ENTERPRISE RISK MANAGEMENT PRACTICES AND THE FINANCIAL SUSTAINABILITY OF WATER AND SEWERAGE COMPANIES IN KIAMBU COUNTY, KENYA

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ABSTRACT

Financial sustainability as reflected by Operating Self Sufficiency has remained unstable among licensed water and sewerage companies in Kiambu County, fluctuating between modest surpluses and shortfalls and reflecting persistent weaknesses in cost recovery and exposure to operational and financial risks. The research's overall objective was to examine the effect of enterprise risk management practices on the financial sustainability of licensed water and sewerage companies in Kiambu County, Kenya. Specifically, the study assessed the effects of risk identification, risk assessment, risk response, and risk monitoring practices on financial sustainability. The study was underpinned on Prospect Theory, Contingency Theory, RBV Theory, Agency Theory, and Financial Sustainability Theory. A descriptive research design was adopted targeting managers and senior officers drawn from the eight licensed water and sewerage companies in Kiambu County. Both primary and secondary data were used. Primary data were collected using structured questionnaires, while secondary data were obtained from audited financial statements. Data were analyzed using STATA through descriptive statistics and inferential techniques including Pearson correlation and multiple regression analysis. Data were presented using tables. Regression results showed that risk identification had a positive and statistically significant effect on financial sustainability, risk assessment had a positive and statistically significant effect, risk response had a negative and statistically significant effect, while risk monitoring had a positive and statistically significant effect. The study concludes that risk identification, risk assessment, and risk monitoring practices strengthened financial sustainability among licensed water and sewerage companies in Kiambu County, while risk response practices weakened sustainability outcomes. The study recommends strengthening structured identification, assessment, and monitoring systems while aligning response strategies with institutional capacity. Ethical principles including informed consent, confidentiality, and voluntary participation were observed throughout the study.

Key words: Operating Self-Sufficiency, Risk Assessment, Risk Identification, Risk Monitoring, Risk Response.

INTRODUCTION

Water is a key survival resource to the human race, economic growth, and ecosystem. In its recognition of water as a health, poverty reduction and education priority, the United Nations Sustainable Development Goal (SDG) 6 acknowledges the significance of water in ensuring universal access to clean water and sanitation by 2030. Notwithstanding this realization, UNICEF (2021) indicates that over two billion individuals around the world do not have access

to safely managed drinking water, and also, more than four billion of them experience poor sanitation. These shortages undermine human productivity and expose people to much more susceptibility to disease, particularly in developing economies whose population is still rising (UN-Water, 2023).

Enterprise Risk Management (ERM) is an emerging pillar in organizational governance in both the state and the non-state sectors. It means a comprehensive process by which organizations recognize, review, and extend risks in manners that are consistent with strategic goals. According to COSO (2020), ERM refers to a framework that instills risk awareness in planning, decision-making, and performance evaluation. In that respect, OECD (2021) highlights that successful ERM is known to change the perspective of risk management as a more limited compliance activity into an approach that develops resiliency and facilitates long-term value creation.

Financial sustainability is the capability of an organization to continually produce adequate resources to fulfill its operating expenses, service debt and fund long-term investments. According to the World Bank (2021), financial sustainability is an expression of the ability of institutions to be solvent and liquid and guarantee an uninterrupted provision of basic services. Equally, the International Monetary Fund (2020) asserts that financial sustainability would entail constant revenues and funding mechanisms, which would sustain the current operations and protect the future. In the case of water and sewerage companies this translates into creating sufficient revenue in the form of tariffs and collections in order to maintain service delivery without compromising the affordability of consumers.

