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Stakeholders in Ghana's water sector development and implications for rural water tariff payment: a review

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ABSTRACT

Despite the separation of rural and urban water services under models of service delivery suitable to rural and urban areas in Ghana, there is still evidence of urban water service extensions to some rural communities. Using content analysis of the mainstream literature and documentary report, the study reveals that there are overlapping stakeholder roles as some rural communities are still connected to urban water services, yet not given preferential treatment under water tariff regulation and policy provisions. This leads to water tariff arrears in affected rural areas compared with their urban counterparts.

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Introduction

Stakeholders are the strongest supporters of an organization and can affect or be affected by the organization and constitute those groups without whose support the organization would cease to exist (Schiller et al., 2013). According to the Water and Sanitation Program (2011), the prioritized issues of stakeholders in Ghana's water sector include the identification of the stakeholders, their roles and weaknesses. In the water sector, key stakeholders emerge from: governments, responsible for policy and infrastructure; the private sector, for the supply of water through cost recovery and for profit; non-profit non-governmental organizations, caring for the needs of the urban and rural poor; and representatives of citizens who are impacted by the water projects (Akhmouch & Clavreulv, 2016; Dangah, 2012).

Stakeholder engagement has become a central requirement for water-related projects in many different contexts (Wehn et al., 2018). Accordingly, this paper presents a picture of the place of stakeholders in Ghana's public water sector. The broad objective was to review the historical development of Ghana's water sector, and specifically to explore the evolution of the institutions that brought about the separation of rural and urban water services and the policies and regulations that accompanied the process. The paper further considered how the roles of the stakeholders conform to the water sector reforms in the

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rural and urban water sectors, and the effects of the stakeholder roles on water tariff payment performance. The Theory of Planned Behaviour was used as the analytical lens as it helped to establish a framework for the identification and understanding of the behaviours of various stakeholders, in conformity to an explanation of the practical applications of promoting water tariff payment in rural areas. It is basically a reviewed paper dependent on content analysis of the available and relevant literature.

The main thesis of the paper is that despite the separation of rural and urban water services under policies, regulations, institutional frameworks and models of service delivery suitable for rural and urban areas in Ghana, there is still evidence of juxtaposed urban–rural water service extensions (Bukari, 2017). This paper, therefore, sought to explore what preferential treatments are given to rural areas connected to urban water systems in terms of tariff payment, and how these affect their abilities to pay the tariffs. This fills the niche in the contemporary water sector mainstream literature that focuses on either rural or urban water services, but not both.

Contextualizing payment for water in the Theory of Planned Behaviour

Willingness to pay is a concept that measures how much customers want to pay for a commodity. In this context willingness to pay refers to the amount of money a consumer is willing to pay for a unit of water after considering other compensating factors (Bukari, 2017). According to Makwinja et al. (2019), the determinants of willingness to pay include demographic (e.g., literacy), socio-economic (e.g., price and income) and institutional (e.g., social network and quality of the services of the institution) factors.

On the other hand, the Theory of Planned Behaviour is one of the dictums used to predict how attitudes, subjective norms and perceived behavioural control dictate one's behavioural intention at a particular place and time (Pouta & Rekola, 2010). The theory has six components, which include moral obligations such as attitudes, behavioural intention, subjective norms, social norms, perceived power and perceived behavioural control (Lamorte, 2019). It was found relevant in the explanation of rural people's willingness to pay water tariffs, following its successful applications in other willingness-to-pay studies. For example, López-Mosquera et al. (2014) applied it to the examination of the willingness to pay for the conservation of an urban park, and found that there were relationships between the components of the Theory of Planned Behaviour and willingness to pay, because social norms significantly determine the attitudes, moral norms and perceived behavioural control of individuals, which influence their willingness to pay for environmental conservation. Taqipour et al. (2015) also applied the theory in the water sector by examining farmers' behaviour to membership of water-user associations, and concluded that perceived behavioural control and subjective norms influence farmers' behaviour towards membership in such associations.

From the mainstream literature, there is apparently scanty information on the application of the Theory of Planned Behaviour to a willingness to pay for water, despite its relevance. In this study, the Theory of Planned Behaviour was applied to the examination of the willingness to pay for urban water extended to rural households in Ghana, using quantitative and qualitative data from the relevant literature. Quantitatively, inferential statistics on willingness to pay, drawing on examples from Bukari (2017), was used to

explain how subjective norms influenced willingness to pay. Qualitatively, the effects of public sector policy as perceived power, and how the model of water delivery influenced behavioural intentions, were also used to illustrate the application of the theory using literature.

Materials and methods

This review paper consolidates the relevant literature from journal articles, books, newspapers, institutional reports, theses and other internet materials on stakeholders in Ghana's water sector development and the implications for rural water tariff payment. The Boolean search terms constituted the means of obtaining relevant literature for the study. This involved the use of combined keywords related to the specific research objectives, with operators such as AND, NOT and OR in the online search in order to ensure that only relevant results were generated for further interpretation and synthesis (Journal Storage, 2019). Examples of search terms used in this study were history of water sector institutions 'and' Ghana; stakeholders in Ghana's water policy in rural 'or' urban areas; stakeholders in Ghana's water sector regulations in rural 'or' urban areas; rural/urban/small town water supply stakeholders 'and' Ghana; water supply challenges 'and' Ghana; urban water connections 'and' rural areas in Ghana; and payment of urban water tariff 'and' rural areas in Ghana.

The criteria for selection of hard copies and soft copies of materials online focused on the geographical scope (related to Ghana, Northern Region, Upper East Region, rural and urban areas, as well as relevant international issues). Sometimes 'journal articles', 'student thesis' or 'PDF' were added to the search terms to ensure that credible and peer-reviewed materials were accessed for selection. This was followed by the chronological scope, in which texts not older than 10 years were prioritized. However, many times much older texts were used because of their relevance to the study, policy perspectives behind the required synthesis and lack of immediate substitutes. But generally, 86% of the sources used met the selection criteria.

The presentation and analysis of the data were done under themes based on the specific objectives from which the search terms were derived to obtain the literature sources. The reliance on literature as a reviewed paper does not exempt this paper from limitations of biases of introducing authors' personal viewpoints, diminished meanings and errors during the interpretation of original texts, and difficulties in getting current and relevant data to address certain objectives. However, the adopted Boolean search method was a technique used to address most of these limitations, while personal bias was controlled by using empirical evidence to support all claims.

Results and discussion

This section is a presentation, consolidation, analysis and synthesis of the literature based on the research objectives and contextualized in the adopted Theory of Planned Behaviour as an analytical lens.

Historical development of public water services, regulation and policy

In Ghana, decentralization of sanitation and water services for rural areas and small towns under the district assemblies began in 1993, followed by the institutionalization of the Community Water and Sanitation Agency for rural and small town water and sanitation services in 1998 (Ghana Water Company Ltd, 2012a) (Table 1). These were to cater for the preferential needs of low-income rural communities and small towns (Anokye, 2013).

