AN ASSESSMENT OF PUBLIC PRIVATE PARTNERSHIP IN WATER SUPPLY AND GOVERNANCE IN MATHARE INFORMAL SETTLEMENT, NAIROBI COUNTY

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A research project submitted in partial fulfillment of the requirement for the award of the degree of Master of Arts in Environmental Planning and Management of the University of Nairobi

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DECLARATION

I declare that this research project is my original work and to the best of my knowledge has not been presented for award of degree in any other University.

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TABLE OF CONTENTS

DECLARATION..... ii

ACKNOWLEDGEMENT..... iii

TABLE OF CONTENTS iv

LIST OF TABLES vii

LIST OF FIGURES vii

ABSTRACT..... ix

CHAPTER ONE: INTRODUCTION..... 1

1.1 Background of the study problem..... 1

1.2 Statement of the research problem..... 3

1.3 Research questions..... 4

1.4 Objective of the Study 4

1.4.1 Specific objectives 4

1.5 Significance of the Study..... 5

1.6 Scope and limitations of the Study 5

1.7 Operational definitions and concepts..... 6

CHAPTER TWO: LITERATURE REVIEW..... 9

2.1 Water Sector Reforms in Kenya 9

2.2 Water Situation in Informal Urban Settlement..... 11

2.3 Nature of public private partnership in water supply and governance 14

2.4 Opportunities and challenges of public private partnership in water governance in informal settlements..... 17

2.5 Theoretical framework..... 20

2.6 Conceptual Framework 22

CHAPTER THREE: THE STUDY AREA 27

3.1 Geographical location 27

3.1.1 Mathare Informal Settlement 27

3.1.2Kosovo Village 27

3.2 History of Mathare informal settlement 29

3.3 Climatic conditions 30

3.3.1 Rainfall 30

3.3.2 Temperature 31

3.3.3 Topography, geology, soil structure and Housing 31

3.3.4 Population size and composition 32

3.3.5 Socioeconomic activities 32

CHAPTER FOUR: RESEARCH METHODOLOGY 33

4.1 Research design 33

4.2 Sample Size and Sampling procedure 33

4.3 Data Collection Methods 34

4.4 Data Analysis 34

4.5 Ethical Considerations 35

CHAPTER FIVE: RESULTS AND DISCUSSIONS 36

5.1 Response rate 36

5.2 Demographics of the Households 36

5.3 Water situation in Kosovo village of Mathare informal settlement 39

5.3.1 The water situation 39

5.3.2 Distance from the water source 40

5.3.3 Amount of water consumed 42

5.3.4 Frequency of fetching water 43

5.3.5 Water Affordability 44

5.4 Nature of public private partnership in water supply and governance in Kosovo village 46

5.4.1 Problems encountered when fetching water in Kosovo village 46

5.4.2 Weekly Water Supply 47

5.4.3 Water Scarcity 49

5.4.5 Scarcity Coping Mechanisms 50

5.4.6 Participation in the Formulation Process of the PPP 51

5.4.7 Efficacy of the public private partnership 52

5.5 Opportunities and challenges of public private partnership in water governance in ..... informal settlements 53

5.5.1 Hours Spent in Fetching Water 53

5.5.2 Implementation of the public private partnership 54

CHAPTER SIX: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS 58

6.1 Summary of findings 58

6.1.1 Water situation in Kosovo village 58

6.1.2 Nature of public private partnership in water supply and governance in Kosovo village 59

6.1.3 Opportunities and challenges of public private partnership in water governance in informal settlements 59

6.2 Conclusion 60

6.3 Recommendations of the study 62

6.3.1 Recommendations to policy makers 62

6.3.2 Recommendation for further research 62

REFERENCES..... 63

ANNEX 1: HOUSEHOLD QUESTIONNAIRE..... 78

ANNEX 2: KEY INFORMANT INTERVIEW GUIDE..... 82

ANNEX 3: FOCUS GROUP DISCUSSION GUIDE..... 84

LIST OF TABLES

Table 5.1: Response Rate..... 36

Table 5.2: Demographic characteristics of the Household..... 37

Table 5.3: Source of Water..... 39

Table 5.3: Distance from the water source..... 41

Table 5.4: Amount of water consumed in a day per household..... 42

Table 5.5: Number of times a household fetches water in a day..... 43

Table 5.6: Measures adopted during water scarcity..... 43

Table 5.7: Participation in the formulation process of the public private partnership..... 51

Table 5.8: Efficacy of the public private partnership..... 53

Table 5.9: Number of Hours spent in fetching water..... 54

Table 5.10: Implementation of the public private participation..... 55

LIST OF FIGURES

Figure 2.1: Conceptual Framework..... 25

Figure 3.1: Kosovo Village in Mathare informal settlement..... 28

Figure 5.1: Household income per month..... 38

Figure 5.2: Water Bill per Month (in Kes) 44

Figure 5.3: Problems encountered when fetching water from different sources 47

Figure 5.4: Frequency of water supply in a week 48

Figure 5.5: Water scarcity periods 49

LIST OF PHOTOS

Photo 1: Water kiosk installed during the partnership 40

Photo 2: A yard tap installed within the household premises (plot) 42

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ABSTRACT

The study investigated the contribution of public-private partnership to water supply and governance in Kosovo village of Mathare informal settlement. This was with a view to showcase whether such a partnership would be essential in addressing the water challenges in the informal settlements. In so doing, the study was steered by three objectives; firstly was determination of the situation of water accessibility in Kosovo village; second was an examination of the nature of public private partnership in water supply and governance in Kosovo village of Mathare informal settlement; and lastly, assessment of the opportunities and challenges of public private partnership in water governance in informal settlements. Primary and secondary data were utilised from a household survey of 87 respondents, focus group discussion and 10 key informant interviews. Qualitative and quantitative techniques were applied in analysing the data in this study. Primarily, descriptive techniques which involved the use of frequency tables and the central tendencies measures were applied. The findings of the study have revealed that the adoption of public private partnerships contributed immensely in water supply and governance in Kosovo village. Specifically, it has been found that the co-option of all water and sanitation sector stakeholders enabled the improvement of water supply by ensuring that vandalism is reduced, time spent in fetching water is reduced and that water is available for the most part of the week. The study recommends that public private partnerships in water supply and governance must exist within an effective enabling environment with a strong regulatory body. Secondly, the policy makers should also consider incorporating the informal water service providers into the institutional framework since they can support, disrupt or replace the water utility. Thirdly, the active participation of the informal settlement dwellers in the water provision service alongside the other partners has proved effective. Water policies should thus allow for the active role of the communities in the provision service with supervision from the public water service utility companies. The public water utility companies (Nairobi City Water and Sewerage Company) should thus enforce monitoring and evaluation system to be able to track progress and take stock of valuable lessons and good practices from the partnership to be replicated in other informal urban settlements.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study problem

Many countries in the world have achieved the middle class status through urbanization (Spence et al., 2008) with 66% of the global population expected to be urban centres' dwellers by the year 2025 (Biswas, 2000; UN HABITAT 2014; Brunt and Garcia-Penelosa, 2012). However, several scholars have noted that rapid urbanization in Sub Saharan Africa and Asia has brought about rapid expansion of informal urban settlement (Baker, 2008; Otiso, 2003; UNCHS, 2001; UN HABITAT 2014; UN DESA, 2015). The rapid growth in informal urban settlement is rooted in rapid population growth, poor planning in urban management and growth, poor governance, inadequate government policies, capacity constraints to provide fundamental services including shelter, water supply and sanitation services (Baker, 2008; Otiso, 2003; Grimm et al., 2008; WASREB, 2018:10)

Access to water is one of the essential services vital to economic growth in urban areas and is intertwined with the concept of human right including; the then Millennium Development Goals (MDGs) and recently, the United Nations Sustainable Development Goals (SDGs) specifically SDG 6 on safeguarding the availability and sustainable management of water and sanitation for all by the year 2030 (Hutton and Haller, 2004; UN HABITAT, 2003; Ojo, 2018). Water services and sanitation provision as a basic human right is far from universally being achieved despite the tremendous step made towards the achievement of the MDGs (and recently the SDGs).

Globally, 6.7 billion people had access to improved drinking water in 2015 as compared to 4 billion in 1990 (Hannah and Max, 2019). However, 663 million people still cannot access improved water sources (WHO, 2015). A report by UN HABITAT (2013) argues that everyone has access to water in some form; the issue is normally how safe the water is, if it is sufficient for the needs, availability, convenience and affordability. Studies have shown that the urban poor households suffer the most due to lack of water since they rely on unsafe water sources (Bartram and Cairncross, 2010) thus adversely

affecting their human rights, economic growth, development, and increase their water-related health costs (Watkins, 2006; UNDP, 2006; WHO, 2007). Lack of adequate water resources by the citizens goes against the set resolution 64/292 by the United Nations General Assembly and Committee on Economic, Social and Cultural Rights Comment number 15 on the human right to water (Winkler, 2017). Amao (2012) and Muzondi (2014) have also noted that sustainable water provision improves the livelihoods of informal settlements households.

An impact report published by Water Services Regulatory Board (WASREB) in 2018 shows that Kenya has more than 8 million people living in over 2,000 informal urban settlements depending on alternative water services provision that do not abide with the set human rights conditions (WASREB 2018:10). Additionally, the 2019 Water Services Regulatory Board Impact report indicates coverage of 3.23 million households with an average of 4 persons per household by the year 2018 (WASREB, 2019:11). The average water coverage in Kenya translates to 57% by the year 2018 (Ibid). 64% of the Nairobi County residents have access to connected water or yard taps as a main source of water although the distribution is not equal. Nairobi informal urban settlements have coverage as low as 12% (Ledant, 2013).

Several efforts have been made in a bid to supply the basic amenities to the informal settlements by Government who are the primary providers and policy makers; and the private sector that come in to close the gap left by the Government through increasing efficiency, infrastructure development and maintenance (Otiso, 2003; WSTF, 2010). However, the efforts have not overcome the existing barriers towards increasing the residents' access to water due to inefficiencies, market failures due to poverty levels and poor water governance leading to higher levels of poverty due to misallocation of scarce water resources (Rogers and Hall, 2003; Otiso, 2003).

The effect is the intervention to fill in the gap left by other players including nongovernmental organizations (NGOs), community-based organizations (CBOs) and informal small scale service providers (WSTF, 2010; Evans, 2007). There is a perception that non state actors are not as bureaucratic as the State nor market oriented

like the private sector and are closer to the informal urban dwellers (Wekwete, 1997; Otiso, 2003). However, well intentioned initiatives have been overtaken by private water vendors who form cartels and exploit the residents by charging prices that are 2 to 10 times above the normal charges by water utility (Boakye-Ansah et al, 2019; Ledant, 2013; WSTF, 2010; Owuor and Foeken, 2009).

To overcome the challenges mentioned above, several proponents of public private partnership agree that when State, non-state, private sector (formal and informal) and the community come together to maximize on their strengths they provide a solution to the provision of water services among other basic needs since the needs of the urban informal settlement residents cannot be met singlehandedly (Otiso, 2003; Otiso, 2001; Osinde, 2008). In addition, the World Summit on Sustainable Development (2002) in Johannesburg, acknowledged that partnerships arrangements could augment governments' endeavour in meeting the goals of United Nations Sustainable Development Goals (Eales, 2008).

1.2 Statement of the research problem

In light of a myriad of challenges in the water sector in Kenya, the government championed a number of water sector reforms since 2001. Despite the institutionalization of the reforms, the informal urban settlements still face challenges regarding water availability and access. Part of the water issues in the informal urban settlements are occasioned by deliberate moves by water utilities not to venture into the informal urban settlements for fear of the uncertain land tenure rights, non-payment of bills and vandalism of pipes among others (Heymans et al. 2014; WSTF, 2010; Bakker, 2003; Boakye-Ansah et al., 2019; Evans, 2007; Schwartz et al. 2017; Obosi, 2017). The Kosovo village in light of the water challenge had their water supply controlled by cartels who indiscriminately hiked water prices. To address this challenge, the Nairobi City Water and Sewerage Company (NCWSC) installed free communal water points at the border of Mathare informal settlement next to Juja Road. Non-governmental organisations also came in to address the water issue though in unsustainable way. This did not address the water challenge as the dwellers of Kosovo village still faced

problems in accessing water. There was therefore, a necessity to streamline water supply in order to enhance water governance in Mathare informal settlement. This was done by the coming together of different players in the water service sector to form a partnership based on their strengths and expertise (WSTF, 2010). The partnership intended to use a pro-poor approach towards improving the water supply in the informal settlement, increase revenue collection for the utility and improve water governance in the informal settlement. The impact of this partnership as regards water governance remains unknown. There is therefore a need to study and analyse the contribution the partnership has made towards the improvement of water availability and access in the settlement. This study therefore desired to fill the gap by assessing the effects of the public private partnership to water supply and governance in Kosovo village of Mathare informal settlement.

1.3 Research questions

The study therefore sought to answer the research questions below:

1. What is the access to water situation in Kosovo village, Mathare informal settlement?
2. What is the nature of public private partnership in water supply and governance in Kosovo village of Mathare informal settlement?
3. What are the opportunities and challenges of public private partnership in water governance in urban informal settlements?

1.4 Objective of the Study

The main objective of the study is to assess the contribution of the public private partnership in water supply and governance in Kosovo village of Mathare informal settlement.

1.4.1 Specific objectives

The specific objectives are:

1. To determine the situation of water accessibility in Kosovo village of Mathare informal settlement.

2. To examine the nature of public private partnership in water supply and governance in Kosovo village of Mathare informal settlement.

3. To assess the opportunities and challenges of public private partnership in water governance in informal settlements.

1.5 Significance of the Study

The study findings qualify reconsideration of the water governance system, finance models and supply being used in the informal settlements by utility managers, political planners, funding organizations and the community for the water supply services to reach a more significant proportion of informal urban residents. It highlights the reality that the urban poor represent a vast untapped market and that they pay higher for water than customers in the well up urban residences because they procure water informally through intermediaries.

The findings of this study will assist policy and decision makers streamline public private partnership by taking lessons learnt from the assessment as part of ongoing water sector reforms. The study will also contribute to research world in terms of adding new information or collaborating studies on public private partnership and water governance that do not have empirical data. The study will also assist development partners and other project financiers including Government into seeing gaps and opportunities on areas that can further be up scaled.