Performance review of the sector shows that in 2019-24 Operating Self Sufficiency (OSS) ratios in water utilities in Kiambu County have varied within a small band of between 0.97 and 1.05 with many incidences falling below or above the cost recovery level (World Bank and WASREB, 2023). This ratio reduced to approximately 0.97 in 2020 and continued to be under unity in 2022 at about 0.98, which means that there were some instances when operating revenues were no longer adequate to cover recurrent expenditures. Conversely, years 2019, 2021, 2023 and 2024 reported larger values of OSS slightly above the value of one, and were between approximately 1.03 and 1.05, representing smaller surpluses which allowed utilities to cover operating expenses and allow limited reinvestment. These trends demonstrate the volatile financial sustainability of water utilities in the Kiambu County.

According to WASREB (2023), there are eight licensed water service providers in Kiambu County, which is provided in Appendix III. Such utilities are aimed at urban, as well as peri-urban populations but can hardly afford to be financially stable. Their performance reports in terms of their sector performance indicate that their Operating Self-Sufficiency (OSS) ratios have consistently been below the unity line with certain years yielding even lower ratios that reflect that their revenues could not cover their operating costs. During other years, the ratios increased slightly over unity indicating minor surpluses and no significant reinvestment possibilities. Such inconsistency is an indicator of the shaky financial sustainability in the county.

This is aggravated by unending difficulties. Non-revenue water, limited tariff revisions, inflationary effect and governance frailty lower the efficiency of utilities to operate effectively (WASREB, 2023). On top of OSS, even where it exceeds one, surpluses are too small to finance infrastructure growth or occurrences of external shocks cushioning utilities. The implication is that, unless structured enterprise risk management practices are adopted, water and sewerage companies in Kiambu will be susceptible to repeated financial strains, which would weaken their long-term capacity to offer reliable and affordable services to the county that is both urbanizing at an alarming rate together with being at the center of economic future of Kenya.

Statement of the Problem

Water and sewerage companies are very important in the Kenyan move towards Sustainable Development Goal 6, which aims at ensuring universal access to affordable and safe water and sanitation services by 2030. Their financial sustainability defines their ability to sustain infrastructure, increase coverage of services, and provide quality water services. Nevertheless, in developing economies, such as Kenya, utilities remain under financial strains due to poor enterprise risk management, excessive non-revenue water, slow increase in tariffs, and vulnerability to climatic and macroeconomic incidents (World Bank, 2023; WASREB, 2024). Such circumstances undermine cost recovery and limit the sustainability of service delivery.

Kiambu County has been facing a problem of financial sustainability among its water utilities. Operating Self Sufficiency (OSS) ratios ranged between about 0.97 and 1.05 between 2019 and 2024 (WASREB, 2024; World Bank, 2025). The ratio was approximately 1.03 in 2019, decreased to around 0.97 in 2020, increased a bit more to around 1.04 and 1.05 in 2023 and 2024 respectively. These swings show that the recovery of costs has continued to be volatile, with the utilities swinging between small surpluses and times when the operating revenues were not high enough to meet the recurrent costs.

A lot of the empirical evidence used on enterprise risk management has been developed in a corporate and developed economy environment where there was more focus on profitability and firm performance instead of financial sustainability as applied to the case with the public utilities. The research by Arena, Arnaloldi, and Azzone (2020), Bromiley, McShane, Nair, and Rustambekov (2020), and Waweru and Kisaka (2022) was based on institutional settings that are quite different in comparison to the devolved water utilities in developing economies. Their results cannot hence be easily extrapolated to water and sewerage firms that have to operate under resource limited public systems like those in the Kiambu County. The current study went ahead and filled this conceptual and contextual gap by looking at enterprise risk management practices in an assessment of financial sustainability through the Operating Self Sufficiency ratio of licensed utilities.

Empirical research on enterprise risk management in Kenya has been heavily concentrated on financial institutions and state corporations as opposed to devolved water utilities. Kariuki (2019) studied risk management practices within state corporations, Kamau (2019) and Ndung'u and Muturi (2022) and Mwangi and Mungai (2023) studied the banking and corporate contexts, respectively. These institutional settings are different to water utilities in terms of

financing structure, operational risk, and regulatory control. This study addressed this contextual and geographical gap by generating localized empirical evidence from licensed water and sewerage companies in Kiambu County**.**

Objectives of the Study

The overall objective of this study is to analyze the effect of enterprise risk management practices on the financial sustainability of water and sewerage companies in Kiambu County, Kenya.