In spite of these structural arrangements, there were still overlapping institutional roles in public sector water supply services for urban and rural areas until 1999, when the Ghana Water and Sewerage Corporation, which had served both rural and urban areas since 1965, was converted into a public limited liability company under the new name Ghana Water Company Ltd (2012a). The company was, and still is, charged with the responsibility of providing urban water services under the Conversion of Statutory Corporations to Companies Act, Act 461 of 1993 (WaterAid Ghana, 2005).

The influence of the economic recovery programme led to the withdrawal of government direct subsidies (subventions) on public water services in 1986. This, together with an emphasis on water tariff payment under the Ghana Water Company Ltd, facilitated by the establishment of the Public Utilities Regulatory Commission under Act 538 of 1997, was a major step in ensuring that Ghana Water Company Ltd tariffs could be heading for a full-cost recovery as against the prevailing interference from the government, the owner of the company (Grusky, 2001). Table 1 presents details of the historical development of public water services in contemporary Ghana. In the specific context of this study, interest is in efforts to ensure the fair treatment of urban and rural areas in terms of access and affordability of water services.

Table 1 shows that whereas the Community Water and Sanitation Agency was established to cater for the needs of rural and small-town water services as a separate unit in 1998, the Ghana Water Company Ltd became mandated for urban water services in 1999 (Ghana Water Company Ltd, 2012a). Edwards and Cameron (2011) assert that in view of the low-income status of rural communities, low-cost technologies are usually

Table 1. Ghana water sector reforms.

Year	Water sector event, policy, regulation or law	Target
1994	Establishment of the Environmental Protection Agency under the Ministry of Environment and Science to ensure that water operations would not cause harm to the environment and public health	National
1996	Establishment of the Water Resources Commission for the regulation and management of natural water resource utilization under the Water Resources Commission Act No. 552 of 1996	National
1998	Community Water and Sanitation Agency to facilitate the provision of safe water and related sanitation services to rural communities and small towns under the Community Water and Sanitation Agency Act No. 564 of 1998	Small towns and rural areas
1999	The Ghana Water and Sewerage Corporation was converted to the Ghana Water Company Ltd under the Statutory Corporations (Conversion to Companies) Act 461 of 1993 as amended by LI 1648, on 1 July 1999, to be responsible for urban water services	Towns
2004	Preparation of the National Water Policy commenced	National
2006	Five-year management contract awarded to Aqua Vitens Rand Ltd (2006–11)	Urban
2007	The National Water Policy fully developed and launched in 2008	National

Sources: Updated from WaterAid Ghana (2005); Ministry of Water Resources, Works and Housing (2007); and Ghana Water Company Ltd (2012a).

adopted for water supply in such areas. Thus, although rural water services could also entail water tariff imposition, the associated low-cost technology involved make the tariffs more affordable compared with urban piped water systems making use of treated surface water, as is the case in the Northern and Upper East Regions of Ghana. This generates interest in why some rural and peri-urban areas are still connected to urban water services, especially in matters of high tariff payment. This is addressed as the content of this paper unfolds in subsequent sections.

Stakeholders in Ghana's water policy formulation for tariff and service regulation

In spite of the abundance of natural water resources in Ghana, there is still inadequate production and use of potable water. Ghana has therefore undertaken some institutional and policy reforms to optimize the performance of the water sector (Ministry of Water Resources, Works and Housing, 2007). The stakeholders in public water policy formulation for supply and tariff regulation, as well as an overview of the national water policy, are discussed below.

Stakeholders in water policy

The stakeholders in public water regulation and policy formulation are presented in Figure 1. It relates to the government institutions tasked with the responsibility of promoting optimum and sustainable use of water through the planning and development of water resources (Brook & Smith, 2002).

Apart from being controlled by the dominant political institution in the water sector, some stakeholders actually have a role in the water policymaking process based on their interests (Ricarto, 2010). The author identifies the following as the categories in which such stakeholders fall under:

Ministries in charge of water and sanitation, such as the Ministry of Sanitation and Water Resources of Ghana, with a focus on issues such as water resource conservation through the Water Resources Commission, rural and small-town water facility management, and tariff subsidization by the Ministry of Local Government and Rural Development are often represented by the district assemblies at the grassroots level (Figure 1, second layer). These represent the state as the key stakeholder in the policy formulation process for the supply and affordability of rural water tariff (Gbedemah, 2010). In the context of the Theory of Planned Behaviour, the Ministry of Sanitation and Water Resources and the district assemblies satisfy the perceived power tenet, while their policy formulation roles define the behavioural intentions that should guide implementation processes in urban and rural water interventions.

The regulatory agencies, either as part of the dominant ministry in charge of water or as independent authorities. Examples are the PURC as an independent regulatory authority and the Environmental Protection Agency under the Ministry of Environment, Science and Technology (Figure 1, top layer). Central to this sphere of stakeholders are issues of tariff regulation, setting standards for service delivery and quality, environmental by-laws, Acts of Parliament related to water, and other legislative instruments (Ghana Water Company Ltd, 2012a; WaterAid Ghana, 2005). These conform to the behavioural control tenet of the theory of planned behaviour. In other words, regulations are enforced to control behaviour. For example, tariff and service quality

Figure 1. Framework of stakeholders in Ghana's water sector. Source: Modified from WaterAid Ghana (2005).

regulations by the PURC control the behaviour of water utility providers in the determination and imposition of urban water tariff.

Intermediate levels of government, such as the metropolitan, municipal and district assemblies (Figure 1, second layer). These may also be interested in policy interventions in matters of water subsidies and their implementation, or owning their local water utility agencies such as the Water and Sanitation Agency (Anokye, 2013). The roles of the assemblies constitute perceived power at the local level, which influence behavioural control in rural and small-town point source water tariff and service conditions. Also the task of policy implementation that make provision for preferential treatment of rural and small-town dwellers in water services and tariff conditions conform to the social norms tenet of the Theory of Planned Behaviour.

Public or private water utility companies interested in matters of efficient services and cost recovery. The cost-recovery motive, for instance, informs their behavioural intentions, while guided by policy and regulatory provisions as behavioural control, as

expatiated in the Theory of Planned Behaviour. The Ghana Water Company Ltd is an example in the public sector mandated for urban water supply (Figure 1, second layer), while Water Dome and Universal Aqua Ghana Ltd are examples in the private sector.

Alternative service providers (communities, private water vendors through water tanker services, non-governmental organizations, private borehole operators and consultants of water project development) with profit motives; and consumers as part of local level stakeholders (households, agricultural, commercial and industrial consumers). These are represented by communities in Figure 1 (second layer for rural and small towns), and urban areas (Figure 1, second layer). Consumers can participate directly or through intermediaries (e.g., Consumer Protection Agency and community water committees in Ghana). In the context of the Theory of Planned Behaviour, attitudes towards water-use behaviour and tariff payment, as well as subjective norms, including household size, religious believes, educational status, tariff amount, income level and service quality, are more associated with consumers, which have been measured later in this work.