1.6 Scope and limitations of the Study

The study was conducted in Kosovo village of Mathare informal settlement. The study focused on the assessment of public-private partnership in water supply and governance in Nairobi's Kosovo village in Mathare informal settlement. The area was selected for study since it was a pilot area for the partnership. The area had previously been controlled by water cartels; it was partially planned and the community members willing to participate in formalization on the water supply through the partnership (WSTF, 2010). The researcher experienced limitations in terms of inability of the Kosovo village residents to volunteer information especially on informal water vendors,

illegal connections and vandalism. Given their history, the residents were suspicious of any foreign person who came to seek information from them. The researcher overcame the hurdle by using research assistants who were well known in the study area. The researcher experienced limitations in terms of past studies done on public private partnership contribution to water governance in informal settlements since not many studies have been done on the same especially in urban areas. The researcher overcame the limitation by consulting and reading widely including unpublished materials.

Additionally, due to limitations in terms of funds and time, the study does not assess the pattern of life and livelihoods that applies largely to informal settlement residents and factors that makes them particularly vulnerable to the inadequate water and sanitation supply other than water governance. These issues can be dealt with in further researches.

1.7 Operational definitions and concepts

Public private partnership (PPP): This is a contractual agreement between one or more governments or public agencies and one or more private sector or non-profit partners for the purpose of supporting the delivery of public services or financing, designing, building, operating and/or maintaining a certain project for the public good (Diggs and Roman, 2012; Van Ham and Koppenjan, 2001; Bovaird, 2004).

Informal urban settlements: These are unplanned urban settlements and areas where housing is not in compliance with current planning and building regulations (unauthorized housing) (United Nations, 1997).

Governance: This is defined as the complex processes and institutions through which citizens and groups voice their interests, mediate their differences, and exercise their legal rights and obligations (UNDP, 2006).

Water governance: This refers to the range of political, social, economic and administrative structures that are in place to develop and manage water resources, and the delivery of water services, at different levels of society (GWP, 2003; Rogers and Hall, 2003; OECD, 2011).

Private: The term private in the study will be defined as a private company or a group of citizens united in a community-based organization (CBO) and either or not supported by one or more NGOs (K'Akumu, 2007).

Water Vendor: The study uses the term water vendor to refer to private service providers selling water sourced from known (water kiosks, boreholes, household connections) and unknown sources to households. They are not formal and the quality of the water they supply is unknown (Kjellen and McGranahan, 2006; WHO, 2004)

Water Kiosk: The term is defined as a private service provider that formal water utility provides water to whereby it is re-sold to the local customers (K'akumu, 2007)

Public Water utility: This is an organization that is majority owned and controlled by government and could consist of number of different forms and is served with the mandate of water and sanitation service provision. It is also known as a water service provider (WSP) (Baietti et al., 2006).

Collaborative governance: Processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished (Emerson et al., 2012).

Transparency: Transparency involves openness and public accessibility to information whereby the citizens are familiar with decision making processes and the standards expected from the public officials in order to participate meaningfully in decision making processes (Butterworth, 2008).

Accountability: Accountability contributes to ensuring that the interests of the poorest and most marginalized groups in society are taken into account in decision making processes (Lister, 2010).

Participation: Participation implies that all stakeholders, including marginalized and resource-poor groups, are meaningfully involved in deciding how water is used,

protected, managed and allocated. Participation involves responsibilities as well as rights (Berthin, 2011)

CHAPTER TWO: LITERATURE REVIEW

The chapter includes the review of the theoretical and empirical frameworks of literature that are relevant to the research questions. A conceptual framework is also illustrated to show how the variables are interrelated. Finally the chapter highlights gaps in the reviewed literature and how the study intends to fill them.

2.1 Water Sector Reforms in Kenya

Kenya has endorsed several international treaties and conventions (Wagah et al., 2010). Kenya has therefore; put in place a robust legal foundation towards enforcing the treaties through Article 43 of the Constitution, which stipulates that "Each person has the rights to reasonable standards of sanitation and to clean and safe water in adequate quantities" (GoK, 2010; United Nations, 2010). All Kenyan citizens have a right to safe, affordable, sufficient and accessible water for utilisation without discrimination (WASREB, 2008:1). Additionally, Article 56 of the Constitution spells out that the State emphasizes on programs designed to ensure that minorities and marginalized groups access water, supply services indiscriminately (GoK, 2010). Kenya's development blueprint, the Vision 2030 echoes the same sentiments (WASREB, 2008:1).

To achieve the goal, Kenya has been continuously working towards improving water governance through the sector reforms. The first Kenyan Water Law was the Water Ordinance in 1927, then the Water Act Cap 372. The National Water Master Plan (July 1992) prescribed the ammendment of the Water Act Cap 372 which led to the enactment and implementation of Water Act (2002) (KWAHO, 2009).

The Kenya Water Act of (2016) synchronizes the water sector with the Constitution whose key objective is devolution. The Act provides the framework water management and supply services. The fundamental principles underlying the water sector reforms include: Devolution; stakeholder participation to enhance transparency and accountability; disaggregating regulation, policy and service provision; socially responsible commercialization of water services provision and participation of private

sector and cost-recovery principle that includes a pro-poor pricing policy (KWAHO, 2009; WASREB 2018:10; Moraa et al., 2012).

The Water Act (2016) repealed the Act of (2002), created and transformed water institutions to be able to carry out their mandates as follows: i) Section (70) establishes Water Services Regulatory Board (WASREB), to regulate water services sub sector including licensing the water utilities or the Water service providers (WSPs) ; ii) Section (11) establishes Water Resources Authority (WRA) to regulate the management and use of water resources at the national level; iii) Section (85) establishes the Water Service Providers (water utilities) to supply water and sanitation services; iv) Section (113) establishes the Water Sector Trust Fund (WSTF) which has the duty of financing the sector especially the marginalized and underserved and lending to credit worthy utilities; (WASREB, 2018:10; GoK, 2016); v) Section (29) establishes the Water Resources Users Associations (WRUAs) which are a group of water users or other stakeholders who have formally and voluntary associated to conserve a common water resource; vi) Water User Groups (WAGs) are volunteers who bridge the gap between the sector institutions on water services supply and the consumer by improving the responsiveness to consumer concerns (GoK, 2016).

The sector reforms were geared towards contributing to improved universal availability to safe drinking water, improved sustainable utilization and development of water resources, strengthened water governance, as well as reduction of socio-economic and environmental loss from climate change disasters such as extreme floods and drought. However, gaps exist over how the institutions mandated with water resources management interact with institutions mandated with water service provision. The citizens' forums that are supposed to bring the citizens together to demand their rights and exercise their responsibilities are still very weak and have no voice or financial muscle to carry out their mandate. There is overlap of roles and responsibilities among the institutions at the national level and those at the county level.

2.2 Water Situation in Informal Urban Settlement

Africa's access to improved water supply coverage stands at 62% of the population (WHO/UNICEF, 2015; Cross and Morel, 2005). In global terms, Africa has the lowest access to water situation at 28% of the global population (WHO/UNICEF, 2000). There were 326 million in 2015 persons who have no access to improved source of water in Sub Saharan Africa as compared to 271 million in 1990. This contrasted the global trends, whereby, for instance East Asia and the Pacific had 42% of urban dwellers who had no access to water in 1990; however this figure decreased to 20% in 2015 (WHO/UNICEF, 2015). Kenya has about 647 cubic metres of water per capita with a probability of dropping to 235 cubic metres per capita by 2025 if the consumption does not match the supply (GoK, 2008).

Many African countries have not put in efforts to prioritise informal urban settlement areas when it comes to investments in water service provision (Mutisya and Yarime, 2011). Scholars have noted that extending water supply services to informal urban settlements is coupled by a number of challenges including: risks due to uncertainty in land tenure, absentee landlords; fears of cost recovery which threatens investment plans; uncontrolled development; high proportion of poor households and difficulties in exercising management arrangements within water utilities due to socio-economic and technical characteristics of urban informal settlements (Cross and Morel, 2005; UNHABITAT, 2003; Tropp, 2007).

In the top of the list of the basic needs of urban informal settlement households is water (Hailu et al., 2011). The issues relating to the water problems include cost, access, and quality. The Kenya National Water Services Strategy (2007– 2015) endeavored to make sure that citizens have 20 litres of water per person per day at an affordable price. However, the recommended 20 litres is insufficient to meet the daily needs (United Nations, 2010). Scholars however, indicate that the existence of extreme discrepancies in water quantities consumed within an urban dwelling depend on their lifestyle, access to water situation and different water needs. The better off neighborhoods consume up to 200-300litres of water per day per capita whereas an informal urban settlement

dweller consumes 15 litres of water per day per capita. The population increase, poor urban planning standards, informality has made it difficult for the water service companies to keep up with the pressure of water supply infrastructure (Ledant, 2013). In Nairobi, the public water utility with the mandate of supplying water has not been able to balance between consumption and demand of water (Hailu et al, 2011). The population increase, informality and poor urban planning create ground for inequality to prosper (Kariuki et al., 2003). Consequently, private individuals in the city drill boreholes which are unsustainable in the long run when unregulated (Hailu et al., 2011). Most of the dwellers on informal settlements are thus left just with the option of purchasing water from piped water network, and this pose a risk of contamination since the government actors or users don't monitor the quality of the informal and small scale water providers routinely (United Nations, 2010).

According to Note (2005) water vendors run illegal pipes of up to 1500 metres from the water utility mains into the informal settlements. The water vendors have been found to be vandalizing the water supply network in the informal settlements to induce artificial water shortages, and thus increasing the prices of water by the vendors; some being gangs such as *Mungiki* and *Jeshi la Wazee* (Gemon, 2008; Mutahi, 2011). This has resulted in persistent water shortage in the informal settlement.

The dwellers of informal settlement have thus to contend with the many water related problems including long queues at water points; queue jumping and heckling; unsafe water points that make women and girls vulnerable to attack (Katua et al., 2007). In the case of Kosovo village, the residents indicated that before the public private partnership, there were limited water access points, and even some landlords cut water supply, that it is accessible during certain days and times of the week. Furthermore, women spend most of their time fetching water thus have less time available for other chores such as childcare and revenue generating activities resulting in a lower income (United Nations, 2010; Moraa et al., 2012; Karimi, 2011).

Past scholars also noted that the previous water situation in Kosovo village saw children being involved in helping out with water issues and that led to them missing school for

a number of days (Karimi, 2011). Sattler, (2010) notes that these issues do not only affect the livelihoods of these families but also have an impact on their Governments, who eventually end up spending much more in health and lost economic activity in case of widespread illness or epidemic outbreaks. Additionally, poor people have to tackle the issue of high opportunity costs of obtaining access to water in a market economy (UNICEF, 2005).

Researchers show that water prices go up as the water passes through intermediaries due costs incurred by the vendors with the residents in informal urban settlements paying up to 5 times higher than those getting water from a formal utility with consumers in developing countries paying more than residents in New York or London (Sattler, 2010). The high-cost results in the residents spending most of their income on water (Watkins, 2006). For instance, a twenty-litre jerry can of water was sold at a cost Kes 5 in informal settlements in Nairobi in 2015 (UN DESA, 2015). The cost was over two times the tariff of Kes 2 per 20 litres approved by Nairobi City Water and Sewerage Company.

The residents in the informal urban settlements are charged a higher tariff due to shared water meters, unregulated water vendors overcharging water and large families despite Water Services Regulatory Board (WASREB) recommending guidelines that encourage pro-poor policy and prohibit water kiosks from charging significantly higher amounts (UN DESA, 2015; Hailu et al., 2011). Empirical studies show that roughly 63 percent of households use over 3 percent of total household income on water (Hailu et al., 2011). Therefore, many households restrict their water use to levels that endanger their basic requirements including their health (UN DESA, 2015). However, a survey study carried out in 10 countries (Kenya included) by Collignon and Vezina, (2000), did not find any evidence to support the opinion of high costs charged by private informal water suppliers. Another concern is the proposed adoption of a management model that proposes the takeover of the running of water supply systems that are run by Community Based Organisations (CBOs), by the Nairobi City Water and Sewerage Company. While the objective may be to improve the quality of water service redelivery, care must be taken to avoid reversing achievements by the CBOs (K'Akumu

and Appida, 2006).

2.3 Nature of public private partnership in water supply and governance

Public private partnership presumes a shared beneficial relationship between involved the actors (Hodge and Greve, 2007). Public private partnership is designed as a contractual agreement between one or more governments/public agencies and one or more private sector or non-profit partners for the purpose of supporting the delivery of public services or financing, designing, building, operating and/or maintaining a certain project for the public good (Diggs and Roman, 2012; Van Ham and Koppenjan, 2001; Bovaird, 2004).There are two broad categories of public private partnership which include the institutionalized, where there is a joint venture between public and private stakeholders and contractual public private partnerships (K'Akumu, 2007).

A range of public private partnership models exists, based on the degree of private and public sector engagement and level of risk allocation. The partnership agreements include: Buy Build Operate, Buy Own Operate, Build Own Operate Transfer, Build Operate Transfer, Build Lease Operate Transfer, Design Build Operate Transfer, Finance Only, Operate and maintenance contract, operation license (UNECE, 2008). The main types of public private partnership arrangements involved in the urban informal settlements include operate and maintenance contract arrangement through management contract and operation license through the delegated management model whereby the public water utility installs water kiosks or yard taps in premises (delegating responsibility to the landlords)(Boakye-Ansah et al., 2019) .

Several studies carried have shown that the different public private partnership models have been adopted in various sectors such as water, health, education, transport in parts of France, Canada, Norway, the Netherlands, Portugal, Ireland, Japan, Finland, Australia, Malaysia, Singapore, and the United States of America as part of broader reforms for better delivery of public services (UNECE, 2008). Additionally, Sansom, (2006) noted that there was a progressing trend in the use of long-term public private partnership (PPP) contracts such as concession contracts, and lease for the management of urban water services from the 1990s up to around 2002 in Latin America, Africa, and

East Asia. Scholars note that however, the contracts have little or no provisions to provide for the poor (Sansom and Bos, 2008). However, examples have been cited by scholars on areas where public private partnership has worked well to improve the lives of the citizens such as the slum networking project in Ahmedabad and the privatization of Manila's water authority (Partnerships, 2012). Proponents of public private partnership have demonstrated very limited empirical information to refer to when it comes to public private partnership's effectiveness, advantage and disadvantages with mixed results produced (Diggs and Roman, 2012); although there have been more gains in water supply sector than drawbacks (Prasad, 2006). Studies have shown that public private partnership has proven challenging to implement in many countries where there are no institutional processes and procedures developed to create an enabling environment that can deliver public private partnership projects (UNECE, 2008; Obosi, 2017; Diggs and Roman, 2012).

Poor access to water supply is normally linked with bad water governance (Botting et al., 2010). To enhance access to safe water, countries including Kenya have initiated a number of reforms in the water sector. An outcome of these reforms in Kenya was the birth of public private partnership (PPP) in the water sector. The public private partnerships have not only been witnessed in Kenya but in other countries around the globe as well. The goal of the adoption of the public private partnerships strategies is the desire to attract the complementarity of the private practitioners in financing, building, designing, maintenance of infrastructure, and provision of operational services (Barlow et al., 2013).

