

Developing a framework for effective institutional management of Ghana's urban water supply

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Abstract

Purpose – A viable framework has been proven to reduce operational and institutional inefficiencies in the urban water supply sector. The absence of drivers necessary to develop a framework may have hindered institutional development and effective Ghanaian urban water supply management. Thus, the research aims to identify the drivers and develop a framework for effectively managing the urban water supply in Ghana.

Design/methodology/approach – The study utilised a qualitative research design approach and analysed collected data to proffer answers to the research questions. The research sampled 19 participants, and saturation was achieved.

Findings – Findings identified drivers for developing Ghana's urban water supply framework. They categorised them into the availability of water supply resources, the level of professionalism of the personnel, the provision of accessible quality water, the efficient management system of water supply, prudent financial management, ethics for managing water supply and the culture of managing water supply. These pertinent constructs form components of Ghana's urban water sector framework.

Originality/value – Besides supporting transformation and sustainability to develop a framework for managing Ghana's urban water supply sector, policymakers may utilise the developed model to evaluate public urban water supply compliance with Ghana's water sector performance.

Keywords Drivers, Framework, Ghana, Institutional management, Stakeholders, Urban water

Paper type Research paper



1. Introduction

Safe drinking water is one of the 2015 United Nations (UN) “2030 Agenda for Sustainable Development Goals.” It offers a mission where safe drinking water can become a basic human entitlement (Egan and Agyemang, 2019). However, achieving this goal remains vague for many developing countries. In 2015, the UN reported that water scarcity affects at least 40% of the world's population (United Nations, 2015). Also, the report stated that roughly 1,000 kids died daily from avoidable water and sanitation-related sicknesses such as diarrhoeal. Egan and Agyemang (2019) opined that about half of the world's population needs help accessing safe drinking water from Sub-Saharan Africa. Similarly, UNICEF (2015) corroborated the submission of the United Nations (2015). This is a critical concern to the governments in developing countries, especially in Sub-Saharan Africa. Working with international bodies, for example, International Monetary Fund (IMF) and World Bank, for financial support cannot be over-emphasised (Pessoa, 2008). In 2016, besides substantial rises in funding for water-related projects in Ghana (Jubilee Debt Campaign, 2016), about 40% of the urban population did not have access to clean drinking water (Ministry of Finance and Economic Planning, 2017). The absence of drivers necessary to develop a framework may have hindered institutional development and effective Ghanaian urban water supply management.

Previous studies have investigated problems of urban water administration. Saikia *et al.* (2022) focused on resilience indicators for assessing framework and building urban water resilience but lax in stakeholders' engagement. Meaningful engagement of communities through civil society organisations, supporting community networks and information sharing are germane to offering inclusive interventions and services to achieve a prosperous and healthy community. Some focused on financing, but the encumbrances for effective water administration still need to be more adequately understood in developing countries, including Ghana (Schmidt, 2017; Anand, 2017). This is one of the gaps the study will fill. In Ghana, Zaato (2015) studied surrounding contract termination issues. Several studies focused on issues enhancing contract termination (Atarah, 2015; Hirvi and Whitfield, 2015; Suleiman and Khakee, 2017). Also, Appiah-Obeng (2010), Chan and Ameyaw (2013), Ameyaw and Chan (2015), Ameyaw *et al.* (2017), Kelly *et al.* (2018), Egan and Agyemang (2019) and Dosu *et al.* (2021) addressed water supply problems. Chan and Ameyaw (2013) identified the hindrances facing private organisation involved in Ghanaian water supply via public-private partnerships (PPP). Ameyaw and Chan (2015) examined the risk factors allocation in PPP water projects in Ghana. This includes corruption, political interference, foreign exchange rate, water theft and non-payment of bills. Ameyaw *et al.* (2017) evaluated critical success factors for appealing to the private sector in water supply projects in developing countries. Egan and Agyemang (2019) evaluated urban water administration via a failed PPP from 2005 to 2017. Dosu *et al.* (2021) identified the barriers to safe drinking water in Ghana's urban locations and their social and economic implications.