The Water and Sanitation Monitoring Platform (2009) also acknowledges the influence of the mass media on national water policy. This is by way of generating new knowledge that could be expressed as part of policy recommendations for problem solving (Crew & Young, 2002). In Ghana, the Council for Scientific and Industrial Research, International Water Management Institute and the universities are the major stakeholders in the field of research for water policy formulation and implementation (Gbedemah, 2010).

Apart from the above which are found within the country, there are also external stakeholders who participate in the policymaking process. For instance, WaterAid Ghana (2005) and the Ministry of Water and Sanitation also solicit support in the forms of funds and expertise for water sector projects from external sources. The World Bank, African Development Bank, Nordic Development Fund, European Union and Austrian government have been useful in funding water sector projects in Ghana (Ghana Water Company Ltd, 2012b). In addition, a number of donor countries offer technical support and expertise through their international development agencies and multinational corporations. Such examples include the Canadian International Development Agency, the UK's Department for International Development, German Technical Cooperation, Overseas Economic Cooperation Fund of Japan and Vitens Evides International of the Netherlands (Ghana Water Company Ltd, 2012a). These contribute to policymaking since their interests, expertise and resource commitments are incorporated into the national water policy cycle.

Ghana's water sector regulations

Regulations in the water sector are distinguished from policies because they refer to the norms of legality that serve to prevent or correct some imperfections by identifying and remedying such imperfections. They could take the forms of command-and-control regulations, incentive-based regulations, and preference-shaping regulations (Orbach, 2012). These involve prescriptions and bans; making some considerations as incentives; and changing preferences, respectively. According to Gbedemah (2010), in Ghana the thematic issues of water sector regulation (identified in Figure 1) relate to water resource use and pollution control through prescriptions and outright prohibitions/bans; tariff and special service conditions either by changing the preferences of service providers or

making special considerations for some customer groups as incentives (see also Adank & Tuffuor, 2013). Figure 1 provides adequate illustration of the stakeholders in water sector regulations and their roles explained in the ensuing subsections.

Water Resources Commission

The WRC was established for the regulation and management of natural water resources and their utilization under the Water Resources Commission Act No. 552 of 1996 (Ghana Water Company Ltd, 2012a). This Act declares all water resources to be under the ownership and control of the President of the Republic on behalf of the people of Ghana. The functions of the WRC as contained in section 2 (2) of the Act 552 of 1996 include the following:

- Propose integrated water resources management plans to guide the utilization, conservation, development and improvement of water resources.
- Initiate, control and coordinate activities connected with the development and utilization of water resources.
- Grant water abstraction rights.
- Collect, collate, store and disseminate data or information on water resources.
- Engage water sector agencies to undertake scientific investigations, experiments or research into water resources.
- Monitor and evaluate programmes for the operation and maintenance of water resources.
- Advise the government on any matter likely to have adverse effect on the water resources.
- Advise pollution control agencies in Ghana on matters concerning the management and control of pollution of water resources.
- Perform such other functions as are incidental to the foregoing (Water Resources Commission, 2015).

In addition to the stakeholders mentioned in the section on water policy are the commission partners with a host of others to promote water resources development and its sustainable utilization. These include the Hydrological Services Department, Volta River Authority, Irrigation Development Authority, Ghana Meteorological Agency, Forestry Commission and Minerals Commission (Water Resources Commission, 2015). The collective efforts aim at ensuring sustainable use of water through conservation and pollution control, which result in affordable water tariffs since water scarcity and the high cost of treating polluted water are either reduced or prevented, for the benefit of service providers and consumers (Community Water and Sanitation Agency, 2004).

Public Utilities Regulatory Commission

The PURC was established under the Act of Parliament No. 538, 1997 (Ghana Water Company Ltd, 2012a; WaterAid Ghana, 2005). Central to its mission is to regulate tariffs and set quality standards for consumers and potential consumers of public utility services, particularly water, electricity and gas (Public Utilities Regulatory Commission, 2005). The roles of the commission in the regulatory process include the following:

- To take the lead role in the resolution of pro-poor issues in the urban water sector in line with its regulatory mandate to protect the interest of consumers, as well as government poverty reduction objectives.
- To support any interventions that result in improved and more reliable access to water, with the ultimate goal of direct connections.
- To instruct urban water utility companies to include pro-poor criteria when undertaking investments in the water supply chain.
- To lead the formation of a working group of stakeholders to address the provision of services to the urban poor.
- To adopt innovative approaches to reaching the urban poor in the short term through secondary suppliers such as tanker operators (Gbedemah, 2010, p. 128; Public Utilities Regulatory Commission, 2005).

In the performance of these roles, the commission seeks 'to become a model institution which ensures the delivery of the highest quality services to all consumers at fair prices' (Public Utilities Regulatory Commission, 2005, p. 3). This information shows that the PURC is more urban focused and its pro-poor strategies target the urban poor. However, support for special considerations for the poor in water supply projects as one of its roles could benefit rural and peri-urban areas connected to urban water systems.

Dominant of tariff structure and its application

The dominant tariff structure regulated by the PURC and implemented by the Ghana Water Company Ltd in Ghana is the increasing block tariff. This involves an initial lower block of consumption being free of charge as the lifeline to cater for poor consumers, after which subsequent blocks attract tariff in volumetric water systems (Bukari, 2017). Table 2 presents details of increasing block tariff in Ghana. Because the Ghana Water Company Ltd is meant for urban water services and aims at cost recovery, there is no stratification by socio-economic status of consumers such as rural and urban or high and low income. How this affects the subjective norms and attitudes of rural communities connected to urban water systems in terms of tariff payment is the gap this paper sought to fill as an illustration of the application of the Theory of Planned Behaviour.

Table 2. Approved tariffs under Ghana Water Company Ltd.

Category of service	Schedule	Approved rate effective on 1 July 2020
(a) Metered domestic		
0–5 Litres (lifeline)	GHp/1000 litres	329,2121 (but exclusive lifeline)
5 and above	GHp/1000 litres	560,2083
Service charge	GHp/month	600,0000
(b) Commercial	GHp/1000 litres	923,0390
Service charge	GHp/month	600,0000
(c) Industrial	GHp/1000 litres	1111,8338
Service charge	GHp/month	600,0000
(d) Public institutions/government departments	GHp/1000 litres	718,6628
Service charge	GHp/month	600,0000
(e) Premises without connection (public standpipes)	GHp/1000 litres	5607,5588
Service charge	GHp/month	600,0000

Source: Ghana Water Company Ltd (2020).

