Justice and the Right to Water*, ed. Farhana Sultana and Alex Loftus (London : Routledge, Earthscan, 2018), 84–98.

31 Specifically, the work highlighted here was conducted by Cynthia Morinville, Megan Peloso, Elizabeth Dapaah, and Crystal Tremblay, all EDGES affiliates, working together with local research assistants and with the support of Dr. Akosua Darkwah, Dr. Jacob Songsore, and other colleagues at the University of Ghana-Legon.

32 More details on this multi-sited, multi-investigator effort undertaken by the EDGES research collaborative at the University of British Columbia can be found online (www .edges.ubc.ca), including links to associated survey instruments, reports, and publications. All relevant original and published works are cited throughout, as appropriate.

33 See Ian Yeboah, "Subaltern Strategies and Development Practice : Urban Water Privatization in Ghana," *The Geographical Journal* 172 (1) (2006) : 50–65 ; and Amenga-Etego and Grusky, "The New Face of Conditionalities" for discussion of resistance movements that opposed the initial privatization.

34 Marieke Adank, Bertha Darteh, Patrick Moriarty, et al., *Towards Integrated Urban Water Management in the Greater Accra Metropolitan Area : Current Status and Strategic Directions for the Future* (Accra : SWITCH Accra, 2011).

35 Jackie King and Cate Brown, "Africa's Living Rivers : Managing for Sustainability," *Dædalus* 150 (4) (Fall 2021) ; and Megan Peloso, Cynthia Morinville, and Leila Harris, "Water Scarcity beyond Crisis : Spotlight on Accra," *International Journal of Urban and Regional Research* (2018), https ://www.ijurr.org/spotlight-on/parched-cities-parched-citizens/ water-scarcity-beyond-crisis-spotlight-on-accra/ (accessed April 12, 2021).

36 Ministry of Water Resources, Works and Housing, Republic of Ghana, *Water Sector Strategic Development Plan (2012 – 2025)* (Accra : Ministry of Water Resources, Works and Housing, 2014), https ://www.gwcl.com.gh/water_sector_strategic_development__ plan.pdf (accessed October 5, 2015) (emphasis added).

37 See, for example, Mahama et al., "Factors Influencing Householders' Access to Improved Water in Low-Income Urban Areas of Accra, Ghana" ; and Jacob Songsore, "Environmental and Structural Inequalities in Greater Accra," *Journal of the International Institute* 16 (1) (2008).

38 Austin Dziwornu Ablo and Edwige Enam Yekple, "Urban Water Stress and Poor Sanitation in Ghana : Perception and Experiences of Residents in the Ashaiman Municipality," *GeoJournal* 83 (3) (2018) : 583–594.

39 Kweku G. Ainuson, "Ensuring Adequate Water Supply to Disadvantaged Urban Communities in Ghana" (Ph.D. diss., Clemson University, 2009), 45.

40 See www.edges.ubc.ca for more detail on methods, survey instruments, and other information. Leila Harris, Lucy Rodina, Emma Luker, et al., "Water Access and Governance

in Accra, Ghana and Cape Town, South Africa : 2012 Survey Data Report" (Vancouver : EDGES, 2016), www.watergovernance.ca ; www.edges.ubc.ca. Both Ga Mashie and Teshie can be considered older, largely Indigenous communities along the coast, while Madina and Ashaiman are generally newer settlements of the Greater Accra region with more mixed populations of in-migrants from other parts of Ghana and nearby neighboring countries.

41 Cynthia Morinville, "Sachet Water : Regulation and Implications for Access and Equity in Accra, Ghana," *Waters Wire* 4 (2017): 1244 ; and Justin Stoler, "From Curiosity to Commodity : A Review of the Evolution of Sachet Drinking Water in West Africa," *Wires Water* 4 (3) (2017): 1206.

42 Issac Asante-Wusu and Ian E. A. Yeboah, "Geography of Water Insecurity in Three Localities in the Accra-Tema Region, Ghana," *African Geographical Review* 39 (4) (2020): 308–323 ; and Keziah Illidge, "A Systematic Literature Review on Water Access and Governance in Accra Public Health Theses" (M.Ph., Georgia State University, 2019), https://scholarworks.gsu.edu/iph_theses/669/ (accessed April 12, 2021).

43 Amenga-Etego and Grusky, "The New Face of Conditionalities," 283. As they note based on earlier work conducted in 2003 in Madina, Sukura, Mamobi, Nima, and Ashaiman, households spend between 18–25 percent of their income on water alone.

44 Crystal Tremblay, with ISODEC and Leila Harris, "Water Is Life," participatory video on the water situation in Teshie (2016), available at www.edges.ubc.ca.

45 Megan Peloso and Cynthia Morinville, "'Chasing for Water' : Everyday Practices of Water Access in Peri-Urban Ashaiman, Ghana," *Water Alternatives* 7 (1) (2014): 140–159 ; and Dapaah and Harris, "Framing Community Entitlements to Water in Accra, Ghana." Even if many households do not have in-home or in-compound piped access, if the neighborhood overall is connected, often these residents will access water through neighbors who vend water from the piped system.