The public private partnerships are not standardized and take any structure depending on the local situation that is to be addressed, as such, defining and classifying them has proven difficult (Bakker, 2003). Scholars argue that public private partnerships are a way of hiding other strategies that might not be attractive to the public and so instead of the use of terms such as "privatization" and "contracting out" partnership is favoured (Hodge and Greve, 2007). The model adopted in Kenya has a lot of traction to influences by the World Bank and UN HABITAT that supports integration of small-scale water service providers into the state support system. The focus of the public

private partnerships in Kenya are thus more on supporting communities and individuals in provision of water through vending and establishing alternative water supply sources (Kjellén and Mcgranahan, 2006); expansion of services to help improve the services to the poor and those in the peri-urban settlement; legal recognition of the informal providers, development of cooperation of utilities, informal providers and government authorities, regulatory measures for pricing and quality, encouragement of the formation of vendor associations and partnering of local community-based organizations operations with international NGOs which facilitate technical and financial resources; and consideration of microfinance initiatives to facilitate their investments (Kulindwa et al., 2008).

The participation of private practitioners (civil society, private sector and communities) to the management and development of water resources was opened up at the beginning of water sector reforms in 2001. The introduction of the then Kenya Water Act of (2002) saw a rise in water initiatives in various forms of partnerships but without proper guidelines. The different types of private initiatives (Water Service Providers, and water service provision financiers) were as a result of the ambiguity in the policy (Obosi, 2015). Consequently, there is no definite order and scope of interactions but a myriad of options in the very many water initiatives.

Proponents of public participation theory have noted that in recent years, nongovernmental organizations (NGOs) are more involved in the provision of public services thus blurring the line between nonprofit sector and private sector (Diggs and Roman, 2012). Some scholars regard public private participation as a compromise solution and introduced as a last minute measure to remedy an economic or technical situation or as replacement for state led development (Crawford, 2003; Baruah, 2007).

In the Kosovo Village initiative, the public private partnership is rooted on Nairobi City Water and Sewerage Company (NCWSC) which is the public utility mandated with water service provision in Nairobi and is owned by the County Government of Nairobi City. The company however operates autonomously as a private limited company (Gemon, 2008). Nairobi City Water and Sewerage Company (NCWSC) has thus

partnered with the community and civil society in the management and distribution of water in the village. The Nairobi City Water and Sewerage Company (NCWSC) alone was not able to supply water in Kosovo village effectively, because of fears of illegal water connections leading to non revenue water, perceived notion of accumulated water bills and high incidences of water supply service disconnection (Heymans et al., 2014). As a result of this fear, water in Kosovo village was controlled by cartels as is always true whenever the formal water supply is absent (Bakker, 2003).

The engagement of the cartels in the supply of water in the village often resulted in the creation of artificial water shortages by maliciously destroying water pipes or disconnecting of the water supply to the households (WSTF, 2010). The public private partnership in Kosovo village is both at governance and institutional level with more at the lower level among those providing the service. Due to the ambiguity of the policy, the partnership has been formed on a contractual basis. In light of the challenges, the NCWSC partnered with private practitioners already existing in Kosovo village upon their invitation to help address the water governance issue. This is accurate in other informal settlements where water supply seems lucrative yet a risky venture that has seen the legalisation of water vending and a delegation of the water supply business to the informal suppliers by the water utility companies (Kjellén et al., 2015; Hailu, 2011).

2.4 Opportunities and challenges of public private partnership in water governance in informal settlements

Water is not only an important economic resource but is also a vital human need. As such, its supply is subject to political attention. There have been intense debates over availability, pricing and access due to many unique traits. Water remains a special commodity because of its essential nature and non-substitutable, as well as systemic in nature and expensive to transport (Savenije, 2002). Reforms in the water sector, particularly those regarding privatization are complex considering that water is ‘key to life, dull in innovation, local in supply and mysterious in information’ (Shirley, 2007).

The essential water nature makes debates surrounding it more politically charged than are in other public utility services. The situation is exacerbated by the local situation

due to the sensitivity of the local politicians to the immediate interests, and the potential competition over local supply by informal players. The 'dull' aspect of water regards the fact that urban water supply is capital intensive with large fixed costs and with returns on investment that accrue only over long time periods. The situation gets worse in urban informal settlements, poor physical planning in these settlements make it difficult in directly examining subterranean piping network (Shirley, 2007). This inaccessibility leads to high levels of uncertainty in valuation and regulation – activities critical to public private partnership structuring and governance.

The factors mentioned above among others complicate the implementation and operationalization of public private partnerships in a number of ways. Deep politicization means that arguments in support of public private partnerships must withstand rigorous tests of public approval. The lengthy time frame for cost recovery makes long-term regulatory and legal stability critical to investment decisions and private-sector attractiveness. There is a high extent of unpredictability in contracting and pricing for cost recovery due to pervasive information problems related to existing network valuation and projected demand. And a high degree of coordination is required to manage potentially adverse effects on profitability, related to consumer use of alternative sources of water supply.

Past scholars show that poor water governance leads to failure in the supply of water for the poor and marginalized areas which hinder the attempts of the poor to overcome vulnerability (Obosi, 2015; Kjellen et al., 2015). The failure is attributed to corruption, poor resource management, inappropriate institutional arrangements and fragmentation, bureaucracy, insufficient human capacity, shortages of finances for investments and inability by the water utilities plans and systems to acknowledge the context and needs of the informal urban settlements (Roger and Hall, 2003; Bakker, 2003; Jones et al., 2014; Kjellen et al., 2015).

First and foremost water governance is affected when there are capacity challenges in translating existing policies into institutional structures that can improve pro poor governance and enhance sustainability in informal urban areas water supply (Kisima,

2008; Jones et al., 2014). Secondly, inadequate financial resources and human resource capacity to supervise the management and compliance of licensed small-scale water providers has hindered the implementation of the pro poor policy (United Nations, 2015; World Bank, 2004). Moreover, water utilities are yet to fully implement the pro poor policies as guided by the law as they perceive service provision to informal urban settlements commercially unattractive (World Bank, 2004).

Most houses in the informal urban settlements cannot meet the cost of connecting to water services since there are no gradual repayment schemes or subsidies from the water utility (Hailu et al., 2011). However, there is evidently need for cross subsidies to cater for cost recovery hindered by increased levels of non-revenue water and old pipelines in informal urban settlements (GIZ, 2007). However, while the revenues obtained from the utilities must cover the operating and maintenance costs, there must be a compromise between capitalism and socialism (GIZ, 2007). Therefore, mechanisms of financing the water infrastructure are crucial in balancing costs recovery and affordability. However, there must be a balance in finances obtained from the donors and Government resources and subsidies. Donors concentrate more on piecemeal projects and upgrading existing systems rather than technologies that could provide viable low cost technology for fast tracking water access (Verhagen and Ryan, 2008).

For a long time, the Government has failed to include informal urban settlements into their plans despite their rapid growth (Kariuki and Schwartz, 2005). Empirical evidence shows those investments in water and other basic services infrastructure has resulted in regularization of the land tenure rights (Weru et al., 2018). Muzondi, (2014) on the other hand, argues that investing in services without the security of tenure is short term since such projects do not address illegality. Lack of involvement of the community or stakeholders has affected the water projects established in the informal urban settlement since there is no ownership created and thus affecting sustainability and governance (Kjellen et al., 2015). Despite the reforms to improve water governance and supply in Kenya, Nilsson and Nyanchaga, (2008) argue that adoption of historical perspective needs is essential to accomplish sustainable development that can also benefit the urban

poor. They say that the sustainability of public service systems was stable from the 1920s to the 1980s. However, sustainability has been eroded over the years due to shifts in the institutional framework that do not put into consideration, upgrading of standards and technological choices as that were present during the colonial era. There is a need to start addressing technology choices and utility's service standards that cater to the urban poor as well (Nilsson and Nyanchaga, 2008). In conclusion, Jones et al. (2014) argue that governance is important in effective water service delivery, although the available evidence on how specific major governance challenges in urban informal settlements can be overcome is not substantial.

2.5 Theoretical framework

The study is based on collaborative governance theory. Several scholars have put in efforts to trace the origin of collaborative governance (Ansell and Gash, 2008; Emerson et al., 2012; Bingham, 2008). Collaborative governance is now seen as an alternative to adversarial and accountability failures in managerial models of policy formulation and implementation (Ansell and Gash, 2008; Bryson et al., 2006). New school of thought places collaborative governance as the current paradigm for managing democratic systems (Frederickson, 1991; Huxham and Vangen, 2013). Scholars have cited the importance of deliberative democracy as a situation where citizens are given the chance to voice out their concerns, and there exists a government that strongly embeds governance (Henton et al., 2005; Huxham and Vangen, 2013; Emerson et al., 2012).

Ansell and Gash, (2008) define collaborative governance as a governing arrangement where one or more public agencies directly involve non-state stakeholders in a collective decision-making process that is formal, consensus-oriented and deliberative; and that aims to make or implement public policy or manage public programs or assets. However, the study uses the definition provided by Emerson et al (2012) as the processes and structures of public policy decision making and management that involve people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished. Collaborative governance can also be used to

advise participatory governance and civic engagement, despite the fact that the degree of citizens' engagement varies considerably (Emerson et al., 2012). The term ''stakeholder'' refers to the meaningful participation of different actors as individuals or as organized groups in decision making processes (Ansell and Gash, 2008). Collaborative governance results from increased specialized and distributed knowledge whereby institutional structures become more complicated and mutually beneficial especially in instances of uncertainties in specific contexts faced by the policymakers and managers (Ansell and Gash, 2008; Gray, 1989).

Scholars have argued that collaborative governance and public private partnership refer to identical situations whereby, public private partnership's main objective is to achieve coordination (process outcome) rather than to reach an agreement (policy or management outcome) in decision-making process (Emerson et al., 2012; Ansell and Gash, 2008; Huxham and Vangen, 2013). Scholars assume that collaborative governance will lead to better designed and implemented policies which enhance service provision in terms of proximity, representativeness, and innovativeness (Ansell and Gash, 2008; Bryson et al., 2006).

Ansell and Gash, (2017), created a model on collaborative governance which focused on i) Forums being led by public agencies; ii) Participants include non-state actors; iii) Participants take an active role and meaningfully participate in decision making processes; iv) Forum is formalised and meets collectively vi) Concentration of collaboration is public policy interest. Collaborative process variables include starting conditions, institutional layout, and leadership variables expressed as important contributions to or context for the collaborative process. Starting conditions set the fundamental level of trust, conflict, and social capital that become either resources or liabilities during collaboration (Ansell and Gash, 2008). Institutional layout sets the essential ground rules under which collaboration takes place. Leadership provides essential intervention and facilitation for the collaborative process. The collaborative process itself is mutual and nonlinear. This study will adopt this model to assess the public private partnerships in water governance and supply in Kosovo village of Mathare informal settlement. Emerson et al., (2012) note that collaborative governance

occurs in a system context that has drivers such as leadership, interdependence, important incentives, and uncertainty that bring forth the energy that is required to set the ball rolling and set collaborative governance framework in its initial direction.

However, numerous writers caution that collaborative governance also has flaws and weaknesses (Tang and Mazmanian, 2008; Imperial, 2005). One of the shortcomings of collaborative governance is if a stakeholder exits from the collaboration, it jeopardises the commitment of the other stakeholders; and it would be difficult to build trust, ownership and understanding (Purdy, 2012). Bingham, (2008) notes that collaborative processes must have detailed legal foundation to avoid raising concerns about authority, transparency, and accountability. Additionally, critical interests are often not represented (Imperial, 2005; Leach, 2006) the participants with greater resources may be prejudiced in their decisions (Langbein, 2002). Collaborative governance can also be a way of progressing self-interests (Huxham et al., 2000; Purdy, 2012). Other scholars have, however, pointed to the problems that collaborative strategies including manipulation of the process by powerful stakeholders; public agencies lacking the real dedication to the collaboration; and mistrust (Purdy, 2012).

Many scholars observe that collaborative governance is an intense process and takes a long time (Gunton and Day, 2003; Roussos and Fawcett, 2000). However, once stakeholders come to an agreement, the literature proposes that actual execution can occur quite quickly (Ansell and Gash, 2008). Thus, policy makers may prefer the collaborative governance if they anticipate a complex execution process.

2.6 Conceptual Framework

The study has adapted the collaborative model designed by Ansell and Gash, (2008) after an analysis of 137 natural resources management cases. The independent variables are the starting conditions between the water utility, community living in the informal urban settlements and the water vendors. The starting conditions represent the context for the collaborative process. Ansell and Gash, (2008) note that mistrust among stakeholders is usually the starting point for collaborative governance since

collaborative governance is not merely about negotiations but trust building amongst partners.

