GOVERNANCE AND SUSTAINABILITY OF PUBLIC-PRIVATE PARTNERSHIP IN GHANA'S URBAN WATER SECTOR: THE CASE OF TESHIE-NUNGUA SEA WATER DESALINATION PROJECT

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ABSTRACT

The paper explores the governance architecture of the Teshie-Nungua Sea Water Desalination Project (T-NSDP) and its implications for sustainability outcomes and Ghana's Sustainable Development Goals (SDGs) agenda. Using qualitative research design by employing purposive sampling and snowball sampling techniques, qualitative data was collected from a sample of 14 individual participants and 2 different focus-group discussants. Thematic analysis was employed to analyse primary data. The results revealed that the project operates under a Build-Own-Operate and Transfer Public-Private Partnership (PPP) model which requires the private partners to invest, procure, process and distribute potable water to Teshie-Nungua and surrounding communities. The results indicate that implementation was threatened by a lack of due diligence, weak oversight and accountability, and poor financial arrangements, as well as deficit in technical expertise on the part of the contracting authority, leading to stalling of the project. The study recommends that the Government of Ghana improves on its policy coherence and the monitoring function, develop technical capacity, and foster active ownership and commitment of key state institutions to accentuate the sustainability outcomes in order to meet both intended and unintended project outcomes.

KEYWORDS: Water governance, Private-Public Partnership, sustainability, SDGs, T-NSDP. Ghana.

1.0 INTRODUCTION

The involvement of private investment in public infrastructural services fosters effective partnership for efficiency in resource sharing in the provision of public goods and services, while reducing the complexity of social problems (Klijn, 2010; O'Leary & Vij, 2012). In the last two decades, Public-Private Partnerships (PPPs) have been recognized as instruments for delivering sustainability goals (Grimsey & Lewis, 2004; Hodge, Greve, & Boardman, 2010; Lenferink, Tillema, & Arts, 2013; Yescombe, 2007). However, the adoption of PPP in many countries for economic, social and political reasons (Nyanyofio, Domfeh, Buabeng, Maloreh-Nyamekye, & Appiah-Agyekum, 2022; Ahenkan, 2019; Ohemeng & Grant, 2008) has experienced some governance deficits, including insufficient funding, political interference and public sector capacity deficit (Nyanyofio et al., 2022; Ahenkan, 2019; Verhoest, Thiel, Bouchaert & Laegreid, 2012; Free & Radcliffe, 2009). Meanwhile, PPP risks the dilemma of development direction and value orientation due to the dominance of economic considerations in current studies and practices (Cheng, Wang, Xiong, Zhu, Cheng, 2021; Wang, Xiong, Wu, & Zhu, 2018) without emphasis on governance practices as well. The reality is that, the objectives for the implementation of many PPP programmes are not exclusively economic, but in many instances non-economic (Nyanyofio et al., 2022; Wang, Xiong, Wu, & Zhu, 2018: World Bank, 2018). The neglect of research focus on governance architecture of PPP and its implications for sustainable outcomes ought to be resolved, particularly in developing countries where PPP is given prominence. In particular, as observed in Ghana, the focus on economic issues in the sustainability of public goods and services established under PPP seems unsatisfactory, requiring analysis of other non-economic factors such as

governance structures (Ahenkan, 2019), hence the need to explore these perspectives in PPP research. The policy recommendations deducible from such a study would not only contribute to the literature but also the achievement of sustainable outcomes of PPPs. This intends to expand the existing theoretical contributions, by highlighting the necessity of integrating both economic and non-economic constructs regarding PPPs.

Also, recent studies in the area have recognised the need to incorporate sustainability considerations in PPP infrastructure projects (Akomea-Frimpong, Jin & Osei-Kyei, 2022; Pinz, Roudyani &Thaler, 2018; Hueskes, Verhoest, Block, 2017). As Pinz et al. (2018) noted, the growing influence of PPPs highlights the need for further enquiry into their contributions to sustainability-related objectives. Akomea-Frimpong et al. (2022) argue that the incorporation of sustainability issues into public infrastructure projects through the adoption of PPP is central to the realization of Sustainable Development Goals (SDGs). Akomea-Frimpong et al. (2022) found that despite acknowledgement of social, economic, and environmental factors as core tenets of sustainability, there is limited interest within the PPP research field that provides an integrative review and operationalisation into the key sustainable performance measures. Similarly, despite the plethora of PPPs implemented in Ghana and the emphasis in literature for it to be studied, the inherent sustainability outcomes have not been explored, particularly in the services sector.

Besides, a recent study by Nyanyofio *et al*. (2022) on the governance arrangements for the implementation of PPP management contract model in Ghana's rural water sector found that a robust community-owned governance architecture is crucial for successful outcomes. The paper recommended that the focus on PPP management contract model in a rural/community water sector may limit generalization of its findings to different contexts, hence the need for broader research on other PPP models with larger numbers of participants.

In response to these gaps in empirical literature, the present study aims to contribute to the PPP governance literature by assessing investigating the governance architecture for a BOOT model in Ghana's urban water sector, focusing on the Teshie-Nungua Sea Water Desalination Project (T-NSDP), as well as exploring the governance implications for PPP water sustainability outcomes and Ghana's SDGs, serving as the basis for practical and managerial policy making. The uniqueness of the current study from existing ones globally (Akomea-Frimpong, Jin & Osei-Kyei, 2022; Pinz, Roudyani & Thaler, 2018) and locally (e.g., Nyanyofio et al, 2022) are empirically and theoretically indicative. First, the study highlights the fact that even though PPP governance architecture can promote the successful delivery of urban-based PPP water projects to facilitate the achievement of SDG goal six on access to **"**clean water and sanitation for all"**,** enhanced governance arrangements could have implications for broader economic, social, environmental and governance sustainability outcomes. While some studies have been done in the developed (Wang et al., 2020; Wei et al., 2018; Verhoest, et al., 2016; Mouraviev, N., & Kakabadse, 2015; Sabry 2015) and developing economies (Nyanyofio et al., 2022; Akomea-Frimpong et al., 2022); Ahenkan 2019), there is a paucity of literature to unearth the link between PPP governance practices and sustainability outcomes in the Ghana context. Among the few empirical PPP studies in Ghana are; mainstreaming PPP (Ahenkan, 2019), effectiveness of PPP (Nyanyofio et al., 2022) and performance measurement of PPP projects (Akomea-Frimpong et al., 2022). These studies on governance of PPPs in Ghana have predominantly focused on non-sea water and less multi-stakeholder PPP, with only a few in the water related sector (Nyanyofio et al., 2022; Akomea-Frimpong et al., 2022). Hence, this paper contributes to the literature by providing new understanding on governance practices of PPPs and sustainability of such projects generally and particularly in Ghana.

Second, the paper deviates from the dominant application of economic and neo-liberal theoretical paradigms in PPP research and instead deploys public administration theories. Thus, the paper makes a theoretical contribution by deploying the public-value and stakeholder theories to magnify important dimensions of the PPP architecture.