Despite stakeholders, especially communities in governance processes of urban water supply management, none attempt to develop a framework that could incorporate key stakeholders to improve urban water. Thus, the need to develop a framework to enhance the role of stakeholders in the institutional management of urban water supply cannot be over-emphasised, especially in Ghana, with an increasing population in urban locations. The call for urban water has become germane because urban communities are fast-growing and require better facilities, including safe drinking water. This study bridge the theoretical gap. More so, the role of safe drinking water relevant to SDG target 6.1 by 2030 cannot be over-stated. Ghana, a component of Sub-Saharan Africa, one of the poorest regions in the world, is expected to increase its water supply from 32 to 46% (WHO, 2015). About 73% of Ghana's population (23.1 million people) used water that falls below the yardstick of SDG requirements of at-home use (ISSER, 2017). This includes accessibility, availability, reliability and potable water. It implies that people accessing drinking water through an improved water source were close to 3.9

million. This situation could be improved through multi-holistic approaches. Thus, the literature gaps need more empirical insight into how researchers can generate the drivers necessary to develop a framework to enhance institutional development and effective Ghanaian urban water supply management. The study addressed the gap of interest to many developing countries. Thus, the study aims to identify the drivers and develop a framework for effectively managing the urban water supply in Ghana. The objectives to accomplish the study's aim are:

- (1) To identify the drivers necessary to develop an urban water supply framework for effective institutional management.
- (2) To develop a framework for effective management of urban water supply in Ghana.

2. Literature review

2.1 *Management of urban water supply*

Water management issues are intricate for all countries because of the worries of global climate change. Lax water management threatens sustainable infrastructure development, especially in developing countries. This is compounded with unsustainable practices in managing fragile humans and ecosystems (Opoku *et al.*, 2022; Gorse *et al.*, 2023). This concern is complicated by the desire to accomplish Sustainable Development Goals in less than one decade, including clean water and sanitation (Egan and Agyemang, 2019). They affirmed that the Ghanaian Government and supranational establishments, such as the IMF and the World Bank, need to re-focus energy on appealing with transparency and network governance (Addo, 2020; Dosu *et al.*, 2021). Although infrastructure provision such as urban water provision is the sole responsibility of the government, especially in developing countries (Olojede *et al.*, 2023), reforms and engaging stakeholders are inclusive of urban water management. Thus, an institutional framework is pertinent to achieve this goal. This is currently missing. The reform will address the various issues and proffer ways to enhance urban water supply sustainability. Fukufuka and Jacobs (2018) acknowledged the case of Tongan development projects. Stakeholders, including village actors, forged an influence as the World Bank projects tend to become intricate as projects progress. Ghana's Government has experienced some encumbrances regarding aims, awareness and power to direct urban water supply management (Egan and Agyemang, 2019). Anand (2017) claimed that the major hindrance in attaining "sustainable" water management is the need to proffer solutions to the issues resulting from many perspectives brought by many stakeholders. One-way stakeholders, especially policymakers and scholars, may resolve this is via an institutional framework that will embrace all the necessary drivers to yield quality management of urban water supply in Ghana. Regulatory issues and legal and institutional arrangements as hindrances to effective urban water management are pertinent (Abderrahman, 2000; Addo, 2020; Dosu *et al.*, 2021). Water administration philosophies have shifted from emphasising scarcity to focusing on security relevance (Schmidt, 2017). "Scarcity" emphasised human rights and the needs of the public for a safe supply of clean water, while "Security," on the other hand, emphasised claims of government maladministration and economic incompetence. Bayliss (2014) avowed that sequel to the shift to "security," understandings of water administration have transmuted from "public service" to "commodity."

Mian *et al.* (2023) affirmed that water utilities applying drinking water management strategies could ensure water is safe for drinking, especially in rapid population communities. This strategy has threatened SDGs, environmental emissions and increased inclination towards climate change. To mitigate these issues, Mian *et al.* (2023) developed an integrated framework combining life cycle thinking and water quality assessment techniques to appraise the strategy's performance regarding economics, environment and water quality. Globally, drinking water management is complex, especially in some developing countries, Ghana inclusive. Bereskie *et al.* (2017) opined that the World Health Organisation water safety plan mechanism for