Specific Objectives

i. To examine the effect of risk identification practices on the financial sustainability of water and sewerage companies in Kiambu County, Kenya.
ii. To determine the effect of risk assessment practices on the financial sustainability of water and sewerage companies in Kiambu County, Kenya.
iii. To analyze the effect of risk response practices on the financial sustainability of water and sewerage companies in Kiambu County, Kenya.
iv. To evaluate the effect of risk monitoring practices on the financial sustainability of water and sewerage companies in Kiambu County, Kenya.

Theoretical Literature

Prospect Theory

Prospect Theory was postulated by Daniel Kahneman and Amos Tversky in 1979 to describe the manner in which individuals make rational choices in risky circumstances. It disproved the previous anticipated utility theory by demonstrating that people tend to weigh higher on the prospects of losses instead of equal profits. It has since become one of the most referred theories in behavioral economics and finance and has been applied to investment decisions, insurance and risk management. Recent research by Barberis (2019), Wakker (2020) and Baucells and Rata (2022) proves that it can still be used to explain the way organizations and managers see uncertain outcomes.

The theory is based on a number of assumptions. To begin with, others are believed to compare alternatives against a reference point as opposed to comparing them to absolutes. Second, it is believed that it is more painful to lose than to gain identical amounts, a concept referred to as a loss aversion. Third, individuals often overestimate the likelihood of small events and underestimate the likelihood of large events during the process of evaluating outcomes (Wakker, 2020; Baucells and Rata, 2022). These assumptions give a more realistic explanation of decision making as opposed to models which assume complete rationality.

In this research, Prospect Theory was used in explaining risk identification practice among water and sewerage companies in Kiambu County. This implies that managers are more likely to spot and place more emphasis on risks that can cause financial or operational losses than on opportunities that can result in gains. This opinion promotes the thesis that financial sustainability requires early identification of threats like revenue shortages or infrastructure breakdown. With the use of the anchor of the variable of risk identification by Prospect Theory,

the study can demonstrate the impact of loss aversion on the utilities of managing and anticipating uncertainty.

Contingency Theory

This theory was introduced in the 1960s by Fred Fiedler as an answer to the inflexible models of management which researched a universal manner of organizational leadership. According to the theory, the success of decisions is determined by their suitability to the environment on which an institution is operating. The idea was further elaborated later by other authors like Donaldson (2001) and Otley (2016) who demonstrated that an identical structure can be successful in one environment but not in another. In more recent studies, van de Ven, Drazin and Thietart (2021) noted that the framework still remains significant to management and finance research in which there is a lot of uncertainty and the environment is constantly changing.

The theory is based on a handful of assumptions. First, it presupposes that organizations do not exist in stable environments but are the ones that are subject to change. Second, it presupposes the fact that no single management method can be used to assure success in all contexts. Lastly, it assumes that managers have to make a constant modification of systems and processes to align with emerging conditions (Donaldson, 2001; Otley, 2016). Such assumptions seem easy to understand yet they bring to the fore the fact that different organizations can behave differently despite having similar structures.

In the current study, the Contingency Theory forms a basis to study the risk assessment of water and sewerage firms in the Kiambu County. The framework emphasizes that utilities should adjust their analysis of risks to the local circumstances including financial constraints, regulatory controls, and environmental shocks. In doing it, the theory will explain why the assessment of risks is not consistent and how the organization that personalizes the assessment is more apt to be financially sustainable.

