



First-Class but not for Long: Heterogeneous Infrastructure and Water Bricolage in Accra's Kiosk Compounds

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Abstract

This paper explores the micro-geographies of water access in the context of a first-class residential neighborhood of Accra served by the city's networked infrastructure. We focus our analyses on how water is accessed and supplied to six kiosk compounds—privately owned, walled plots of land provisionally inhabited by urban dwellers living in kiosk-like structures with the (tacit) knowledge of the plot-owners. We document how kiosk inhabitants access pipe-borne water, despite not being directly connected to the city's network, through diverse configurations of actors, practices, and material set ups. Our findings suggest more attention should be paid to the micro-geographies of water distribution in networked neighborhoods as this contributes to more nuanced understandings of the uneven and diverse ways through which water is distributed in the context of Accra's incremental urbanization. To analyze this diversity, we suggest combining the heuristic of heterogeneous infrastructure configurations with the concept of water bricolage and using the plot as a unit of analysis.

Keywords Infrastructure · Water bricolage · Kiosks · Ghana · Plotting urbanism

Introduction

In recent years, urban scholars have put forward the idea of paying more attention to local geographies and everyday infrastructural relations in the analysis of urbanization and urban inequalities (Lawhon et al., 2014; McFarlane & Silver, 2017; Pieterse, 2008; Simone & Pieterse, 2017). Focusing on how infrastructures are made and used in the

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everyday, it is argued, contributes to a more precise analysis of urban challenges and helps us to appreciate the diversity of solutions already put in place by residents to meet their basic needs and inhabit the city (McFarlane & Silver, 2017). Learning from the quotidian experiences of living in the city in turn has the potential to develop more effective and progressive urban policies (Pieterse, 2011).

In this paper, we contribute to the project of crafting more situated understandings of urbanization processes and access to basic services, specifically focusing on urban water supply. We do so by exploring the micro-geographies of water access in the Accra city-region, Ghana. More specifically, we focus on one neighborhood which several urban planners who we interviewed described as a first-class residential area because it is characterized by the presence of villas surrounded by gardens and swimming pools, gated communities, a planned layout, and renowned residents.¹ The locality is also relatively well supplied by the city's water company, the Ghana Water Company Limited (GWCL). The area has been served by pipe-born water for about 15 years; water flow is rather regular compared to other areas of the city and, as several residents told us, "unless they [the water company] close the pipe, in the area there are no problems with the water" (Interview notes, Kiosk inhabitant, 2017).

Responding to invitations by urban scholars to explore the city in a "bottom-up" manner, privileging the stories and experiences of the majority of "poor denizens who appropriate the city for their own ends" (Pieterse, 2008 p. 109), we focus on how water is accessed in (and supplied to) kiosk compounds. These are privately owned plots of land located between multimillion landscaped properties and provisionally occupied by urban dwellers living in kiosk-like structures, with the (tacit) agreement of the plot-owner and at times in exchange for a monthly rent (Fig. 1).² Kiosk-like structures include shacks, huts, re-purposed shipping containers, metal structures, wooden sheds of various colors, and sizes. The plots host several kiosks—in one case, we counted 28 structures—each inhabited by individuals or entire families who serve as caretakers preventing the multiple sale of the land and theft of building material. Kiosk inhabitants are constantly in danger of being evicted by plot-owners and the city's authorities, a risk that was reported to us by kiosk inhabitants we interviewed. Therefore, to protect the research participants, we use the pseudonym of Edano to refer to the locality we focus on in this paper.

¹ In using the term first-class residential areas, the planners we interviewed referred to a characterization of Accra's localities according to similar levels of income, housing characteristics, and environmental conditions introduced in 2002 and based on the census data. Accordingly, first-class residential areas were defined as localities where the average annual per capita household income in 2000 was about 12,462,499 GHS /US\$1,519.82 (World Bank 2010). Oben Odoom (2011) suggests using this classification as a reference to analyze urban inequalities in Accra. Over time, income levels in urban areas in Ghana and Accra have changed; in 2017, the annual per capital income was 16,373 GHC for urban Ghana and 23,532 GHC for the city of Accra (GSS, 2019).

² We prefer the term kiosks to the term hut or shack for the former foster a more positive connotation of the housing and living spaces of lower-income dwellers and for the term has become of common usage among Accra's urban planners, architects, artists, and newspapers (Idriss 2016, Jansen 2016, Glover 2018).



Fig. 1 Kiosk compound in Edano seen from outside. Source: Christoph Reimers, 2017

A burgeoning literature explores the geographies of water access in the city of Accra, thereby showing how uneven and fragmented the urban waterscape is (Bartels et al., 2018; Braimah et al., 2017; Oteng-Ababio et al., 2017). Existing literature establishes a link between poverty and limited access to pipe-born water, with several authors pointing out that lower income residents living informally are not only largely excluded from pipe-born water supplies but also pay higher prices per unit of water, often of dubious quality (Amankwaa et al., 2014; Braimah et al., 2017; Oteng-Ababio et al., 2017). The strategies used by lower income dwellers to access water have largely been studied by focusing on sanctioned low-income informal settlements in the city and on areas poorly served by the city's networked infrastructure (Amankwaa et al., 2014; Peloso & Morinville, 2014; Tutu & Stoler, 2016). And yet, scholars have demonstrated for Accra and other cities that low-income households not only live at the margins of high-income neighborhoods but also play a pivotal role in sustaining the growth of middle- and upper-income neighborhoods like Edano, i.e., they are employed as caretakers to guard unfinished construction sites and to prevent land litigation and occupation that is unauthorized by landowners (Adu-Gyamfi, 2021; Gough & Yankson, 2011; Guerrini, 2019). At the same time, living in high-income neighborhoods can offer lower income residents opportunities to access basic services, including water, and improve their livelihoods, as such areas tend to be historically better served by public infrastructure or higher income residents use their private resources to extend networks (Bartels, 2020; Uitermark and Tieleman 2020). Hence, the specific objectives of our research are, first, to analyze the strategies through which lower income urban dwellers manage to access water on a daily basis in the context of a first-class residential area of the

city. Second, we interrogate the possibilities that living in a relatively well-served neighborhood might offer to low-income urban dwellers trying to establish viable ways of inhabiting the city.

