CONSTRAINTS AFFECTING ACCESS TO PRIVATE FINANCING FOR WATER INFRASTRUCTURE IN KENYA

BY

JAMES KIGUTU

UNITED STATES INTERNATIONAL UNIVERSITY-AFRICA

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A Research Project Report Submitted to the Chandaria School of Business in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration (MBA)

UNITED STATES INTERNATIONAL UNIVERSITY - AFRICA

SUMMER 2019
STUDENT’S DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University–Africa for academic credit.

Signed: __________________________ Date: ______________________

James Kigutu (ID NO: 653911)

This project has been presented for examination with my approval as the appointed supervisor.

Signed: __________________________ Date: ______________________

Dr. Francis Gatumo

Signed: __________________________ Date: ______________________

Dean, Chandaria School of Business
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ABSTRACT

The purpose of this study was to assess the constraints affecting access to private financing for water infrastructure in Kenya. The study was guided by the following objectives: to establish the effect of fiscal policy constraints on access to private financing for water infrastructure; to examine the effect of financial sustainability constraints in water projects on access to private financing for water infrastructure and; to determine the effect of long-term debt financing constraints on access to private financing for water infrastructure in Kenya.

The research used an explanatory research design. The study population constituted of 37 Water Infrastructure Finance professionals drawn from WSTF, KIFFWA, WASREB, The World Bank, AFD, IFC, BFA, AfDB and KfW in Nairobi. The sampling technique used in the study was non-probability sampling using purposive judgmental sampling. Structured open and closed ended questionnaire was used. The data was analysed in SPSS using descriptive statistical techniques and inferential statistics.

The results of descriptive statistics indicated that majority of respondents were of the neutral view that various aspects of fiscal policy constraints affected access to private financing for water infrastructures as shown by an aggregate mean of 3.37. The findings of the study further revealed that majority of respondents agreed on financial sustainability constraints in water project as shown by an aggregate mean of 3.87. Additionally, majority of respondents strongly agreed on various elements of long-term debt financing constraints as shown by aggregate mean of 4.53. The findings of correlation between each of the individual variables and access to private financing revealed a positive and not significant correlation for fiscal policy constraints. A negative and not significant correlation was found on financial sustainability constraints in water projects. The results revealed a strong negative and significant relationship between long-term debt financing constraints and access to private financing for water infrastructure.

The results of regression analysis established that the adjusted $R^2$ was 0.017 for fiscal policy constraints, an indication that it affected 1.7% of the access to private financing for water infrastructure. For financial sustainability constraints in water project the adjusted $R^2$ was 0.070 and indication that it affected 7.0% of the access to private financing for water infrastructure. The adjusted $R^2$ was 0.449 for long-term debt financing constraints, an indication that it affected 44.9% of the access to private financing for water infrastructure.
For composite regression model, adjusted $R^2$ was 0.479 which means that included explanatory variables explained only 47.9% of the variations in access to private financing for water infrastructure. The other explanatory variations not in the model explain the remaining 52.1% variations. The results of ANOVA test revealed that linear regression model was of significantly of good fit. The regression also established a positive for fiscal policy and a negative for financial sustainability constraints in water projects which were both found not statistically significant at a significant level of 0.05. However, long-term debt financing constraints had a strong negative which was statistically significant at a significant level of 0.05. The results of Beta coefficient correspond those of Pearson Correlation.

In the light of aforementioned, the study recommends introduction of government fiscal policies on tax exemption in water projects financed through private capital to attract more private investment in water sector. The water utilities and government agencies should work towards enhancing sustainability in water projects through investment in technologies that reduce non-revenue water (NRW), detection of nonpayment of water bills and illegal connections in water projects. This will improve the cost recovery in water projects and boost investor confidence. The financial institutions (The World Bank, IFC, AfDB, KfW, commercial banks etc.) should develop innovative long-term debt financial products that match large capital requirements with long payback periods involved in water infrastructures.
ACKNOWLEDGEMENT

I thank the Almighty God for the gift of life and strength without which I couldn’t have managed to complete the research project. My sincere gratitude goes to my supervisor Dr. Francis Gatumo for his guidance, advice and effective timely response at each stage in the preparation and execution of this research project for examination. Thank you for your support and inspiration.

I extend my gratitude to management of the WSTF, The World Bank, AfDB, AFD, IFC, BFA, WASREB, KfW and KIFFWA in Nairobi for giving me support I required during data collection. I would also like to thank my family, colleagues at work, friends and fellow classmates at USIU-A for their input and constant encouragement. The research assistants’ team who assisted in the actual research data collection, data entry and analysis, I say thank you once again. May God bless you All.
DEDICATION

I dedicate this paper to my parents Mr & Mrs Kigutu for their continued support during my study and in preparation of this research project.
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<tr>
<td>AFD</td>
<td>Agence Française de Développement</td>
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<td>AfDB</td>
<td>African Development Bank</td>
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<td>AMCOW</td>
<td>African Ministers' Council on Water</td>
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<td>BFA</td>
<td>Big Four Africa Ltd</td>
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<td>CAMIF</td>
<td>Central American Infrastructure Fund</td>
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<td>CBK</td>
<td>Central Bank of Kenya</td>
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<td>DFI</td>
<td>Development Finance Institutions</td>
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<td>DFID</td>
<td>Department for International Development</td>
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<td>EU</td>
<td>European Union</td>
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<td>FDI</td>
<td>Foreign Development Investment</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GoK</td>
<td>Government of Kenya</td>
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<td>IDB</td>
<td>Inter-American Development Bank</td>
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<td>IFC</td>
<td>International Finance Corporation</td>
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<td>IFI</td>
<td>International Financial Institution</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<td>ITDP</td>
<td>including export credit agencies</td>
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<td>KES/Ksh</td>
<td>Kenya Shilling</td>
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<td>KfW</td>
<td>Kreditanstalt für Wiederaufbau /German Development Bank</td>
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<td>KIFFWA</td>
<td>Kenya Innovative Financing Facility for Water</td>
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<td>KPWF</td>
<td>Kenya Pooled Water Fund</td>
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<td>KRA</td>
<td>Kenya Revenue Authority</td>
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<td>Ltd</td>
<td>Limited</td>
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<td>MDB</td>
<td>Multilateral Development Bank</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<td>NRW</td>
<td>Non-revenue water</td>
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<td>NSE</td>
<td>Nairobi Securities Exchange</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>PPI</td>
<td>Private Participation in Infrastructure</td>
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<td>PPP</td>
<td>Public Private Partnership</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SIWI</td>
<td>Stockholm International Water Institute</td>
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<tr>
<td>Abbreviation</td>
<td>Full Name</td>
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<td>--------------</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
</tr>
<tr>
<td>SWA</td>
<td>Sanitation and Water for All</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
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<tr>
<td>UNICEF</td>
<td>United Nations International Children's Fund</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<tr>
<td>US</td>
<td>United States</td>
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<tr>
<td>USA</td>
<td>United States of America</td>
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<tr>
<td>USIU-A</td>
<td>United States International University-Africa</td>
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<tr>
<td>VAT</td>
<td>Value Added Tax</td>
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<tr>
<td>WASREB</td>
<td>Water Services Regulatory Board</td>
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<td>WFF</td>
<td>Water Finance Facility</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<tr>
<td>WSP</td>
<td>Water Service Provider</td>
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<td>WSTF</td>
<td>Water Sector Trust Fund</td>
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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Sustainable access to safe water measures the health status and the well-being of a people in a given society it is well established that people cannot function well without adequate water. It is sufficiently obvious that the challenge of providing safe and adequate water in urban and rural areas of developing countries persists as governments were unable to achieve much since the early 1990s. There are several backlogs in the provision of water and other physical infrastructure required for accelerated economic growth and development (Effah, & Chan, 2013). Governments have therefore come under continuous domestic (public) and international pressure to consider alternative ways of improving water provision in their respective countries.

Water is essential to all aspects of life as it sustains society, and supports health, hygiene and economic productivity of a nation. Even though access to safe and affordable water is considered a basic human right, about 844 million people lacked basic drinking water services worldwide in 2015. Nearly half of the people without access to drinking water lived in Sub-Saharan Africa (WHO & UNICEF, 2017). These challenges in water and other sectors of economy compelled leaders from 193 countries of the world to create 17 set of SDGs in the year 2015, to be achieved by the year 2030. The goal number 6 of SDGs focused on universal access to safe and affordable drinking water and sanitation for all (UNDP, 2015).

Inadequate water management (in the form of poor policies, weak organization and reluctance of water users to pay for the service) is a drag on health and wellbeing, and on the economy. Countries, thus, are striving for “water security”. Water security is the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability. Poor water supply and sanitation (WSS) services are estimated to cost EMDEs about US $260 billion per year due to poor health, pollution and inefficiencies in households and industries (United Nations, 2018).
Water infrastructure encompasses all physical systems used for storage, treatment, transmission, and distribution of water supply. According to McKinsey Global Institute (2017), the world needs US$3.7 trillion a year of investment in economic infrastructure (roads, power, water, telecom etc.) between 2017 and 2035. Of this amount, about US$0.5 trillion 14% is required annually in water sector. Another estimate by OECD (2017) indicated a global infrastructure investment needs from US$3.3 trillion to US$6.9 trillion per year over the period 2016-2030. Water and sanitation infrastructure needs are estimated between US$0.9 trillion and US$1.4 trillion annually in the same period. The two estimates show that trillions of dollars will need to be spent in coming decades in water and other infrastructures.

There are various challenges faced by many governments especially in developing countries because of over-reliance on public financing for water and other public infrastructures. The ever-increasing water infrastructure deficit in many developing countries is attributed to poor public spending, budgetary constraints and inefficiencies in governments of these countries. Majority of these governments also continue to experience years of fiscal consolidation and pressure to bring their public debt to manageable levels less than 60 percent of GDP, a standard prescribed by the IMF (Croce et al., 2014; McKinsey Global Institute, 2013). With public finance stretched, a big pool of investment in water infrastructure will have to be private sector money. This need to attract private financing and investment in public infrastructure has become a major concern among policy makers around the world.