Third, the study focuses on the T-NSDP as a case, recognizing the huge capital involved in the project and the uniqueness of the BOOT PPP model, as well as its enormous implications for sustainability outcomes. The import of the study will spawn further interest for future research on different PPP models. Fourth and finally, the PPP system is dynamic with increasing complexities, with diverse stakeholders which requires continuous and up-to-date knowledge through research. The present study fills these gaps. The rest of the paper is structured as follows. The literature review is in section two while materials and methods are in section three. The results and discussion are in section four while the conclusion and policy recommendation are in section five.

2.0 LITERATURE REVIEW

2.1 The Theoretical Framework

This study used both the Stakeholders Theory and Public Value Theory as the main theoretical framework. Freeman (1984) defined the stakeholders from two perspectives: first, it can be described as a "group of people who can affect or can be affected by the achievement of the organization's objectives" and second, as "those groups who are vital to the survival of the organization" (Freeman, 2004, p. 46). According to Nwanji and Howell (2007), Stakeholder Theory serves as a framework for prescribing, describing, and developing options for corporate governance that integrates and balances the interests of many parties.

Freeman and Phillips (2002, p. 342) focused on "The Principle of Stakeholder Responsibility", and they argued that all parties involved in a social contract must duly and mutually comply with their responsibility and accountability for their actions, including any potential harm they cause other parties or stakeholders involved to mitigate the government regulations. According to McDonald (2005), citizen involvement fits the governance dimension instead of the partnership architecture itself.

Investigating the implementation of the T-NSDP from the perspective of the stakeholder theory highlights how parties to the project discharge their responsibilities and manage their relationships in a way that minimizes harm and improve the value of the consequences of their actions, while at the same time addressing the overarching interests of all stakeholders more sustainably (Nwanji &Howell, 2007).

On the public value theory, Barzelay (2007) argued that public value is "what public managers do or a normative prescription of what they should do" (p. 526). Thus, public value is developed through the commitment of partnerships and organisations (Hartley et al., 2017; Hartley et al., 2015). Thus, the public value theory explains the democratic and deliberative processes by which public officials and users of PPP projects co-operate in response to -what the public values and also, -what adds value to the public sphere (Benington, 2011, p. 31) while creating values relevant to sustainable societal outcomes (Hartley et al. 2017). This presupposes that PPP in the water sector can create public value once there is sufficient commitment from the partners involved, including the government, private investors and the community.

2.2 Concept of Governance and Sustainability in Urban Water Supply

OECD (2004) argued that "governance involves a set of relationships between a company's management, its board, its shareholders and other stakeholders" (p. 11). Governance involves relationships, tools and management of a complexity of various actors in the delivery of public service (Wang et al., 2020). Puni and Anlesinya (2020) define governance as a set of relationships between a company’s board, management, its shareholders and stakeholders.

Thus, this set of relationships offers the necessary arrangements that can be used to achieve organisational objectives, and engage in performance monitoring and evaluation towards good governance and outcomes of the project (OECD, 2002). Wei et al. (2018) maintained that effective water governance can expand water quality because stakeholders' welfare is constantly fused into

the framework and most fundamentally employed toward realizing effective arrangement, harmonisation and joint production among these key stakeholders. Sabry (2015) embraces good governance institutions as a precursor to promoting effective Public-Private Partnerships and collaborations. According to the reference guide of UNECE (2008), a good governance framework in a PPP arrangement should exhibit six key principles including Accountability, Decency, Participation, Efficiency, Fairness and Transparency.

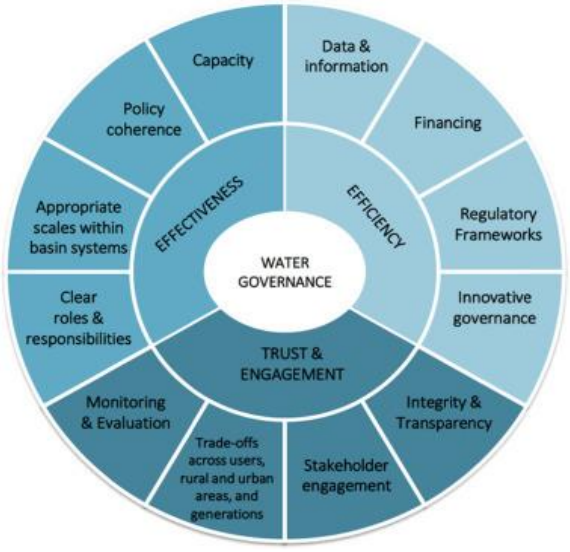
The Efficiency dimension of the principle focuses on the prudent use of resources without delay, waste, corruption or unjustified burden on future generations. Accountability focuses on the degree to which both public and private actors in PPP are answerable to the general public for their actions and behaviours; The Transparency aspect hinges on the clarity and openness in decision-making by the actors involved. The Decency aspect of the principles deliberates on the rules of development and implementation in a way that eschews potential harm being caused to people. The Fairness focuses on ensuring equal application of rules to all members of society, while Participation highlights the involvement of all stakeholders (UNECE, 2008).

The incorporation of governance principles in urban water supply has received increased recognition by policymakers and researchers. With the increasing wave of urbanization, both international development prescriptions and policy research have recognised the need to encourage stakeholder participation in urban water management, for short- and long-term sustainability considerations (Morinville, & Harris, 2014).

2.3 OECD Principles of Water Governance & Sustainable Development Goals (SDGs)

The water governance principles provide the arrangements for key players of PPP water projects to investigate and understand the governance system's performance and to evaluate the appropriateness of implementing PPP projects successfully (OECD, 2015). Thus, water governance involves diverse political, institutional, processes (formal and informal), demonstrative rules and practices through which informed decisions are built and implemented with much emphasis on the interests of other stakeholders, including the community and the end-users, and the responsibility of managing the water resources and facilities execution (OECD, 2015).

Figure 1: OECD 12 Principles of Water Governance



Source: Adopted from OECD (2015)

The OECD identifies twelve principles of good water governance framework which can be applied in all aspects of water management functions, all water uses, and all government levels irrespective of the ownership models. These are broadly based on efficiency, effectiveness, and trust and

engagement as shown in Figure 1 (OECD, 2015a; OECD, 2018). OECD (2015a) argues that water governance *efficiency* focuses on expanding the benefits and welfare of sustainable water management practices, including cost reduction to the community and the government. Additionally, water governance *effectiveness* focuses on policies and principles in project implementation in relation to best-practices for achieving objectives, executions and expectations. Moreover, the principles of *trust and engagement* in water governance, support the creation of confidence, fairness, and democratic legitimacy that would enhance stakeholders' interest in decision-making and sustainable PPP water management practices (OECD, 2015).