For our analysis, we build on literature that suggests attention should be paid to everyday practices and infrastructural diversity as an analytical lens to research the actual processes through which urban residents manage to access basic services, including water (Jaglin, 2014; Lawhon et al., 2018; Peloso & Morinville, 2014; Smiley, 2020). Our interest is not so much focused on assessing proximate dimensions of water access, i.e., in terms of quantity, quality, and affordability. Rather, we seek to contribute by exploring processual dimensions of water access, including the social and material relations through which water is accessed on a daily basis (Peloso & Morinville, 2014; Ranganathan & Balazs, 2015). We do so by combining the heuristic of Heterogenous Infrastructure Configurations, in short HICs (Lawhon et al., 2018) and the concept of water bricolage. The former provides a vocabulary to capture the diversity of geographically spread socio-material configurations through which urban residents manage to access basic services (Graham & McFarlane, 2014; McFarlane & Silver, 2017). The latter is helpful to capture how people navigate the presence and possibilities provided by different configurations to meet their needs, mandates, and/or desires. We extend the use of these two analytics from a focus on individual households, the neighborhood, and city-level dynamics, to the plot as a unit of analysis.

In the next section, we further explain the analytical and methodological approach we employed to examine water access in six of Edano's kiosk compounds. Then we contextualize the presence of "kiosk compounds" within contemporary urban dynamics in Accra, including the growing housing crisis, increased land competition, and incremental urbanization. Subsequently, we move on to our case study. We begin by narrating how a piped water supply was first extended to the neighborhood, then describe the heterogeneous water supply configurations of Edano and analyze the bricolage practices through which kiosk inhabitants manage to access water on a daily basis. In concluding, we summarize the findings and discuss their implications in terms of improving access to water in urban Accra.

Heterogeneous Configurations and Water Bricolage

In recent years, urban and water scholars have paid growing attention to understanding and conceptualizing how residents access water in contexts where networked infrastructure is historically fragmented and a diversity of water providers coexist (Bakker, 2003). One way to research this multiplicity is the heuristic of HICs introduced by Lawhon et al. (2018). Thinking through HICs shifts attention towards the role of situated users in shaping urban infrastructural geographies, hence, a "configuration might be thought of as the range of infrastructural options potentially available to a person for everyday use" (Lawhon et al., 2018, p.726). Such a perspective should help analyses of basic service provision and access to move beyond "debates over state, community, or private ownerships, as well as formal or informal infrastructures" (ibid., p. 722) and to inquire into the conditions of possibility for

incremental change. This involves researching the “conditions under which particular socio-technical artifacts work, for whom they work, and what it means for infrastructure to work” (Lawhon et al., 2018, p. 730). Importantly, infrastructural artifacts are not understood “as individual objects but as parts of geographically spread socio-technological configurations” (p. 722).

Applied to the study of urban water supply and access, thinking through HICs has proved a productive way to move beyond a dichotomous understanding of water governance (i.e., formal vs informal, connected vs disconnected) (Truelove, 2019). It also allows to appreciate the opportunities that local level individual and collective relations (i.e., within one household or a neighborhood) offer to improve water access (Smiley, 2020) but also to recognize their limits (Albaet al., 2020; Kundu & Chatterjee, 2020). In the specific case of urban Ghana and more in general African cities, a HIC perspective extends debates on urban water access beyond a focus on state institutions and networked infrastructure (Wamuchiru, 2017, Smiley, 2020). Scholars employing the heuristic of HIC have thus demonstrated how access to water is not only about formalized governance frameworks but also through resident’s own individual and collective initiatives and everyday acts of inventing and building infrastructures (Dakyaga et al., 2021). A HIC perspective also calls for paying attention towards differences in access practices within and between neighborhoods across the same city (Guma et al., 2019; Smiley, 2020).

We combine the heuristic of HICS with the notion of bricolage in order to explore these water-related practices. Bricolage thinking has already been applied to the study of water, mainly in its formulation as institutional bricolage (Clever, 2012; Frick-Trzebitzky et al., 2017; Peloso & Harris, 2017; Rusca et al., 2015) but also in studying socio-technical tinkering in irrigation and in piped water systems (Benouniche et al., 2014; Kuper et al., 2017; Silva-Novoa Sanchez et al., 2019). The water bricolage concept reflects a growing interest of water scholars in interrogating “where or what agency is, or where powers of authority and expertise are located” (Kemerink-Seyoum et al., 2019) in processes of water governance. This literature documents how marginalized residents (or users) but also engineers, development practitioners, traditional authorities, local associations, and the many different actors and groups tinker with infrastructure and institutions shaping the water flows and their governance (Haapal & White, 2018; Kemerink-Seyoum et al., 2019; Rusca et al., 2015). Following Clever, these works underscore that water bricolage is an authoritative process as “some bricoleurs are likely to possess more authoritative resources than others” (Clever, 2002, p. 19). She underscores how people, even within the same social group, are unequally interdependent (Clever, 2007). Hence, processes of water bricolage are not neutral, rather social inequalities may be either preserved and reproduced or altered. For instance, Kuper et al. (2017) show how bricolage can be understood as an everyday form of “contestation by appropriation” that is a creative process through which socially marginalized actors renegotiate their relationships with other actors. For Kemerink-Seyoum et al. (2019), processes of tinkering can be seen as a “creative and micro-political act of agency” (p. 10) as although not always intentionally political they show that “there is room for shifting and changing the interpretations and distributions” (p. 10) enforced through infrastructural projects. These findings resonate with literature on incremental urbanism

