

**DETERMINANTS OF PROJECT ECONOMIC SUSTAINABILITY:
EMPIRICAL EVIDENCE FROM COMMUNITY BASED WATER SUPPLY
ORGANISATIONS IN KARAGWE DISTRICT COUNCIL**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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2024

CERTIFICATION

The undersigned certify that, I have read and hereby recommends for the acceptance of the dissertation titled; **“Determinants of Project Economic Sustainability: Empirical Evidence from Community Based Water Supply Organisations in Karagwe District Council”** in partial fulfilment of the requirements for the degree of Master of Project Management (MPM).

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DECLARATION

I, **Kakuru, Tama Magai**, do hereby declare that, the work presented in this dissertation is original. It has never been presented to any other university or institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Masters of Project Management (MPM).

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Date

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DEDICATION

I dedicate this project to God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program. I also dedicate this work to my parents and my loving wife, sister, colleagues and brothers who encouraged me all the way to this end. May the blessing of God be with them now and always, Amen.

ABSTRACT

The study examined the determinants of economic sustainability of projects with reference to community based water supply (CBWSOs) organisations in Karagwe district council. Specifically it examined the extent to which payment of services rendered influence the economic sustainability of projects; assessed the influence of cost recovery mechanisms on economic sustainability of projects and determined how reliance on external funding influences economic sustainability of projects (ESP) managed by CBWSOs. Resource based view theory with explanatory research design along with a mixed approach that utilized the questionnaire and interview guide, 150 respondents used to collect data. Data collected were analysed through content and descriptive analysis. Multiple regression analysis was employed to measure the effects of independent variables on dependent variable. The results revealed that poor household economy affected the payment of services rendered from the fact that when the household economy becomes poor, necessitates poor payment of services. Findings show that cost recovery mechanisms enhanced the economic sustainability of projects managed by CBWSOs by improving cooperation and management of finance with external agencies, community participation in operation and maintenance costs while seeking government subsidy to recover costs that cannot be managed by users. Reliance on external funding influenced ESP. Conclusively, while donor funding maintained economic sustainability, the reliance on government subsidy resulted into non-economic sustainability of water schemes. It is recommended that non-economic sustainability of water schemes is unwelcome thus improving the economy of households is important.

Keywords: *Economic Sustainability, Project, Rural Water Supply and Sanitation Agency, Water.*

TABLE OF CONTENTS

CERTIFICATION	ii
COPYRIGHT	iii
DECLARATION.....	iv
ACKNOWLEDGEMENTS	v
DEDICATION.....	vi
ABSTRACT	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	xii
LIST OF FIGURE	xiii
LIST OF ABBREVIATIONS AND ACRONYMS	xiv
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background to the Study.....	1
1.2 Statement of the Research Problem	3
1.3 Objective of the Study	4
1.3.1 General Objective	4
1.3.2 Specific Objectives	4
1.4 Relevance of the Research	4
1.5 Organisation of the Study	5
CHAPTER TWO	6
LITERATURE REVIEW	6
2.1 Conceptual Definitions of Key Terms	6
2.2 Theoretical Literature Review	7

2.2.1	Resource Based View Theory	8
2.3	Empirical Review	10
2.3.1	Payment Services and Economic Sustainability of Projects	10
2.3.2	Cost Recovery Mechanism and Economic Sustainability of Projects	12
2.3.3	Reliance on External Funding and Economic Sustainability of Projects.....	13
2.4	Research Gap	14
2.5	Conceptual Framework	15
CHAPTER THREE		17
RESEARCH METHODOLOGY		17
3.1	Research Philosophy	17
3.2	Research Design.....	17
3.3	Research Approach	17
3.4	Survey Population	18
3.5	Area of Research.....	18
3.6	Sampling Design and Procedures	18
3.6.1	Sampling Design	18
3.6.2	Sample Size.....	19
3.7	Methods of Data Collection	20
3.8	Variables and Measurements	20
3.9	Validity and Reliability Issues	20
3.9.1	Validity	20
3.9.2	Reliability.....	21
3.10	Data Processing and Analysis	21
3.11	Ethical Considerations	22

CHAPTER FOUR.....	23
FINDINGS OF THE STUDY	23
4.1 Response Rate.....	23
4.2 Demographic Characteristics	23
4.3 The Extent to Which Payment of Services Influence Economic Sustainability.....	24
4.4 The influence of Cost Recovery Mechanism on Economic Sustainability of Projects	25
4.5 Influence of Reliance on External Funding on Economic Sustainability of Projects	26
4.6 Regression Analysis.....	27
4.6.1 Assumptions of Multiple Regression.....	27
4.6.2 Hypothesis Testing.....	30
CHAPTER FIVE	33
DISCUSSION OF FINDINGS	33
5.1 Chapter Overview	33
5.2 Payment of Services rendered to Water Users.....	33
5.3 Availability of Cost Recovery Mechanisms	37
5.4 Reliance on External Funding.....	41
CHAPTER SIX	44
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	44
6.1 Chapter Overview	44
6.2 Summary of Major Findings	44
6.3 Conclusion	45

6.4	Recommendations.....	47
6.5	Limitations and Areas for Future Research	48
6.5.1	Limitations	48
6.5.2	Areas for Future Research.....	48
	REFERENCES.....	49
	APPENDICES	53

LIST OF TABLES

Table 3.1: Variable Measurement.....	20
Table 4.1: Demographic Characteristics.....	23
Table 4.2: Payment of Services.....	24
Table 4.3: Influence of Cost Recovery Mechanism.....	25
Table 4.4: Influence of Reliance on External Funding	26
Table 4.5: Linearity Assumption	28
Table 4.6: Skewness and Kurtosis Coefficients.....	29
Table 4.7: Durbin-Watson Test.....	29
Table 4.8: Correlation Matrix of Variables.....	29
Table 4.9: Multicollinearity Assumption	30
Table 4.10: Regression Model Summary.....	30
Table 4.11: ANOVA Results	31
Table 4.12: Regressions Coefficients.....	32

LIST OF FIGURE

Figure 2.1: Conceptual Framework 16

LIST OF ABBREVIATIONS AND ACRONYMS

CBWSOs	Community Based Water Supply Organisations
COWSOs	Community Owned Water Supply Organisations
FGDs	Focus Group Discussions
HA	Alternative Hypothesis
HO	Null Hypothesis
SPSS	Statistical Package for Social Sciences

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Sustainability of development projects occupies a significant proportion of contemporary discourse on development (Eliamring & Kazumba, 2017). Economic sustainability of development projects such as those owned by community is considered essential for the continued delivery of services to beneficiary communities beyond external financing (Hassan et al., 2020). The International Fund for Agricultural Development Strategic Framework (IFAD, 2007) defines project sustainability as the ability to ensure that the institutions supported through projects and the benefits realized are maintained and continue after the end of the project's external funding. However, various factors compel community-based water supply organisation (CBWSOs) projects to fail (Hassan et al., 2020). These factors include poor leadership, limited management capacity (Rutatora et al., 2008), excessive external support and lack of follow up of micro projects by the community (Ngailo, 2010).

Spaling, et al., (2014) assert that limited economic sustainability of community-managed projects has been attributed to community management deficiencies such as weak cost-recovery mechanisms, inadequately trained project managers and technicians at grassroots level and weak local institutions. Yet, Ibrahim (2017) opined that the failure by individual community members to contribute towards maintenance fees leading to disillusionment among project committee members and often affects community cohesion that is critical for project sustainability.

Kanda, et al., (2018) asserted that the challenges that encounter CBWSOs towards economic sustainability include; high operational and maintenance cost, high non-revenue water, low revenue collections, low metering of connections, governance challenges and low quality of services. However, there are limited studies regarding the factors determining economic sustainability of rural water projects in Karagwe. Nkambule and Peter (2012) assert that water supply systems serving rural communities including Karagwe district are mostly not operational due to breakdown or because they are eventually abandoned. Yet, rural water supply services in Karagwe district are still inadequate.

Similarly, as per Eliamringi & Kazumba (2017), despite the substantial resources invested to provide safe water, there are significant numbers of water points that are non-functional. This raises questions as to why this is happening. Similarly, understanding the most important factors that determine the economic sustainability of rural water projects in this study helps the government to set strategies for water management projects (World Bank, 2017). Studies in other countries indicate that, inadequate budgets, poor management of projects and lack of ownership of projects by community members are among the factors affecting economic sustainability of rural water projects (Hassan, et al., 2020 & Ibrahim, 2017).

However, since acceptance of water projects differ from one community to another and from one location to another; this study proposes that payment of services rendered, cost recovery mechanism and reliance on external funding determine the economic sustainability of rural water projects in the study area (Salom and Khumalo, 2022). In determining whether these factors influence economic

sustainability of water projects, a resource based view (RBV) theory was utilized. The RBV is considered to be the best theory when it comes to utilization of resources. It is a superior explanatory basic model in explaining how resources are managed in different places including rural areas like Karagwe district (Salom and Khumalo, 2022). It is from that background that this study aimed at examining the determinants of project economic sustainability with reference to CBWSOs in Karagwe district council.