According to Akomea-Frimpong et al. (2022), the integration of sustainable practices into PPP infrastructure projects is a prerequisite to the realization of the United Nation's Sustainable Development Goals (SDGs). Since the inception of the SDGs agenda in 2015, the attention of the world has been shifting towards more sustainable practices, and it is essential that the conventional performance measurement models on PPP projects also adapt to the trend of sustainable practices. Meanwhile, sustainable potable water supply to rural and urban communities has been found to have significantly influenced the achievement of SDG targets, specifically SDG 6 (clean water and sanitation), SDG 1 (no poverty), SDG 2 (elimination of hunger), SDG 4 (equitable and inclusive quality education), SDG 3 (healthy lives), SDG 13 (life below water), and SDG 15 (life on land) as well as promoting sustainable local socio-economic development (SDG 8) (Nyanyofio et al., 2022; Mugagga and Nabaasa, 2016).

Since 2011, Ghana's PPP regime has been governed by the *National Policy on Public-Private Partnership (PPP)*, now referred to as the Public Private Partnership Act, 2020 (Act 1039) which gives full expression to the relevant sections of the OECD governance framework. To ensure that Ghana realizes the overall value-for-money in its PPP regime, the National PPP policy framework requires that the Government of Ghana shall establish intuitional arrangements for successful implementation of PPP programmes. The governance institutions shall undertake among others; policy development monitoring and enforcement, project preparation and execution, gatekeeping and approvals, as well as PPP promotion and advise. The adoption of the National Policy Framework as a guideline for implementing PPP projects in Ghana represents an adequate governance mechanism for the delivery of sound PPP in the Ghanaian water sector. This is in line with the World Bank, UNECE (2008) and OECD (2015) PPP governance frameworks that highlight the need to promote the principles of efficiency, effectiveness, trust and engagement, accountability, decency, participation, fairness and transparency in PPP arrangements.

2.4 PPP Sustainability

With the inauguration of the United Nation's Sustainable Development Goals (SDGs) in 2015, sustainability has received significant research appeal in various areas. The increasing recognition of sustainability is not only limited to procurement and PPP literature. In the field of project management, sustainability has seen some attention as well (Silvius, Schipper, Planko, Van Den Brink, & Köhler, 2012). Despite this growing attention, debate continues to rage on the exact definition of the sustainability concept (Hueskes et al., 2017) and a subject of controversy, particularly between strong and weak sustainability (Neumayer, 2003) making the concept ambiguous. Brundtland (1987) offers a more appropriate explanation of sustainability, as actions that produce the kind of development that addresses the needs of the current generation with adequate mechanisms that preserve resources for future generations.

In their study, Liang and Wang (2019) argued that to realize a balance between PPP arrangements and sustainability, there is the need for the integration of efficiency, technological innovation and social dynamics into such projects. What remains a puzzle, however, is how the incorporation of sustainability considerations can be encouraged, and how public authority will address sustainability issues in PPP contracts, especially as private partners in PPPs are reluctant in addressing such concerns (Silvius, 2012). Studies have underscored the need to investigate

sustainability outcomes as various contract types influence sustainability outcomes differently. This is due to the fact that the form of a particular PPP provides a various incentive structure (Hueskes et al., 2017).

Some authors have argued that for sustainability to realize its core outcome, there must be a move beyond the action-rhetoric gap, to a decision-guiding strategy which is conceptualized as a roadmap for a desired future state (Hugé, Waas, Dahdouh-Guebas, Koedam, & Block, 2013). Similarly, Akomea-Frimpong et al. (2022) underscore the need for an examination into how the integration of these foundational tenets of sustainability (social, economic, and environmental factors) in PPP research provides a view of how to develop key sustainable performance measures.

In the literature, the "three-pillar" or "triple bottom line" approach of sustainability has been discussed. These include the social, ecological and economic perspective (Carter, 2018). In a more recent work, Akomea-Frimpong et al. (2022) identified four dimensions of sustainability; economic, environmental, social and governance. While the economic perspective embraces financial and value-for-money considerations, the environment criteria focus on energy consumption, environmental pollution and resource use. Meanwhile the social perspective addresses issues affecting end-users whereas the governance dimension focuses on contractual and regulatory governance. Studies have found that sustainability considerations have been given limited attention in many PPP projects and that the social dimensions, in particular, have often been ignored (Hueskes et al., 2017).

2.5 Empirical Evidence on Water Governance Outcomes

Chetty and Luiz (2014) examined the private investment in South Africa and observed that technical skills and efficiency had improved due to the private sector participation while the equitable distribution of potable water supply across the communities is realised. Mouraviev and Kakabadse (2015) maintained that overregulation through government dominance in PPP management is theoretically unsuitable. According to Mouraviev and Kakabadse (2015), collaborative and co-production arrangements between the government and the private sector partners can improve PPP outcomes (Mouraviev & Kakabadse, 2015). Asare and Frimpong (2013, p.11) revealed that Public-Private Partnership in Ghana has not realised the 'much touted' efficiency and effectiveness outcome due to deficits in accountability and participation structures. Mitchell, Agle and Wood (1997) maintained that stakeholders who exercise their power of engagement, their sense of managerial urgency, level of usefulness and legitimacy to connect with other stakeholders, exhibit a positive impact of attaining robust governance systems to ensure project success. Thus, strong governance in legal, institutional, and regulatory mechanisms is requisite to ensure sustainable PPP water governance systems.

Ahenkan (2019) observed that PPPs implementation in Ghana faces enormous challenges such as weak institutions, poor technical expertise, lack of robust regulatory arrangements, high bureaucracy, weak political will, maintenance culture, frail risk-sharing arrangement, and high corruption. According to OECD (2017), the political drive continues to influence PPP investment in infrastructure, and as argued by Ruiters and Matji (2016), this makes it challenging for effective and successful execution of PPP projects, particularly in the water resource sector. Several empirical studies showed mixed findings on the objective of PPP to improve value for money. For instance, Vining, Boardman and Poschmann (2006) examined PPP in both Canada and USA and observed that they did not realise the value-for-money goal. Greve and Hodge (2009) also showed that PPP in many developing countries failed to meet the value-for-money objectives. However, Pollitt (2005) and Grimsey and Lewis (2004) showed a positive outcome on value for money whereas Fitzgerald (2004) was uncertain. World Bank (2010) and Gassner et al. (2009) showed that PPP promotes efficiency in infrastructural projects. World Bank (2010) argued further that PPP improves fiscal constraints and infrastructural services for deprived communities whereas Hall and

Lobina (2006; 2007) observed that contractual commitment failures, poor service quality and financial problems are the main causes of unsuccessful implementation of PPPs.

Chong et al. (2006) examined PPP performance within the water sector and showed that the average tariff (customer price) is usually higher when PPPs are involved as compared to direct public water supply management. Thus, the involvement of PPP in water services usually causes problems such as network density or water quality (Carpentier et al., 2006).

