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EFFECTS OF WATER QUALITY ON OPERATIONS OF HOSPITALITY INDUSTRY IN KAFUE CATCHMENT AREA

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Abstract

Purpose: The study examined the effect of water quality operational costs of tourism establishments along the Kafue River in Zambia. It was conducted from middle Kafue River in Central province up to the confluents in Southern province. The objectives that guided the study were to; Ascertain perceptions of hospitality business owners on influence of water quality on operational costs in the catchment; Ascertain ways in which water was used in hospitality businesses located in the catchment; Determine measures used to sustain water quality cost operations in hospitality businesses in the catchment.

Method: The study used a mixed methods approach and entailed application of a concurrent design. Data analysis entailed use of a quantitative-dominant mixed analysis which was supplemented by the qualitative one. A sample comprised of 60 respondents for the quantitative and 10 for qualitative. Data were collected simultaneously using a questionnaire and interview guide for quantitative and qualitative components respectively. Descriptive statistics were applicable in analyzing quantitative data using frequencies and percentages. Qualitatively, analysis of data was done using an inductive approach.

Result: Business owners were skeptical about the quality of river water sources. The majority experienced positive effects of water quality on their business operations. The owners perceived effects of water quality on operational costs differently, which were both positive and negative. Not all the business owners used river water for drinking and bathing. Many of the business owners were aware and concerned about the quality of water they used in the hospitality establishments. Some owners experienced extra cost due to water quality while others did not. Extra costs were incurred due to water quality as experienced by a few owners, therefore, measures were put in place to operate their businesses. The majority of the owners put up measures to sustain their businesses.

Contribution: This study which explored water quality and its effect on hospitality industry in the river catchment is important in revealing experiences which relate to operational costs. As a result, business owners can use the varied experiences as a basis for making informed decisions in improving water quality for the benefit of the industry. Ensuring good quality of water will become a shared responsibility not only for hospitality business owners, but also for other users in the catchment. Informing policy makers on how to come up with sustainable measures on the water quality supplied by the River. The study will also contribute to the existing body of knowledge on how to come up with sustainable measures on supplying quality water in hospitality industry.

Keywords: Water, Quality, Operational, Hospitality, Industry, Effect.

Introduction

Hospitality industry uses water to provide different services. Water is responsible for creating and maintaining an impressive conducive environment. Therefore, quality of water is crucial to ensuring operation in the industry. Quality of water has a bearing on operational costs of the industry. When the water quality is good, its maintenance is low. It is the source of

water which determines the quality of water. Some water sources offer high standards while others do not. Attributed to these varying water quality standards is the environment. While some of the environments produce clean water, others do not. This study, therefore explored the effect of water quality on operations of hospitality industry in Kafue catchment area

The Kafue River, with its ecosystems rich in biodiversity provides an economically and ecologically conducive environment for tourism development [United Nations Educational Scientific and Cultural Organisation (UNESCO), 2006]. However, industrial and mining activities along Kafue River and its tributaries make it prone to different kinds of contaminants. Kasonde (2009) reports that the Kafue River is polluted with major sources of contamination coming from mining and industrial effluents, as well as sewage, with impacts more severe on local tributaries. Water quality is compromised and it hinges on operational costs of the hospitality industry. Treating water for contaminants or using other means, can be an extra cost for running such. This study examined influence of water quality from the Kafue River on hospitality operational costs.

The objectives of the study were to ascertain perceptions of hospitality business owners on influence of water quality on operational costs in the catchment; ascertain ways in which water was used in hospitality businesses located in the catchment; and to determine measures used to sustain water quality cost operations in hospitality businesses in the catchment.

The findings of the study will help business owners come up with varied experiences on how to make informed decisions in improving water quality for the benefit of the industry. Ensuring good quality of water will become a shared responsibility not only for hospitality business owners, but also for other users in the catchment. Informing policy makers on how to come up with sustainable measures on water quality supplied by the River. The study will also contribute to the existing body of knowledge on how to come up with sustainable measures on supplying quality water in hospitality industry.