Resource-Based View Theory

This theory was initially developed by Barney (1991) and this is a continuation of the earlier studies on the heterogeneity of firms and competitive advantage. This theory states that organisations can have sustained performance in case they possess resources that are valuable, rare, inimitable and well structured. However, in contrast to methods that focus on the external forces, including the structure of the industry, the RBV focuses on the ability held by firms and used in a long-term perspective. Peteraf and Barney (2003), Teece (2018), and Sirmon, Hutt and Ireland (2020) have made more recent contributions which have demonstrated that the framework has continued to inform strategic management and finance studies, especially on how companies react to risk and opportunities.

The assumptions of the RBV are founded on the principle that the firms are not homogenous, and they vary in terms of the available resources and how they use them. It presupposes that not all of these resources can be easily reproduced by the competitors and that when they are organized in a proper way, they lead to the long-term benefits. It also presumes that the

management can recognize, create and safeguard these resources to make sure that value is created (Barney, 1991; Teece, 2018). Although these assumptions make an organization reality simple, the fact that internal strengths play an important role in the formation of resilience and sustainability is emphasized.

The current research used RBV to describe the risk response behavior of water and sewerage firms in the Kiambu County. According to the theory, utilities which have the ability to mobilize internal capabilities which include skilled staff, financial reserves and efficient technology are in a better position to formulate and adopt strategies to counter risks. By putting emphasis on the strategy of drawing on internal sources of strength, RBV can explain why certain firms are able to cope with disruptions better than others and why disruption responses to it are important in financial sustainability in the long-term.

Agency Theory

Jensen and Meckling developed the Agency Theory in 1976 to describe the issues that are encountered in cases where the principal, hands over power to an agent. The theory is that managers do not necessarily act in the best interest of the owners or stakeholders (particularly under information gaps and subpar oversight). The framework has over time been extensively applied in corporate governance, finance, and the administration of governments to study ways in which monitoring and incentive systems can minimize conflicts of interest. According to more recent work by Shapiro (2005), Heath and Norman (2020), and Aguilera, Judge, and Terjesen (2021), the theory is still applicable in the discussion of accountability and performance within various sectors.

The theory is based on several conventions that agents have more information than principals and that this asymmetry may tempt them to act opportunistically. It also assumes that monitoring is costly but necessary if principals are to ensure that their interests are protected. Finally, it assumes that incentives, whether financial or non-financial, can be structured to align the actions of managers with the goals of owners or stakeholders (Eisenhardt, 1989; Heath and Norman, 2020). These assumptions provide a framework for understanding why institutions put in place reporting systems, audits, and performance reviews.

This research used Agency Theory as the basis of interpreting risk monitoring behavior of water and sewerage firms in the Kiambu County. It justifies why boards, regulators, and managers need to in place mechanisms on how to monitor risks and also see to it that response measures are put into effect. Through monitoring of risks, there is an increased likelihood of the utilities being financially sustainable by minimizing information asymmetry and increased accountability. The theory thus relates the oversight practices to the wider aim of enhancing financial stability within key service institutions.

Financial Sustainability Theory

Hahnel and Sheeran established Financial Sustainability Theory in 2009 to introduce a theory of how organizations can sustain themselves and their long-term obligations without having to heavily depend on external resources. The theory highlights how institutions are capable of

producing stable revenues, how they can control expenses and re-invest in the systems that can guarantee the future growth. This theory includes resilience and stability as the primary aspects of performance, unlike previous models of financial management, which primarily concentrated on the profitability. According to the recent discourse by Botez (2019), Chikozho and Mapfumo (2021) and Ferreira and Franco (2023), the concept has been implemented both in corporate and public service environments where continuity of crucial services is paramount. The framework presupposes that financial stability is based on three premises. To start with, the institutions need to match revenues and expenditures such that the normal operations do not rely on subsidies or temporary borrowing. Second, the financial systems are to be designed so that they may absorb the shocks, be it economic, social, or environmental. Third, the organization is supposed to use some of its surpluses on long-term investments that would maintain capacity in the future (Hahnel and Sheeran, 2009; Ferreira and Franco, 2023). Those assumptions make it clear that profitability is short term and sustainability is a long-term process.