Rural areas mostly fall under service category (e) Premises without connection, and are largely provided with public standpipes, and pay the same tariff rate of GHp 5607.5588 per 1000 litres, after provision for the lifeline of 0–5 litres at GHp 329.21. Although increasing block tariff is pro-poor, when the urban poor, rural and peri-urban low-income households are connected to such services through public standpipes there are tendencies for increased demand to push up consumption far above the lifeline to defeat the objective of increasing block tariff (Nkrumah, 2004). Thus, subjecting rural low-income households to the same tariff conditions with urban dwellers for any particular service tends to be regressive to the rural households. Recognizing this situation, Cardone and Fonseca (2004) assert that in water services to rural and other low-income areas, beneficiaries should be consulted in determining the lifeline block and the tariff-setting process, so as to incorporate their real needs. However, the pro-urban nature of the Ghana Water Company Ltd does not give rural people a voice in its operations, despite extending water services to some rural areas.

District assemblies and decentralized water regulation

Figure 1 shows that the regulation of rural and small-town water tariff is the responsibility of the metropolitan, municipal and district assemblies in Ghana. This started with the decentralization of sanitation and small-town water supply services to the metropolitan, municipal and district assemblies under the Local Government Act No. 462 of 1993. This was to be in collaboration with the Ministry of Local Government and Rural Development (Ghana Water Company Ltd, 2012a). Specifically, the roles of the assemblies in rural and small-town water systems include:

- the promotion of community participation in the choice of location, type and design of water facilities as well as their management; and
- the preparation of budgets based on government transfers (5% as district assemblies common fund), raising revenue from local sources and other external aids for the provision of social services, including drinking water; and regulate tariffs for small-town piped water systems and rural hand-pump water systems (WaterAid Ghana, 2005, pp. 4–5).

Table 2 shows further that the CWSA was established in 1998 to support the district assemblies in the management of rural and small-town water services.

Stakeholder participation in rural and small-town water supply

Stakeholders and their roles in rural and small-town water supply constitute a separate model known as the Community Ownership and Management model (Adank & Tuffuor, 2013). It is anchored on the bottom-up, demand-driven and appropriate-technology approaches (Gbedemah, 2010). The CWSA acts as an intermediary institution between metropolitan, municipal and district assemblies and communities, on one hand, and external institutions, on the other, for funding, technical, construction of low-cost water infrastructure (e.g., boreholes with pumps), major repairs as well as integrating sanitation and hygiene education into the process.

The metropolitan, municipal and district assemblies through their established district water and sanitation teams select communities that apply for water and sanitation services. The assemblies then apply for government funds and other funding options from donors as recommended by the CWSA for project implementations. It also encourages the mobilization of funds by client communities to meet 5% of capital investment cost of projects to be implemented (Bukari, 2017). The metropolitan, municipal and district assemblies in collaboration with the community committees set tariffs approved by the CWSA for collection from households by the committees for the use of the facilities.

The tariffs are calculated based on the operation, maintenance, major repairs, replacements and extension of water resources facilities to new areas. The need to promote and provide affordable tariffs to rural low-income households is by ensuring that the final tariff is low and should not exceed US$1/m^3. This makes the final tariffs set somewhat negotiable, and so conforming to the social norms tenet of the theory of planned behaviour (Lamorte, 2019).

Some case studies on rural tariff conditions in Ghana provide relevant data worth presenting. For instance, Nyarko et al. (2010) state that rural communities in the Ashanti Region of Ghana paid an average tariff of US$0.60/m^3 of water per month in 2003. Water tariff payment performance was about 57–77% in terms of coverage of the total cost of water supply. This reveals a success story in the realm of pro-poor water tariff determination and collection in a typical rural water supply context.

The effectiveness of the tariff collection process is attributed to the roles of community committees. These are instituted by the metropolitan, municipal and district assemblies to facilitate the community ownership facet of rural water and sanitation projects (Bukari, 2011). They are composed of gender-balanced community members, who determine the procedures for tariff collection, as well as bookkeeping and minor repairs and the maintenance of rural and small-town water systems (Galaa & Bukari, 2014). They also receive capacity-building, technical assistance and other forms of support from non-governmental organizations (The Netherlands Development Organization (SNV), 2009). These provisions constitute perceived power through community ownership and to influence behavioural intentions as the communities have built capacities to lead the rural water service-delivery process for the achievement of set objectives, especially sustainability, and behavioural control, as they influence the behaviours of rural community consumers to some rules of water use as dictated by the Theory of Planned Behaviour.

The relevance of rural water sector stakeholders and their roles to this study is that it facilitates the understanding of how the non-profit nature of the service providers, the freedom of choice of technology, affordable tariffs and the sense of ownership overcome constraints of the willingness to pay by the rural poor. However, the Community Ownership and Management model provides avenues for assessment on whether the socio-economic status of rural and peri-urban communities actually have no effects on the sustainability of services and cost-recovery objectives.

Most studies on the Community Ownership and Management model in Ghana have focused on the effectiveness of community participation on sustainability, such as the work of Kangah (2009), or the expectations of the communities from the projects, such as the work of Adams (2010). But there is virtually none to account for improving the

willingness to pay water tariff by rural and peri-urban communities through stakeholder participation in the context of urban water systems in Ghana.

Stakeholder participation in urban water supply

The stakeholders and their roles in the urban water sector also constitute the Utility Management model (Adank & Tuffuor, 2013). This involves the PURC setting standards for water tariff determination and service quality, as well as assessing the viability of proposed tariff increases by the Ghana Water Company Ltd. Although the Public Utilities Regulatory Commission has a formula for automatic tariff adjustments, utility companies may submit proposals for tariff adjustments in order to meet their operations and maintenance costs (Public Utilities Regulatory Commission, 2013). In the case of the general public (consumers), the commission engages in a process known as 'extensive stakeholder consultations to solicit views and gather inputs for the final upward adjustments' (Public Utilities Regulatory Commission, 2013, p. 1).

The consultation of the general public is popularly through the media, while the Public Utilities Regulatory Commission observes public reactions, via the Bureau of Consumer Services within the Public Utilities Regulatory Commission secretariat (Bukari, 2017). Thereafter, the key stakeholders including the Public Utilities Regulatory Commission as the statutory regulator, the Ghana Water Company Ltd as the service provider, Trades Union Congress as the representative of commercial/industrial water users, Ministry of Water Resource and Sanitation; and Consumer Protection Agency, representing all other utility consumers, among others, meet to negotiate for the final tariff to be imposed. The Public Utilities Regulatory Commission then decides and publishes the approved tariff after its own internal meeting (Public Utilities Regulatory Commission, 2012, 2013).

The Ministry of Sanitation and Water Resources, WRC and the Environmental Protection Agency are at the apex of both rural and urban water policy and regulation issues in Ghana (Figure 1). However, the urban water sector is dominated by the Public Utilities Regulatory Commission and Ghana Water Company Ltd as the direct stakeholders. This generates criticism of Figure 1 because it is not clear why the Public Utilities Regulatory Commission and metropolitan, municipal and district assemblies appear at the top of the box when their roles affect only urban and rural/small-town water services, respectively. Additionally, even though both rural and urban water services are now demand driven, rural and small-town services are typically bottom-up, while there is some degree of centrality in urban water services (Britwum, 2004). This is because the latter is based on a high-tech piped water network with specific options: domestic (individual/public), industrial and commercial connections (Ghana Water Company Ltd, 2012a). Services are readily available for extensions upon demand, compared with the rural water sector, where clients choose the type of technology before it is constructed (Adank & Tuffuor, 2013). These are not shown in Figure 1.