drinking water management represents an option preventative management framework to the traditional approaches. Sustainable urban water management has become critical because of the increasing demand for sustainable development and its impact on urban infrastructure (Hellstrom *et al.*, 2000; Addo, 2020). However, a similar framework, City Water Resilience Framework, was developed to strengthen urban water resilience supply management in Cape Town, South Africa (Saikia *et al.*, 2022). They focused on resilience indicators for assessing the framework and building urban water resilience. Cole *et al.* (2018) developed a framework for Integrated Urban Water Management in the United States of America within a local government context. They focused on the evolution of the framework mechanism and its impact on the local case study. Beside the present study identifying the drivers, the study would develop an urban water supply framework for effective institutional management in a developing urban location. This is pertinent to enhance sustainable urban water supply management.

In Ghana, regarding urban water administration, the Ghana Water and Sewerage Corporation (GWSC) was established in 1965. The sole function is managing sanitation, national water supply and setting water tariffs. About three decades and three years later, the corporation was divided into two entities (Ghana Water Company Limited (GWCL) and Community Water and Sanitation Agency). The former was charged with the responsibility for urban water supply in 2017. In the early 1980s, GWSC exhibited operational inefficiency due to deteriorating pipe connections and multiple institutional encumbrances (Wolf *et al.*, 2007). In 2005, a five-year privatisation contract was awarded Aqua Vitens Rand Limited to manage the urban water supply (Amenga-Etego and Grusky, 2005). The contractor's performance was hostile (Atarah, 2015; Badu *et al.*, 2013) and terminated in July 2011. The government took over the management of GWCL at that time. The Aqua Vitens Rand Limited experience was robbed of weak due diligence, poor planning and poor contract negotiation (Zaato, 2015). The Aqua Vitens Rand Limited experience made the World Bank, one of the big financiers to emphasise profitability, cost efficiency goals, privatisation and full cost recovery for urban water supply projects (Amenga-Etego and Grusky, 2005; Addo, 2020). However, in these encumbrances, the reworking of water management goals became evident in 2017. The Government of Ghana's 2014 "Water Sector Strategic Development Plan (2012–2025)" stated that "*the vision of the water sector is 'sustainable water and basic sanitation for all by 2025'*", which means ensuring that "*all people living in Ghana have access to adequate, safe, affordable and reliable water services, practice safe sanitation and hygiene, and that water resources are sustainably managed*" [Ministry of Water Resources, Works and Housing, 2014, p. 16]. Besides the financial commitment required, the institutional framework is germane to achieve this goal.

2.2 Study's supporting theory

The study adopted Scott's institutional framework approach theory. Scott (1987) affirmed that organisations either give up or change their reactions depending on circumstances or demands. Therefore, Mohamed (2017) described the concept as developing standards, principles and codes suitable for transparency to assist clients. A concise description of theory and knowledge of institutional theory focuses on deeper, more resilient aspects of social structure (Scott, 2008). Weedon (1987) avowed that institutional theory diverts attention from real-life concepts. An institutional approach also deals with process-based knowledge as rules are enacted, not divined (Lawrence, 1999). According to Scott, applying the framework emphasises institutions' capability to constrain and regulate behaviour. The three pillars hypothesised by Scott on institutionalisation were applied in this study within the institutional process of ensuring stakeholder participation in water supply management to the urban communities by Ghana's Water Company Limited (GWCL). This study is aimed at organisational transformation in the form of a public utility organisation linking other stakeholders in delivering urban water supply to communities in Ghana. The Scott institutionalisation framework centres on the organisation's cognitive, regulative and normative systems. The GWCL's readiness for improvement and the

highlighting of encumbrances and opportunities for upgrading water supply to urban communities were also analysed under the category of stated objectives.

