

Drops in the city: the puzzle of water privatization and consumption deficiencies in urban Ghana

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Abstract

The water industry in Ghana has recently experienced a massive proprietary change, from its public monotonic system to a public–private system mixed with localized private participation options. Although these changes have contributed to local and national revenue generation, the consumption bracket continually de-equalizes due to inaccessibility and unavailability patterns of water provision. This has made water a scarce commodity for some, whilst others are over-supplied and over-satisfied. In this research, the manifestation of private sector participation in Ghana’s urban water sector in the midst of the public water system and its implications on water supply have been investigated using both secondary and primary data. The study reveals significant deficiencies in urban water needs and wider inequality outcomes amongst urbanites despite government’s neo-liberal interventions in the water sector. The major proposals include the need for re-alignment of private sector engagements characterized by proper state’s regulatory control mechanisms and encouragement of community/neighborhood joint water supply systems to complement state and private interventions in order to reverse the access and consumption deficiencies in the urban water sector.

Keywords: Consumption; Deficiencies; Ghana; Privatization; Water access

1. What makes this research necessary?

The regional distribution of water has been literally irritating, as it critically challenges the global quest to reach the goal of ensuring clean and safe water for human survival (see Sustainable Development Goal (SDG) 6). Globally, there is an incremental challenge in ensuring adequate access and supply

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of water with its diverse roots linked to the poor water supply systems particularly amongst countries in the global south. Commensurate with the global challenge, [Water Aid \(2005\)](#) identified that millions of inhabitants worldwide continue to live in a water-deficient system lacking safe water facilities. In Africa, for instance, 40% of the population battle with an improved water supply system compared to 19% in Asia ([Hutton & Haller, 2004](#)). The neo-liberal approach in water supply has popularly been spearheaded to deal with water discrepancies. Private water delivery investments are generally seen to facilitate the development of critical areas in the water industry such as technology, rehabilitation and extension of water supply systems among others ([World Bank, 2004](#)). Although this could undeniably serve as a remedy in bridging the existing water supply gap of the public sector, it is still an underperformance if such intervention leads to a complete absence of ‘balance consumption’ amongst those who are the beneficiaries.

In Africa, the failure of the public management of water supply has resulted in various distribution options in the water supply market ([Huttinger et al., 2017](#)). For example, there are now water vendors who transport water to consumers through tanker trucks, carts or localized delivery systems, while direct local suppliers have a central location that consumers visit to obtain water ([Wutich et al., 2016](#)). Other options like the water kiosks have been proposed as an intermediate subsidiary option, a variant of the direct merchant model ([Huttinger et al., 2017](#)). These are stationary water points where operators fill and supervise water containers for fees. These systems though may seem intangible, have somewhat aided in balancing the water accessibility lacuna between the privileged (formal areas) and the non-privileged (informal areas). The key issue is the ‘cost dimension’ aspect of these interventions, and whether the urban poor can sustainably afford to embrace such provisions to meet their water needs.

With continuous private participation and complexities of private and local industries in the water supply market and unequal access to this basic need of humanity, there is an alarming prediction of national water deficit, escalating inequality margins and most importantly, increasing the decline of accessing safe water ([Fuest & Haffner, 2007](#)). This paper aimed at exploring the implications of growing private sector participation (in the water service market) on urban residents, especially the poor and the vulnerable. This has been concretely analyzed in the literature obtained from secondary sources especially from the local and foreign organizations that have studied Ghana’s water supply systems. Studies were practically connected with factual data collected from the four major cities in Ghana – Accra, Kumasi, Sekondi-Takoradi and Tamale making the findings much more applicable. Primary data were thus collected through a series of 26 semi-structured interviews with urban residents (12 of them, with 3 from each city), 4 officials of the Metropolitan Water and Sanitation Team in each city, two officials working in Ghana’s Water Public Sector and 8 individuals (2 from each city) working with water-related enterprises. The study further integrated its findings with the geographic information system (GIS) approach that was used to derive spatial representations and maps that depicted water coverage and consumption in the country for better appreciation of the study.

By structure, the subsequent sections of the research comprise a theoretical review of private sector participation for better appreciation of the divergent theoretical propositions on privatization: literature on the privatization experiences of other African countries, the performance of Ghana’s public water supply systems and the inclusion of private sector on the basis on public sector inefficiencies, the participation of private sector actors in water supply and the consequences on urban residents, discussions that delve into how water privatization in Ghana can be streamlined to fix supply deficiencies to achieve adequate access and consumption of water in urban Ghana and the conclusion which contains tacit proposals to improve Ghana’s urban water supply system for development.

In this study, water privatization is seen to overlap with private sector participation, which as indicated by [Finger & Allouche \(2002\)](#) can assume different forms such as concession, management contract, and water service provision amongst others. While the conventional literature shows that privatization is the transfer of ownership of assets (either partial or full) from the state to a private entity ([Lobina & Hall, 2003:4](#)), much of the empirical findings of this research are directed by ‘private sector participation’ which exists to augment the public sector inefficiencies of water services.

2. Conceptualizing discourses on privatization: literature and theoretical prepositions

‘Water Privatization is a big issue in many African Countries. Investors say it brings efficiency, opponents say it hurts the poor. Whatever one believes, the poor have no say in the matter.’

([Akande, 2002:1](#))

In trying to understand the divergent positions concerning water privatization, the literature explores and adapts several theoretical arguments that surround ‘privatization’ and its manifestations. Studies including that of [Kleemeier \(2000\)](#), [World Bank Group \(2004\)](#) and [Water Aid \(2005\)](#) have revealed that the participation of private entities in water supply is very relevant in improving people’s access to potable drinking water. This indication has meant that countries around the globe should endorse private firms in the water sector in order to promote access to safe water. On the other hand, [Rees \(2004\)](#) has forewarned that privatization in itself cannot be the ‘panacea’ for the water problems faced by countries around the globe. The involvement of the private sectors should not be seen as a ‘magic strategy’ to solve the enormous water gap that exists in many countries especially the developing ones. [Johnstone et al. \(1999\)](#) supported the assertion brought forth by [Rees \(2004\)](#) and further indicated that the failure of the government to provide universal access to safe water is not, in itself, sufficient grounds to validate private sector participation in the water sector. In fact, the private monopolistic service provider could even worsen the situation in terms of water supply, by taking advantage of its privileged position in the market rather than having concerns for the service users.