The study was guided by Resource-Based View (RBV) theory which suggests that a firm's competitive advantage comes from its internal resources and capabilities. In the context of hospitality industry, water is a critical resource and effective water management can lead to significant operational efficiencies and cost savings. The theory was applicable to a study since its focus was on how hospitality industry can leverage water as a strategy resource to achieve competitive advantage since water is considered as an essential factor of production and can be seen as a valuable and non-substitutable resource. This was supported by Barney (2001), who pointed out that the theory highlights the importance of optimizing internal resources and capabilities, including water management, to achieve sustainable competitive advantages.

A number of studies have been conducted in relation to the use of water in hospitality industry. The following is the literature based on the objectives of the study:

Uses of Water in the Hospitality Industry.

Antonova, Ruiz-Rosa, and Mendoza-Jiménez (2021) reviewed literature on water resources in the hotel industry, identifying the key areas and research gaps in this field, Water consumption, water management, impacts of water use and good practices, with different research methods and topics within each one, were reviewed. Benefits of the review hinge on an elaboration of the comprehensive requirement of water in the hospitality industry and need for ensuring its management through appropriate utilization. It provides a basis for contextualizing uses of water in designated areas to obtain specific perceptions on uses of water. They conducted a review of the food industry water footprint and water supply chain management, explored water demand management, distribution and supply. Water supply included security, buffering, technologies, and water recycling techniques. It was revealed that water is widely used in the food industries as an important raw material and as a utility, for example, steam, cooling water, and mass transfer agent. Strict requirements for product quality and the associated hygiene issues in manufacturing contribute to large amounts of high-quality water being consumed by the food processing industry.

The study describes various ways in which water is used and treated. Furthermore, the study contributed to the understanding of the need quality water to enhance operations in the hospitality industry. Therefore, there is need to examine specific uses of water in some hospitality industry in the River catchment.

Alonso and Ogle (2010) explored environmental sustainability in relation to water usage of small and medium enterprises in the hospitality and tourism industries. They examined this dimension from the perspective of the operators. Also salient in their study were factors impinging on implementation of environmental initiatives. Business demands or added costs also posed challenges in materializing the operator's environment in practices that were sustainable, particularly concerning water consumption in service areas, such as in toilets, which represents a large proportion of total water usage. Benefits from the study, is the insight on implication of environmental practices on operational costs of the hospitality industry. There was need to specify the aspect of water quality which affected the industry, a component which the current study dwelt on.

Wasike (2010) noted water as a crucial resource for maintaining hygiene and sanitation in any hospitality industry. While contaminated water is a major cause of infectious diseases, it also has an impact on health through the spread of organic and inorganic chemicals that are harmful to health.

Hospitality industry is required to maintain high standards of hygiene, and safe water is the core of this aspect. The provision of safe drinking water and the effective removal of bodily waste by suppliers and food handlers are vital for human health and well-being. The United Nations covenant on Economic, Cultural and Social Rights (2002) observes thus: “Water is a limited natural and a public good, fundamental to life, and healthy; the human Right to water is indispensable for leading a healthy life in human Dignity. It is a prerequisite to the realization of other human rights”. Despite having compromised water quality, the industry must meet international standards. The hygiene and sanitation theory lays emphasis on cleanliness and the absence of germs and the facilities which enable hygiene to be achieved. Water quality is crucial in ensuring good standards of hygiene in the hospitality industry. Based on this understanding, there is need to explore the effects of water quality on operational costs for ensuring such levels of hygienic standards in the industry are achieved.

Shanklin (1993) reports on critical environmental threats that affect the hospitality and tourism industry, and those highlighted include solid waste, water quality and availability, energy, as well as air pollution.

Tim (2002:149) ascertains the need to determine reliability and acceptability of supplies to produce quality and safe products. Scarcity of safe water implies the presence of contaminated water. Some unscrupulous suppliers will definitely use any water available to them to wash their farm products before supplying them. Some contaminated water used could be so toxic that internal cleanliness may not wholly remove the germs. Based on this assumption, Tim (2002) proposes to establish a clear process of handling and cleaning suppliers in all hospitality and tourism facilitates. While this article provides insights into the need for provision of good water quality, it does not explain implications of effects of water quality on operational costs of hospitality industry.