3. Research method

This study adopted a qualitative approach. In the qualitative research design, phenomenology was adopted. Phenomenology focused on the experience of the central phenomenon and analysed the meaning of the collected data by describing themes about the essence of the experience (Plano-Clark and Creswell, 2015; Ebekozién and Aigbavboa, 2023), through a face-to-face interview. The face-to-face interview was based on the investigators' experience (Denzin and Lincoln, 2017; Creswell and Creswell, 2018; Kikwasi and Mbuya, 2019) and a pilot semi-structured questions interview test (Ebekozién et al., 2019). The study participants were urban water services providers, regulatory bodies, government agencies and non-governmental agencies, as illustrated in Table 1. Purposive sampling technique was utilised via semi-structured questions to achieve the study's objectives. Bryman (2012) and Ibrahim et al. (2022) affirmed that purposive sampling is a non-probability in which participants are sampled to respond to semi-structured questions. The interviewees post is hidden, as illustrated in Table 1. It was concealed because of the study's ethical considerations. The engaged participants are experts.

The study engaged 19 participants, as presented in Table 1 and saturation was achieved at the 17th participant. This was established when there was no new construct from the interview data after the 17th participant. Also, the research utilised thematic analysis and manually analysed the generated codes. The investigators read nineteen documents several times. They doubled as the study's coders to describe the participants' opinions regarding the phenomenon. Ebekozién et al. (2022a) utilised the same mechanism to develop their studies' initial coding. The study adopted two coding stages (Saldana, 2015). This aligns with (Ebekozién et al., 2020b). The first stage is open coding (Jaafar et al., 2021). The last phase involves utilising the emerging sub-themes to re-read the transcript and find the key constructs. Triangulation, member checking and researcher reflexivity were employed as the validity method for the collected data (Ebekozién et al., 2019). Sixty codes were identified and re-assembled into ten sub-themes. Two themes were generated from the ten sub-themes and presented in the next section.

4. Findings

The results from the analysed face-to-face and guided by the stated objectives are presented in this section. Findings concerning exploring information to develop an urban water supply framework cannot be overstated.

4.1 Theme one: information to develop an urban water supply framework

This sub-section offers the participants to proffer information that will guide urban water supply framework formulation in Ghana, and by extension, to other developing countries with similar urban water supply challenges. One germane point from this theme is the categorised information necessary (drivers) to develop an urban water supply framework. The seven sub-themes (drivers) emerged from the analysed data as presented. This includes

Table 1.
Background of the
participants

Item	Categorisation of interviewees	Code of interviewees	Number of interviewees
1	Urban water service providers	UWSP	P1-P3
2	Regulatory bodies	RGB	P4-P6
3	Government agencies	gigaampere	P7-P11
4	Non-governmental agencies	NGA	P12-P19
Total number of interviewees			19
Source(s): Authors work			

the availability of water supply resources, level of professionalism of the personnel, provision of accessible quality water, the efficient management system of water supply, prudent financial management, ethics for managing water supply and culture of managing water supply. Participant P4 says, "... *These are the institutional drivers if instituted in a framework that will ensure quality management of urban water supply in Ghana ...*" Thus, they are significant components of effective or quality management of urban water supply in Ghana (P2, P4, P5, P12, & P17).

4.1.1 Availability of water supply resources. Findings grouped equipment for urban water supply (P2, P5, & P16), connections of water systems in the urban areas, meters for urban water supply (P3), working facilities for urban water supply, power supply, information and communication services (P13), resources such as river source for urban water supply (P12) and the existence of a standard supply resources and equipment as components of availability of water supply resources. Participant P6 says, "... *Stable power supply is key for efficiency of urban water supply, and recent epileptic power outage should be review for urban water supply sustainability ...*"

4.1.2 Level of professionalism of the personnel. The level of professionalism of staffers is one of the key drivers for efficiency regarding the urban water supply institutional framework. "... *A default in this aspect is likened to a faulty foundation ...*" said P2. Findings grouped nine variables under this category. This includes the attitude of the staff of GWCL in urban water supply, technical support for water supply services (P1-P3), maintenance culture of GWCL, staff of GWCL's response to complaints (P1), the experience of GWCL's staffers in servicing water pipes and other types of machinery for urban water supply (P4, P12, & P17). Others are the know-how of the staff of GWCL in the distribution of water to clients, the ability of the staff of GWCL to plan and develop water supply systems (P13), the supportiveness of staff of GWCL and competency of staff of GWCL in water supply management (P18).