The private sector participation in water infrastructure has been in practice in the past few decades. In Asia, private sector participation has existed in water sector since 1992 and has increased more significantly over the decades. In Latin America, water utilities actively engage private financing. In Africa, only a small number of private contracts have been awarded in water infrastructure since 2006 (OECD, 2009b). According to World Water Council (2018), private sector participation in water sector in Latin America and Africa remains relatively small compared to other regions of the world. The World Bank (2017) reported that in the year 2017, water and sanitation sector in low and middle-income countries attracted little private financing of about US$1.9billion which represented 4 percent of total private investments in public infrastructure across 30 projects recorded. The road and energy sectors recorded highest level of private investment at 56 percent and 39 percent respectively.
Usually, private investment in infrastructures is driven primarily by the attractiveness of the risk-return profile and efficiency of financial market (OECD, 2018). However, in the past few decades water infrastructure has been aggravated by the perception that: investment returns are low, capital intensive, regular maintenances are required, involves occasional replacement and has longer payback period (World Water Council, 2018). In this regard, government support plays a major role in making water sector attractive to private investors. The direct government support could be in form of capital subsidies, revenue subsidies, and/or land. The indirect government support can be in supportive policies such as exchange rate, debt, tax incentives etc. Thus, the importance of government policies in encouraging greater private investment in public infrastructure cannot be underrated (World Bank, 2017).

Financing is the main factor towards making the water sector more sustainable and secure. Improving planning and policies, strengthening institutions, imposition of proper economic incentives and addressing the reluctance of water users to pay for the service are likely more crucial (Foster, & Briceño-Garmendia, 2009). Nonetheless, given the large amounts of capital and recurrent finance that will be required, and fiscal prudence regarding public budgets, commercial (private) finance will be an important factor in creating the conditions for a more sustainable future. Also, commercial finance is likely to play a growing role as it is seeking new investment opportunity and is responding to the request to help finance water. Compared to the GDP and capital available, the needs for the water sector are significant but certainly not insurmountable, at less than 1–2% of GDP. The observation that, nonetheless, commercial finance uptake by the water sector has remained very small compared to that in the energy and roads sectors suggests the presence of structural obstacles of institutional nature. Such finance is constrained by the high-risk profiles of many water investments.

In Africa, many governments are unable to fund water and other public infrastructures solely using public financing/tax collection. According to AfDB (2018), the Africa’s annual funding gap in water infrastructure is estimated between US$56 billion and US$66 billion. Although Foster et al. (2009) reported a lower annual water infrastructure funding gap in Africa of US$22 billion, the amount is still significant considering the competing needs Africa has to her limited public financial resources. Given Africa’s ever-increasing competing demands placed on national budgets by social sectors such as education, health
care etc., the funding gap in water infrastructure is expected to widen even further in the coming years (SIWI, 2015).

Kenya like any other African country, the public budget deficit has been on rise for decades prompting Treasury to use foreign and domestic borrowing mechanisms to fund public infrastructures including water projects. Consequently, level of public debt has risen from KES 1.8 trillion (US$ 1.8 billion) in 2014/2015 to over KES 5 trillion (US$ 5 billion) by June 2018 which is 57 percent of country’s GDP (Kamundia et al., 2015; Kondongo, 2018). Kenya’s ever-increasing budget deficit is an indication of the need for GoK to engage private sector in financing of public infrastructure.

In Kenya, various private and public institutions including DFIs are involved in financing of water infrastructure. Currently, the public water institutions are undergoing transformation in compliance with the Water Act 2016. The Water Act 2016 considered the need to have private sector participation in water sector. The WSTF is an institution mandated by Water Act 2016 to mobilize financial resources from private investors and DFIs into water infrastructures. Additionally, Part IV (93) of Water Act 2016 also allows WSPs to enter into PPP arrangement (The Water Act, 2016). The Kenya PPP policy is established under section 11 of the Public Private Partnership (PPP) Act, 2013. The PPP policy is formed to enhance pace of infrastructure development by availing investment opportunities to the private sector and supporting prudent public debt management (Kenya Gazette Supplement, 2013).

The Kenya’s financial sector is considered as an important player in closing the water infrastructure financing gap. Kenya has a vibrant financial sector that is ranked among Africa’s most innovative. There are 42 commercial banks licensed and regulated by Central Bank of Kenya (CBK, 2017b). It’s only Sidian Bank (formerly K-Rep bank) that has provided commercial loans for water infrastructure projects. However, these commercial loans are not adequate as they are relatively small (usually less than US$1 million or KES100 million). Moreover, these commercial loans have shorter maximum repayment period of 60 months (5 years) compared to over 15 years payback period for water infrastructure (WFF, 2016).

Despite Kenya having robust capital market and commercial banks (balance sheet US$38.4 billion/KES 3.84 trillion in 2016), these institutions have not been fully utilized in financing water and other public infrastructures (CBK, 2017a). In 2017, KPWF planned to issue first
water bond of KES1.5 billion (US$15 millions) to fund water infrastructures (Bonds & Loans, 2018). However, the much-anticipated water bond was not floated in NSE at the time of this study. Again, the database in World Bank Private Participation in Infrastructure (PPI) shows no completed major large water project in Kenya financed through private capital between year 1990 and 2016. Therefore, the need to analyze some of the constraints that affect access to private financing for water infrastructure in Kenya becomes important.

1.2 Statement of the Problem

Kenya’s vision 2030 is the blueprint for her economic development that is hinged on economic, social, and political pillars. Water and sanitation fall under the social pillar that targets on attaining a 100 percent coverage by 2030. However, water coverage in the country remains low 10 years after launch of Kenya’s Vision 2030 in June 2008. Currently, the water coverage in Kenya stands at 55 percent, and over 20 million people lack access to clean and safe drinking water (WASREB, 2018). The country requires about US$12.9 billion annually to achieve vision 2030 targets on water supply infrastructure. The financing deficit in water infrastructures is estimated at US$7.3 billion annually (SWA, 2017). With widening fiscal deficit and increasing public debt that currently stands at 57 percent of GDP, private investments must be promoted to accelerate development in water sector.

Private financing in water infrastructure is a new concept promoted by GoK and DFIs. Despite effort by GoK to mobilize a bigger percentage of private financing in water infrastructure, little has been achieved and challenges remain. According to the World Bank (2018), by the end of year 2017 only US $25 million (0.3 percent of projected US $7.3 billion annual deficit) in private financing was successfully mobilized towards water infrastructure in Kenya. Limited empirical research exists on how fiscal policies influence private investment in water infrastructures. To fill the research gap, this study attempts to study the effect tax incentives (tax holidays and exemption on machineries), and level of government debt on private financing/investment in water infrastructure in Kenya’s context. Therefore, the aim of this study is to find out and explore constraints affecting access to private financing for water infrastructure projects in Kenya. The study also seeks to fill the existing literature and research gap.

1.3 General Objective

The general objective of the study was to assess constraints affecting access to private financing for water infrastructure in Kenya.
1.4 Specific Objectives

The specific objectives that guided study include;

1.4.1 To establish the effect of fiscal policy constraints on access to private financing for water infrastructure in Kenya.

1.4.2 To examine the effect of financial sustainability constraints in water projects on access to private financing for water infrastructure in Kenya.

1.4.3 To determine the effect of long-term debt financing constraints on access to private financing for water infrastructure in Kenya.

1.5 Significance of the Study

1.5.1 Government and Policy Makers

It’s the responsibility of any government to provide water to its citizens. The government mainly depends on taxpayer’s money to finance water infrastructure. However, constraints in public budget limit the scale of water infrastructures undertaken by government. To bridge the infrastructure gap in water sector, private financing needs to be involved. The study provides an insight to the GoK policy makers and other stakeholders to develop effective policies and regulations needed to mobilize private investment in water infrastructures.

1.5.2 Development Finance Institutions and Agencies

Development finance institutions (DFIs) and agencies provide credit inform of loans, equity and risk guarantees to private sector to promote development in the country. The study gives DFIs an insight to devise more innovative financing instruments that can attract additional private financing/capital into the water sector.

1.5.3 Commercial Banks and Financial Institutions

Commercial banks provide loans while financial institutions like capital markets regulates and facilitates the issuance of stocks and bonds to attract private capital in public infrastructures. The study gives them an insight to develop tailor made instruments and mechanisms that suits private investors in Kenya.

1.5.3 Other Researchers
The study adds to the existing body of literature on water infrastructure finance. The study is also an avenue for further research on challenges and constraints in access to private financing in water infrastructure.

1.6 Scope of the Study

This study investigated the constraints affecting access to private financing for water infrastructure in Kenya. The research focused on the water infrastructure finance organizations namely KIFFWA, WSTF, The World Bank, IFC, BFA, AFD, WASREB, AfDB and KfW all located in Nairobi. The target population in this study comprised of 37 water infrastructure finance professionals. The study data was collected for a period of two months between November and December 2018. The major limitation in this study was inadequate previous information given that the private financing absorption in Kenya’s public infrastructure is relatively low. However, the researcher tried as much as possible to collect relevant and available information. The sample size was also limited to only a few who possessed knowledge and experience in water infrastructure finance.

1.7 Definition of Terms

1.7.1 Infrastructure

Infrastructure refers to the long-lived physical structures (telecommunication, electricity, transportation, energy, water etc.), facilities and supporting operating systems that provide essential services to consumers (Kabiru, 2016).

1.7.2 Water Infrastructure

Water infrastructure refers to a network of pipe system (distribution network, treatment and storage assets) that supplies drinking water to consumers (Van-Derslice, 2011).

1.7.3 Infrastructure Finance

Infrastructure finance is defined as all means or methods available for mobilizing the resources required to finance physical assets and services which are fundamental to the growth and development of an economy (Kalu, 2015).