Privatization in itself is known to have facilitated free market and competition-driven economy, given the state wider alternatives in engaging with individual actors for socio-economic development (as agreed by [Xu & Lee, 2012](#); [Prizzia, 2005](#)). Studies (though not aligned to the water sector) conducted by [Boles de Boer & Evans \(1996\)](#) and [Eckel et al. \(1997\)](#) identified a strong positive correlation between privatization and general development outcomes. Notwithstanding this, scholars such as [Kikeri & Nellis \(2002\)](#) and [Li et al. \(2011\)](#) have, on the other side, argued that privatization can lead to substantial development failures, thwarting efforts in spearheading sustainable growth and development. Evidencing the detrimental consequences of privatization, empirical studies conducted by [Gerber & Hout \(1998\)](#) in Russia identified that privatization led to decline in GDP by 41% between 1992 and 1995, joblessness increased from 0 to 7%, and living standards generally declined due to a drastic fall in income levels (also supported by [Tan et al., 2007](#)).

The growing literature on privatization has been very divergent in terms of its outcomes. Findings from different contexts reveal dissimilar revelations hovering around either positive or negative outcomes of privatization interventions, whether or not it was the water sector that was under consideration. For this, [Ramamurti \(2000\)](#) has argued on the need for an in-depth attention to be granted

to enhance critical insight and understanding on the subject matter. Carter (2013) made a deliberate attempt to conceptualize the divergent revelations on privatization through a multi-theoretical lens (by making assumption that the state intends to act in the interest of its people and to improve overall development outcomes) by finding answers to (a) what should trigger the consideration of privatization option in a country? and (b) what account for success or failures in differing contexts? This was aimed at resolving the disputing findings and to somewhat draw theoretical conclusions in explaining the consequences of privatization (provided context-specific studies exist for reference and enrichment in understanding). The literature espouses on the relevant theories through the development of a framework for them which has later been used to discuss the findings of the study.

2.1. Theoretical prepositions and framework for the research

The first theoretical consideration is the system theory; and this is premised on the idea that countries are systems in themselves, composed of interrelated elements and activities (internal components). That is, countries are made up of the integrated socio-economic and political system that interacts with the world (Scott, 2003). These internal components relate with the external environment, and the nature of the relationship should trigger privatization interventions. Here, the following propositions underscore privatization or not, and they are the efficiency of state companies (the higher the efficiency, the lower the need for privatization and vice versa), the relevance of the enterprise to the country's economy and social welfare (the more important enterprises are to the country's economy and social welfare, the lower the need for privatization or otherwise) and the global competitions facing the country (stronger global competitions may drive privatization).

In connection with the system theory is the contingency theory which argues the need for policy bureaucrats to examine the socio-economic and political environment correctly for privatization congruence. Here, privatization decisions should be determined on the basis of efficiency and welfare (Brada & Ma, 2007). Ultimately, contingency theorists call for a critical assessment and full consideration of a country's socio-economic and political environment and to align them to privatization if requisite. The central proposition of contingency theory is that privatization programs to be implemented by a country must be contingent upon the country's peculiar environmental conditions (socio-economic and political elements).

There is also real options theory, of which proponents hold the viewpoint that countries that intend to undergo privatization stand the chance to be successful provided they have experiences, a wide range of options and flexibility in options (Leiblein, 2003; Parker & Kirkpatrick, 2005). Historical experiences and knowledge are seen as 'containers of wisdom', and countries with such 'containers' can easily fetch from that to inform pragmatic and proactive privatization ventures. If a state has no extensive experiences with privatization in the water sector, it stands very fragile stance to reap the full benefits of privatization interventions. Proponents contend that if countries do not have experiences, it could be very laudable (though uncertainties and unpredictability could be higher compared to our own experiences) to view other countries' successful privatization interventions as options and adopt them taking into account context-based conditions and divergent environmental situations characterizing the country (Parker & Kirkpatrick, 2005). To reduce uncertainties, real option theorists call for countries to embrace a 'narrow form of privatization' (transfer of partial ownership/control to the private actor) instead of a 'broad form' (total ownership to the private actor), as this allows flexibility and that the state can

incrementally advance privatization interventions provided earlier ones prove positive (see for example: Joseph, 2010's study in India).

In another school of thinking has emerged the agency theory of privatization, which views the entire privatization arrangement as a principal-agent relationship based on a contractual agreement between two parties (the state and the private actor). Contenders call on state governments to take careful scrutiny and control of privatization agreement (as private actors are seen as self-interested economic actors) to ensure that they ultimately align with the interest of the public so as to thwart opportunistic behaviors of private actors (Ramamurti, 2000). The proposition here is that the more favorable government's controls and regulatory mechanisms are, the less likely the private actors can take advantage to act in a manner to suit their selfish economic needs.

Conversely, the resource-based view (RBV) theory which espouses the type of resource being privatized, and whether or not such resource should be privatized by governments. According to Leiblein (2003) who endorses this perspective, critical resources, including scarce and valuable assets, capabilities and unique and essential/basic services need not be privatized in order to create national competitiveness. However, non-critical resources managed by underperforming state agencies could be privatized in order to reap economic gains.

In summary, the complicated nature of privatization makes the use of multi-theoretical lens the appropriate mechanism to understand privatization regime. Subscribing to complementary perspective, we identified that all the theories considered in the study complement each other, and so, Figure 1 is a proposed synergistic framework we have developed (as called for by Carter, 2013) to holistically submerge the theories to present our findings and offer a way forward for privatization initiatives in Ghana's water sector.

3. Experimentation of private sector involvement in urban water supply service delivery: experiences from other African countries

For over two decades, development focus in most African countries has gradually shifted from only the public sector to either public–private collaborations or private sector. This is because of the weak financial positions of the state to finance development in a satisfactory manner. Neo-liberalism is thus at the center of utility reformations and transformations in Africa, particularly, those in the sub-Sahara (Bayliss, 2003). Overall results of privatization experiences, however, tend to show that Africa is far behind the other parts of the world (Megginson & Netter, 2001); and this adds to the dilemma of how privatization interventions can be streamlined to produce positive results on development, especially in the current dispensation of sustainability and inclusivity. According to Kayizzi-Mugerwa (2002), water privatization (and even the entire privatization paradigm) in Africa seems to have taken four main systematic routes: (i) slow privatization of small enterprises with no critical legal scrutiny which happened until the latter part of the 1980s; (ii) easy privatization of small enterprises, but resistance toward large enterprises – ‘path of least resistance’; (iii) eventual privatization of large enterprises, which happened in the mid-1990s and was characterized by some institutional and political resistances and (iv) fully accelerated and accepted privatization where utilities such as water were given up to large-scale private enterprises; though this is yet to reach many African countries, including Ghana.