Environmental Effects on Operational Costs of Hospitality Establishments

Wang, Chen and Lu (2020) analyze environmental effects on the hospitality industry. The study focused on air quality as one of the environmental aspects which affects the status of the hospitality industry. There is need to also consider other environmental areas which affect the industry. Water quality is another critical component which influences operations of the industry. Methodologically, the study was conducted in China which is a different location from the current one, hence the need to contextualize it. A longitudinal study was used, but a cross sectional one suited the current study due to the need to obtain data over a short space of time.

Measures for Sustaining Water Quality in Hospitality Industry

Rani and Gupta (2021) discussed the adoption of water minimization techniques which can reduce the fresh water demand of water-using processes considerably and, consequently, reduce the amount of effluent generated. They envisage that the costs incurred in the acquisition of fresh water and the costs involved in the treatment of effluent streams are ultimately reduced. The study focuses on the water saving systems of hotels of Rajasthan that implement different useful techniques to conserve water. The findings reveal that the majority of the five-star and four-star hotels implemented water saving measures in their properties while majority of three-star hotels have no such policy. Such revelations are indicative of the fact that not all the hospitality industries have sustaining measures in place for mitigating water crises. This revelation contributes to the need for exploring sustainability measures applicable in the hospitality industry in the Kafue River Catchment.

It is proposed that hotels can innovate and enhance their water management approaches under these 4Rs: Innovative Reducing, Innovative Reusing, Innovative Reaching and Innovative Recycling. The framework offers examples and strategies about how hotels of different sizes, with differing financial, technical, knowledge and managerial capacities could address the challenge of implementing water management and obtain commercial benefit.

Research Method

In this study, pragmatism as a research philosophy was used to bridge the gap between positivism and interpretivism (Rashid, 2023). Pragmatism recognizes that different research methods and approaches can be useful in different contexts. This study was mixed with a qualitative aspect to understand the interpretations of individuals about the social phenomena they interact with. Qualitatively, according to Boswell and Bubchuk (2022) power dynamics were assumed through the reflexive process and positions assigned to the researchers and participants. It was done under the assumption that the participant is the expert and the researchers subordinate themselves. Reflexively, the researchers had practical work experience in the hospitality and tourism. This positionality and reflexivity informed and motivated the study.

Research Design

This mixed methods study examined influence of water quality on operational cost of hospitality business establishments in the catchment. It further explored detailed views of business owners. Design of this study entailed mixing quantitative and qualitative traditional strands. A concurrent design was used to complement data from one strand to enhance, expand, illustrate, or clarify findings derived from the other. Mixing of these traditions of inquiry enabled the study to attain a comprehensive understanding of the phenomenon studied (Doyle, 2015). Integration was done at interpretation and discussion levels.

Quantitatively, the question addressed was: Did water quality influence operational costs of hospitality establishments? Qualitatively, the question addressed was: What were the experiences of water quality on operational costs in hospitality establishments? The site of the study was the Kafue River catchment. Its focus was the hospitality businesses.

Sampling

Concurrent sampling involved simultaneous use of probability and purposive sampling techniques. Teddlie and Yu (2007) explain that both sampling techniques are used at the same time. Two strands were used which included quantitative and qualitative and focused on one level of analysis (Teddlie and Yu, 2007).

Quantitatively, a sample comprising 60 respondents was selected for obtaining data on various ways in which water was used in the hospitality establishments along the catchment. Qualitatively, the sample of 10 participants was drawn from the previously selected one. This second sample was used for collecting data on various perspectives on influence of water quality on operational cost in hospitality establishments.

Qualitatively, phenomenological sampling was applicable because of need for identified participants to articulate their lived experiences studied. Purposive sampling was philosophically aligned with the belief that people's expertise with ordinary facets of their lives is the reason for their selection as participants (Boswell and Bubchuk, 2022). According to Hassan (2023) a homogenous sampling is applicable because of the need for participants with similar experiences. Therefore, a sample size of 10 was selected for obtaining varied views on influence of water quality on operational cost of establishments in hospitality and tourism.