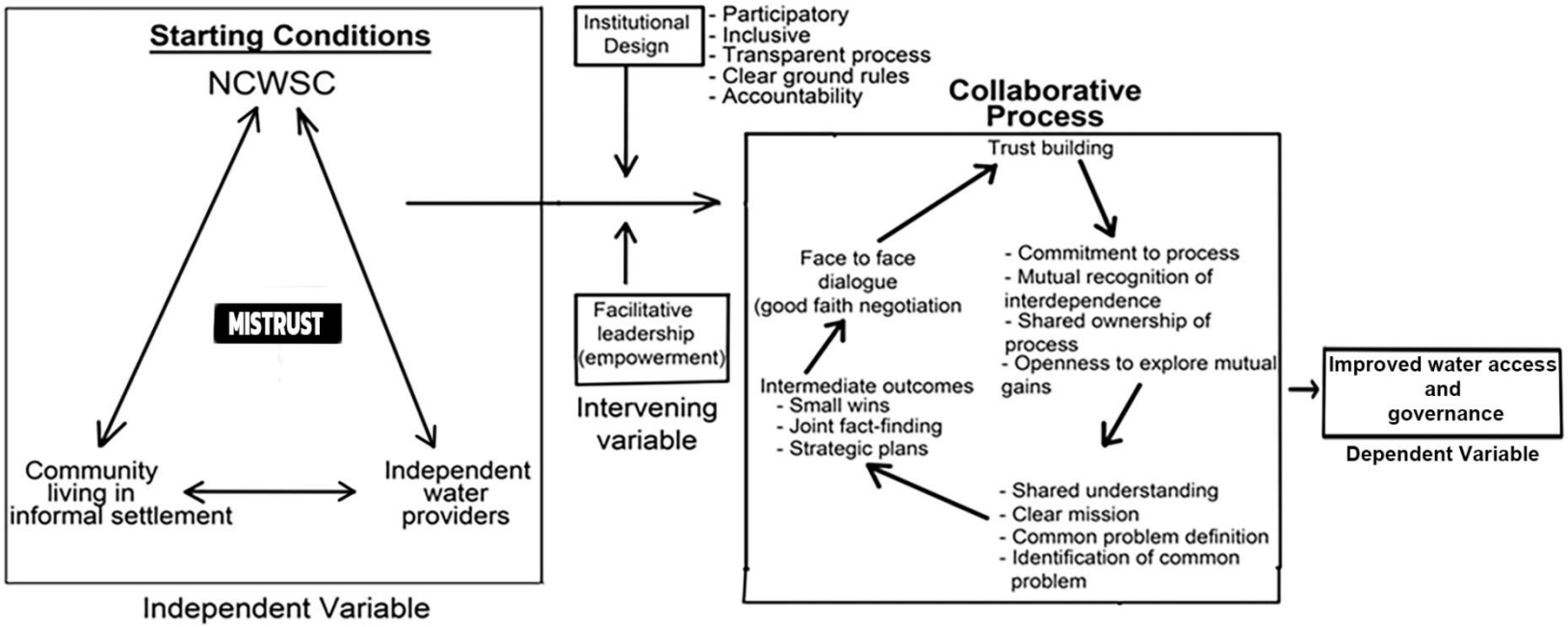
In a study conducted by Gemon, (2008), she notes in her study on 'Triangle of Mistrust' that there has been strained association among the water utility, water vendors and the community dwellers in informal urban settlements. Kjellen et al., (2006) note that for water services supply improvement in the informal urban settlements, there is a need to improve interactions, cooperation and communication among the stakeholders involved. Ansell and Gash, (2008) notes that circumstances that exist at the conception of the collaboration can either build or destroy partnership among stakeholders. As reviewed in literature, power imbalances and resources can influence the collaborative process (Gray, 1989). Sometimes, some stakeholders especially individuals are incapable of participating in the collaboration on a similar level which leads to manipulation by the stronger stakeholders (Rogers et al, 1998; Bryson et al., 2006). Gemon, (2008) in her study felt that the water utility left out or overlooked the community from the beginning of project implementation and this affected ownership. A successful collaborative process must embrace all stakeholders who are impacted by or have an interest in the issue (Leach, 2006).

Several scholars have also observed that collaborative governance process may be affected by lack of technical know-how, ability and professional skills to pursue discussions about extremely technical issues (Gunton and Day, 2003; Tang and Mazmanian, 2008). Ansell and Gash, 2008 also note the limitation of time or energy to dedicate to the collaborative process. From the literature reviewed, it is noted that stakeholders such as NGOs conduct pilot projects that are time bound and usually leave recommendations for the public sector to adopt which is not always the case (Verhagen and Ryan, 2008). Ansell and Gash, (2008) note that the institutional design sets the foundation for good governance (i.e. transparency, accountability, inclusiveness and participation) which guides the collaboration while leadership mediates, enables and represents the weaker stakeholders thus facilitating the collaborative process (Gunton and Day, 2003). Additionally, the logical framework adapted from Gemon, (2008) shows the water utility at the top of the triangle since it is the only stakeholder with

ability to influence the relationships through its partnership with other stakeholders. The collaborative process should be distinct and have clear guidelines for fairness, equitability, and impartiality (Choi and Robertson, 2013).

The stakeholders' motivation in participating in the process depends on their expectations on the collaborative processes yielding substantive results (Rogers et al., 1998; Emerson et al., 2012). Consensus building as described by Gray (1989), defines the process in three steps as i) Problem setting stage which starts with dialogue meetings between stakeholders to break down obstacles to dialogue that may prevent achievement of common benefits in the first place (Bentrup, 2001) ii) Direction setting iii) Implementation. Stakeholders' degree of involvement in the process is vital for the success or failure of the collaboration (Gunton and Day, 2003). Several scholars have found non commitment of public agencies to collaboration (Ansell and Gash, 2008; Genom, 2008; Bryson et al., 2006). Ownership requires stakeholders to share responsibility with their opponents (Bentrup, 2001) Intermediate outcomes may represent outputs or critical small success steps that can contribute into the collaborative process thus invigorate the process of building trust and dedication (Bryson et al., 2006).

Figure 2.1: Conceptual Framework



Source: Researcher, (2019): Adapted (with modification) from Gemon, (2008) and Ansell and Gash, (2008)

2.7 Literature Gap

The reviewed literature above suggests that there have been a number of studies on the subject of public-private partnership and governance in the water sector. However, majority of the studies on this subject has been in the context of the developed economies; such as China (Shirley, 2007) and India (Savenije, 2002). Moreover none of these studies has assessed the role public private partnership play in water governance. As evident in the review there is a lot of interest in public private partnerships in a number of service sectors including the water sector due to a variety of problems witnessed in the public water utilities. At the same time, studies have not explored the contribution of target beneficiaries to water governance. The study in a bid to fill these gaps, aimed at assessing the public private partnerships in water governance in an informal settlement in a developing country. The study also explores the role played by the community in governing water resources.

CHAPTER THREE: THE STUDY AREA

This chapter looks at the study area in details including the study area geographical location, the history of the settlement, climatic conditions, topography, geology, housing, population size and socioeconomic activities.

3.1 Geographical location

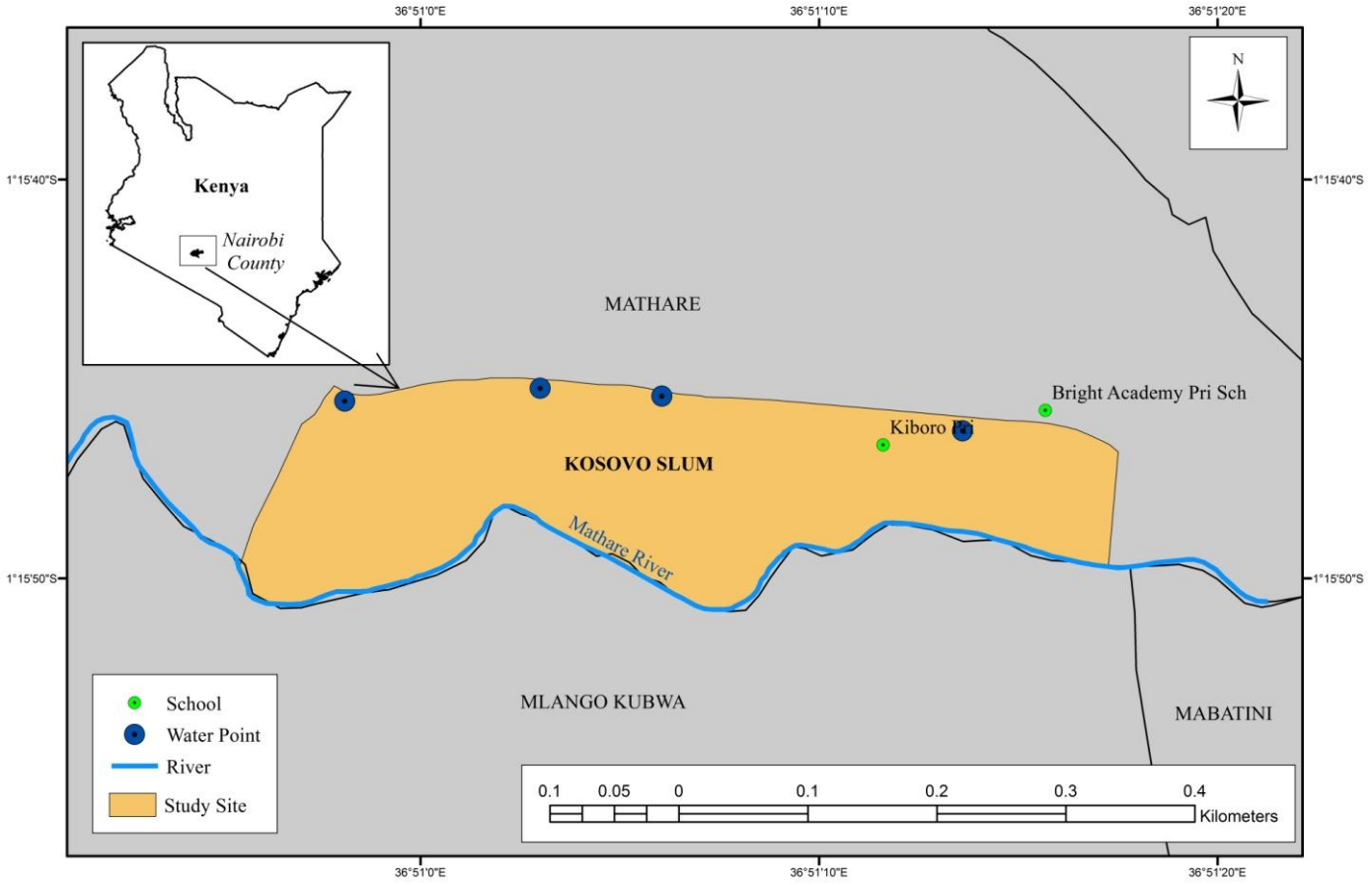
3.1.1 Mathare Informal Settlement

The study area is found in the Mathare informal settlement located about 3-7 kilometres from the Central Business District in Nairobi County. It stretches over Starehe and Kasarani Constituencies adjoining Thika Road and Juja Road (WSTF, 2010). Mathare is roughly 73 hectares in area size, making it the second biggest informal settlement in Nairobi after Kibera (UN HABITAT, 2010). Mathare is composed of 13 different villages (Corburn et al. 2012). River Mathare and River Gitathuru rivers pass through the informal settlement to join the larger Nairobi River watershed.

3.1.2 Kosovo Village

Kosovo is one of the villages in the expansive Mathare informal urban settlement found in Mabatini sub location, Mathare location, Nairobi City and Nairobi County (Figure 3.1). It covers 0.0835km^2 (Census, 2009). The settlement started in 2001 after the residents were oustered from Village II where Muslims bought land to construct a mosque (Pamoja Trust, 2008). The government gave the affected residents land through the balloting process. The approximately 12 acres of land is Government owned and was to become a Police Force Bazaar (Pamoja Trust, 2008). Once in a while, the residents get eviction threats from the police force. There is a poor road network, and one can only access the settlement from Thika Road. The residents dump all garbage and sewer into the nearby river or drains. The area is unplanned with the informal settlement made of iron sheet roofs and walls and tightly clustered together. There are a few private schools and hospitals contributing to its socio-economic status.

Figure 3.1: Kosovo Village in Mathare informal settlement



Source: Researcher, (2019)

3.2 History of Mathare informal settlement

The history of Nairobi's informal settlements started with the British colonial policy of spatial and social segregation where they barred most Africans from the neighbourhoods reserved for Europeans and Asians (K'Akumu, 2007; Andvig and Barasa, 2014). Black people were only allowed into the city as temporary workers and not to settle (Darkey and Kariuki, 2013). Much of Mathare was formerly a quarry, which limited human settlement due to the rock mining activities that were ongoing in the river valley.

In the 1950s, Asians predominantly occupied the Mathare Valley where they extracted stones for building (UoN, 1971). During the colonial era, there were a few authorised houses in the area. The British had designed the houses for a specific number of people and did not consider the aspect of population growth (UoN, 1971). They also did not see the need to develop infrastructure for water supply and sanitation services areas settled by Africans and instead, built resource extraction services (Darkey and Kariuki, 2013). Nairobi's informal urban settlements remain a profitable business for the persons that control land, landlords and those who take money from cartels that provide unregularised service provision such as water and electricity where the public utilities are unable to deliver (Nyambura, 2012).

In the 1960s, Mathare residents founded their own schools and community based organizations that championed for basic services provision from the then Nairobi City Council. However, immediately after Kenya independence, the City Council destroyed the houses and refused to give the residents water or garbage collection services since they termed the settlements illegal (Corburn et al., 2014). As a result, the residents organised their own leadership framework, land purchasing and house construction companies.

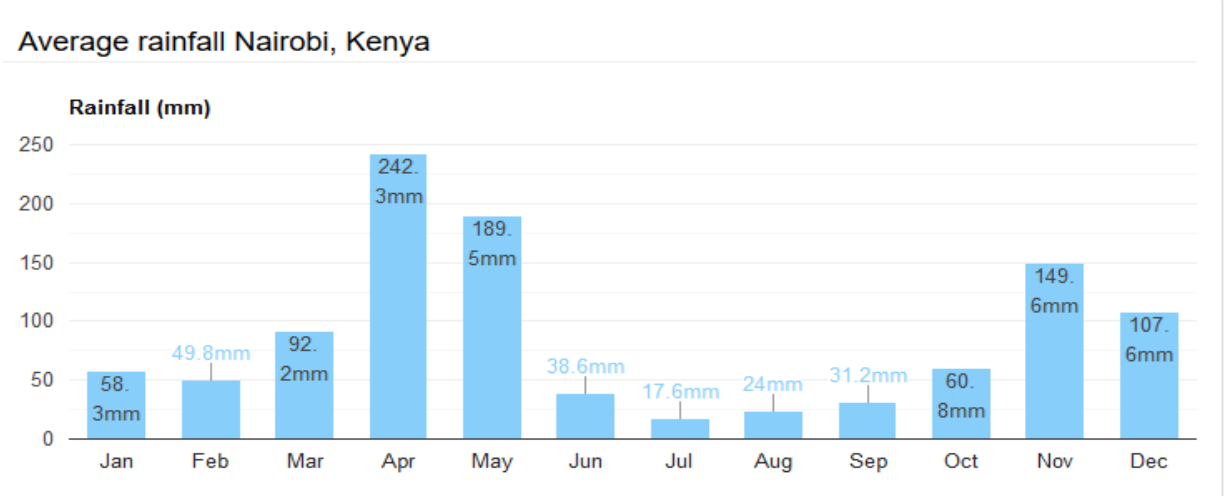
In the late 1960s, settlement's population grew rapidly with over 20 construction companies' building many houses in the settlement to accommodate more people. The housing construction companies leveraged on Mathare's proximity to the Central Business District by constructing cheaper housing but they did not give title deeds or the essential services. In 1971, the Nairobi City Council started to supply free water

following a cholera outbreak. The Government adopted a new Master Plan for Nairobi City in 1973, though it did not give a extensive development strategy for the expanding informal urban settlements. Therefore, to date the informal urban settlements planning in Nairobi continues to be fragmented and focused on small specific projects (AWSB, 2013).