3.0 METHODOLOGY

3.1 Research Design and Sampling Technique

The study used a qualitative case-study method to examine the governance architecture of the implementation of the T-NSDP and its implications for sustainability outcomes. This choice is based on the interpretivism paradigm which seeks to present the perception of the truth of the event (Roth & Mehta, 2002). This approach helped to obtain quality and relevant data to explore in-depth a phenomenon in a real-life context such as the T-NSDP (Simons, 2009; Ahenkan, 2019; Nyanyofio et al., 2022). The present study used a qualitative case study research methodology, although there are alternative methods that could be suitable for conducting the research, such as documentary, content and observational studies. Quantitative approaches would not permit exploring the understanding of the governance structures and processes. The qualitative case study (which utilizes interviews and focus-group discussions) enables researchers to obtain detailed explanations of a subject matter. It helps to discover the perspectives, understandings and responses of people on a phenomenon of interest unlike other quantitative designs. The choice of this qualitative design is to enable follow up questions, probing and further clarifications as required in studying the issues of interest. Also, this study focused on the T-NSDP due to the large size and cost of the project and its enormous implications for sustainability outcomes. To address the objectives of the study, the authors purposively sampled 14 participants who constitute all major stakeholders involved in the governance and implementation of the T-NSDP. These included the Ministry of Water and Sanitation (for policy oversight), Public Utilities and Regulatory Commission (regulator), Ministry of Finance (the gatekeeper), Befesa Limited (private partner), the Ghana Water Company Limited (contracting authority) and residents of Teshie-Nungua communities (end-users).

These participants were considered on the basis of their rich experiences and their capacity to provide rich and quality data on the implementation of the project (Tongco, 2007). Additionally, snowball sampling techniques helped the researchers to receive referrals and reached key participants who provided relevant and quality data to a point that it was realized that new data could not provide further insights to address the research objectives (Guest et al., 2020).

3.2 Instrumentation and Qualitative Data Collection

The study collected qualitative primary data through interviews and FGD. The interviews and FGDs enabled the researchers to obtain explanations of actions and inactions, which helped to discover the perspectives, understandings and responses of people on a PPP phenomenon of interest. The interview was designed with the aim of eliciting responses from the targeted sample, who were persons with adequate information and knowledge about the study issues. The interview and FGD questions guide drew their focus and contents from the objectives of the study and the extant literature. The guides contained sets of questions which had been arranged sequentially according to the objectives in the preferred order for the interviews and FGD implementation processes.

Both primary and secondary data were used. The primary data employed were interviews and Focus-Group Discussions (FGDs) which comprised 10 representations each from the Teshie-Nungua residents, while the secondary data focused on archival and relevant documents related to the T-NSDP contract arrangement. This include the National Policy on Public-Private Partnerships

(NPPP) developed by the Ministry of Finance to guide PPP projects in Ghana, Water Purchase Agreement (WPA) between the Government of Ghana (GoG) and Befesa Desalination Development Ghana (MoF, 2011).

3.3 Reliability and Validity

In line with Lincoln and Guba (1985), the researchers enhanced the quality of the study by ensuring that consistency, applicability, credibility, neutrality, and dependability are maintained. The researchers used the feedback from the pre-test to review the interview guide by rewording, rephrasing and reducing errors to enhance readability and clarity for the participants.

3.4 Data Analysis

The primary data collection was subjected to a data analysis process. First, there was cleaning of the data. There was a cleaning of the transcribed interview and FGD files. This involved the removal of responses that were considered irrelevant to the study objectives. The transcribed documents were then subjected to a detailed examination with the purpose of identifying the important themes and concepts within the data. These themes and concepts were identified by the number of times they occurred in the data. By using thematic analysis, the authors identified emerging themes after transcribing and familiarizing with the data. The themes were then indexed, charted and mapped for analysis and interpretation in line with the data analysis protocols prescribed by Pope, Ziebland and Mays (2000), and Nyanyofio et al. (2022). The emerging themes highlight the water governance architecture of T-NSDP and its influence on sustainability dimensions (economic, social, environmental and governance sustainability) and Ghana's SDGs as presented in figure 2.

3.5 Ethical Consideration

The researchers obtained an institutional clearance and informed consent was sought from the study institutions. Also, diverse research ethics such as consent of all participants, privacy and confidentiality, reporting accurate information, and right to access the research report to enhance the trustworthiness of participants' responses (Allmark et al., 2009) were adhered to.

4.0 RESULTS

4.1 Profile of Participants

The participants in the study had diverse positions including Directorship, District Managers, Union Chairperson, Principal Economic Officer, Policy and Governance Officer, Senior Technical Managers for Water Performance and Monitoring, Water Quality Managers, Finance Managers, and Water and Health Policy Analysts from the key institutions including Befesa Ghana Ltd (Befesa), Ghana Water Company Ltd (GWCL), Public Utilities Regulatory Commission (PURC), Ministry of Water and Sanitation (MoWS) and Ministry of Finance (MoF). The participants had extensive years of work experience between 2 and 35 years (average of 17 years) with qualifications in diverse areas such as MSc. in Engineering, MPA in Public Finance and Policy, Master in Business Administration, MA in Governance, MSc in Environmental Management, PhD. in Water Management, MA Policy and Political Economy, and MSc Water Management. Also, participants in the focus-group discussion (FDG1 and FDG2) had Senior High School as their highest academic qualifications and had stayed in their respective residences for a maximum of 30 years. The participants therefore had strong professional and educational backgrounds and hence could contribute to quality data related to governance, sustainability and outcomes of the T-NSDP.

4.2 Thematic Analysis Results and Discussion

4.2.1 Water Governance Arrangement of the PPP Project

In respect of objective one which is assessing the water governance arrangement of the PPP, it was revealed that the T-NSDP is an unsolicited Build, Own, Operate, Transfer (BOOT) Private-Public Partnership (PPP) arrangement between Befesa, the private developer, and GWCL representing the

Government of Ghana (GoG). Thus, the investing partners were to procure, invest, process and distribute safe potable water to the beneficiary communities under a Water Purchase Agreement (WPA).

A detailed analysis of the governance structure of the unsolicited T-NSDP shows that the Parliament of Ghana approved the project for the developers (Befesa) to produce water for sale to Teshie-Nungua and its environs. However, there was a lack of robust oversight responsibility, due diligence and policy oversight responsibility relating to the financing and water production on the part of the MoF (Gatekeeper) and MoWS (parenting and monitoring), as revealed by some respondents.

> *a proper feasibility study and due diligence would have dictated the kind of governance structure which would have helped to deliver the project to its specification. Without such, the Ministry of Finance could not have the insight to appraise the entire project……, those were lapses that may have contributed to the challenges that the project has faced right from its inception*

Also, P 1 confirms that:

> *For an expensive project such as this, one that involves international developers and international money, the risk becomes higher if you don't monitor. So, there was a complete lack of monitoring and reporting system*

The PURC oversaw the regulatory functions including setting water tariffs, water quality and delivery services benchmarks with the GWCL (Contracting Authority) performing monitoring and evaluation responsibilities to ensure that standards are achieved. On governance structure, P1 recounted that the unsolicited T-NSDP was approved by the Parliament of Ghana, where GWCL asked the developers (Befesa) to produce water and sell to the Teshie-Nungua community.