1.7.4 Fiscal Policy

Fiscal policy refers to the use of government spending and taxation to influence economy. Governments typically use fiscal policy to promote stable economic growth (Horton and El-Ganainy, 2009). Fiscal policy arrangements are used by the government to collect
revenue through a raft of taxation, charging and pricing mechanisms. The potential fiscal instruments in water sector include taxation, grants and subsidies, water pricing (Young, 2015).

1.7.5 Tax Incentive

Tax incentives as those fiscal measures used by governments to attract investment domestically and internationally in certain key sectors of economic development (Bolnick, 2001).

1.7.6 Financial Sustainability

Financial sustainability is the ability of the organization or project to maintain its financial capacity by generating adequate profits over time that enables it to maintain or expand services (Sontag-Padilla et al., 2012).

1.7.7 Long-term Debt Financing

Long-term debt financing involves borrowings that usually take more than one year to repay, and it comes in form of selling bonds and loans (DFID, 2014).

1.7.8 Public Debt

Public debt is defined as the government’s debt used to raise the required amount of funding to pursue its cost/risk objectives and meet any other development goals the government may have set (Jensen, 2003).

1.7.9 Private Finance

Private finance refers to private money and skills used to deliver capital investment projects traditionally provided by the public sector (Alshawi, 2009).

1.8 Chapter Summary

The chapter introduces the constraints affecting the access to private financing for water infrastructure in Kenya. The chapter clearly outlined the problem statement, general and specific objectives, significance of the study and scope. Chapter two presents a comprehensive review of past literature on the subject and their findings. Chapter three outlines research design and methodology adopted during the study, while chapter four provides analysis of the data collected. In chapter five discussion, conclusions and recommendations are presented.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter provides the literature review study on constraints affecting access to private financing for water infrastructure. The study is based on the specific objectives outlined in the previous chapter. In this section, the literature on linkage between private finance for water infrastructure and fiscal policy constraints, financial sustainability constraints in water projects, and long-term debt financing constraints are reviewed and finally the chapter summary.

2.2 Fiscal Policy Constraints and Access to Private Financing

2.2.1 Fiscal Policy Constraints

In the recent decades the importance of fiscal policy in the private investment and growth of infrastructure has received a lot of attention from researchers (Ogeh-Soli et al., 2008). Many studies argue that different types of fiscal policies have different impact on private investment. The theoretical linkage between fiscal policy and investment is that firm fiscal policy can influence private investment positively through increased domestic savings and building investor confidence. However, some researchers argue that some fiscal policies distort private investment decision while others have positive impact (Malik, 2013).

The effectiveness of fiscal policy on the private investment is explained using two theories. The neoclassical model theory argues that financing of fiscal deficit through increased taxation and public borrowing reduces future consumption and savings, increases interest rates, and crowds out private sector investment. The Keynesian theory a proponent of neoclassical theory asserts that increase in government spending through expansionary fiscal policy makes household feel wealthier and stimulates domestic economic activity and crowds in private investment (Perotti, 2007; Madni, 2014; Phuc-Canh, 2018).

2.2.2 Tax Incentives

Tax incentives are a common phenomenon for promoting investment in developing developed countries. Tax incentives are normally applied broadly in developing countries to attract foreign direct investment (FDI) and promote domestic investment. The most common tax incentives in infrastructure projects are tax holidays with reduced corporate tax, and exemptions such as (tariffs, excise and VAT) on capital equipment. On contrary,
in developed economies the use of tax incentive is more focused on particular sector such as foreign investment (Klemm, 2010; Jordaan, 2012; Daude et al. 2017).

Large infrastructure projects like transport, water and sewerage usually have longer payback periods, and in some cases, the stream of revenues is not enough to repay the cost of the private investment. To make such infrastructures attractive to private investors, the government may provide tax relief in form of incentives (Croce, 2014). For example, Ross et al. (2016) stated that policy advisors to Donald Trump advised that, to encourage private investors to commit large amounts to finance America’s crumbling infrastructure, the government should create tax incentives to reduce the cost of the financing on equity amount. As cited in Daude et al. (2017), argued that policy makers should focus on the tax incentive instruments that targets investment, and that results to lower financial costs like foregone revenue.

2.2.3 Corporate Tax Holidays Incentives

Tax holidays are temporary tax reductions by government usually granted to firms making new operational investments in the country (Chow et al., 2018). Tax holidays have long been used to encourage firms operate in priority sectors of economy and regions of countries. Tax holidays provide a firm with reduced tax rate (usually zero) for a specified period after which the firm starts to pay taxes at usual rates. Tax holidays are used worldwide but they are more popular in developing countries (Gebremedhin et al., 2016; Goodspeed, 2006).

The studies on tax holidays have in recent decades concentrated on the developed economies and limited studies have been done in the developing economies. The academic research on tax holiday in developing countries has been hampered by a lack of data (Chow et al., 2018; George et al., 2015). The effectiveness of tax holiday in attracting investment has also been questioned because firms tend to exit the project after the end of incentive (Single, 1999). There exist some studies on relationship between tax holidays and investment. However, most of the studies focused on DFI and limited literature is available on infrastructure. Gebremedhin et al. (2016) empirical analysis of impact of tax holiday on investment in Ethiopia finds a significant positive correlation but not effective due to short period given and risk of abuse by taxpayers. Sari et al. (2015) study finds that tax holiday in Indonesia increase investment activities and does not cause loss of tax revenue to the
government. On contrary, tax holidays lead to increased US tax on foreign income (Chow, 2018).

Klemm et al. (2012), tried to gather the empirical evidence on the effects of tax incentives (tax holidays and corporate income tax) on the FDI. The study found a positive correlation between the tax holiday, corporate income tax in Latin America and Caribbean but not in Africa. George et al. (2015), established a similar positive correlation between corporate tax incentive and investment in India. However, there are some studies that argue contrary to the neo-classical theory of investment that tax incentives like tax holidays that lowers the cost of capital increases private investment. Van-Parys et al. (2010) studied the effectiveness of tax holidays on private investment in twelve Western and Central African countries. The study found that there was no significant positive relationship between tax holidays and private investment attraction. A study by Kinda (2014) using data from thirty Sub-Saharan Africa countries revealed that infrastructure, human capital, and institutions, are influential in attracting investment and not tax holidays incentives are not.

Corporate tax holiday incentives have been used to attract private investment in infrastructure projects, but limited literature exists. Tax holidays and other tax incentives are some of leveraging tool that enables higher-tier governments to engage private investors (Kim, 2016). The magnitude tax incentive has on the overall price of infrastructure is an important mean to stimulate the private sector into PPP. The application of tax holiday in infrastructure has proven successful in some countries particularly in Asia. For example, Indonesia has a 5-10 years corporate tax exemption period granted for infrastructure construction. Thailand has 8 years period enterprise income tax exemption for PPP (Yang, 2018; Gebremedhin et al., 2016). However, the case is different in Kenya. According to Kenya’s Private Partnership Act 2013, the PPP companies are required to pay 30 percent corporate tax and are not tax exempt.

2.2.4 Exemption on Value Added Tax (VAT)

VAT was first invented by French Economist Maurice Laure in 1954. VAT is accepted form of indirect taxation system that has been implemented in over 150 countries worldwide. VAT is considered the third most important source of government revenue after social security contributions and personal income taxes. The concept of VAT is considered as one of the best ways of providing incentives for increasing productivity and industrialization through few exemptions (Hasan, 2015; Okoye et al., 2013).
There are empirical studies on the relationship between VAT and investment, but few studies exist on the effect of VAT exemption on private investment in water and other public infrastructure. The studies available have contradicting findings. Adegbite et al. (2017) examined the impact of VAT on private investment in Nigeria using regression analysis. The results show that VAT has a strong positive effect on private investment in Nigeria. Hasan (2015) empirical study finds an increase in VAT didn’t distort the decision of investors in Pakistan. On contrary Njuru et al. (2013), investigation on the impact of taxation on private investment in Kenya using Vector auto-regression technique found that VAT had negative impact on private investment while excise tax, import tax and tax amnesty impacted positively on private investment.

Osei-Kyei et al. (2017) studied the various socio-economic factors that attract private sector into PPP projects. The study found that VAT tax exemption on imported equipment have a minimal effect in attracting private investors in PPP compared to social factors like political stability, legal framework etc. On contrary, Basílio (2017) studied the degree of private participation in the PPP. The study found that the higher the tax burden in an investment project the less the private investors are attracted to the PPP in the developing economies. According to Van-Parys (2012), even if tax incentives may mobilize private investment in infrastructure projects in developed economies, that might not be the case in developing countries. In Kenya, KRA allows VAT exemptions on the projects that are financed by concessional loans from development banks and private investors are not incentivized.

The effectiveness of VAT exemption and other tax incentives in attracting private investment remains one of the unsettled concepts in public infrastructure finance because most of private financed projects are in the initial stage and little relevant research is available (Yang, 2018). The policy makers also argue that most of tax incentives lead to significant corruption and this makes it difficult to apply tax incentive effectively in developing countries (Zelekha et al., 2012).

### 2.2.5 Public Debt

Public debt usually occurs whenever there is shortfall on government revenue collection. To finance the public expenditure, the government results to external/foreign borrowing and/or domestic borrowing from within the country. This results to heavy debt obligations and burden that constrain the economic growth and financial systems in these countries (Lidiema, 2018; Dooley, 2000; Richards et al., 2003; Akram, 2015). Changyong (2012)
stated that after global financial crisis in recent years, many countries have accumulated foreign debt that exceed their ability to pay off. As a result, many countries have or may default their debt payment thus putting them at high financial problems.

There are different empirical and theoretical arguments about relationship between public debt and investment. The traditional Keynesian Theory of public debt view increased government debt is a burden to the economy and increased government spending is an expansionary shock to an economy. The Ricardo's theory of public debt argued that primary burden to the community was derived from the wasteful nature of public expenditure itself rather than from the methods adopted to finance such expenditure (Ntshakala, 2015). The proponents of these theories introduce a different argument. The modern theory of finance theory argue that deficit financed spending has a much greater final impact on the economy than spending financed by taxes since taxes reduces disposable income that would have otherwise been invested (Lidiema, 2018).