Bayliss (2002) has revealed that most of the privatization ventures are guided by the international donor community composed of the World Bank and others, although not all public sectors in Africa (for instance, Burkina Faso, Namibia and Botswana) have poor results in utility ownership and

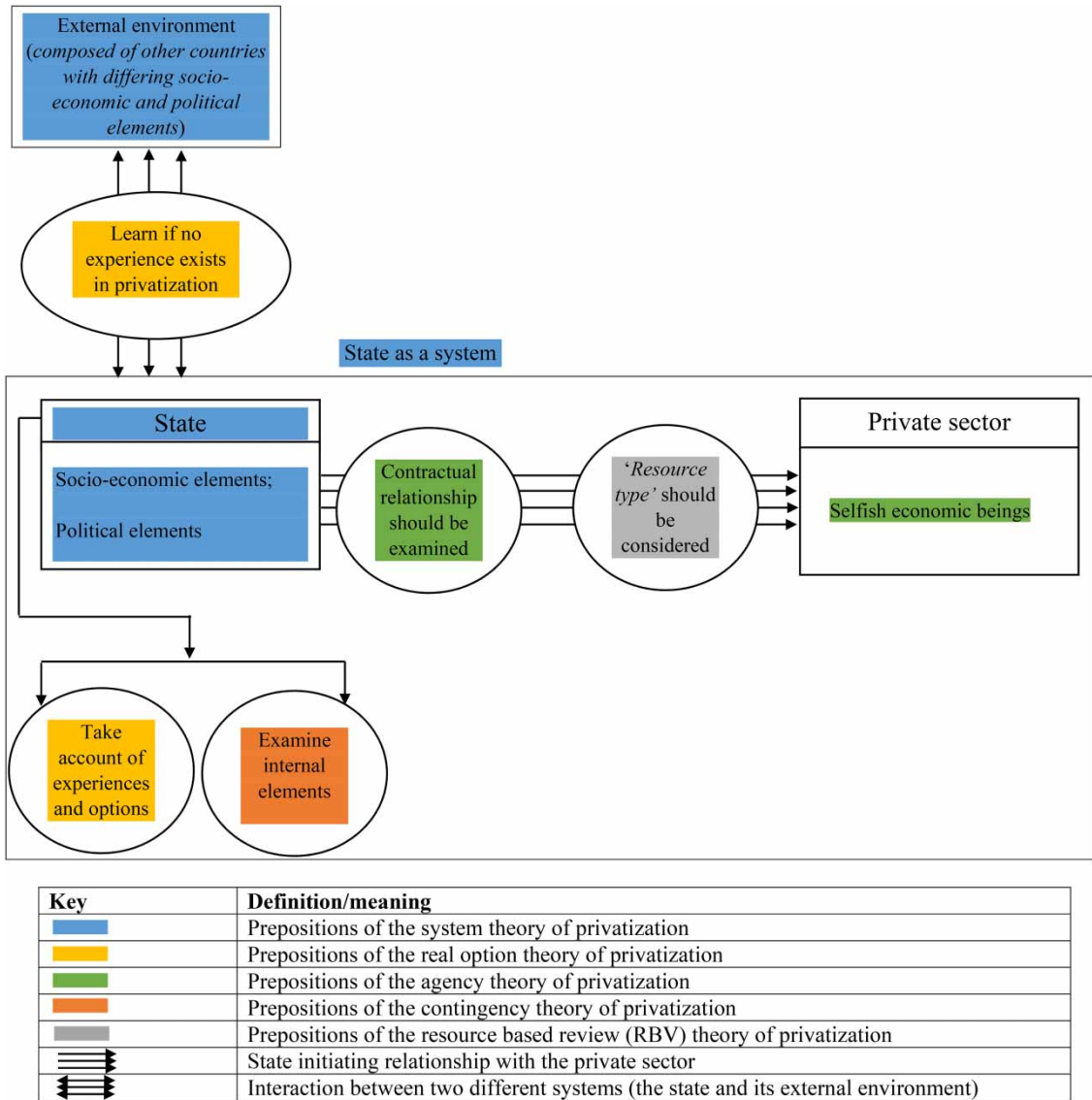


Fig. 1. A conceptualized synergetic multi-theoretic framework for privatization. *Source:* Authors’ construct, 2019 (insight from literature). Please refer to the online version of this paper to see this figure in color: <http://dx.doi.org/10.2166/wp.2020.175>.

management as popularly spearheaded. The database of the Public Services International Research Unit (PSIRU) of University of Greenwich, UK reveals water privatization contracts, particularly in sub-Saharan Africa ranging from short term management contracts as in Uganda, Burkina Faso and South Africa with private entities such as Suez-Ondeo, Vivendi and Suez accordingly.

But what have been the general outcomes of the different privatization experiences of African countries in the water sector? In the context of regulation and competition, the African case of privatization shows generally weak regulation despite limited scope of competition in the water sector. Findings

from Menard & Clarke (2000) indicated that in Guinea, for instance, the private company applied pricing formulae in a wrong manner, resulting in over-charged water tariffs. The state as a regulatory body in the lease contract agreement could not enforce the private utility company to comply with financial reporting requirements. As a result, consumers were paying huge tariffs for the use of water (Bayliss, 2003). This has transcended and reflected in the abysmal performances of the private sector companies. In Guinea, for instance, unaccounted for water was 50% at pre-privatization but reduced by merely 3% after privatization. Also in Senegal, despite a target of 15% for leakage cut in contractual agreement, it was rather reduced from 31% to 22% (Tremolet & Neale, 2002). In pricing, the implementation of water privatization has increased the cost of accessing water in many African countries. In Guinea, for instance, there was a significant rise in water prices far higher in tandem with mean prices in Africa. This led to the instances where the high-income groups found it difficult to pay for water (Brook & Locussol, 2001); one can only imagine the manner in which the low-income groups coped with the high prices – dependence on unsafe water sources and their attributed negative health implications were obviously the outcomes.

In general, the privatization interventions in Africa have led to an improvement in water quality, with manifestations in infrastructure such as pipelines, pumping stations and others especially when foreign agencies are involved (Kerf, 2000). The puzzle of water privatization lies in the regulatory environment and enhanced accessibility of the poor to safe water services. This calls for strong policy mechanisms and regulations for effective water management.

