

Moderating Influence of Strategic Management Practices on the Relationship between Quality Management System and Access to Water and Sanitation Services in Kenya

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DOI: <https://doi.org/10.47772/IJRISS.2026.100600479>

Received: 01 June 2026; Accepted: 06 June 2026; Published: 27 June 2026

ABSTRACT

In Kenya, over 3,100 children die annually for using unsafe water and poor sanitation. In the year 2024, only 41 percent households had access to piped water in Kenya. Previous studies have revealed the unsuccessful attempts to improve access of water and sanitation services through privatization and structural reforms in the water sector. These studies did not assess how management practices such as the quality management system and the strategic management practices can enhance access to water and sanitation services. The main objective of the study was to establish the moderating influence of strategic management practices on the relationship between quality management system standards and access to water and sanitation services in Kenya. The study was guided by a conceptual framework anchored on the Theory of Constraints (ToC) and the Resource Based Theory with quality management system standards as the independent variable, strategic management practices as the moderating variable and access to water and sanitation services as the dependent variable. The study adopted a combination of descriptive and explanatory research design. The target population consisted of the 86 water service providers in Kenya. The sample comprised of 70 water service providers who were selected using the stratified random sampling. The respondents of the study included the 70 general managers of the selected water service providers. Primary data was collected by the use of questionnaires. Secondary data was obtained from the 2024 WASREB report. The instruments were tested for validity and reliability through the content validity and the Cronbach Alpha's internal consistency index for reliability. The study found out that strategic management practices increased the influence of quality management system standards on access to water and sanitation services from 82% to 94% ($t=1.0, p>0.05$). This implied that though strategic management practices moderated the relationship between adherence to quality management system standards and access to water and sanitation services, the degree of moderation was not statistically significant. The study recommended that the management of the water service providers should align the quality management system with the strategic management practices to enhance access to water and sanitation services to the members of the public. The study provides a strategic management model for strengthening the relationship between quality management system and access to water and sanitation services.

Keywords: Strategic Management Practices, Quality management system, Access to Water and Sanitation Services

Background to the Study

Access to clean water and adequate sanitation services remains a major global development concern, particularly in developing countries. The United Nations recognizes access to safe water and sanitation as a fundamental human right and an essential component of sustainable development. Globally, millions of people still lack reliable access to safe drinking water and improved sanitation facilities, leading to adverse health, social, and economic consequences. In response, Sustainable Development Goal 6 (SDG 6) seeks to ensure availability and sustainable management of water and sanitation for all by 2030 (World Health Organization

[WHO] & United Nations Children's Fund [UNICEF], 2023). Despite significant investments in water infrastructure and reforms in the water sector, many developing countries continue to experience challenges related to service quality, efficiency, and accessibility.

In Kenya, the water and sanitation sector has undergone major reforms aimed at improving service delivery, operational efficiency, and sustainability. The enactment of the Water Act 2002 and later the Water Act 2016 introduced institutional and regulatory changes intended to enhance access to water and sanitation services across the country. However, despite these reforms, access to quality water and sanitation services remains inadequate, particularly in rural and informal urban settlements. According to the Water Services Regulatory Board (WASREB), disparities in service provision continue to exist due to inefficiencies in management, inadequate infrastructure, limited financial resources, and poor implementation of quality standards (WASREB, 2023).

Quality management practices have increasingly been recognized as critical drivers of organizational effectiveness and service delivery in both public and private sectors. These practices include customer focus, continuous improvement, employee involvement, leadership commitment, quality planning, and adherence to established quality standards such as Total Quality Management (TQM) and ISO systems. Organizations that effectively implement quality management practices are likely to achieve improved operational performance, customer satisfaction, and efficient resource utilization (Njenga, 2016). In the water sector, quality management practices can contribute significantly to reliable service delivery, reduction of water losses, customer responsiveness, and enhanced public trust.

Several studies conducted in Kenya have emphasized the importance of quality management in improving organizational performance within water and sanitation companies. For example, Mithika and Moronge (2017) established that quality planning and effective resource allocation positively influence quality management in water and sanitation infrastructure projects in Nairobi County. Similarly, Koskei and Murigi (2021) found that strategic planning, continuous improvement, customer focus, and employee training positively affect organizational performance in Nakuru Water and Sanitation Services Company. These studies demonstrate that quality management practices are essential in enhancing efficiency and service outcomes in water service providers.

Strategic management practices are equally important in determining organizational success and sustainability. Strategic management involves formulation, implementation, monitoring, and evaluation of organizational strategies aimed at achieving long-term objectives. Effective strategic management enables organizations to align resources, anticipate environmental changes, improve decision-making, and enhance competitiveness. In the context of water and sanitation services, strategic management practices can help water service providers address operational challenges, optimize resource utilization, and improve access to services. Njiru (2014) observed that water and sanitation companies in Kenya that embraced strategic management practices demonstrated improved organizational performance and customer responsiveness.

