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Determinants of Performance of Water Projects in Urban Center in Kenya: A Case of Mji Wa Kale Sub-Location in Mombasa County

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Abstract

Purpose: This study examined the determinants of the performance of water projects in urbanized centres based on a Case Study of Mji wa Kale in Mombasa County.

Methodology: The study adopted to descriptive study with a target population of 10,069 people comprised of 10, 056 population of the sub-location (KNBS, 2019 Census), ten purified water service providers (purposive), and a respondent each from the region's water supply regulators, i.e., Kenya Bureau of Standards (KEBS), Mombasa Water and Sanitation Company and Coast Water Works Agency. They were sampled using Solvins formula n = N / (1 + N e2) and simple random reduction to 15% to utilize a sample size of 70 respondents. Data was collected through the use of questionnaires and, where possible, interviews. Data analysis was through mean, frequencies, inferential statistics and descriptive methods through Statistical Package for Social Sciences - SPSS. Data was narrated and reported below frequency Tables

Findings: The study found that technology uses in water supply influences the Performance of Water Projects in urbanized centres and that water services companies have the relevant technology skills required in the current trends on new innovative technologies in their supply to the commodity. The study concluded a significant relationship between the availability of natural water sources, consumer preferences of price, appropriate technology, stakeholder involvement, management skills and Performance of water projects in urbanized centres.

Unique contribution to theory, policy and practice: The study recommends that water management committees that have untrained community members should not be entrusted to manage these facilities, leading to mismanagement and unwarranted system breakdowns. The study also recommends that project leaders and members be trained on the effective use of scarce water supplied to reduce the losses in quantity and quality of water as delivered from source through to households for use to eventual disposal. There is a need to enhance transparency and accountability levels among the committee members. There is a need for close monitoring and evaluation of water projects by implementing organizations to enhance sustainability. Community participation right from conception and design of water projects to implementation is recommended to enhance water projects' community ownership. There is a need to encourage diversified livelihoods, especially those directly supported by water resources.

Keywords: *Performance, availability of natural water sources, consumer's preferences, technology stakeholder involvement, management skills, water projects, urbanized centres.*

1.0 INTRODUCTION

1.1 Background of the Study

Water remains a critical requirement for the survival of human beings. Provisions of Safe Water for drinking and sanitation are the bare minimums in deliverable by a nation to its people but remain a sparse commodity in both Rural and Urban areas. Various research studies worldwide, together with one conducted by (Akhmat & Khan, 2014), have disclosed that sustainable water use and management measures the populate ability to live and survive. As a natural resource, water defines the shape of the human being's livelihood. In an environment of acute water shortage or insufficient water supply, no human evidentiary advancement is manifestly expressed to the degree of sustainable social-economic growth is concerned. Although any development to the populace's right to clean, safe water services and sanitation facilities consequently does have a bearing on poverty alleviation, improving development levels as productivity sets about souring World Health Organization (WHO, 2014).

Lack of access to safe water for drinking and use (cooking, bathing, and cleaning) is also a significant cause of societal problems associated with increasing poverty levels. In fact, a substantial shortage of water is an acute form of deprivation by many standards. It threatens the physical and health well-being while affecting gender correlations and fundamental population dependencies. The economic challenges that it reflects and develops has severe repercussions on normal household livelihoods and general family relationships. The health effects are perhaps the most obvious of all. An approximate 13 million children under the age of 5 years die every year from poor sanitation and other related diseases linked to poverty (Redclift, 2014). Contaminated water and air pollution are the critical cause of diarrhea and respiratory infections, which remain the two biggest killers of poor children (World Bank, 2015). The study by Gleitsmann (2015) suggested that ownership of the water supply and sanitation projects be ideally dependent upon the degree to which the available technology mutually corresponds to both the users' needs and the users' ability to operate and maintain it over time. Studies by Harvey and Reed (2013) showed that low sustainability rates are directly related to the most common issues ailing community such as limited supply, perceived lack of ownership, limited community education, and the limited sustainability of community management structures, such as water use committees.

Besides, water supply and sanitation projects have been strongly criticized for their narrow planning approaches, which have focused too much on expansions and physical construction to increase coverage targets while mainly ignoring what transpires at the water sources post-construction Lockwood (2014). For the last decade, literature in the water supply sector has shown that rural water supply structures' sustainability has become actively related to smaller scales initiatives, which push for public participation. Thus, the key to actual sustainability is to meaningfully and purposefully involve the users in planning, executing, operating, monitoring, and maintaining water supply systems according to their needs and potentials (Davis, 2012). Several developed governments and donor agencies have made substantial investments in projects to improve water supplies in poor rural areas. In addition to additional funding, external agencies can acquire technical and critical managerial skills and while opening up access to credit. Often political influence is borne and may provide charismatic leadership to stimulate project development (Aggarwal, 2012).

The Mombasa Water Supply and Sanitation Company Ltd that previously operated under the umbrella body called the Coast Water Services Board (CWSB), has a mission statement that seeks to provide safe, reliable, affordable water and sewerage services in a progressively efficient and viable manner to the residents of Mombasa County. However, this can only be achieved when several factors have been put in place to enhance its continuity. Essential, for example, is Proper WSP planning, implementation and monitoring (WHO, 2012), proper allocation of both capital and financial resources (Mwamburi, 2017), transparent strategies and steps towards involving the stakeholders fully (World Bank, 2013), use of modern technology, etc. Mombasa County has encountered persistent water problems due to many factors like rapid population growth and low maintenance of existing water supply networks. Although the area is geologically rich in Groundwater, which is often seen as an option, exploitation is limited due to salinity because of seawater intrusion (Musingi et al., 1999). Groundwater exploitation is also curtailed by pollution from numerous pit latrines and septic tanks in the town.