There are several empirical studies that focus on the impact of public debt on economic growth and overall investment in developed and developing countries. Akram (2015) studied the consequences of public debt on economic growth and investment in Philippines for the period 1975-2010. The autoregressive distributed lag technique design method was used. The study established a negative relationship between external debt and investment due to debt overhang. The study also found a negative relationship between domestic debt and investment due to crowding out effect. Lidiema (2018) analyzed the empirical relationship between domestic debt and gross capital formation in Kenya. The study established a negative but insignificant relationship. Kamundia et al. (2015) studied the effect of the public debt on the private investment in Kenya using time series data for the period 1980 to 2013. The study found that public debt had negative effect on private investment.

DiPeitro et al. (2012) using fixed and random effect models finds that increase in government debt in 175 countries reduced economic growth and private investment. Akomolafe et al. (2015) empirical study on the effect of public borrowing on private investment in Nigeria finds that external debt has a positive relationship with gross domestic investment in the long run, but a negative relationship in the short run. Secondly, domestic debt has a negative relationship with domestic investment in both short-run and long-run. Huang (2018) argued that public debt increases the sensitivity of corporate
investment to cash flow and crowds out corporate investment by tightening credit constraints. Basilio (2010) empirical analysis finds private sector being more willing to invest in projects located in richer countries than poor countries that have high probability of defaulting their public debts. However, limited literature is available on how the public debt influences investor’s decision in water and other public infrastructures.

2.3 Financial Sustainability Constraints and Access to Private Financing

2.3.1 Water Tariff/Pricing Uncertainty

Water tariff/pricing structure is a set of procedural rules used to determine the monthly bills for water users in various categories or classes. A water monthly bill may include two distinct components: a part based on the volume of water used, and another part based on factors other than water use (Boland, 2000). Water pricing provides revenues to water utilities which can be used for reinvestment, maintenance, improvement and extension of water supply and sanitation infrastructure. The water tariff policy should ensure water tariffs are sufficient to cover all the direct economic and financial costs of water supply and sanitation investment (OECD, 2009a).

Water tariff is considered as an important tool to achieve sustainable water and sanitation infrastructure. Water tariffs provide means of cost recovery for the water infrastructure investments. However, water pricing appears to be a difficult task for governments at national and local levels (Pinto et al., 2018). Water pricing systems may be subject to institutional constraints including legal restrictions, and underlying informal rules, such as the perception of water as a basic right (Lehmann, 2010). Water pricing can also be difficult because of water variability. For example, water sourced from rivers is often polluted with industrial and agricultural wastes from upstream users. This pollution means water will incur an additional treatment costs that has to be recovered from tariff (Fogel et al., 2014). Davis (2005) stated that the issue of tariff attracts a lot of political attention and this creates considerable risks to any tariff adjustment.

There exist several studies on the relationships between water tariffs and revenue. Guerrini et al. (2011) studied the relationship between revenue and water tariff in water utilities from different areas of Italy. The study found a positive correlation between water tariff and generated revenue. Fogel et al. (2014) argued that relatively high tariff provides enough revenue that enables water utility to finance water infrastructures to supply majority of its citizens. Ameyaw et al. (2013) empirical study found that water tariffs determine the
amount of revenue and profitability of water utilities in Ghana. However, the water tariffs in Ghana are quite low making water projects financially unviable.

The World Bank promotes the concept of PPP as an alternative to ensure tariff discipline and provide access to private capital (Ameyaw, 2017). Ameyaw et al. (2013) empirical analysis finds that all PPP water projects started in Ghana failed to leverage the needed private capital due to low tariff. According to OECD (2009a), low tariffs prevent extensions of water networks to poorer communities. To attract private investment in water infrastructure, cost recovery tariffs are recommended because they will provide market signals so that decisions to consume water (or not) are fully reflective of the associated costs. WSP (2012) assert that the need to attract private capital leveraging is interlinked with the need for cost recovery pricing as a stronger financial performance will allow access to revenue sources such as commercial debt finance.

Under the Water Act 2002 the Government of Kenya established new tariff policy and created a Water Services Regulatory Board (WASREB). The WASREB is mandated to establish tariffs that balance commercial, social and ecological interests by ensuring access to all while allowing Water Service Boards (WSBs) and Water Service Providers (WSPs) to recover justified costs. AMCOW (2015) argued that large scale private investment in Kenya water sector is unlikely due to the complex institutional setup in the sector, and still evolving water tariff regulations. WASREB (2015) confirms that many small utilities in Kenya operate under tariffs that can hardly cover their operation and maintenance costs. The revision of water tariff in Kenya remains unattended due to the insufficient understanding on its contribution towards mobilization of private investment and lack of political will.

2.3.2 Lost Revenue on Non-Revenue Water (NRW)

NRW water is the difference between the volume of water put into a water distribution system and the volume that is billed to customers. It includes leakages, non-payment of bills, and illegal connection or water theft along the water supply network (Van den Berg, 2015). NRW affects the financial viability and sustainability of water utilities through lost revenues and increased operational costs (Appiah, 2017). The financial loss through NRW to water utilities is estimated at US$14 billion annually worldwide. About a third of this financial loss occurs in the developing countries (Liemberger et al., 2006).
Inadequate revenue streams because of NRW remains an impediment to private investment in water infrastructure (Danilenko et al., 2014). According to Shah et al. (2011) developed countries record lowest levels of NRW in the range of 10-20 percent, and in exceptional cases, as low as 5% (Germany 7%, UK 5%). NRW in developing countries is exceptionally high estimated to be more than 40 in most countries. Oliver et al., (2016) stated that in Kenya NRW is about 40 to 50 percent on average. The study of water utilities shows that full costs are rarely covered or not recovered at all, especially in middle income countries Kenya where the water sector faces an increasing demand.

There are many study articles published on NRW reduction. However, most of these studies tend to be on sources of NRW, performance of utilities and practical guidelines as to how to reduce NRW. Ameyaw, and Chan, (2015) studied various risks affecting implementation of PPP water projects in Ghana. The risk of water theft ranked high followed by the non-payment of bills and pipe failures. Farok (2017), study finds that NRW shortened the revenues of water utilities significantly in Dhaka. Murrar (2017) argued that NRW affects the revenue part of water utilities and results to profit devaluation and causes financial unsustainability and unviability. As for how NRW influences investment decisions of private investors, the literature is scarce in both developed and developing countries.

The illegal water connection and nonpaid bills exists as a result of regulatory failure, corruption, and political interference. Without institutional participation in sensitization of communities against the menace, revenue generated by utilities will not match the need for expansion of water infrastructure (Felbab-Brown, 2017). Lai et al. (2017) empirical analysis finds little public participation in NRW management in Malaysia that has NRW ranging from 18 to 62 percent on average. Yazid (2017) stated that NRW reduction in Malaysia is often hindered by the inadequate public awareness, political interference, corruption and private sector involvement. Although there can never be a perfect water distribution system with zero percent NRW, there is a growing concern on the need to reduce NRW to minimum value to change the negative perception private investors have towards water infrastructures.

There are limited studies to deduce a correlation between NRW and number of water project financed through PPP. According to OECD (2012), developed countries like USA and Europe registered highest number of private participations in water projects through PPP in the year 2009. The distribution of water project developed through PPP recorded in
2009 was as follows: United States-158, Europe -171, Asia-119 and Africa and Middle East combined-45. Shah et al. (2011) data of NRW shows that developed countries have low levels of NRW compared to developing countries. However, there is little empirical evidence to show that low levels of NRW increases appetite of private investment in water infrastructure.

2.3.3 Transaction Costs

The neoclassical theory argues that in an ideal world people meet each other and exchange goods and services easily and there are no issues in fulfilling agreement. The transaction costs are just the cost of product/service itself. However, in real world goods and services are not exchanged at expense-free. The negotiations for these contracts could take long and could be very costly because of time spent, travel expenses, layer fees etc. The major impediment transaction cost in large infrastructure that private investor face includes the ex-ante transaction costs (search of information cost, bargaining cost) and ex-ante transaction costs (cost of enforcing contracts) (Thomassen et al., 2016).

Considerable development has occurred on transaction theory. Ronald Coase developed the transaction cost theory and referred to transaction costs as “the cost of carrying out a transaction by means of an exchange on the open market”. Thereafter, Oliver Williamson buildup the theory further and stated that transaction costs are the economic equivalent of friction in physical systems (Thomassen et al., 2016). Dagdeviren (2016) examined the empirical validity of Williamson’s propositions of transaction costs approach in the context of private participation in water and sanitation sector. The study found that literature does not provide any concrete measure of the extent of transaction costs under private and public ownership in water sector. However, there is anecdotal evidence suggests that transaction costs might be higher under private models. Whittington et al. (2006) argued that given the capital intensity of water infrastructure, there are large opportunities for bribery and kickbacks on construction contracts. These problems greatly increase the transaction costs of private investors doing business.

The effect of transaction cost on the investment has been discussed by researchers for decades. Junior et al. (2011) studied the empirical relationship between transaction cost and investment decision. Regression was used to study data from 35 countries for period 2001-2007. The study found a negative correlation between transaction cost and investment rate. However, the study suggested further study on effects of transaction cost on different
sectors in developing countries. De-Schepper et al. (2015), study on the magnitude of transaction cost on delivery on 172 PPP infrastructure projects in Belgium finds burdened transactions than traditional public procurement. Thomassen et al., (2016) analyzed the transaction cost in PPP infrastructure project tendering in Norway. The study finds transaction costs up in range of 70 percent of the tendering cost which according to transaction cost theory means these resources spent goes to waste. Dudkin et al. (2005) estimate transaction costs in the procurement phase of about 10 percent of capital value of the project.