(Silver, 2014), and as they document how by putting together diverse technologies and strategies in an improvised and gradual way, the urban poor not only manage to access basic services but also prefigure improved future conditions. It also resonates with the concept of urban energy bricoleurs introduced by Munro (2019) as a way to further understand “how urban inhabitants negotiate dynamic and heterogeneous infrastructure configurations” and “how forms of creative adaptation are an integral part of urban infrastructural geographies” (p. 2).

As the above cited research shows, the concept of bricolage and the related process of socio-technical tinkering have been helpful to broaden understandings of urban infrastructural relations and water governance processes. Yet, literature that employs bricolage thinking to study the coexistence of heterogeneous water supply configurations remains limited. In this paper, we prove the usefulness of the notion of water bricolage to understand the water geographies of Accra’s first-class residential areas. In doing so, we follow the invitation of urban scholars (Munro, 2019; Pieterse, 2008) to start from the urban poor that live at the margins, hence our focus on kiosk compounds and their inhabitants. Following insights from water governance literature, we also pay attention to the role of other urban actors/bricoleurs to interrogate how through their practices they (might) limit or enhance the opportunities of kiosk inhabitants to access water. Specifically, following insights from existing research on Accra’s waterscape, we pay attention to traditional authorities (Frick-Trzebitzky et al., 2017), water vendors (Alba et al., 2020), and plot-owners (Dapaah & Harris, 2017) as they shape urban water access. Moreover, while the coexistence of different water supplies and access configurations has been analyzed in lower income informal settlements and peripheral areas where networked infrastructure is rather limited or absent, we extend the analysis to a first-class residential neighborhood served by networked supply. Lastly, while existing work on infrastructural heterogeneity in water supply and access has productively focused on the individual, the household, the neighborhood, and the city scales (Munro, 2019; Peloso & Morinville, 2014; Schindler et al., 2019; Smiley, 2020), we start from the level of the plot, a parcel of land. As recent literature underscores, looking at plots of land is helpful to understand urbanization in contexts “where affordable housing is missing, access to land is restricted, and territorial regulations are unclear, ambivalent, and/or contested” (Karaman et al., 2020, p. 1144) as it is the case in Accra (Gillespie, 2020). Plots reveal the (individualized) strategies of urban development in which residents individually and/or collectively establish themselves in the city in more or less permanent ways through piecemeal incremental housing practices, recurrent negotiations and forms of (quiet) encroachment (Bartels, 2020; Karaman et al., 2020; Nunbogu & Korah, 2017).

Study Area and Research Methodology

This paper draws on research we carried out in a locality north-east of Accra which is administratively part of the Adenta Municipal Assembly (AdMA). In the process of the empirical fieldwork (carried out in 2015 and in 2017), we got to know and finally selected this area as it provided an example of a locality that is relatively well served by the city’s water company when compared with other areas of the AdMA

and indeed the entire city (Norström et al., 2009). As we mentioned in the introduction, Edano has been served by pipe-born water for about 15 years, and piped water supply is rather regular compared to other neighborhoods of the city. According to a schematic representation provided by the staff of the water company, the neighborhood is served by a 200-mm (8 inch) pipe connected to a major pipeline of the city's network. Although neighborhood-level distribution networks do not appear in the GWCL maps (Uitermark and Tieleman 2020), from our own mapping and interviews, we derived that at the time of the research, the neighborhood was fairly well-covered by piped water infrastructure. According to residents, GWCL staff and tanker drivers, the area was regularly supplied by pipe-born water. A senior family member, James, explained, "most of the houses now have their own pipes, so we are not suffering" (interview, senior family member 2017). The relatively good water supply in the locality is also revealed by the fact that it hosts several water-filling points used by tanker drivers to fetch water in bulk. A former water vendor, now an elected politician (assembly man), explained, "because we have water in abundance here, they [the tanker drivers] normally come and buy it here and supply it to the other areas that do not have water" (Interview Assembly man, 2015). Although our study focuses largely on pipe-born water, it is important to underscore that this is not the only source of water in the neighborhood. One mechanized borehole installed by the district administration was located near the local school. During our walks, we observed sachet water and bottled water being sold on the streets and, in one instance, we came across a borehole being drilled in the garden of a semi-detached house by a specialized company.

We chose Edano for our study as it is exemplary of many of the processes that characterize Accra's urbanization. Like other peri-urban areas, the neighborhood developed largely from the 1990s when Ghanaian returnees started to invest in land, a process enabled by the globalization and liberalization of the economy and the end of military rule.³ Much of the neighborhood has developed incrementally over one or two decades with individuals acquiring plots of land to self-build their dwellings—typically single-family houses—engaging small-scale contractors and completing the projects in stages (Ahadzie & Amoah-Mensah, 2010). As in other areas of the city (Bartels 2020), newcomers settled around an original village, still inhabited by extended families of the first Ga groups that settled in the area (reference omitted for peer-review). The village is recognizable due to the scattered spatial distribution of the buildings; the few mud houses still standing, some of which are inhabited, and an enlargement used for traditional ceremonies (Fig. 2). The neighborhood is largely urbanized; however, we observed several unfinished buildings and, in some plots, urban agriculture being practiced. Moreover, housing in the neighborhood is profoundly differentiated, reflecting a pattern documented across the entire city (Obeng-Odoom, 2011). When walking across the neighborhood, one observes kiosk-like structures lacking basic services in which multiple people share one room, but also

³ During this period, the city of Accra experienced overall spatial and population growth—while in 1984, the population was 970,000; in 1997, it was 1,800,000 (Konadu-Ageyman 2001).