3.3 Climatic conditions

3.3.1 Rainfall

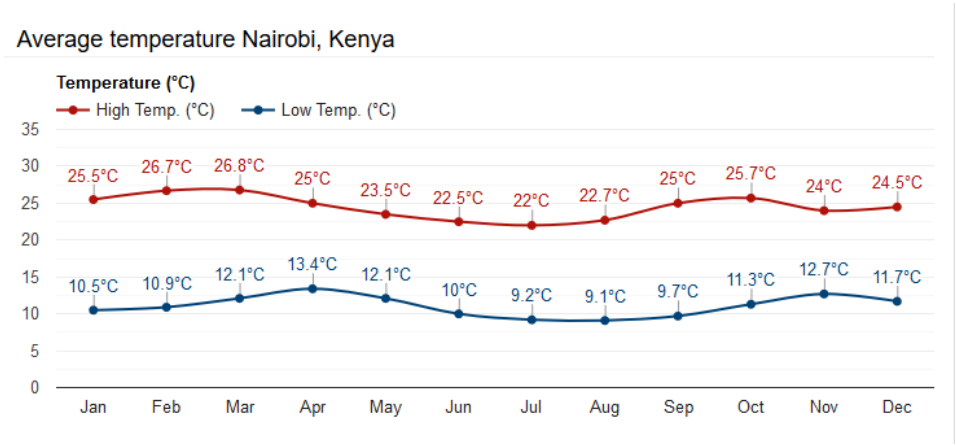
Rainfall ranges for Mathare informal settlement are similar to those of Nairobi city. April receives the highest amount of rainfall at 242.3 mm. July receives the lowest amount at 17.6mm.



Source: https://www.weather-atlas.com/en/kenya/nairobi-climate (Accessed 21st February 2019).

3.3.2 Temperature

The temperature ranges for Mathare informal settlement are similar to Nairobi City. August has the lowest average low temperature at 9.1°C. March is the warmest month at 26.8°C.



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Source: https://www.weather-atlas.com/en/kenya/nairobi-climate (Accessed 21st February 2019).

3.3.3 Topography, geology, soil structure and Housing

Mathare informal settlement is characterized by rugged terrains which are attributed to quarrying which previously took place in the area. River Mathare and River Gitathuru which join the Nairobi river basin system flow through the settlement. Many residents live along the riparian reserve risking their lives to floods and landslides (Baraka, 2012). The soils structure consists of alluviums and black cotton soil which make parts of the settlements prone to landslides.

According to Charles, (2010) about 30% of the informal settlements in Mathare are located within the stipulated 30 metres riparian reserve of the rivers. The proximity to the river exposes the residents to risks in times of floods or landslides or both (Baraka, 2012). The houses are constructed from iron sheets, wood, mud and cement. The rooms measure approximately 10ft by 12 ft. 90% of the population are tenants paying rent of Kes 800-1500 per month (Pamoja Trust, 2008) Residents construct temporal drainage systems that drain into the Getathuru River. Kenya Power and Lighting Company has fixed electricity

permanently, and the residents pay a standard fee of Kes 300 per month for the service (Wanjiru and Matsumbara, 2017).

3.3.4 Population size and composition

Kosovo has a population density of 8,085; Female: 3642 Male: 4443 (Census, 2009). The population is fast increasing due to high birth rate, affordable housing, and closeness to the Thika Superhighway. The village has a population of 2,846 households in Kosovo village (Census, 2009). The population comprises of mixed ethnicity (majorly Luos, Luhyas, Kambas and Kikuyus).

3.3.5 Socioeconomic activities

After independence, informal labour opportunities came up through construction sites of the booming housing business in Mathare by the housing companies (AWSB, 2013). Some residents started brewing illicit commercial brews (chang'aa and busaa) which is the predominant economic activity. Others started small food kiosks, green groceries and hawking. Others took up robbery with violence (AWSB, 2013).

CHAPTER FOUR: RESEARCH METHODOLOGY

This chapter describes the research design, sample size and sampling techniques, data collection and data analysis methods.

4.1 Research design

The present study employed a mixed study design in which both qualitative and quantitative techniques were used to assess the contribution of public private partnership in water governance and supply in Kosovo village of Mathare informal settlement. The design was deemed suitable because of its ability to offset the weaknesses of both quantitative and qualitative research.

4.2 Sample Size and Sampling procedure

The study targeted a population of 2,846 households in Kosovo village (Census, 2009). The sample focused on the household's heads and key informants. The sample was established using the Nassuima, (2000) model of determining the sample size when the total population size of the study area is known.

The Nassuima model

$n= \{NC_v^2\}/ \{C_v^2+ (N-1)\ e^2\}$…… *(Eqn. 1)*

Where: N = is the target population

Cv = is coefficient of variation

e = is tolerance at desired level of confidence

For this study:

Cv = 0.5

e = 0.05.

Therefore: $n= \{NC_v^2\}/ \{C_v^2+ (N-1)\ e^2\}$

$n= 2846\ (0.5^2)/\ 0.5^2+ (2846 -1)\ 0.05^2$

n = 800/8.2475

n= 97

To arrive at individual household, numbers were assigned to households, each written down on a piece of paper which was then folded; the folded pieces were put in a container and mixed. The researcher then randomly picked items until the required sample size was obtained. Households were defined as the set objects. Other respondents targeted in the survey to collaborate household survey information were water utility (NCWSC) officials, provincial administration (Chief), local community leaders, and community based organizations (CBO), nongovernmental organisation (Pamoja Trust), and water vendors. Data was collected with an aid of a questionnaire from 87 households and 10 key informants for the water utility, CBOs in the study area, water vendors, community leaders, and the local administration.

4.3 Data Collection Methods

Various primary and secondary methods were used to collect data. These methods included review of existing documents, use of key informants, doing group discussion, use of questionnaire and participant observations.

Secondary data entailed a review of relevant publications on public private partnership and water supply. Of particular interest was how the public privation participation framework contributed to water supply and governance.

Primary data was collected via the use of key informant interview guides, questionnaires and focused group discussion guides. Primary data was also collected by observation and photography. The collected data covered the demographic characteristics of respondents; the perceptions of the respondents on the contribution of public private partnership on water supply and governance. Data was collected from water vendors, community based organisations and administrative officers and key informants from nongovernmental organisations, community based organisations and the water utility.

4.4 Data Analysis

The purpose of data analysis is to generate structure, explanation and order to the mass of collected data. Data analysis aids in description and summary of information as well as forecast of outcomes. Data from the field were edited, coded, entered into a computer

using the Statistical Packages for Social Sciences and cleaned to ensure accuracy, consistency, uniformity and completeness. Descriptive statistics which is a mathematical technique for summarizing, organising and displaying a set of numerical data (Gall & Borg, 1996) was applied in analysing the data. Central tendency and variability measures were utilised to illustrate the values in distributions. Data collected was accurately scored and systematically organised to facilitate data analysis (Collins, 2010; Richardson, 2005). Data is presented using charts, graphs, tables of frequencies and percentages. Thematic analysis was used in analysing the qualitative data to identify patterned meaning across the dataset that was used in adding value to the quantitative findings.

4.5 Ethical Considerations

The researcher sought permission from the relevant local authorities and the university in order to ensure the study follows principles guiding ethics in research were observed. Prior to gathering information from the respondents, the researcher explained to the respondents what the objectives of the study were, and how the findings would help them improve their livelihoods.

CHAPTER FIVE: RESULTS AND DISCUSSIONS

This chapter focuses on presenting the empirical results of the study. First, it presents the preliminary findings of the characteristics of the sample and data collected, and secondly, it focuses on the descriptive statistics. Descriptive interpretation provided for the values of the individual variables and their components based on inferential statistics which provide frequencies, percentages and averages (or mean).

5.1 Response rate

The study targeted 87 respondents. However, only 83 questionnaires were fully filled representing a response rate of 95% was achieved meaning that the data was good enough to be analysed. Richardson, (2005) indicated that a response rate of 60% is desirable and that above 80% is excellent (Table 5.1).

Table 5.1: Response Rate

Response Rate	Frequency	Percentage
Filled Questionnaires	83	95
Unfilled Questionnaires	4	5
Total	87	100

Source: Researcher, (2019)

5.2 Demographics of the Households

Data was collected from 83 respondents. The results of demographic characteristics included composition of the household, household size, income source, and income per month (Table 5.2). The results indicated that 50% of all the households interviewed were male-headed, 48% were female headed while 2% were child headed (Table 5.2). The higher percentage of men headed households in the region imply that were the decision makers in the dwelling. However, the fact that more households were headed by male was not a significant consideration in this study because males' control of household activities does not include access to water. The percentage of households headed by

female was significant implying that since in the African setup, water access and usage is mostly a concern of women. Women should be taken into account in water governance in informal urban settlements since they spend a lot of their time fetching water thus have less time available for other tasks such as childcare and economic activities with the latter resulting in a lower household income (United Nations, 2010; Foeken et al., 2013).

Table 5.2: Demographic characteristics of the Households

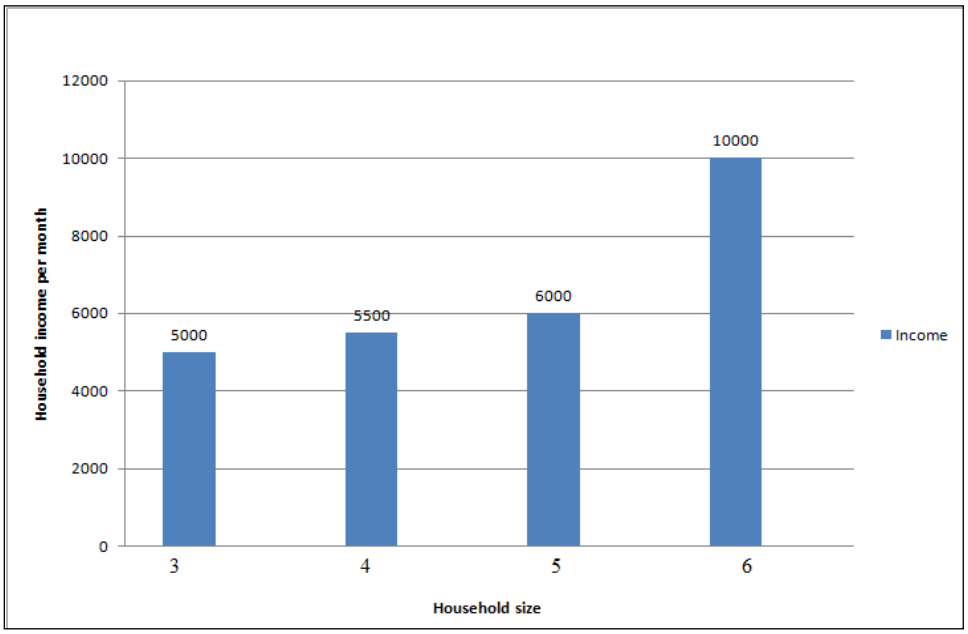
Characteristic		**Percentage**
Household head	Female	50.0
	Male	48.0
	Child	2.0
Household Size	3	35.0
	4	2.0
	5	30.0
	6	33.0
Source of Income	Self-Employment	39.0
	Casual Employment	59.0
	Formal Employment	2.0

Source: Researcher, (2019)

According to Rogers and Hall, (2003) water management systems can operate better by leveraging on the knowledge, creativity, and experience of both women and men. Furthermore, women are the managers of water use worldwide in an informal way. In terms of household size, the study established that majority of households had 3 members making a family. This was 35% of the households in the study area as indicated in Table 5.2. The average household size was 5 members. The household size was significant in this study because it determines how much water is required for each household to sustain its daily needs. In terms of sources of income, the study established that only 2% of the respondents derived their income from salaried employment while the rest were in informal sector in casual jobs or small businesses.

A significant 59% derived their incomes from either casual jobs and sometimes found themselves unemployed thus their source of income irregular (Table 5.2). As a result of the fluctuation of income by respondents in this informal sector, there is a direct impact on the provision of daily basic needs in form of water, food and shelter. The study further sought to find out the main sources of income among the self-employed and the casuals. 27% of the respondents in the two categories were involved in cooking food for sale; 34.9% were tailors; 31.9% were washing clothes for a livelihood; 2.4% were masons and carpenters and 3.6% were mechanics. The respondents in the informal sector earned between Kes 100 and Kes 200 per day. The researcher also observed that illegal chang'aa brewing was a huge economic activity in the area but the respondents shied away from the subject. The study further sought to establish the income level relative to the size of the family; the findings are presented in Figure 5.1.

Figure 5.1: Household income per month



Source: Researcher, (2019)

The findings in Figure 5.1 indicate that the household income in a month increased with the household size, depicting the nature of informal settlement households where every member is engaged in his or her capacity to generate income for the household. The

researcher observed that even children as young as 13years were involved in some sort of income generating activity when they were not in school.

5.3 Water situation in Kosovo village of Mathare informal settlement

The first objective was to assess the situation as regards to water accessibility, the following section features the access to water situation in Kosovo Village with data collected from the households.

5.3.1 The water situation

The study sought to assess the water situation in Kosovo village. The findings revealed that 40% of the households in the study area rely on Nairobi City Water and Sewerage Company (NCWSC) Water Kiosks/Yard taps as their water access point as indicated in Table 5.3 followed by independent water vendors at 32%. The 32% respondents purchasing water from water vendors was attributed to the frequent water rationing or reduced pressure for the water to reach the households' location due to topography and illegal connections from the mains by the water vendors. The supply of water by Nairobi City Water and Sewerage Company mains network was serving 28% of the households in the study area. Nairobi City Water and Sewerage Company therefore supplied water to 68% of the population. This was a shift from the fact that there are no well-defined land ownership rights to necessitate the installation of water meters to households.

Table 5.3: Source of Water

Water supply source	**Frequency**	**Percentage**
NCWSC Mains	23	28
NCWSC Kiosk/Yard Tap	33	40
Water Vendors	27	32
Total	**83**	**100.0**

Source: Researcher, (2019)

The study also found that the actors in the partnership had agreed to have a mix of infrastructure (water kiosks, individual household connections and pipeline connectivity

to a plot in form of a yard tap). The mix of infrastructure was to cater for the residents with different levels of income and thus their ability or inability to pay for household water connection or keeping up with monthly water bills payments. The connections were also demand driven based on citizen involvement from the onset of the project. The respondents expressed their trust in the quality of water offered by the water kiosks (Photo 1). The arrangement of a mixed infrastructure is an indication of good governance since it took into consideration the views of the water users in designing a working solution in aid of water access. This is in congruence with the views of Kjellen et al., (2015) who aver that the ability of the government to deliver its desired outcomes must emphasise participation and bottom up decision making process.