1.2 Statement of the problem

The enactment of the Water Act 2002 aimed to implement reforms in the water sector that would contribute to efficiency and improvement in the provision of water services in rural and urban areas. The Act resulted in a growth in budget for water development projects from KSh. 4.2 billion in the fiscal year 2004/2013 to KSh. 30.8 billion in the fiscal year 2011/2012 (ROK, 2012). This indicated an increase of over seven times on water project disbursement from 2004 to 2012. Additionally, it shows that the authorities have been putting efforts to guarantee the accessibility of water to the population for daily use/consumption and development purposes. However, despite the existence of water supply infrastructure by governments in both rural and urbanized zones, studies in various counties show that between 30% and 40% of water programs initiated with the county governments, national government or non-governmental organizations operate below optimum capacity. A deficiency in the capacity that is made up of purified and bulk water supply.

The sustainability rate on water programs in developing nations is alarmingly low due to limited resource utilization, capabilities, appropriate technology and innovation. The study by Kemuma (2015) assessed that by the year 2025, it is approximated that upwards of two-thirds of the entire world's populate will be urban dwellers. While the speedy evolution of cities is taking place in the developing world, urbanization is an international phenomenon closely related to its environmental impacts. Urbanized centers' rapid growth will create enormous stresses on the environment and manifest redoubtable problems of social, institutional change, infrastructure development, and pollution control. Previous studies seem not to have established the performance of purified drinking water projects in Kenya as an alternative to the portable water supply to urbanized centers and, more importantly, in Mombasa County. Therefore, this study aimed at bridging the present knowledge disparity by assessing the Influences in the Performance of Purified Drinking Water Projects in urbanized centers.

1.3 Purpose of the Study

This study examined the determinants of the performance of water projects in urbanized centers based on a Case Study of Mji wa Kale in Mombasa County.

1.4 Objectives of the Study

The research was guided by the following objectives

i. To establish the extent to which the availability of natural water sources determines water projects' performance in urbanized centers in Kenya.
ii. To examine the extent to which consumer's preferences of price determine the performance of water projects in urbanized centers in Kenya.
iii. To access the extent to which the use of appropriate technology determines the performance of water projects in urbanized centers in Kenya.
iv. To find out the extent to which Stakeholder Involvement determines the performance of water projects in urbanized centers in Kenya.
v. To establish the extent to which management skills determines the performance of water projects in urbanized centers in Kenya.

1.5 Research Study Hypothesis

The study was guided by alternative hypotheses tested at the 95 % level of significance:

H11 There is a significant relationship between the availability of natural water sources and the performance of water projects in urbanized centers.

H12 There is a significant relationship between consumer preferences of price and the performance of water projects in urbanized centers.

H13 There is a significant relationship between the use of appropriate technology and the performance of water projects in urbanized centers.

H14 There is a significant relationship between stakeholder involvement and the performance of water projects in urbanized centers.

H15 There is a significant relationship between management skills and the performance of water projects in urbanized centers.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Stakeholders Theory

Stakeholder theory is a theory of business ethics, etiquette and organizational management that addresses morals and values in managing an organization which was originally detailed by (Freeman, 1984) and identifies and models the groups which are stakeholders of corporations and describes and advances methods by which management can give priority to the interests of those groups. The study was informed by the Stakeholder Theory as suggested by Miles and Friedman (2006), who illustrated it through two principles, the organization legitimacy and stakeholder fiduciary principles. The principle of organization legitimacy argued for the management of the organization by considering the benefit of the stakeholders, the rights of different groups are considered as well as their involvement in decisions that substantially affect their welfare. In comparison, the stakeholder trustee principal proposed management was to act in the interests of the stakeholders as well as the corporate while safeguarding the long-term stakes of each party. In a revelation by this study, it was deduced that the sustainability of projects in organizations could

only be achieved by the way management sticks to the principles of management. Effectiveness always depends on the extent of organization, staffing and Budgeting.

2.1.2 Systems Theory

Interpretive and constructivist's theory is a comprehensive theory about the nature, development and advancement of human intelligence and was first created by the Swiss developmental psychologist Jean Piaget (1896–1980). The prepositions of the theory are: - that knowledge is socially constructed by people active in the research process. Scwandt (1994) has it that the researcher should attempt from those who live it. This research is a product of the values of researchers and cannot be independent of them. Thus, opts for a more personal, interactive Mode of data collection.

As has been applied to this study, the theory holds that project preparation and implementation, community management, co-ordination of stakeholders, financial management, monitoring and evaluation, together with political interference, would influence the sustainability of water projects. This is true because knowledge is socially constructed. Thus, if management understands that project preparation and implementation, community management, co-coordinating of stakeholders, financial management, monitoring and evaluation together with political interference influence sustainability of water proje**cts,** then the interpretive/ constructivists theory is appropriate. In their efforts to make projects successful, the stakeholders ensure that the interrelationships between parts of the system are well understood, that all people involved have an idea of what needs to be accomplished and that there is cohesion among all participants for project future sustainability.

2.2 Empirical Review

2.2.1 Performance of Water Projects

Project sustainability is the degree to which a water project functions for an extended period while benefiting end-users (Habtamu, 2012). The contributing factor of water projects sustainability depends on before and after implementation reasons (Gebrehiwot, 2015). Factors before the implementation stage include demand responsiveness, community involvement, site selection, construction quality, current inhabitants, technological know-how and community capacity development. In the post-implementation stage, factors encompass community fulfillment, monetary and institutional supervision, practical support and preparedness to support, maintain, and sustain the project. The study by Kanyanya in 2014 indicated that sustainability for water projects is a significant desire for Government, non-government and communities at large. This is because the sustained project ensures continuous deliverance of benefits to the target receivers for a lengthy period (Kanyanya, 2014).

2.2.1 Availability of natural water sources and influence on the performance of water projects in urbanized centers.

A study by Duran (2017) examined the impact of global climate change on water sources, quantity and quality that the approach can improve conditions and prevent social unrest and hinder economic development. Egbinola (2017) examined the trend in sources and access to safe water supply in West Africa and conferred that inadequate financing, mismanagement, insufficient

capital allocation in the water sector are the key challenges to better water supply services. He stated the need to improve the financing of water infrastructure in rural and sub-urban areas.