4. Inefficiencies in public water supply systems and private sector inclusivity

Ghana's water resources are broadly grouped under surface and groundwater sources. The projected renewable water volume stands about 53 billion cubic meters annually (Ministry of Water Resources, Works and Housing (MWRWH),¹ 2010). Surface water consists of river systems – comprising 70% Volta Basin river system, 22% south-western river system and 8% coastal river system of a total land area of 240,000 km². The groundwater resources underneath the Volta Basin river system, for instance, are constantly replenished by seasonal rains satisfying various agricultural, industrial and domestic purposes. As revealed by an official of the Ministry of Sanitation and Water Resources, 'Ghana has no issue with water resources, but their protection, management and effective utilization for the benefit of Ghanaians have always been the problem'. (Interview, Senior Staff member, Directorate of Water under the Ministry of Sanitation and Water Resources, Greater Accra, Ghana). This revelation is confirmed by the empirical studies by Afriyie & Ferber (2018) who also contended that Ghana has abundant water resources with seasonal but plenty rainfall. Figure 2 demonstrates a regional density of water consumption across the country with the Greater Accra region having the densest with about 285,000 m³ of water/day (Osumanu *et al.*, 2010; MWRWH, 2014).

However, the water consumption pattern has experienced massive alteration in the past years which is a major development concern (UNICEF 2016). The predominant water sources available particularly to

¹ The name of the ministry has been changed from the **Ministry of Water Resources, Works and Housing** (MWRWH) to **Ministry of Sanitation and Water Resources** (MSWR). Because of previous reports used and primary data collected from the ministry, both names are used to ensure data originality. In cases where the two names appear, readers must know that they stand for the same ministry.

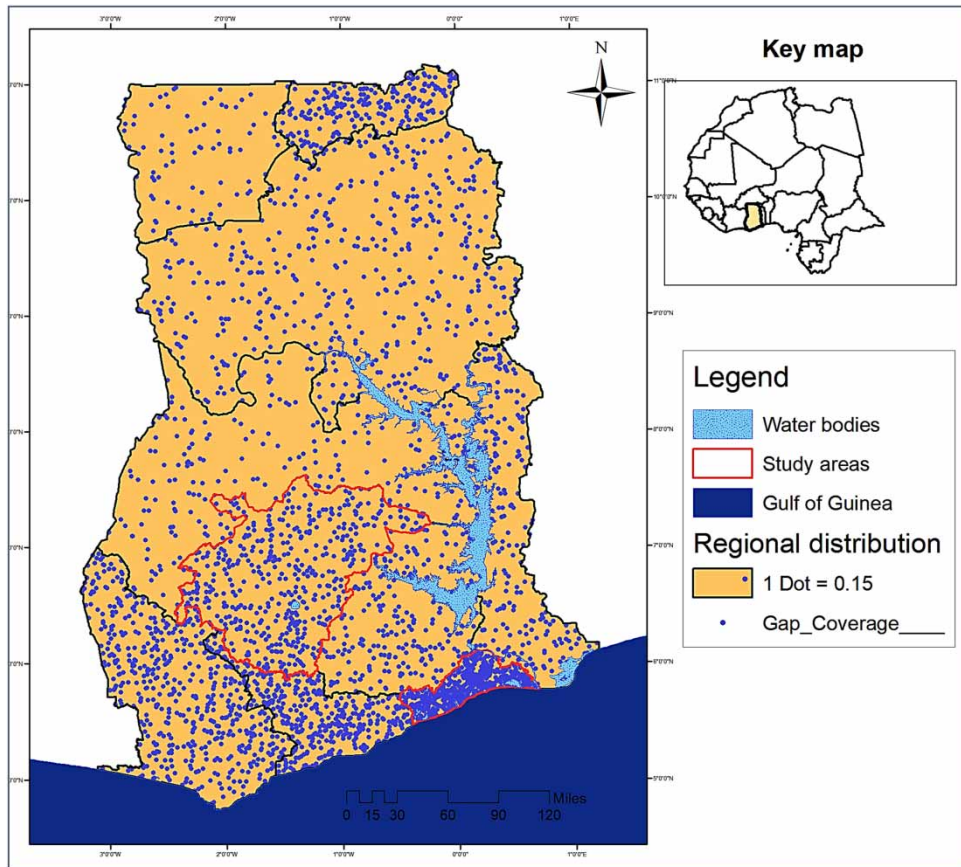


Fig. 2. Density map of water consumption within the regions of Ghana. *Source:* Authors' construct based on data from the National Population Council, 2017.

urban dwellers are conventional treatment plants which supply water from surface water taken from rivers to households. As indicated by Officer, Kumasi Water and Sanitation Team (K.W.S.T.), the city depends on water supplied from the Kumasi Water Supply System at Owabi and Barekese head-works, but the treatment plants in the supply system are not very efficient, leading to inadequate supplies of water. This has validated the engagement of the private companies in water supply. The call for private sector participation is in congruence with the preposition of RBV theorists, including [Leiblein \(2003\)](#) who argued that underperforming state agencies can be supported with privatization options provided the resources they are in charge of are not scarce in a particular context. An interviewee also justified the need for private actor involvement: 'We are aware that the state cannot provide water to meet our people's needs; so, we have allowed local and international water enterprises to augment the services of the government. Kumasi has a considerable quantity of underground water, and that remains as the predominant source used by the private enterprises for water supply' (senior member, K.W.S.T.).

The country produces about 30.3 km³ of water/annum, and this constantly puts the urban space into water stress ([Ainuson, 2010](#); [Owusu et al., 2016](#)). For instance, the [Food and Agricultural Organization \(FAO\) \(2005\)](#) noted that in 2000, only 3.27% (representing 0.982 km³) of internally produced water was

withdrawn for use due to infrastructural constraints. Despite the abundance of water resources in the country with enough water resources to satisfy urban and rural water needs, water supply is unreliable and inaccessible in many places across the country. Obviously, massive infrastructural provision will be needed, but public authorities do not have the necessary funds to invest heavily in the water sector. As it stands now, it is impossible for pipelines and pumping stations to be provided by the state to ensure comprehensive delivery of water services in all parts of Ghana. As a result, private sector water providers are becoming more preferable by some cities than others (as shown in Figure 3), particularly as a result of the reliability of private water systems.