Fig. 2 Inhabited mud houses and shared water connection (red hose) in Edano. Source: authors, 2017

single-family houses, landscaped properties, and gated communities inhabited by higher income groups. Due to its wealthy residents, Edano was described by urban planners, GWCL staff, and residents as a first-class residential area comparable to the fairly nearby East Legon (Interview Town and Country Planning Department, TCPD district officer). This is also reflected in the cost of land and rental prices that often reach six-digit figures quoted in foreign currencies such as US dollars and euros.

For 3 months (July–September 2017), the first author regularly visited the neighborhood alone and/or with a research collaborator. During these visits, we carried out transect walks, participatory observations, semi-structured interviews, and informal conversations. We focused our study on six privately owned plots that are kiosk compounds. We chose plots located in the south part of the neighborhood that both residents and staff of the water company reported was covered by piped water supply. The plots were partly or fully walled, and in each of them multiple kiosks were present—based on Google Earth images (2015), we counted a minimum of two kiosks and up to 28 structures (Table 1). The kiosks were inhabited by single persons and also by families, including children. Surveying the number of inhabitants per kiosk or per plot proved difficult as many of the kiosk inhabitants were not present during the daytime when we conducted our research. However, we derived some indications by taking the average household size in Greater Accra as estimated in the latest Ghana Living Standard Survey, i.e., 3.4 people (Ghana Statistical

Table 1 Characteristics of the six kiosk compounds considered in the study. Source: authors' fieldnotes, 2017

	Compound 1	Compound 2	Compound 3	Compound 4	Compound 5	Compound 6
Type of structures and number of kiosks*	20 kiosks distributed on two adjacent plots	Block house inhabited by the caretaker, 10 kiosks	8 kiosks	28 kiosks including a bar	Unfinished two-story house, 2–3 kiosks in the backyard	18 kiosks
Estimated number of people**	68	34	27	95	10	61
Size of the plot*	2 adjacent plots of 860 m ²	1500 m ²	5741 m ²	1000 m ²	1522 m ²	
Walled	Yes	Partly	Yes	Yes	Partly	Partly
Connection to pipe-born water on plot	No	Yes	Yes	No	No	No
Presence of toilet facilities	No	Yes	Yes	No	No	No

*Own calculation based on Google Earth image 2015.

**Estimation based on an average household size of 3.4 people (GSS 2019).

Service, 2019). Assuming one household per kiosk, the plot with the greatest number of kiosks (28) could well be home to approaching 100 people.

We interviewed a total of 10 people living in kiosks or in unfinished buildings on these seven plots, most of whom were women. The interviewees were engaged in Accra's informal economy with several of them selling food, sachet water, and other goods. All of them were rural–urban or urban–urban migrants who had arrived in the neighborhood from other parts of Accra, from Northern Ghana, or even from neighboring countries (i.e., Togo). They had been living in Accra for several years (some for more than 10 years) during which time they had moved several times, often together with their kiosks. Some of the kiosk inhabitants we interviewed had moved in a kiosk that was already located on a plot; others moved onto a specific plot with their kiosks after being evicted from another place. All those we interviewed lived on the plots with the tacit or explicit permission of the landlord and/or the caretaker of the plot.

Besides kiosk inhabitants, we interviewed 14 key informants selected using a snowballing approach. These included senior family members (4), a religious leader (1), a local politician (Assembly man), water vendors (5), and the managers of two toilet facilities (see table in supplementary materials). While we focused on low-income residents living in kiosks and on residents living in the original village, the perspectives of higher income residents were included as we interviewed two representatives of a residents' association located within the neighborhood. At institutional level, interviews were carried out with national, regional, and district staff of the TCPD (in total 3) and with staff of the water company including staff seconded to the GWCL's Low Income Customer Support Unit, regional and district managers (in total 6). Interviews were carried out in English and/or vernacular languages (Ga, Twi) depending on the preference of the interviewee. When the circumstances allowed and the interviewees agreed, interviews were recorded and subsequently transcribed, otherwise notes were taken. Google Earth images (2008, 2015) were used as a map for field investigation and for the preparation of the maps included in this paper.

Contextualizing the Presence of Kiosk Compounds

Kiosks are one-room dwellings (3×3 or 4×4 m²) made out of different kinds of recycled materials including wooden planks, corrugated iron, and plastic sheets (Fig. 3). Located on almost every street corner and used as stores to sell food or other fast-moving consumer goods, telecommunication products, or water and even used as museums, these structures are ubiquitous in Accra (Jansen, 2016). In this study, we focus specifically on kiosk-like structures located on privately owned plots, which we refer to as kiosk compounds. In this section, we contextualize the phenomena of kiosk compounds in relation to three main trends characterizing Accra's urbanization. First, an increasingly unequal housing market, second incremental building practices, and third, the violent attempts of the city's authorities to beautify Accra by evicting lower income dwellers who live and work informally.