Mombasa is the second-largest city in Kenya and does not have enough domestic and industrial development supply of water. Domestic water demand continues to be a nightmare. Clean water, basic sanitation and acceptable hygiene practices are essential for the survival of young ones. Water and sanitation borne diseases are among the leading causes of death for kids under five years old (The WASH joint monitoring program report (2019) by The World Health Organization and UNICEF) found that only 59% of Kenyans have access to essential water services.

2.2.2 Consumer Preferences of Price Influence the Performance of Water Projects in urbanized centers

Through a report on Delivering on the consumer promise by Price Waterhouse Coopers -PWC (2007), they stated that meeting consumer expectations incorporate a consumer-centric approach. According to a report generated through UWAZI in (2012) in over five water services providers in Kenya (Kisumu, Embu, Tana Athi) has shown that financial resources sources. The volume of money allocated and the communities' willingness to pay either bills or capital money has a significant influence on projects' sustainability. Where income levels are appropriately high and continued subsidies are not assured, the reduction and finance costs of repayment (principal and interest) or replacement (sinking fund) are also recurrent costs (UWAZI, 2012)

Given the current push to raise additional resources to meet development goals, donors are again exploring how to engage the private sector. Through World Bank (2017), a financial report inferred the need to achieve the SDGs for water and sanitation globally. The report stated further that governments need to place a greater priority on leveraging commercial finance into the sector while at the same time bolstering public funds for the sector (Goksu, Tremolet & Kolker, 2017). According to a recent econometric analysis of how regulatory costs affect the availability and desirability of using private finance, the "tension between financial viability and inclusion, in the very places where the share of poor consumers to whom one would wish to extend the service is higher, is the first fundamental challenge of infrastructure finance in developing countries" (Fay, Martimott, & Straub 2018).

2.2.3 Appropriate technology influence and the performance of water projects in urbanized centers in Kenya

Technology is the 21st-century driver of development in any community and all sectors of the economy. According to Carlevaro and Gonzalez (2011), community members, for example, need to be empowered and, therefore, must be versed with the necessary knowledge on how to operate, repair and maintain the water supply system as this enhances the sustainability of the project. Technology that fails to fulfill the needs of its users, or is poorly installed or is difficult to maintain or repair poses significant challenges for sustainability. A study by UWAZI (2014) reported that among technical factors contributing to the sustainability of services in the Coast Water Services Board (CWSB) parastatal that include (Mombasa Water Supply and Sanitation Services Company, Malindi Water and Sewerage Company, Kilifi-Mariakani Water and Sewerage Company, Kwale Water and Sewerage Company, Lamu Water and Sewerage Company and, Tana Water and Sewerage Company, are technology identification, complexity and multitude of the technology, the overall technical capabilities of the system to respond to the demand and provide the required

service level, the technical skills required to operate and maintain the system, the availability, accessibility and the general cost of spare parts.

2.2.4 Stakeholders' involvement and its influence on the Performance of Water Projects in urbanized centers.

By this definition, a 'stakeholder' includes those who may live far away from the environs of a sustainable development project but who may take an interest nonetheless. Xinhua News Agency (2013) reported on the role of the stakeholder in the sustainability of dam projects in China. It shows a stakeholder first, as someone with interest and how the interest reveals itself in the project.

The study by the World Bank (2014) has focused on the role of Regulation and continuity of WSPs in various counties in the country, starting with northeastern counties and finishing with the Kenyan coast counties. According to the World Bank, the regulation and monitoring of urban and rural water service provision are carried out by the Water Services Regulatory Board (WASREB). WASREB is a state corporation established in March 2003 based on the 2002 Water Act. Its role is to enhance the integration of environmental considerations into government policies, plans, programs and projects countrywide. As regards the water sector, in particular, the National Environmental Management Agency (NEMA) is responsible for the formulation of water quality regulations. Through the maintenance of the environment and checks on the environment, the WSPs are perceived to be on the survival trend for the coming decades (World Bank, 2010).

2.2.5 Management skills influence and the performance of water projects in urbanized centers in Kenya

Project Management Institute-(PMI 2008) defined management is defined as the application of skills and techniques to project activities or surpass the stakeholder's needs and expectations. Project supervision can be complex due to the phases and stages involved to the time the delivery is made. These stages include preparation of a plan, forming a project group, execution, control and monitoring, and termination of the project. Each of these stages requires attention and demands special skills from team managers. Project management has three main aims, namely to ensure a project is completed within its preset budget, concluded in its stipulated time frame, to ensure it meets the desired functional and technical performance and ultimately to satisfy end-user requirements-(PMI, 2008)

According to Rico (2009) observes that communication within a team can be a factor to influence the fate of most components of team management and their interdependencies. Aula, in their study (2010), further noted that conflicts in a project could be related to the level of communication within the team. The project team leader is required to have prerequisite skills in managing conflict and making decisions that are sound to bring harmony to the team. Management of projects involves increasing the alignment of development projects with priorities of the host community and delivering the intended project within time, cost and to the satisfaction of the client or beneficiaries. This increases the ownership and efficient delivery of services. It is therefore basically offering leadership to achieve certain laid down objectives. According to McDade (2014), good management ensures that sufficient local resources and capacity exist to continue the project in the absence of outside resources.

2.3 Conceptual Framework

Figure 1 is the conceptual framework that illustrates the relationship between Performance of Water Projects in urbanized centers in Kenya and the Availability of natural resources, consumer preference of price, Technology use, stakeholder involvement and management skills.