Below shows the nature of water demand and preferences among urban respondents interviewed.

An unpopular feature of Ghana's public water service provider (Ghana Water Company Ltd, GWCL) has been its distribution inefficiencies and inability to meet growing demand especially in urban areas (Adu-Ampong, 2014). The national water coverage rate was estimated at 63.15% in 2012 based on provider estimates and 86.00% in 2010 (UNICEF, 2017) with GWCL operating about 82 urban systems, at an average daily output of 1,572,012 m³/day as against a daily demand of about 21,049,306 m³/day (Government of Ghana, 2007). Over the years, the GWCL finds it very challenging to put systems in place to supply efficient and effective services to the urban population causing a trend of public frustration and uproar with some even losing hope in the state's establishment (Ainuson, 2010). Consequently, water is rationed to many consumers with only a few customers able to get a 24-hour supply. In both the urban periphery where there are new and emerging developments and the densely populated poor urban areas, consumers receive supplies once a week or not at all (Owusu *et al.*, 2016). For instance, water collected by these urbanites is stored in 25 liter yellow gallon containers in most suburbs during water shortages (Shang-Quartey, 2014), and this is typical in the informal urban communities. An informal urbanite has this to say: 'Here, water is rationed and we don't even get sufficient water. As you see, I have 15 'Kuffour

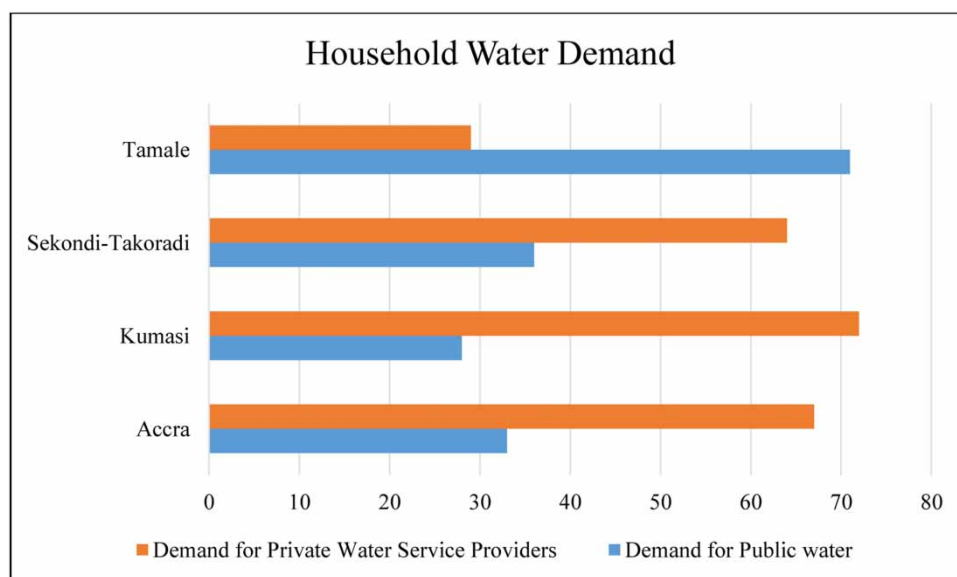


Fig. 3. Household water demand from major cities in Ghana. *Source:* Authors' construct based on data from the National Population Council, 2007).

gallons’ (25-liter yellow gallon containers commonly used by informal urban households in Ghana), and they are what I use to store water for my 10 household members’ (woman, Sekondi-Takoradi). Another added that ‘Northern Ghana has issues with water scarcity due to extreme heat and intense nature of our dry season. In the rainy season, water is never an issue as we largely depend on rain water, but this is also not safe for us. The Public Water Supply has not been effective and efficient, so access to safe water is a big challenge for my household’ (household head, Tamale). The water-access discrepancies run on the same path with the indications by the Ministry of Sanitation and Water Resources. This is because data from the [Ministry of Water Resources, Works and Housing \(2010\)](#) shows that whilst the urban population as at 2010 was 11,529,723, only 6,802,536 people were served with water by the public actor (GWCL) accounting for 41% water supply coverage in urban Ghana. Whereas 52.4% of water is produced from surface water, 47.6% is produced from groundwater. Besides, data from GWCL indicated an alarming dependency ratio (43%) on water. This possible outcome is as a result of the failed supply of water by the institutions ([Figure 4](#)).

With Ghana’s emerging population, the urban investment requirement for water supply is high. [UNICEF \(2016\)](#) projects an annual average cost of over US\$ 230 million on water supplies, which government cannot afford. Currently, the water sector investment is such that government covers 41.49% of the costs through its budget, whilst the remaining 48.98% is covered through loans and grants from developed countries or international partners. [Bayliss \(2003\)](#) in her study of Water Privatization in Sub-Saharan Africa identified the weak financial bedrock of the African governments to adequately finance the water sector. There is, therefore, public economic stress in the water sector, and this has contributed to private involvements in the water service delivery in Ghana ([Ainuson, 2010](#); [Shang-Quartey, 2014](#)). These private participations have subsequently assisted in reducing the downward trend in coverage, considering the conditions of water infrastructure and the cost intensity, particularly in the major cities of Accra, the national capital; Kumasi, the second major city after Accra; Sekondi-Takoradi, the oil city of Ghana and Tamale, the major city in the entire northern Ghana. Without the private actors to complement water service provision, the access discrepancies could have been more intense, validating the

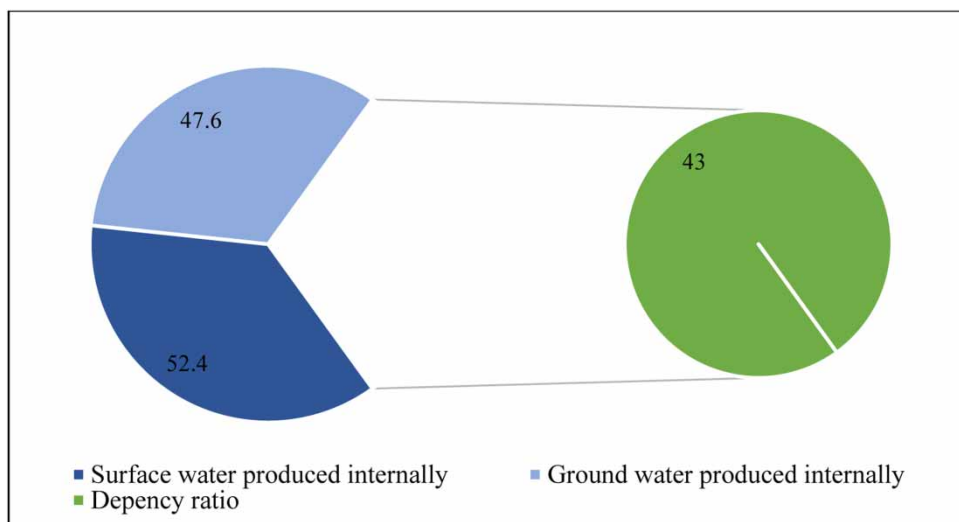


Fig. 4. Water supply and dependency. *Source:* Authors’ construct, based on data from [MWRWH \(2012\)](#).