Fig. 3 Kiosks made out of wood sheets and corrugated iron roofs in Edano. Source: Authors, 2017

Above all, the presence of kiosk compounds needs to be understood in the context of Accra's increasingly inequitable housing sector. In recent decades, Accra has become what Gillespie (2020) recently called a real estate frontier. Following the liberalization of the housing market, state incentives for private sector developments, decades of limited investment in public and affordable housing, and an increasingly limited availability of land, rental prices in Accra have skyrocketed (Gillespie, 2020; Grant, 2009). Housing development is carried out by a booming (but still limited) real estate sector focused on providing upper-end residential spaces, i.e., gated communities. Alternatively, houses are incrementally built through individual initiatives where private residents acquire a plot of land and self-build their houses, often engaging small-scale contractors and taking up to 10–15 years to complete (Bartels, 2020; Grant, 2009). It is estimated that more than 80% of houses in Ghana are built through this do-it-yourself process (Ahadzic & Amoah-Mensah, 2010). However, the large majority of Accra's residents can hardly afford to engage in these types of housing development (Awanyo et al., 2016). Lower income residents resort to renting a room in a compound house. Nonetheless, many struggle as they cannot afford to pay the 2 years of advance rent required by landlords (Appeaning Addo, 2013; Danso-Wiredu, 2018). Those who cannot afford to rent individual rooms, resort to living in make-shift structures, like kiosks, and to forms of multi-habitation like sharing rooms. Kiosk compounds combine these two strategies as they are



Fig. 4 Schematic representation of a section of Edano; kiosk compounds are highlighted in light red. Source: authors' elaboration based on Google Earth image 2015

inhabited by people living in kiosks jointly on the same plot (Fig. 3). Typically, kiosks are sparsely distributed across the plot or clustered around a building under construction (Fig. 4).

Additionally, kiosk compounds are closely related to the incremental character of Accra's urbanization. Kiosks are themselves examples of incremental building practices as they are built piecemeal by putting together different materials in a rather improvised manner (Silver, 2014). And when located on private plots, like in the case of kiosk compounds, kiosks and their inhabitants become involved in the incremental building practices of other urban dwellers, typically wealthier ones, who self-build their houses, often taking up to 10–15 years to complete the building. Kiosk compounds in fact follow a similar logic to the practice of employing a caretaker, as documented by Gough and Yankson (2011) and more recently by Adu-Gyamfi (2021). A caretaker is a person who, commonly together with his or her family, dwells often rent-free on a plot owned by other people until the owner completes his/her house. Caretakers are in charge of protecting the properties from theft (i.e., of building materials) and/or help avoid land disputes and multiple sales of the land, a common practice in Accra. In the case of kiosk compounds, instead of one structure and one household, several kiosks find a place on a single plot. Importantly, the kiosk's presence is sanctioned by (private) landowners and/or caretakers who allow kiosk occupants to temporarily live on a plot of land—often in exchange for monetary payments but not always. A representative of a residents' association explained the practice as follows:

Some of the people on the kiosks were brought there by the landowners, the people who bought the property (...); people can get off and start building on your land if you are not there, and if you are not careful, you go to court; the court can say “Where were you when the person was building? (...)” You know people have bought land and they are not living in, they are outside [abroad]. So, for you to make sure your land is secured, you put a small kiosk then ask somebody to live in like a caretaker.

Kiosks and their inhabitants are allowed to stay on the plot provided that they are willing to vacate the property at any time when requested by the plot-owner. While requests to move might come at any time, it may also take several years before a plot-owner decides to start or complete the construction of a building. Some of the kiosk inhabitants we interviewed had lived on the same plot for 8 years, others for only 2 years, yet they all mentioned the temporary character of their living arrangements. A woman living in a kiosk compound explained:

It depends on the landowner, and if the landowner is not yet ready to develop the land, then we can stay as long, but if the landowner comes and we have to move (...); 2 weeks ago the landowner came, and he is doing a project and I will move.

The material design of the housing arrangements partly reflects the temporary character of the kiosk compounds as the relatively small size and low weight of kiosk structures allow inhabitants to relocate relatively easily (Idriss, 2016). For instance, while researching tanker water supply in Accra (Alba et al., 2019), we several times witnessed tanker drivers using their trucks to move kiosks from one place to another by loading the metal and wood structures on to the backs of the trucks.

Locating a kiosk in a private compound not only responds to plot-owners' prerogatives but also offers kiosk inhabitants a viable (if temporary) option of living at the margins. Settling on a private plot is an alternative to settling on state land and thus being the target of recurring forced eviction and so-called “decongesting exercises”. These forced evictions are carried out in the name of an entrepreneurial urban governance strategy that aims to beautify and modernize Accra but results in many people being displaced and losing their livelihoods (Fält, 2016; Gillespie, 2016). According to Obeng-Odom (2011), forceful evictions are one of the key drivers of growing socio-spatial inequality in Accra. Kiosk-like structures are perceived by urban planners and city authorities as antithetical to the ideas of modernity that are pursued in the recent spatial plans for turning Accra in a “world-class city” able to compete with other cities like Lagos and Abidjan (Government of Ghana, 2017b, p. 26). An official of the TCPD of one of the districts of the Accra region explained to us that kiosks are “destroying the urban landscape of Accra,” bringing criminals, and they are unsuitable for living as “they create a nuisance because there are no facilities like a bath and washroom so like a container cannot serve as a living space” (Interview TCPD district officer). While city planners remain critical of kiosks located on private plots, precisely the fact that these are private plots limits the power of the state authorities to intervene. As one city planner explained to us, “The assembly would go ahead and dismantle them if they were by the roadside

(...). If you are on somebody's plot you cannot enter, you need the other person's permission to do that and maybe they have negotiated with the owner of the plot" (Interview TCPD district officer). This does not mean that evictions do not happen. For instance, some of the kiosk inhabitants reported that they had been evicted from a plot. More recently, in summer 2019, more than 200 structures inhabited by thousands of people located on a private plot known as a "kiosk estate" not too far from Edano (but in another district) were pulled down by the municipal assembly (Glover, 2018).

