FACTORS INFLUENCING SUSTAINABILITY OF WATER PROJECTS IN TANZANIA: CASE STUDY OF BABATI DISTRICT IN MANYARA REGION

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Master of Science Degree in Project Planning and Management of the

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By

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DECEMBER, 2023

DECLARATION

I, **Rabin Yonaza**, declare that this Dissertation is my own original work and that it has not been presented and will not be presented to any learning institution for similar or any other degree award.

Signature……

Date……

CERTIFICATION

I, the undersigned certify that I have read and hereby recommend for acceptance by Institute of Accountancy the dissertation entitled: **"*Factors Influencing Sustainability of Water Projects in Tanzania: Case Study of Babati District in Manyara Region",*** in partial fulfilment of the requirements for the degree of Masters of Science in Project Planning and Management of the Institute of Accountancy Arusha.

Signature …….

Supervisor

Dr. Pascal Massawe

Date ……

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ABSTRACT

This study aimed to investigate the factors influencing the sustainability of water projects in Babati District, Tanzania. The research focused on community participation, collaboration with the local government, and the effectiveness of community capacity building. A descriptive study design was used, incorporating quantitative and qualitative data collection and analysis methods. Data was collected through surveys, interviews, and focus group discussions and analyzed using SPSS for quantitative data and content analysis for qualitative data. The findings revealed that the project had moderate sustainability, with community participation being a key factor. Collaboration with the local government was limited, leading to decreased sustainability, and there were deficiencies in community capacity building, especially in infrastructure maintenance. The study concludes that involving the local government from the early stages of project design and strengthening community capacity building is crucial for achieving sustainability in water projects implemented by NGOs.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS/ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CDD	Community Driven Development
CBWSOs	Community-based Water Supply Organizations
COWSOs	Community-owned Water Supply Organizations
CSO	Civil Society Organization
FGD	Focus Group Discussion
MDG	Millennium Development Goals
NGO	Non-Governmental Organization
PADEP	Participatory Agricultural Development and Empowerment Projects
REAL	Rural Evidence and Learning for Water
RUWASA	Rural Water Supply and Sanitation Agency
SCT	Social Cognitive Theory
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Sciences
TASAF	Tanzania Social Action Fund
URT	United Republic of Tanzania
WASH	Water Sanitation and Hygiene
WVT	World Vision Tanzania

CHAPTER ONE

INTRODUCTION

1.0 Overview

Evidence from different studies indicates that a significant proportion of water projects do not continue beyond the first few years following phase out of the donor. Unsustainable projects have less impact on the local community as they leave community needs unmet. This study intended to determine factors influencing sustainability of water projects in Tanzania using Babati District as a case study. Specifically the research considered the water project at Duru Ward, covering Yeratonik and Endagwe Villages. The study focused on three key factors of sustainability namely; community participation, collaborations with local government, and community capacity building prior phase out of the project.

1.1 Background to the Problem

Designing a good project is easier said than done. Projects should impact sustainably to the people they were created to assist. Unfortunately, experience shows projects and associated benefits gradually disappear a few years after they are withdrawn (Mkomagi *et al*., 2023). Oino *et al*. (2015) provided a conceptual explanation of factors that influence sustainability of projects in Kenya and other parts of the world, especially in the very needy communities. It was observed that although many projects highlight elements of sustainability in their proposal stage, the actual implementation seems to lack emphasis on sustainability. It was established that lack of stakeholder ownership and commitment leads to project failure. Additionally, aid support from development agencies often do not fully understand and consider socio-economic, cultural, and political factors influencing the project design, planning and implementation. As well, very limited follow-up support during implementation is tendered by these development agencies.

For the purpose of this study, project sustainability defined by Oino, Towett, Kirui and Luvega (2015) as a project's continued presence and service delivery to beneficiaries when donor support has ceased is adopted. To be effective, development projects must result in lasting change. Projects may meet their objectives by improving economic, health, or social conditions while they are operating, but genuine success is achieved only through sustained change that does not depend on continued external resources. In other words, sustainability is achieved when outcomes and impacts (and sometimes activities) are maintained or even expanded after a project withdraws its resources through the exit process (Rogers et al, 2016).

Ensuring sustainability has been a challenging endeavour for most donor funded projects. Compared to other emerging nations, Africa, and more specifically the region south of the Sub Sahara has a higher prevalence of projects that do not meet sustainability standards (Gulali, 2018). The situation is very prevalent in the Tanzanian context. For instance, in Korogwe District, Mjema (2017) examined the level of sustainability of eight implemented agricultural community-based investment sub-projects after donor funding has stopped. Results showed that, except for one sub-project the other seven sub-projects were not sustainable.

According to Muro and Namusonge (2015), community involvement is crucial for a successful and sustainable public development projects. Kilewo and Frumence, (2015) showed that community participation provides local people with a great amount of experience and insights to planning, implementing and monitoring and evaluation of projects. Participation can increase people's commitment to the project. Involving local people help to increase the resources available for projects in a way to bring social learning for both beneficiaries and planners. When assessing community participation and rural water projects' sustainability in Chamwino District, Dodoma, Tanzania, Mgulo and Kamazima (2022) found that lack of community participation, lack of

community support, and involvement at various stages of project implementation from the designing, implementation, operation, and monitoring and evaluation through various village water committees were key factors negatively impacting sustainability of the projects.

Collaboration with the government on the other hand, is one of the keys for NGOs to unlock sustainability. No single organization or sector has the knowledge or resources to "go it alone" (Rajabi, 2021). Leaders from all sectors of society agree that solving sustainability challenges will require unparalleled cooperation. Due to general challenges such as insufficient resources, the services needed by people cannot be provided completely by the NGOs alone. Therefore, nongovernmental organizations-government collaboration, or even collaboration with other actors is considered a common approach in services provision for different communities.

Conversely, a key element in demonstrating sustainability is capacity building for the community to take over immediately after termination of funding from a donor. The study by Mkomangi, Namwata and Masanyiwa (2015) showed that most of the project activities in donor funded rural development projects in Chipanga Area Development Programme, which was sponsored by World Vision Tanzania were not continued as anticipated. This is because, among others, there was inadequate capacity building for the community. Sustainability could be achieved by developing human capacity by training local leaders in relevant knowledge and skills and allowing them assume responsibility as early as possible. This would enable them to gain confidence, influence and control over work strategies and their own personal destinies. When planned with communities in advance, capacity building has proven to contribute to better project outcomes, as they encourage beneficiaries to commit to project sustainability (Anjum, 2021). Without an exit strategy, program transitions are likely to be more haphazard, and project outcomes and benefits are less likely to be sustained. Exit strategy is a plan of action telling how an existing project or programme will withdraw support in

terms of financial and personnel resources without compromising the quality and continuity of the set goals and or objectives.

The literature shows different factors influencing sustainability of projects depending on the context of the project situation. The above have been just highlighted as they are assumed to be applicable in the area of the proposed study. According to the Global Sustainable Development Report (2015), in order for a project to achieve sustainable development from the start, it must acknowledge and integrate the project's social, economic, and environmental concerns to ensure economic and environmental stability. Indeed project sustainability is not a short term assignment, but a continuous process because community projects require strategic management skills (Mutiso & Lilian, 2019). Considering all the above, it is clear that factors influencing sustainability of water projects are still multifaceted. Therefore the current study intended to come up with a deep knowledge of factors influencing sustainability of water projects in Tanzania, taking Babati District as a case study.

1.2 Statement of the Problem

Despite the fact that water is most important for the human being survival still there is low sustainability of water projects in Africa (Molekoa et al. 2021). For the case of Tanzania, most of NGOs have been implementing various water projects across the country but their sustainability is questionable (Ngulo, 2022). Most of the water projects fail to achieve the intended objectives in providing communities with clean and safe water, and ensure functioning of water projects' infrastructures as soon as the projects phase out (Mgoba and Kabote, 2019).

It is not clear why some projects fail to provide services shortly after their completion or the withdrawal of the donor/sponsor while few continue to generate benefits for an extended period of time to the intended beneficiaries. It implies that the projects which could no longer provide services to the beneficiaries are not sustainable. This study, therefore, intents to identify factors that lead to

the sustainability of water projects in Tanzania, taking one phased out water project implemented in Duru Ward in Babati District, as a case study.

1.3 Objectives of the Study

1.3.1 General Objective

The overall objective of this study was to establish factors influencing sustainability of phased out water project in Duru Ward, Babati District.

1.3.2 Specific Objectives

The following specific objectives guided the study:

(i) To examine the influence of community participation on the sustainability of phased out water project at Duru Ward.

(ii) To assess the effect of collaboration with the local government on sustainability of phased out water project at Duru Ward.

(iii) To analyze the effectiveness of community capacity building on sustainability of phased out water project at Duru Ward.

1.4 Research Questions

The study sought to answer the following research questions:

i) To what extent does community participation influenced sustainability of phased out water project at Duru Ward?

ii) How the collaboration with local government influenced sustainability of phased out water project at Duru Ward?

iii) How the community capacity building influenced sustainability of phased out water project at Duru Ward?

1.5 Scope of the Study

This study investigated the factors influencing sustainability of water project implemented at Duru Ward in Babati District, Tanzania which already phased out. Though projects can be sustainable in terms of organizational, financial, and community, the present study considered the category of community sustainability only. The study focused on only three major factors affecting the sustainability of water projects namely, community participation, collaboration with the local government, and capacity building. This provided a researcher a confined area of study which was easy to manage and modest to interpreting the effect of those factors. The study also considered a water project initiated by an NGO in the past five years. Main research respondents among others included the intended project beneficiaries, local government authorities, the NGO which implemented the project and other relevant stakeholders.

1.6 Limitations

Since the study was conducted some years after the phase out of the project, some of the targeted respondents had moved out of the project areas for various reasons. Some of the village leaders who were involved or witnessed the project were transferred to other places or had already retired, some beneficiaries had migrated to some areas, and even some project implementers already shifted to other localities. However, efforts were made to request local leaders to make arrangements that enabled the researcher to meet a good number of respondents for interview.

1.7 Significance of the Study

The study was essential in identifying and realizing reasons for failure of projects to deliver below the expectation after support of donors/sponsors. The findings provide important information that could be used by government, private and nongovernmental organizations in embarking on sustainable water projects. Moreover, the findings would provide important information and knowledge that would guide policy makers for fostering sustainability pertaining to water projects.

Lessons drawn from this study would be employed by CSOs, communities, implementing partners, and donors to address challenges regarding sustainability by better planning for sustainable water projects. The study would offer insight to the organization whose project was covered by this study so as to ensure that future projects are more sustainable.

On the other hand, the study would enable the general Institute of Accountancy Arusha as well as other scholars to reflect to the future studies in the related areas following the gaps to be highlighted. Additionally, the study was a requirement for the researcher as part of fulfillment of an award of Masters of Science Degree in Project Planning and Management at the Institute of Accountancy Arusha.