On issues relating to how governance mechanisms influence stakeholders' interest, the interview participants believe that even though the PURC effectively exhibited regulatory supervision, the project exhibited deficit in due-diligence, oversight and monitoring responsibility from the MoF, MoSW and the GWCL, which affected its outcomes. The evidence of poor due diligence practice is not consistent with the World Bank (2009) which argued that an extensive due diligence checklist should include pre-feasibility and feasibility, technical and financial due-diligence, government support, fair procurement process, monitoring, tariff and standard settings, and dispute resolution mechanism. Further, it deviates from the requirements for adherence to insolvency laws and sovereign immunity, as well as labour, environmental and social issues related to stakeholders. Finally, on oversight, accountability and monitoring mechanisms, participants generally believed that the project stakeholders failed to follow the recommended governance guidelines.

4.3. Analysis of PPP Water Governance and Sustainability Outcomes

4.3.1 Economic Sustainability

From a value-for-money perspective, the PPP governance framework for the T-NSDP is to support the Government of Ghana to optimise the use of fiscal resources and mitigate risk and financial repercussions towards achieving high returns for key stakeholders, including the end-users of the water within the catchment community (MoF, 2011). Participants revealed that the total cost of the water project (USD $ 125 million) is relatively more expensive for the Government of Ghana to operate. In considering the cost and affordability, a distinction must be made between availability and volumetric payment from the contracting authority and user payment by consumers. On the availability charge, one participant said,

> "...then, I was in the Water Quality Department…. My candid opinion was that the project was going to be expensive in terms of the production cost and the water customers purchased" (P10).

Certainly, high costs per cubic meter can lead to a high cost of water service to the consumers which may, in turn, affect the revenue from the project. The GWCL buys water from the plant at $1.32 per cubic metre. This was against the PURC-approved tariff for the water of GH¢1.47 ($ 0.28) per cubic metre. Thus, a huge tariff differential of $1.03 per cubic metre was incurred as a result of the bad water purchase agreement covering the project. In addition, the GWCL was incurring extra capacity charges of about $1.4 million per month even when the plant was not in production. Hence, the GWCL built a large debt stock which is now being borne by the GoG through its sovereign guarantee.
Similarly, P12 confirms that;

> *…. our main problem is the unsustainable cost; the capacity charge is like the total cost of construction, we are paying tariff, capacity charge, variable charge for abstracting or for off-taking the water, electricity and energy for the treatment….*
>
> He continued:
>
> *…..hmm, you know when we started the times, we were so low that we were not able to pay the bills. When we started in 2015 February our collections for the month were around GH¢ 17 million. And the capacity charge alone was $1.4 million which those days when added to variable charge we would be running into like 8 million.*

Admittedly, a desalination plant is not cheap. Water from a river is cheaper compared to sea water which undergoes a complex technical treatment process to ensure the right quality for human use. Thus, this highly unsustainable project cost is not in line with the fundamental premise of improving affordability through a PPP project by the government (OECD, 2015) and is inconsistent with the economic prescriptions recommended by Akomea-Frimpong et al. (2022).

The cost of the capacity charge of water from the T-NSDP is almost equivalent to the construction of the plant. Meanwhile, GWCL is expected to pay $1.4 million every month for 25 years, causing high indebtedness and default by GWCL, resulting in the long period of shut down. This finding is consistent with Asare and Frimpong (2013) who observed that PPP projects in Ghana are usually saddled with high costs due to inefficiencies and ineffective governance frameworks underpinning the PPP regime. Thus, the failure of the MoF, MoWS and the GWCL to adhere to the financial arrangements undermine the cost, investment, profitability, value for money, debt service and affordability (economic) sustainability criteria of the project (Akomea-Frimpong et al., 2022)

4.3.2 Social Sustainability

The social sustainability aspect of the sea-water desalination PPP project addresses issues about access; coverage, financial and volume (quality and quantity) (Nyanyofio et al., 2022), as well as general satisfaction of the end-users in the target communities. On the access to potable water and general satisfaction with the delivery of water, participants were of the view that the consumers within the targeted communities experienced good access to potable water and were satisfied. For instance, one participant stated:

> "I will say by and large these are being met… there's good access to water in the beneficiary communities…I happened to have an uninterrupted flow of water during the period that the plant was operational. Also, many other community folks have indicated their satisfaction with the service delivery in terms of output and flow of water" (P4).

The FGD 1 participants also indicated that the construction of the sea-water desalination plant has increased access to potable water which in turn has encouraged many people within the community to start the construction of water closet toilets in many households.

However, residents in the community are unhappy with the high cost of operating the project which is impacting the cost of treated water they consume. In practice, a full costs recovery of the water PPP project is dependent on a sound tariff structure and policy that focuses on sharing the charges among consumers in a fair manner. This arrangement has implications for the operational sustainability and quality of water services delivery through prompt payments of the charges. Thus, a sound tariff arrangement should consider a balance between the cost recovery of Befesa and the affordability of the consumer. Therefore, contrary to the views of P1 on the weighted average principle for determining utility tariffs in Ghana, in principle, the tariff set by the regulator (PURC) defines the maximum charge that consumers can afford to pay to GWCL. In a developing country such as Ghana, the government provides significant subsidies for water tariffs especially in low-income households such as residents in the Teshie-Nungua communities to help reduce the financial burdens and make the water supply affordable to the consumers. Consequently, any additional increase in the water charges per cubic metre supplied to the GWCL by Befesa would increase their financial obligation and the overall financial burden of the GoG. The net effect is that customer tariff would be increased making it difficult for prompt payments of water bills which can affect the objective of making water affordable to the Teshie-Nungua communities. According to the National Policy on PPP, the key consideration for all PPP projects is the ability of the end-user to pay while the PPP "must demonstrate long-term affordability" to the government and public budget sustainability whilst it provides the necessary investment return to the private investor (MoF, 2011, p. 4).

On social externalities, one participant quizzed:

> *"How would you quantify ailment with cost….how about not having adequacy of water in terms of quality and quantity and you have to go searching for water at the expense of your life…. at the expense of your [child] schooling, at the expense of health/life. Getting water from unapproved locations, the quality will be compromised" (P10).*

This confirms that the general assumption underpinning the implementation of PPP projects, and indeed the T-NSDP, extensively considers project success based on the traditional economic preoccupation without extending it to other important social externalities resulting from the project implementation process. This is consistent with Hueskes et al. (2017) who argued that the social dimensions of sustainability often play only a limited role and are largely neglected in PPP projects. Thus, the study confirms that effective water governance architecture of the T-NSDP can improve positive social externalities (Nyanyofio et al., 2022; Akomea-Frimpong et al., 2022) with implications for the achievement of Ghana's SDGs (Grimsey & Lewis, 2004; Hodge, Greve, & Boardman, 2010; Lenferink, Tillema, & Arts, 2013; Yescombe, 2007).