participation of the private sector. However, private sector engagements can perform better to ensure balanced consumption instead of skewing their services to certain groups of people leading to over-supply of water, whilst others (especially the poor) are in dying need (Agyeman, 2007). The better performance of the private sector, however, as argued by system theorists such as Scott (2003), focuses on careful considerations given to the integrated socio-economic and political system of Ghana to inform policy options. The socio-economic and political environment needs to be examined so as to formulate and implement policies that streamline privatization options contingent on efficiency and welfare (as contingency theorists such as Brada & Ma, 2007 would expect).

Like other developing countries, Ghana continues to struggle in its quest to improve access to safe water to its urban citizens (United Nations, 2014). Many urban areas within the country are still poorly serviced with respect to the access of potable water from the national network. For instance, records from Water Sector Strategic Development Plan (2012–2025) indicate that a high rate of water loss (on average 40%) has been the major cause of water decline within the public water supply network in the urban space. In comparison with Guinea and Senegal, Tremolet & Neale (2002) identified a respective water loss of 50% and 31% before privatization. Adu-Ampong (2014) revealed that the rate of distribution of potable water to principally urban populations in Ghana also declined from 76% in 2008 to 59.8% in 2012, and this situation still lingers. All these revelations of public water sector deficiencies point to the need for private players to support the state, though they need to be incrementally integrated (as Parker & Kirkpatrick, 2005 who are real option theorists will recommend), and carefully regulated, controlled and managed by the state (in congruence with agency theorists such as Ramamurti, 2000).

This ‘public disappointment’ is largely attributed to the incapability of the supply systems to meet growing demands, the nonpayment and low payment of bills coupled with illegal connections resulting in revenue losses and high operational costs. For instance, the extent of water loss and revenue is compounded by 52% of total water produced by the GWCL for distribution which are lost due to leaks or theft, especially by illegal connections. Additionally, the local damage from constant wear and tear leaves water pipes and other facilities under perilous conditions especially in the informal urban areas where water is tapped illegally (Osumanu, 2008). Consequently, the maintenance of these pipes and facilities is not commensurate with the expected proceeds from consumers thus, explaining the resource constraints, inadequate supplies and low standard of services experienced within the sector. These are the major causes of public water decline in urban regions (Osumanu *et al.*, 2010).

The government seems committed to improve water service delivery across the country particularly in peri-urban areas, informal and low-income communities. However, for this to materialize, practical efforts such as integrating a systematic design of the urban space, establishing a coherent water supply system and creating multiple water supply options with high economic access for especially poor informal areas within the urban centers are necessary (MWRWH, 2014). Ghana’s urban majority is progressively becoming dominated by informality where water is scarce and regularly rationed due to the high demand coupled with disproportionate supplies. Remarkably, the deficiency of an apposite metering system of urban water production and consumption by GWCL makes it tedious to monitor the flow of consumption within these areas, contributing significantly to water loss. The water-access system is such that peri-urban centers have limited access to pipe water due to their location, whilst the inner urban areas have domestic private water supply, although informal, common and extempore (Fuest & Haffner, 2007). This has proven inadequate, thus the majority of the urban dwellers resort to the patronage of other means of water supply systems for their survival. With their large market share, the deprived urban areas have significantly become an economic platform for private water suppliers where they charge dubiously in order to make an avalanche of

profit. The private water suppliers are incrementally dominating the water sector, as their areas of coverage are expressively getting wider in the country (Duti, 2017).

5. Private sector participation in water supply and implications on urban residents

Although accessibility to improved drinking water sources is gradually gaining attention in urban Ghana, only 30% have access to pipe water which in most cases is supplied irregularly (Government of Ghana, 2007; MWRWH, 2012). The remaining 60% depend on other improved sources such as protected dug wells, protected springs and rainwater harvesting (Osumanu *et al.*, 2010). The private sector has interest in Ghana's water sector, but it demands participation in water supplies that warrants no direct investments (Public Citizen, 2002). As indicated in Figure 3, the Ghana water supply system options remain limited to hand-dug wells (with or without pumps fixed), boreholes (built-in with pumps), spring coverage systems, limited mechanization and pipe schemes (Afriyie & Ferber, 2018). Notwithstanding, the introduction of private local-supply initiatives such as water tankers and households' rainwater harvesting systems is also helping to manage the water accessibility disparities in the country. These have, however, received little consideration in the design of water supply systems (MWRWH, 2014).

The water sector of Ghana has therefore become porous with various types of water systems (as indicated in Figure 5) from its traditional dependent water pipe lines, which are polyvinyl chloride (PVC) and high-density polyethylene (HDPE) pipes that carry water from the GWCL primary distribution lines to households (very typical in the urban centers), and boreholes which are privately owned water sources that require certification and approval from Water Resources Commission (Kang *et al.*, 2010). Moreover, there are private water sellers made up of individuals who typically store water and offer it on-sale to local homes, usually at exorbitant prices. A private water supplier in Accra indicated 'the water sector has become very profitable venture. I have two large scale mechanized boreholes in Accra, and I make a daily profit of GhC1000.00 (US\$190.00). I provide services to specific urban residents who can afford my services. I see huge market which I am working hard to tap into in other parts of Accra. I will extend my services to other cities in the coming years' (manager of a local private water provider, Accra, Greater Accra region of Ghana). The private water suppliers normally sell at US\$0.10 per water bucket, and this also manifests greatly in the urban peripheries. There are also private water tankers that exist especially in the informal urban centers. Water in trucks is distributed to these neglected areas allowing them to also get access to potable water although it is quite expensive. The private suppliers/tanker operators sell potable water for US\$0.18 per gallon. The expensiveness characteristic of private sector participation in water supply is not entirely new in Africa, as Brook & Locussol (2001) identified a situation in Guinea where water became extremely expensive for even the rich to afford as a result of privatization initiatives. This can be attributed to the lack of a strong regulatory environment for private sector operations caused by the lack of better appreciation and understanding of the integrated socio-economic and political systems (see Scott, 2003; Brada & Ma, 2007) in water provision in Africa, including countries such as Cote d'Ivoire, Senegal and Gabon.