The emphasis on neoliberal principles in urban water services also involves some rigid conditions such as cost recovery, removal of direct subsidies and encouragement of private sector participation to re-echo the centralized character of urban water services or the utility management model (Grusky, 2001). The last criticism is the failure to indicate where and why overlapping roles of stakeholders exist. For instance, under what conditions would urban piped water services be extended to rural areas and still remain

under the management of Ghana Water Company Ltd and hence subject to the urban tariff conditions of the Public Utilities Regulatory Commission? The extension of urban water services to rural areas manifests the encroachment of the jurisdictions of the metropolitan, municipal and district assemblies and the Water and Sanitation Agency, by the Ghana Water Company Ltd and the Public Utilities Regulatory Commission, which have implications for the attitudes and subjective norms of affected rural consumers in terms of water tariff payment.

The implication is that adequate information on this issue is necessary for ensuring the success of the policymaking machinery to address the special challenges of affected rural communities. The lack of sufficient information on the tendencies of overlapping roles or the neglect of what is available explains why the above stakeholder framework is incomplete. This is because the overlapping issues must reflect alongside special institutional arrangement to mitigate the negative consequences of subjecting the rural poor to service conditions, such as regular monthly water tariffs that are not within their capabilities (Blanc, 2007).

Public–private partnership in the water sector of Ghana

Beginning from 1986, neoliberalism started gaining roots in the public water sector of Ghana. This took the form of the withdrawal of government direct subsidies for the water supply (Bukari, 2017). In addition, the conversion of the Ghana Water and Sewerage Corporation to Ghana Water Company Ltd as a limited-liability company in 1999 (WaterAid Ghana, 2005), the failed attempt to award a 10-year lease contract to Azurix of the United States due to the activisms of the Coalition Against Water Privatization in 2000, and the award of a five-year management contract to Aqua Vitens Rand Ltd of the Netherlands from 2006 to 2011, are in consonance with the neoliberal ideologies of the World Bank and the International Monetary Fund (Alhassan, 2011).

The Aqua Vitens Rand contract in particular had the main objectives of improving the reliability and quality of potable water; ensuring the company's financial sustainability; improving customer service; and providing access to potable water at affordable prices to low income consumers (Vitens Evides International, 2012). The Ghana Water Company Ltd was still responsible for investments in assets and funding the operations of the company. Some positive achievements of th contract included improvement in water quality in terms of effective monitoring of water quality parameters such as pH, water colour, residual chlorine, turbidity and *Escherichia coli* bacterium (Vitens Evides International, 2012). On the issue of financial sustainability, the annual revenue of the company increased from GHC 57 million before the contract to GHC 143 million by the end of the contract. There was also an operational surplus that grew to GHC 36 million per annum under the private operator (Vitens Evides International, 2012).

Water tariff collection efficiency was 97% in 2009, and remained at 90% in 2010 (Alhassan, 2011). These were improvements over the average 80% of unpaid tariffs between 1997 and 2005 (The Netherlands Development Organization, 2009). The establishment of customer call centres and the training of staff also improved customer satisfaction, as well as staff attitudes towards customers. On the issue of affordability and improved access of water to the poor, Aqua Vitens Rand made no special provision for water tariffs and access targets for the poor (Vitens Evides International, 2012). But

generally, new connections increased from 364,000 to 438,000, while the role of non-governmental organizations in the pro-poor water sector led to increased access to improved water sources to about 75,000 people in peri-urban areas (Ghana Water Company Ltd, 2012a). This report, however, concludes that if there were any rural low-income areas that benefitted from the services of the company within the public–private partnership regime, there were no special pro-poor considerations for them.

State of water supply and associated challenges in Ghana

Previous discussions have shown that the Ghana Water Company Ltd and the Water and Sanitation Agency are the major direct stakeholders in the management of urban and small-towns/rural community water supply respectively. The Community Water and Sanitation Agency (2004) classifies rural areas as those with populations not exceeding 1200; small towns as those not exceeding 50,000, and big towns and cities (herein referred to as urban areas) as those whose populations exceed 50,000. An assessment of comparative access to water services in general and urban piped water services in particular are presented in Tables 3 and 4, respectively.

Table 3 shows that with the exception of 2010, in which rural and small towns in Ghana recorded 62% coverage of improved drinking water services over that of urban areas (58%), urban areas enjoyed a wider coverage than rural and small towns. Despite the disparities, Ghana was apparently measuring up to its Millennium Development Goal targets of 85% and 76% coverage for urban and rural areas, respectively, by 2015, with effect from 2000 (National Development Planning Commission, 2010).

Table 3. Overall coverage of water services.

	Coverage of water services by settlement types		
Year	National	Urban	Rural, peri-urban and small towns
1990	56%	86%	39%
2004	53.05%	55%	51.10%
2006	68%	79%	52.86%
2007	–	59%	53%
2008	83.8%	93%	76.6%
2010	86%	58%	62%

Sources: Anokye (2013); Ghana Statistical Service (2012).

Table 4. Access to municipal and metropolitan piped water.

Region	Municipality/metropolis	Piped inside Urban	Water dwelling Rural	Piped outside Urban	Water dwelling Rural	Public Urban	Standpipe Rural
Upper East	Bolgatanga Municipal	37.6%	5.2%	28.4%	3.5%	5.4%	0.8%
Volta	Ho Municipal	36.1%	7.9%	40.8%	20.0%	15.0%	23.4%
Brong-Ahafo	Sunyani Municipal	33.5%	10.1%	16.5%	3.4%	18.5%	7.4%
Central	Cape Coast Metropolis	37.7%	18.8%	14.8%	26.0%	32.0%	35.6%
Western	Sekondi-Takoradi Metropolis	32.0%	18.2%	29.9%	39.7%	24.9%	17.7%
Northern	Tamale Metropolis	46.2%	9.2%	45.2%	23.3%	4.7%	6.2%

Source: Ghana Statistical Service (2014).

Table 4 also provides evidence of the extension of urban piped water services of municipalities and metropolises to rural areas, based on the 2010 population and housing census data. The development of public water supply services has been with some challenges. The first challenge is the inability of the state to develop and maintain its own service delivery model. For instance, Kwame Nkrumah's African Socialist inclination influenced his choice of the supply-driven approach to public water services to both rural and urban areas (Ghana Water Company Ltd, 2012a; Nkrumah, 1967). This was initially successful because the economy performed well enough to generate surplus revenue to pay annual subventions to the public water utility and direct subsidies for water services (Ghana Water Company Ltd, 2012a).