1.2 Statement of the Research Problem

Most of developing countries (Tanzania in particular) initiated changes on water related supplies management that emanated from the adoption of a community management model (Eliamring and Kazumba, 2017). Moreover, there have been little empowerment of community based owned water supply organisations (CBWSOs) to manage water supply projects economically and sustainably (Salom and Khumalo, 2022). The adoption of such a model in Tanzania was channeled and managed through RUWASA where many districts are concerned (Kirenga et al., 2018). Moreover, CBWSOs fall into management difficulties as the community is challenged by the inability to pay the services in order to recover the costs of investment and operations without external support (Hassan et al, 2020).

Therefore, a large number of the water development projects tend to experience difficulties with economic sustainability and it is estimated that over 40% of all community-managed projects in Africa (Tanzania in particular) are not functional or function for a short while (Hassan et al., 2020). The reasons have been attributed by the inability to pay for the services rendered, lack of external assistance and

economic difficulties encountering many households (Salom and Khumalo, 2022). Therefore, it is from this backdrop that this study aimed at examining the determinants of project economic sustainability managed by RUWASA with reference to CBWSOs in Karagwe district council.

1.3 Objective of the Study

1.3.1 General Objective

To examine the determinants of economic sustainability of projects with reference to community based water supply organisations in Karagwe district council.

1.3.2 Specific Objectives

- i) To examine the extent to which payment of services rendered influence the economic sustainability of projects managed by CBWSOs in Karagwe district council
- ii) To assess the influence of cost recovery mechanisms on economic sustainability of projects managed by CBWSOs in Karagwe district council
- iii) To determine how reliance on external funding influences economic sustainability of projects managed by CBWSOs in Karagwe district council

1.4 Relevance of the Research

This study is relevant to CBWSOs focusing on discovering ways towards economic sustainability of projects managed by RUWASA. It would theoretically be a source of knowledge to practitioners and researchers in project management towards achieving quality performance of projects managed by RUWASA. The recommendations would lead practically to possible solutions towards quality

management of projects. Moreover, the study is a partial fulfillment of masters' degree in Project Management from the Open University of Tanzania.

1.5 Organisation of the Study

The study is organised into five chapters. The first chapter presents the background of the study. The second chapter presents the literature review regarding scholars' views, the third chapter presents the research methodology; chapter four presents the results and discussion of findings and finally chapter five presents the conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Definitions of Key Terms

2.1.1 Economic Sustainability

Economic sustainability means that people have the resources essential to a healthy life (Kanda et al., 2018). As per Salom and Khumalo (2022) economic sustainability refers to practices that support long-term economic growth without negatively impacting social, environmental and cultural aspects of the community. Therefore, the definition by Salom and Khumalo (2022) is adopted and suits the study from its long term reflection.

2.1.2 Project

A project is any undertaking, carried out individually or collaboratively and possibly involving research or design, that is carefully planned (usually by a project team) to achieve a particular aim (Kanda et al., 2018). As per Ibrahim (2017) a project is a series of tasks that need to be completed to reach a specific outcome or a set of inputs and outputs required to achieve a particular goal where projects can range from simple to complex and can be managed by one person or a hundred. Moreover, the definition by Kanda et al., (2018) is adopted and fits the study as it provides the inner inputs and outputs of the project.

2.1.3 Rural Water Supply and Sanitation Agency

The Water Supply and Sanitation (RUWASA) Act No.5 of 2019, among other things, established the Rural Water Supply and Sanitation Agency (RUWASA) which took over mandates that were previously vested to PO-RALG, Regional

Secretariats (RSs) and Local Government Authorities (LGAs) (URT, 2021). The transferred mandates involve ensuring the provision of water services to rural communities, small towns and district headquarters. The Water Supply and Sanitation Act No.5 of 2019 has also transferred accountability of officers responsible for water service provisions from PO-RALG, RSs and LGAs to the Ministry of Water. The newly established Agency (RUWASA) has offices at Headquarters, Regional and District levels as opposed to previous structure which compose of office at LGA's level and RSs. As stipulated under the Water Supply and Sanitation Act, No. 5 of 2019, the RUWASA has been provided with mandate in various functions; therefore the definition is constructed from the review.

2.1.4 Community Based Water Supply Organisations

The community based water supply organizations (CBWSOs) are established by the agreement of the majority members of the community and shall be a fully autonomous corporate body. The CBWSOs can be established in different forms including: i) Water Consumer Association; ii) Water Trust; iii) Cooperative Society; iv) Non-government Organization; v) Company; or vi) any other body as approved by the Minister. These CBWSOs are responsible for the management, operations and maintenance of water projects. In addition, these communities are the main sources of sustainable water and sanitation services in rural areas (Eliamringi and Kazumba, 2017).

2.2 Theoretical Literature Review

This study was underpinned by the following theory as hereunder.

2.2.1 Resource Based View Theory

Resource-Based Theory (RBT) was first put forward by Penrose (2009), who proposed a model on the effective management of firms' resources, diversification strategy and productive opportunities. There are two underlying assumptions of the RBT related to the explanation of how firm-based resources generate sustained competitive advantage and why some organisations may continually outperform others by gaining higher competitiveness (Helfat & Peteraf, 2003). First, the bundles of resources owned by firms are different from each other as one of the cornerstones of RBT is the heterogeneity of resources and capabilities in a population of firms, which differentiate the competitive advantage of each firm; in this case the ability of households to pay services rendered by RUWASA.

The heterogeneity of resources assumes that a firm possesses unique resources in a specific situation can potentially be more skilled to perform particular activities and create competitive advantage by enhancing the services through cost recovery mechanisms and not relying on external funding as the study stipulates. Second, the complexities of trading resources across firms may create persistence in differences in resources (the assumption of resource immobility) whereby getting rid of external support (Goh and Loosemore, 2017).

According to Wernerfelt (1984) the firm in any industry has either tangible or intangible asset to utilize for creating competitive position. The central focus of this theory is on essence that the firm resources and how organization can make the use of such resources to create competitive benefit in the given industry through service enhancement that are paid for, recovering costs and not depending on external

funding in the case of the study (Kraaijenbrink, et al., 2010). Moreover, the organization can involve the use of resources such as financial resource, technology, human being and social relationship (Mweru and Maina, 2015). Makadok (2001) reported that the organisation to have sustainability in competitive environment should ensure its resources are rare, non-tradable and valuable. This tendency creates more favourable environment to have efficient operations (Loosemore, 2017).

Strengths of the theory: According to Sirmon et al., (2011) resource based view theory enables firms to create and sustain competitive advantages through the collection and integration of rare, valuable, inimitable and non-substitutable resources such as personnel to achieve the organisation's efficiency through enhancing services rendered and cost recovery. Therefore, the resource-based view theory aids the economic performance of the organisation while helping personnel utilize their innovations to achieve effective outcomes (Xu et al., 2014). It is from this background that this theory captures key information that focus on examining the economic sustainability of projects managed by RUWASA with reference to Karagwe district.

Weaknesses of the theory: RBT has attracted criticisms from four key fronts. First, the traditional RBT is limited when it comes to explaining why and how some organisations gain a competitive advantage in an unpredictable and rapidly changing business environment (Kleinschmidt, et al., 2007). Second, the value creation idea that has been proposed based on this theory regarding valuable resources is tautological and static (Kozlenkova, et al., 2014), meaning that the theory is self-verifying and is not empirically testable (Barney, 2001), causing poor quality RBT

research (Kozlenkova et al., 2014). The theory has also been criticised for being static and for failing to tackle the effect of organisational activities on resource effectiveness over time (Kozlenkova et al., 2014).

However, this criticism has been addressed by later theory refinements, such as by decoupling the direct relationship between VRI resources (valuable-rare-imperfectly imitable) and outcomes by defining organisational processes applied to exploit resources (Peteraf and Barney, 2003; Barney, 2007). Third, as the concept primarily refers to the work by Barney (1991), the support for the resource condition of being rare may be redundant, as any resource that meets the requirement of value, non-substitutability and inimitability is rare. Finally, RBT tends to ignore exogenous resources and assumes that only endogenous factors are essential to driving competitive advantage, although exogenous factors may otherwise offer potential as advantageous capabilities (Lewis et al., 2010). Despite the limitation of RBT, the rapid development of RBT and the innovation to the theory through adjustment, clarification and modification continue to improve its applicability and scope (Kozlenkova et al., 2014). As a result many studies have applied the theory to help in solving the impacts of resource effectiveness usage at organisational level (Kanda et al., 2018 & Salom and Khumalo, 2022).