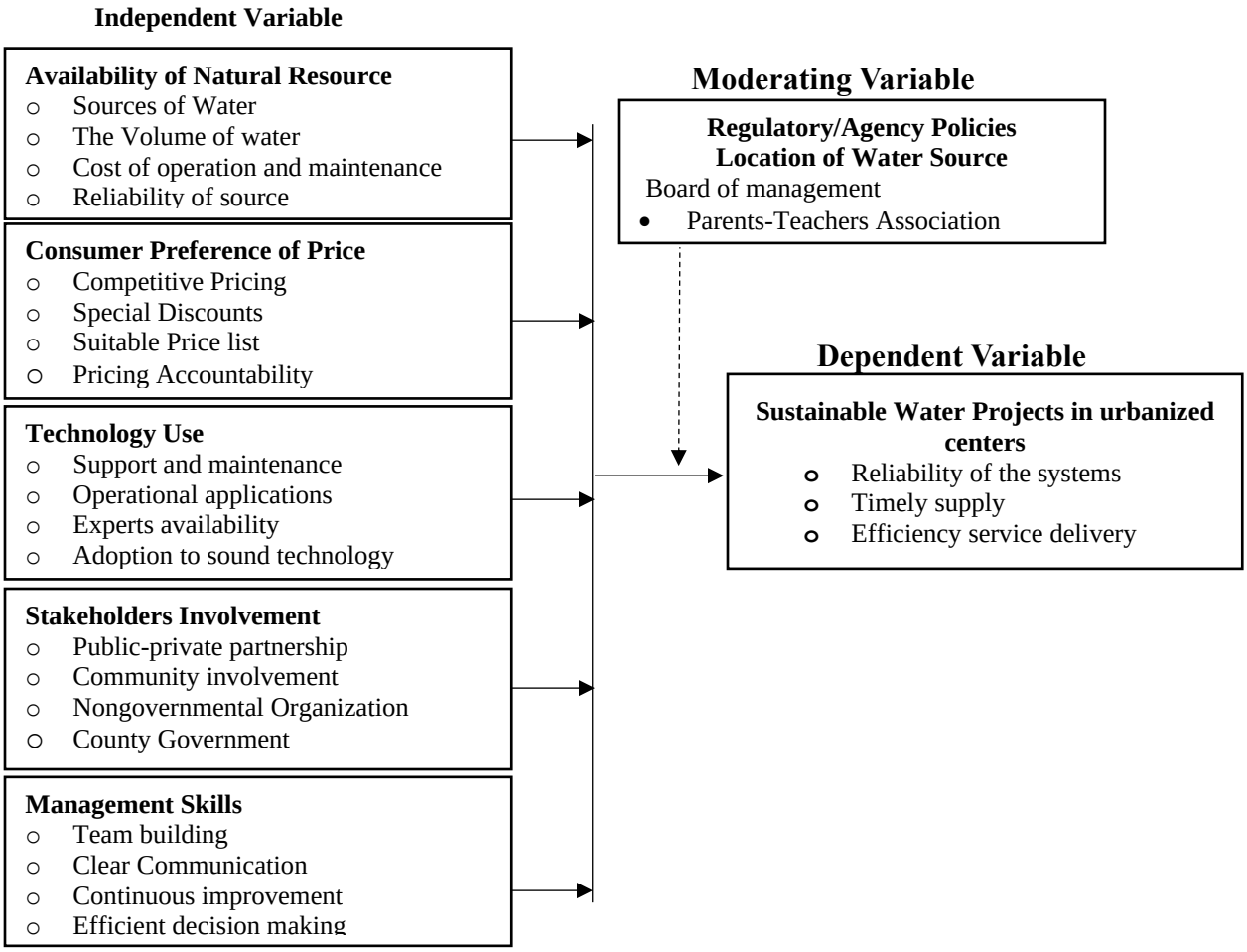

Figure 1: Conceptual Framework

2.4 Knowledge Gap

This section the study discussed research knowledge gap as illustrated and related in table 2.1.

Objective	Author	Findings	Knowledge Gap	Study Objective
1.) To establish the extent to which Availability of natural water sources determines the Performance of water projects in	National Water Master Plan (2014)	That water in Kenya is a nightmare and that Kenya is a land of contrasts in relation to water sources supply to their cities. Though the country is home to some of the great water towers of East Africa, above 75 % of the country is either arid or semiarid	The author is refereeing to Kenya being a country of great water Towers in East Africa and is not specific to key sources in the area of study	This study has focused on major sources to be more specific in Mombasa county and its surroundings and its availability.

urbanized centers in Kenya.				
2.) To examine the extent to which consumer preferences of price determines the Performance of water projects in urbanized centers in Kenya.	Fay, Martimot t, and Straub (2018).	According to a recent econometric analysis of how regulatory costs affect the availability and desirability of using private finance, the "tension between financial viability and inclusion, in the very places where the share of poor consumers to whom one would wish to extend the service is higher, is the first fundamental challenge of infrastructure finance in developing countries	There is very little information on the aspect of price and availability of water and in relation to the current services and quality within urbanized centers.	This study focused on addressing the requirement for consumers against the product
3). To examine how Appropriate Technology use influences of the Performance of water Projects in urbanized centers: A Case Study of Mji wa Kale sub-location in Mombasa County	UWAZI (2014)	This study indicated that among technical factors contributing to sustainability water services are technology selection, complexity of the technology, the technical capacity of the system to respond to the demand and provide the desired service level, the technical skills required to operate and maintain the system, the availability, accessibility and the cost of spare parts.	The study focused on how the selection of technology systems are complex and its technicality to comply with demand to provide the desired services among others.	This study not only used Technology but also looked at how the use of technology was compliant with the latest sound technicality for water project sustainability and which Uwazi Study did not address.
4). To determine how Stakeholders Involvement Influence of the Performance of water Projects in urbanized centers:A Case Study of Mji wa Kale sub-location in Mombasa County	World Wide Fund for Nature (2013)	The report stated that, stakeholders' participation includes locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests	This study was not specific where in Africa and the type of water project. They stated that communities or individuals among other stakeholder's participation.	This study was done in Kenya, Mombasa County and had key Water Supply regulators as part of stakeholders and also Water supply companies within Mombasa fully involved in all level of the project performance and which has more weight than participation.
5). To establish how Management Skills Influence of the Performance of water Projects in urbanized centers: A Case Study of Mji wa Kale sub-location in Mombasa County	Said and Osman (2013)	That management patterns in community, private and hybrid management in the rural water supply. This was an empirical study and the findings indicated that proper management of water supply profoundly influences the sustainability of the water supply system. The study found out that all over the developing countries most of rural water supply is	This concept did not focus on urbanized centers and supply of bottled drinking water. The study focused on Management through community teams.	This study focused on the whole inclusivity of both the urban community and the project team with other key stakeholders for the project Sustainability which form the knowledge gap

		managed by the community project teams.		