Data Collection

Subjectively, according to Rehman and Alharthi (2016) data were collected from socially constructed multiple realities to allow for interaction among the researchers and participants to ascribe meaning and names to different social phenomena. Therefore data collected emanated from participants' experiences as professional or laymen accordingly. Interpretative methodology allowed the study to gain understanding of the social phenomena through the eyes of the participants rather than the researcher (Cohen, et. al., 2007:21).

Data were collected simultaneously using a questionnaire and interview guide for quantitative and qualitative components, respectively. The study was dominated by quantitative aspect which was complemented by the qualitative one. Questionnaires administered contained closed and open ended items. Ten in-depth interviews were conducted with owners of hospitality establishments.

Data Analysis

A quantitative-dominant mixed analysis was adopted which took a post positivist stance while simultaneously including a qualitative data and analysis to increase understanding of the underlying phenomenon (Johnson, Onwuegbuzie and Turner, 2007). Creswel (2006) assumed that the embedded data will play a secondary role and be supplemental to the primary dataset.

Qualitatively, analysis of data was done using an inductive approach to enable the researchers discover patterns in the data which are collapsed under broad themes to understand a phenomenon and generate theory (Rehman and Alharthi, 2016). Quantitative and qualitative findings were presented together on a theme-by-theme basis (Doyle and Brady, 2016).

Result and Discussion

The results reviewed varied opinions about hospitality and tourism business in the catchment. The catchment provides an enabling environment for business in hospitality and tourism. Water quality affected hospitality establishments differently.

Business owners perceived the catchment area differently. While some of the owners found the catchment a good place for their businesses, others did not. The majority of the owners perceived the catchment as an enabling environment for business in hospitality and tourism. Holden (2016) explains quality of fresh water as a significant factor in the choice of tourist destination. However, less than half of the business owners found the catchment as an unconducive environment for their businesses. Perceptions on the business environment in the catchment area are positive and negative. The positive perceptions on the catchment indicate that there is potential for business in hospitality and tourism to flourish. On the other hand, the negative perceptions on the business in hospitality and tourism pose threats to the development in the catchment. Figure 1 shows the business outlook of the catchment.

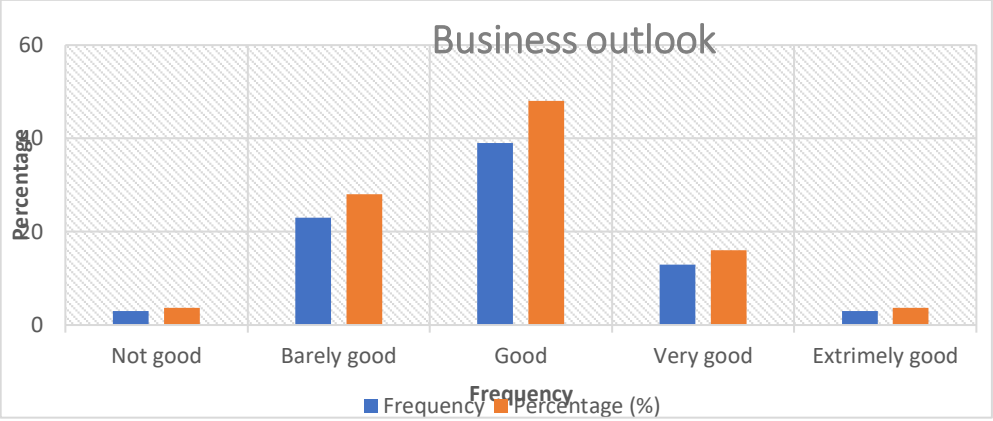

Figure 1: Business outlook
Source: Field (2025)

Findings revealed varied opinions about the position of hospitality and tourism business in the catchment. The catchment provides an enabling environment for business in hospitality and tourism. It is evidenced by 68% (n – 55). However, 32% (n – 26) showed that the catchment was not very conducive for business. Statistics have shown that the majority of the respondents were positive in their view to do business in the catchment. The business owners had different views on their hospitality and tourism businesses conducted in the river catchment. While the majority of the business owners were optimistic in their outlook of their businesses, the minority were not.