1.8 Organization of the Dissertation

This dissertation is divided into five chapters each of which is subdivided into sections and sub sections. Chapter one covers the introduction and presents the background to the problem, statement of the problem, objectives of the study, research questions, scope of the study, significance of the study, and the limitations of the study. Chapter two reviews the literature relating to the study while chapter three presents the research methodology; in particular, it describes the study area, research design, data management and ethical considerations. Chapter four presents findings in accordance with the specific objectives that guided the study. The presented findings of each specific objective was followed by discussions. Chapter five, the last one, presents conclusions and recommendations. The chapter also present recommendations, areas for further research, and the critical evaluation of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Chapter Overview

The chapter is a review of literature and indicates how authors and researchers dwell on project sustainability, particularly in the context of community participation, local government collaboration and community capacity building. It includes related theories to the research problem and organized into theoretical and empirical reviews leading to the derivation of knowledge gaps existed in various studies. The study consists of a conceptual framework which shows variables on sustainability of water projects. The chapter, however, starts by defining key words used.

2.2 Definition of Basic Concepts

2.2.1 Capacity Building

Capacity building is the development of human resources (knowledge, skills, individual and group attitudes) for the purpose of developing and managing certain areas in society. According to Laverack (2022) Community capacity building focuses on enabling all members of the community, including the poorest and the most disadvantaged, to develop skills and competencies so as to take greater control of their own lives and also contributes to inclusive local development.

2.2.2. Collaboration in Projects

Johansson (2023) Project collaboration is when a team of people work on the same project to achieve a common goal. They will come together to share skill sets, ideas, resources, and information to complete that project. Collaborative teams may include project management experts, as well as other stakeholders and specialists required to execute a particular project successfully. Depending on their roles and responsibilities, a collaborative project team will be responsible for working together to strategize, plan, execute, monitor, and report on the progress of a project from beginning to end.

2.2.3 Community Based Projects

Community Based Projects are core initiatives for intervention of common problems while enhancing development in most communities. With this in mind, different projects are formulated and carried with different purposes such as ensuring clean water supply, improving community health, reducing poverty, promoting human rights and peace, managing natural resources, climate change adaptation and many more. These projects work to provide solutions and hope to communities in need such as rural areas where majority of population in developing countries dwells (Oino, 2015).

2.2.4 Empowerment

According to Slocum et al (2014), empowerment is the process with which communities, local groups and normal citizens identify and modify their daily lives and the society where they live. It is a degree of measure of people's ability to bring about change that is very much concerned with assessing and addressing the dynamics of repression and helping individuals and group of individuals to play a very important role in making decisions for their benefits. On the basis of community development projects, empowerment can be defined as the process with which individuals are able to influence and organize change based to their access to decision making, exchange of knowledge, control of financial matters and proper allocation and utilization of resources

2.2.5 Participation

According to World Bank learning group on participatory development, participation is defined as the process with which various stakeholders influence and share control on development initiatives, resources and decisions that affect them (World Bank, 2016).

2.2.6 Sustainability

Sustainability can be defined differently based on various contexts. In community development projects, sustainability is referred as the continuation of benefits for a long duration of time after technical, managerial and financial assistance from donors, development partners or sponsors have been withdrawn (Brikke, 2015). This explanation shows that community development projects must have continuous benefits for current and future use and members of the responsible community should be responsible for the security and operation of project infrastructure. For the case of water projects, sustainability is all about continued accessibility to water with the same quantity and quality as designed (CDMT, 2018).

2.3 Theoretical Framework

The theories that underlie this study include the Stakeholder Theory, Social Cognitive Theory, and Empowerment Theory, which are discussed below in details.

2.3.1 Stakeholder Theory

Stakeholder theory has its origin in the year 1984. At that time, stakeholder was defined as “any group or individual who can affect or is affected by the achievement of the organization’s objectives”. Stakeholder theory is based on the assumption that businesses can only be considered successful when they deliver value to the majority of their stakeholders. It goes hand-in-hand with Corporate Social Responsibility and, therefore, sustainability as well. That means, profit alone cannot be considered the only measure of business success, and value creation is not just about money.

Stakeholder theory is widely applicable and can be used in many key fields such as project management, strategic management, and business ethics. In the projects context, stakeholder theory suggests that in order for any project at any organization to succeed and be sustainable, stakeholders should be involved in all stages of project life cycle. Bal *et al*. (2013), identified six steps to a stakeholder engagement process: (i) Project identification; (ii) Relating stakeholders to

different sustainability-related targets; (iii) Project prioritization; (iv) Project management (v) Measuring performance; and (vi) Putting targets into action. Further, Diego *et al* (2018) reviewed the literature on stakeholder theory in project management during the past nine years, and provided a comprehensive view of how the stakeholder theory has an influence on sustainability.

Failure to involve stakeholders in project development makes lack of ownership leading to poor performance of the projects. The theory was used in the present study to look at the way the above steps were applied to the stakeholders (in this case the community) at the water project in Duru ward in Babati District.

2.3.2 Social Cognitive Theory

Social Cognitive Theory (SCT) started as the Social Learning Theory (SLT) in the 1960s and developed into the SCT in 1986. It is an interpersonal level theory developed by Albert Bandura that emphasizes the dynamic interaction between people (personal factors), their behavior, and their environments. To explain behaviour performance the theory uses self-efficacy and outcome expectancies concepts. Self-efficacy is about how people can put forth efforts and endure challenges. Outcome expectancies relate to how people decide to act or not, based on the evaluation of a phenomenon's likelihood to occur and its relative value. The SCT postulate that everyone has the potential to succeed, if they are given the right opportunities to pursue their objectives, but it also contends that there are limits to what a person can achieve individually or collectively.

In the context of this study, it is argued that when project implementers build the capacity to undertake project activities they enhance their self-efficacy and outcome expectancies. Here self-efficacy refers to the capability to engage in project-initiated activities and address emerging challenges. Outcome expectancies refer to value judgment based on positive expectations of the behaviour, which must outweigh the negative expectations. It is determined, therefore, that the

levels of self-efficacy and outcome expectancies compromise the extent of engaging in a project and the resulting benefits. The likelihood to engage in activities is similarly high where the project benefits are perceived to be high. In contrast, the possibility of engaging in project activities is low when the benefits are perceived to be low, which compromises the likelihood of local benefits sustaining their engagement in project-initiated activities. Therefore, SCT provided a framework for ascertaining whether local beneficiaries' level of engagement in project activities was affected by project benefits in terms of outcome.

2.3.3 Empowerment Theory

The empowerment theory by Perkins and Zimmerman (1995) connects individual well-being with the larger social and political environment, and suggests that people need opportunities to become active in community decision-making in order to improve their lives, organizations, and communities. As such, the theory uses intervention methods to help guide people towards building autonomy and control in their lives. Empowerment is a process through which people lacking an equal share of valued resources gain greater access to and control over those resources. It is a process by which people gain control over their lives, democratic participation in their lives and a critical understanding of their environment (McLaughlin, 2016). Theories of empowerment include both processes and outcomes, suggesting that actions, activities, or structures may be empowering, and that the outcome of such processes result in a level of being empowered (Fetterman and Wandersman, 2014). Empowering processes for individuals might include participation in community organizations. At the organizational level, empowering processes might include collective decision making and shared leadership. Empowering processes at the community level might include collective action to access government and other community resources.

Empowerment suggests that participation with others to achieve goals, efforts to gain access to resources, and some critical understandings of the sociopolitical environment are basic components

of the construct. As an implication for community empowerment theory, an analysis done by Mohammad and Noraini (2014), showed a positive significant relationship between community empowerment and sustainability, on one hand, and between community empowerment and sense of community, on the other hand. This suggests that community empowerment is an important construct in measuring sustainability of community-driven projects. The construct of community empowerment measures the community participation, community capacity building and community access to information. Consequently, it is not surprising that members with better capacities and access to timely information would be animated by a higher sense of community and would contribute significantly more to the sustainability of community-driven projects.

2.4 Empirical Literature Review

Recent studies of development food security activities observed that impact at the time of project exit does not necessarily predict longer term benefit, implying that impact evaluations do not always provide a complete picture of long-range project effects (Coates et al., 2016; Rogers et al., 2017; Rogers and Coates, 2015). Understanding what activities, outcomes, and impacts persist after donor resources are no longer provided is critical to ensuring durable, resilient, and effective development.

Over 30 years Zambia has been implementing three robust social investment projects through Community Driven Development (CDD) approach with the aim to empower local communities. However, due to inadequate government counterpart funding and lack of community maintenance of the post project facilities, the benefits of the projects could not be sustained when funding for the same ended. As a result, the social investment project infrastructures achieved remain “white elephants”, and to-date, beneficiaries are daunted by poverty and food insecurity (Lungo et al., 2017).

Kaimenyi and Wanyonyi (2019) examined the factors influencing sustainability of community based county projects in Kenya. The study found that community participation influences sustainability of community based county projects. Other factors found to influence sustainability are capacity building so as to empower the community to solve their own problems; utilization of local available resources instead of overreliance on donors which leads to a dependency syndrome; and progress reporting which enhances transparency and accountability.

Alelah and Mueke (2017) in their study of the influence of community participation on sustainability of the water project in Kenya found that community participation has a significant influence on project sustainability. Active involvement by the community led to success of the water project. Moreover, community participation is enlightened about the importance of their engagement in identifying and resolving matters that affect them which are geared towards sustainable development. Bakari and Said (2018) examined the challenges and opportunities emanated from community participation drawing example from the 15 sub-projects selected in TASAF II national project in Bagamoyo District, Tanzania. The finding from this study indicated that community participation is important in monitoring and evaluation given that they contribute to the sustainability of the sub-projects.

Mlage (2014) assessed the sustainability of farmer groups investment sub-projects in Morogoro District, Tanzania. It was found that sustainability of farmer groups requires empowerment of local communities so that they can plan for their development to ensure commitment and feel a sense of ownership, which ensures social, economic and environmental sustainability. Conversely, Samata (2019) assessed the factors influencing community participation in Participatory Agricultural Development and Empowerment Projects (PADEP). Based on the results, the level of community participation was low especially at identification and designing stages and most activities were performed by very few people. This led to the unsustainability and lack of ownership of the projects.

As for collaborations, in Cabo Verde, it was found that when the government joins hands or links with other institutions and CSOs to implement education policies, they generate societal linking social capital, widespread institutional mutual trust, shared understanding, and norms, which are responsible for their commitment to work together and achieve common policy goals. Thus, societal linking social capital, as a shared resource employed in the education policy process, influences its outcomes (Lopes, 2022).

Abiddin *et al.* (2022) examined the role and impact of non-governmental organizations in Malaysia towards Sustainable Community Development. It was found that sustainable community development is not a one-time effort but it is vital to engage other stakeholders to further ensure the effectiveness of this effort.