3.0 RESEARCH METHODOLOGY

The study adopted to descriptive study with a target population of 10,069 people comprised of 10, 056 population of the sub-location (KNBS, 2019 Census), ten purified water service providers (purposive), and a respondent each from the region's water supply regulators, i.e., Kenya Bureau of Standards (KEBS), Mombasa Water and Sanitation Company and Coast Water Works Agency. They were sampled using Solvins formula n = N / (1 + N e2) and simple random reduction to 15% to utilize a sample size of 70 respondents. Data was collected through the use of questionnaires and, where possible, interviews. Data analysis was through mean, frequencies, inferential statistics and descriptive methods through Statistical Package for Social Sciences - SPSS. Data was narrated and reported below frequency Tables.

4.0 DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.2 Questionnaire Return Rate

The study computed the response rate to ascertain whether it was adequate for analysis. The findings were as illustrated in Table 2.

Table 2: Questionnaire Return Rate

Responses	Frequencies	Response Rate
Response	56	80%
Non-response	14	20%
Total	**70**	**100**

From the findings, 70 questionnaires were administered to the respondents from which only 56 questionnaires were fully filled and returned. This gave a response rate of 80%. This was a significant response rate for statistical analysis since it is above 50% as per Kerlinger (2002) recommendations.

4.2 Descriptive Statistics

4.2.1 Availability of Natural Water Sources and its Influence the Performance of Water Projects

Table 3: Agreement with Statements on Availability of Natural Water Sources

Statements	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Mean	Std. Dev.
Sources of water influence the performance of water projects in urbanized centers	0	0	6.7	80	13.3	4.067	0.958
The volume of water influences the performance of water projects in urbanized centers	0	0	13.3	80	6.7	3.933	0.958
Cost of operation and maintenance Influence the Performance of Water Projects in urbanized centers	13.3	0	20	13.3	53.3	3.814	0.817
Reliability of Source Efficient decision-making Influence the Performance of Water Projects in urbanized centers	46.7	26.7	6.7	6.7	13.3	2.133	0.957
Composite Mean and Std. Dev.						**3.500**	**0.923**

1 =Strongly Disagree, 2 = Disagree, 3 =Neutral, 4 =Agree, 5 =Strongly Agree, M =Mean and Std. D =Standard Deviation

From the findings, the respondents agreed that sources of water influence the performance of water projects in urbanized centers as shown by a mean of 4.067, that the volume of water influences the performance of water projects in urbanized centers as shown by a mean of 3.933 and that cost of operation and maintenance influence the performance of water projects in urbanized centers as shown by a mean of 3.814. However, the respondents disagreed that the reliability of source efficient decision-making influences the performance of water projects in urbanized centers, as shown by a mean of 2.133. The composite mean was 3.487 and the standard deviation was 0.923. This implies most of the respondents were in agreement with statements concerning the availability of natural water sources that influence the performance of water projects in urbanized centers. This is an indication that respondents believed that the availability of natural water sources has an influence on the performance of water projects in urbanized centers.

4.2.2 Consumer Preferences of Price and its Influence on the Performance of Water Projects

Table 4: Agreement with Statements on consumer Preferences of Price

Statements	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev.
Competitive Pricing Influence the Performance of Water Projects in urbanized centers.	20	13.3	13.3	40	13.3	3.133	0.907
Special Discounts Influences the Performance of Water Projects in urbanized centers.	6.7	0	6.7	13.3	73.3	4.467	0.625
Suitable Price List Influence the Performance of Water Projects in urbanized centers.	13.3	0	20	13.3	53.3	3.813	0.957
Pricing Accountability Influence the Performance of Water Projects in urbanized centers.	46.7	26.7	6.7	6.7	13.3	2.134	0.965
Composite Mean and Std. Dev.						**3.387**	**0.864**

1 =Strongly Disagree, 2 = Disagree, 3 =Neutral, 4 =Agree, 5 =Strongly Agree, M =Mean and Std. D =Standard Deviation

From the findings, the respondents agreed that special discounts influence the performance of water projects in urbanized centers as shown by a mean of 4.467 and that a suitable price list influences the performance of water projects in urbanized centers as shown by a mean of 3.813. However, the respondents were neutral that competitive pricing influences the performance of water projects in urbanized centers as shown by a mean of 3.133 and disagreed that pricing accountability influences the performance of water projects in urbanized centers as shown by a mean of 2.134. The composite mean was 3.387 and the standard deviation was 0.864. This implies most of the respondents were neutral with most of the statements concerning consumer preferences of price influence the performance of water projects in urbanized centers. This is an indication that respondents didn't agree or disagree that consumer preferences of price have an influence on the performance of water projects in urbanized centers.

4.2.3 Technology Use and its Influence the Performance of water Projects

The study sought to examine how technology use influences the performance of water projects in

Table 5: Agreement with Statements on Technology Uses influence the Performance of Water Projects

Statements	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev.
Support and Maintenance Influence of the Performance of water Projects in urbanized centers	0.0	0.0	19.6	21.4	58.9	4.393	0.812
Operational Applications Influence of the Performance of water Projects in urbanized centers	5.4	0.0	14.3	60.7	19.6	3.893	0.926
Experts availability Influence of the Performance of water Projects in urbanized centers	0.0	62.5	1.8	19.6	16.1	2.893	0.781
Adoption to sound technology Influence of the Performance of water Projects in urbanized centers	0.0	3.6	10.7	60.7	25.0	4.071	0.934
Composite Mean and Std. Dev.						**3.813**	**0.863**

1 =Strongly Disagree, 2 = Disagree, 3 =Neutral, 4 =Agree, 5 =Strongly Agree, M =Mean and Std. D =Standard Deviation

From the findings, the respondents agreed that support and maintenance influence of the performance of water projects in urbanized centers as shown by a mean of 4.393, that adoption to sound technology influence of the performance of water projects in urbanized centers as shown by a mean of 4.071 and that operational applications influence of the performance of water projects in urbanized centers as shown by a mean of 3.893. However, the respondents were neutral that expert's availability influence of the performance of water projects in urbanized centers as shown by a mean of 2.893. The composite mean was 3.813 and standard deviation was 0.863. This implies most of the respondents agreed with most of statements concerning technology use influence the performance of water projects in urbanized centers. This is an indication that respondents believed that technology use have an influence the performance of water projects in urbanized centers.