46 See Peloso and Morinville, "Chasing for Water."

47 Justin Stoler, John R. Weeks, and Günther Fink, "Sachet Drinking Water in Ghana's Accra-Tema Metropolitan Area : Past, Present, and Future," *Journal of Water, Sanitation and Hygiene for Development* 2 (4) (2012). In combination with estimates provided above, there are widely varying estimates of water affordability. Many in Accra pay much more than the recommended 5 percent of income that is generally associated with notions of affordability (such as from the World Health Organization).

48 Dapaah and Harris, "Framing Community Entitlements to Water in Accra, Ghana," 30.

49 Harris et al., "Water Access and Governance in Accra, Ghana and Cape Town, South Africa."

50 See, for example, Dapaah and Harris, "Framing Community Entitlements to Water in Accra, Ghana."

51 Tremblay, "Water Is Life."

52 Author interviews with EDGES, 2015.

53 Nathan Gadugah, "Water Company Shuts Down Teshie Desalination Plant," *MyJoyOnline.com*, https://www.myjoyonline.com/water-company-shuts-down-teshie-desalination-plant/ (accessed March 20, 2018).

54 Leila Harris, Christopher Sneddon, and Jacqueline Goldin, eds., *Contemporary Water Governance in the Global South: Scarcity, Marketization, Participation* (London: Routledge, 2013). For more on resistance in Accra to the involvement of PPPs and demand management in water provision, see Julian Yates and Leila Harris, "Hybrid Regulatory Landscapes: The Human Right to Water, Variegated Neoliberal Water Governance and Policy Transfer in Cape Town, South Africa and Accra, Ghana," *World Development* 110 (2018): 75–87.

55 Godfred Amankwa and Edward F. Ampratwum, "COVID-19 'Free Water' Initiatives in the Global South: What Does the Ghanaian Case Mean for Equitable and Sustainable Water Services?" in *Water International* 45 (7–8) (2020): 722–729; and Sarah L. Smiley, Bejamin D. Agbemo, Ellis A. Adam, and Raymond Tutu, "COVID-19 and Water Access in Sub-Saharan Africa: Ghana's Free Water Directive May Not Benefit Water Insecure Households," *African Geographical Review* 39 (4) (2020): 398–404.

56 See www.edges.ubc.ca.

57 Interview, 2012, cited in Peloso and Morinville, "Chasing for Water," 128.

58 Interview, June 15, 2012, cited in ibid.

59 As reported in Peloso and Morinville, "Chasing for Water."

60 The Public Utilities Regulatory Commission is responsible for oversight of water quality and pricing, among other issues related to public utilities.

61 Interview cited in Peloso and Morinville, "Chasing for Water," 131.

62 Ibid.

63 Harris et al., "Water Access and Governance in Accra, Ghana and Cape Town, South Africa."

64 Wutich and Ragsdale, "Water Insecurity and Emotional Distress," for example, highlights stress and other emotional-affective aspects of the lived experiences of uneven access to water.

65 Dapaah and Harris, "Framing Community Entitlements to Water in Accra, Ghana."

66 Cited in ibid., 32.

67 Ibid.; and Sultana, "Suffering for Water."

68 Drawing on the work of Sen and colleagues, entitlements refer to the "Bundle of ownership rights, endowments, assets, economic and social that individuals and households draw on to enable 'sufficient access to resources," discussed in Dapaah and Harris, "Framing Community Entitlements to Water in Accra, Ghana," 27.

69 Leila M. Harris, Danika Kleiber, Lucy Rodina, et al., "Water Materialities and Citizen Engagement: Testing the Implications of Water Access and Quality for Community Engagement in Ghana and South Africa," *Society and Natural Resources* 31 (1) (2018): 89–105.

70 Ibid.

71 Ibid.

72 Cynthia Morinville and Leila Harris, "Participation, Politics, and Panaceas: Exploring the Possibilities and Limits of Participatory Urban Water Governance in Accra, Ghana," *Ecology and Society* 19 (3) (2014): 36.

73 As discussed in Megan Peloso and Leila Harris, "Pathways for Participatory Water Governance in Ashaiman, Ghana : Learning from Institutional Bricolage and Hydrosocial Perspectives," *Society and Natural Resources* 30 (12) (2017): 1491–1506. It is of interest to note that these organizations also push for water-related institutions to focus on water-related goals, rather than addressing broad welfare goals. The authors speak to this tension, and instead suggest it might be meaningful to support, and enhance, existing institutions rather than aiming to replace them with narrow water-focused use groups. See also Morinville and Harris, "Participation, Politics, and Panaceas" ; and Peloso and Harris, "Pathways for Participatory Water Governance in Ashaiman, Ghana."

74 Interview with LWB chairperson, July 14, 2011, cited in Morinville and Harris, "Participation, Politics, and Panaceas," 40.

75 Peloso and Harris, "Pathways for Participatory Water Governance."

76 Rosinger et al., "Water Borrowing Is Consistently Practiced Globally and Is Associated with Water-Related System Failures across Diverse Environments."

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78 Perreault, "What Kind of Governance for What Kind of Equity ?" ; and Lu et al., "Equitable Water Governance," 129.

79 Lucy Rodina, "Reflections on Water Ethics and Human Right to Water in Khayelitsha, South Africa," in *Global Water Ethics – Between Action and Reflections*, ed. Rafeal Ziegler and David Groenfeldt (London and New York : Routledge, 2017), 167–183 ; and Harris et al., "Revisiting the Human Right to Water from an Environmental Justice Lens."

80 Peloso et al., "Water Scarcity beyond Crisis."