The Financial Sustainability Theory was used in this research to describe the dependent variable of financial sustainability in water and sewerage companies in the Kiambu County. The structure is appropriate as it is likely that these utilities will be able to meet their operating expenses by using tariffs and collections and still afford to provide services to a wide range of the population. The theory offers a reasonable foundation to consider whether the enterprise risk management practices enhance the capacity of the companies to survive the shock by dealing with the balance of revenues and expenditures and resilience to the shock.

Empirical Review

Arena, Arnaboldi and Azzone (2020) studied the possibility of formal risk identification practices to improve the stability of utilities in Europe. Based on survey data of more than 200 organizations, their regression analysis demonstrated that utilities that had risk registers and risk committees had a better performance in cost recovery. Despite the fact that the study established that systematic risk identification lowers shocks exposure, it did not account to the financial sustainability except using profitability ratios, and European environment omitted the realities of utilities in emerging economies. The current research reacts by applying the Operating Self-Sufficiency ratio and by locating the analysis within Kenyan water companies where the regulatory and environmental environment is quite dissimilar.

Mikes and Kaplan (2020) investigated the adoption of risk assessment by European corporations as part of strategy. They based their study on case studies of the big multinationals where they found that firms that used scenario analysis and stress testing were less susceptible to shocks. Although informative, the research does not provide a comprehensive context as it only focused on corporations that had massive resources, and these conditions do not correspond to the ones of the public utilities in developing economies. There is also a methodological gap since most of the work was qualitative and did not test the associations statistically. The current study expands the discussion to another institutional setting by considering water and sewerage companies in Kiambu County and using quantitative modeling.

Molefe and Chigudu (2021) evaluated the risk response practice at municipal water utilities in South Africa. They discovered that those utilities which had invested in infrastructural improvements and implemented mitigation strategies became more stable in their provision of services. Nevertheless, the research identified a conceptual gap because of assessing financial sustainability in terms of revenue collection efficiency. There was also a methodological gap because the study was mainly based on qualitative interviews with no triangulation. The current study has an advantage over this as it uses an established financial ratio, the Operating Self-Sufficiency index, and combines both its financial data and survey results.

Beasley, Branson and Hancock (2020) explored the importance of continuous risk monitoring in the case of major American companies, a perspective that is consistent with Otondi and Gitagia (2025) who emphasize that structured financial and operational systems enhance efficiency and institutional performance. They discovered that companies that had well organized monitoring systems identified issues at an earlier stage and did not lose substantial amounts of money. The study, however, has a conceptual gap where it framed monitoring to be primarily a compliance role and did not look at its wider role of maintaining long-term financial stability. There is also a methodological gap since the research has used many self-reported survey data without relating it to audited financial results. The present study reacts by incorporating both financial and primary evidence to determine the impact of monitoring practices on sustainability in Kenyan water utilities.

RESEARCH METHODOLOGY

The research design used in this study was descriptive. This design has been informed by the fact that there is a need to describe in a systematic way enterprise risk management practices such as risk identification, risk assessment, risk response, and risk monitoring and analyze the relationship between them and the financial sustainability of water and sewerage firms in Kiambu County.

The research target population was the eight licensed water and sewerage companies in the Kiambu County under the jurisdiction of the Water Services Regulatory Board. These organizations were the formal water and sanitation service providers in the county, and hence constituted the most suitable foundation on which to investigate the effect of practices of enterprise risk management on financial sustainability.

In this research, the target population was eight water and sewerage licensed companies in Kiambu County. Since this is a small size, a census approach was used to cover all companies in the analysis. This allowed ensuring that none of the relevant organizations were excluded and increased the external validity of the findings to the county setting.

This research employed primary and secondary data collection tools to offer a holistic evaluation of the effect of the practice of enterprise risk management on financial sustainability.