2.3 Empirical Review

2.3.1 Payment Services and Economic Sustainability of Projects

A study conducted by Sjodin et al (2016) aimed at examining the water consumption and strategies considered by users. It utilized a survey design with questionnaires used to solicit information. It was reported that water consumption and pricing

strategy should consider water to be administratively priced to include the cost of externalities, as an incentive or subsidy. It was further found that there is a strong interlinking between energy, water, and food nexus, and sustainable initiatives that should move immediately from concept to practice. The strengths and weaknesses of the study are that full cost pricing and efficient use of water alone cannot control the sustainable use of water, but policy and instrumental changes to consider water as a limited natural resource are mandatory.

Thompson and Hope (2015) carried out a study that investigated the factors influencing the sustainability of water projects in Tanzania and showed that African countries and in particular, Tanzania suffer in terms of achieving sustainable water supply services due to barriers of user fees payment. Descriptive research design was used where questionnaire tools were being used to solicit respondents' opinions. It was found and suggested that it is the availability of resources regarding the operations and management within the capacity of communities which can only make supply projects sustainable. The study does not assess whether cost recovery mechanisms may aid organisations to sustain projects.

Kirenga, et al., (2018) conducted a study in Tanzania on the influence of Water Fund on the economic sustainability of community managed rural water supply projects. Cross-sectional design was used. It was found that water fund collected were inadequate to cover the operations and maintenance costs due to low level of tariff and weak water consumption rated. The weakness of the study shows that the reliance of funds could not predict the economic sustainability of projects when donor funding was no more. Therefore, it is hypothesized that;

H₀₁: Payment of services rendered do not influence the economic sustainability of projects managed by CBWSOs

2.3.2 Cost Recovery Mechanism and Economic Sustainability of Projects

The study by Sanju et al (2021) on the impact of externalities from the social, economic and ecological aspects of exploiting water found that resources are often not accounted into the pricing mechanism. Cross-sectional design was utilized to enable the results. It was found that with a full cost recovery strategy single and multi-block pricing models were created and their effects on water pricing were discussed. It was further found that the unit cost of potable and non-potable water was brought down from 0.94 USD/m³ and 0.51 USD/m³ to 0.62 USD/m³ and 0.29 USD/m³, respectively using a multi-block pricing strategy. Its strengths are that policy interventions in a full cost recovery water pricing strategy should consider the cost of externalities with a multi-block pricing system for breakeven in water infrastructural investments.

A study conducted by Sahin et al (2017) on water management programs in a few cities across the globe showed that non-metered flat pricing privileges consumers to use water till the marginal benefit becomes zero resulting in aggregate consumption mismatches. The study was guided by survey design. The results showed that pricing below the full cost results in the ineffectiveness of water management, while the cities which used an increasing block pricing strategy have resulted in meeting social inequality and motivating the individual user to use water efficiently. The impact of block pricing to improve water use efficiency, conclude that identifying the size of block and price slabs is difficult in a divergent socioeconomic group.

The study conducted in Wami/Ruvu Basin by IUCN (2010) in assessing the role of water users associations in managing water projects. Survey design was used. It was found that Tanzania indicated that sub-catchment water users associations (WUAs) stood at the lowest level of management within water management structure. It was further found that the WUAs assisted the Basin Water Office in the managing of water sources. It was recommended that, WUAs would form sub-catchment committees and provide representatives on Basin Boards and Catchment Committees for the enhancement of water resources management towards economic sustainability. Therefore, it is hypothesized that,

Ho₂: Cost recovery mechanisms do not influence the economic sustainability of projects managed by CBWSOs

2.3.3 Reliance on External Funding and Economic Sustainability of Projects

Oduor (2015) carried out the study on sub-Saharan African countries on the influence of water resources in enabling water supply services. Cross-sectional design was used. It was found that countries in most cases deviate resources meant for the poor due to selfishness and halts the projects development especially when they establish a relationship with the local elites creating room for exploitation of resources that lead to the impoverished. As most of the countries provide limited finance while most of the water projects are financed by donors, their economic and social sustainability have been questionable.

A study conducted in Namibia by Salom and Khumalo (2022) regarding the role of water supply in rural areas. Descriptive design was used. The results found several challenges, such as poor economic conditions, reliance of external support; location

of settlements in environmentally fragile areas, management models dominated by diverse cultural values, and associated cost recovery challenges. As a result, the rural population depends on local water sources (wells, hand pumps, river), which are frequently contaminated.

The World Bank (2017) carried out a study on the role of government in facilitating water supply projects. Descriptive design was used. The results revealed that Governments and water sector stakeholders have worked hard in ensuring improvement in institutional capacities through policies and guiding frameworks for sustainable service delivery. The findings further showed a challenge of financing rural water supply projects as the projects seemed not recover costs, capital maintenance, cost of operations and maintenance yet they collect revenues from the sale of water that is inadequate. It was recommended that rural schemes may require cost recovery in this line of thought where the government is usually called to fix broken parts or replace infrastructure without considering Life Cost Cycle approach. Therefore, it is hypothesized that;

H₀₃: Reliance on external funding does not influence economic sustainability of projects managed by CBWSOs

2.4 Research Gap

The studies such as World Bank (2017) focused on improving institutional capacities focusing on governance and technical capacity enhancement while not putting an emphasis on project economic sustainability of projects; Oduor (2015) sought for the impoverishment of projects due to poor management something that renders little recovery of payment among water users; Salom and Khumalo (2022) focused on the

challenges facing rural water supply without emphasizing much on the way to get rid of external reliance from donors. Whilst, Thompson and Hope (2015) established water supply services among the poor without eliminating external support and the way to get rid on external support for sustainable development; Kirenga et al (2018) examined the influence of water fund and economic stability. Moreover, it is found that a few studies examined precisely the determinants of project economic sustainability specifically utilizing CBWSOs. This is the gap to be filled.

2.5 Conceptual Framework

Figure 2.1 provides the conceptual framework. This is defined as an abstract idea or a theory used to develop new concepts or to reinterpret existing ones (Creswell, 2018). It gives the relationship between the dependent and independent variables where the economic sustainability of project managed by CBWSOs is the dependent variable while the independent variables include payment of services rendered to users; availability of cost recovery mechanism and reliance on external funding.

The variables include the independent variables such as payment of services rendered to users, availability of cost recovery mechanism and reliance on external funding while economic sustainability of projects is dependent variable. The independent variables present the ways projects may attain economic sustainability as follows; when users pay for the services the goals for attaining project sustainability are attained. More so, when strategies are put and implemented towards cost recovery, the projects become sustainable while such sustainability is enriched by the cooperation from the users. However, reliance on external funding may be avoided when users pay their dues as required where all costs incurred are

recovered to enable water supply projects become sustainable. This is what the study aims to attain.

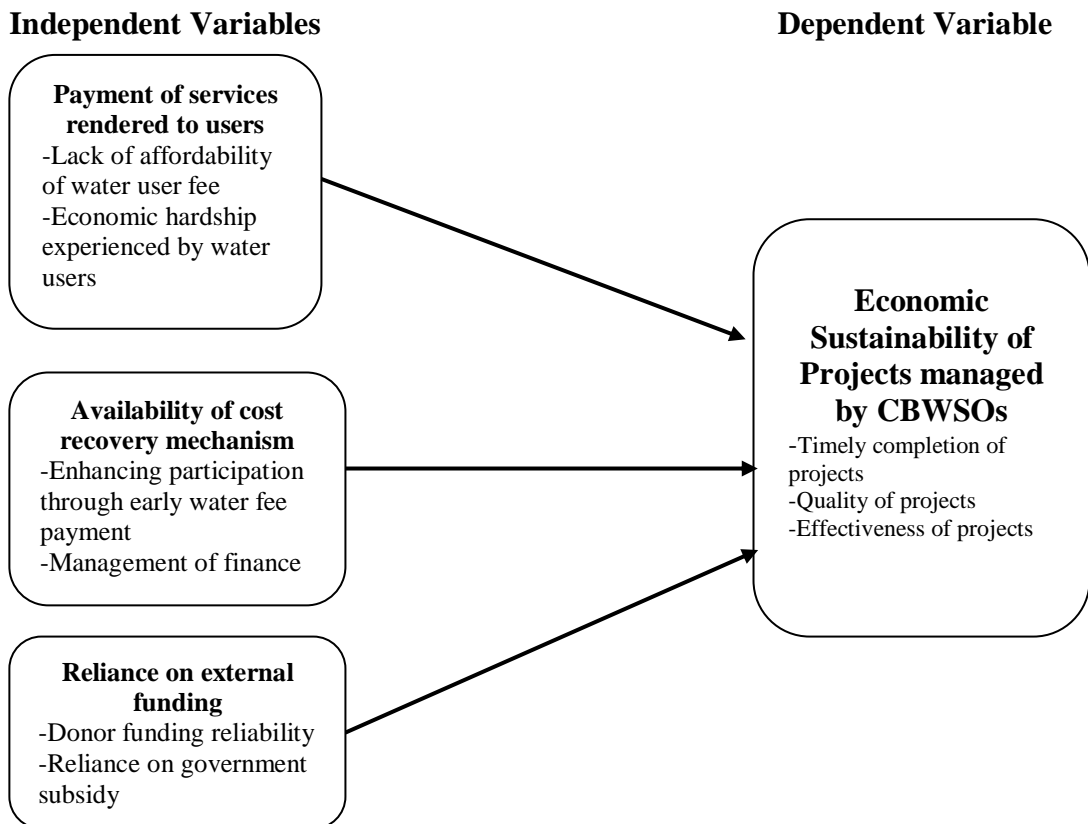


Figure 2.1: Conceptual Framework

Source: Researcher's Own Model (2024).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Philosophy