Photo 1: Water kiosk installed during the partnership

Source: Researcher, (2019)

5.3.2 Distance from the water source

The study sought to establish the distance covered by the residents in accessing water. The findings reveal that 26% of the households had to cover over 500 metres to fetch water for their household use as indicated in Table 5.4. The respondents in this category

had to fetch water in any of the four (4) water kiosks that had been installed by the Nairobi City Water and Sewerage Company through the partnership or fetch water from the informal water vendors within Kosovo village. This was followed by 24% of the households that had to cover as little as 50-100 metres to fetch water as indicated in Table 5.4. It is important to note that households that covered this distance had a yard tap connected to the plot from the Nairobi City Water and Sewerage Company Main water network (Photo 2).

The distance covered had significantly reduced unlike when the residents would fetch water from the free communal water points installed by Nairobi City Water and Sewerage Company along Juja Road. The recommended distance in terms of access to improved water is 1000 metres (WHO, 2008). The findings imply that the residents' access to water is within the accepted limit. Whereas there was access, it is imperative to note that not all the informal urban settlement residents had water connection to their houses as earlier intended by the partnership; hence they only accessed water by buying from water vendors and Nairobi City Water and Sewerage Company water kiosks. The findings concur with findings in IRIN, (2007) and WSTF, (2010) reports that revealed that there is displeasure over distance covered, and cost in accessing water.

Table 5.4: Distance from the water source

Distance	**Frequency**	**Percentage**
50-100 metres	20	24
200-500 metres	18	22
Over 500 metres	22	26.0
Connected to Water Mains	23	28
Total	**83**	**100.0**

Source: Researcher, (2019)

Photo 2: A yard tap installed within the household premises (plot)

Source: Researcher, (2019)

5.3.3 Amount of water consumed

The study sought to establish the amount of water consumed in a day by the households. The findings revealed that 31.3% of the households in the study area used 250-350 litres in a day on all household chores including bathing and cooking for a family as shown in Table 5.5. 30.1% of the households consume 100-250 litres of water and only 8.4% of the households used less than 50 litres of water in a day.

Table 5.5: Amount of water consumed in a day per household

Amount	Frequency	Percentage
Less than 50 litres	7	8.4
50-100 litres	20	24.1
100-250 litres	25	30.1
250-350 litres	26	31.3
Over 400 litres	5	6.0
Total	**83**	**100.0**

Source: Researcher, (2019)

The UN recommends that a human being requires 50 litres of water per day for cooking and personal hygiene in order to be efficient and to avoid diseases (WHO, 2008). However, most people in African countries survive on 20 litres a day per person (WHO/UNICEF, 2017). Taking the average persons per household in Kosovo, it means 67% of the respondents were within the recommended amount of water for use per person per day. A majority of the respondents in the study area were within the recommended standards in the achievement of access to water. The trend in water consumption has however, been dropping over the years in Nairobi. This could be attributed to water scarcity that requires the Nairobi City Water and Sewerage Company to ration water sometimes and thus residents readjust their water use priorities accordingly (Pursehouse et al., 2015).

5.3.4 Frequency of fetching water

The study sought to establish the frequency the households fetched water. The findings reveal that the households collected water between 1-6 times in a day depending on their household needs as indicated in Table 5.6. It was established that 41% of the households fetch water 3 times in a day, majority of whom fetch water in a water kiosk or with informal water vendors; this was followed by 32.5% and 14.5% who spent 2 times and 1 time respectively to fetch water for their households in a day. About 12% of the households spent 6 times in a day fetching water. Majority of the respondents in this category were those involved in social economic activities such selling food and vegetables near their households.

Table 5.6: Number of times a household fetches water in a day

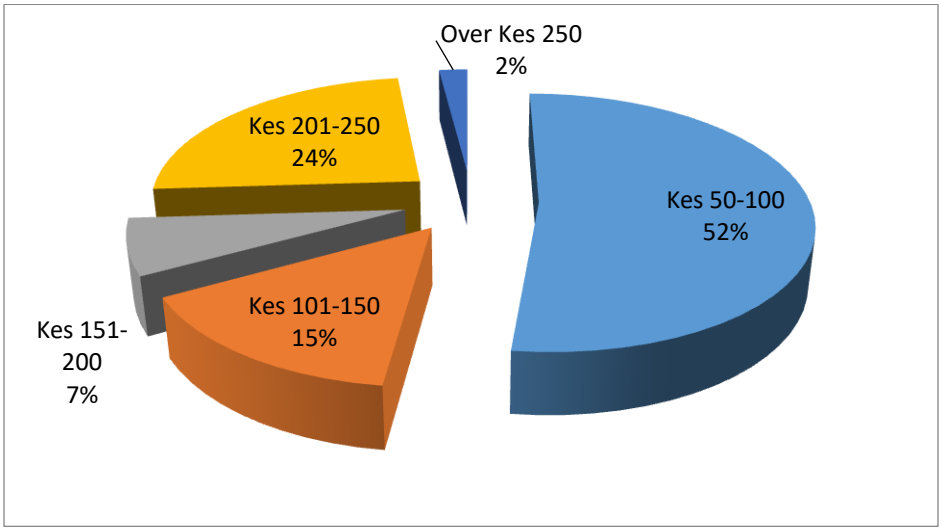
Times of fetching water per day	Frequency	Percentage
Once	12	14.5
Two Times	27	32.5
Three Times	34	41.0
Six Times	10	12.0
Total	**83**	**100.0**

Source: Researcher, (2019)

5.3.5 Water Affordability

The study sought to establish the affordability of the water supplied by Nairobi City and Sewerage Company (NCWSC). The findings reveal that 52% of the households paid for water at a rate of between Kes 50 - 100 per month depending on their consumption. This was followed by 24% who paid between Kes 201 and Kes 250 as their monthly water bill (Figure 5.2). However, the billing varied depending on the water supplier to a household and the respondents' monthly water consumption. Article 158(b) of the Kenya Water Act of (2016) stipulates that Water Services Regulatory Board (WASREB) evaluate and recommend water tariffs to the County Water Service Providers (in this case NCWSC) to protect the consumers (GoK, 2016). Households are meant to pay a one off connection fee during installation as well as a monthly standing charge.

Figure 5.2: Water Bill per Month (in Kes)



Source: Researcher, (2019)

In informal urban settlements, the connection fee can be paid in installments (WASREB, 2018:10) although at the time of data collection, NCWSC was not allowing partial payments thus limiting the number of households with household connections. The standing charge is constant irrespective of the amount of water consumed. The study found out that the low monthly standing charge encouraged households with connection

to sell water to their neighbors 'illegally' at a small fee. The low rates also encourage wastage despite the scarcity. On the contrary, Castro and Morel, (2008) suggest that rising block tariffs penalize yard taps and house-hold connections that resell water to neighbors.

Nairobi City Water and Sewerage Company set tariffs based on guidelines from the regulator, Water Services Regulatory Board whereby the average price was Kes 45 per cubic metre; the lower block tariff was Kes 12 per cubic metre to households consuming less than 10 cubic metres in a month. Informal settlements tariffs were subsidized to Kes 10 per cubic metre although the water kiosks can add their own margins for sustainability of the business but the tariff must be below the lower block tariff. The guidelines also encouraged the establishment of other income generating activities within the kiosk (WASREB, 2018:10). The study found the water kiosks running other income generating activities such as small shops, barber shops within the water kiosk.

It is worth noting that Nairobi City Water and Sewerage Company revised the tariffs in 2015 and were effective till 2019 after which they would be subject to review if necessary. The lower block tariff pays a standing charge of Kes 204; the average price of water is Kes 53 up from 45 per cubic metre and the tariff for Water Kiosk is Kes 20 per cubic metre. The households also pay a connection deposit of Kes 2,500 and the water kiosks pay Kes 5,000 WASREB, 2018:10). The researcher found out that the residents paid the Kes 5,000 that was inclusive of the Kes 2,500 as connection deposit and the rest of the money went into surveying fees and other administrative costs.

The study area is supplied water primarily by the Nairobi City Water and Sewerage Company at a fee of Kes 2 per 20litres of water at the Water Kiosks. However, households that were not connected to Nairobi City Water and Sewerage Company supply Mains or Yard tap or fetching water from the installed water kiosks paid more for the water. In a recent visit, the researcher noticed that Nairobi City Water and Sewerage Company had adopted the use of technology to purchase water from some of the installed water kiosk as a pilot. The technologies involved having households top up cards with credit of 50 each and use it to purchase water at the kiosk at a fee of Kes 0.50 per 20 litre

jerrican until the credit is depleted. The method had an advantage of cost thus reaching out to more customers and also reduces queuing time as one can fetch water at any time of the day or night as long as the water is available (Pursehouse et al., 2015). Previously an attendant would be present from 6am to 6pm. However, the Kiosk operators felt they had become redundant although they still used the kiosks to run other income generating activities.

5.4 Nature of public private partnership in water supply and governance in Kosovo village

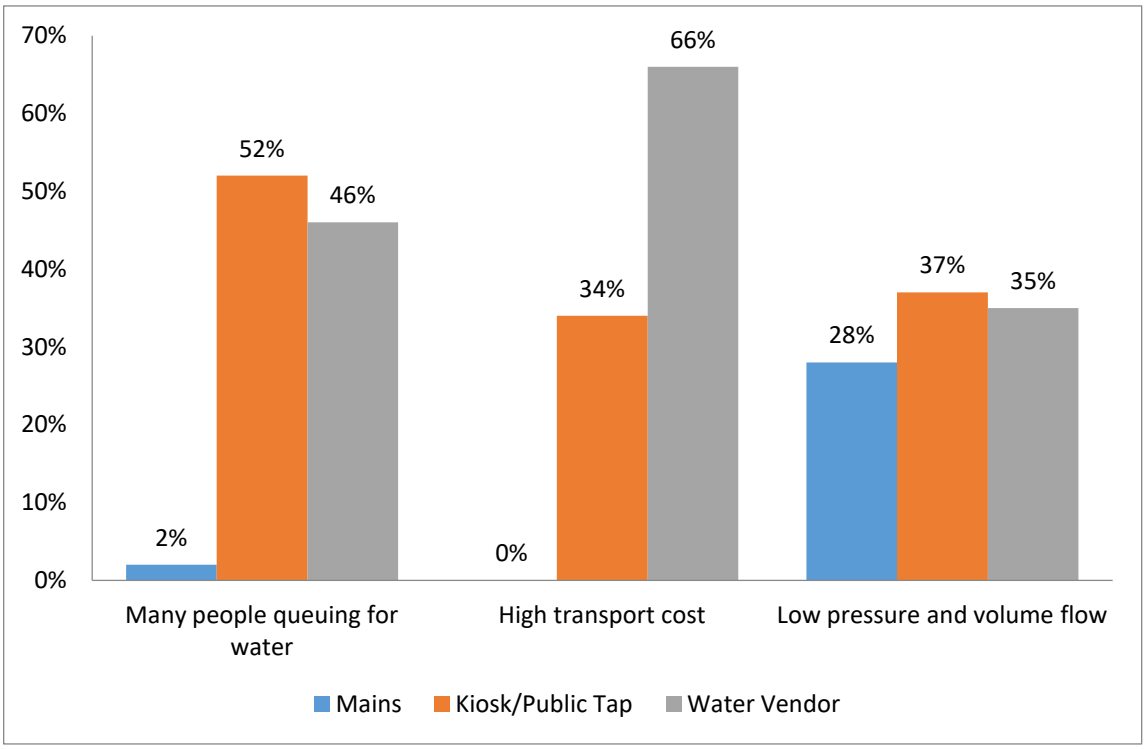
5.4.1 Problems encountered when fetching water in Kosovo village

The study sought to establish some of the problems households faced in fetching water. The findings revealed the respondents attributed long queues leading to a lot of time taken in fetching water; low water volume flow as a result of low pressure as a problem that led to the long hours spent in fetching water and high transportation costs as the major problems encountered. The study further revealed that the long queues were experienced at the Water Kiosks/ Yard taps and at the water vendors with 52% and 46% respectively as shown in Figure 5.3. The 2% response from respondents connected to the Nairobi City Water and Sewerage Company mains was as a result of respondents allowing their neighbors to fetch water in their houses at a small fee.

In addition, the study found out that due to topography of the study area and issues of illegal connections by the informal water vendors, the water pressure reduced thus reducing the volumes as attributed by 37% who fetched water in a Water Kiosk/Yard tap; 35% who fetched water from the informal water vendors and 28% who had Nairobi City Water and Sewerage Company mains connection in their households (Figure 5.3). The study established that the respondents who obtained water from water kiosks and water vendors incurred more money sourcing for transportation of the water to their homes at 34% and 66% respectively as indicated in Figure 5.3. The study established that, informal water vendors would charge as much as Kes 10 on a 20 litre jerrican that they deliver to a household.

The increase in cost was attributed to the transport cost of the jerrican of water making the water too pricey for the respondents. The challenges imply that these challenges could be as a result of poor water governance that has led to poor resource management. As shown in Figure 5.3, much of the problems listed relate to water access from the private players, implying that there is no coordinated structure that allows for public private partnership to address the challenges. This is in concurrence with the findings of Kariuki and Schwartz, (2005) who noted that there is need to formalize the relationship between the private water vendors and the public water utility as the water vendors are known for innovations that improve cost-effectiveness and cover their cost of water service delivery.

Figure 5.3: Problems encountered when fetching water from different sources



Source: Researcher, (2019)

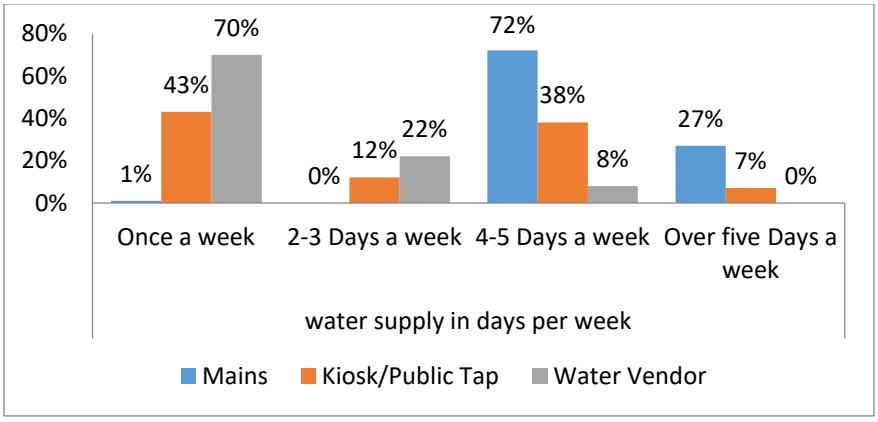
5.4.2 Weekly Water Supply

The study sought to establish the frequency of weekly water supply in Kosovo. The findings revealed that for households connected to Nairobi City Water and Sewerage Company main water supply network, 72% received water for between 4-5 days in week,

while 27% received water over 5 days a week. It was further revealed that each day of water supply lasted for at least 2 hours to 4 hours. However, 70% of households that get water from water vendors would get their water once a week; followed by 22% receiving the water for 2-3 days a week and 8% at 4-5 days a week as shown in Figure 5.4. This could be attributed to the high cost of obtaining water from the informal water vendors. Thus, the larger households or the households involved in other socio economic activities that required water were the only ones who obtained water from the vendors more than once a week.