4.2.4 Stakeholders Involvement and its Influence the Performance of Water Projects

Table 6: Agreement with various Statements on Stakeholder's Involvement influence the Performance of Water Projects Statements	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Mean	Std. Dev.
Public-private partnership Influence the Performance of water Projects in urbanized centers.	0.0	3.6	12.5	60.7	23.2	4.031	0.851
Community involvement Influence the Performance of water Projects in urbanized centers.	0.0	3.6	60.7	19.6	16.1	3.482	0.735
Nongovernmental Organization Influence the Performance of water Projects in urbanized centers.	0.0	3.6	39.3	50.0	7.1	3.607	0.761
County Government Influence the Performance of water Projects in urbanized centers.	0.0	3.6	28.6	60.7	7.1	3.714	0.784
Composite Mean and Std. Dev.						**3.709**	**0.783**

1 =Strongly Disagree, 2 = Disagree, 3 =Neutral, 4 =Agree, 5 =Strongly Agree, M =Mean and Std. D =Standard Deviation

From the findings, the respondents agreed that public-private partnership influences the performance of water projects in urbanized centers as shown by a mean of 4.031, that county government influence the performance of water projects in urbanized centers as shown by a mean of 3.714 and that nongovernmental organization influence the performance of water projects in urbanized centers as shown by a mean of 3.607. However, the respondents were neutral community involvement influence the performance of water projects in urbanized centers as shown by a mean of 3.482. The composite mean was 3.709 and standard deviation was 0.783. This implies most of the respondents agreed with most of statements concerning stakeholder's involvement influence the performance of water projects in urbanized centers. This is an indication that respondents believed that stakeholder's involvement have an influence the performance of water projects in urbanized centers.

4.2.5 Management Skills and its Influence the Performance of water Projects

Table 7: Agreement with various Statements on Management Skills influence the Performance of Water Projects

Statements	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Mean	Std. Dev.
Team building Influence the Performance of Water Projects in urbanized centers	0.0	3.6	28.6	64.3	3.6	3.679	0.776
Clear Communication Influence the Performance of Water Projects in urbanized centers	0.0	1.8	19.6	75.0	3.6	3.804	0.803
Continuous improvement Influence the Performance of Water Projects in urbanized centers	0.0	0.0	3.6	89.3	7.1	4.036	0.852
Efficient decision-making Influence the Performance of Water Projects in urbanized centers	0.0	1.8	7.1	87.5	3.6	3.929	0.829
Composite Mean and Std. Dev.						**3.862**	**0.815**

1 =Strongly Disagree, 2 = Disagree, 3 =Neutral, 4 =Agree, 5 =Strongly Agree, M =Mean and Std. D =Standard Deviation

From the findings, the respondents agreed that continuous improvement influence the performance of water projects in urbanized centers as shown by a mean of 4.036 and that efficient decision-making influence the performance of water projects in urbanized centers as shown by a mean of 3.929. The respondents also agreed that clear communication influence the performance of water projects in urbanized centers as shown by a mean of 3.804 and that team building influence the performance of water projects in urbanized centers as shown by a mean of 3.679. The composite mean was 3.862 and standard deviation was 0.815. This implies most of the respondents agreed with most of statements concerning management skills influence the performance of water projects in urbanized centers. This is an indication that respondents believed that management skills have an influence the performance of water projects in urbanized centers.

4.3 Multiple Regression Analysis

This section covers details on how hypothesis was tested. The study conducted multiple regression analysis to test the influence of the five independent variables on the performance of water projects.

4.3.1 Regression analysis of Availability of Natural Water Sources and Performance of Water Projects

Table 8: Results for Testing Hypothesis One

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error**
1	.789[a]	.622	.615	.36498

ANOVA[a]

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	11.838	1	11.838	88.870	.000[b]
	Residual	7.193	54	.133		
	Total	19.031	55			

Coefficients[a]

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		β	**Std. Error**	**Beta**		
1	(Constant)	2.652	.714		3.714	.000
	Availability of natural water sources	1.414	.150	.789	9.427	.000

a. Dependent Variable: Performance of water projects in urbanized centers
b. Predictors: (Constant), Availability of natural water sources

The findings in Table 8 shows that r=0.789. This indicates that availability of natural water sources has a very strong relationship with performance of water projects in urbanized centers. In addition, R^2 was 0.622 which indicate that availability of natural water sources explains 62.2% of the variations in the performance of water projects in urbanized centers. The results on test of significance also indicate that availability of natural water sources (β=1.414, p=0.000) was significant at p<0.05 and 95% confidence level. The overall F statistics, (F = 88.870, p=0.000<0.05), indicated that there was a very statistically significant relationship between availability of natural water sources and performance of water projects in urbanized centers. The hypothesis was therefore accepted and it was concluded that there is a significant relationship

between availability of natural water sources and performance of water projects in urbanized centers. These findings are in line with Duran (2017), who examined the impact of global climate change on water sources, quantity and quality, that the approach can improve conditions and prevent social unrest and hinder economic development. The study also established that inadequate financing, mismanagement, and low initial capital allocation in the water sector are significant challenges to an improved water supply. These findings are in line with Ababa's (2013) study on community-based water projects' sustainability.