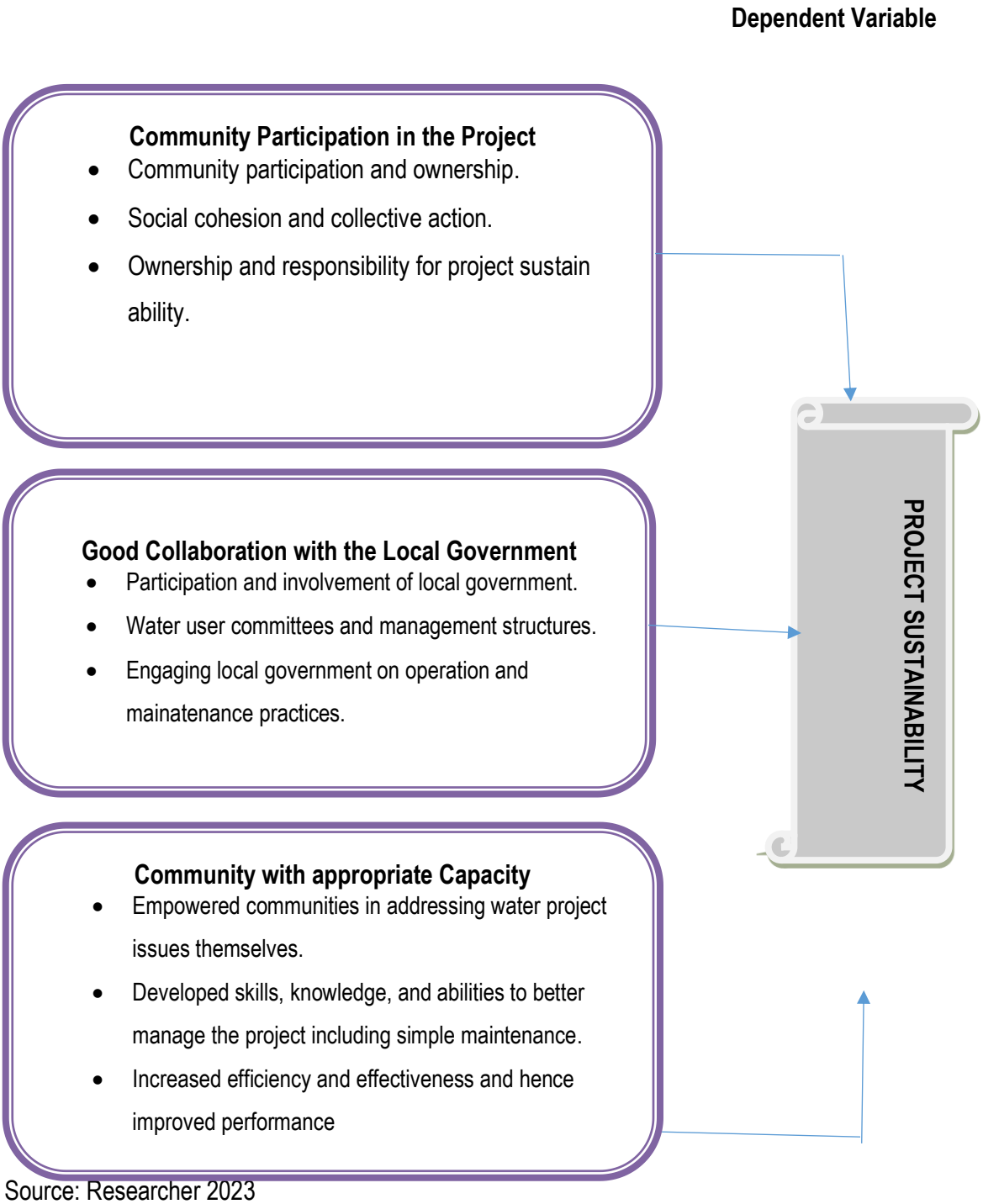
The study by Mkomangi, Namwata and Masanyiwa (2015) showed that most of the project activities sponsored by World Vision in Tanzania (WVT) were not continued by the local institutions to which were phased over. This is because of the low capacity of the community to manage continuation of the projects.

2.5 Knowledge Gap

A review of the literature shows that most studies (see, for example, Martens & Carvalho, 2017) about sustainability tend to consider factors for sustainability in general terms. Only a few are focused on community water projects (Maijo, 2020), which was the focus of this study. The impact of non-governmental organizations in collaborating with the government has been dwelled on very little. Moreover, in most studies, community capacity building before project completion that contribute to sustainability have been rarely considered throughout most studies. In Babati District in particular, by then there was no any study conducted on sustainability of water projects. Using phased out water project at Duru Ward, the present study intended to close this gap by analyzing factors influencing sustainability of water projects.

2.6 Conceptual Framework

Figure 2. 1: Conceptual Framework
Independent Variables



Source: Researcher 2023

Figure 1 assumes that sustainability of projects is promoted through more rigorous participation of the community in the project, including project formulation and in monitoring and evaluation (not only in implementation); good collaboration and networking with the respective local government; and beneficiaries (in this case the community) with appropriate capacity to proceed with interventions. This forms the independent part of the variables. It was assumed that having all these requirements in place would lead to the maintenance of project dynamics and in turn lead to continuous accessibility to project services by the beneficiaries after project phase-out and even increased intervention area or scale up of interventions in the former area. All these were then considered as pillars of project sustainability.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter on research methodology describes the research area of the study, research design, research approach, population of the study, the sample and sampling procedures. The chapter also discusses about data collection methods and tools which were employed in answering the research questions, and data analysis on sustainability of the water project at Duru Ward.

3.2 Study Area

The study was conducted at Duru Ward in Babati District, Manyara Region where both agriculture and livestock enterprises play a significant role to the economy of the people. Babati District is situated between latitudes 3^{o} - 4^{o} South and longitude 35^{o} - 36^{o} East. It is one of the seven districts of Manyara Region, which was divided from Arusha Region in 2002. It is situated in the Rift valley of Northern Tanzania, some 172 km south of Arusha City. According to the 2022 Population and Housing Census, the population of Duru Ward was 12,609 (male 6,466, female 6,143). Duru Ward was selected for this study because is one of the areas of newly established Manyara Region, with an influx of NGOs running community projects, water being among the main community's needs.

3.3 Research Design

Descriptive research design was deployed in this study as it would help to describe the factors influencing sustainability of water projects. Trochim *et al*. (2015) highlighted that descriptive survey design is one of the best designs for describing situation without manipulation. Therefore it concerns with the collection of data and description of events as they exist without manipulation of any kind. The design was preferred because of its strength and therefore would help the researcher to revile the truth about the variation in research.

Descriptive research provides a comprehensive picture of the characteristics, behaviors, and attributes of a particular population or phenomenon, which can be useful in informing future research and policy decisions; it allows for a wide range of data collection methods; and it is less expensive and less time-consuming than other research methods.

3.4 Research approach

This research covered a combination of quantitative and qualitative methods of data collection and analysis, undertaken to measure key conditions of sustainability. According to Creswell (2014), this mixed method provides a more complete understanding of a research problem than either approach alone. The approach allows data collection at a single point of the study in one time. Moreover, the case study covers small area and hence helps to deeply understand the magnitude of the problem of concern. The findings thus apply to the study area at the particular time that the study was undertaken. The factors influencing sustainability do not change rapidly and thus time allocated for doing research might not change the variables. The units of analysis were the selected households in Duru Ward, beneficiaries of the water project.

3.5 Targeted population

The target population in this study was the 100 households distributed in the villages of Yeratonok and Endagwe at Duru Ward which were the beneficiaries of the water project implemented by Friends in Development (FIDE), a local NGO in Babati District between 2016 and 2019. The project was funded by Helfen Durch Teien (HDT) based in Austria. The households were the sampling unit because they are the basic unit for resource management, production, and consumption at the micro level. Others included the committee members of the water project and the respective local

government authorities. These groups were involved in order to get information that could be triangulated for confirmation.

3.6 Sampling strategies

The study used both random and purposive sampling techniques to select the study sample. Random sampling was employed to get households where one person would be interviewed (preferably one of the parents). Similarly, random sampling was employed to obtain sub villages. On the other hand, purposive sampling was used to get three local government authorities for interviews (1 at ward and 2 at village levels) and five FIDE staff including the Director/Coordinator. For FGDs a homogeneous random sampling technique was employed as it aims to achieve a homogeneous sample; that is, a sample whose units share the same (or very similar) characteristics or traits**.** As such a group of 10 men, women, and youth were obtained at each village. In addition five water committee members were involved in FGD in each village. The sample size of households at 5% level of significance was involved in household interviews computed making use of the Taro Yamane's (1967) formula which is:

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

Where,

n = the sample size

N = the population size (total number of households in project area)

e = the acceptable sampling error

A 95% confidence level and p = 0.5 are assumed. A margin of error (acceptable sampling error) = +/- 5% (or 0.05).

n = 200

$1 + 200\ (0.05)^2$

n =133 households

However, due to time constraints, it was assumed that a coverage of 100 households would be a representative sample.

3.7 Data collection methods

The research applied the following data collection methods: household survey, key informant interviews, focus group discussions and direct observations. Each of the methods together with respective data collection tools is hereunder explained:

3.7.1 Household survey

Quantitative data were collected mainly through household survey. The method involved a researcher going to the respondent household and asking him/her questions face to face. The questionnaire was administered to the project beneficiaries to uncover the extent to which they participated to the project and the present sustainability levels, that is their perception of sustainability, institutional arrangements for the management of the water project, and institutional factors influencing sustainability of the project. Both open and closed–ended questions were included in the questionnaire.

3.7.2 Key-informant interviews

Key-informant interviews were conducted with local government authorities, staff of the local organization involved in the phased out project (FIDE), and the FIDE project director/coordinator. Major themes in the interview guide were: involvement of stakeholders, how the community valued project activities, the extent of project ownership by the communities, if community members had the knowledge and skills needed to implement the project activities, if the local organization implemented the phased out activities had sufficient institutional and human resource capacity, effectiveness capacity building to the communities, collaborations with the local government, etc.

3.7.3 Focus group discussions

Focus group discussions were conducted with homogeneous groups of community members (i.e. men, women, and youth differently) and with village water committees. The same themes as for the key-informant interviews were covered. Because focus groups are structured and directed, but also expressive, they can yield a lot of information in a relatively short time. Nonverbal communications and group interactions were also be observed. Focus groups can therefore get closer to what people are really thinking and feeling. Moreover, group members can often stimulate new thoughts for each other, which might not have otherwise occurred.

3.7.4 Direct Observations

An observation guide was prepared in advance in order to observe the prevailing situation in the communities. The aim was to have results that are realistic. Under this method the researcher undertook systematic observation, recording, description, analysis and interpretation of phased project interventions. The researcher as well observed physical conditions, accessibility to water and functioning of water facilities while learning other behaviors portrayed.

3.8 Pilot study

Before the actual data collection, the tools used were pre-tested in one sub village (not sampled for the study). The purpose for this pre-testing was to give the researcher a practical insight of the tools, that is, to estimate the time taken per tool, the flow of questions and data fields, as well as possible misinterpretation of questions in the tool. Pre-testing feedback was then compiled and corrections made.

3.9 Data Analysis

The collected data were edited for consistency and proper recording. The information was then punched in the computer using Statistical Package for Social Sciences (SPSS) for household

interviews. Qualitative information was transcribed. As such there was one script for each focus group discussion and key informant interview conducted. The detailed analysis procedure was as explained below:

3.9.1 Measurement of Sustainability

Measurement of sustainability was conducted to determine whether or not the implemented water project was sustainable. The sustainability criteria were effectively considered to separate sustainable outcomes from unsustainable ones as asserted by Pope *et al*. (2017). This was computed using Sustainability Index (SI). The SI was constructed using four sets of indicators as adopted but modified from Mjema (2017) as follows: (1) the continued delivery of services and benefits (adequate water supply), (2) the maintenance of water infrastructure, (3) continuation of project activities since the donor support stopped and (4) continued support to the project (e.g. community contributions). A checklist was developed to ensure that no major aspects of sustainability were overlooked.