With the decline in economic performance and subsequent dependence on foreign capital for the water sector from the 1970s and beyond, the government of Ghana lost its sovereignty over the water-delivery model. This has brought about neoliberal influences such as privatization, cost recovery and an emphasis on tariff payment in both rural and urban water services in Ghana as described above. More specifically, the dominance of foreign influences on the water sector is attributed to lack of investment capital (Moss & Young, 2009), and the dependence on external managerial expertise due to inadequate skilled personnel for the sector within the country (Vitens Evides International, 2012). Additionally, in the case of the use of surface water sources, the high cost of water treatment due to high levels of pollution of water bodies increases the production costs of water utilities (Anokye, 2013; Community Water and Sanitation Agency, 2004). These together led to increases in water tariffs, and low-income households mostly found in rural and small towns are the most vulnerable (Ghana Statistical Service, 2014). It is also argued that declining rainfall patterns and other human activities threaten the water resource base of the country (Nkrumah, 2004), and justifies the need for tariff imposition to discourage the waste of water by consumers as a move towards sustainability.

Furthermore, there is still the problem of overlapping stakeholder roles and water-delivery models, despite efforts to promote affordability and equity in access to water services, through the separation of urban water services from that of rural and small-town settlements (Gbedemah, 2010). This is particularly true of rural and peri-urban communities connected to urban water systems instead of benefiting from the services of the CWSA. How low-income households in such communities cope with the high urban water tariffs and the influence of stakeholder participation in addressing their special needs is, therefore, a major challenge of research interest.

It is important to mention that since this study makes use of population data provided by Ghana Statistical Service, the classification of settlement types would be based on the Ghana Statistical Service's standards. That is, rural areas are those with populations below 5000 and urban areas are those with 5000 or more people. Peri-urban areas are those closer to urban areas and exhibit features of both rural and urban areas, as defined by Mondal (2015). It means their population sizes could be similar to rural areas, but not up to urban areas.

Ghana's national water policy

The basic principles of the National Water Policy of Ghana are stated as follows:

- The principles of fundamental rights of all people without discrimination to safe and adequate water to meet basic human needs.
- The principle of meeting the social needs for water as a priority while recognizing the economic value of water and the goods and services that it provides.
- The principle of improving equity and gender sensitivity.
- The principle of recognizing water as a finite and vulnerable resource given its multiple uses.
- The principle of integrating water resources management and development with environmental management in order to ensure the sustainability of water resources in both quality and quantity.
- The principle of adopting the river basin (or sub basin) as planning unit.
- The principle of the polluter pays to serve as a disincentive to uncontrolled discharge of pollutants into the environment.
- The principle of subsidiarity in order to ensure participatory decision-making at the lowest appropriate level in society.
- The principle that international cooperation is essential for the sustainable development of shared basins.
- The principle of integrating management of river basins with the management of coastal zones and wetlands.
- The principle of greatest common good to society in prioritizing conflicting uses of water.
- The principle of solidarity, expressing profound human companionship for common problems related to water (Ministry of Water Resources, Works and Housing, 2007, p. 11).

Recognizing that the lack of effective collaboration among stakeholders has been the major setback in the successful implementation of previous water sector reforms, the MSWR sought to address this problem through the formulation of the National Water Policy of Ghana (Ministry of Water Resources, Works and Housing, 2007). The basic principles of the National Water Policy are guided by the Ghana Poverty Reduction Strategy, the MDGs and Africa Water Vision for 2025. The important aspects of these principles, so far as the needs of rural and peri-urban communities are concerned, include improving access to safe water supply and sanitation to reduce the proportion of population without access to basic water and sanitation by 50% by 2015 and by 75% by 2025; promoting efficient and sustainable use of water to address food security, income generation and reduction of cases of malnutrition; and empowerment and capacity-building for improving equity, gender sensitivity and pro-poor water governance and policy (Ministry of Water Resources, Works and Housing, 2007).

The water policy is of relevance to this study because it embraces a stakeholder approach for integrated water management, including issues of urban, rural and small-town water delivery which have linkages to the specific objectives of this study. The stakeholders and their roles expatiated above, as well as the data on the state of water

supply, show that Ghana is on track in terms of compliance to the principles of the National Water Policy and the associated achievements. However, the issue of rural and peri-urban communities connected to urban water systems still remains a complex one. This is because the country can boast of achieving its targets for rural and urban water supply. But the situation in which rural and peri-urban areas are connected to urban water systems and the associated challenges of tariff payment seems to attract no direct attention in the policy framework and extant literature. Hence, a review of some empirical findings is necessary in depicting the inconsistency.

Tariff payment performance of rural communities connected to urban water systems

This section evaluates the tariff payment performance of rural areas connected to urban water systems by presenting a case study of the Northern and Upper East Regions of Ghana by Bukari (2017) (Table 5). The purpose is to ascertain what happens when rural communities are connected to urban water systems, despite the separation of rural and urban water services under the Community Management and Utility Management models, respectively.

The findings show the effects of deviating from stakeholder roles contrary to the water sector reforms as provided in Table 1, as well as the regulations and policy frameworks as presented in Figure 1. The results of rural water tariff payments were compared with that of an urban area for each region (Table 5). By recording the monthly debit and credit figures from water tariff records provided by the Ghana Water Company Ltd to obtain annual totals, the payment performances of the settlement types in the study area from 2010 to 2015 are shown in Table 5.

The findings indicate that urban areas performed better in tariff payment than rural areas. Table 5 reveals that urban areas had the incidences of overpaid water tariffs for three out of the six years for which tariff records were available (2011, 2013 and 2015). They also had the lowest average annual water tariff arrears in 2010 and 2012 compared with the rural areas. Between the regions, however, communities in the Upper East Region performed better than those in the Northern Region.

In the explanations of Raphael (2009) and UNESCO (2015), the poor performance of rural communities in water tariff payment is an aspect of relative poverty. Their explanation is consistent with the postmodernist perspective. In other words, there is a state of structural cause of water poverty because the institutionally determined urban water tariffs lack differentiation in the best interests of the rural low-income households (Bukari, 2017). Statistical simulations based on binary logistic regression, to establish the relationships between willingness to pay and some socio-economic variables in the same study that produced Table 5, indicated that water tariff level, service quality and consumer income size were statistically significant at 0.047, 0.022 and 0.005, respectively (Bukari, 2017). In other words, in the context of the Theory of Planned Behaviour, these factors have strong implications for explaining the attitudes and subjective norms of consumers in terms of their willingness to pay for urban water tariffs as rural households.

The apparent good performance of urban areas over rural areas confirms that urban areas not only have higher household monthly incomes than rural areas, but also that their willingness and ability to pay for water were higher (Munasinghe, 1992). In relation

Table 5. Water tariff payment performance.