Recent empirical studies suggest that strategic management practices may directly not only influence service delivery outcomes but may also strengthen the effectiveness of quality management practices. Njoroge (2021) established that strategy formulation significantly moderated the relationship between quality management systems and access to water and sanitation services in Kenya. The study revealed that organizations with well-formulated strategies were better positioned to translate quality management initiatives into improved access to services. This implies that strategic management practices may enhance coordination, policy implementation, resource allocation, and operational efficiency, thereby strengthening the impact of quality management practices on service delivery.

Despite the growing body of literature on quality management and strategic management, there remains limited empirical evidence on the moderating influence of strategic management practices on the relationship between quality management practices and access to water and sanitation services in Kenya. Most existing studies have focused independently on quality management, organizational performance, or strategic

management without adequately examining how strategic management practices interact with quality management practices to influence access to water and sanitation services. Consequently, a contextual and conceptual gap exists that necessitates further investigation.

Therefore, this study seeks to examine the moderating influence of strategic management practices on the relationship between quality management practices and access to water and sanitation services in Kenya. The study is significant because it will provide insights to policymakers, water service providers, and regulatory agencies on how strategic management can be leveraged to strengthen quality management initiatives and improve access to essential water and sanitation services.

Statement of the Problem

Access to clean water and adequate sanitation services remains a major global development concern, particularly in developing countries. The United Nations recognizes access to safe water and sanitation as a fundamental human right and an essential component of sustainable development. Globally, millions of people still lack reliable access to safe drinking water and improved sanitation facilities, leading to adverse health, social, and economic consequences. In response, Sustainable Development Goal 6 (SDG 6) seeks to ensure availability and sustainable management of water and sanitation for all by 2030. In Kenya, over 3,100 children die annually for using unsafe water and poor sanitation. In the year 2024, only 41 percent households had access to piped water in Kenya. This low access to water and sanitation services could be because of the management practices in the water services providers. Previous studies have revealed the unsuccessful attempts to improve access of water and sanitation services through privatization and structural reforms in the water sector. These studies, however, none of these studies sought to establish how strategic management practices moderates the relationship between the level adherence to quality management systems standards and access to water and sanitation services in Kenya.

Objective of the Study

The main objective of the study was to establish the moderating influence of strategic management practices on the relationship between quality management system and access to water and sanitation services in Kenya.

METHODOLOGY

The study was guided by the theory of constraints. This study used a combination of descriptive and correlational research design. Data was collected using self-administered questionnaires. Secondary data was obtained from 2024 WASREB report. The target population consisted of the general managers of the 84 water service providers in Kenya. The Reliability of the instrument was tested using Cronbach's Alpha reliability coefficient ($r=0.72$). Content validity was tested using content validity index ($CVI=0.88$). The data was analyzed using descriptive statistics, which included percentages, means, and frequencies.

Findings of the study

The study tested the hypothesis that there is no statistically significant moderating influence of strategic management practices on the relationship between quality management system and access to water and sanitation services. To test this hypothesis, the moderating effect was computed using the method proposed by Baron and Kenny (1986). A moderator is a variable that specifies conditions under which a given independent variable is related to an outcome. The moderating effect is measured in terms of how the effect of the explanatory variables changes when the moderator variable is introduced. The following hypothesis was formulated:

H₀₁: There is no statistically significant moderating influence of strategic management practices on the relationship between quality management system and access to water and sanitation services in Kenya. A three-step stepwise regression analysis was then used to test this hypothesis

Step 1: Dependent variable is regressed on the independent variable.

Step 2: Moderating variable is added to the regression equation.

Step 3: The interaction term between independent and moderator variables was introduced to the regression model. All the variables comprising quality management system, strategic management practices and the interaction term were entered in the regression model. To confirm the moderation, the interaction term should be significant ($p < 0.05$). The results of stepwise regression predicting that the effect of quality management on access to water and sanitation services is moderated by strategic management practices are presented in table 1.