The calculation of the project sustainability score was done by assigning each question seeking information for any indicator a score based on a five points scale – (1 = "Very Poor", 2 = "Poor", 3 = "Average", 4 = "Good", and 5 = "Very Good"). The scores recorded for all questions relating to a given indicator were summed up and the result divided to the respective number of questions so as to get an average score for that particular indicator. Finally an average score for the four indicators was computed representing the final sustainability score of the project. The project was then ranked and classified according to its sustainability score into unsustainable (score < 2.5 or percent < 50%) or sustainable (i.e. score > 2.5 or percent > 50%).

3.9.2 Measurement of Community Participation (Specific objective 1)

In analyzing specific objective one, frequencies and percentages of responses for a series of questions with strongly disagree; disagree; neutral; agree; and strongly agree options intended to capture the level of community participation, were computed using the Statistical Package for Social Sciences. This revealed percentage community participation at each stage of the project cycle. Through cross-tabulation, the percentage of community members involved in two, three or even all the four phases of the project cycle was revealed. Finally, the results were compared with the sustainability index obtained in order to determine whether the community participation had an influence on project sustainability or not.

3.9.3 Analysis of Collaboration with the Local Government (Specific objective 2)

Information regarding collaboration with the local government was captured through interviews with local government authorities and staff and coordinator from the phased out water project, the information obtained was subjected to content analysis. Generally the following steps were involved: understanding the data through reading and re-reading the text (script) while writing any impressions noted; categorizing the information by identifying themes or patterns (ideas, concepts, behaviours, interactions, incidents, terminology or phrases used); identifying connections within and between categories (capture similarities and differences in groups' responses within a category; and finally interpretation of the information (bringing it all together) based on patterns and trends of information gathered. As for data from household questionnaire regarding collaboration with the local government, frequencies and percentages of responses were produced as explained in the analysis of specific objective one.

3.9.4 Analysis of Community Capacity Building (Specific objective 3)

Through several questions in the household questionnaire and focus group discussions, the study was able to capture if the community was trained in order to build their institutional capacity at the local level with regards to realizing long term benefits as per research specific objective three. Questions for the household questionnaire were analyzed through descriptive statistics using SPSS in order to obtain frequencies and percentages for individual variables. These were summarized and tabulated. Content analysis was utilized for FGD information. Ultimately, comparisons with the obtained sustainability index was made in determining existence of any relationship.

3.10 Validity and Reliability

To enhance the validity and reliability of then data and methods, the researcher used multiple sources and methods of data collection and analysis to triangulate and cross-validate the results.

3.10.1 Validity

In ensuring internal validity the measurement techniques were of high quality and targeted to measure exactly what was required. In this case, the questions were carefully and precisely worded. However, the study does not guarantee external validity because usually a single case study (like the present proposed research) has often been criticized on the grounds that its findings are not generalizable, especially by comparison with those of survey research (Ahmad *et al*, 2023). Generalizing is difficult or impossible because one person or small group cannot represent all similar groups or situations.

3.10.2 Reliability

Reliability ws considered throughout the data collection process. When a tool or technique is used to collect data, the researcher ensured that the results are precise, stable, and reproducible. For instance, in conducting interviews or observations, the researcher clearly defined how specific

behaviors or responses will be counted, and made sure questions are phrased the same way each time. On the other hand, during data collection the researcher kept the circumstances as consistent as possible to reduce the influence of external factors that might create variation in the results.

3.11 Ethical Consideration

Ethical issues were taken into account during data collection. When the researcher arrived at every village of study he sought permission from the respective authorities to talk with the intended respondents besides the already acquired research ethics clearance from the appropriate board. No respondent was forced to provide information for the research. The research objectives were clearly explained to all the respondents before gathering data from them. Thus, verbal consent of the respondents was taken before collecting data. The researcher was highly committed to the respondents to keep privacy of their information and source of data and also put heartiest endeavor to be unbiased in collecting data. The research report did not reveal the identity of the respondents, as per the Research Policy and Standards.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents research findings and discussions on the factors influencing sustainability of water projects in Tanzania, taking Babati District in Manyara Region as a case study. It consists of response rate, demographic and socio-economic characteristics of the respondents, presentation and discussions of the findings related to the study specific objectives. The general objective was to establish factors influencing sustainability of the phased out water project in Duru Ward, Babati District.

4.1 Response Rate

This research targeted 100 households in Yeratonok and Endagwe Villages (50 in each village) at Duru Ward for quantitative data (household survey); while qualitative data were expected from three sampled respective local government authorities and five staff from FIDE, the local organization involved in the phased out project, for key informant interviews. The study as well targeted groups of men, women and youth each constituting 10 people in each village and five water project committee members in each village for focus group discussions. However, due to various reasons and especially people being in the farms for all day long to make preparations before the El Nino rains, all the expected respondents could not be reached for the household survey. As such, for all the methods applied, a total of 151 respondents were covered as indicated in table 1.

For household survey, a total of 73 questionnaires were administered to the respondents and well completed. This resulted in a response rate of 73.0%. According to Welch and Barlau (2013) a response rate approximating 60% for most research should be the goal of researchers and certainly

are the expectation of the Editor and Associate Editors of the journals. For qualitative data there was enough representation of the required respondents as planned.

Table 4. 1: Number of respondents involved in the research

Methods	Frequency		Total
	Male	Female	
Questionnaire with parents	35	38	73
Focus group discussions with communities	28	32	60
Focus group discussions village water committees	6	4	10
Interviews with local government authorities	2	1	3
Interviews with FIDE staff	2	3	5
TOTAL	**73**	**78**	**151**

Source: Researcher (2023)

4.2 Demographic and Socio-economic Characteristics of the Respondents

The demographic and socio-economic characteristics of respondents which were considered important to the study included: sex, age, marital status, level of education and occupation. These characteristics were relevant to the study because they helped in drawing analysis in their endeavors to acquire essential needs including water.

4.2.1 Sex of the respondents

It can be deduced from table 2 that there was more or less an equal representation in terms of sex as male constituted 47.9% and female 52.1%. This was a result of randomly sampled households but not that it was intended to have equal number of female and male. Sex determines the responsibility of the individual for the economic wellbeing of the household. In gender perspective, women relative to men are involved in handling water issues at household level.

Table 4. 2: Socio-demographic characteristics of respondents

Characteristics	Frequency	Percentage
Sex of respondents		
Male	35	47.9
Female	38	52.1
Age group (years)		
25 – 39	24	32.9
40 – 49	33	45.2
50 and above	16	21.9
Marital status		
Single	19	26.0
Married	44	60.3
Widowed	7	9.6
Divorced/Separated	3	4.1
Education level		
No formal education	10	13.7
Primary	53	72.6
Secondary	10	13.7
Sources of income		
Farming	65	89.0
Livestock keeping	3	4.1
Business	5	6.9

Source: Researcher (2023)

4.2.2 Age distribution of respondents

The mean age of the respondents was 43 years, with a range of 25 – 62 years. Majority of the respondents (45.2%) were in the age group of 40 - 49 years, followed by respondents in the age group 25 - 39 years (32.9%). On the other hand minority (21.9%) were in the age group 50 and above. The age distribution obtained at the two villages of Duru Ward may provide an impression that majority of the adult population by then residing in the villages was at the age between 33 and

49 years (68.5%). This age group is likely participating much in the water project. Literature shows that age is an important demographic factor when determining economic status of a household (Bakari *et al*., 2016).

4.2.3 Marital status

Data obtained in table 2 further indicates that 60.3% of the respondents who are the majority were married, followed by 26.0% who were single. The findings are more or less similar to those in the Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS) of 2022 which reported that 61% of women and 51% of men are married or living with someone as if married while 27% of women age 15–49 have never been married, compared with 44% of men (URT, 2023). Additionally 9.6% of the respondents in this study were widowed, while 4.1% were either divorced or separated. The findings also somehow agree with the Tanzania National Panel Survey of 2020/2021 which showed that separation increased from 3.8% to 5.0% (NBS, 2022). It is assumed that households with married couples may provide more manpower than single, divorced and widowed households in activities to be undertaken in the water project.

4.2.4 Level of education of respondents

The levels of education of the respondents as presented in table 2 indicate that 72.6% had attained primary education. This level was higher than 53.8% of the heads of households who had primary education in 2022 TDHS (URT, 2023). Furthermore, 13.7% of the respondents had no formal education. This percentage is almost the same as 13.1% reported in the TDHS of 2022. Moreover, 13.7 of the respondents had secondary education which far lower than 33.2% found in the 2022 TDHS. None of the respondents had a tertiary educational level. It is important to understand educational levels of the respondents as this might influence the implementation of the water project, especially in designing the trainings.

4.2.5 Sources of income

The sources of respondents' income can be used to determine the livelihood level of community members in that particular location. The categorization of respondents by main source of income revealed that 89.0% were depending on farming, 4.2% mainly earned their income through livestock keeping and 6.8% were depending on different businesses. Being aware of sources of income of the community is crucial as it may determine the extent to which the population depends on water resources. Moreover, as respondents from different sources of income were covered, the findings provided were more relevant and reliable and can be used to conclude about the study topic. It can also be concluded that; since the researcher employed different respondents with different categories of occupation status; the findings provided were relevant and reliable and can be used to conclude about the study topic.

4.3 Sustainability Index

The sustainability of the project was computed using Sustainability Index (SI). The SI was constructed using four sets of indicators as adopted but modified from Mjema (2017) as follows: (1) the continued delivery of services and benefits (adequate water supply), (2) the maintenance of water infrastructure, (3) continuation of project activities since the donor support stopped and (4) continued support to the project (e.g. community contributions).

Table 4. 3: Water project's sustainability indices for given indicators

						Indices	Total
Rating: 1=Very Poor, 2=Poor, 3=Moderate, 4=Good, and 5=Very Good	**1**	**2**	**3**	**4**	**5**		
A. Continued delivery of services and benefits							
A-1 Continued access to quality and adequate water since the donor support stopped	0.000	0.000	1.809	1.588	0.000	3.397	
Average sub-index A						**3.397**	
B. Maintained water infrastructure							
B-1 Maintenance of the laid water infrastructure	0.000	0.410	1.440	1.260	0.000	3.110	
B-2 Condition of the laid water infrastructure	0.000	0.684	1.194	1.040	0.000	2.918	
Average sub-index B						**3.014**	
C. Continued project activities since the project phase out							
C-1 Awareness of community roles and responsibilities in relation to project implementation	0.000	0.136	2.055	0.988	0.000	3.179	
C-2 Technical skills and ability by community members to operate and manage their water project	0.000	0.000	1.602	1.588	0.340	3.530	
C-3 Community involvement in project maintenance and repair	0.000	0.136	2.013	1.044	0.000	3.193	
C-4 Functional water committee with basic knowledge and skills on their roles in project implementation	0.000	0.410	1.770	0.820	0.000	3.000	
Average sub-index C						**3.226**	
D. Continued support to the project							
D-1 Community financial contribution towards project activities	0.000	0.136	2.592	0.272	0.000	3.000	
D-2 Provision of resources such as staff, expertise, and funding by the local government	0.000	0.410	2.016	0.492	0.000	2.918	
D-3 Commitment of the village water committee towards implementation of the project	0.000	0.274	1.563	1.368	0.000	3.205	
D-4 Transparency of the village water committee	0.000	0.822	0.822	1.260	0.000	2.904	
D-5 Accountability of the village water committee	0.000	0.410	1.644	0.988	0.000	3.042	
Average sub-index D						**3.014**	
Average sustainability index for the 4 indicators (final sustainability score of the project)						**3.163**	

Source: Researcher (2023)

From table 3 it is generally deduced that none of the respondents rated an achievement of any indicator as very poor. With an exception of the indicator on continued project activities since the project phase out, other indicators were not rated as very good in any of their sub-indicators. For all indicators, the achievements of most of their sub-indicators were rated as moderate; and there was a remarkable "poor" rating concerning the transparency of the village water committees. The overall sustainability index for the project is 3.163 (> 2.5 or percent > 50%) indicating that the project was sustainable by around 63% which can be considered as moderate. Moreover, there was no significant difference in sustainability index scores among the four indicators since the range was between 3.014 and 3.397, in other words, between 60.28% and 67.94%. The indicator on the continued delivery of services and benefits (adequate water supply) scored the highest (67.94%) followed by continuation of project activities since the donor support stopped (64.52%). Both the indicators on the maintenance of water infrastructure and continued support to the project scored 60.28%. The relatively low score for the two indicators were attributed to just a normal level of the laid water infrastructure and inadequate transparency of the village water committee towards implementation of the project respectively. To some extent this was also attributed to low provision of resources such as staff, expertise, and funding by the local government. Contrarily, the household survey showed that 86.3% of the households contribute in kind or cash for implementation and maintenance of the water project.