There are numerous studies focused on the PPP but very few have studied on transaction cost in private financed water infrastructure projects. Ye et al. (2017) empirical analysis finds profitability including transaction costs, political connections as the main factors influence the private investor participation in infrastructure finance. Jin (2012) argues that the uncertainty in the PPP infrastructure projects increases the risks and consequently the transaction costs. This discourages many private investors from investing in such capital-intensive infrastructure. Takeshima et al. (2010), study finds that the unobserved transaction costs can be as important as the factors determining the profitability of assets and emphasizes the importance of reducing transaction costs to provide the environment for higher returns from investment.

2.4 Long-Term Debt Financing Constraints and Access to Private Financing

The need to improve and build an inclusive financial system is a goal of all economies. There is empirical evidence that shows well-functioning and efficient financial systems are crucial in channeling funds to productive uses thus boosting economic growth and investment. The greatest challenge is making financial services available to all (Maalim et al., 2016). This section presents the existing empirical literature on the challenges in access to long-term credits from commercial banks and capital market.

2.4.1 Long-term Debt Finance from Commercial Banks

Access to long-term finance is considered as one of the critical financial challenge in developing countries facing policy makers. Lack of long-term finance is linked to increased infrastructure need and low private investment in developed as well as developing countries (Beck, 2016). Theory and empirical studies have shown that long-term sources of finance are critical for to spur economic development (ITDP, 2016). Commercial Banks normally offer loan services to their customers on short, medium or long-term loan basis. The amount
of money available for lending from commercial bank normally depend on amount of mobilized deposits in surplus from customers and other economic agents (Mukoya et al., 2015).

According to Demirgüç-Kunt et al., (2017), firms that operate in a business environment where the availability of long-term finances is limited tend to be disadvantaged when it comes to their long-term investment projects. When a firm decides to only use short-term debts to finance long-term investment, this introduces liquidity risk. Cowling et al., (2016) argue that since the global financial crisis in 2007-2008, banks have been reluctant to finance long term debts in public infrastructure projects. However, research finds little evidence on drop in long-term debt financing after the financial crisis in developing countries but recognized there is significant risk for financing infrastructure investment (Giovannini et al., 2015).

The water infrastructure projects are capital intensive and long-term in nature that makes them carry several risks to lenders. Not many commercial banks are able to provide long-term banking finance to match the long payback period of water infrastructure investment (Annamalai et al., 2016; OECD, 2010). According to Scott-Quinn et al. (2015), in the recent transactions some banks in Europe provided a 15-year loan for a 30-year concession that left the project sponsor and company with a refinancing risk of 15 years. Similarly, banks in the developing countries are also reluctant to extend long-term credit to private business due to the changes in regulatory, and loan maturity policies (Mukoya et al., 2015).

Fan et al. (2012) studied debt maturity choices in 39 developed and developing countries. The study found that in countries perceived to be more corrupt investors used less equity and more short-term debt whereas in countries operating under legal systems more equity and long-term debt was used. According to Kirch et al., (2012), empirical studies find a positive relationship between debt maturity and asset maturity, growth opportunities and credit rating. Beck (2016) argue that long-term finance is sensitive to macroeconomic stability and institutional framework, which explains why we can see a prevalence of short-term and foreign currency lending in many developing countries.

Water infrastructure assets are difficult to use as collateral due to their low resale market value (Bender, 2017). The major primary challenge that low and middle-income countries face is to prepare bankable water projects. The secondary challenge is that many commercial banks are new to water and sanitation sectors and requires certain enhancement
to reduce the perceived risks (Goksu et al., 2017). The commercial banks also see water infrastructure as being too risky for them due to difficulties with increasing the tariffs, inefficiency and wide-spread corruption. In addition, many commercial banks in developing countries are unwilling to compete with the development banks and development financial institutions which offer finance to water infrastructures on more favorable terms and interest rates (OECD, 2010).

In Kenya the major reasons commercial banks are not chosen as potential source of finance for water infrastructure is: banks in Kenya do not typically lend for periods beyond seven years, whereas the useful life of water assets is often much longer and; water assets provide limited collateral to lenders because they have little liquidation value (World Bank, 2015). The water utilities also lack adequate or have unreliable data needed to assess credit worthiness required by the commercial banks (Claasen, 2016). The maximum accessible loans from commercial banks range from US$ 1000 to US$100,000 with maximum repayment duration of 3 years (OECD, 2010).

2.4.2 Availability of Water/Green Bond Financing

Bonds have been used extensively to raise finance for water infrastructure. In USA the national, state and municipal governments have used bonds to raise funds for infrastructure investment including water and sanitation. Bonds are popular with investors because most of them carry tax exempt interests (Abeysuriya et al., 2014). Bond investors generally make their investment decisions based on a project bond’s merits and credit rating relative to other investment opportunities (Association for Financial Market in Europe, 2015). In developed countries water infrastructure is considered to have low risk profile that makes bond debt finance attractive. Corporate bonds have been successfully issued in UK to finance water infrastructure (OECD, 2010).

The challenge of climate change is making the capital markets to come up with innovative instruments to finance infrastructure projects. There is an emerging use of climate aligned bonds from the Climate Bond Initiative labeled “green” or “climate” bonds to finance water infrastructure and other projects that increase resilience to impacts of climate change. Climate bond can be used to mobilize private capital into infrastructure (Lazurko, 2017). However, few studies have been done on climate bond. Banga (2018) study on potential of green bonds in mobilizing adaptation and mitigation finance for developing countries finds that the market remains incipient and full potential is underappreciated. Zerbib (2018) study...
on the yield premiums between green bond and conventional bonds find the later to have lower yield potential. This could be the reason why there is low utilization of green bonds in infrastructure projects but there is no empirical evidence.

Lloyd-Ownen (2006) observed that only 21 countries had issued bonds between 2000 and 2006 in water and sanitation infrastructures. Majority of bonds issued for water infrastructure are in USA, France and UK. The bond market for water infrastructures in developing countries is still small or nonexistent. Platz (2009) stated that the borrowing costs for bonds comprise the principal and interest rate payments. The interest rate investors are prepared to pay depends on the market environment. This limits the issuance of bonds in majority of developing countries where business environment is poor. According to OECD (2010), innovation is needed to develop access to bond finance by; improving credit rating of potential bond issuer or project; pooling water utilities together to reach capacity for issuing bond; and improving information sharing about the water sector through development of credit ratings. Credit enhancements guarantees and International Financial Institution (IFI) lending can be used to increase the credit rating of a project to support issuance of bonds.

### 2.4.3 Availability of Quasi-Equity/Mezzanine Debt Financing

Mezzanine or quasi-equity finance is a hybrid financing instrument that combines both debt and equity financing. It is considered as a convenient way to finance infrastructure projects with higher risk. It is a form of external financing for the entrepreneurs who intend to carry out the investment project. Mezzanine finance carries medium-high risks between debt and equity financing (Dec et al., 2017). Mezzanine finance has been around for decades and is increasingly being used to finance infrastructure. It is mostly structured in form of subordinated loan which is unsecured loan with lower ranking in case of bankruptcy compared to senior debt. The subordinated debt brings in additional returns to compensate for the additional risk (higher interest rates or ownership shares) (Romero et al., 2014).

Mezzanine finance is used when an investor is not able to obtain bank loan and measures of existing shareholders are not sufficient i.e. there is equity gap. The expected rate of return range between 14-21 percent compared to up to 35 percent required by equity finance (Dec et al., 2017). Baldwin (2012) argued that mezzanine debt usually bears interest at a fixed rate, maturity is usually longer than the term of the senior loan, and typical interest rates are at 14 percent per annum. The mezzanine debt investors normally collect sizeable
upfront fees at closing as compensation for investor added risk. The fees plus interest rates enables investor to achieve desired rate of return which is usually in the range of 20 to 25 percent.

The mezzanine finance is critical for funding infrastructure project in developing countries. For example, in the year 2006, IDB approved US$60 million for Central American Infrastructure Fund (CAMIF) to provide mezzanine lending to private investors in infrastructures. The use of mezzanine finance in developing countries is limited by lack of enough and varied pool of infrastructure projects, and interest cap on borrowing which affects pricing of debt or quasi-equity instruments (World Bank, 2006; IDB, 2006). The public entities such as multilateral development banks (MDBs) can step in to reduce amount of equity raised by private investors in a project through mezzanine debt or subordinated debts. Mezzanine debt strategies are emerging as a niche investment area for pension funds, insurance, and other institutional investors (Croce et al., 2015). Mezzanine Financing is growing rapidly as an investment structure in East Africa in corporate sector but not in infrastructure (I&M, 2018).

2.5 Chapter Summary

The chapter highlighted the literature review on constraints affecting access to private financing for water infrastructure in Kenya. The chapter examined the existing literature on fiscal policy constraints, financial sustainability constraints in water projects, and long-term debt financing constraints affecting access to private financing in water infrastructure. The next chapter presents the research methodology used in the study.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology used in this study. The aspects covered in this chapter include research design, population and sampling design, data collection methods, research procedures, data analysis methods and chapter summary.

3.2 Research Design

Research design refers to the way the study is designed, and the method used to carry out the research (Kothari, 2001). For this study, the researcher used explanatory research design. Explanatory research design focuses on analysis of a situation or a specific problem to explain the patterns of relationships between variables. Explanatory research design is particularly used in research aiming to explain the “how” and “why” questions involved in casual explanations (Zikmund, 2000; Cairns, 2016). Explanatory research design was found to be the most appropriate for this study as it can explain any casual links between the independent variables and dependent variable. The independent variables were fiscal policy constraints, financial sustainability constraints in water projects and long-term debt financing constraints. The dependent variable is access to private financing for water infrastructures in Kenya. Explanatory research design is fundamental in this study since it seeks to explain how the various constraints affect access to private financing for water infrastructure in Kenya.

3.3 Population and Sampling Design

3.3.1 Population

Target population is set of the study of all members of real or hypothetical set of people, events or objects to which an investigator wishes to generalize the result (Mugenda & Mugenda, 2003). The researcher defines the population and it must be accessible, quantifiable and related to the purpose of research (Balnaves & Caputi, 2001; Kothari, 2001). The study population consisted of water infrastructures financing professionals derived from 9 organizations involved in water infrastructure financing and development in Kenya. The organizations included: KfW, AFD, IFC, The World Bank, and AfDB-international financial institution; WSTF and WASREB -government parastatal; and
KIFFWA, BFA- private investment organization. The study involved 37 water infrastructure finance professionals as listed in Table 3.1.