Research philosophy is a belief about how data about a phenomenon should be gathered, analyzed, and used (Green et al., 2010). Four main trends of research philosophy are distinguished in the works by many authors: the positivist research philosophy that claims that the social world can be understood objectively; interpretivism research philosophy where a researcher states that based on the principles it is not easy to understand the social world; pragmatist research philosophy that deals with the facts and the practical results are considered important where researchers have freedom of choice, and realistic research philosophy that is based on the principles of positivist and interpretivist research philosophies (Creswell, 2018). Therefore, in this study, a pragmatic philosophy was used.

3.2 Research Design

This study utilised an explanatory research design that used questionnaire and interview guide. Explanatory research design is a research design in which the researcher investigates the state of affairs in a population at a certain point in time (Zheng, 2015). Also, According to Saunders et al (2017), the explanatory research design involves observing and collecting data on a given topic without attempting to infer cause-and-effect relationships.

3.3 Research Approach

The study utilised a mixed approach that includes the qualitative and quantitative approaches. Qualitative approach aims to explore and discover issues about the

problem on hand, because very little is known about the problem (Creswell, 2018). Quantitative approaches measure variables on a sample of subjects and express the relationship between variables using effective statistics such as correlations, relative frequencies or differences between means (Zheng, 2015).

3.4 Survey Population

Fleming (2018) affirms that the target population refers to the total number of items about which the information is desired. The target population of this study included the board and CBWSOs members totaling to 240 (Karagwe District Report, 2022). The units of inquiry include all board members, leaders and CBWSOs members found in Karagwe district.

3.5 Area of Research

This study was conducted in Karagwe district council, Kagera. The reason for conducting the study is that changes that occurred in Tanzania could not empower CBWSOs to manage water supply projects economically and sustainably through RUWASA where many districts are concerned. Karagwe district is found to have projects that lack continuity and sustainability after they are handed to the community something that creates a question to answer.

3.6 Sampling Design and Procedures

3.6.1 Sampling Design

In this study purposive and simple random sampling were applied. The reason for their application is that each plays a role to complement the other. Also, from the approach point of view, the two fit to be used. Purposive sampling is a non-

probability sampling, which refers to sampling procedures where the sample for the study is deliberately selected by the researcher (Fleming, 2018). This was used to the board members as these respondents are ones who possess key information regarding the matter. On the other hand, simple random sampling was used to select staff from water user association members (CBWSOs) where each staff had a chance of being chosen. In this study a complete list of members was provided and a rotary system was used to select the needed respondents (Saunders et al., 2007). Pieces of paper with YES or NO were used where those who chose the YES papers were called to answer questions regarding the matter.

3.6.2 Sample Size

A sample is a part of the population from which it was drawn (Fleming, 2018). The Yamane (1967) formula was applied in determining the appropriate portion of respondents to represent the study population. Where n is the sample size, N is the total target population in this case the 240 population size obtained, and e is the error rate in this case 5%. The sample size for this study was calculated as shown below.

$$n = \frac{N}{1+N(e)^2}$$

N = the Total Population

e = the margin of error (5% has been used to obtain the best sample given the population size)

n = the sample size

$$n = \frac{240}{1+240(0.05)^2}$$

$n = 150$

Therefore, the sample size is **150** respondents.

3.7 Methods of Data Collection

Primary data were collected through questionnaires and interview guide. In this study, the researcher applied a questionnaire to collect data from CBWSOs members. These questionnaires were self-administered and managed with drop and pick method. Interview guide was administered to the board members through gathering information from the set questions.

3.8 Variables and Measurements

The scale items from previous studies were used to measure the variables of this study which included; payment of services rendered to users; availability of cost recovery mechanisms; reliance on external funding and the economic sustainability of projects managed by CBWSOs.

Table 3.1: Variable Measurement

S/N	Variable	Number of scale items	Source
1	Payment of services rendered	5	Hassan et al, 2020; Ibrahim, 2017; & Kanda et al 2018
2	Cost recovery mechanisms	3	Sanju et al.; Sjodin et al, 2016 & Sahin et al, 2012
3	Reliance on external funding	3	Oduor, 2015; Sanju et al, 2021; Sjodin et al, 2016 & Sahin et al, 2012
4	Economic sustainability of projects managed by CBWSOs	3	Goh and Loosemore, 2017; Eliamring and Kazumba, 2017 & Kirenga et al, 2018

3.9 Validity and Reliability Issues

3.9.1 Validity

To validate the data and instruments (questionnaires and in-depth interview) used in the research, the researcher asked the experts to recommend their representativeness and suitability (Creswell, 2018). In this study validity of data was ensured by

choosing the sample from a true representative of the population, preparing a good research tools, having appropriate methods of data collection, carrying pilot study to 20 expected respondents and proper recording of data.

3.9.2 Reliability

To test the reliability, the researcher carried out a Cronbach's Alpha test on questionnaires. According to Creswell (2018) a Cronbach's Alpha above 0.7 is preferable. Reliability was concerned with the questions' consistency of responses in repeated measurements that would lead to a value greater than 0.7.

3.10 Data Processing and Analysis

The researcher embarked on data analysis process after collecting the data from the field which involved identifying common errors and views from the respondents' description of their experiences. The responses to the close-ended items were assigned codes and labels. Quantitative data were analyzed descriptively using frequencies and percentages through Statistical Packages for Social Science (SPSS Version 20). More so, qualitative data from interviews were coded and analysed through content analysis where themes and emerging patterns were then coded from the interview transcripts.

However, inferential analysis using multiple regression analysis was used for quantitative data. Here the researcher was interested to measure the effect of each independent variable to dependent variable.

The following regression model was used

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Whereby:

Y = Dependent Variable (Economic Sustainability)

β_0 = y intercept (Constant)

β_1 = regression coefficient for the payment services

β_2 = regression coefficient for cost recovery mechanism

β_3 = regression coefficient for reliance on external funding

X_1 = payment services

X_2 = cost recovery mechanism

X_3 = reliance on external funding

ε = error term

Moreover, Multiple Linear Regression Analysis was done to test the strength and significance of the relationship between variables. The results indicated that, the model was statistically significant at ($p < 0.05$).

3.11 Ethical Considerations

The researcher sought for necessary procedures in order to conform to the ethical standards of research. The researcher sought for the permission from the director of postgraduate studies of the Open University of Tanzania, Regional Administrative Secretary for Kagera region and the Director for RUWASA, before carrying out the research. All information obtained in this research were strictly used for academic purposes and respondents were assured of the confidentiality of information given. Moreover, anonymity together with accessibility to research information was observed. Treatment was done according to the organisational protocol for the management of data collection.

CHAPTER FOUR

FINDINGS OF THE STUDY

4.1 Response Rate

In this study, 138 questionnaires were distributed among CBWSOs members and administered in terms of drop and pick method. All questionnaires were filled and collected to assume 100% response rate. Moreover, all 12 board members provided their opinions on the in-depth interview administered to them.

4.2 Demographic Characteristics

The demographic characteristics of respondents included; gender, age, length of service with the organisation and employment status of the respondents. Table 4.1 shows the results.

Table 4.1: Demographic Characteristics

Category	Frequency	Percentage %
Gender		
Male	104	69.3
Female	46	30.7
Age (in yrs)		
Under 20	04	2.6
21-30	18	12.0
31-40	94	62.8
41-50	30	20.0
Over 50	04	2.6
Length of Service (in yrs)		
Less than 2	24	16.0
3-5	48	32.0
More than 5	78	52.0
Employment Status		
Permanent	138	92.0
Temporally	12	8.0

Source: Research data, (2024).

The results in Table 4.1 reveal that gender distribution was presented as 69.3% males and 30.7% females respectively. Yet, the age distribution showed that those under 20 years were 2.6%, those between 21 to 30 years were 12%, those between 31 to 40

years were 62.8%, those between 41 to 50 years were 20% and those over 50 years were 2.6%. With regard to the length in service, those who worked less than 2 years were 16%, those who worked between 3 to 5 years were 32% and those who worked for more than 5 years were 52%. Finally, employment status revealed that those who were permanently employed were 92% while those who worked temporally were 8%. These included board members.