4.3.3 Environmental and Governance Sustainability of the T-NSDP

Respondents were asked whether the desalination plant was delivering on its mandate and outcome based on the quality standards. Even though residents were of the view that the water as supplied is of good quality and drinkable, the residents complained of it being salty.

FGD 1 revealed:

> *the more they delay, the more the sea water rusts and wears out the metals. Even if they decide to operate it today, the water will give stomach problems when consumed.*

Similarly, FGD 2 noted:

> *I think the salt content in the water should be reduced to make it drinkable and useful for washing too.*

Similarly, P10 said:

> *"Occasionally, they went off the standards…there were complaints that the quality of the water was not that good. Considering the higher level of salinity ranging around 120 milligrams per litre compared to about 12 milligrams per litre for the Kpong corridor, there was a problem" (P10).*

P 7 confirmed that:

> *We normally receive complaints about the water and we go and check according to water quality standard …. but when we have this problem, by the time you realize and are going to rectify, people would have consumed the water already. So, we came out with something called the water safety plan to be monitoring the quality of the water from the production right down to the consumer level to be able to detect problems*

The level of salinity (quality and potability) of the water is dependent on compliance with the chemical parameters prescribed by the regulator (PURC), Ghana Standards Authority and the contracting authority (GWCL). In this regard, the concerns about the high salinity of the water as reported by both the residents, and officials of the regulator (PURC) as well as the contracting authority (GWCL) suggest that there was a lack of compliance with the water quality specifications as prescribed by the relevant governing authorities. This is consistent with studies on desalinated water which suggest that desalinated water is not the most suitable option for direct use as it is prone to corrosion and adverse effects on human health and the environment (Lesimple, Ahmed & Hilal, 2020).

The poor quality of water can potentially affect effective collaboration with the beneficiary communities which in turn would harm the outcome of the T-NSDP. According to the WPA, Befesa has the responsibility to supply quality water to the residents of Teshie-Nungua. The WPA further prescribed that in a situation where parties doubt the water quality, there is a need to collectively call for an independent expert/consultant to assess and report the state of the water quality in order to ensure that the water standard is maintained (MoF, 2011b). However, based on P1's arguments, these expert views had not been engaged. Consequently, in the absence of quality water for the consumers, Befesa is expected to compensate the consumers through an acceptable tariff or based on a mutually agreed compensation model between the contracting authority and the developer. Wei et al. (2018) argued that effective water governance can help improve water quality as all stakeholders interests are always incorporated into the sustainable framework and most essentially working towards securing agreement, coordination and joint production among key stakeholders. Thus, inconsistent with the fundamental governance and environmental criteria prescribed by Akomea-Frimpong et al. (2022), the project was unable to meet some output specifications and regulatory requirements, thereby resulting in an 8-month long dispute between the contracting authority (GWCL) and the private party (Befesa).

4.4 Implications of the Sea Water Desalination Project for Ghana's SDGs

The findings suggest a lack of proper execution of water governance framework with implications for Ghana's 2030 SDG agenda. For instance, the lack of proper adherence to the financing arrangement is inconsistent with the OECD Water Governance principles 12 and 15 which argue for the establishment of a robust and coherent financing arrangement, stronger and responsive engagement with key stakeholders, including project partners (OECD, 2015a). In this regard, the challenges observed in the governance architecture of the sea-water desalination PPP project led to the project being stalled for several months and thus interrupting the constant flow of potable water across the Teshie-Nungua communities.

This challenge is as good as the project not being commenced in the first place, which could potentially worsen the sanitation condition in the catchment communities and hence affect national efforts at achieving SDG 6 *(clean water management and sanitation).* Poor sanitation can generally heighten the health burden on the target community in several ways: diarrhoea, cholera, typhoid

fever and general worsening health and wellness. This poses serious implications for the capacity to sustain a productive labour force and economic productivity for the achievement of SDG 8 in the target communities. It has further implications for efforts to *end hunger, achieve food security and improve nutrition* (SDG 2) among affected families or household.

Likewise, poor water governance architecture of the sea water desalination project significantly impacts economic activities of business operators who depend on potable water to offer products and services to their clients. Again, this inhibits efforts at achieving *sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all* (SDG 8). Moreover, lack of access to potable water can reduce the school attendance of school-going children. This is because traditionally, children are invariably heavily involved in searching for potable water for their families and this, affects the equitable and inclusiveness of the *quality education target* as described in SDG 4 (Mugagga & Nabaasa, 2016).

4.4 Challenges Associated with the T-NSDP PPP

4.4.1 Economic Sustainability

Unsustainable financial burden

Lack of investor commitment and support was observed which caused weak financial obligation and potential international commercial dispute between GoG and Befesa during T-NSDP implementation. Consequently, the project was halted for several months for a renegotiation of the Water Purchase Agreement by GoG in order to conserve capital and avoid financial liability. As one participant indicated:

> *"…the project has already been constructed. Our primary interest is to conserve capital. We want to avoid the case going through court proceedings and to protect the GoG from having to pay any sums in settlement and termination, which is estimated to be about US$126 million" (P8).*

Even though the WPA document required Befesa to formally complete the T-NSDP in June 2014, there was a delay due to a lack of financial commitment from the MoF. According to the National Policy on PPP, "the Government shall take all steps to institute mechanisms to ensure that its financial obligations under PPPs are settled promptly" (MoF, 2011, p.16). This suggests that the MoF failed to meet its financial obligations as prescribed in the PPP policy and governance framework, with serious implications for the economic sustainability of the project.

4.4.2 Social Sustainability

Poor stakeholder engagement

Also, the lack of adequate engagement with end-users and community stakeholders posed a significant challenge to the effective execution as user satisfaction and public perception of the T-NSDP was low. For instance, an FGD1 participant observed:

> *"……. they should have involved the people of Nungua on the panel…we don't get to know what is going on… No information has come to us as to whether repair works have caused this or what exactly is the problem" (FGD1).*

The participants of FGD1 believe they needed to be involved in the preliminary arrangements and renegotiation process as they constitute an important group of stakeholders in the T-NSDP. They further explained that the information about the shutdown was not communicated to them directly, and rather, through a radio announcement and rumours from grapevine sources. Similarly, FGD2 said they were expecting that government would find a way to engage them to discuss how the problems such as high levels of salinity of the water and high cost of power would be resolved for the plant to continue operations. This is consistent with studies that suggest that the implementation of desalinated water PPP projects suffer popular scepticism and disaffection (**Dolnicar** & Schäfer, 2009; Dolnicar, Hurlimann & Grün, 2011).

The study findings reveal a clear exclusion of the host community in the decision-making process resulting in failure to adequately address their interest leading to trust deficit from key project

stakeholders. These findings contradict the Principle of Water Governance which encourages effective stakeholder engagement in PPPs to promote effective multi-actor relationships between public organisations, private sector operators, non-profits, volunteers, citizens and communities as a crucial requirement for project success (OECD, 2015). Similarly, the findings are inconsistent with Akomea-Frimpong et al. (2022), Wang et al. (2018) and Yun et al. (2015). Wei et al. (2018) suggests the importance of ensuring that there is a collective platform for stakeholder engagement and collaboration to promote good governance in PPP projects. Yun et al. (2015) advised that stakeholder relations will foster an effective governance mechanism that aligns project goals with different stakeholder interests and addresses conflicts.