The project sustainability level was justifiable by findings from focus group discussions which involved community members (men, women and youth differently). It was uncovered that since the project phase out activities continued albeit at low pace and households had access to water though not all water points were functioning. In general the leadership (the project was integrated to RUWASA) made the project somehow function well despite the fact that a number of community members were reluctant to contribute to the project especially in monetary manner, something that

made the project not to function properly. It was also discovered that some community members were just leaving their animals to just roam freely outdoors and thus damaging the water infrastructure. In addition, some members of the community were deliberately cutting water pipes so that their livestock could get water easily. This was more evident in the village of Endagwe where the water project started. Village governments never contributed to the project in terms of staff or financially. The village governments just played the role of advising the village water committees on how to manage the project.

Having discovered that the accessibility to water is becoming worse as the days were passing on, the village governments contacted the district administration and then a solution was found where the project was integrated to the management of Rural Water Supply and Sanitation Agency (RUWASA). This is a newly formed and centrally managed Tanzanian Government agency with the responsibility for rural water planning and governance. Initially the responsibilities for rural water investment was under the local government authorities. The agency was established in by the National Water Supply and Sanitation Act, 2019. The Act provides the legal framework and policies for urban, peri-urban, and rural water, sanitation, and hygiene service delivery and regulation. Among others, RUWASA is responsible for overseeing provision of water supply and sanitation services in rural areas through monitoring and regulations of Community Based Water Supply Organizations (CBWSOs). The CBWSOs are the basic units responsible for management of water supply and sanitation services in rural areas under the general coordination of RUWASA. The CBWSOs help community members gain valuable technical skills and ensure that their water points are well maintained and operational throughout the year. They also set affordable tariffs and maintain cash books.

The CBWSOs replaced the Community-owned Water Supply Organizations (COWSOs). CBWSO can be either a Water Consumer Association, a Water Trust, a Cooperative Society, a non-governmental organization (NGO), a company, or any other body as approved by the Minister (REAL-Water, 2022). From the moment the project was undertaken by RUWASA, the availability of water improved gradually and as of the moment this study was conducted the communities were experiencing adequate water supply nearly to when the donor was still supporting the project. However, according to Allegretti and Greene (2022) the new centralized approach limits community participation that enables integration of local knowledge and priorities into the planning process. Yet this kind of project sustainability is supported by findings of the study by Distanont *et al*., (2018) who explored the key factors affecting community water resource management in the southern part of Thailand. The results of the study show that collaboration among government agencies, communities and other institutions such as universities is an important element to drive community water resource management toward sustainable development. However, the endeavor should be driven from the community level by creating community ownership. The government agencies and other institutions play a partnership role in supporting the community in terms of transferring knowledge, giving advice, supporting management-related issues, and coordinating with water management officials and other government agencies. This interaction can transform the concept of community water resource management into real practice and create sustainable development for the community.

A study by Rajabi et al. (2021) also supports that projects should be integrated within the normal government system for them to continue in the long-term. However, the process of integration should be carried out gradually so as to enable them to ensure that they retain a major role in managing the projects and can continue to respond to community needs. The study also showed

that senior officials became more interested and involved as the projects start to produce outputs which meet their goals. Together with their proven success, this will enable them to ensure that they retain a major role in managing the projects and can continue to respond to community needs.

4.4 Community Participation in the Water Project

Respondents were asked to indicate the extent to which they agree with eight actions depicting community participation in their water project. The level of agreement was rated in which 1 represented “Strongly Disagree”; 2 was “Disagree; 3 “Neutral”; 4 “Agree” while 5 signified “Strongly Agree”. The participation index for each community participation action rating was calculated by taking the percentage response of the respective score multiplied by its corresponding rating value (appendix 7).

The total participation index for each community participation action was calculated by adding up the respective individual rating indices for “agree” and “strongly agree”. There was no any respondent appraised any action as “strongly disagree” or “disagree”, but also the indices for “neutral” were left out as they signified nothing in the assessment. Then the percentage participation of each action was calculated by dividing the total index of each action by five (5) which is a maximum index value. Finally, the average index and ultimately average percentage for all community participation actions were computed. (Table 4).

Table 4. 4: Community participation indices and percentages for given project actions

Actions	Index	Percentage
The community members participated in the designing and planning of the project.	2.476	49.520
The needs of the community were assessed during project initiation	3.248	64.960
There were sessions of sensitization meetings between the community members and FIDE on the project activities.	3.303	66.060
Community members participated in implementation of the project.	3.303	66.060
Community members regularly attended the meetings of the project and their opinions considered	3.575	71.500
The beneficiaries joined in the monitoring of the project activities.	2.963	59.260
Community members participated in the evaluation of the project results.	2.687	53.740
The outcomes from the project have benefited the community.	3.906	78.120
Average	**3.183**	**63.660**

Source: Researcher (2023)

Table 4 shows that for all assessed actions/activities, the community participation in the water project is appraised at approximately 64%. This shows that besides this attractive percentage, yet a large number of community members (36%) did not participate in their water project. This level of participation is backed up by other questions asked in the household questionnaire in which 54.8% of the households participated in the conception and design of the water project. Out of these, only 13.7% considered the level of participation as good, while most of them considered the level of participation as either poor (39.7%) or just fair (46.6%). None of them considered the level of participation as excellent. Contrarily, 72.6% of the respondents participated in the implementation of their water project. Out of these, 60.3% considered the level of participation as fair, 27.4%

considered it as poor and only 12.3% perceived the participation level as good. Similarly, none considered the level of participation in the implementation as excellent.

The study by Mwiru (2015) showed that low participation may influenced by lack of trust to their leaders, lack of accountability and transparency to the side of leaders, ignorance among community members and misuse of public funds done by leaders. Indeed the present study established that as regards project sustainability, the maintenance of water infrastructure and continued support to the project scored relatively low (60.28%) because of inadequate transparency of the village water committee towards implementation of the project, among others. On the other hand the water committees in each village ensure that water sources are protected, water infrastructures like water tapes are not destroyed and mobilize villagers to provide their contributions in the water fund.

Referring to the previous section, the sustainability of the project was found to be around 63%. This denotes that the sustainability of the project is almost directly proportional to the level of community participation. In other words, as regards the study specific objective one, community participation directly influenced the sustainability of phased out water project at Duru Ward. The findings are supported by the study by Temba (2015) who found that stakeholders' participation in various forms including resource mobilization, setting standard for monitoring project success, material contribution, advocacy, lobbying, and information giving and consultation promote project sustainability. Further, the strength of stakeholders' participations in promoting project sustainability was portrayed in effective utilization of local knowledge and skills in project activities and use of local resources and materials. Moreover, the Tanzanian Water Supply and Sanitation Act (2019) which stipulates the importance of community participation during project implementation from planning to operation and maintenance stage. The study conducted in Dodoma by Mgulo and Kamazima (2022) concluded that majority of water projects in rural communities in developing

countries come in the form of one-off investment programs with a specified duration such as three to six years. This contributes much to the prevailing pattern where NGOs ultimately hand over the management, operations, and maintenance functions entirely to the beneficiary communities. Therefore, for the project to be sustainable, even after the hand over all the management, operations, and maintenance functions to the beneficiary communities, the communities should entirely contribute from the designing, assessment, analysis, implementation of the project, security of the completed project, maintenance, and servicing of the project.

The above allegation also applies to the researched project as FIDE, the NGO which was implementing the project, later handled it over to the community which became sluggish in operation until the project was handed over to RUWASA. This happened partly because the community was not well prepared to take over in terms of implementing the project especially in maintenance and servicing as one woman from Endagwe Village narrated during focus group discussions:

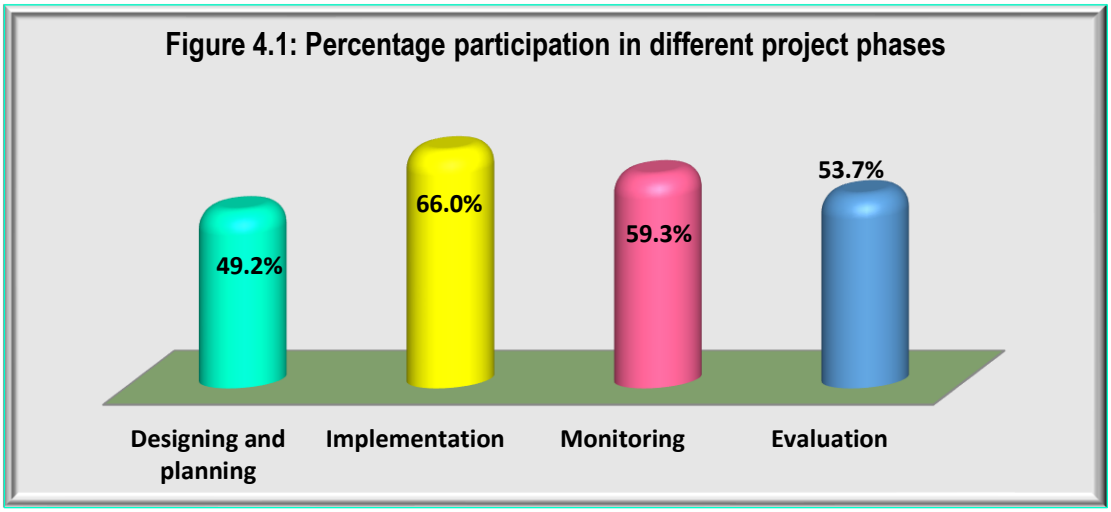
"We knew that FIDE had brought us a water project for us to benefit in a long run, but things have been the opposite. What is surprising is that they left after only three years. We thought that even if they leave, they would hire a technician for the project so that we continue to get enough water without any inconvenience. Now when it comes that we are asked to pay for the maintenance of the water infrastructure, that's when it becomes a problem, and really a big problem".