Differential Water Access in a First-Class Neighborhood

In Edano, as in other areas of the city, the water company does not directly supply kiosk residents with private connections. As a GWCL member of staff explained to us, "For kiosks, because they are not permanent houses, as much as possible, we will not connect water, but in areas where we have a lot of kiosks, we rather put up standpipes" (Interview GWCL, Low Income Urban Communities Unit, 2017). Standpipes installed by the water company are operated by water vendors appointed by the GWCL and sell water according to a dedicated tariff system. They are present in sanctioned low-income neighborhoods of the city; however, in Edano, we did not come across standpipes installed by the GWCL. How do kiosk inhabitants then access water on a daily basis? In this section, we address this question focusing on three plots and the stories of their residents. We chose these three plots (out of the six considered in the study) because each of them is illustrative of a different configuration through which kiosk residents can access pipe-borne water. They are also illustrative of the role of different actors (neighbors, caretakers, plot-owners), acts of bricolage and artifacts shaping water access geographies within the neighborhood.

Plot 1: Relying on Neighbors

Ester, Equia, and Augustina live in three different kiosks located a few meters from one another across two adjacent walled plots belonging to the same person and managed by the same caretaker. Ester shares her kiosk made out of wooden planks of different colors with her sister; Equia lives with her son and her husband; Augustina sleeps in a kiosk that also serves as her shop just outside the walled plot while the rest of her family—her children, sister, and mother—sleep in three kiosks located on the plot. Augustina explained that on the plot, there are only a few people that do not belong to the extended family; the rest live together as a family; they are all from the same town in the Volta region; they cook together and they share the space. When we met them, an afternoon in mid-August, the three women were occupied with cooking and getting ready to go to work. All three women were worried about the future as the plot-owner recently asked them to leave the plot; they were told they only have 2 weeks to find a new place.

Although piped water runs under the surface of the street facing the plot, there is no tap connected to the network in the compound, so in order to access water, Ester, Equia, and Augustina make do with the only option they have and buy water by the bucket (18–20 l) from a neighbor—the price ranges between 0.30 and 0.50 GHS depending on the size of the bucket.⁴ The closest place where they can get water is the neighbor living just opposite, but several neighbors in the vicinity sell water, three only in the street where the piped water runs. The GWCL has authorized private residents to resell pipe-borne water by the bucket provided that they register as commercial customers, water bills are paid for, and illegal connections are not established (Alba et al., 2020)—although it was unclear if Augustina’s neighbor was authorized by the GWCL. At the neighbor’s “there is always water,” we were told; he is connected to the network, and if the water is not running, he buys water from a tanker. All three women told us that thanks to the neighbors that resell water; they can get water all the time. Despite this relatively good water situation, the three women told us that among themselves, the kiosk inhabitants had been talking about connecting to the network but had failed to find a common agreement. One of the reasons was that some of those who live on the plot were not able to afford to pay for the connection—a connection to the network costs an average of 700 GHC (175\$) (Uitermark and Tieleman 2020). Second, kiosk inhabitants need to have a rental contract or another written document to prove that they reside in a specific kiosk and/or on a specific plot in order to be able to apply for a connection.⁵ Given the fact that they are not the owners of the land, Equia describes this as a headache, and the task of connecting to the network is as almost impossible. The temporariness of the living arrangements of kiosk inhabitants is yet another reason for not investing in a connection to the piped water supply. All the inhabitants we talked with knew that they would probably be unable to live on the same plot for long and, if forced to move, they would not be able to take the pipe connection with them.

Plot 2: When the Caretaker Is Also a Water Vendor

Astar has lived in Edano for 3 years; she moved there from Wejia, a neighborhood west of Accra, and before that, she used to live in Kumasi. She lives in a brick house located on a plot owned by the older brother of her husband, who was in Holland at the time of the research. Astar is a caretaker; she looks after the plot on which she lives and another two adjacent plots. When she and her family moved to the plot, pipe-borne water was already provided through a connection established by their predecessor—who resold the pipe-borne water without the authorization of the water

⁴ In August 2017, 1 GHS corresponded to 0.223 USD.

⁵ According to the GWCL’s guidelines these documents include: an approved site plan, a valid building permit, name and address of applicant, telephone number/e-mail address of applicant, the number or address of house/premises to be connected, purpose for which the supply is required (whether for domestic, construction, commercial or industrial use). Bartels (2019) demonstrated that not all documents are necessary to actually obtain a connection, in practice a site plan is often sufficient for the staff of the water company.