Table 3.1: Population Size

<table>
<thead>
<tr>
<th>No.</th>
<th>Organization</th>
<th>Population Size</th>
<th>Percentage (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>Agence Française de Développement</td>
<td>2</td>
<td>5</td>
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<tr>
<td>2</td>
<td>African Development Bank</td>
<td>5</td>
<td>14</td>
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<tr>
<td>3</td>
<td>Big Four Africa Ltd</td>
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<td>4</td>
<td>International Finance Corporation</td>
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<tr>
<td>5</td>
<td>Kreditanstalt für Wiederaufbau</td>
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<td>8</td>
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<tr>
<td>6</td>
<td>Kenya Innovative Financing Facility for Water</td>
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<td>11</td>
</tr>
<tr>
<td>7</td>
<td>Water Services Regulatory Board</td>
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<tr>
<td>8</td>
<td>The World Bank</td>
<td>8</td>
<td>22</td>
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<tr>
<td>9</td>
<td>Water Sector Trust Fund</td>
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<td>16</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>37</strong></td>
<td><strong>100</strong></td>
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3.3.2 Sampling Design

The sampling design refers to selecting the target population and selection of the sample (Cooper & Schindler, 2008). The target population in this research was the water infrastructure finance professionals working for financial institutions (KfW, AfDB, IFC, The World Bank, AFD) government agencies (WSTF and WASREB), and water sector private investors (BFA and KIFFWA). All the 37 water infrastructure financing professionals were selected for the study.

3.3.2.1 Sampling Frame

Sampling frame refers to the list of elements from which the sample is drawn. It is closely related to the population of study the study being undertaken. Sampling enables to lower cost, improve accuracy of results, increase speed of data collection, and availability of population elements (Cooper & Schindler, 2011). The sampling frame for this research was derived from KIFFWA, IFC, BFA, The World Bank, AfDB, AFD, WASREB, WSTF, and KfW all operating in Kenya from Nairobi offices. The study involved all 37 Water Infrastructure Finance Specialists that ensured the sample frame was relevant to the study objectives.
3.3.2.2 Sampling Technique

The non-probability sampling technique of purposive/judgmental sampling was used in this study. The Sampling technique refers to a method used to select elements from the population that represent the population in the research study (Collis & Hussey, 2009). The purposive/judgmental is often used with very small sample and conforms to certain criteria particularly individuals of certain characteristics (Greener, 2008; Cooper & Schindler, 2008). In this study, respondents were experts/professionals in the field of Water Infrastructure Finance. The expert opinions were sought because private financing in infrastructure is a new concept, and therefore high degree of knowledge, understanding or experience was needed in infrastructure finance, policies, PPPs, and financial sector in Kenya.

Table 3.2: Sample Size

<table>
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<td>2</td>
<td>African Development Bank</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>Big Four Africa Ltd</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>International Finance Corporation</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Kreditanstalt für Wiederaufbau</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Kenya Innovative Financing Facility for Water</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>Water Services Regulatory Board</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>The World Bank</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>9</td>
<td>Water Sector Trust Fund</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>37</td>
<td>100</td>
</tr>
</tbody>
</table>

3.3.2.3 Sample Size

Sample size determination is a way in which the number of observations is determined in a sample. The sample size is an important feature of any study or investigation in which the aim is to make inferences about the population from a sample. In general, the sample size used in a study is determined based on the cost of data collection and based on sufficient statistical power (Singh et al., 2014). Since the target population is relatively small and therefore higher degree of accuracy is required, census method was used to study the entire population as shown in Table 3.1. The study population included all 37 water infrastructure finance specialists working for the KIFFWA, IFC, BFA, The World Bank, AfDB, AFD, WASREB, WSTF, and KfW.
3.4 Data Collection Methods

Structured open and closed ended questionnaires were used in the study. Questionnaires were preferred for this study because they elicit confidential information, can be used for a large sample and they are easier to administer (Mugenda & Mugenda, 2003). The questions were open and closed ended. Closed ended questions were used to ensure that the given answers were relevant. The researcher phrased the questions clearly to make them understandable by respondents. In open ended questions, spaces were provided for respondents to provide relevant additional information. This method is considered effective to the study in that; it created confidentiality (Kothari, 2001).

3.5 Research Procedure

The research questionnaires for this study were developed based on the specific objectives. This was followed by recruitment of enumerators or research assistant. The enumerators were trained on the research tool to minimize data collection errors. Each respondent received cover letter and a copy of the questionnaire. The cover letter provided the purpose of the study and assured confidentiality of responses. Respondents were expected to take an average of 3 weeks to complete the questionnaires. The researcher obtained authority to circulate questionnaires from relevant departmental sections of the organization selected for the study. To ensure reliability and validity, questionnaires were pre-tested on ten respondents from KPWF who after one week were given the same instruments again. These respondents were not included in the final study. The questionnaires were then fine-tuned for the final distribution.

3.6 Data Analysis Methods

After the data collection was completed, the data analysis started. Data analysis is an iterative process and requires “reflexive interpretation”. This is needed for reflection and interpretation on several levels (Alvesson & Sköldberg, 2000). The most important requirement is that, the data should be accurate, complete and suitable for further analysis (Sekaran & Bougie, 2010). Researcher records and arranges the data, and then applies various descriptive and inferential statistics concepts to explain the data and draw inferences (Saunders et al., 2009). However, selection of inappropriate statistical technique or econometrics model may lead to wrong interpretations (Khalid, 2012).

After the respondents were through, all questionnaires were collected from respondents and adequately checked for reliability. The data from questionnaire was sorted, organized and
entered into SPSS for quantitative analysis. The descriptive statistical techniques were used to present the data. Cooper and Schindler (2008) defined descriptive statistics as the process of transforming raw data into tables and charts using frequency distributions and charts. The descriptive statistics of mean and standard deviation was used to compute the central tendencies of the variables. The results were displayed in tables and charts. Interpretation of the statistical outputs was done and discussed in the presentation of results and findings. Regression analysis was conducted to investigate the relationship between the constraints and access to private financing for water infrastructure in Kenya. The regression model was of the form;

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \]

Where:
- \( Y \) = Dependent variable access to private financing for water infrastructure projects
- \( \beta_0 \) = Constant of regression
- \( \beta_1, \beta_2, \beta_3 \) = Coefficients of \( X_1, X_2 \) and \( X_3 \) respectively
- \( X_1 \) = Fiscal policy constraints
- \( X_2 \) = Financial sustainability constraints in water project
- \( X_3 \) = Long-term debt financing constraints
- \( \epsilon \) = Error term of the model

The inferential statistics was based on 0.05 level of significance.

### 3.7 Chapter Summary

The chapter described the methodology used in conducting the study. The chapter outlined the research design, population and sampling design, composite model of variables of interest, data collection method, research procedure, and data analysis method. The study used explanatory research design approach and census method was used to study the entire population. Chapter four presents result and findings of the study.
CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Introduction

In the previous chapter, the methodology of the research was discussed. This chapter focuses on data analysis and presentation of results and findings of the study. The aspects covered in this chapter include general information of respondents including response rate; findings of specific objectives. The chapter also covers descriptive and inferential statistics; and a summary results and findings.

4.2 General Information

4.2.1 Response Rate

The questionnaire required respondents to indicate their gender, name of organization they worked for, position, sector, level of education, and years of experience in water infrastructure financing. Out of 37 experts in Water Infrastructure Financing who were given the questionnaires, 33 completed and returned questionnaires giving a response rate of 89 percent as shown in Figure 4.1. This response rate is good for accuracy of the information provided by respondents.

Figure 4.1: Response Rate

Source: Author (2019)
4.2.2 Respondent by Gender

The Figure 4.2 shows that majority of the respondents were male at 70 percent, while 30 percent of the respondents were female. Therefore, majority of the employees in this organization are represented by male.

![Respondent Gender](image)

**Figure 4.2: Respondent by Gender**

*Source: Author (2019)*

4.2.3 Organizations

The Figure 4.3 shows that 21 percent of respondents worked for The World Bank followed by AfDB and WSTF at 15 percent. The findings imply that The World Bank is major player in financing Kenya’s water projects.

![Respondents by Organization](image)

**Figure 4.3: Respondents by Organization**

*Source: Primary Data (2019)*
4.2.4 Sector of the Organization

The respondents were asked to state the sector of the organization they worked for. The findings of the study presented in Figure 4.4 shows that majority of the respondents (76 percent) worked for private sector and 24 percent worked in public sector. The results of the study mean that the private sector is active in financing and investment of water infrastructure in Kenya.

![Sector of the Organization](image)

**Figure 4.4: Sector of the Organization**

**Source: Primary Data (2019)**

4.2.5 Work Experience

The findings of the study presented in Figure 4.5 shows that 39 percent of the respondent had worked between 2 and 5 years and 36 percent of the respondents had worked between 2 and 9 years in their respective organizations. The findings mean that majority of respondents had good understanding of their organization’s operations in water infrastructure financing.
4.2.6 Level of Education

The Figure 4.6 shows that majority of the respondents (73 percent) had master’s degrees. The results further show 18 percent of the respondents had doctorates degree. The results mean that the respondents were well educated, and the response was well informed.

Figure 4.6: Level of Education

Source: Primary Data (2019)

4.2.7 Years of Experience

The results of the study presented in Figure 4.7 show that 45 percent of the respondents had experience spanning 6 to 9 years and 21 percent of the respondents had experience of over 9 years. The findings indicate that majority respondents had good and adequate experience in water infrastructure financing.