Rural northern region communities	Water tariff payment (GH₵)	2010	2011	2012	2013	2014	2015
Yilonayili	Debit	2111.20	674.26	864	946	691	2679
	Credit	1119.40	657.40	501	688	490	2577
	Remark	47% arrears	2% arrears	42% arrears	27% arrears	29% arrears	4% arrears
Gbolo	Debit	–	368.76	232.63	308.52	68	–
	Credit	–	218	145.5	100	100	–
	Remark	–	41% arrears	37% arrears	68% arrears	32% overpaid	–
Dungu	Debit	–	–	511	705	1822.57	1292
	Credit	–	–	146	1140	1550	1091
	Remark	–	–	71% arrears	62% overpaid	15% arrears	16% arrears
Kpalsi	Debit	–	368.76	232.54	245.29	–	–
	Credit	–	270	155.5	100	–	–
	Remark	–	27% arrears	33% arrears	59% arrears	–	–
Jakarayili	Debit	–	–	4.21	135.51	398	174.87
	Credit	–	–	0	30	92	60
	Remark	–	–	100% arrears	78% arrears	77% arrears	66% arrears
Dohinayili	Debit	–	192.68	501.52	1081.52	1000.21	425.38
	Credit	–	0	417	1167	811	321
	Remark	–	100% arrears	17% arrears	8% overpaid	19% arrears	25% arrears
Bilpeila	Debit	–	521	61.54	364.09	98.51	245.30
	Credit	–	79	74	190	101	130
	Remark	–	85% arrears	20% overpaid	48% arrears	2.5% overpaid	47% arrears
Zagyuli	Debit	–	517.46	367	860	2285.17	5,447
	Credit	–	528.00	329	1,175	1956	4,090
	Remark	–	2% overpaid	10% arrears	37% overpaid	14% arrears	25% arrears
Urban Northern Region							
Kakpayili	Debit	–	–	629.64	1,584.68	1,391.57	1,968.92
	Credit			279.00	1,634.00	1,470.90	1,901.00
	Remark			56% arrears	3% overpaid	5.7% overpaid	3.4% arrears
Rural Upper East Region	Water tariff payment (GH₵)	2010	2011	2012	2013	2014	2015
Bulungu	Debit	514.38	290.15	89.36	46	220.77	454.98
	Credit	704.00	185.00	111.50	46	214.00	360.00

Source: Based on tariff data from Ghana Water Company Ltd (2010–15), as in Bukari (2017).

to the question of factors influencing water tariff payment, Bukari (2017) reports that rural respondents in the Upper East and Northern Regions connected to urban water services of the Ghana Water Company Ltd recounted that they paid the same price for piped water to the company as those in urban towns do. However, they the rural people know that the government, the Ghana Water Company Ltd and people in the cities think that most people in rural areas are poor, yet they make them pay for water equally with urban rich households.

Conclusions

The reviewed literature has shown that historically Ghana's water sector saw significant transformation from the 1990s to the 2000s. This is more realistic with the separation of the CWSA from the then Ghana Water and Sewerage Corporation for the former to be responsible for rural and small-town water services in 1998. The Ghana Water and Sewerage Corporation was also converted to the Ghana Water Company Ltd and charged with the responsibility of urban water supply in 1999. These two developments, accompanied by the activities of metropolitan, municipal and district assemblies and the Public Utilities Commission for the regulation of rural and urban water supply and tariff conditions, respectively, characterizes the Community Ownership and Management and Utility Management models, respectively.

By revisiting the Theory of Planned Behaviour, the the Ghana Water Company Ltd, which falls under the Ministry of Sanitation and Water Resources, along with the Public Utilities Regulatory Commission and other regulatory bodies, constitute the perceived power, to influence behavioural control and behavioural intentions in urban water services. However, it is an ailing revelation in the literature that the intended purpose of making water supply and tariff conditions suitable for the socio-economic backgrounds of rural and urban areas has been defeated by the extension of urban water service and tariff conditions to some rural areas. This is ailing because it constitutes a trespassing of the jurisdictions of the Ministry of Local Government and Rural Development, the metropolitan, municipal and district assemblies, and the CWSA to exercise their perceived power and the corresponding influence on behavioural control and behavioural intentions in rural water services as advanced by the Theory of Planned Behaviour. Accordingly, the overlap of policy and institutional roles in the water service and tariff conditions exacerbates the influences of poverty and the breakdown of social norms and other subjective norms on the willingness and abilities to pay tariffs for urban water services extended to communities in rural north Ghana.

Furthermore, the lessons learnt, which are of international interest in the water sector, are that the neoliberal aspects of international cooperation, which led to the use cost-recovery principles under the Aqua Vitens Rand regime, failed to comply with the international advocacies through the MDGs and African Water Vision for 2025, for improving access to safe water, especially in rural areas. This is because urban tariff imposition under cost recovery on the rural poor households impeded the affordability of safe water in this case study.

Based on the aforementioned reasons, it is recommended that the Ministry of Sanitation and Water Resources should ensure that rural and peri-urban communities endowed with groundwater resources but which fall under the urban services of the

Ghana Water Company Ltd be put under the CWSA if they face tariff payment challenges. The ministry should also review the National Water Policy by ensuring compliance with the relevant models of water delivery and tariff conditions for rural and urban areas. However, if there are water-scarce rural communities that have no alternative sources of water apart from the urban water services of the Ghana Water Company Ltd, provisions should be made for preferential treatment of such rural and peri-urban dwellers by reducing the water tariffs for them, which should be recognized by the utility tariff regulator and the service providers.

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References

Adams, N. (2010). *Community expectations of Funsi small town water system in the Upper West Region of Ghana* [Master's thesis]. Kwame Nkrumah University of Science and Technology.
Adank, M., & Tuffuor, B. (2013). *Management models for the provision of small town and peri-urban water services in Ghana*. TPP Project/RCN Ghana.
Akhmouch, A., & Clavreulv, D. (2016). Stakeholder engagement for inclusive water governance: "practicing what we preach" with the Oversees Economic Cooperation and Development water governance initiative. *Water*, *8*(204), 1–17. https://doi.org/10.3390/w8050204
Alhassan, A. (2011). *Urban water policy reforms in Ghana: power, interest and performance* [Master's dissertation]. University of Greenwich.
Anokye, N. A. (2013). *Stakeholder participation in water resources management: The Case of Densu Basin in Ghana* [Doctoral thesis]. University of Amsterdam.
Blanc, D. L. (2007). *A framework for analysing tariffs and subsidies in water provision to urban households in developing countries*. United Nations.
Britwum, N. K. (2004). Institutional challenges for small towns' water supply delivery in Ghana. InT. R. Chaoka (Ed.), *Water resources of arid and semi arid regions. International Conference* (pp. 217–226). London, England: Taylor and Francis Group.
Brook, P. J., & Smith, W. (2002). *Improving access to infrastructure services by the poor: Institutional and policy responses.* Background paper for the private sector sector development of the World Bank. World Bank.
Bukari, F. I. M. (2011). *An assessment of the tri-sector partnership model in pro-poor water tariff collection at Dalun, Northern Region Ghana* [MPhil thesis]. University for Development Studies
Bukari, F. I. M. (2017). *Improving water tariff payment in rural and peri-urban communities connected to urban water systems in northern Ghana* [PhD thesis]. University of Cape Coast.
Cardone, R., & Fonseca, C. (2004). *Financing and cost recovery* (Thematic overview paper 7). International Water and Sanitation Centre.
Community Water and Sanitation Agency. (2004). *Strategic investment plan – 2005–2015*.
Crew, E., & Young, J. (2002, June). *Bridging research and policy: Context, evidence and links* (Working Paper No. 173). Overseas Development Institute.