4.1.3 Provision of accessible quality water. This sub-theme is critical regarding regulatory framework components because the inaccessibility of quality water would hinder clean and drinkable urban water supply. Findings grouped six variables under this sub-theme. This includes the continuous supply of water in urban areas (P1), cleanliness of water supplied in the urban areas (P8), access to water supply in the urban areas (P3), unpolluted water systems for urban water supply (P14), adequacy of water supply in the urban areas (P12, P15, & P19) and overall quality of water supplied.

4.1.4 Efficient management system of water supply. Variables that emerged under this sub-theme are level of supervision, administration of water supply (P2), participation of regulatory bodies in the management of urban water supply (P13), continuity in the management of urban water supply (P1-P3), stakeholder engagement in the management of urban water supply (P6), flexibility in the administration of urban water supply, line of authority in the management of water supply and incentives for stakeholder engagement. P14 says, "... *Urban water supply management is germane to achieving water sufficiency and sustainability. Urban water supply sustainability can be assured if there is proper management from the onset ...*"

4.1.5 Prudent financial management. Prompt collections of water bills, fairness of the charging system of water supply, billing systems for urban water supply (P5), government subvention for providing urban water supply, a payment system for urban water supply (P12), affordability of urban water supply and funds for providing urban water supply infrastructure emerged as the variables grouped under prudent financial management. P18 says, "... *For every business management, financial prudence cannot be over-emphasised ...*" Thus, this sub-theme should be a key driver for an efficient urban water supply framework. P11 says, "... *generating revenue from the investment to sustain routine maintenance is one critical issue that past and present governments have struggled to tackle. This may hinder the urban water supply if not well managed ...*"

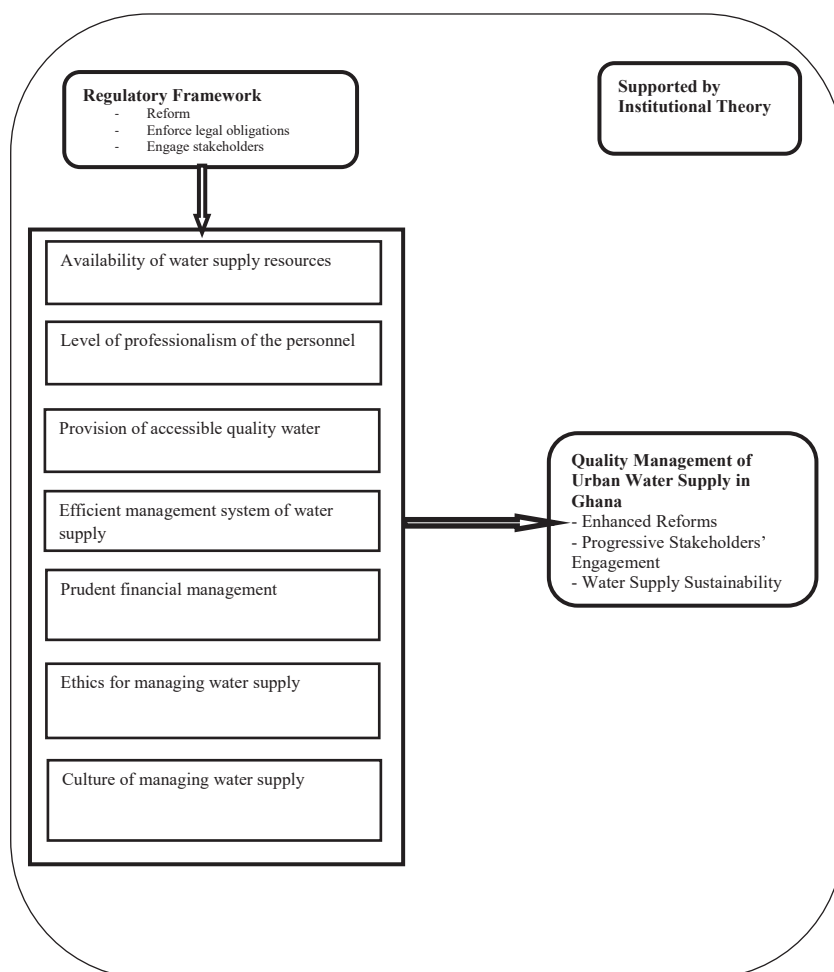
4.1.6 Ethics for managing water supply. Findings grouped habits of workers ensure effective management urban water supply, roles are specified for participation in the managing urban water supply (P9), managers of urban water supply always fulfil their moral obligations (P6), work ethic for managing urban water supply is effective (P3) and right channels are always followed in managing urban water supply. Findings reveal that the duties and responsibilities of key stakeholders for engagement in urban water supply management are detailed to enhance efficiency and sustainability (P2, P5, P9, & P17).