company, a practice considered illegal by the GWCL. Astar decided to take over the water business, a business that initially appealed to her as she could do it while at home. However, she wanted to regularize the connection; she had all the necessary documents as she had a family connection to the owner of the plot (she was asked by the GWCL to provide a site plan and a certificate of land ownership). Initially, she attempted to resell pipe-born water in bulk to tanker drivers from a concrete storage tank that she built in the middle of the plot. However, shortly after she had finished the storage construction and right before she was about to start selling water in bulk, she had to stop and change her plans. As she explained, “The water company came and said it is illegal to sell to the trucks. When we went to the water company, they told us all those businesses are illegal so they cannot let us sell water to trucks. The water company said those who want to buy in a small bucket then we can sell it to them”.⁶ Given these conditions, Astar opted to resell piped water by the bucket to those living in kiosks from a tap located a few meters from her house. She connected the tap to a large polytank (plastic storage tank) so that she could store water in case of disruptions to the water flow. However, when we met Astar, the polytank was damaged, preventing her from storing water and exposing her—and kiosk inhabitants—to the risk of running out of water when the taps ran dry as an effect of the water rationing scheme implemented by the water company (Stoler et al., 2012). When the “tap goes off”—pipe-born water stops flowing—Astar has no water-related income, and kiosk inhabitants have to walk to other water vendors in the neighborhood. Usually, Astar sells water from 6:30 a.m. to 9:00 a.m. and from 4 p.m. to 7 p.m., while in between she works in a shop in a nearby neighborhood. For the water, she charges 0.40 GHS per bucket, less than the recommended reference prices that the water company gave her when she registered her business (0.70 GHS).⁷

Although we could not verify whether all those living on the plot buy water from Astar (or if they prefer to walk to another neighbor), Astar’s story is illustrative of how caretakers’ own acts of bricolage can influence water access for kiosk inhabitants. Indeed, by setting up a water-filling point, Astar maintained a connection to the network that in turn allowed her and kiosk residents to access water on the plot where they live. Astar did not mention any specific rules that kiosk inhabitants (she addresses them as squatters) have to follow if they want to buy water from her, besides paying for the water they get. However, she told us that in the past, she had asked kiosk inhabitants to leave if they did not contribute towards keeping the compound clean or did not pay for the waste company to collect the waste. This in turn is revealing of the unequal interdependencies between different people who live on the same plot and depend on the same piped water connection. Not only can Astar, as a caretaker and relative of the plot-owner, establish a connection, but she also has the power to influence who lives on the plot (and who does not)—as she underscores,

⁶ It remains unclear why Astar was not allowed to resell water to tanker trucks as the water company authorizes private households to resale water to tanker trucks provided that they register as commercial customers and that they regularly pay monthly bills (Alba et al., 2020).

⁷ We could not confirm this with kiosk inhabitants buying water from Astar and/or with the GWCL.

kiosk inhabitants need nothing but her permission to dwell on the plot. Yet, Astar and her relatives also rely on the presence of a number of kiosks to secure the property because, as she herself explains, “If there are no structures on the land, then people come in (...) and start developing their properties.”

Plot 3: The Plot-Owner’s Connection

Doria, her husband, and their two children live in a kiosk made of a combination of metal sheets, wooden planks, and plastic sheets. They have been living in the compound for more than 3 years. Their kiosk is located on a plot surrounded with a stone wall—the wall is more than 2 m high, so high that it is impossible to get a glimpse of the plot from the outside. When we met Doria, she was sitting under palm trees preparing cassava roots; a pot of water was boiling on the charcoal stove; her husband was out at work. Lined up along the kiosks, we observed a few jerry-cans (locally known as Kufuor gallons) and a few buckets of different sizes used to fetch and store water. Doria and her family collected water with these buckets from a tap located on the plot and installed by the plot-owner (who paid for the connection fees). They share the tap and the water bills with the inhabitants of other eight kiosks located on the plot. However, the water connection on the plot does not guarantee a reliable water supply as the pipe “goes off” sometimes for longer periods (e.g., 2 weeks); and unlike Astar, Doria does not have a large storage tank. Hence, Doria relies on other configurations to access water. When the tap “goes off,” Doria walks to the old village (about 10 min by foot) and fetches water from water vendors. She also gets water from uncompleted septic tanks (tanks intended for collecting waste water coming from houses, not yet in use) located in the gardens of houses under construction near her compound; she uses the latter water only for washing and bathing.

Coincidentally, the owner of the plot where Doria and her family live is also the representative of a local residents’ association formed by newcomers. Such associations perform different tasks including lobbying for and participating in the provision of services, attempting to ensure the implementation of spatial plans and regulation, and policing neighborhoods (Bartels, 2020). When we discussed the presence of kiosks in the neighborhood, this owner and representative underscored that it is not legal to have people living in kiosks on a plot, while being fully aware of the housing problems the kiosk inhabitants face: “We all know the social problem that we have with habitation [and] rent; some of them cannot really afford [to rent].” He explained that presence of kiosk compounds in the neighborhood was not a subject of discussion in the association (the concern was with the kiosk structures along the roadsides) nor was the limited access to basic services of those living in the kiosks. It was up to the plot-owners to decide whether to provide basic services to caretakers and kiosk inhabitants. In his case, connecting the plot with the network was something he would have to do anyway in the future. Therefore, he decided to do it in advance for the benefit of those who live there: “There is no way I can allow them be there without these amenities. I brought the water, where they pay the water bill; they pay an electricity bill; they have a simple toilet.” He insisted that plot-owners

should provide minimum basic services to those living on their properties; yet he also referred to the city authorities and their responsibility to verify this. As in the case of Astar, the plot-owner's tap comes with some restrictions. Perhaps because he did not register the standpipe with the GWCL as a commercial connection but only as a domestic one, he does not allow those living on the plot to resell the water to others not living on the plot—when this happened in the past, he intervened and asked the residents to stop but if it had continued, he was also ready to “kick out” (evict) the kiosk inhabitants.