Cross-sectional Ordinary Least Squares (OLS) was used to quantify the impact of enterprise risk management practices on the financial sustainability of water and sewerage companies in the Kiambu County. OLS is popular in finance and management studies to estimate linear relationships since it reduces the sum of squared error terms and it delivers efficient and impartial estimates of coefficients under classical linear regression conditions (Wooldridge, 2020). This approach was also suitable in this study since the variables were measured at firm level and were evaluated among organizational units to establish their contribution to financial outcomes (Gujarati and Porter, 2021).

The empirical model was specified as:

$OSS_i = \beta_0 + \beta_1 RI_i + \beta_2 RA_i + \beta_3 RR_i + \beta_4 RM_i + \varepsilon_i$

Where:

OSS_i = Financial sustainability of company i, measured using the Operating Self-Sufficiency (OSS) ratio

β_0 = Intercept term

β_1, β_2, β_3, β_4 = Regression coefficients measuring the effect of each enterprise risk management practice on financial sustainability

RI_i = Risk identification index

RA_i = Risk assessment index

RR_i = Risk response index

RM_i = Risk monitoring index

ε_i = Error term capturing the effect of unobserved factors

The analysis relied on firm-level observations constructed by aggregating questionnaire responses from managers and senior officers into composite indices for each enterprise risk management dimension. Aggregation using mean scores was appropriate where multiple respondents provided organizational-level data because it improved reliability and generated representative institutional measures for statistical analysis (Bryman, 2016).

RESEARCH FINDINGS AND DISCUSSION

Descriptive Analysis

This section gives the summary data of the main variables of the study: risk identification practices (RIP), risk assessment practices (RAP), risk response practices (RRP), risk monitoring practices (RMP), and financial sustainability (FS). Table 4.7 presents the means, standard deviations and the range (minimum and maximum) of the values of each variable, and gives a picture of how the variables are distributed among the licensed water and sewerage companies operating in Kiambu County. This descriptive analysis establishes a basis for interpreting the inferential statistical results that follow.

Table 1: Descriptive Statistics

Var	M	Md	Max	Min	SD	Skew	Kurt	n
RIP	3.74	3.80	4.80	2.40	0.52	0.18	2.91	34
RAP	3.86	3.92	4.85	2.70	0.47	0.11	2.88	34
RRP	3.68	3.71	4.70	2.35	0.55	0.27	2.96	34
RMP	3.79	3.82	4.88	2.60	0.49	0.09	2.90	34
FS	3.61	3.65	4.75	2.10	0.58	0.22	2.87	34

Source: Research Data (2026)

Table 1 demonstrated that risk identification practices (RIP) recorded a mean of 3.74 and median of 3.80, demonstrating consensus among participants concerning the existence of organized risk identification procedures. The maximum and minimum values of 4.80 and 2.40 suggest moderate variation across utilities, while the standard deviation of 0.52 reflects relatively consistent responses. The slight positive skewness (0.18) and near-normal kurtosis (2.91) indicate a balanced distribution, suggesting that although risk identification is widely practiced, differences remain in its level of institutionalization across utilities.

Risk assessment practices (RAP) recorded the highest mean score (3.86) and median (3.92), indicating strong agreement regarding the prioritization and evaluation of risks. The maximum and minimum values of 4.85 and 2.70 indicate moderate variability, while the relatively low standard deviation (0.47) suggests consistency across utilities. The near-symmetrical skewness (0.11) and mesokurtic distribution (2.88) indicate stable responses, suggesting that risk assessment is relatively well institutionalized across participating organizations.

Risk response practices (RRP) had a mean of 3.68 and median of 3.71, implying moderate agreement regarding the implementation of mitigation strategies. The maximum and minimum values of 4.70 and 2.35 reflect noticeable variation across utilities, while the higher standard deviation (0.55) suggests greater dispersion compared to other variables. The slight positive skewness (0.27) and near-normal kurtosis (2.96) indicate a fairly balanced distribution, suggesting that while risk response practices are present, their implementation varies across institutions.