Figure 4.7: Years of Experience

Source: Primary Data (2019)
Figure 4.7: Years of Experience
Source: Primary Data (2019)

4.3 Fiscal Policy Constraints and Access to Private Financing

The study sought to assess constraints affecting access to private financing for water infrastructures which are fiscal policy constraints, financial sustainability constraints in water projects, and long-term debt financing constraints.

4.3.1 Fiscal Policy Constraints

The study sought to determine the extent to which the respondents agreed or disagreed that tax holiday, tax exemption (VAT and excise duty) and public debt affect access to private financing for water infrastructure in Kenya. Likert scale was used to rate the responses where 1 = strongly disagree, 2=disagree, 3= Neutral, 4 = agree and 5 = strongly agree. Table 4.8 revealed that majority of respondents were of the neutral view that fiscal policy constraints affected access to private financing for water infrastructures as shown by aggregate mean of 3.37.

The findings also indicate that majority of the respondents partially agreed (M=3.48, STD=1.149) that lack of tax exemption (VAT and Excise duty) for water projects developed through private financing affected access to private financing. There was near neutral view that lack of corporate tax holidays for water projects developed through private financing (M=3.36, STD.=1.270), and level of public debt (M=3.27, STD.= 1.206) affected access to private financing for water infrastructure in Kenya.
### Table 4.1: Fiscal Policy Constraints

<table>
<thead>
<tr>
<th>Statements</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of tax exemption (VAT and Excise duty) for water projects developed</td>
<td>33</td>
<td>3.48</td>
<td>1.149</td>
</tr>
<tr>
<td>through private financing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of corporate tax holidays for water projects developed</td>
<td>33</td>
<td>3.36</td>
<td>1.270</td>
</tr>
<tr>
<td>through private financing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of public debt</td>
<td>33</td>
<td>3.27</td>
<td>1.206</td>
</tr>
</tbody>
</table>

**Average** 33 3.27 1.206

*Source: Primary Data (2019)*

#### 4.3.2 Correlation between Fiscal Policy and Access to Private Financing

Pearson Correlation analysis was done to investigate the relationship between fiscal policy constraints and access to private financing for water infrastructure. The results as shown in the Table 4.2 indicate that there is a positive but not significant correlation between the two variables. This means that fiscal policy constraints do not significantly affect access to private financing with $(r = 0.158, p = 0.636 > 0.05)$.

### Table 4.2: Correlation between Fiscal Policy and Access to Private Financing

<table>
<thead>
<tr>
<th></th>
<th>Access to private financing</th>
<th>Fiscal policy constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to private</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td>financing for water</td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td>infrastructure</td>
<td>N</td>
<td>33</td>
</tr>
<tr>
<td>Fiscal policy constraints</td>
<td>Pearson Correlation</td>
<td>0.158</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.636</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>33</td>
</tr>
</tbody>
</table>

*Source: Primary Data (2019)*
4.3.3 Regression between Fiscal Policy and Access to Private Financing

A linear regression analysis was done to investigate the extent to which fiscal policy constraints affect access to private financing for water infrastructure. The results from the model summary Table 4.3 indicates that $R=0.158$ meaning that the relation between the two variables is positive and adjusted $R$-square $=0.017$, an indication that fiscal policy constraints affect 1.7 percent of the access to private financing for water infrastructure.

Table 4.3: Regression Model Summary for Fiscal Policy Constraints

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.158a</td>
<td>0.025</td>
<td>0.017</td>
<td>0.36064</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Fiscal policy constraints

Source: Primary Data (2019)

The results from the ANOVA Table 4.4 indicate that p-value is 0.636 which is greater than alpha (0.05) implying that the model is not statistically significant. The linear regression model is $Y=\beta_0+\beta_1X_1$ where $Y=$ access to private financing, $\beta_0 =$ a constant, $X_1=$ fiscal policy constraints and $\beta_1 =$ effect of $X_1$ on $Y$.

Table 4.4: ANOVA for Fiscal Policy Constraints

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regression</td>
<td>0.048</td>
<td>1</td>
<td>0.048</td>
<td>0.228</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>6.578</td>
<td>31</td>
<td>0.212</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6.626</td>
<td>32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing
b. Predictors: (Constant), Fiscal policy constraints

Source: Primary Data (2019)

The results in the coefficients Table 4.5 indicates that constant $\beta_0 = 1.327$, and $\beta_1 = 0.038$ and therefore the linear regression model is $Y=1.327-0.038X_1$ or Access to private financing $= 1.327 + 0.038$ x fiscal policy constraints. This means that, with all other variables held constant, increasing fiscal policy constraints by one unit, access to private financing will be significantly affected by 0.038 units. The results also revealed that fiscal policy constraints were not a significant predictor of access to private financing (Beta $= 0.158, p >0.05$).
Table 4.5: Model Coefficients for Fiscal Policy Constraints

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.327</td>
<td>0.279</td>
<td>4.765</td>
<td>0.000</td>
</tr>
<tr>
<td>Fiscal policy</td>
<td>0.038</td>
<td>0.079</td>
<td>0.158</td>
<td>0.478</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing

Source: Primary Data (2019)

The results from the model summary Table 4.6 indicates that $R=-0.699$ meaning that the relation between the three variables is strongly negative. The adjusted $R$-square = 0.479, an indication that the included explanatory variables explained only 47.9% of the variations in access to private financing for water infrastructure. The other explanatory variations not in the model explain the remaining 52.1% variations in access to private financing for water infrastructure.

Table 4.6: Multiple Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.699a</td>
<td>0.489</td>
<td>0.479</td>
<td>0.3017</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Long-term debt financing constraints, Fiscal policy constraints, Financial sustainability constraints in water projects

Source: Primary Data (2019)

The results from the ANOVA Table 4.7 indicates that the linear regression model is significantly of good fit at $(F=7.197$, $p=0.004<0.05)$.

Table 4.7: ANOVA for Composite Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>3</td>
<td>0.655</td>
<td>7.197</td>
<td>0.004b</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>29</td>
<td>0.091</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>32</td>
<td>0.091</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing
b. Predictors: (Constant), Long-term debt financing constraints, Fiscal policy constraints, Financial sustainability constraints in water projects

Source: Primary Data (2019)
The results in the model coefficients Table 4.8 indicates that constant $\beta_0 = 3.865$, and $\beta_1=0.094$, $\beta_2=-0.192$, $\beta_3 = -0.629$ and $\varepsilon = 0.176$. The results also found that fiscal policy constraints ($\text{Beta} = 0.213$, $p > 0.05$), financial sustainability constraints in water projects ($\text{Beta} = -0.227$, $p > 0.05$) were not significant predictors of access to private financing for water infrastructures. Long-term debt financing constraints was a significant predictor ($\text{Beta} = -0.626$, $p < 0.05$). Therefore, the linear regression model is $Y = 3.865 + 0.094X_1 - 0.192X_2 - 0.629X_3 + 0.176$.

The regression model shows that for every unit increase in fiscal policy constraints, a 0.094 unit increase in access to private financing is predicted, holding all other variables constant. For every unit increase in financial sustainability constraints in water project, we expect an approximately -0.192 unit decrease in the access to private financing, holding all other variables constant. Finally, for every unit increase in long-term debt financing constraints, we expect a -0.629 unit decrease in the access to private financing for water infrastructure projects, holding all other variables constant. The model also shows that an increase in financial policy constraints by 0.094, decrease in financial sustainability constraints in water projects and long-term debt financing constraints by -0.192 and -0.629 respectively, would lead to increase in access to private financing for water infrastructure in Kenya by 1 unit.

Table 4.8: Regression Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.865</td>
<td>0.176</td>
<td>4.981</td>
</tr>
<tr>
<td></td>
<td>Fiscal policy</td>
<td>0.094</td>
<td>0.073</td>
<td>0.213</td>
</tr>
<tr>
<td></td>
<td>Financial sustainability</td>
<td>-0.192</td>
<td>0.150</td>
<td>-0.227</td>
</tr>
<tr>
<td></td>
<td>Long-term debt</td>
<td>-0.629</td>
<td>0.172</td>
<td>-0.626</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing

Source: Primary Data (2019)
4.4 Financial Sustainability Constraints and Access to Private Financing

4.4.1 Financial Sustainability Constraints in Water Projects
The study sought to determine the extent to which the respondents agreed or disagreed various aspects of financial sustainability constraints in water projects affected access to private financing for water infrastructure in Kenya. Likert scale was used to rate the responses where 1 = strongly disagree, 2 = disagree, 3 = Neutral, 4 = agree and 5 = strongly agree.

The findings of the study in Table 4.9 show that majority of respondents agreed that financial sustainability constraints affected access to private financing for water infrastructures as shown by aggregate mean of 3.87. It is also clear from the research finding that majority of the respondents agreed (M=4.33, STD. =1.080) that persistent revenue losses through NRW registered in water utilities affected access to private financing. There was a partial agreement that lack of political will to adjust water tariffs (M=3.82, STD.=0.917), transaction costs involved in water infrastructure projects (M=3.73, STD.=0.977) and water tariff/pricing structure (M=3.67, STD.= 0.890) affected access to private financing for water infrastructure in Kenya.

Table 4.9: Financial Sustainability Constraints in Water Projects

<table>
<thead>
<tr>
<th>Statements</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistent revenue losses through NRW registered in water utilities</td>
<td>33</td>
<td>4.330</td>
<td>1.080</td>
</tr>
<tr>
<td>Lack of political will to adjust water tariffs</td>
<td>33</td>
<td>3.820</td>
<td>0.917</td>
</tr>
<tr>
<td>Transaction costs involved in water infrastructure projects</td>
<td>33</td>
<td>3.730</td>
<td>0.977</td>
</tr>
<tr>
<td>Water tariff/pricing structure</td>
<td>33</td>
<td>3.670</td>
<td>0.890</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>33</td>
<td>3.888</td>
<td>0.966</td>
</tr>
</tbody>
</table>

Source: Primary Data (2019)

4.4.2 Correlation between Financial Sustainability and Access to Private Financing
Pearson Correlation analysis was done to investigate the relationship between access to private financing for water infrastructure and financial sustainability constraints. The results shown in the Table 4.7 indicates that there is a negative but not significant
correlation between the two variables. This means that financial sustainability constraints do not significantly affect access to private financing with ($r = -0.314$, $p=0.075 >0.05$).