Conclusion

In this paper, we explore the uneven micro-geographies of water access in a first-class residential neighborhood of Accra which we fictitiously call Edano. This neighborhood is composed of inhabited villas as well as unfinished houses, which are constructed in an incremental manner plot by plot and temporarily inhabited by kiosk dwellers. Compared to many other (peri)urban neighborhoods of Accra, Edano is unique in the sense that a network supply has been available for more than 15 years, and piped water flow is described as rather regular. By looking at lower income kiosk dwellers living behind walls and in and next to properties owned and built by wealthy residents, we examined the diverse infrastructural configurations and bricolage practices through which pipe-born water is accessed, even when there is no direct connection to the water network. In particular, we detailed the social and material arrangements through which water is obtained: relying on buckets, storage tanks, standpipes, neighbors, caretakers, or stewardship by plot-owners.

We find that kiosk inhabitants are neither fully and directly included in the provision of pipe-born water nor are they entirely excluded; they rather navigate between differential water access spaces. Due to the temporary housing situation, a lack of documents, or financial restrictions, kiosk inhabitants are usually not connected to the water network. Yet, we find they manage to access pipe-born water through bricolage strategies that vary from plot to plot, relying on the connections of other actors (neighbors, caretakers, plot-owners). So while these kiosk inhabitants lack direct infrastructural connections, their social connections ultimately provide them with piped water. Against this background, we conclude by outlining how our study contributes to further understandings of urban (water) inequalities in Accra and beyond.

First, combining bricolage thinking and the heuristic of HICs is helpful to explore processual dimensions of water access. Through the heuristic of HICs, it is possible to identify the diversity of the social and material configurations through which urban dwellers access water, while the notion of bricolage is helpful to analyze how these diverse configurations/connections are set up in specific social and geographical contexts. Taken together, HICs and water bricolage shift attention beyond the linear single provider—single user relation (that tends to be presented in formalized water governance frameworks) towards the diversity of actors and practices through which water is actually supplied and accessed. For the case of Accra, our findings go along with and extend recent literature in demonstrating the importance of the

bricolage practices of end-users but also those of other actors, such as plot-owners, water vendors, and caretakers, for ultimately they limit and/or enhance the opportunities of end users to access water. Moreover, our research indicates the significant role that housing arrangements and plot-level relations, and indeed land tenure more generally, have in shaping water access. A key reason for kiosk inhabitants not connecting (and not wanting to connect) to piped infrastructure is their insecure land tenure, quasi-legal occupation of the plots, and housing conditions (the GWCL does not provide connections for kiosk-like structures).

Second, our study contributes to complicating understandings of Accra's uneven waterscape as we show that, even in planned residential neighborhoods inhabited by higher income earners and integrated in the city's water supply network, water access remains highly fragmented and heterogeneous. This in turns indicates the need for a more nuanced understanding of the differentiated water geographies of Accra, one that recognizes that fragmented networks and infrastructural heterogeneity are not spatially limited to popular neighborhoods or to areas historically not supplied by public infrastructure but are rather widespread across the city. Edano is exemplary of the two faces that characterize Ghanaian urban society: one where upper income groups have premium access to infrastructure and basic services and can even opt out of pipe-born water to have their own (ground)water supply arrangements, and one where low-income groups are marginalized in accessing housing and basic services (Owusu & Oteng-Ababio, 2015). The case of Edano shows that these two faces are not distant from one another but that they coexist, living door by door in the same neighborhood. First and foremost, they are interrelated and interdependent. We agree with other scholars about the need for further attention to be directed towards the micro-geographies of water access and infrastructure (Asante-Wusu & Yeboah, 2020; McFarlane et al., 2017; Smiley, 2020) while not losing sight of the "city as a whole" (Amin, 2013, p. 484) and the mutual relations between people and topographies. Attending to interconnections between people and places can open up opportunities for improving urban conditions—for kiosk residents dwelling on a private plot is a temporary alternative to state land and forced evictions. However, interrelations primarily reveal the processes of marginalization embedded in neoliberal and privatized urbanism—to secure their properties Edano's wealthy residents rely on and exploit the survival needs of kiosk inhabitants without providing minimum infrastructure.

Third, and related to the last point, the story of Edano and its residents raises questions about current urban (water) governance approaches. We see an ambivalence between the everyday practices of residents in providing and accessing water and the sole focus of water policies and infrastructural projects, supported by donor interests, to extend pipe-born water and thus pursue a provision scheme in which the GWCL is and remains the only urban water provider. Our study goes along with other recent literature in underscoring the need to recognize the limits of single centralized solutions and to appreciate and work with the diversity of arrangements actually used to supply and access water and basic services (Jaglin, 2014). As the water company struggles with a perennial shortage of funds and a leaky network in need of constant maintenance, it focuses on expansion of production capacity, strengthening collaboration with residents and other non-state actors in a way that

ensures water access for marginalized groups that might be promising for improving access to water across the city. When supplied with plot-level connections and basic amenities (water, energy, sanitation), water-sharing practices in contexts of multi-habitation like kiosk compounds have the potential to improve the livelihoods of marginalized urban dwellers. Yet, everyday practices should not be romanticized, the aforementioned opportunities should be scrutinized cautiously. First, relying on the connections established by other actors means that kiosk inhabitants (at least those living in kiosk compounds) are not included in any formal water governance schemes—including pro-poor programs implemented by the water company and by other NGOs. Second, being connected to the network is never a guarantee for reliable water access—e.g., storage facilities can burst and the flow of water in the pipes remains irregular. Third, relying on other actors implies following specific rules and behaviors, and collaboration is always characterized by unequal interdependencies. To conclude, we believe a renewed “politics of the staple” (Amin, 2013) is much needed, whereby the everyday practices of residents go along with structural changes and public investments in infrastructure that are all aimed at fostering shared infrastructural rights—including water access for all.

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Declarations

Conflicts of interest The authors declare no conflict of interest.

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