The 26% respondents who obtained water from the Nairobi City Water and Sewerage Company mains network was attributed to the households situated at the lower levels gradient due to the topography of Kosovo village (Figure 5.4). It was also established that despite the partnership efforts to reduce the number of illegal connections from the Nairobi City Water and Sewerage Company mains, there were still a few rogue residents who tapped the water illegally from the mains thus reducing the water pressure and flow. The findings imply that the partnership boosted water availability and not reliability considering that the households connected to the mains could access water for an average of four days in a week. Water reliability is an all-encompassing concept that is not only measured by the availability but by other factors including rate of failure in pipes and pipe failure combinations as well (Raghupathi, 2003).

Figure 5.4: Frequency of water supply in a week

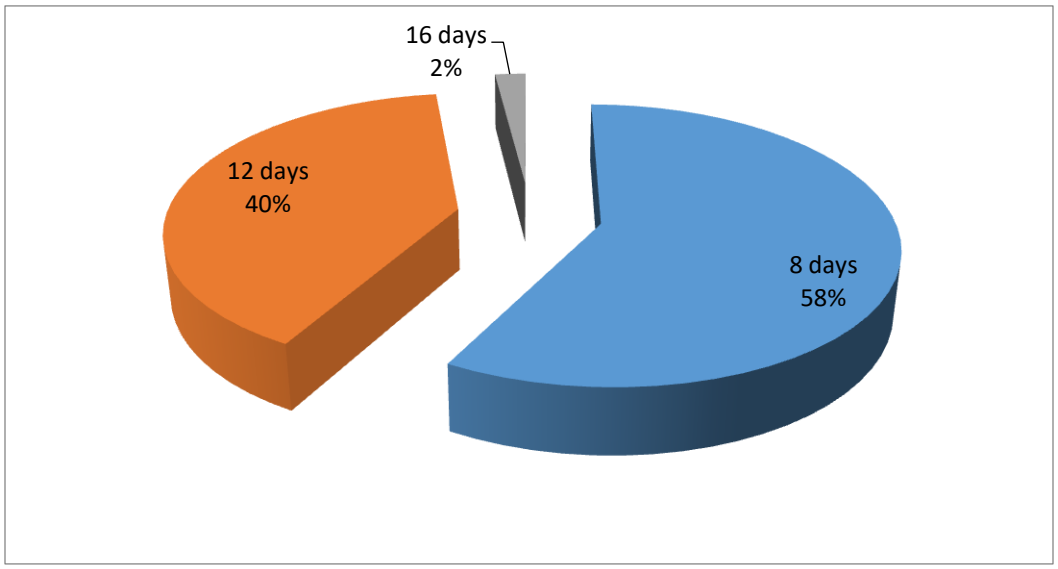


Source: Researcher, (2019)

5.4.3 Water Scarcity

The study sought to establish the experiences of water scarcity in Kosovo village. The findings revealed that 58% of the households in Kosovo village would go for at least 8 days a month without any form of water supply as shown in Figure 5.5. This was followed by 40% of the households with 12 days a month and in worst case scenario, 2% of the households reported going for 16 days in a month without water supply (Figure 5.5). The findings imply that the households still experienced an element of water scarcity considering that water scarcity was viewed as low or lack of water supply for 5 days or more in a month and did not include short term water disconnection or an advertised water shortage. Nairobi City Water and Sewerage Company has not had a pro poor policy yet despite the introduction of the informal settlement department, therefore most of the times, the utility struggles with extending more connections or supplying water to the ever increasing informal urban areas population citing the already pressured sources of water resources for Nairobi (WSTF, 2010).

Figure 5.5: Water scarcity periods



Source: Researcher, (2019)

5.4.5 Scarcity Coping Mechanisms

The study sought to establish the water scarcity coping mechanism by households in Kosovo village. The study established that different measures were employed in coping with the scarcity based on the ability of the households in terms of income levels with 95% of the households earning between Kes 5000 and Kes 10,000 (Table 5.7). 42% of the households have bought water storage containers which they use after fetching water from the Nairobi City Water and Sewerage Company mains system to store water in their houses for future use as shown in Table 5.7. In a study by Crow and Odaba (2010), they discovered that water in Kibera informal settlement was often unavailable making storage essential. The case was similar in Kosovo village. However, the reservoir storages, they noted could lead to more reduced service by the water utility. Additionally, the respondents are more prone to increase in diseases due to contamination during storage.

Table 5.7: Measures adopted during water scarcity

Measures	**Frequency**	**Percentage**
Buy large water storage Containers	35	42.0
Walk to distances where it can be fetched	16	19.0
Pay a water vendor to supply the water	28	34.0
Recycle available water for different uses	4	5.0
Total	**83**	**100.0**

Source: Researcher, (2019)

This was followed by 34% (Table 5.7) of the households who would pay water vendors to fetch water from far distances. The respondents noted that during water scarcity the cost of water per 20 litre jerrican would rise from Kes 10 to Kes 50. The water vendors interviewed said that they obtained this water from neighboring settlements or from open spaces with low quality water for consumption. The household respondents did not mind the quality of water as long as they had water to undertake the household chores to an

extent that some did not even treat or boil the water. The respondents' have to forgo other basic commodities such as food and education. Table 5.6 shows that 19% of the households would walk to far distances to fetch water. The findings imply poor water governance strategies because reduction of time spent in accessing water and elimination of water scarcity since time spent in availing water during scarcity could be spent in engaging in gainful economic activities as suggested by Osinde, (2008).

5.4.6 Participation in the Formulation Process of the PPP

The study sought to establish whether there was stakeholder's participation in the public-private partnership (PPP) formulation process.

Table 5.8: Participation in the formulation process of the public private partnership

	N	Mean(m)	Std. Deviation(SD)
The community participated in the prescriptions in the project document	83	4.10	.919
The project properly identified the target group	83	3.58	1.260
All the water problems in this community was well analysed and covered by the project	83	3.87	1.267
The overall objective of the partnership was realistic	83	3.71	1.065
The project design ensures equitable access to all households	83	2.83	1.314
The interest of all stakeholders were taken into account in the project design	83	4.24	.709

Source: Researcher, (2019)

The findings revealed that there was considerable participation as presented in Table 5.8. From the findings, most of the respondents strongly agreed (m=4.24, SD = 0.709) that the

interest of all stakeholders were taken into account in the project design. It was also evident that majority of the respondents strongly agreed that the community participated in the prescriptions in the project document (m=4.10, SD = 0.919). Further the respondents agreed that all the water problems in this community was well analysed; that the overall objective of the partnership was realistic; and that the project properly identified the target group (m=3.87, 3.71 and 3.58 respectively). However, there was a general belief that the project did not properly identify the target group as indicated by a mean of 2.83. This was evidenced by the fact that not all households had piped water. Those without piped water were however able to get water from strategic water points established by the project.

5.4.7 Efficacy of the public private partnership

The study sought to establish the factors that enable the effectiveness of the public private partnership agreement in Kosovo village. The findings revealed that majority of the respondents strongly agreed (m=4.17, SD = 1.091) that for the project to be effective the value for money is maintained during operation, renegotiation and project failure (Table 5.9). The findings also revealed that the participants agreed that Nairobi City Water and Sewerage Company has necessary institutional roles and capacities, that the leadership of Nairobi City Water and Sewerage Company ensured there was an understanding of the relative costs, benefits and risks of the partnership with the community, and that the partnership has clear, predictable and well regulated legal framework (m=3.59, 3.28 and 3.08 respectively). The findings imply that the partnership met the legal provisions as stipulated in Section (93) of the Water Act of (2016) that provides a legal framework for the water utility to enter into public private partnership for water service provision subject to approval by the regulator (WASREB).

Table 5.9: Efficacy of the public private partnership

	N	Mean(m)	Std. Deviation(SD
The leadership of NCWSC ensured there was awareness of the relative costs, benefits and risks of the partnership with the community	83	3.28	1.476
The partnership has clear, predictable and well regulated legal framework	83	3.08	1.363
NCSWC has necessary institutional roles and capacities	83	3.59	1.288
The value for money is maintained during operation, renegotiation and project failure	83	4.17	1.091

Source: Researcher, (2019)

5.5 Opportunities and challenges of public private partnership in water governance in informal settlements

5.5.1 Hours Spent in Fetching Water

The study sought to establish the hours the households spent in fetching water. The findings reveal that the households spent between one and four hours per day fetching water. It was established that 40% of the households spent less than an hour in a day to fetch water; this was followed by 34% and 26% who spent 3 hours to 4 hours and 1 hour to 2 hours respectively to fetch water for their households in a day (Table 5.10). The findings imply that the households spend more than the recommended 30 minutes in fetching water (WHO, 2008). On enquiring further, the respondents who spent less than one hour in a day to fetch water were connected to the Nairobi City Water and Sewerage Company mains while those who spent 1 to 2 hours fetched water in the yard taps. Those who spent 3 to 4 hours fetched water from the Water Kiosks or from the water vendors.

The findings imply that there is not a strong public private partnership in the water sector that would enable reduction in the number of hours taken in fetching water. A good water administration structure would ensure that the households take the least possible amount of time in fetching water. The long hours taken in fetching water imply poor water governance as suggested by Obosi, (2015) and Kjellen et al., (2015) who opine that due to poor water governance, there are failures in the provision of water for the poor and marginalized areas.

Table 5.10: Number of Hours spent in fetching water

Man-hours spent on fetching water	Frequency	Percentage
Less than an hour	33	40.0
1-2 hours	22	26.0
3-4 hours	28	34.0
Total	**83**	**100.0**

Source: Researcher, (2019)

5.5.2 Implementation of the public private partnership

The study sought to establish the implementation process of the public private partnership in Kosovo village. The study established that majority of the respondents strongly believed that the community was given specific roles in the implementation process with a mean of 4.24 (Table 5.11). This is evidenced by the arrangement in which the maintenance of the infrastructure was done by the Nairobi City Water and Sewerage Company yet the utility had contracted the local community through a vetting process to run the water kiosk. At the same times the allocation of specific activities was found to have acted as a security measure as the kiosk operator would man the infrastructure installed by the utility such as tanks and water metres from theft. The water cartels were given priority by the community based on their commitment and change of behaviour, needs and ability to become champions of discouraging other cartels from mushrooming once again.

Despite the study area not having water resources users association (WRUAs) or Water user Groups (WAGs) as stipulated in the Kenya Water Act of (2016), the partnership engaged the local community in water governance. The study established the existence of the lane representative responsible for ensuring that there were no illegal connections or leakages in their neighbourhood. There were 2 representatives per lane (male and female). The 10 cluster committees supervised the lane representatives and were made up of a representative from each lane. The cluster committee reported to the oversight committee. The oversight committee ensured smooth implementation and sustainability of the project; received water connection applications and monitored all water supply related activities in the village. They were the link between the community and the utility. It was also established that there was a strong agreement that water access has improved since the implementation of the partnership with a mean of 4.05 (Table 5.11).

Table 5.11: Implementation of the public private participation

	N	Mean(m)	Std. Deviation(SD)
The implementation team was setup with all the stakeholders including target beneficiaries	83	3.77	1.162
The community was given specific roles in the implementation process	83	4.24	.709
All the stakeholders achieved their expected results	83	3.77	1.162
The project has achieved its objective of piloting the PPP approach to Informal settlement Water supply	83	3.87	1.267
The community was positive in participating in the project	83	3.83	1.113
The target community has benefited from the project	83	3.95	1.258
Water access has improved since the implementation of the partnership	83	4.05	.896

More households have water connection due to the partnership	83	3.95	1.258
The distance to water points has reduced due to introduction of water points by the project	83	3.58	1.260

Source: Researcher, (2019)

The study also found that more households have water connection due to the partnership and the target community has benefited from the project both with a mean of 3.95 (Table 5.11). Further, it was revealed that the implementation team was setup with all the stakeholders including target beneficiaries and that the project has achieved its objective of piloting the public private partnership approach to informal settlement water supply both with a mean of 3.77 (Table 5.11).

The participation of different stakeholders in the implementation process allowed for consensus building on the piloting approach to be followed. It was agreed that 4 water kiosks be built as a pilot including one that had been previously built by other stakeholders (Pamoja Trust). The findings were corroborated by those from the key informant interviews where it was revealed that there was participation of all stakeholders in the project, it was pointed that the stakeholders played different roles based on their strengths and areas of expertise. The actors were categorised into service providers (Nairobi City Water and Sewerage Company), community mobilisers (Pamoja Trust and Muungano wa Wanavijiji) and the financiers (WSTF and Akiba Mashinani). Nairobi City Water and Sewerage Company was responsible for overseeing the provision of clean and safe water to the households; maintenance of the infrastructure and ensuring improved customer satisfaction in order to have a turnaround in its revenue collection and cost recovery as well (GoK, 2015). Pamoja Trust, a non- governmental organisation, brought in their expertise in a process that was tailor made to accommodate the unique characteristics of Kosovo village residents. Section 113 of the Kenya Water Act of (2016) establishes Water Sector Trust Fund (WSTF) as the financing body in the water sector. Water Sector Trust Fund implements through the public water utilities since they have the mandate to implement and have the capacity and the governance system in place to

implement. The study found out that the Nairobi City Water and Sewerage Company, Pamoja Trust and the community wrote a joint proposal and forwarded to Water Sector Trust Fund. The project was funded to a tune of Kes 4million through its urban projects concepts established in 2007 to respond to the specific water and sanitation issues of low income urban areas. The study found that Akiba Mashinani Trust, a local community based organisation, had given members loans to access household connections. Some respondents had indicated that they feared loans and would rather buy the water from the water kiosks rather take the loan.

As reflected in Table 5.11, the Kosovo project has achieved its objective of piloting the public private partnership approach to informal settlement water supply, the distance to water points has reduced due to introduction of water points by the project, and that the community was positive in participating in the project each scoring 3.87, 3.58 and 3.83 respectively. This was supported by the revelation by the key informant respondents who opined that the partnership has been of significance. While they indicate that there was a rough start, the utility had actually made significant progress in Kosovo village. The findings from the key informant interviews further revealed that that partnership recognised and worked with structures that had been created by the community under the hospice of Pamoja Trust who tailor made their expertise to accommodate the unique characteristics of Kosovo village residents. It was revealed that it is the community through the Muungano wa Wanavijiji, a community based organisation that invited Pamoja Trust to help them address their identified need for the address of water as a priority need.