4.3.2 Regression analysis of Consumer Preferences of Price and Performance of water Projects in Urbanized Centers

Table 9: Results for Testing Hypothesis Two

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error**
1	.743[a]	.551	.543	.39758

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	10.496	1	10.496	66.400	.000[b]
	Residual	8.536	54	.158		
	Total	19.031	55			

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		β	**Std. Error**	**Beta**		
1	(Constant)	2.435	.799		3.047	.004
	consumer preferences of price	1.343	.165	.743	8.149	.000

a. Dependent Variable: Performance of water projects in urbanized centers
b. Predictors: (Constant), consumer preferences of price

The findings in Table 9 reveals that r=0.743. This indicates that consumer preferences of price have a very strong relationship with performance of water projects in urbanized centers. In addition, R^2 was 0.551 which indicate that consumer preferences of price explain 55.1% of the variations in the performance of water projects in urbanized centers. The results on test of significance also indicate that consumer preferences of price (β=1.343, p=0.000) was significant at p<0.05 and 95% confidence level. The overall F statistics, (F = 66.400, p=0.000<0.05), indicated that there was a very statistically significant relationship between consumer preferences of price and performance of water projects in urbanized centers. The null hypothesis was hence accepted and it was concluded that there is a significant relationship between consumer preferences of price and performance of water projects in urbanized centers. These findings concur with OECD (2017) and Kanyanya (2014), who both argued that common administrative pricing structures include flat, volumetric, tiered and two-part tariffs. The challenge is to balance the complexity of performance (e.g., rate setting and monitoring) with the power to focus on demand that's wasteful or incompatible with goals. Single rate volumetric prices are directly associated with the quantity of water withdrawn or consumed in use.

4.3.3 Regression analysis of Use of Appropriate Technology and Performance of water Projects

Table 10: Results for Testing Hypothesis Three

Model Summary					
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error**	
1	.784[a]	.615	.608	.396	
ANOVA[a]					
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	13.542	1	13.542	86.143	.000[b]
	Residual	8.489	54	.157		
	Total	22.031	55			
Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		β	**Std. Error**	**Beta**		
1	(Constant)	2.604	1.162		2.240	.029
	Use of appropriate technology	1.013	.138	.784	1.258	.014

a. Dependent Variable: Performance of water projects in urbanized centers
b. Predictors: (Constant), Use of appropriate technology

The findings in Table 10 shows that r=0.784. This indicates that use of appropriate technology has a strong relationship with performance of water projects in urbanized centers. In addition, R^2 was 0.615 which indicate that use of appropriate technology explains 61.5% of the variations in the performance of water projects in urbanized centers. The results on test of significance also indicate that use of appropriate technology (β=1.013, p=0.014) was insignificant at p<0.05 and 95% confidence level. The overall F statistics, (F = 86.143, p=0.014>0.05), indicated that there was a very statistically significant relationship between use of appropriate technology and performance of water projects in urbanized centers. The null hypothesis was hence accepted and it was concluded that there is significant relationship between use of appropriate technology and performance of water projects in urbanized centers. The findings conform to Carlevaro and Gonzalez (2011) and Ababa (2013), who noted that community members, for example, need to be empowered and therefore must be equipped with the necessary knowledge on how to operate efficiently, repair and maintain the water supply system as this enhances the sustainability of the project. Technology which fails to fulfill the needs of its users, which is poorly installed or which is difficult to maintain or repair, possess significant challenges for sustainability.

4.3.4 Regression analysis of Stakeholder Involvement and Performance of water Projects

Table 11: Results for Testing Hypothesis Four

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error**
1	.741[a]	.549	.541	.39851

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	10.455	1	10.455	65.835	.000[b]
	Residual	8.576	54	.159		
	Total	19.031	55			

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		β	**Std. Error**	**Beta**		
1	(Constant)	-1.131	.642		-1.761	.084
	Stakeholder involvement	1.101	.136	.741	8.114	.000

a. Dependent Variable: Performance of water projects in urbanized centers
b. Predictors: (Constant), Stakeholder involvement

The findings in Table 11 shows that r=0.741. This indicates that stakeholder involvement has a very strong relationship with performance of water projects in urbanized centers. In addition, R^2 was 0.549 which indicate that stakeholder involvement explains 54.9% of the variations in the performance of water projects in urbanized centers. The results on test of significance also indicate that stakeholder involvement (β=1.101, p=0.000) was significant at p<0.05 and 95% confidence level. The overall F statistics, (F = 65.835, p=0.000<0.05), indicated that there was a very statistically significant relationship between stakeholder involvement and performance of water projects in urbanized centers. The hypothesis was hence accepted and it was concluded that there is a significant relationship between stakeholder involvement and performance of water projects in urbanized centers. These findings are in line with a study by the World-Wide Fund for Nature (2013) on the stakeholders' participation in water projects' sustainability in Africa. It argues that stakeholders in water projects in the continent may include locally afflicted communities, individuals and their formal or informal representatives, federal or local government authorities, politicians, religious or spiritual leaders, critical civil society organizations and special interests groups.

4.9.5 Regression analysis of Management Skills and Performance of water Projects

Table 12: Results for Testing Hypothesis Five

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error**
1	.775[a]	.601	.594	.374

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	11.421	1	11.421	81.439	.000[b]
	Residual	7.573	54	.140		
	Total	19.031	55			

Coefficients						
		Unstandardized Coefficients		**Standardized Coefficients**		
Model		**β**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	1.131	.642		1.761	.084
	Management skills	0.982	.136	.741	8.114	.000

a. Dependent Variable: Performance of water projects in urbanized centers
b. Predictors: (Constant), Management skills

The findings in Table 12 shows that r=0.775. This indicates that management skills have a very strong relationship with performance of water projects in urbanized centers. In addition, R^2 was 0.601 which indicate that management skills explain 60.1% of the variations in the performance of water projects in urbanized centers. The results on test of significance also indicate that management skills (β=0.982, p=0.000) was significant at p<0.05 and 95% confidence level. The overall F statistics, (F = 81.439, p=0.000<0.05), indicated that there was a very statistically significant relationship between management skills and performance of water projects in urbanized centers. The hypothesis was hence accepted and it was concluded that there is a significant relationship between management skills and performance of water projects in urbanized centers. These findings are in line with Gido (2009) and Habtamu (2012), both noted it is essential for every member of the project team to clearly understand the goals and each objective at every stage of the project and have the responsibility to be ethical at work and endeavor to be as efficient as possible.