4.3 The Extent to Which Payment of Services Influence Economic Sustainability

The first objective examined the extent to which payment of services rendered influence the economic sustainability of CBWSOs in Karagwe District Council. Questionnaires were administered to CBWSOs members and the results are summarized in Table 4.2.

Table 4.2: Payment of Services

Statements	Strongly agree %	Agree %	Not sure %	Disagree %	Strongly disagree %
Poor household economy has rendered difficulties in paying for the services	85	05	0	10	0
Poor community economy render difficulties in paying for the services	80	0	0	20	0
There is a lack of affordability of water user fee among users	75	0	30	0	0
The economic hardship experienced by water users result into inability to pay for the services	90	10	0	0	0
Usage of updated technology in payment systems has reduced risks in paying costs used	80	0	20	0	0
User fees lead to economic sustainability of water projects	70	0	30	0	0

Source: Research data, (2024).

Generally, the results show that there have been poor household and community economy that render difficulties in paying for the services in the study area. Yet, lack of affordability of water user fees has been a hindrance towards attaining economic

sustainability of CBWSOs as the economic hardship experienced by water users resulted into inability to pay for the services in one way or another. However, it was found that usage of updated technology in payment systems has reduced risks in paying costs used. Besides, user fees payable lead to economic sustainability of water projects although accompanied with little challenges that may be accommodated if queer strategies are put forward.

4.4 The influence of Cost Recovery Mechanism on Economic Sustainability of Projects

The second objective of the study assessed the influence of cost recovery mechanisms on economic sustainability of projects managed by CBWSOs in Karagwe District Council. Questionnaires were administered to COWSOs members therefore; the results are summarized in Table 4.3 as hereunder.

Table 4.3: Influence of Cost Recovery Mechanism

Statements	Strongly agree %	Agree %	Not sure %	Disagree %	Strongly disagree %
Cost recovery enhance cooperation and management of finance with external agencies	80	0	20	0	0
Cost recovery mechanisms enhance community participation in operations and maintenance cost through early payments	90	10	0	0	0
Cost recovery mechanisms aid in seeking government subsidy for the purpose of recovering costs that can't be managed by users	75	0	0	25	0
Cost recovery strategies lead to economic sustainability of water projects	80	0	20	0	0
Cost recovery mechanisms have resulted into performance of water supply schemes leading to quality water provision	90	0	0	10	0

Source: Research data, (2024).

Generally, the results show that cost recovery mechanisms enhanced the economic sustainability of projects managed by CBWSOs in Karagwe district through improving cooperation and management of finance with external agencies, community participation in operation and maintenance costs by paying early, and seeking government subsidy for the purpose of recovering costs that cannot be managed by users. Yet, cost recovery strategies resulted into performance of water supply schemes leading to quality water provision and economic sustainability of projects.

4.5 Influence of Reliance on External Funding on Economic Sustainability of Projects

The third objective of the study determined how reliance on external funding influences Economic Sustainability of Projects managed by CBWSOs in Karagwe District Council. Questionnaires were administered to COWSOs staff and the results are summarized in Table 4.4.

Table 4.4: Influence of Reliance on External Funding

Statements	Strongly agree %	Agree %	Not sure %	Disagree %	Strongly disagree %
Donor funding has maintained the economic sustainability of water projects	60	0	0	40	0
Reliance of government subsidy has resulted into non-economic sustainability of water schemes	80	0	20	0	0
Performance of water supply schemes has been affected by the need from external funding	70	0	0	0	30
The quality of service rendered has been influenced by the reliance on external funding leading to economic sustainability of water projects	70	30	0	0	0

Source: Research data, (2024).

Generally, the results show that reliance on external funds influenced economic sustainability of projects managed by CBWSOs in Karagwe district from the fact that donor funding has maintained economic sustainability, yet reliance of government subsidy resulted into un-economic sustainability of water schemes where the performance of water supply schemes has been affected by the need from external funding. Moreover, the quality of service rendered has been influenced by the reliance on external funding leading to economic sustainability of water projects.

4.6 Regression Analysis

4.6.1 Assumptions of Multiple Regression

Pallant (2005) stated that multiple regression analysis assumes a number of assumptions on the collected data. Some of the assumptions include; Linearity assumption, Normality assumption, Autocorrelation's assumption, Multicollinearity assumption and Multiple linear regression analysis.

4.6.1.1 Linearity Assumption

This assumption demands that the relationship between independent and dependent variables should be linear in nature. Therefore, Pearson correlation is used to establish this assumption where the results show that the economic sustainability of projects managed by CBWSOs has significant positive linear relationship with independent variables ($p < 1.000$) [1- Tailed]. Also, the relationship between the variable has a weak positive or negative value such that, payment of services rendered to users (-ve), $r(150) = -0.139$, availability of cost recovery mechanisms (+ve), $r(150) = 0.339$ and reliance on external funding (-ve), $r(150) = -0.321$, as shown in Table 4.5.

Table 4.5: Linearity Assumption

		Correlations			
		Economic Sustainability of Projects managed by CBWSOs	Payment of Services rendered to Water Users	Availabilit y of Cost Recovery Mechanis ms	Reliance on External Funding
Pearson Correlation	Economic Sustainability of Projects managed by CBWSOs	1.000	-.139	.339	-.321
	Payment of Services rendered to Water Users	-.139	1.000	-.175	.520
	Availability of Cost Recovery Mechanisms	.339	-.175	1.000	-.403
	Reliance on External Funding	-.321	.520	-.403	1.000
Sig. (1- tailed)	Economic Sustainability of Projects managed by CBWSOs	.	.044	.000	.000
	Payment of Services rendered to Water Users	.044	.	.016	.000
	Availability of Cost Recovery Mechanisms	.000	.016	.	.000
	Reliance on External Funding	.000	.000	.000	.
N	Economic Sustainability of Projects managed by CBWSOs	150	150	150	150
	Payment of Services rendered to Water Users	150	150	150	150
	Availability of Cost Recovery Mechanisms	150	150	150	150
	Reliance on External Funding	150	150	150	150

Source: Research data, (2024).

4.6.1.2 Normality Assumption

This assumption demands the independent variables' errors be normally distributed. Skewness and Kurtosis are employed to test normality. Moreover, all variables' errors are assumed normally distributed as per rule of thumb for Skewness-Kurtosis of ± 2.58 . The test is depicted in Table 4.6.

Table 4.6: Skewness and Kurtosis Coefficients

Variable	N Statistic	Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
Payment of services rendered to users	150	0.800	.610	0.211	.111
Availability of cost recovery mechanisms	150	0.672	.610	0.202	.121
Reliance on external funding	150	0.451	.610	0.219	.119

Source: Research data, (2024).

4.6.1.3 Autocorrelations Assumption

Osborne and Waters (2002) report that autocorrelations means that errors between independent variables remain independent. Therefore, Durbin-Watson is used to check this assumption. Moreover, Field (2009) notes that, Durbin-Watson guarantees low autocorrelations when its coefficient lies between 1.5 and 2.5. Table 4.7 shows the results.

Table 4.7: Durbin-Watson Test

Model	Model Summary ^b									Durbin-Watson
	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.395 ^a	.156	.139	1.024	.156	9.013	3	146	0.000	0.138

a. Predictors: (Constant), Payment of Services rendered, Availability of Cost recovery mechanisms, Reliance on External Funding

b. Dependent Variable: Economic sustainability of Projects managed by CBWSOs

Moreover, Table 4.8 shows the correlation coefficients as per significance.

Table 4.8: Correlation Matrix of Variables

	1	2	3
1. Payment of Services rendered to Water Users	1		
2. Availability of Cost Recovery Mechanisms	-.175*	1	
3. Reliance on External Funding	.520**	-.403**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

4.6.1.4 Multicollinearity Assumption

To test this assumption, the Variance Inflation Factor (VIF) and Tolerance Rate were determined. VIF and tolerance conform to the rule of thumb which implies extremely low Collinearity between independent variables. Stevens (2009) suggested that, low VIF and large tolerance implies presence of low multicollinearity. Tolerance rate coefficient ranges between 0 and 1 whereas VIF ranges between 1 and 10. Table 4.9 shows the results.

Table 4.9: Multicollinearity Assumption

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
1		
Payment of Services Rendered to users	.729	1.373
Availability of Cost recovery mechanisms	.836	1.196
Reliance on External Funding	.630	1.588

4.6.2 Hypothesis Testing

The study conducted the regression analysis to establish the statistical significance of the relationship between dependent variable (economic sustainability of projects managed by CBWSOs) and independent variables (reliance on external funding; availability of cost recovery mechanisms and payment of services rendered to water users) The results indicate that, the model was statistically significant at ($p < 0.05$). Table 4.10 shows the analysis.

Table 4.10: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig
1	.395 ^a	.156	.139	1.024	0.000

Source: Research data, (2024).