Consequently, the cost of consuming clean water is excessive for the poor especially, directly (regarding their incomes) and incidentally through adverse impact on health as well as posing burdens on women and children and occasionally denying consumption of other basic needs. For instance, in poor/informal urban neighborhoods, untreated water from hand-dug wells costs US\$10 to US\$20 (Interview with public sector official, 2020; Interview with an urbanite in Accra, 2020; Interview with Private

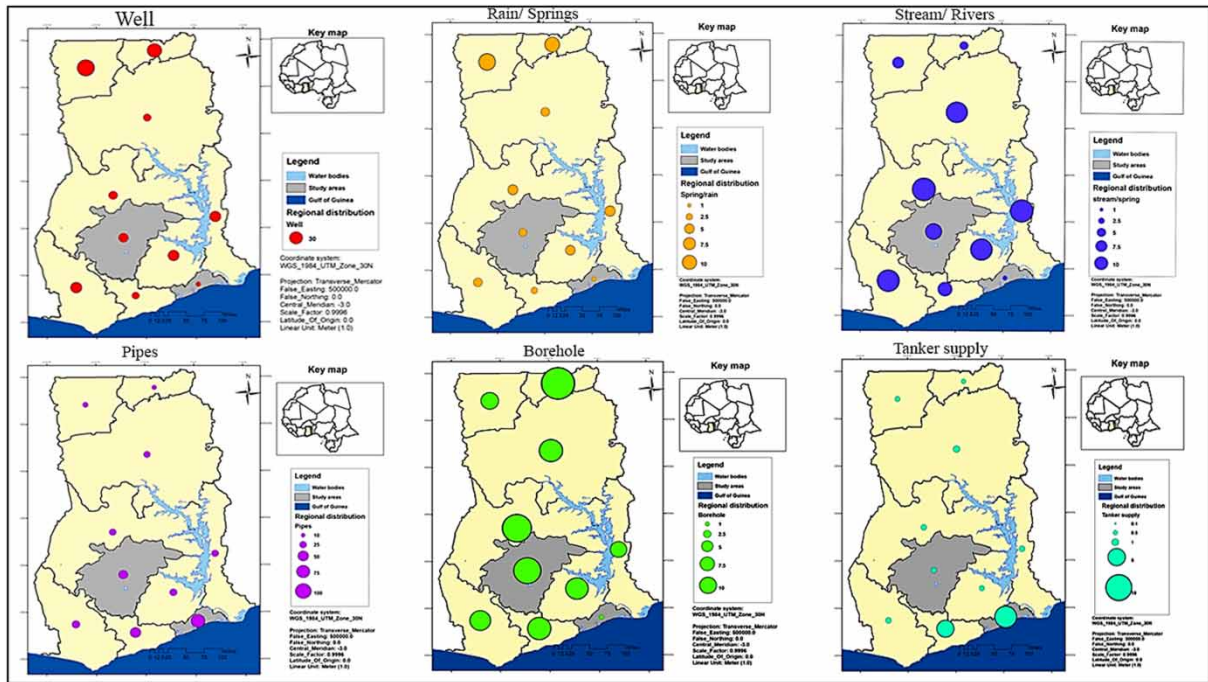


Fig. 5. Distribution map of water consumption by type within the regions of Ghana. *Source:* Authors' construct, 2019 based on data from National Population Council, 2008.

Water Enterprises, 2020; Shang-Quartey, 2014). These hand-dug wells are situated close to open drains, becoming prone to contamination. Kang *et al.* (2010) have reiterated that the poor/informal urban neighborhoods are usually the last to receive water services from formal private water service providers. In cases where pipe water exists, the informal nature of the living arrangements also prevents residents from acquiring the necessary legal documents for household pipe connections, automatically restricting them and forcing them to use private water supply systems (Osumanu *et al.*, 2010; Adu-Ampong, 2014). Hence, such urban areas are usually entitled to only 'drops' of pipe water usually through private arrangements, which are also expensive and exert unintended economic burden on them. As a result, they have high consumption deficiencies despite the services of the private sector (as revealed by urbanites in Accra, Kumasi, Sekondi-Takoradi and Tamale).

Generally, urban households which are served by water retailers incur higher charges for water compared to those directly connected to the pipe system. Besides, beyond price concerns, water from the private retailers can also be polluted leading to health problems (WHO, 2017). Notwithstanding the direct benefits of private retail water provision which is a valuable service for water-deficient urban centers, it seems to overwhelm the users making it unpopular to consider the side effects. 'Here, we access water from available private owners, we don't care about the quality of the water. All we need is water to meet our needs. Forget about safety and hygiene. We can only talk about that when we have plenty of water in this neighborhood' (an informal urbanite, Tamale). The existence of private water suppliers saves consumers a great deal of time compared to fetching water from other sources. This system also provides employment to locals through retail options, and it features simple technologies that can be easily maintained at the local level (Osumanu *et al.*, 2010). The expensive nature of water privatization is informed by the mechanisms of

operations, including Build Operate Transfer (BOT) or Build Own Operate Transfer (BOOT) which make private actors liable to losses in the long run if their services do not meet financial targets.