The implication of this finding is that the river catchment provided a conducive environment for conducting hospitality and tourism businesses in the river catchment. This finding is consistent with the previous one by Tena, Mwaanga and Nguvulu (2019) who reported the benefits accrued from using river water for industry, and socio-economic purposes. The catchment was a good area for hospitality business enterprises.

The Kafue River was the major source of water for all the hospitality business establishments in the catchment. The majority of the business owners used water from the Kafue River. The Kafue River is critical to the development of hospitality and tourism in the catchment area. Therefore, there is need to ensure that the quality of the water in the river is of the required standard for use in the industry. Figure 2 shows water source in the catchment.

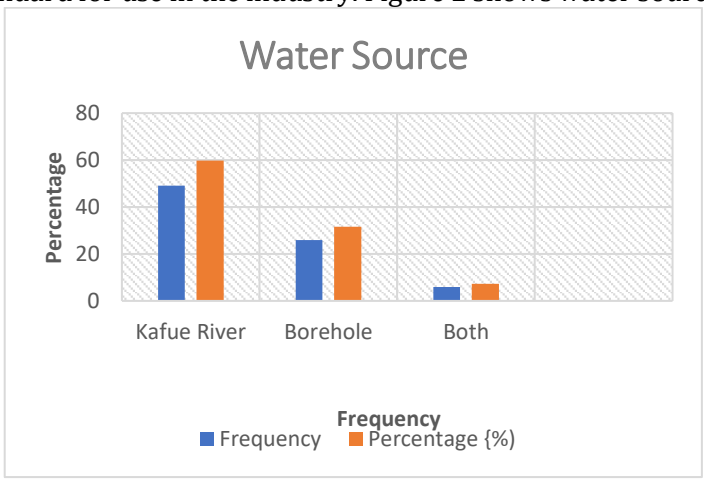

Figure 2: Water Source
Source: Field (2025)

Various sources of water were used in the hospitality and tourism establishments. The water sources used included the river, borehole and a combination for the two. Of these

sources, river water was used more than the others. The majority of the people, 60% (n- 49), in the hospitality and tourism establishments used water from the Kafue River. Nevertheless, 32% (n- 26) of the people in the business used water from the borehole. The remaining number of people who were in their minority, 7% (n – 6), used both the river and borehole water in their businesses. The findings revealed that more than half of the business owners in the catchment used water from the Kafue River. Less than half used borehole water whereas less than a quarter used both sources of water.

This finding implies that some of the business owners resorted to using other sources of water other than the one from the river for some reason. Tirado, Nilsson, Deya-Tortella and Garcia (2019) specified the demand for water in tourism that catered for drinking and hygiene needs. Less than half used borehole water whereas less than a quarter used both sources of water. This finding implies that some of the business owners resorted to using other sources of water other than the river.

The river is critical to the development of hospitality and tourism in the catchment area. Therefore, the quality of the river water should be kept up to the required standard for use in the industry. UNWWD (2003, p. 19) stresses that "the projected growth in industrial demand for water can only be met by integrating improved supply-side considerations with enhanced demand-side management at government and enterprise levels.

Some business owners used water from the Kafue River while others did not. The majority of the business owners used water from the Kafue River for bathing in their hospitality and tourism establishment. Less than half of the owners used water from the borehole for bathing. The minority of the business owners used both Kafue River and borehole water for bathing. Different sources of water where used for bathing. Despite the Kafue River being the natural source of water, not all the business owners used it for bathing. Figure 3 shows the bathing water used in the catchment.