The economic sustainability of projects managed by CBWSOs was found to be satisfactory variable in explaining the reliance on external funding, availability of cost recovery mechanisms and payment of services rendered to water users. This is supported by the coefficient of determination also known as R square of 0.156.

This means that the economic sustainability of projects managed by CBWSOs explains 15.6% of the variations in project implementation. The results further means that the model applied to link the relationship of the variables was satisfactory; an indication of changes of dependent variable that can be explained by payment of services rendered to water users, availability of cost recovery mechanisms and reliance on external funding. The residual of 84.4% can be explained by other variables beyond the scope of the current study. This is in line with Davis et al (2016) who reported that changes in economic sustainability of project managed by CBWSOs is the outcome of payment of services rendered to water users, availability of cost recovery mechanism and reliance on external funding.

The Analysis of Variance (ANOVA) results are shown in Table 4.11.

Table 4.11: ANOVA Results

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.352	3	9.451	9.013	.000 ^b
	Residual	153.088	146	1.049		
	Total	181.440	149			

a. Dependent Variable: Economic Sustainability of Projects managed by CBWSOs

b. Predictors: (Constant), Reliance on External Funding, Availability of Cost Recovery Mechanisms, Payment of Services rendered to Water Users

The results further confirm that the regression model is significant and supported by The F-Calculated (3, 149) = 9.013 which is greater than F-Critical (3, 149) = 3.95 at 95% confidence level. The findings further confirm that the regression model of economic sustainability of projects managed by CBWSOs is significant and supported by $p = 0.000 < 0.05$. Moreover, the regression coefficients are shown in Table 4.12 as hereunder;

Table 4.12: Regressions Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.428	.228		6.264	.000
Payment of Services rendered to Users	.033	.114	.024	.290	.001
1 Availability of Cost Recovery Mechanisms	.202	.068	.244	2.991	.003
Reliance on External Funding	-.152	.062	-.230	-2.299	.004

Source: Research data, (2024).

Regression coefficients on Table 4.12 suggest that, all variables were significant predictors ($p < 0.05$) of the model. This informs that one unit increase of payment services rendered to users explains **3.3%** increase in economic sustainability of projects managed by CBWSOs. An increase in one unit of availability of cost recovery mechanisms suggests **2%** unit increase of economic sustainability of project managed by CBWSOs. Also, one unit increase of reliance on external funding explains **-1.5%** decrease in economic sustainability of project managed by CBWSOs.

The following regression model was used

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

$$Y = 1.428 + 0.033 \beta_1 + 0.202 \beta_2 - 0.156 \beta_3 + \varepsilon$$

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Chapter Overview

This chapter presents the discussion of findings arising from the study objectives as hereunder.

5.2 Payment of Services rendered to Water Users

The results in Table 4.2 reveal that 90% of respondents agreed that poor household economy has rendered difficulties in paying for the services rendered by CBWSOs in Karagwe district council. This implies that the household economy being poor necessitates poor payment of services and vice versa. It was found that in Karagwe district, the majority of households depend on banana and coffee products that in some seasons have a good price that raise their economy while the other seasons the banana and coffee products' prices go low resulting into economic downturn.

Such unpredictable seasons with diverging product price changes enable households to either pay or become unable to pay for water services. This is in line with Thompson and Hope (2015) who opined that the availability of poor economy among households in rural areas necessitates difficulties in paying for the services rendered towards the sustainability of water projects in Tanzania. It is from such background that rural Tanzania suffers in terms of achieving sustainable water supply services due to barriers of user fees payment as proposed by Kanda et al., (2018). Moreover, 10% of respondents disagreed that the poor economy possessed by households in Karagwe district does not necessarily render difficulties in paying for the services from the fact that what is being charged does not exceed TZS

3,000/= per month something that may be payable.

One of the interviewees pointed out that:

There have been claims that water users are unable to pay for the services rendered to them to the extent of requiring government subsidy, the issue is that a few households have been depending on free water services something that become difficult to pay for the service they get. This dependence has been a hindrance towards sustaining water projects in the study area (Interviewee, M1)

On the other hand, the results in Table 4.2 reveal that 80% of respondents strongly agreed that poor community economy renders difficulties in paying for water services. This implies that in many cases the community in the study area is encountering difficulties in accessing essential services such as health care and water to the extent of being unable to afford. It was found that although the community can support the implementation of water projects in terms of labour, when it comes to paying for the services, external support has been an alternative as supported by Spaling et al (2014). Moreover, 20% of respondents disagreed that a few among community members in Karagwe district are able to pay for water services, but due to little mobilization to acquire water services at their home places; the service has been marginally extended.

Nonetheless, the results in Table 4.2 reveal that 75% of respondents strongly agreed that payment of services rendered are hindered by the lack of affordability of water user fee among users. It was found that the user fees in the study area seem to be unaffordable to the extent of influencing the non-sustainability of projects. The statement above is in alignment with Kirenga et al (2018) who opined that some projects in rural areas face challenges during the implementation time due to the

inability of users to pay for user fees. This inability goes with the need to support them as their economic situation is poor. Therefore, the inability to afford paying user fees renders projects non-sustainability. Moreover, 30% of respondents were not sure on the matter as the concept of affordability was divergently understood by the water users. It was found that many users could utilize the services from the community tanks that enable users pay TZS 50/= per 20 litres while others having water connection at their homes. Those connected with water at their home places could afford to pay and in case of unaffordability, disconnection was done as asserted by Goh and Loosemore (2017).

The interviewees had the following views;

In our place, there are people who have water connected at their homes while those with little income utilizing water from community tanks that enable them pay little. However, the little amount to be paid (in some cases) becomes unaffordable due to the economic hardship facing users. Therefore, the need to subsidize the cost has been vital to enable more people access the service (Interviewees, M2, M3 & M4).

The statement above concurs with World Bank (2017) report that suggested the need for the government to subsidize the costs for the purpose of rendering services to more rural people.

More so, the results in Table 4.2 reveal that 100% of respondents agreed that payment of services rendered influenced the economic sustainability of CBWSOs from the fact that the economic hardship experienced by water users resulted into inability to pay for the services. This implies that when users encounter economic downturn, they are deprived of the ability to pay for the services rendered. The

statement above supports the affirmation by Ibrahim (2017) who opined that many rural areas are disadvantaged by having income variability that necessitate economic hardship when it comes to paying for social services that they are entitled to get.

Moreover, the results in Table 4.2 reveal that 80% of respondents strongly agreed that the usage of updated technology in payment systems has reduced risks in paying costs used while 20% of respondents being unsure of the matter. This implies that technology use has hastened the process of paying user fees by using mobile phones or agents. It was found that in order to raise income towards sustaining projects, technology use has been a mechanism as supported by Oduor (2015). This has been advantageous from the fact that many users would utilize little time in paying their services or go to the extent of using mobile phones in paying fees needed. This has also reduced time and enabled users access the services in time and to their convenience. The statement above concurs with Hassan et al (2020) who stated that the incorporation of new technology in paying for the services has enabled water users utilize their time economically while making sure that the time served is used for other economic activities.

The interviewees had the following view;

It has been fortunate that the new technology used in paying for the services has enabled water users utilize their mobile phones in paying for the services. This has reduced the time in working long distances to pay for the services while being able to manage their time for other economic endeavors (Interviewees, M4, M6, M8 & M9)

Finally, the results in Table 4.2 reveal that 70% of respondents strongly agreed that user fees lead to economic sustainability of water projects. This implies that user

fees were introduced to enable water users own their projects after being handled to them, implement what is required and sustain them. Therefore, the culture inculcated to enable water users pay for the services that contradicts the traditional way experienced before has in some ways been accepted without more consensus something that renders little implementation as opined by Sahin et al (2017). However, as time goes water users have been used to and able to pay for the services, although with little challenges that are unavoidable. This is in concurrence with Kirenga et al (2018) who opined that water fund collected is inadequate to cover the operations and maintenance costs due to low level of tariff and weak water consumption rated. Yet, 30% of respondents were not sure of the matter.

5.3 Availability of Cost Recovery Mechanisms

The results in Table 4.3 reveal that 80% of respondents strongly agreed that cost recovery mechanisms enhance cooperation and management of finance with external agencies in sustaining the projects. It was found that with the help of external agencies such as Water Aid and World Bank support, Karagwe district water projects were supported and they introduced cost recovery mechanisms that at most enhance the availability of services as supported by Kirenga et al (2018). Yet, 20% of respondents were not sure of the matter from the fact that in most cases, participation of more people in project implementation has been minimal with little local community sensitization. The statement above concurs with Sanju et al (2021) who reported that more water projects fail to attain their intended goals from little awareness of the projects as well as poor sensitization that hinder the implementation of projects when it comes to cost sharing and sustainability of projects handled to

them.