It was strange that even one village Chairperson was supporting the assertions of this mother. He was not aware that the purpose of community contribution is to build capacity and a sense of ownership, where communities feel that the implemented water project is their property and once the project fail to operate, it is the communities themselves who will be affected.

4.4.1 Participation in different project phases

The present study further examined community participation in different project cycles. It considered community participation in the designing and planning of the project; implementation of the project; monitoring of the project activities; and participation in the evaluation of the project results. The findings showed that more participation was on the implementation of the project (66.0%) while less participation was on designing and planning of the project (49.2%). The participation levels on other cycles were as indicated in figure 1.

Figure 4. 1: Participation in different project phases



Source: Researcher (2023)

The observed low participation in project design and planning might have impaired project sustainability to some extent. A study by Peerapun (2018) on participatory urban conservation project in Thailand, concluded that, a reliable participatory identification of community needs, and their respective solution modalities improves project ownership and draws a roadmap for guaranteed efficient management and maintenance even after handing over to the beneficiaries. The present study results as well agree with the research done by Samata (2019) in the study of factors influencing community participation in PADEP community projects in Morogoro District. The

study findings revealed that the level of participation in PADEP community projects was relatively low especially in project identification and designing stages, which could lead to unsustainability and lack of ownership of the project. Certainly, it makes sense to involve communities in making plans because they know local conditions and possibilities for change. If the community is involved in choosing priorities and deciding on plans, it is much more likely to become involved in the project and take up the services.

Moreover, Diing *et al*. (2022) in a study of influence of participatory project identification on community water point projects in Turkana County, Kenya concluded that a thorough project identification process that includes beneficiaries and community leaders leads to correct assessment of needs of beneficiaries, accurate proposition of effective ideas to fill the need gaps and informed comparison of identified project ideas. Participation ensures sustainability of water point projects because the beneficiaries own the project and understand the technology needed to maintain it. The study by Mussa (2020) on effects of community participation in sustainability of rural water supply projects taking Yombo project in Bagamoyo District as a case study also aligns with the findings. Community members refused to operate and manage the project despite the available project infrastructure and water service. The major reason for the refusal was because they were not involved in project planning and construction. The study thus concluded that community participation is an important component in water supply projects in rural areas in Tanzania. This is because the projects need community willingness and engagement to guarantee ownership and sustainability after handing over.

Figure 1 also shows that community participation in project evaluation was satisfactory (53.7%) but falls lower compared to participation on project implementation (66.0%). Similarly participation in monitoring (59.3%) was fairly higher than in evaluation but also fairly lower than in implementation. In general the level of participation in monitoring and evaluation can be considered as moderate.

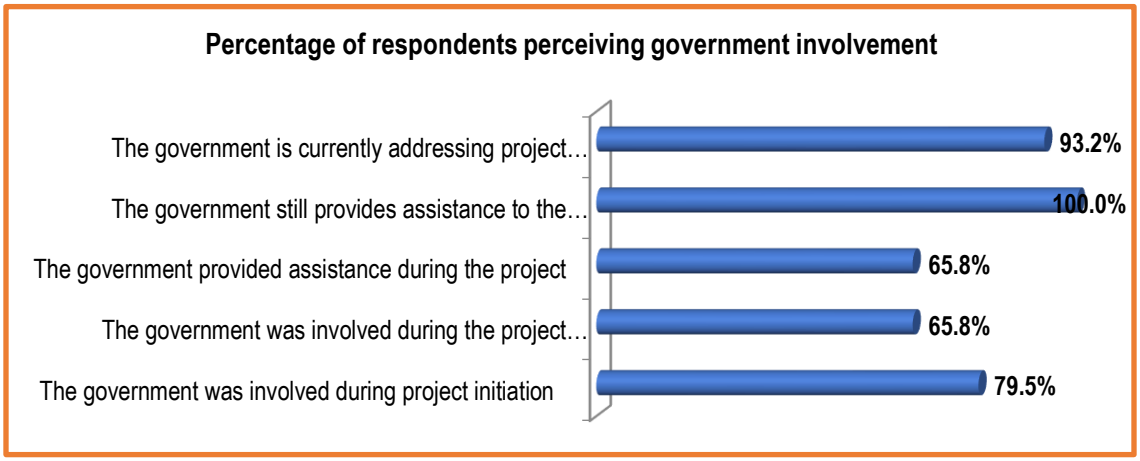
As the level of sustainability obtained from the water project under this study was just moderate, it is more likely that this has been influenced by the perceived moderate community participation in monitoring and evaluation. The study by Maijo (2020) on the effectiveness of monitoring and evaluation systems on the sustainability of community based projects in Kisarawe District, Tanzania supports that monitoring and evaluation system is more imperative in the sustainability of community-based projects. Since monitoring and evaluation guides the implementation and tracks the project progress, its repercussion should be seen in impact and sustainability. Poor monitoring and evaluation not only affect the project outcome but also the sustainability in the community. The use of monitoring and evaluation systems should be linked to the impact and sustainability of the project. All in all, with the differences that emerged regarding community participation in different project phases, community participation in all phases of the project is very important and all phases should be given equal and sufficient weight.

4.5 Collaboration of Implementing NGOs with the Local Governments

Even if they have different goals, mandates and constraints, GOs and governments need each other; especially when essential services like access to water, education, etc. are at stake. Information gathered through key informant interviews with local government authorities revealed that the village governments had a great contribution in the establishment of the water project. This is because as an initial step, the leadership of the Endagwe Village where the project commenced, contacted FIDE management to request for their support in establishing the water project. FIDE responded positively to the request and thus the process of establishing a water project started from there. Then, the village government appointed a water project committee responsible for the overall project management and to collaborate with FIDE throughout the process. Having realized the successes in their neighboring village in accessing potable water, Yeratonik Village also requested

FIDE for the same and hence the water project was extended to them. This illustrates that the village governments were involved in the establishment of the water project.

Figure 4. 2: Percentage of respondents perceiving government involvement



Source: Researcher (2023)

The main task of the village governments was to manage the operation of the project in general, especially by providing advice to the water committee, advising FIDE on policy issues and mobilizing the community for full participation in the project. Apart from that, the local government did not contribute financially, technically, or materially to the project. The project management was very effective when the water project was being implemented by FIDE in collaboration with the village water committees. The water service was very good as villagers got adequate water. Certainly, as success stories illustrate, for NGOs to achieve impact in their community interventions at scale requires putting the government at the center from the earliest stages of designing a project or pilot. However, after FIDE withdrew and handing over the project to the villages, the project began to falter and the services became almost non-existent. Having witnessing the project dying, the village governments contacted the district authority which decided to handover the project to RUWASA and that's when it started to revive. Since the project was transferred to the ownership of RUWASA, to a certain extent, the community resumed accessing water services though not to the quantity

experienced when the project was run by FIDE. Even the leadership of the villages admitted that besides the resumption of services, both water quantity and quality has been less compared to the period when the project was run by FIDE. There has been frequent damage to the water infrastructure, apart from the fact that they have become dilapidated.

On the other hand a questionnaire administered to the households also sought some data on the collaboration between the local government and FIDE on the water project. Specifically the information required was the involvement and contribution of the government to the project during the implementation of FIDE and after project phase out. Figure 2 summarizes the findings.

From the figure it is inferred that the community perceived high-level involvement of the local government to the project and especially on the fact that the local government continued to be involved beyond project phase out (100.0%) and that it was still addressing project challenges. It is also likely that it is not easy for the community to understand whether the government contributed any resources to the project. This is demonstrated by the relatively low response on government involvement during the planning of the project and if the government provided assistance during the project (65.8%). All in all, regardless of the percentages, it is obvious that there was collaboration between the local government and the implementing NGO (FIDE), and this has contributed to the sustainability of the project as it was the goal of specific objective number two. This is especially demonstrated by the fact that the government continued to manage the project even after FIDE has finished its term of serving the project.

Project collaboration is when a team of people work on the same project to achieve a common goal. They will come together to share skill sets, ideas, resources, and information to complete that project. Depending on their roles and responsibilities, a collaborative project team will be responsible for working together to strategize, plan, execute, monitor, and report on the progress of

a project from beginning to end. However, for the case of the water project at Duru Ward, the role of the government was just providing advice to the water committees, advising FIDE on policy issues and mobilizing the community for participation. As the government never provided any financial contribution, technical staff or even any materials required for the project, this definitely lowered project sustainability. This conclusion is similar to that of Liu *et al*. (2021) in the study on factors influencing collaborative innovation project performance, the case of China. Among others, it was concluded that resource dependence, organizational climate, and collaborative innovation willingness had both direct and indirect effects on project performance.

In support to the importance of collaboration with the local governments is also the study by Donessouné *et al* (2023) which assessed the factors that influence the capacity for sustainability and the level of sustainability of a community tuberculosis programme implemented in Burkina Faso three years after the end of the funding. The programme used civil society organizations for implementation. There was a strong support at the national government but the instability of financial resources was a drawback to sustainability after the end of the funding. It was thus concluded that a well-designed community programme with a strong capacity for sustainability is not necessarily maintained after funding is withdrawn. The implementation of a community programme must ensure that it is integrated into the existing organizational system. The objectives and operating rules of the host structures must be in line with those of the programme to be implemented. Definitely, progressively transfer of project ownership from the implementing NGOs to the government should be a goal from the beginning. Of course, given the risks associated with new or innovative ideas, it is understandable that government officials want to be convinced of the project's feasibility and effectiveness before they are willing to take the reins. But ownership is absolutely critical to long-term success and sustainability. Effective government ownership ensures that a project will continue

once the NGO is no longer leading implementation. Therefore, NGOs' relations with local governments ensures effectiveness of implementation and sustainability of results.

4.6 Effectiveness of Community Capacity Building on Project Sustainability

As the last specific objective, the study assessed the effectiveness of community capacity building on sustainability of phased out water project at Duru Ward. This was documented by providing them five statements portraying capacity building. For each statement they were asked indicate the extent of agreement which like in section 4.4 was rated where 1 denoted "Strongly Disagree"; 2 "Disagree; 3 "Neutral"; 4 "Agree" while 5 represented "Strongly Agree". Similarly, the capacity building index for each community capacity building statement rating was calculated by taking the percentage response of the respective score multiplied by its corresponding rating value (appendix 8). The total capacity building index for each community capacity building statement was calculated. There was no any respondent appraised any action as "strongly disagree" or "strongly agree". Then the percentage community capacity building of each statement was calculated. Finally, the average index and ultimately average percentage for all community capacity building statements were computed. (Table 5).

Table 4. 5: Community capacity building indices and percentages for given statements

Statements	Index	Percentage
Community members were adequately trained before the project closed	1.260	25.200
Community members have skills required to continue carry out project activities	1.044	20.880
Since project closure other institutions or individuals have supported the project	3.456	69.120
The water committee is skilled in maintenance of the water supply facility	2.356	47.120
There is community mobilization activities in running operations of the water facility	2.356	47.120
Average	**2.094**	**41.888**

Source: Researcher (2023)

Following capacity building results in table 5, the average community capacity building for the project stood at approximately 42%. This shows that only minority of community members received capacity building regarding overseeing their water project. More worse is the fact that only 25.2% of community members were adequately trained before the project closed while only 20.9% had skills required to continue carry out project activities. Moreover, only 47.1% of the community was mobilized in running operations of the water facility like paying the costs of maintenance services.