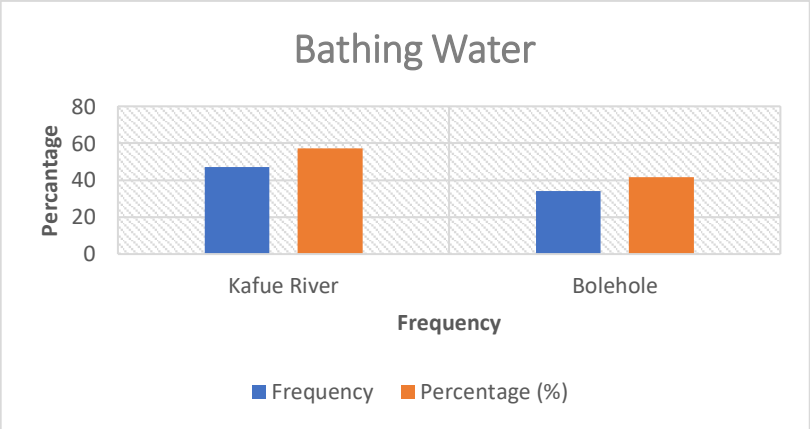

Figure 3: Bathing Water
Source: Field (2025)

Most of the clients, 57% (n- 47), in the hospitality and tourism establishments used water from the Kafue River for bathing. The remaining clients, 42% (n-34) used borehole water for bathing. Therefore, the findings revealed that majority of the clients in the hospitality and tourism establishments in the catchment used Kafue River water for bathing. Business owners used different water sources for bathing purposes. Barely more than half of the business owners used river water close to half of them used borehole water for bathing purposes. This finding indicates that business owners had mixed feelings about river water sources for bathing.

The majority of the owners did not receive complaints from their clients about water from the River. However, only a few did. This implies that the majority of the business owners found water from the river conducive for use in their establishments. Figure 4 shows water complaints in the catchment. Figure 4 shows water complaints in the catchment.

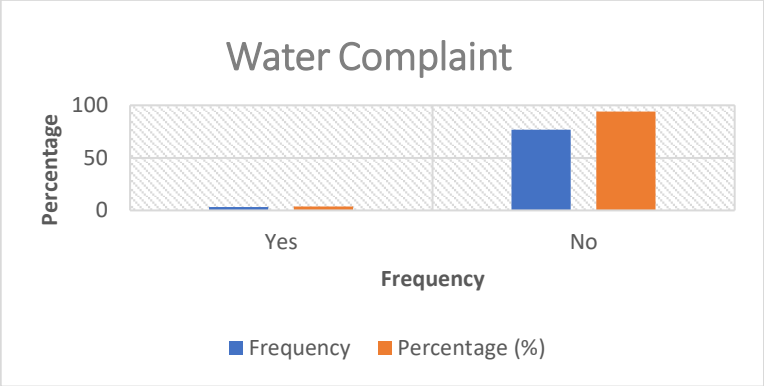

Figure 4: Water Complaint
Source: Field (2025)

The majority of the owners of the establishments, 94% (n-77) reported that their clients did not have complaints about water. However, owners of the establishments, 4 % (n-3) reported that their clients had complaints about the water. The findings revealed that majority of the clients had no complaints concerning the use of water in the Kafue Catchment.

Many of the business owners were aware and concerned about the quality of water they used in the hospitality establishments. Only a few owners did not experience any effect on the quality of water in their operation. Availability of clean water is a major concern in many parts of the world (Eurostat, 2009; United Nation World Water Development [UNWWD], 2006), posing a serious threat to industries such as tourism and all their related key players. This revelation is indicative of issues regarding the quality of water used. Similarly, Cole (2014) used a political ecology approach to water problems and uncovered a number of linked environmental and political factors including: land use conflicts, awareness issues, social power and cultural issues, politics and regulatory issues as well as the condition of local water supply itself. Figure 5 shows the water quality in the catchment.