The interviewees had the following views;

There have been little sensitization among community members regarding the initiated water projects in the study area to the extent of leaving more people unnoticed on the projects that take place. Such non-participation has rendered poor cost recovery when the projects are handled to the community (Interviewees, M 7, M 8, M9 & M10).

Furthermore, the results in Table 4.3 reveal that 90% of respondents strongly agreed that cost recovery mechanisms have enhanced community participation in operation and maintenance cost through early payments. Similarly, 10% of respondents agreed on the matter. This implies that although; participation in operation and maintenance cost has been to some extent improved, it has enabled water users contribute the agreed amount that help in accommodating the costs for operations and maintenance. Yet, the challenges have been the inability of most community members to contribute the required amount agreed. This necessitates the provision of subsidy from the government and other water related donors. The statement above is in support of Salom and Khumalo (2022) who stated that operations and maintenance costs have been a burden to water users as they become higher and higher to the extent of being unaffordable. Such incidences have called upon support from various donors to rescue the situation. When such support has been provided, the implementation of projects has been in a good condition as found in the study area.

The interviewees had the following view;

The reliance of donors to support the operations and maintenance costs have accelerated community members to relax in owning and running their project handled to them. This has been a challenge towards projects sustainability as a great amount of costs are not

recovered in time (Interviewees M2, M7, M10 & M11)

On the other hand, the results in Table 4.3 reveal that 75% of respondents strongly agreed that cost recovery mechanisms have aided in seeking government subsidy for the purpose of recovering costs that cannot be managed by users. This implies that when users become unable to pay for the services, the government has been able to a certain extent recovering the costs. This is in line with Ibrahim (2017) who asserted that when there are alternative mechanisms such as subsidies; these accelerate users to be reluctant in their day to day obligations something that deteriorate the initiatives towards sustaining projects. Yet, 25% of respondents disagreed that cost recovery does not rely on government subsidy alone but from the management of projects through CBWSOs. CBWSOs have helped in maintaining projects by educating water users on the importance of quality water something that necessitate voluntary payment of user fees. The statement above is in support of Goh and Loosemore (2017) who stated that maintaining water project needs collaborative efforts that include the use of CBWSOs and other water actors to enable cost recovery as well as sustaining the projects that are handled to the community after completion. This goes hand in hand with initiating strategies that bring about coordination towards thorough implementation of the projects.

Nonetheless, the results in Table 4.3 reveal that 80% of respondents strongly agreed that cost recovery strategies lead to economic sustainability of water projects while 20% of respondents were not sure. It was found that strategies such as educating water users on the importance of using quality water as well as paying for the services rendered to them were vital towards sustaining projects with queer strategies

enacted to maintain the service delivery to water users. The statement above is in line with Sahin et al (2017) who stated that water management programs across the globe need non-metered flat pricing privileged consumers who use water till the marginal benefit becomes zero resulting in aggregate consumption mismatches. When such benefits are attained water users are voluntarily able to recover costs without many efforts as supported by Hassan et al (2020). Therefore, pricing below the full cost results in the ineffectiveness of water management, while increasing block pricing strategy have resulted in meeting social inequality and motivating the individual user to use water efficiently.

The interviewees were of the following views;

Cost recovery strategies include pricing below the full cost something that enable many water users to confine to the cost payment thereby enabling voluntary payment. Although, this strategy has been challenges and proved to be inefficient in the study area, its usage has maintained many users while sustaining the projects with external financing to subsidize the costs not recovered (Interviewees M6, M10 & M13)

Finally, the results in Table 4.3 reveal that 90% of respondents strongly agreed that cost recovery mechanisms have resulted into performance of water supply schemes leading to quality water provision with 10% of respondents being in disagreement. It was found that water supply schemes' performance was evidenced from the provision of quality water that is affordable to users. When many costs were added, water users were unable to afford paying for the services something that ended up with projects non-implementation and sustainability. The fact that cost recovery could take a lot of strategies, managing such cost recovery caused CBWSOs to engage in community sensitization in order to enable each water user pay the user

fees properly has been a challenge as opined by Salom and Khumalo (2022).

5.4 Reliance on External Funding

The results in Table 4.4 reveal that 60% of respondents strongly agreed that donor funding has maintained the economic sustainability of water projects from the fact that there have been donor funding in water projects in Karagwe district to the extent of relying on them. This implies that funds from donors have been released to enable the facilitation of project while engaging the community towards owning the project when handled to the community. This has also in many cases incorporated a great number of community members who are aware on the running of the project through CBWSOs. The statement above concurs with the World Bank (2017) that emphasizes the role played by donors and government in facilitating water supply projects on all water sector stakeholders work hard in ensuring improvement in terms of institutional capacities through policies and guiding frameworks for sustainable water service delivery. Moreover, 40% of respondents were in disagreement that although there have been funds that support the implementation of water projects, mismanagement and misappropriation of those funds have rendered poor performance of projects and their sustainability as argued by Eliamringi and Kazumba (2017).

The interviewees had the following views;

Reliance on external funds has necessitated CBWSOs to manage the projects without more emphasis on collecting user fees that would lead to the sustainability of projects. Yet, such reliance has brought about challenges when user fees need to be collected among water users to the extent of causing unnecessary conflicts between CBWSOs and community members (Interviewees M5, M7 & M15)

On the other hand, the results in Table 4.4 reveal that 80% of respondents strongly agreed that reliance of government subsidy has resulted into non-economic sustainability of water schemes from the fact that water users have heavily assumed that to depend on government subsidy is an advantage as argued by Hassan et al (2020). Yet, 20% of respondents were not sure of the matter as they stated that although the subsidy is provided, the situation seems to remain the same as water users are charged accordingly.

Moreover, the results in Table 4.4 reveal that 70% of respondents strongly agreed that the performance of water supply schemes in Karagwe district has been affected by the need for assistance from external funding. This implies that the need for assistance emanates from the way water supply schemes were organised and need to be managed by CBWSOs. It was found that CBWSOs are managed by people who in one way or the other do not have skills adequate to carry out their duties and when it comes to raising funds from their own sources, the capacity to mobilize water users becomes a challenge.

However, 30% of respondents strongly disagreed that water supply schemes are not affected by external funding from the fact that a great number of water users know and appreciate the projects handled to them and are ready to pay for the user fees as long as water supply is adequate and accommodates the needs of the community. The statement above concurs with Salom and Khumalo (2022) who stated that the role of water supply in rural areas goes with the need to pay for the services although several challenges, such as poor economic conditions, reliance of external support; location of settlements in environmentally fragile areas, management models

dominated by diverse cultural values and associated cost recovery challenges may hinder water users to access and afford the utilization of services.

The interviewees had the following views;

We appreciate the services rendered to our community from the support of various agencies. However, such support has rendered some water users to rely only on external funding with little accountability on their side. This in some extent has paralyzed the strategies put by CBWSOs to manage the provision of water services in the study area (Interviewees M 12 & M 14)

Finally, the results in Table 4.4 reveal that 70% of respondents strongly agreed while 30% of respondents agreed that the quality of services rendered has been influenced by the reliance on external funding leading to economic sustainability of water projects. This implies that external support necessitated CBWSOs handle well the funds provided while making sure that the services are provided as per standards needed. Therefore, quality becomes a measure for sustainability that enable water users enjoy the service by paying what is required as argued by World Bank (2017). The statement above concurs with Sanju et al (2021) who reported that when CBWSOs are capacitated with knowledge and skills relevant to the sustainability of water projects; quality and standards are attained where water users enjoy the service.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Chapter Overview

This chapter presents the summary, conclusion and recommendations arising from the study findings. It starts with the summary, conclusion; recommendations and recommendations for further studies.

6.2 Summary of Major Findings

This study examined the determinants of economic sustainability of projects with reference to community based water supply organisations in Karagwe district council. Specifically, it examined the extent to which the payment of services rendered influence the economic sustainability of projects; assessed the influence of cost recovery mechanism on economic sustainability of projects and determined how reliance on external funding influences economic sustainability of projects managed by CBWSOs in Karagwe district council. It was revealed that payment of services rendered were challenged by the availability of poor household and community economy in paying for the services as affordability of water user fees has been a hindrance resulting into inability to pay for the services.

However, the usage of updated technology in payment systems reduced risks in paying costs used. More so, cost recovery mechanisms improved cooperation and management of finance through community participation in operation and maintenance costs. Moreover, the reliance on external funds influenced economic sustainability of projects where donor funding sustained water schemes.

6.3 Conclusion

The regression results show that economic sustainability of projects managed by CBWSOs are positively and significantly related ($\beta=0.033$, $p=0.001$) where the p-value was 0.001, which is less than 0.05. The results implied that while other factors are held constant, economic sustainability of project managed by CBWSOs would lead to payment of services rendered to water users by 0.033. Therefore, the study concludes that economic sustainability of project managed by CBWSOs has a statistically significant relationship with payment of services rendered to water users in Karagwe district council. This concurs with the argument by Salom and Khumalo, 2022; Hassan et al., 2020 & Ibrahim, 2017 that the beneficiary communities are held responsible in payments that are associated with the services they get while avoiding all challenges that may render poor management of the projects they own.