Focus group discussions with community members indicated that real training for project management was given to the water committees only. This was also supported by the village governments and FIDE, the organization which implemented the project. Only sensitizations and mobilizations regarding the project were conducted to the community members. Information

gathered from the village water committees displayed that lack of training for the community has considerably contributed to the low sustainability of the project following its phase out, as most of them were not active in supporting the project. Even some community members have shown that a large percentage of their peers were not contributing to water services (do not pay for water) and others delayed the payment, something that has contributed to the deterioration of the project. This resulted even to failure to buy the necessary spares in case of any malfunction of water infrastructure.

Similar to the findings regarding low level capacity building among community members, Kilonzo and George (2017) also found that capacity building jeopardizes sustainability of the community based water projects in Central Tanzania as very few community members had ever attended any training related to water resource management. The study concluded that if the global and national actors wants to increase the capacity of the local actors to expand and manage well their resources, capacity building is inevitable. Again these findings are supported by the study by Kirui (2017) which noted that in a variety of the Kenyan rural areas there are a number of factors rampant to sustainability of the water projects, there is inadequate capacity building processes, neglect of use of modern technology, poor management by the committees delegated to lead the water committee, and mismanagement of funds, among others. Kirui (2017) pointed that communities that receive training are more satisfied with their systems, more willing to pay the costs of maintenance, keep their water supply system in better physical condition, and thus carry out better operations and maintenance services. At the same time, training members of the water committee leads to better maintenance programs and financial management. It is, therefore, likely that the water project at Duru Ward has to some extent sustained due to the training of the water committees, leave alone that community members were not trained.

On the other hand the findings conform to the study by Nyakwaka and Benard (2019) on factors influencing sustainability of community operated water projects in Central Nyakach Sub-County, Kenya. It was found that 19 out of the 25 projects were not sustainable. The failure of these projects was attributed to lack of plans for routine maintenance of the water infrastructure and that most of the water users had not been trained on how to operate the machines. Moreover, it was established that the high cost of repairing the machines negatively affected their sustainability. Contrarily, the other 6 projects sustained because community members were involved in contribution of resources, decision-making on the technology to be used (solar and hand pumps), location of facilities, operation and maintenance of the projects, among others. The study concluded that the major challenges to sustainability of the water projects were the lack of funds, high cost of repairs, lack of certain spare parts for the machines, and operation of water pumps by people who had not received any training.

Similarly, these findings regarding community capacity concur with a study by Mgoba and Kabote (2020) on effectiveness of participatory monitoring and evaluation on achievement of community-based water projects in Tanzania. Among others they concluded that lack of capacity among the local communities to evaluate their community-based water projects can jeopardize project sustainability. Finally, in support to the present findings is the study by Mahushi (2018) on factors affecting sustainability of water project at Ukenyenge Ward in Kishapu District, Shinyanga Tanzania. It was found that the project suffered major setbacks due to breakdown since persons who maintained the water project systems when they broke down were the local artisans who lacked adequate skills. The local water project committees and local government personnel were rarely utilized as they were also lacking necessary skills. It was concluded that, for the sustainability of the water projects at the Ukenyenge ward the local community and the local government should be equipped with adequate skills for project maintenance and should be fully engaged.

As a conclusion, community capacity building was found to be effective on sustainability of phased out water project at Duru Ward. The water project sometimes failed to achieve the intended objectives in providing communities with clean and safe water, and ensure functioning of water project's infrastructures as soon as the projects phase out. This was largely contributed by inadequate skills among the local communities due to poor capacity building.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of key findings, conclusion, and recommendations made regarding the factors influencing sustainability of water projects in Tanzania, case study of Babati District in Manyara Region. The summary, conclusion and recommendations pertain to the specific objectives of this study. The study involved the water project implemented by FIDE at Yeratonik and Endagwe Villages of Duru Ward in Babati District. The research addressed the following specific objectives: the influence of community participation on the sustainability of phased out water project; the effect of collaboration with the local government on sustainability of phased out water project; and the effectiveness of community capacity building on sustainability of phased out water project.

5.1 Summary of Findings

The project sustainability index stood at 3.163, indicating that it was sustainable by around 63% which can be considered as modest. The community participation in the water project was approximately 64%, indicating a considerable number of community members (36%) who did not participate in their water project. This indicates that the sustainability of the project is almost directly proportional to the level of community participation. In other words, community participation directly influenced the sustainability of phased out water project at Duru Ward. On the whole, it was also noted that more participation was on the implementation of the project (66.0%) while less participation was on designing and planning of the project (49.2%).

The local governments collaborated with FIDE in the water project mainly through appointing water project committees responsible for the overall project management and to support FIDE throughout the project process. However, the role of the government was just providing advice to the water

committees, advising FIDE on policy issues and mobilizing the community for participation. The local governments never provided any financial contribution, technical staff or even any materials required for the project, something which lowered project sustainability. Nevertheless, the collaboration between the local governments and the implementing NGO (FIDE), has contributed to the sustainability as the government continued to manage the project even after FIDE stopped support to the project.

The community was capacity built for the project by approximately 42%, indicating the minority of community members with capacity regarding overseeing their water project. Only 20.9% had skills required to continue carry out project activities while majority were not contributing to water services and others delayed the payment, leading to the deterioration of the project following failure to buy the necessary spares in case of any malfunction of water infrastructure. As such community capacity building was found to be effective in ensuring functioning of water project's infrastructures as soon as the projects phase out.

5.2 Conclusions

The study concluded that the community fairly participated in the water project but noted deficiencies in collaboration between the implementing NGO and the local government, and in community capacity building. Community involvement and participation are essential during the designing and planning of projects through the implementation, monitoring and evaluation. After the phase out of the project, community members are also effective in the utilization of the project as well as the maintenance of the project thereby contributing to the sustainability of the project. A proper sensitization and mobilization of the community members on the project is inevitable in ensuring good involvement and participation. The sense of ownership of the project is greater with community participation and this leads to greater sustainability of the project. Another issue is the collaboration between an implementing NGO and the respective local government. This is important

as it is the way to promote successful implementation and sustainability of projects. Moreover, collaboration, streamlines transfer of project ownership from the implementing NGOs to the government upon project phase out. Finally, community capacity building especially on issues related to operation and maintenance empower them to look after water supply infrastructures thus promoting sustainability. All in all the discussed sustainability factors are just few determinants of sustainability. There are multiple factors which their relative importance is yet to be established.

5.3 Recommendations

It is recommended that NGOs and funders of the projects to effectively involve all community members at all stages of the project cycle. Results show that community members mainly participated during project implementation and this, in the way, jeopardized project sustainability. Project funders are also recommended to ensure the implemented water projects are cost-effective especially water pumps using solar power to cut the high running costs of the projects.

It is important for supporting donors in collaboration with the implementing local NGOs to clearly design a mechanism by which communities, especially the village water committees (or the present community based water supply organizations), so that they can be fully engaged in project implementation and take over projects after phase out. The empowerment of water committees would better ensure sustainability and transferal of water project management responsibilities to the community. In so doing, the respective local governments should be at the driver's seat from the earliest stages of designing a project or pilot.

The establishment of revolving funds and local spare part shops would allow water committees to have better access to spare parts and decrease the rate of malfunctioning facilities. It is, however, important for the community to be informed of all the incomes and expenditures from their water project.

There is a need to strengthen capacity building for the local communities to manage their water projects effectively. This is a policy issue that needs serious efforts at all levels of the government. The water project implementers, should provide training and run workshops especially for water committee members to build their capacity and ensure they effectively manage the water projects and guarantee their sustainability.

5.4 Areas for Further Research

Following the newly adopted National Water Supply and Sanitation Act, 2019 in which RUWASA became responsible for overseeing provision of water supply and sanitation services in rural areas, Community Based Water Supply Organizations (CBWSOs) were engaged as basic units responsible for management of water supply and sanitation services in rural areas under the general coordination of RUWASA. These CBWSOs replaced the Community-owned Water Supply Organizations (COWSOs) like the conventional village water committees. There is a need of a research on effectiveness of the CBWSOs in comparison to the former COWSOs.

5.5 Critical Evaluation of the Study

Before embarking on this research on factors influencing sustainability of phased out water projects, the researcher considered the three factors researched as the most important ones. However, with further literature reviews it was realized that there are many factors and it might take a lot of time to research them all. It is good, however, that those three factors have been analyzed deeply and have really shown that they are among those influencing the sustainability of water projects. One considerable limitation was that some local government leaders who were implementing the project were transferred or had retired. In this case, it was a challenge to gather enough information, although efforts were made so that even some of them could be found.

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APPENDICES

Appendix 1: Questionnaire for household members

My name is Yonaza Rabin, a student at the Institute of Accountancy Arusha. I am researching on the "Factors Influencing Sustainability of Water Projects in Tanzania: Case Study of Babati District in Manyara Region" as a requirement for the degree of Masters of Science in Project Planning and Management of the Institute of Accountancy Arusha, I'm enrolled in. In order to accomplish my study, I would like to interview you on some issues based on your knowledge and experience about your phased out water project implemented by FIDE at Duru Ward covering Yeratonik and Endagwe Villages between 2016 and 2019. I have obtained permission from my Institute and the District Executive Director (DED). Please note that this interview is confidential and we will not quote you by name in any of our reports. Could you please spare some time for the interview? Consent given ☐

Part A: Background information

Date of interview: ----------

01. Village: ----------

02. Ward: ----------

03. District----------

04. Age of respondent (years): ☐

05. Sex: Male = 1, Female = 2 ☐

06. Marital Status: Single = 1, Married = 2, Widowed = 3, Separated = 4, Cohabiting = 5 ☐

07. Highest Level of Education: Not gone to school = 1, Primary = 2, Secondary = 3, Tertiary = 4 ☐

08. What is the size of your household? (Number of people in the household) ☐

09. What is your main occupation? Farming = 1, Livestock keeping = 2, Business = 3, ☐

Employee = 4, other (state) ---------- = 77.

10. Did you participate in the conception and design of the water project? ☐

Yes = 1, No = 0

11. If yes, what is your assessment of the level of your participation in the conception and design of the projects? ☐

Poor = 0, Fair = 1, Good = 2, Excellent = 3

12. Did you participate in the implementation of the water project? ☐

Yes = 1, No = 0

13. If yes, what is your assessment of the level of your participation in the implementation of the project? Poor = 0, Fair = 1, Good = 2, Excellent = 3 ☐

14. In your opinion, do you feel that your contributions influenced decisions made during conception, design and implementation of water project? ☐

Yes = 1, No = 0

15. Do you make contributions in kind or cash for implementation and maintenance of water project? ☐

Yes = 1, No = 0

Part B: Project Sustainability

Please rate the following statements regarding your phased out water project by placing a tick (V) in the appropriate box as "Very Poor", "Poor", "Average", "Good", or "Very Good"

	Statement	Very Poor	Poor	Average	Good	Very Good
1	Technical skills and ability by community members to operate and manage their water projects					
2	Continued access to quality and adequate water since the donor support stopped					
3	Condition of the laid water infrastructure					
4	Maintenance of the laid water infrastructure					
5	Community involvement in project maintenance and repair					
6	Possession of basic knowledge and skills on project implementation by the village water committee					
7	Commitment of the village water committee towards implementation of the project					
8	Transparency of the village water committee towards implementation of the project					
9	Accountability of the village water committee for the project implementation					
10	Awareness on your roles and responsibilities in relation to project implementation					
11	Community financial contribution towards project activities					
12	Provision of resources such as staff, expertise, and funding by the local government					

Part C: Community participation

Please indicate the extent to which you agree with the following statements regarding community participation in the phased out water project by placing a tick (V) in the appropriate box, where:

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

	Statement	SD	D	N	A	SA
1	The community members participated in the designing and planning of the project.					
2	The needs of the community were assessed during project initiation					
3	There were sessions of sensitization meetings between the community members and FIDE on the project activities.					
4	Community members participated in implementation of the project.					
5	Community members regularly attended the meetings of the project and their opinions or suggestions on the project were considered					
6	The beneficiaries joined in the monitoring of the project activities.					
7	Community members participated in the evaluation of the project results.					
8	The outcomes from the project have benefited the community.					
9	The Project still serves the beneficiaries though it is completed.					