4.1.7 Culture of managing water supply. Regarding the efficiency of urban water supply and its management, culture is a key component that can influence the quality of management. The idea of effective management of urban water supply, the desire to ensure that urban water supply is managed effectively (P3), values of management of urban water supply (P4), the value of stakeholder engagement in urban water supply, society's appreciation of community engagement in urban water supply (P16), effective cultural systems for the management of urban water supply (P12 & P18), internal change for the effective management of urban water supply (P11), and perceived current system of managing urban water supply emerged as the variables grouped under the culture of managing water supply.

4.2 Theme two: develop a framework for quality management of urban water supply

This sub-section collated seven sub-themes (Theme One) that proffer answers to identify key drivers for developing a framework for Ghana's urban water supply. It attempts to accomplish the key study's aim (developing a framework for quality management of urban water supply in Ghana). [Figure 1](#) shows the developed framework. For this study, drivers necessary to develop Ghana's urban water supply framework were adopted as the independent variables (availability of water supply resources, level of professionalism of personnel, provision of accessible quality water, efficient management system of water supply, prudent financial management, ethics for managing water supply and culture of managing water supply) while the quality management of urban water supply was adopted as the dependent variable. These pertinent constructs form components of Ghana's urban water supply framework. Findings show that a framework (regulatory and institutional) is long overdue. Participant P13 says, "... *For efficiency and sustainability of the efficiency, a viable framework is needed for better service delivery ...*"

What is noteworthy from the empirical findings is that they revealed that there are drivers necessary to develop Ghana's urban water supply framework. For the effectiveness of water supply in urban areas, the necessary drivers and their variables must be taken seriously since they can influence the quality management of urban water supply in Ghana. This signifies the need for crucial attention for an effective urban water supply. Findings suggest policy reforms and stakeholders' engagement to enhance urban water supply sector efficiency. P3 says, "... *reform is dynamic and should be embraced by all progressives. Policies reforms in the era of digitalisation for effective management of urban water supply cannot be over-emphasised ...*" Findings show that more stakeholder engagement will mitigate the bureaucratic structure of GWCL, and the outcome would yield effective management of urban water supply. P16 says, "... *The developed framework captured the main study's variables to reflect the purpose ...*" The essence is to improve the quality management of the urban water supply sector in Ghana and other developing countries with similar hindrances. Findings show that it is germane that an urban water supply framework should be feasible and accessible. The relevant government regulatory agencies should ensure that minimum standards are upheld.



Source(s): Authors work

Figure 1.
Developed framework
for Ghana's urban
water supply

5. Discussion

Findings clustered information necessary to develop an urban water supply framework into the availability of water supply resources, level of professionalism of the personnel, provision of accessible quality water, the efficient management system of water supply, prudent financial management, ethics for managing water supply and culture of managing water supply. Regarding availability of water supply resources, findings agree with [Abanyie *et al.* \(2023\)](#). They found a progressive decline in water-related infections after increased access to improved, safe drinking water. It was emphasised that operational and maintenance should be conducted regularly to ensure water supply sustainability to communities. Training technicians to manage key equipment in the facilities is pertinent to promote positive livelihoods in these communities by providing accessible quality water ([Abanyie *et al.*, 2023](#)). Also, findings agree with [Kelly *et al.* \(2018\)](#). They found that operation and maintenance committees are critical in managing community-water supply issues in sub-Saharan Africa,

Ghana inclusive. These committees ensure proper management but suggest a long engagement to enhance their experience and patterns in management. Also, these committees sometimes have funding issues, especially during the rainy season, hindering their performance regarding operation and maintenance. Thus, training in financial management is key to mitigating this challenge.