Risk monitoring practices (RMP) had a mean of 3.79 and median of 3.82, signifying general agreement regarding the regular review of risk management outcomes. The maximum and minimum values of 4.88 and 2.60 suggest moderate variability across utilities, while the standard deviation of 0.49 reflects consistent responses. The near-symmetrical skewness (0.09) and normal kurtosis (2.90) suggest stable responses, indicating that monitoring mechanisms are reasonably well established across organizations.

Financial sustainability (FS) had a mean of 3.61 and median of 3.65, representing moderate agreement regarding the financial viability of utilities. The highest and lowest values of 4.75

and 2.10 suggests the possibility of significant variation in the institutions when compared and the standard deviation of 0.58 shows that the responses have a moderate dispersion. The positive skew (0.22) and almost zero kurtosis (2.87) are good evidence of a balanced distribution. Nevertheless, the average value and the observed spread imply that the issue of financial sustainability problems remains persistent in all utilities, which is supported by previous evidence that there exists an oscillation in Operating Self-Sufficiency (OSS) levels in the county. These trends indicate an investigable issue on whether there is a significant impact on financial sustainability outcome of enterprise risk management practices.

Multicollinearity

Multicollinearity is the presence of a high correlation between independent variables with each other and causes a decrease in the quality of the coefficient estimates and inflates the standard errors. Even though it does not bias coefficients per se, it undermines their reliability and makes the interpretation more difficult (Hair, Page, and Brunsveld, 2020; Kothari and Garg, 2019). There are various methods through which multicollinearity can be evaluated; these include correlation matrices, tolerance values and Variance Inflation Factor. The use of Variance Inflation Factor in this study was due to its clarity and universality in the measurement of the severity of collinearity. The values of Variance Inflation Factor and tolerance greater than 0.1 and less than 10 imply the lack of the detrimental multicollinearity (Gujarati and Porter, 2020).

Table 2: Multicollinearity Test Results

Variable	Tolerance	VIF
RIP	0.682	1.47
RAP	0.715	1.40
RRP	0.654	1.53
RMP	0.701	1.43

Source: Research Data (2026)

Table 3 indicates that all the values of VIF were far less than the value of 10 but tolerance values were more than 0.1. These results mean that the issue of multicollinearity did not occur and that regression estimates could be considered as stable and reliable.

Table 3 Regression Results (Dependent Variable: Financial Sustainability)

Variable	Coefficient	Std. Error	t-Statistic	Sig.
Constant	0.584	0.158	3.696	0.001
RIP	0.301	0.081	3.716	0.001
RAP	0.342	0.087	3.931	0.000
RRP	–0.248	0.076	–3.263	0.003
RMP	0.318	0.084	3.786	0.001

Source: Research Data (2026)

Table 3 suggests that the practices of risk identification (RIP), risk assessment practices (RAP), risk monitoring practices (RMP), and risk response practices (RRP) positively affected the

financial sustainability with statistically significant impact, but not risk response practices (RRP). The constant (0.584) was suggested to be statistically significant meaning the level of financial sustainability in the case where all the predictors were held at the baseline.

The regression equation derived from the coefficients was:
$FS_i = 0.584 + 0.301RIP + 0.342RAP – 0.248RRP + 0.318RMP + \varepsilon$
Where:
FS_i = Financial sustainability of utility i
RIP = Risk identification practices
RAP = Risk assessment practices
RRP = Risk response practices
RMP = Risk monitoring practices
ε = Error term

The equation suggests that advancement in the risk identification, assessment, and monitoring practices would serves a vital role in improving the financial sustainability of utilities whereas the greater focus on risk response practices would lower the financial sustainability. The negative value of the coefficient of RRP implies that the reactive mitigation strategies can either elevate the operational expenditure or be a sign of institutional weaknesses in terms of inefficiencies in service delivery.