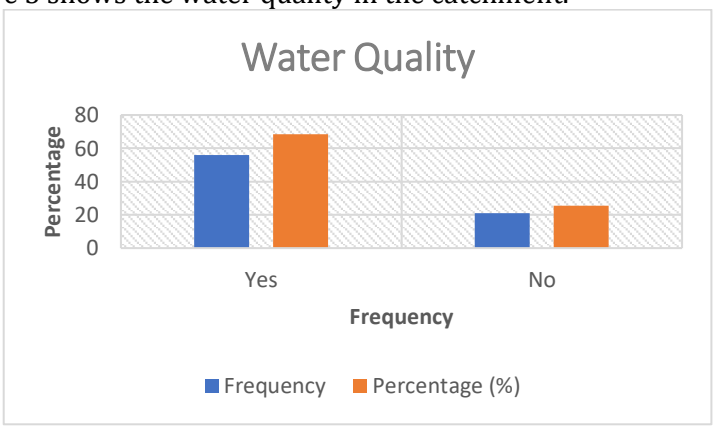

Figure 5: Water Quality
Source: Field (2025)

The majority of the business owners, 68% (n-56) were aware of the quality of water used in their establishment. A few of the owners, 26% (n-21) were not aware of the quality of water. Nearly 60% of business owners were aware of the quality of water. More than half of the business owners were concerned about the water quality and just a quarter were not. Business owners were concerned about the quality of water used in hospitality establishments. Similarly, Giulietti, Romagosa, Esteve and Schröder (2018) note that tourists were quite sensitive to water quality and the reliability of the supply, and demand standards that are higher than those normally expected by residents.

Some owners experienced extra cost due to water quality while others did not. The majority did not incur the extra cost. The majority indicated that the extra cost did not affect

their budgets, however, the minority did experience a negative effect in their budget due to water quality.

Extra costs were incurred due to water quality as experienced by a few owners and had measures in place for operating their businesses. Ayuso (2007) noted high costs associated with adopting any form of environmental management systems and recommends that hotels be given support to overcome the practical difficulties of adopting such systems. Figure 6 shows the effect of water quality and extra cost.

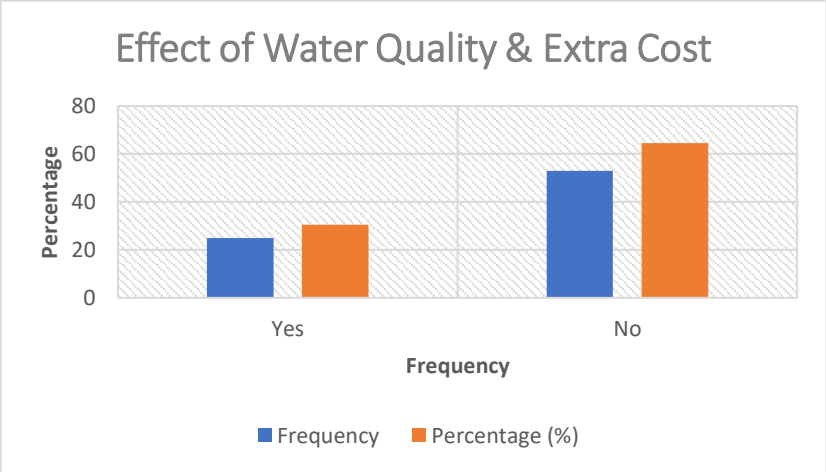

Figure 6: Effect of Water Quality and extra Cost
Source: Field (2025)

Differing views were obtained on effect of water quality as regards attracting extra costs on the operational costs. The majority of business owners, 65% (n-53) indicated that the water quality did not attract extra cost on operational costs. The remaining business owners, 31% (n-25) stated that the water quality did attract extra cost on the operational cost.
In a similar study, Tirado, Nilsson, Deya-Tortella and Garcia (2019) identified some environmental concerns which had a bearing on operational costs in tourism industry.

Different views were obtained on effect of water quality on operations of business establishments. More than three quarters of the business owners, 68% (n-56) indicated that the quality of water had no effect on the operation of their businesses. Twenty nine percent (n-24) revealed that a positive effect of water quality on the operations. These findings show that the majority of the owners experienced positive effects of water quality on their business operations.