Peloso & Morinville (2014) identified that the overall urban water system is affected by an average daily supply deficit of an estimated 60 million gallons. Some urban areas are denser than others, and thus, the supply deficit allows for unequal distribution throughout the urban regions influencing water pricing significantly that tends to affect the urban poor. Though public water supply mechanisms through the GWCL have ensured water rationing schedule – directing water flows to certain areas of the urban communities on selected days – to ensure fairness (Adank *et al.*, 2011); nevertheless, some areas receive water supplies once a week or none at all, while others are serviced as often as 7 days (Morinville, 2012). ‘I do not really have problem with water. I think GWCL is doing a good job’ (urbanite in formal Accra, Greater Accra region, Ghana). Public rationing interventions have therefore been poor, benefiting largely the formal areas to the neglect of the informal areas. In some cases, some informal areas also suffer from poor water rationing. Usually, when rationing tends to be unfavorable, affected urban communities have to rely on private actors, who take exorbitant fees for the provision of water. The private actor inclusivity is also intensifying because of the intermittent nature of water services – water flows for a few hours only through the night. Whilst the erratic water flow affects both upper and lower class urban residents, the former are able to afford the purchase and installation of poly tanks for water harvesting; the latter cannot. In most cases (as identified during our interviews in the major cities), ‘disguise’ privatization initiative emerges such that the upper class urban residents (acting as private actors) store adequate water and later supply to the lower class urban residents (acting as consumers) at very expensive fees. Private retailers that usually operate in informal urban areas also outsourced pipe water from the GWCL at very high price (US\$450) and also bear auxiliary costs which make them charge exorbitantly for urban water provision in order to offset costs (Osumanu *et al.*, 2010). Water sector interventions are therefore deemed relevant as the water consumptive demand will hit 5.13 billion millimeters by 2020 due to population growth (MWRWH, 2014). The surge in demand will make water accessibility more complex, as state interventions to regulate water discrimination and manage exploitation have failed, whereas private suppliers have taken advantage to milk more money at all cost, especially from the vulnerable and urban poor. It may be necessary for Ghana to tap into her historical experiences and knowledge with regards to utility privatization as argued by Leiblein (2003), as a real option theory, as this can guide in taking pragmatic privatization options moving forward.

6. Streamlining water privatization to fix water supply deficiencies in urban Ghana

Water privatization in Ghana has failed to adequately advance water accessibility, with the urban poor being the most negatively affected. This failure needs fixing as water in itself is a basic commodity intrinsically linked with human existence (Department for Environment, Food and Rural Affairs (DEERA), 2011). In fact, access to adequate safe drinking water is considered as a human right which needs to be ensured in every country (World Health Organization, 2014). In the current dispensation of development sustainability spearheaded through the pathway of ‘leaving no one behind’, it behooves water sector policy actors and practitioners to work arduously to ensure comprehensive urban water coverage. Failure to intervene will undeniably mean the manifestation of water accessibility conundrum defeating the SDG-6 – ‘Ensure availability and sustainable management of water and sanitation for all’. For now, the public water sector is seriously bewildered with water distribution inefficiencies (Adu-Ampong, 2014), and the

rapid growth in urbanization in Ghana (Songsore, 2009) makes the operations of private actors somewhat necessary. But as Rees (2004) and Johnstone *et al.* (1999) have forewarned, the adoption of privatization in the water sector can lead to access discrepancies. This runs in tandem with the findings of the study which ascertain that the urban poor especially, are poorly served and there exists wider inequality amongst urban residents through the manifestation of the private actors. But in as much as privatization can lead to development failures (see Kikeri & Nellis, 2002; Li *et al.*, 2011) in the water sector, Kleemeier (2000), World Bank (2004), and Water Aid (2005) have identified that the rightful implementation of privatization interventions holds the potential to advance water accessibility to all.

The rightful implementation of private sector interventions calls for the critical consideration and examination of a country's political and socio-economic conditions. This can largely influence the success of water privatization as spearheaded by system and contingency theorists, including Scott (2003) and Brada & Ma (2007), accordingly. Thus, conditions such as efficiency and relevance of the water sector to social welfare as well as global private-sector competition in the water sector could serve as signposts for authorities (not) to embrace water privatization. The Ghana water sector is characterized by a high level of inefficiency such that water supply loss is significantly high (Adu-Ampong, 2014).

Perhaps, the position of RBV theorists (see Leiblein, 2003) that basic/essential commodities like water need not to be privatized could have hold, but the current urban water investment shows donor dominance in water financing (48.98% as compared to 41.29% from the state). This in itself is very worrying, as the government has the quest to achieve a self-reliance regime in the country as fronted in the mantra 'Ghana beyond Aid'. Therefore, it makes it feasible for the state to amass support from local private actors in order to reduce and incrementally reverse the financing situation. To this end, the position of agency theorists (including Ramamurti, 2000) should be intensified. That is, the state/government must take control over privatization mechanisms in order to align to the real interest of the public, particularly the urban poor. The limited controllability of the state has allowed the private sector actors to participate in urban water supply without any direct investment. As profit-minded actors (Ramamurti, 2000; Joseph, 2010), local private suppliers continue to exploit consumers.

7. Conclusion

From the findings, before any tacit proposals are to be provided by the authors, the perspective of Agyei-Mensah & Owusu (2009) needs to be supported and reinforced. There is the need for fixing and transformation of Ghana's water sector, and this remains very critical and will necessitate infrastructural investments and re-alignment of privatization models, the maintenance of proper management of water systems and ensuring that special attention is granted to the needs of the poor. However, urbanites should be active consumers of water services through self-help and co-production processes. A process of water co-production for servicing urban water-access-deficient areas with incremental improvements will help urban residents to take control, ownership and management of community-based water services. This could be an easy way-out, as Ghana is blessed with water resources (MWRWH, 2010) that can easily be utilized as a source of safe water. The research supports neighborhood-based water supply interventions through joint support at the community level, as this will reduce the over-dependency on state and private actors in water provision.

Codependency of state and private water suppliers limits the control mechanisms over private actors leading to improper alignment of initiatives to ensure balanced water access and consumption. The

reform processes will need to integrate urban spatial planning for easy utility service provision, ensure a coherent water supply systems and encourage multiple private water supply options. The private water supply system should be varied with plurality of technologies and infrastructure (Morinville, 2012), but well regulated, triggering competition such that it becomes operationally impossible for the private sector to over-charge water supply services. The regulatory control mechanisms could be mixed up with sound pro-poor policies (such as tax incentives) that allow private actors to operate business models that are commensurate to the economic conditions of the urban poor.

For government's regulation to be effective, a comprehensive private sector water supply policy guide backed by legislation will be necessary to assist the state and private actors in decisions that ensure the supply of water in a manner that meets the divergent needs of urban members depending on the context (formal or informal) they find themselves. This will also help the state to effectively and efficiently govern the operations of private entities as well as provide legal support to urban citizens for any dubious actions by private actors.

In general, the study provides the paradigm for better visualization of water privatization and opens a further discourse toward urban water supply discrepancies in Ghana. This justifies the need for a critical re-look at the focus of water supply investments in Ghana (and perhaps, other developing countries in the sub-Saharan African region) if the water needs of various urban residents are to be met toward achieving the SDG-6.

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