Dangah, M. M. (2012). *The role of NGOs in the provision of water and sanitation in northern Ghana: the case of Pronet in the Nadowli District* [Master's thesis]. Kwame Nkrumah University of Science and Technology.
Edwards, C., & Cameron, J. (2011). *Economic assessment of improvement in drinking water supply – the global evidence*. IWA Publishing.
Galaa, S. Z., & Bukari, F. I. M. (2014). Water tariff conflict resolution through indigenous participation in tri-water sector partnerships: Dalun cluster communities in northern Ghana. *Development in Practice*, *24*(5–6), 722–734. https://doi.org/10.1080/09614524.2014.940852
Gbedemah, F. S. (2010). *Management uses and values of demand-oriented domestic water facilities in the Akatsi District of Ghana* [Doctoral thesis]. University of Leicester.
Ghana Statistical Service. (2012). *Regional analytical report: Upper East Region*.
Ghana Statistical Service. (2014). *Ghana living standards survey round 6: Poverty profile in Ghana*.
Ghana Water Company Ltd. (2012a). *History of water supply in Ghana*.
Ghana Water Company Ltd. (2012b). *Public Utilities Regulatory Commission publication of water tariffs approved and user water tariff, effective 25th June 2014 schedule*. http://www.gwcl.com.gh/pgs/tarrifs.php
Ghana Water Company Ltd. (2020). *Approved end user water tariff effective July 1, 2020*. Ghana Water Company Ltd.
Grusky, S. (2001, September 9). Privatization tidal waves: IMF/World Bank water policies and the price paid by the poor. *The Multinational Monitor*, p. 9.
Journal Storage. (2019). *Combining search terms & Boolean logic*. Retrieved October 12, 2020, from https://guides.jstor.org/c.php?g=475564&p=3252704
Kangah, H. (2009). *Managing the maintenance of rural water supply facilities in the Builsa District* [Master's dissertation]. University of Cape Coast.
Lamorte, W. W. (2019). *The theory of planned behavior*. Boston University.
López-Mosquera, N., García, T., & Barrena, R. (2014). An extension of the theory of planned behavior to predict willingness to pay for the conservation of an urban park. *Journal of Environmental Management*, *135*, 91–99. https://doi.org/10.1016/j.jenvman.2014.01.019
Makwinja, R., Kosamu, I. B. M., & Kaonga, C. C. (2019). Determinants and values of willingness to pay for water quality improvement: Insights from Chia Lagoon, Malawi. *Sustainability*, *11*(17), 4690. https://doi.org/10.3390/su11174690
Ministry of Water Resources, Works and Housing (MHRWH). (2007). *National water policy*. Government of Ghana.
Mondal, P. (2015). *20 important characteristics of urban community*. Sociology. http://www.yourarticlelibrary.com/sociology/20-important-characteristics-of-urban-community-sociology/4873
Moss, T., & Young, L. (2009). *Saving Ghana from its oil: The case for direct cash distribution*. Center for Global Development.
Munasinghe, M. (1992). *Water supply and environmental management: Developing world applications*. Westview Press.
Nkrumah, K. (1967). *African socialism revisited*. Peace and Socialis Publishers.
Nkrumah, M. K. (2004). Challenges to potable water management in Ghana: Making public–private partnership work. *Ghana Journal of Development Studies*, *1*(2), 85–100.
Nyarko, K., Dwumfour-Asare, B., & Appiah-Effah, E. (2010). *Cost of delivering water services in rural areas and small towns in Ghana*. International Water and Sanitation Center.
Orbach, B. (2012). *What is regulation?* (Arizona Legal Studies Discussion Paper No. 12-27).
Pouta, E., & Rekola, M. (2010). The theory of planned behavior in predicting willingness to pay for abatement of forest regeneration. *Society & Natural Resources*, *14*, 2. https://doi.org/10.1080/089419201300000517
Public Utilities Regulatory Commission. (2005). *Urban water tariff policy*.
Public Utilities Regulatory Commission. (2012). *Eurobonds, TUC's rejection of utility tariffs, dominate Ghanaian media*.
Public Utilities Regulatory Commission. (2013). *Public Utilities Regulatory Commission press release: Approved electricity tariffs effective 1st October 2013*.

Raphael, D. (2009). Poverty, human development and health in Canada: Research, practice and advocacy dilemmas. *Canadian Journal of Nursing Research*, *41*(2), 7–18.

Ricarto, M. (2010). *Water pricing-general.* Sustainable Sanitation and Water Management. Retrieved June 16, 2016, from https://sswm.info/ar/sswm-solutions-bop-markets/improving-water-and-sanitation-services-provided-public-institutions-1/water-pricing—general

Schiller, C., Winters, M., Hanson, H. M., & Ashe, M. C. (2013). A framework for stakeholder identification in concept mapping and health research: A novel process and its application to older adult mobility and the built environment. *BMC Public Health*, *13*(1), 428. https://doi.org/10.1186/1471-2458-13-428

Taqipour, M., Abbasi, E., & Chizari, M. (2015). Farmers' behavior toward membership in Water User Associations in Iran: Applying the theory of planned behavior. *European Online Journal of Natural and Social Sciences*, *4*(2), 336–350.

The Netherlands Development Organization (SNV). (2009). *An assessment of the tri-sector partnership participatory model of pro-poor water delivery services in the Dalun-Tamale Corridor*. SNV.

UNESCO. (2015). *Poverty*. Author.

Vitens Evides International. (2012). *Management contract 2006–2011 for urban water supply in Ghana: A partnership-in and for-development*.

Water and Sanitation Monitoring Platform. (2009). *Glossary of drinking water and sanitation definitions*. UNICEF.

Water and Sanitation Program. (2011). *Water supply and sanitation in Ghana: Turning finance into services for 2015 and beyond*. The World Bank.

WaterAid Ghana. (2005). *National water sector assessment, Ghana*.

Water Resources Commission. (2015). *About WRC*.

Wehn, U., Collins, K., Anema, K., Basco-Carrera, L., & Lerebours, A. (2018). Stakeholder engagement in water governance as social learning: Lessons from practice. *Water International*, *43*(1), 34–59.