The findings imply that by the community having been the initiators of the water projects through the active identification of water as a priority need, a sense of ownership was gained and the community endeavoured to protect the project. As such there is an opportunity in the use of the local accountability mechanisms to improve good water governance. By achieving good water governance, the water scarcity issue would have been resolved as suggested by GWP (2003) that points that water crisis is not as a result of water scarcity but poor water governance.

CHAPTER SIX: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

In this chapter, a summary of findings, discussion, conclusion and recommendations are stated in respect of assessment of public private partnership in water supply and governance in informal urban settlements. The study states policy recommendations to achieve efficient water supply to informal settlement household to spur socio-economic growth. It also identifies and states possible areas for research to fill the gaps that emerged in this study.

6.1 Summary of findings

6.1.1 Water situation in Kosovo village

The findings have revealed that the water situation in terms of water accessibility in Kosovo village greatly improved with the introduction of the public private partnership. The findings revealed that 40% of the households in the study area rely on Water Kiosks/Yard taps as their water access point followed by 32% getting water from vendors. It was further revealed that about 68% of the Kosovo dwellers are supplied by the Nairobi City Water and Sewerage Company water project. Of this category, Nairobi City Water and Sewerage Company beneficiaries, 40% access water in strategically located water points while 28% have water connected to their households. The study also found that the distance covered in fetching water was greatly reduced by the project, it was noted that 26% of the households cover over 500 metres to fetch water. About 24% of the households covered as little as 50-100 metres to fetch.

In terms of the amount of water consumed by households in Kosovo village per day, the study revealed that the average consumption of water by majority (67%) of the households in Kosovo were within the World Health Organisation recommended amount of water for use per person per day. On the affordability of water in Kosovo village, the study revealed that based on Water Services Regulatory Board (WASREB's) provisions on the cost of connection and subsequent fee. The public private partnership enabled the residents in Kosovo village to have affordable water since majority (52%) of the

households paid for water at a rate of between Kes 50 - 100 per month while 24% who paid between Kes 201 and Kes 250 per month.

6.1.2 Nature of public private partnership in water supply and governance in Kosovo village

On the nature of the public private partnership in water governance, the study established that courtesy of the partnership, households connected to Nairobi City Water and Sewerage Company main water supply network, 72% received water for between 4-5 days in week, while 27% received water over 5 days a week, a great improvement to the earlier situation when water was provided at the will of cartels. It was also revealed that water scarcity was addressed by the public private partnership which meant that most households only missed water for 8 days in a month. The element of water shortage was inferred to reveal poor governance because of the potential of stored water to cause diseases like has been witnessed in other informal urban settlements.

The study further revealed that there was full participation by all stakeholders in the public private partnership represented by a mean of 4.24. The study also revealed that the public private partnership analysed the water issues in Kosovo village properly. Paradoxically, it was revealed that the project did not properly identify the target beneficiaries represented by a mean of 2.83. The study further noted that the public private partnership had necessary institutional roles and capacities, that the leadership of NCWSC ensured there was awareness of the relative costs, benefits and risks of the partnership with the community, and that the partnership has clear, predictable and well regulated legal framework.

6.1.3 Opportunities and challenges of public private partnership in water governance in informal settlements

The study established that there were a number of water related problems that call for good governance structure. One of the mostly sighted challenges was long queues while fetching water from the strategic points/Kiosks (52%), the other problem was related to

topography, which meant that any illegal connection would reduce the overall water pressure.

The study established that use of local accountability mechanisms through the communities and non-state actors can improve water supply and governance. The community was empowered and took lead in the project planning, implementation and monitoring during operation. The public water utility should also serve its customers based on the specific context within which they are found and their needs. The utility (Nairobi City Water and Sewerage Company) was found to have a challenge of balancing the demand for water and its supply despite the Article 43 of the Constitution stipulating that water is a basic right for all Kenyans. The utility did not have a pro poor policy at the time making it difficult to monitor progress and work towards connecting water to all households within the Mathare informal urban settlements.

6.2 Conclusion

The study sought to assess the contribution of public private partnership in water supply and governance in Kosovo village of Mathare informal settlement. The focus on the water accessibility and governance particularly in informal settlement is because these factors still face a number of challenges despite the progressive water sector reforms in Kenya. While water supply should be primarily a public utility service, the circumstances in the informal urban settlement makes it complex for the public water utilities to smoothly engage in the water supply business. The public water utilities have also deliberately avoided the informal urban settlements as they perceive service provision to informal urban settlements commercially unattractive (World Bank, 2006).

The informal settlements are characterised by poor physical planning which makes it difficult in directly examining subterranean piping network (Shirley, 2007). By themselves, the private players in the water sector in Kosovo village lacked the financial and human capacity to efficiently manage the water supply challenge; this is in congruence with the notion that lack of financial and human capacity hinders the implementation of the pro poor policy (United Nations, 2015; World Bank, 2006). Consequently this causes high levels of uncertainty in valuation and regulation. Public

private partnerships have thus proved to be essential means of circumventing the challenges in the informal urban settlement considering the understanding and knowledge of the private players in these settlements.

The study has established that the water challenge in Kosovo village was majorly as a result of corruption, poor resource management, inappropriate institutional arrangements and fragmentation, bureaucracy, insufficient human capacity, shortages of finances for investments and inability by the Nairobi City Water and Sewerage Company that ignored the outcry of the dwellers. However, it was established that efforts by the Kosovo residents to work with local non- governmental organisations later saw the coming of the Nairobi City Water and Sewerage Company who then partnered with the local players in a bid to improve the water situation in Kosovo village. This phenomenon is not unique to Kosovo village but true to other informal urban settlements (Roger and Hall, 2003; Bakker, 2003; Jones et al., 2014; Kjellen et al., 2015).

In terms of governance, the study explored the beneficial outcomes as regards water affordability, availability, access and the ability of the public private partnership in Kosovo village to translate existing policies into institutional structures that can improve pro poor governance. The findings have contributed knowledge by demonstrating that despite the conventional challenges in informal urban settlement, the public private partnership successfully managed to address the water problems in Kosovo village by improving water availability and supply. The improvements are courtesy of the nature of the partnership and the delegation of specific roles to different stakeholders in the water supply chain that have ensured that the water supply network is secure and without a threat from vandalism or unaccounted for water. It is therefore concluded that public private partnership is a significant approach that can be employed in enhancing water supply and governance in the informal urban settlement.

6.3 Recommendations of the study

6.3.1 Recommendations to policy makers

The study recommends the realignment of the water sector reforms to encourage the adoption of the public private partnership approach in addressing the water challenges in the informal urban settlements. Such an approach would ensure that a sense of ownership is domiciled among the informal settlement dwellers and thereby lessen the incidences of vandalism and enhances sustainability of water projects in the informal urban settlements.

The active participation of the informal urban settlement dwellers in the water service provision alongside the other partners has proved effective. Water policies should thus allow for the active role of the communities in the provision service with supervision from the public water utility companies. The public water utility companies (Nairobi City Water and Sewerage Company) should thus enforce monitoring and evaluation system to be able to track progress and take stock of valuable lessons and good practices from the partnership to be replicated in other informal urban settlements.

The policymakers should come up with ways of incorporating the informal institutions in the institutional analysis since they can support, disrupt or replace formal institutions, therefore, affecting the progress in water sector reforms.

6.3.2 Recommendation for further research

Further research can be conducted on:
How the community led governance processes can be integrated into the government policy approaches for sustainability in water projects in informal urban settlements. Impact of Integrated water urban management on the informal urban settlements and livelihood improvement

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ANNEX 1: HOUSEHOLD QUESTIONNAIRE

I am a post graduate student at the University of Nairobi conducting research on public private partnership in water governance and supply in Kosovo Village of Mathare informal urban settlement. I will appreciate your participation and time to respond to the questionnaire. Please note that your responses will remain private and confidential and are for research study purposes only. Thank you.

GENERAL DATA

a) What is your name? (Optional)…….
b) Gender: 1. Male……2. Female……
c) How many people live in your household?
d) Who heads the household?
e) What is your occupation? Explain

1. Self-employed ☐2. Employed ☐ 3. Casual Labor ☐ 4. Unemployed ☐

f) What is your average household income?

ACCESS TO WATER

Service level

a) Where do you draw water? (Tick appropriately)

1. Mains☐ 2. Kiosk/Public tap☐ 3. Water vendor ☐ 4. Protected source ☐
5. Unprotected sources☐

b) Is your house connected to the mains? 1. Yes ☐ 2. No ☐

c) If not connected, how far is source of water from your house? (Approximate)

1. 50-100metres☐2. 200-500metres☐ 3. Over 500metres ☐4. Connected to Mains☐

d) How many times do you fetch water in a day?

e) How long does it take to fetch water outside the residential premises in a day?

f) What kind of problems do you encounter while fetching water?

g) How many days in a week do you receive water if connected to the mains?

h) How many hours in a day do you receive water if connected to the mains?

i) How frequent are interruptions in water supply lasting for 24 hours?

Water scarcity

(NB: Scarcity- defined as low or lack of water supply for 5 days or more. This does not include short-term water cut or an advertised shortage.)

a) Do you experience water scarcity? Yes☐ No ☐

b) How many times do you go without water supply in a month?

c) Which months do you experience water scarcity most?

d) How does your water usage pattern change during scarcity?

e) What measures do you adopt to meet the issues of water quantity?

f) Where do you get water when there is no water from NCWSC?

CUSTOMER SATISFACTION

Affordability and transparency of service

a) How much do you pay for water per month? (KES)

b) Who pays the water bill?

c) How often do you get your water bill if connected to the mains?

d) If you are paying on a daily basis, how much do you pay per container of water? (KES)

e) Do you usually have problems paying the water bill? Yes☐ No☐

f) If yes what are the problems?

g) Would you like the water bill increased to improve water services? Yes☐ No☐

h) If yes please explain.

i) Is the water you draw sufficient to meet all your household requirements?

Yes ☐ No☐

j) Please give a brief explanation to part (i) above.

k) Have you ever given an incentive for a service to be provided to you?

l) Do you feel there is adequate information from the Government on water services?

m) Do you feel the channels available for feedback between you and the water suppliers is good? If not, what would you like to see improved?

The following statements relate water governance and supply issues. On a scale of 1 – 5 where 1= Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), and 5 = Strongly Agree (SA) state the extent to which the statements are true/false

		SD	D	N	A	SA
	Factors enabling a PPP to be effective					
	The leadership of NCWSC ensured there was awareness of the relative costs, benefits and risks of the partnership with the community					
	The partnership has clear, predictable and well regulated legal framework					
	NCSWC has necessary institutional roles and capacities					
	The value for money is maintained during operation, renegotiation and project failure					
	Participation in the formulation of the PPP					
	The community participated in the prescriptions in the project document					
	The project properly identified the target group					
	All the water problems in this community was well analyzed and covered by the project					
	The overall objective of the partnership was realistic					
	The project design ensures equitable access to all households					

	The interest of all stakeholders were taken into account in the project design					
	PPP Implementation					
	The implementation team was setup with all the stakeholders including target beneficiaries					
	The community was given specific roles in the implementation process					
	All the stakeholders achieved their expected results					
	The project has achieved its objective of piloting the PPP approach to Informal settlement Water supply					
	The community was positive in participating in the project					
	The target community has benefited from the project					
	Water access has improved since the implementation of the partnership					
	More households have water connection due to the partnership					
	The distance to water points has reduced due to introduction of water points by the project					
	Governance					
	The implementation process was inclusive					
	The project was transparent through from the design to the implementation					
	Clear ground rules have been provided by the project covering every stage					
	The project has provided accountability structures					
	There is full participation of the community in the project					

ANNEX 2: KEY INFORMANT INTERVIEW GUIDE

I am a post graduate student at the University of Nairobi conducting research on public private partnership in water governance and supply in Kosovo Village of Mathare informal urban settlement. I will appreciate your participation and time to respond to the questionnaire.

Please note that your responses will remain private and confidential and are for research study purposes only. Thank you.

Name: ……
Organization: ……...
Position: …….
Occupation: ……..

a) Please describe your organization
    - History of the organization
    - Organizational structure
    - Current organizational activities

b) Are there any public agencies that are involved in water supply in the area (i.e as per the institutional arrangement stipulated in the Water Act?

c) In what ways has public private partnership been demonstrated in service provision in the area?
    - What was the role of the public utility/ County Government?
    - What the role of the private actors if any?
    - Did the consumer play a part in the PPP arrangement? If yes, what was their role?
    - Did the losers play a part in the PPP arrangement? If yes, what was their role?

d) Has the capacity of the individual categories mentioned in (3) affected the PPP's delivery of water services?

e) In your opinion, have the citizens in Kosovo village experienced any change after the partnership in terms of improved water supply or governance?

CUSTOMER SATISFACTION

a) What is your organization doing currently to improve water services in the area?

b) What are the main factors that hinder the performance of water services projects in the area?

c) Are there any measures put in place to ensure long-term sustainability water services projects in the area?

d) What should the Government do to help you improve on your performance and quality of services to the informal urban settlements?

e) Are there any incentive mechanisms put into place to ensure that the residents are willing to pay for water services?

f) What are the major customer complaints with regards to water service provision?

g) How do you deal with such complaints?

h) What challenges are there in water supply service in the area after the partnership started?

i) In your opinion, how can they be overcome?

j) Do you think there are opportunities that exist as a result of the partnership with relation to water service delivery?

ANNEX 3: FOCUS GROUP DISCUSSION GUIDE

I am a post graduate student at the University of Nairobi conducting research on public private partnership in water governance and supply in Kosovo Village of Mathare informal urban settlement. I will appreciate your participation and time to respond to the questionnaire. Please note that your responses will remain private and confidential and are for research study purposes only. Thank you.

Name: ……..
Organization: …….
Position: ……..
Occupation: …….

a) How was the water supply situation, in Kosovo village before the partnership began?
b) What is the water supply situation currently?
c) What has changed?
d) What are sources of water?
e) How regular is the water supply?
f) If not regular, what are the causes of water rationing or dry taps?
g) Describe the organization of the water service provision in Kosovo?
h) In what ways do different partners contribute to water services provision in the area?
i) What do you think is the role of the Government in water service provision?
j) What is the role of the other partners in the partnership?
k) How do the different actors in the partnership relate?
l) What are the major complaints about water service provision from the citizens?
m) Are there customer complaint's handling mechanisms?
n) Is there a specific unit or individual assigned to deal with the complaints?
o) What would you suggest to improve water service provision in the area?