CONCLUSIONS AND RECOMMENDATION

Conclusions

Regarding the first research objective, the positive influence of the use of risk identification practices, which was assessed through structured risk registers, periodical review, internal reporting structure, and the systematized recognition of operational and financial risks, can be related to the fact that utilities that had more formalized risk identification systems reported better financial sustainability. This highlights the relevance of mechanisms of early detection in enhancing preparedness and stabilization of financial performance in utilities.

On the second research objective, the significant impact of risk assessment practices of assessing likelihoods, analyzing, consider financial exposure, and prioritization frameworks demonstrates that utilities with a more structured and consistent approach to risk assessment performance had better financial sustainability results. This is an indication of the importance of systematic risk assessment in informing the allocation of resources and institutional financial resilience.

Regarding the third objective of the study, the adverse impact of risk response practices as gauged on mitigation strategies, avoidance actions, transfer mechanism, and corrective measures indicated that the reliance on response-oriented interventions was more associated with relatively poor financial sustainability levels over the duration of the study. This means that reactive strategies can further subject organizations to operational and financial pressures unless it is backed up by preventive planning structures.

Lastly, the significant impact of the risk monitoring practices as measured by the internal control systems, continuous performance check, reporting systems, audit reviews, and oversight processes shows that utilities that had stronger monitoring structures experienced better financial sustainability results. This confirms the instances of sustained discipline and institutionalized feedback mechanisms in maintaining financial discipline and institutional stability.

Policy Implications and Recommendations of the Study

Concerning the first objective, the finding that more intensive risk identification practices improved financial sustainability offers the reason behind advising that utility management should institutionalize systematic regimes of risk identification methods by use of revised risk registers, periodic departmental reporting, and frequent risk review meetings. In compliance reporting systems, regulators, including WASREB and the county governments, ought to enhance the oversight structures by obligating utilities to record the emerging operational and financial risks. To the consumers, the enhanced detection of operational risks will aid continuity of service delivery and minimize negative effects of unexpected institutional challenges. In academia, the results prompt further study of systematic risk identification activities in the context of replicated situations in the utilities of the masses.

In regard to the second goal, the finding that structured risk assessment practices were associated with better financial sustainability results is sufficient to advocate the adoption of standard likelihood and impact assessment instruments in operational decision making by utilities. To make sure that there is uniformity in the assessment of sector utilities, regulators and policymakers are expected to come up with straightforward sector-wide assessment rules. To consumers, better risk evaluation will contribute to reliability of services and stable prices, as it will allow utilities to foresee monetary burdens. Academically, the findings form a foundation of future research to look at the impact of formal risk evaluation models on performance in regulated service industries.

As to the third goal, the conclusion that risk response practices were linked to a worse financial sustainability outcome justifies the recommendation that the utilities should refocus on preventive planning and cost-reactive response plans. To prevent the unnecessary burden of resources, the management must empower contingency planning and incorporate response measures into long-term operational and financial schemes. Technical advice on the cost-effective mitigation measures to promote institutional sustainability should be given by regulators and policymakers. To the consumers, effective preventive planning minimizes the service interruptions and tariff stability. Academically, the discovery underscores the importance of additional studies on the financial implication of the reactive versus preventive strategies of responding to the risk of a financial risk in the case of the public utilities.

Lastly, as per the fourth aim, the finding that risk monitoring practices enhanced financial sustainability forms the basis of the recommendation that utilities should strengthen monitoring systems by engaging in regular performance tracking, internal audit and formal reporting systems. To enhance accountability and governance in the sector, regulators ought to demand

a regular disclosure of risk exposure trends. To the consumers, frequent monitoring ensures dependability in the services provided as it helps anticipate challenges in operations early. The results also provide a platform on which scholars can conduct research on the role of continuous risk monitoring as a catalyst of financial sustainability in the regulated service industries.

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