Table 1: Model Summary of Influence strategic management practices on access to water and sanitation services

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			
						F Change	df1	df2	Sig. F Change
1	.91a	0.83	0.82	0.42	0.83	247.98	1	52	0.00
2	.97b	0.94	0.94	0.25	0.11	94.58	1	51	0.00
3	.97c	0.94	0.94	0.25	0.00	0.01	1	50	0.92
a. Predictors: (Constant), QMS									
b. Predictors: (Constant), QMS, Strategic Management (SM)									
c. Predictors: (Constant), QMS, Strategic Management (SM) , QMS*SM									

Table 2: Coefficients of Influence strategic management practices on the relationship between Quality Management System and access to water and sanitation services.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error			
1	(Constant)	4.11E-17	0.06		0.00	1.00
	QMS	0.91	0.06	0.91	15.75	0.00
2	(Constant)	6.86E-17	0.03		0.00	1.00
	QMS	0.72	0.04	0.72	18.12	0.00
	SM	0.39	0.04	0.39	9.73	0.00
3	(Constant)	0.00	0.04		-0.05	0.96
	QMS	0.72	0.04	0.72	17.92	0.00
	SM	0.39	0.04	0.39	9.63	0.00
	QMS*SM	0.00	0.04	0.00	0.10	0.92

*Strategic Management (SM), QMS (Quality Management System)

The results in step 1, Table 1 show that quality management system alone accounts for 82% of the variation of access to water and sanitation services (Adjusted $R^2=0.82$). In step 2, the results show that strategic management practices and quality management system account for 94% (Adjusted $R^2=0.94$) of variations in access to water and sanitation services. In step 3, the result for quality management system and strategic management practices (quality management system * strategic management practices) were included in the model to determine whether strategic management practices moderates the relationship between quality

management system and access to water and sanitation services. The interaction term (quality management system and strategic management practices) accounted for 94 % of the variations in access to water and sanitation services. The results in step 2 showed that when the interaction term was entered into the model, this lead to an increase in access to water and sanitation services as the variation increased from 0.82 to 0.94. This implied that quality management system, strategic management practices and the interaction term (quality management system *, strategic management practices) causes variation of 94 % on access to water and sanitation services.

The results show a statistical significance for the effect of quality management system on access to water and sanitation services ($t= 15.75$, $p<0.05$). At step 2, the model of quality management system and access to water and sanitation services was statistically significant ($t=9.73$, $p<0.05$). In step 3, the overall model was statistically insignificant ($t=1.0$, $p>0.05$). Regression coefficients for the test of hypothesis are presented in table 4.24, the regression coefficient was significant at all the three steps of the analysis. It is worth noting that the effect of interaction between quality management systems and strategic management practices on access to water and sanitation services was not significant ($t=1.0$, $p>0.05$). This implied that for every unit change in interaction between level of adherence to quality management system standards and level of application of strategic management practices, there is minimal or no corresponding change in access to water and sanitation services. These results provided sufficient evidence to support the hypothesis that there is no significant influence of strategic management practices on the relationship between quality management systems standards and access to water and sanitation services in Kenya. Therefore, the hypothesis that there is no significant moderating influence of strategic management practices on the relationship between quality management system and access to water and sanitation services was accepted.

Many studies assessing the moderating effects have used other moderators rather than strategic management practices. Seedee (2012) carried out a study on moderating role of business strategies on the relationship between best business practices and firm performance. Data was collected from 169 Thai manufacturing firms. Descriptive statistics and hierarchical regression analysis were used to analyze the data. The finding indicated that the relationship between best business practices and firm's performance could be influenced by business strategies.

Sagwa, K'Obonyo and Ogutu (2015) did a study on moderating effect of competitive strategy on the relationship between employee outcomes and performance of firms listed on the Nairobi Securities Exchange. The study used cross sectional descriptive survey research design. Data was collected using a self-administered questionnaire, from a population of 60 (100%) Nairobi Securities Exchange listed firms. Descriptive statistics, correlation and regression techniques were used to analyze the data. The results indicate that competitive strategy moderates the relationship between employee outcomes and firm performance.

Rosli & Rosman Mahmood (2013) carried out a study on moderating effects of human resource management practices and entrepreneur training on innovation and small-medium firm Performance. Two hundred eighty-four samples were obtained from small-medium firms in Malaysia. The study found that the employee training interacted with innovation and significantly influenced organization performance.

CONCLUSION OF THE STUDY

The study concluded that the level of application of strategic management practices was high. It also concluded that the influence of level of application of strategic management practices on access to water and sanitation services was statistically significant. The study further concluded that the introduction of strategic management practices increased the access to water and sanitation services.

RECOMMENDATIONS

The study noted that water crises in Kenya are largely strategic management outcomes. The study therefore recommends that the water service providers should be guided by central water service strategic management

standards. There is also need for developing sustainable strategic plan for all water service providers to improve the practical competence of water service providers. The water service providers should also use of well-structured planning mechanism, have well written mission and vision, base decisions and actions on formulated organization policies and use resource control teams to ensure the access to water and sanitation services is enhanced.

The study also recommends that the water service providers should align the quality management system with their strategic management practices to ensure increased access to water and sanitation services. The study findings confirm that there is need for the water service providers to reassess their strategic management practices to ensure that they are aligned with the quality management system.

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