Sustainability measures for business operations were applicable to many of the establishments. The majority of the owners put up measures to sustain their businesses. It should be noted that water availability can no longer be guaranteed due to lack of comprehensive action to address pollution of surface ground water sources and the water wasting habits of the people (Choongo, 2011). Sustainability measures need to be enhanced in river catchment to mitigate factors which affect water quality, negatively. Kasimu, Gursoy, Okumus and Wong, (2014) implore that growing tourist flows require a proactive approach to water issues through water management and call for mitigating measures by key tourism players are needed now to prevent future problems. Figure 7 shows the measures that was put in place in the catchment.

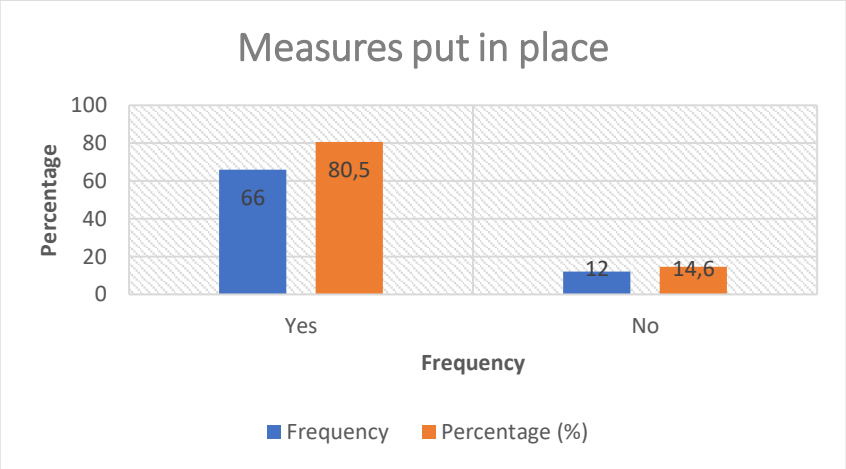

Figure 7: Measures put in place
Source. Field (2025)

Some of the business owners put measures in place to mitigate the effect of the quality of water on their establishments while others did not. Many of the owners, 86% (n-66) indicated that they put measures in place. On the contrary, a few of the owners, 15% (n-12) showed that they had no measures in place.

The findings show that most of the owners had measures in place for operating their establishment in terms of water quality. UNWWD (2003, p. 19) explain that "Demand side initiatives play an important role in increasing the water efficiency of industrial processes, and lowering the pollution load of effluents discharged by industry". On the contrary, a few of the owners, 15% (n-12) showed that they had no measures in place.

Qualitatively: Findings showed that hospitality providers were aware of the status of Kafue river water that it is polluted. One participant from Chirundu said that "they don't use water from Kafue river because guests used to complain of stained linen though it is expensive but better than having a guest who is complaining of using stained linen. Another remarked that: "it is better for the hotel to use mineral water for guest to drink than giving them Kafue water". Also another participant attested thus: "instead of using white linen which is recommendable for hospitality industry the hotel has resorted to use of dark colour linen". The other one said "they only use Kafue water for gardening and for the hotel use, like in the kitchen, restaurant and housekeeping. The hotel uses purified water for drinking which attracts a cost for hotel operations." These views were also echoed by participants in lodges located in the Kafue National Parks; "the cost of water treatment is compensated through factored figures in food and beverage prices". Another one said that accommodation rates are unreasonably high to compensate the cost, with other participant highlighting that local people are unable to consume the tourism products because of higher prices which are influenced by water.

Outcome, Kafue water did not just stain the linen for the hotels but it affected the operational costs of most of the hotels because of extra cost which was used to sustain the businesses such as buying of mineral water for guests, buying of chemicals to purify water and compromising the standard by using dark coloured hotel linen instead of white linen.

Conclusion

The Kafue River Catchment provides an enabling environment for businesses in hospitality. While some of the business owners were skeptical about the quality of river water, others were not. Some of the owners resorted to using alternative means for water so that they could get the required quality. The river provides enough water for use among its recipients. It is for this reason that good water quality should be available for everyone to use if business in hospitality and tourism is to be encouraged and improved in the catchment. It is evident from the findings that using river water helps to cut down operational costs of running hospitality

businesses in the catchment. For this reason, all key stakeholders concerned with use and management of this resource need to keep the quality of the river water at acceptable and sustainable standards.

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