Part D: Government involvement in the projects

Please indicate the extent to which you agree with the following statements regarding government involvement in the phased out project by placing a tick (V) in the appropriate box, where: SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

	Statement	SD	D	N	A	SA
1	The government was involved during initiation of the project					
2	The government was involved during the planning of the project					
3	The government provided assistance during the project					
4	The government is still providing assistance to the phased out project					
5	When there are challenges, the government is currently involved in addressing challenges					

Part E: Community capacity building

Please indicate the extent to which you agree with the following statements regarding capacity building conducted before project phased out by placing a tick (V) in the appropriate box, where: SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

	Statement	SD	D	N	A	SA
1	You were adequately trained before the project closed					
2	You have skills required to continue carry out project activities					
3	Since project closure other institutions or individuals have supported the project					
4	The water committee is skilled in maintenance of the water supply facility					
5	There is community mobilization activities in running operations of the water facility e.g. pay the costs of maintenance services					

Appendix 2: Interview guide for FIDE Director/ Project Coordinator

(i) Could you please tell me how the project was initiated (***probe to find out who initiated the process and overall involvement of the community at project design***)

(ii) Could you please tell me how your project obtained funding? (***probe to find out if community members contributed anything towards the project***)

(iii) How did the community participate in the implementation of the project?

(iv) How did the community participate in the monitoring and evaluation of the project?

(v) How were decisions in the project taken? (***Probe if the community was involved and when and how?)***

(vi) Has the project formed any collaboration with the local government? (***Probe to find out what are the benefits, problems, etc***.)

(vii) Does the community receive any financial, management, technical, etc. support from the local government after the project phase out?

(viii) Are you happy with the role that the local government is playing in this phased out project? (***What are the challenges? What needs to be improved, etc.?***)

(ix) How, if at all, is the community continuing participating in this project? (***please explain***)

(x) If community is still participating in the project, what effect has it had on the project's performance? (***please explain***)

(xi) In your own opinion do you think that the project has empowered the community in any way and if so how?

(xii) Which community structures are in place for management of the water project and what are the functions of the structures?

(xiii) Have water management committee members been trained on operation and maintenance and management of water systems?

(xiv) In your opinion, were the trainings delivered relevant towards enhancing the capacity of the community members to operate and maintain the water system?

(xv) What are your recommendations for enhancing sustainability of this water project?

(xvi) In your opinion what would you say have been the main contributing factors for the success of this project?

(xvii) In your opinion what would you say have been the main contributing factors to any failing of this project?

(xviii) If you could do this project over again, would you do anything differently? Why, and what would you do?

Appendix 3: Interview guide for FIDE project staff

(i) Could you please describe your phased out water project briefly

(ii) Have you been involving key stakeholders from the start of the project?

(iii) Who are the actual stakeholders involved? (Probe of actual community members)

(iv) In which stages of the project cycle were the stakeholders involved? (probe for involvement of community members in each stage)

(v) How they were being involved?

(vi) To what extent does the community still own project activities?

(vii) Do community members and water committees have the knowledge and skills needed to implement the project activities?

(viii) Does your organization still have sufficient institutional and human resource capacity to continue support the project?

(ix) Were the community members involved in capacity building to enable them continue with project activities?

(x) If yes, how were they capacitated?

(xi) Did the project by then establish any collaboration with the local government on the water project?

(xii) What kind of collaboration was developed?

(xiii) What roles and responsibilities were to be played by the local government after project phase out?

(xiv) What challenges have been encountered in the course of project implementation after donor withdraw?

(xv) If you could do this project over again, would you do anything differently? What, and why would you do?

Appendix 4: Interview guide for local government authorities

(i) How was the local government involved during the establishment of this water project?

(ii) Was the local government involved in the water project from the earliest stage of designing?

(iii) What was the role of the local government in this water project?

(iv) What was the contribution of the local government to this water project?

(v) How do you view the management of the project?

(vi) What is the current contribution of the local government to this water project following donor withdraw?

(vii) How do you view the contribution of community to the project?

(viii) Is the ownership of the project transferred to your government after the donor withdraw?

(ix) Is the government facilitating training/capacity building to the community after donor withdraw?

(x) What do you think are the main challenges currently facing this project?

(xi) What are your suggestions in the establishment and management of a similar project in future?

Appendix 5: Focus group discussions guide for community members

The following groups were involved differently: men, women and youth

(i) How is the situation of the water project activities since its phase out?

(ii) Does your water project function properly?

(iii) If yes, what makes it function well?

(iv) If no, what makes it not to function?

(v) Do all villagers get equal access to water service?

(vi) What is the price of water per container of 20 liters?

(vii) Do you afford to pay the amount put for contributing for water service?

(viii) Were you among the deciders for the water service price?

(ix) How was the nature of community participation in this project?

(x) What do you consider are the factors that promoted the community to participate in the project?

(xi) What do you consider are the factors that limited the community from participating in the project?

(xii) How was the community empowered to effectively undertake project task?

(xiii) Were you trained on how to manage your project before the project phase out?

(xiv) If yes, how was the training? How is it helping you?

(xv) How the local government was involved during the project life?

(xvi) How is the local government involved after the project phase out?

(xvii) What strategies have enabled the project activities and services to continue beyond its phase out?

(xviii) What challenges are hindering smooth continuation of the project activities and benefits/services after phase out?

(xix) What are your opinions to improve the functionality of water project?

(xx) What are your opinions about achieving sustainability of water project?

(xxi) What would you suggest to be done differently if another similar project is to be implemented in your community in future?

Appendix 6: Focus group discussions guide for Village Water Committee

(i) How is the performance of the water project so far? (consider quality of water, quantity of water, satisfaction and reliability to users)

(ii) Are there water charges to the users?

(iii) If yes, how much do they pay?

(iv) If yes, who is responsible for setting the charges?

(v) How is the community informed on the income accrued from water services and expenditures?

(vi) How did members of the community participate in the water project? (probe during the design, planning, implementation, and monitoring)

(vii) How is the community involved in the project since its phase out?

(viii) Were the community members/ community representatives adequately trained before the project phase out?

(ix) How do you think training before project closure influences the sustainability of this project?

(x) How was the local government involved in the water project?

(xi) How the local government supports the project since its phase out?

(xii) How FIDE supports the project since it was phased out?

(xiii) In cases of system breakdown, who always meet the financial cost of maintenance?

(xiv) Have you been trained on operation and maintenance and management of water system?

(xv) If yes, How many trainings? How do you rate the effectiveness of the training?

(xvi) Who is responsible for training new water committee members in operation and maintenance of water system?

(xvii) What constraints are you facing for successful operation of the water project?

(xviii) How do you think you can sustain the water project for long period of time?

Appendix 7: Community participation indices for level of agreements with given project actions

	Rating: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree	**Indices**				
	Actions	**1**	**2**	**3**	**4**	**5**
1	The community members participated in the designing and planning of the project.	0.000	0.000	2.524	2.136	0.340
2	The needs of the community were assessed during project initiation	0.000	0.000	1.752	2.908	0.340
3	There were sessions of sensitization meetings between the community members and FIDE on the project activities.	0.000	0.000	1.697	2.688	0.615
4	Community members participated in implementation of the project.	0.000	0.000	1.697	2.688	0.615
5	Community members regularly attended the meetings of the project and their opinions considered	0.000	0.000	1.425	2.96	0.615
6	The beneficiaries joined in the monitoring of the project activities.	0.000	0.000	2.037	2.688	0.275
7	Community members participated in the evaluation of the project results.	0.000	0.000	2.313	2.412	0.275
8	The outcomes from the project have benefited the community.	0.000	0.000	1.094	3.016	0.890

Appendix 8: Community capacity building indices for level of agreements with given statements

	Rating: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree	**Indices**				
	Statements	**1**	**2**	**3**	**4**	**5**
1	Community members were adequately trained before the project closed	0.000	0.410	1.440	1.260	0.000
2	Community members have skills required to continue carry out project activities	0.000	0.794	1.026	1.044	0.000
3	Since project closure other institutions or individuals have supported the project	0.000	0.136	0.204	3.456	0.000
4	The water committee is skilled in maintenance of the water supply facility	0.000	0.000	1.233	2.356	0.000
5	There is community mobilization activities in running operations of the water facility e.g. pay the costs of maintenance services	0.000	0.000	1.233	2.356	0.000

Appendix 9: Data Collection Letter

JAMUHURI YA MUUNGANO WA TANZANIA
WIZARA YA FEDHA

INSTITUTE OF ACCOUNTANCY ARUSHA

Ref. No.: MSC-PPM/0040/2021 **18th August 2023**

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P.O.BOX.....
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Dear Sir/Madam,

RE: REQUEST FOR DATA COLLECTION

The purpose of this letter is to introduce to you **Mr. Rabin Yonaza** who is our student pursuing a Master's of Science in Project Planning and Management with registration number (**MSC-PPM/0040/2021**) Currently, the aforementioned student is conducting a study on the "**FACTORS INFLUENCING SUSTAINABILITY OF WATER PROJECTS IN TANZANIA: CASE STUDY OF BABATI DISTRICT IN MANYARA REGION**" We would like to highlight here that this study is part of the requirement for the award of the above-mentioned program of study.

We, therefore, request you to extend to the student mentioned above of our Institute any help that may facilitate her to achieve her study objectives. We further request permission for her to see and talk to the staff of your Institution in connection to her study. The period for this request is granted from August to the end of October 2023.

Thank you for your continuing support.

Yours Sincerely,
INSTITUTE OF ACCOUNTANCY ARUSHA

Mishael Abduel
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Appendix 10: Plagiarism AND Grammar Check

FACTORS INFLUENCING SUSTAINABILITY OF WATER PROJECTS IN TANZANIA: CASE STUDY OF BABATI DISTRICT IN MANYARA REGION

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MANUSCRIPT TITLE

FACTORS INFLUENCING SUSTAINABILITY OF WATER PROJECTS IN TANZANIA: CASE STUDY OF BABATI DISTRICT IN MANYARA REGION

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AUTHOR(S)

Rabin Yonaza

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DATE ISSUED

08th December 2023

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CERTIFICATE NUMBER

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08th December 2023

Signature……Date……

Name of Editor: Richard Sikira,