4.4.3 Governance Sustainability

Lack of public sector competence

Deficit in technical expertise on the part of the government party that negotiated the Water Purchase Agreement, resulted in project implementation challenges, ineffective legal, financial and technical due-diligence, as well as poor contract negotiation. Majority of the participants revealed that the private party had more expertise than the government party which presupposes that there was a competency deficit on the part of GWCL, which disadvantaged the Ghanaian side from obtaining competitive terms under the agreement.

As revealed by the Director of the private party (Befesa);

> *We have these challenges because they don't do enough research. If you're going to fight somebody, you make sure you do research about the person, know enough about the person so that when you're putting up facts, you know that it is based on research. These guys don't do any research. They don't even read about desalination to understand how the process works.*

From the point of view of the Ministry of Finance, P8 noted that one of the challenges that confronted the government was the lack of public party officials with the requisite technical expertise to be engaged on the contract negotiation.

In the interview, P8 revealed that:

> *I think that one area that we struggle with as a country is matching the level of expertise that our private partners normally have when it comes to PPPs. So, you know, they probably have an army of lawyers, researchers and analysts who are running models and simulations of how they're going to get their money back and the profits margins etc. We don't have that same level of rigor and intensity on the government side.*

As a result of the poor technical know-how of the key public officers involved in the project negotiation and implementation, Ghana's first-ever desalination PPP project was bedevilled with serious challenges culminating in several months of shut-down. This evidence of a lack of technical expertise is consistent with Ahenkan (2020) who argued that public sector staff and the technocrats who are directly involved in PPP implementations must be well equipped with the competencies and sound knowledge of the PPP project development, and the legal and regulatory arrangements to ensure effective and efficient delivery of project outcomes.

OECD's (2015) governance framework argues that public stakeholders should develop professionals who can support the effective implementation of PPP projects. According to the National Policy on PPP, the PPP Advisory Unit (PAU) shall "build capacity among public sector stakeholders, and MDAs, to enable them lead the implementation of PPP projects from start to finish in a professional and technically competent manner" (MoF, 2011, p.8). To address the technical deficit among public officers, the stakeholders' theory encourages the government to obtain access to technical expertise as well as established networks for complementary resource sharing to improve the efficiency and effectiveness of the governance mechanisms and to eliminate the perception that the private sector is better at management than the public sector (Austin, 2007).

Constraints due to lack of infrastructural support

There was lack of adequate infrastructure such as water pipelines to support the effective distribution of potable water across the catchment community. As one participant noted:

> "…we found out that the metal tubes to draw the water were all faulty and that is why the water is not flowing to our houses" (FGD2).

The participants of FGD2 revealed that water tubes were not properly functioning, resulting in the closure of the plant for repair works to be undertaken. In agreement, P1 was of the view that there was the pressing need for GWCL to invest more in the distribution infrastructure as the systems for distributing water were largely inefficient leading to wastage of water with GWCL incurring huge losses. He argued:

> *The challenge was that they (GWCL) had low infrastructure so they couldn't take the water. So, when we (Befesa) started delivering the water, there were burst pipes all over Nungua and Teshie.*

Consistent with the World Bank (2018) the T-NSDP requires private involvement to improve infrastructural services, and ease fiscal constraints in order to provide services for such deprived communities.

Lack of commitment and support from government parties

The study found that the absence of strong supervisor commitment required from the contracting authority (GWCL) and inadequate support on the part of the Ministry of Water and Sanitation to exercise full policy oversight for the project implementation, affected the smooth implementation of the T-NSDP. As P1 indicated:

> *The challenges were as a result of Ghana Water Company failing to honour its responsibilities and the Ministry of Sanitation and Water not playing its parental role on the project. They are simply apathetic towards the project.*

This is inconsistent with the PPP governance best-practice as identified by the OECD (2015a). Also, the National Policy on PPP underscores that the GoG "shall provide the necessary assistance and resources as a shareholder to GWCL to meet all of its obligations under the WPA" (MoF, 2011, p.42). This suggests that GoG failed to act per the WPA for a smooth and effective implementation of the T-NSDP. Thus, the key governance sustainability criteria, transparency and accountability, output specification and project completion and bureaucratic dimensions suggested by Akomea-Frimpong et al. (2022) were not realized. It is also consistent with Hartley et al. (2017), who contend that public-value is created through institutional collaboration and partnership commitments. Overall, the study confirms the argument by Kemp et al. (2005) that an effective governance architecture is a prerequisite for realizing sustainability outcomes.

5.0 CONCLUSION

Using qualitative data and the stakeholder and public-value theoretical perspectives, this study examined the sustainability dimension of the Teshie-Nungua Sea Water Desalination Project and its implications for Ghana's SDGs agenda. The study shows that the governance architecture for the implementation of the T-NSDP was not adequately developed and enforced to fully realise the targets in key sustainability outcomes discussed in the literature. In terms of the economic sustainability criteria, the study highlights that as a result of the governance deficit, the implementation of the project was saddled with high project cost as well as debt service challenges with implications for value for money. On social sustainability, the study evidenced that issues regarding water quality, poor engagement with end-users, and inadequate provision of infrastructure for water distribution, resulted in intermittent interruptions in water supply across the project communities which led to dissatisfaction and low public perception. Even though no major environmental challenges were recorded, the presence of high salinity in the water supplied to the

target communities with potential for human health and material contamination, undermined the environmental sustainability of the project. Overall, the study evidenced that the quality of governance architecture; monitoring, oversight, due-diligence, technical expertise, accountability and public sector commitment can serve as pillars for designing and implementing Ghana's PPP regime, with implications for Ghana's SDGs agenda.

6.0 RECOMMENDATIONS

Firstly, the lack of water policy oversight and monitoring by the MoWS and the GWCL in the implementation of the project requires that key stakeholders apply the global PPP best practices and give recourse to the National PPP policy instrument developed by the GoG. Secondly, despite the evidence of sound regulatory practices by the PURC, the deficit in key governance areas, due diligence, monitoring, and oversight, coupled with the inadequacy of funding and infrastructure support which resulted in high indebtedness and intermittent disruptions in the supply of water, requires that the GoG undertakes a critical review of the entire sea water desalination operation to identify the funding deficit and gaps in revenue inflow. This will help to comprehensively address major project challenges relating to project cost (capacity charges) and its implication for public sector budget. The MoF should conduct a proper financial audit of the entire project and build a roadmap for Ghana's PPP governance and implementation regime in order to forestall future financial obligations which may ruin the international reputation of the country and the possible termination of the project. Additionally, the long period of unsettled dispute which led to the temporary shutdown of the project requires a robust conflict resolution mechanism for the management of fiscal commitment to address any other potential disputes in the future particularly those involving investor risk and sovereign guarantee. This will protect Ghana's international reputation as well as boost investor confidence while at the same time, address the interests of key stakeholders in a responsible manner

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Research Contribution and Future Direction

This study reinforces the fact that PPP sustainability outcomes depend on multiple perspectives. Thus, the dominance of economic theoretical perspectives cannot adequately advance PPP research. It therefore highlights a departure from the traditional PPP research which predominantly focuses on the economic (value-for-money) considerations without much attention to other sustainability criteria, social and environmental perspectives which have crucial implications for achieving Ghana's SDGs. It therefore provides a fertile direction to advance the frontiers of PPP research in the future.