Therefore, based on the output in the analysis, the following equation was established:

$$\mathbf{Y= 5.691+1.414X_1 + 1.343X_2 + 1.013X_3 + 1.101X_4 + 0.982X_5}$$

The regression equation indicates that holding all factors (natural resource availability, consumer price preference, technology use, stakeholder involvement and management skills) constant, performance of water projects in Mji wa Kale Location, Mombasa County, Kenya was 5.691. The study also revealed that taking all other independent variables at zero, a unit increase in the natural resource availability would lead to a 1.414 increase in performance of water projects in Mji wa Kale Location. Natural Resource availability was found to have the greatest influence on performance of water projects. All independent variables tested were found to be significant with P-values<0.05.

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

5.1.1 Availability of Natural Water Sources

The study found that sources of water influence the performance of water projects in urbanized centers, that the volume of water influences the performance of water projects in urbanized centers and that cost of operation and maintenance influence the performance of water projects in urbanized centers. The study established that reliability of source efficient decision-making influence the performance of water projects in urbanized centers.

5.1.2 Consumer Preferences of Price

The study established that consumer preferences of price influence the Performance of Water Projects in urbanized centers. The study found that special discounts influence water projects' performance in urbanized centers and that a suitable price list influences the performance of water projects in urbanized centers. The study established that competitive pricing influences the performance of water projects in urbanized centers and that pricing accountability does not influence the performance of water projects in urbanized centers.

5.1.3 Technology Use

The study found that technology uses in water supply Influence the Performance of Water Projects in urbanized centers and that water services companies have the relevant technology skills required in the current trends on new innovative technologies in their supply to the commodity. The study found that support and maintenance influence water projects' performance in urbanized centers, that adoption to sound technology influence the performance of water projects in urbanized centers and that operational applications influence the performance of water projects in urbanized centers.

5.1.4 Stakeholders Involvement

The study found a partnership with other key stakeholders as the Government and Nongovernmental Organizations, who influence the Performance of Water Projects in urbanized centers and that consumers are consulted periodically to evaluate pricing and quality of production. The study established that public-private partnerships influence water projects' performance in urbanized centers, that county government influence the performance of water projects in urbanized centers and that nongovernmental organizations influence the performance of water projects in urbanized centers.

5.1.5 Management Skills

The study established that Mombasa's water companies have a clear policy on communication with their employee and consumers. The study found that continuous improvement influences water projects' performance in urbanized centers and that efficient decision-making influences the performance of water projects in urbanized centers. The study found that specific communication influences water projects' performance in urbanized centers and that team building influences water projects' performance in urbanized centers.

5.2 Conclusion

In general, the study concluded that there is a significant relationship between the availability of natural water sources and the performance of water projects in urbanized centers. The study found that water sources, the volume of water and the cost of operation and maintenance influence the performance of water projects in urbanized centers. The study established that reliability of source efficient decision-making influence the performance of water projects in urbanized centers. The study further concluded a significant relationship between consumer preferences of price and performance of water projects in urbanized centers. The study found that special discounts and suitable price lists influence water projects' performance in urbanized centers. The study established that competitive pricing influences the performance of water projects in urbanized centers and that pricing accountability does not influence the performance of water projects in urbanized centers

The study established a significant relationship between appropriate technology and water projects' performance in urbanized centers. It was established that support and maintenance, adoption of sound technology and operational applications influence water projects' performance in urbanized centers. The study established that expert's availability influences the performance of water projects in urbanized centers. The study affirmed that there is a significant relationship between stakeholder involvement and performance of water projects in urbanized centers. The study established that public-private partnerships, county government and nongovernmental organizations influence water projects' performance in urbanized centers. The study found that community involvement influences the performance of water projects in urbanized centers.

The study further concluded that there is a significant relationship between management skills and performance of water projects in urbanized centers. The study found that continuous improvement and efficient decision-making influence the performance of water projects in urbanized centers. The study found that straightforward communication influences water projects' performance in urbanized centers and that team building influences water projects' performance in urbanized centers.

5.3 Recommendation

The study recommends that water management committees that have untrained community members should not be entrusted to manage these facilities, leading to mismanagement and unwarranted system breakdowns. It is also recommended that water project implementers ensure that water management committees are formed and members adequately trained. The study also recommends that project leaders and members be trained on the effective use of scarce water supplied to reduce the losses in quantity and quality of water as delivered from source through to households for use to eventual disposal. There is a need to enhance transparency and accountability levels among the committee members. Openness should be encouraged in managing finances raised from the sale of water and community contributions, with proper records and bank statements being kept by the water management committees

There is a need for close monitoring and evaluation of water projects by implementing organizations to enhance sustainability. Community participation right from conception and design of water projects to implementation is recommended to enhance water projects' community ownership. All management committees for water projects should develop by-laws and

constitutions governing such projects. Such constitutions will help in ensuring that the management of such projects steers away from avoidable conflicts. There is a need to encourage diversified livelihoods, especially those directly supported by water resources. The study also recommends that frequent inspections be done on water project performances by Project facilitators to address challenges facing the community on performance and sustainability.

This study recommends that peri-urban water supply projects budget for technology adoption and implementation improve their services and operations. Therefore, water committees' skills must be continuously increased, including setting minimum education and skills levels for effective participation in water committees. Selecting appropriate technology is a primary concern of every project manager, for, without technology, safe sources cannot be exploited. Project designers must consider all parameters mitigating the selection of technology, including source characteristics, demand and adequacy of source and cost of operation and maintenance before making choices.

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