Also, the regression results show that economic sustainability of projects managed by CBWSOs are positively and significantly related ($\beta=0.202$, $p=0.003$) where the p-value was 0.003, which is less than 0.05. The results implied that while other factors are held constant, economic sustainability of project managed by CBWSOs would lead to availability of cost recovery mechanisms by 0.202. Therefore, the study concludes that economic sustainability of project managed by CBWSOs has a statistically significant relationship with the availability of cost recovery mechanisms in Karagwe district council. The findings are in concurrent with Kanda et al., 2017 and Ibrahim, 2017 who reported that non-adherence to mechanisms and strategies that can help in streamlining the implementation of projects would lead to

poor recovery mechanisms attainments.

Moreover, the regression results show that economic sustainability of projects managed by CBWSOs are negatively but significantly related ($\beta=-0.152$, $p=0.004$) where the p-value was 0.004, which is less than 0.05. The results implied that while other factors are held constant, economic sustainability of project managed by CBWSOs would lead to reliance on external funding by -0.152. Therefore, the study concludes that economic sustainability of project managed by CBWSOs has a statistically significant relationship with the reliance on external funding in Karagwe district council. The findings concur with Eliamring and Kazumba, 2017 & Sanju et al., 2021 who opined that low revenue collection and poor governance of projects in most of rural communities have rendered non-sustainability thus relying mainly on external funding.

Besides, regression analysis indicates that the coefficient of correlation R was 0.395 an indication of positive relationship between variables. Coefficient of adjusted determination R^2 was 0.156 which changes to 15.6% an indication of changes of dependent variable that can be explained by payment of services rendered to water users, availability of cost recovery mechanisms and reliance on external funding. The residual of 84.4% can be explained by other variables beyond the scope of the current study. This is in line with Davis et al (2016) who reported that changes in economic sustainability of project managed by CBWSOs is the outcome of payment of services rendered to water users, availability of cost recovery mechanism and reliance on external funding.

6.4 Recommendations

The subsequent recommendations are put forward based on conclusion as follows; The economic sustainability of projects managed by CBWSOs were positively and significantly related implying that economic sustainability of project managed by CBWSOs would lead to payment of services rendered to water users. It is recommended that beneficiaries need to be capacitated towards sustaining the projects handled to them while poor household and community economy that render difficulties in paying for the services, improving the household and community members at large is vital towards sustaining the projects.

Also, the economic sustainability of projects managed by CBWSOs were positively and significantly related implying that economic sustainability of project managed by CBWSOs would lead to availability of cost recovery mechanisms. It is recommended that mechanisms and strategies need to be put forward for the implementation of projects towards effective recovery mechanisms while such changes need to suit the community thereby enhancing quality provision of water all the time.

Moreover, the economic sustainability of projects managed by CBWSOs were negatively but significantly related implying that economic sustainability of project managed by CBWSOs would lead to reliance on external funding. It is recommended that good governance of projects would render non-reliance on external funding but more reliance on external assistance may result into total dependence leading to non-economic sustainability of water schemes something that is unwelcome.

6.5 Limitations and Areas for Future Research

6.5.1 Limitations

Due to limited time in undertaking the study, this study focused on examining the determinants of project economic sustainability with reference to community based water supply organisations in Karagwe district council only. Also, it utilized explanatory research design and involved board and CBWSOs members who were able to provide their opinions on the matter. Therefore, the results would not be generalized to other districts rather than Karagwe district council.

6.5.2 Areas for Future Research

The study examined the determinants of project economic sustainability with reference to community based water supply organisations in Karagwe district council. It is advised that further studies be done on the following issues:

Assess the financial sustainability of CBWSOs on managing water projects in other rural district in Tanzania.

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APPENDICES

Appendix 1 Questionnaire CBWSOs members

Dear Prospective Respondent;

This questionnaire is designed to solicit information from you. The purpose of this research is for the academic award of a Master's degree in project management from the Open University of Tanzania. Kindly fill in the required information as per the researcher's requirement.

Gender: Male (), Female ()

Age: under 20 (), 21 to 30 (), 31 to 40 (), 41 to 50 (), over 50 ()

Length of services with the organization (In years) -----,

Employment status: Permanent (), Temporally ()

For each of the following aspects shown below rate your level of agreement using the following Likert type scale provided:

Agreement: 1= strongly agree, 2= Agree, 3= Not sure, 4= Disagree, 5= strongly disagree

Na.	Extent of Payment of Services rendered for economic sustainability	Level of agreement				
1.	Poor household economy has render difficulties in paying for the services	1	2	3	4	5
2.	Poor community economy render difficulties in paying for the services	1	2	3	4	5
3.	There is a lack of affordability of water user fee among users	1	2	3	4	5
4.	The economic hardship experienced by water users result into inability to pay for the services	1	2	3	4	5
5.	Usage of updated technology in payment systems has reduced risks in paying costs used	1	2	3	4	5
Cost Recovery Mechanisms for economic sustainability		Level of agreement				
6	Enhancing cooperation and management of finance with external agencies	1	2	3	4	5
7	Enhancing community participation in operations and maintenance cost through early payments	1	2	3	4	5
8	Seeking government subsidy for the purpose of recovering costs that can't be managed by users	1	2	3	4	5
Influence of External Funding for economic sustainability		Level of agreement				
10	Donor funding has maintained the economic sustainability of water	1	2	3	4	

Na.	Extent of Payment of Services rendered for economic sustainability	Level of agreement				
	projects	5				
11	Reliance of government subsidy has resulted into non-economic sustainability of water schemes	1	2	3	4	5
12	Performance of water supply schemes has been affected by the need from external funding	1	2	3	4	5
Economic Sustainability of Projects managed by CBWSOs						
13	Time management has influenced water projects attain economic sustainability	1	2	3	4	5
14	Time used by water users to fetch water after the completion of projects has been reduced to enable people undertake other issues than before	1	2	3	4	5
15	User fees lead to economic sustainability of water projects	1	2	3	4	5
16	Cost recovery strategies lead to economic sustainability of water projects	1	2	3	4	5
17	Performance of water supply schemes has led to quality water provision	1	2	3	4	5
18	The quality of service rendered has influenced economic sustainability of water projects	1	2	3	4	5

Appendix 2: Interview Guide for the Board Members for RUWASA

- i. To what extent does payment of services rendered to users influence the economic sustainability of projects managed by CBWSOs in Karagwe district?
- ii. Are there available cost recovery mechanisms towards economic sustainability of projects managed by CBWSOs in Karagwe district?
- iii. Is reliance on external funding influencing economic sustainability of projects managed by CBWSOs in Karagwe district council?



Ref. No OUT/ **PG202002236**

13th July, 2023

Managing Director,
Rural Water Supply and Sanitation Agency (RUWASA),
P.O.Box 28,
KAGERA.

Dear Director,

**RE: RESEARCH CLEARANCE FOR MR. MAGAI TAMA KAKURU, REG NO:
PG202002236**

2. The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007. In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

3. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Mr. Magai Tama Kakuru, Reg. No: PG202002236** pursuing **Master of Project Management (MPM)**. We here by

grant this clearance to conduct a research titled "Determinants of Project Economic Sustainability: A Case of Community based Water Supply Organizations in Karagwe District Council". He will collect his data at your office from 14th July to 30th August 2023.

4. In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820. We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA



Prof. Magreth S. Bushesha

For: **VICE CHANCELLOR**



JAMHURI YA MUUNGANO WA TANZANIA

WIZARA YA MAJI

WAKALA WA MAJI NA USAFI WA MAZINGIRA VUJINI

Mtaa wa Kashekele S. L. P 1905, Bukoba,
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Unapojibu, tafadhali taja:

Kumb. Na. DA.228/272/01/38

23 Julai, 2023

Inj. Magai T. Kakuru,
REG. NO.PG202002236,
BUKOKA.

YAH: KURUHUSIWA KUFANYA UTAFITI (RESEARCH)

Tafadhali husika na mada tajwa hapo juu.

Nimepokea barua yenye Kumb. Na.OUT/PG202002236 ya tarehe 13/07/2023 ya kukuomba kibali cha kufanya utafiti (Research) Mkoa wa Kagera Wilaya ya Karagwe kutoka Chuo Kikuu Huria cha Tanzania.

Kwa barua hii, ninakujulisha kuwa umeruhusiwa kufanya utafiti huo Wilaya ya Karagwe. Aidha, utakapofika wilayani naomba uripoti kwa Meneja RUWASA wa Wilaya kwa msaada zaidi.

Nikutakie majukumu mema.

Agnes Clemence
Kny: Meneja RUWASA (M)
KAGERA.