Regarding ethical consideration, findings agree with Hashemi *et al.* (2007) and Anderson (2007). Hashemi *et al.* (2007) found that ethical considerations in urban water supply administration are relevant to underlying policy issues. Anderson (2007) affirmed that the request for ethical issues is important in urban water supply administration. It can strengthen the decision-making process and needs simultaneous consideration from diverse water use areas (Duflo *et al.*, 2012). For the culture of managing water supply, findings agree with Luckmann and Farber (2016) and found that cultural systems of engagement, values, beliefs and assumptions of stakeholders, internal change to engage, social identity and personal desire to engage and willingness to engage are important to create the needed environment for stakeholders to develop confidence in the effort made in the provision of urban water supply systems. Regarding implementation and compliance, findings suggest it must be all-inclusive to yield the expected results. Results such as efficiency, sustainability, transparency, accountability and autonomy may see the light of day if all hands are on deck (OECD, 2015). Also, the study's developed framework for Ghana's urban water supply and articulated dependent and independent variables that emerged from the results are parts of the implications for practice and research. Regarding research implications, future researchers can research the variables, especially the independent variables, and their items through a quantitative method, while for practice, the developed framework may guide the stakeholders in the urban water supply sector. This is because the developed framework emphasised suggestions such as policy reform, stakeholder engagement and embracing obligations. Thus, the research will contribute to Ghana's urban water supply sector.

6. Conclusion and recommendations

This study investigated the drivers necessary to develop a framework for effectively managing urban water supply in Ghana. The study adopted a phenomenology type of qualitative research to explore the drivers necessary to develop the urban water supply framework. The developed framework intends to improve the urban water supply in Ghana and may transform and sustain the sector if applied effectively. The framework will enhance the institutional processes and stakeholders' engagement at all levels to influence the effective management of urban water supply. This approach will reawaken the stakeholders, especially the urban water services providers and relevant government regulatory agencies related to urban water supply in Ghana. This research presented two outcomes: identified the drivers necessary to develop an urban water supply framework for effective institutional management and developed a framework for effective management of urban water supply in Ghana. Findings revealed the need for a functional framework in Ghana's urban water supply sector. This is of concern to efficient institutional processes and stakeholders' engagement in the management of urban water supply. This can be improved by implementing the suggestions in the developed Ghana's urban water supply framework, as presented in Figure 1, such as the policy reforms, enforcing legal obligations and engaging stakeholders.

Findings have implications (theoretical, social and practical) for the body of knowledge. Theoretically, new constructs emerged from the analysed data, such as the availability of water supply resources, the level of professionalism of the personnel, provision of accessible quality water, the efficient management system of water supply, prudent financial management, ethics for managing water supply and the culture of managing water supply. The items/dimensions associated with these variables could be used in future studies. In practice, the framework

should increase the awareness of the public urban water supply sector concerning the level of management of the urban water supply sector in Ghana. Regarding the social implications, it would improve health, hygiene, productivity and mitigate stress on people, especially children and women. Also, social activities would progressively improve because of the decline in water-related illnesses. The outcome would promote livelihoods in communities. Thus, the government should see urban water supply and sustainability via effective management and institutional framework as part of the social responsibility to its citizens. Stakeholders should embrace effective urban water supply framework management across Ghana's public water supply centres. As part of this study's implications, it supports the transformation and sustainability to develop a framework for effectively managing Ghana's urban water supply sector. Policymakers and researchers may utilise the framework to evaluate the level of public urban water supply compliance with Ghana's water sector presentation in the future. This can lead to sustainable outcomes in Ghana's public urban water supply and other developing countries with the same urban water challenges.

Nevertheless, there are some things that could be improved in future studies. It does not influence the robustness of the findings. The research focuses only on the Accra East, Accra West and Tema Regions of Ghana. The perception of urban water stakeholders regarding the effective management of urban water supply from other regions may permit contrasts in future studies. Also, the study adopted a qualitative technique. This is a limitation because of the sample size and collated data. Thus, future study is germane to further refine the emerged items from the qualitative analysis using a detailed empirical statistical analysis to develop a model of good fit that may develop an urban water supply framework in other parts of Ghana. Also, the drivers and framework should be validated in future studies via triangulation to enhance the findings' reliability and generalisation.

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