Additionally, the adoption of a qualitative research paradigm to highlight how different governance architecture impacts water PPP projects in an urban context, contributes to PPP research. Consequently, the study strengthens the research argument which suggests the view that governance deficit, due diligence, oversight, monitoring and public sector competency deficit in developing and implementing PPP regime threatens project outcomes thereby producing a "dominating effect" that can empower the private party to direct technical needs, especially, in the case of an unsolicited project. However, the adoption of qualitative research design to address the gaps may limit the generalization of the findings. Future researchers can employ a quantitative method with a larger sample of respondents to validate our findings focusing on other PPP models and in different PPP contexts.

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Respondents' Profile

Code	Job Position	Organization	Education	Experience	Type Of Data	Age	Sex
P1	Director	Befesa	Masters	25 Years	Interview	55 Years	Male
P2	Managing Director	GWCL	PhD	20 Years	Interview	56 Years	Male
P3	Dist. Manager	GWCL	Masters	30 Years	Interview	55 Years	Male
P4	Policy & Gov Officer	MoF	Masters	11 Years	Interview	42 Years	Male
P5	Principal Econ Officer	MoF	Masters	20 Years	Interview	54 Years	Female
P6	Economic Officer	MoF	Masters	13 Years	Interview	s37 Years	Male
P7	Tech Mgr. for Water Perf.	PURC	Masters	11 Years	Interview	48 Years	Male
P8	Technical Assistant	MoF	BSc	2 Years	Interview	20 Years	Female
P9	Dep. Mgr. Water Qty	GWCL	MSc	25 Years	Interview	56 Years	Male
P10	Chief Mgr. Special Duties	GWCL	MSc	25 Years	Interview	54 Years	Male
P11	Director of Water	MoWS	MSc	25 Years	Interview	58 Years	Male
P12	Chief Manager Fin.	GWCL	ICAG/EMBA	35 Years	Interview	57 Years	Male
P13	Water & Health Policy Analyst	ISODEC	MA	15 Years	Interview	42 Years	Male
P14	Snr Mgr Water Perf	PURC	Masters	14 Years	Interview	48 Years	Male
FGD1	Residents	Nungua	Secondary	30 Years	FGD	Mixed	Males
FGD2	Residents	Teshie	Secondary	30 Years	FGD	Mixed	Female

Source(s): Field data

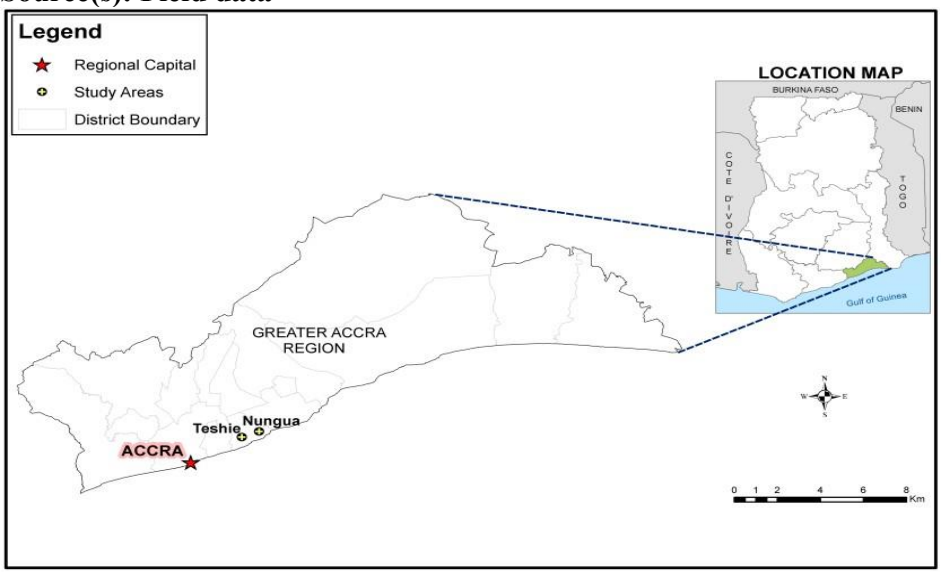

Figure 2: Map of Teshie-Nungua communities

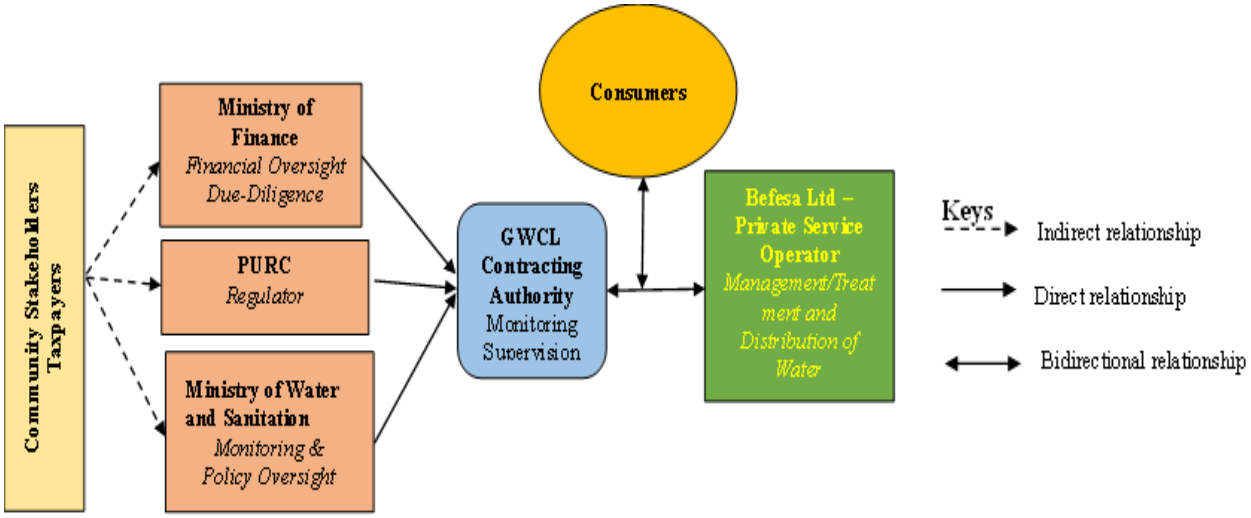

Figure 3: Governance arrangement for the Teshie-Nungua Sea Water Desalination Project