Table 4.10: Correlation between Financial Sustainability and Private Financing

<table>
<thead>
<tr>
<th>Financial Sustainability Constraints</th>
<th>Pearson Correlation</th>
<th>Access to private financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Sustainability Constraints</td>
<td>Sig. (2-tailed)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>-0.314</td>
<td>33</td>
</tr>
<tr>
<td>Access to private financing</td>
<td>Sig. (2-tailed)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>0.075</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Primary Data (2019)

4.4.3 Regression between Financial Sustainability Constraints

A linear regression analysis was done to investigate the extent to which financial sustainability constraints in water projects affect access to private financing for water infrastructure. The results from the model summary Table 4.11 indicates that $R=-0.314$ meaning that the relation between the two variables is negative and adjusted $R$-square = 0.070, an indication that financial sustainability constraints affect 7% of the access to private financing for water infrastructure.

Table 4.11: Regression Model Summary for Financial Sustainability Constraints

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.314$^a$</td>
<td>0.099</td>
<td>0.070</td>
<td>0.43890</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Financial sustainability constraints

Source: Primary Data (2019)
The results from the ANOVA Table 4.12 indicate that p-value is 0.075 which is greater than alpha (0.05) implying that the model is not statistically significant. The linear regression model is \( Y = \beta_0 + \beta_2 X_2 \) where \( Y = \) access to private financing, \( \beta_0 = \) a constant, \( X_2 = \) financial sustainability constraints in water project and \( \beta_2 = \) effect of \( X_2 \) on \( Y \).

**Table 4.12: ANNOVA for Financial Sustainability Constraints**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>0.655</td>
<td>1</td>
<td>0.655</td>
<td>3.398</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>5.972</td>
<td>31</td>
<td>0.193</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6.626</td>
<td>32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing  
b. Predictors: (Constant), Financial sustainability constraints  

**Source: Primary Data (2019)**  
The results in the coefficients Table 4.13 indicates that constant \( \beta_0 = 2.488 \), and \( \beta_2 = -0.266 \) and therefore the linear regression model is \( Y = 2.488 - 0.266 X_2 \) or Access to private financing = 2.488 - 0.266 x financial sustainability constraints. This means that with all other variables held constant, increasing financial sustainability constraints by one unit, access to private financing will be significantly affected by -0.266 units. Financial sustainability constraints in water projects was not a significant predictor of access to private financing (Beta = -0.314, \( p > 0.05 \)).

**Table 4.13: Model Coefficients for Financial Sustainability Constraints**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>2.488</td>
<td>0.566</td>
<td>4.398</td>
<td>0.000</td>
</tr>
<tr>
<td>Financial Sustainability</td>
<td>-0.266</td>
<td>0.144</td>
<td>-0.314</td>
<td>-1.843</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing  

**Source: Primary Data (2019)**
The results of the multiple regression model summary in Table 4.14 indicated an adjusted R-square = 0.479, an indication that the included explanatory variables explained only 47.9% of the variations in access to private financing for water infrastructure. The other explanatory variations not in the model explain the remaining 52.1% variations in access to private financing for water infrastructure.

Table 4.14: Regression Composite Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.699a</td>
<td>0.489</td>
<td>0.479</td>
<td>0.3017</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Long-term debt financing constraints, Fiscal policy constraints, Financial sustainability constraints in water projects

Source: Primary Data (2019)

The results from the ANOVA Table 4.15 indicates that the linear regression model is significantly of good fit at \( F=7.197, p = 0.004 < 0.05 \).

Table 4.15: ANNOVA for Composite Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>3</td>
<td>0.655</td>
<td>7.197</td>
<td>0.004b</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>29</td>
<td>0.091</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing
b. Predictors: (Constant), Long-term debt financing constraints, Fiscal policy constraints, Financial sustainability constraints in water projects

Source: Primary Data (2019)

The model coefficients analysis in Table 4.16 indicates that constant \( \beta_0 = 3.865 \), and \( \beta_1 = 0.094 \), \( \beta_2 = -0.192 \), \( \beta_3 = -0.629 \) and \( \varepsilon = 0.176 \). The results also found that fiscal policy constraints (Beta = 0.213, \( p > 0.05 \)), financial sustainability constraints in water projects (Beta = -0.227, \( p > 0.05 \)) were not significant predictors of access to private financing for water infrastructures. Long-term debt financing constraints was a significant predictor (Beta = -0.626, \( p < 0.05 \)).

The regression model shows that for every unit increase in fiscal policy constraints, a 0.094 unit increase in access to private financing is predicted, holding all other variables constant. For every unit increase in financial sustainability constraints in water project, we expect an
approximately -0.192 unit decrease in the access to private financing, holding all other variables constant. Finally, for every unit increase in long-term debt financing constraints, we expect a -0.629 unit decrease in the access to private financing for water infrastructure projects, holding all other variables constant.

The model also shows that an increase in financial policy constraints by 0.094, decrease in financial sustainability constraints in water projects and long-term debt financing constraints by -0.192 and -0.629 respectively, would lead to increase in access to private financing for water infrastructure in Kenya by 1 unit. The results show that all the independent variables have negative relationship with the access to private financing for water infrastructure except for fiscal policy constraints which has a positive relationship.

**Table 4.16: Multiple Regression Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>3.865</td>
<td>0.176</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiscal policy</td>
<td>0.094</td>
<td>0.073</td>
<td>0.213</td>
<td>1.290</td>
</tr>
<tr>
<td>0.207</td>
<td>Financial sustainability</td>
<td>-0.192</td>
<td>0.150</td>
<td>-1.284</td>
</tr>
<tr>
<td>0.209</td>
<td>Long-term debt</td>
<td>-0.629</td>
<td>0.172</td>
<td>-12.537</td>
</tr>
<tr>
<td>0.003</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing

**Source:** Primary Data (2019)

**4.5 Long-Term Debt Financing Constraints and Access to Private Financing**

**4.5.1 Long-Term Debt Financing Constraints**

The study sought to determine the extent to which the respondents agreed or disagreed on various aspects of long-term debt financing constraints affected access to private financing for water infrastructure in Kenya. Likert scale was used to rate the responses where 1 = strongly disagree, 2=disagree, 3= Neutral, 4 = agree and 5 = strongly agree.

The findings of the study in Table 4.17 show that majority of respondents strongly agreed that long-term debt financing constraints affected access to private financing for water infrastructures as shown by aggregate mean of 4.53. Specifically the findings revealed that majority of the respondents strongly agreed that lack of long-term bank loans that matches
long payback period in water projects (M=4.79, STD.= 0.600), Inadequate credit enhancement mechanisms to reduce perceived bank lending risks (M=4.67, STD.= 0.777) and numerous conditions required by banks to access long-term loans (M=4.67, STD.= 0.645) affected access to private financing for water infrastructure in Kenya. There was a partial agreement on lack of sufficient and varied pool of bankable water projects for mezzanine financing (M=2.27, STD.=0.944) and low yield of water bond compared to conventional bonds (M=2.27, STD.= 1.069).

Table 4.17: Long-term Debt Financing Constraints

<table>
<thead>
<tr>
<th>Statements</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of long-term bank loans that matches long payback period in water projects</td>
<td>33</td>
<td>4.790</td>
<td>0.600</td>
</tr>
<tr>
<td>Inadequate credit enhancement mechanisms to reduce perceived bank lending risks</td>
<td>33</td>
<td>4.670</td>
<td>0.777</td>
</tr>
<tr>
<td>Numerous conditions required by banks to access long-term loans</td>
<td>33</td>
<td>4.670</td>
<td>0.645</td>
</tr>
<tr>
<td>Lack of sufficient and varied pool of bankable water projects for mezzanine financing</td>
<td>33</td>
<td>4.270</td>
<td>0.944</td>
</tr>
<tr>
<td>Low yield of water bond compared to conventional bonds</td>
<td>33</td>
<td>4.270</td>
<td>1.069</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>33</td>
<td>4.534</td>
<td>0.807</td>
</tr>
</tbody>
</table>

*Source: Primary Data (2019)*

4.5.2 Correlation between Long-term Debt Financing and Private Financing

Pearson Correlation analysis was done to investigate the relationship between long-term debt financing constraints and access to private financing. The results shown in the Table 4.18 indicates that there was a strong negative and a significant correlation between the two variables \((r=-0.678, p=0.002<0.05)\). This means that long-term debt financing constraints significantly affect access to private financing.
Table 4.18: Correlation between Long-term Debt Financing and Private Financing

<table>
<thead>
<tr>
<th></th>
<th>Access to private financing</th>
<th>Long-term debt financing constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to private financing</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>33</td>
</tr>
<tr>
<td>Long-term debt financing</td>
<td>Pearson Correlation</td>
<td>-0.678**</td>
</tr>
<tr>
<td>constraints</td>
<td>Sig. (2-tailed)</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>33</td>
</tr>
</tbody>
</table>

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

Source: Primary Data (2019)

4.5.3 Regression between Long-term Debt Financing and Private Financing

A linear regression analysis was done to investigate the extent to which long-term debt financing constraints affect access to private financing for water infrastructure. The results from the model summary Table 4.19 indicates that $R= -0.678$ meaning that the relation between the two variables is strongly negative and Adjusted R-square = 0.449, an indication that long term debt constraints affect 44.9% of the access to private financing for water infrastructure.

Table 4.19: Regression Model Summary for Long-term Debt Financing Constraints

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.678a</td>
<td>0.460</td>
<td>0.449</td>
<td>0.50426</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Long-term debt financing constraints

Source: Primary Data (2019)

The results from the ANOVA Table 4.20 indicates that the linear regression model is significantly of good fit at $(F=6.135, p=0.002<0.05)$. The linear regression model of good fit is $Y= \beta_0 + \beta_3X_3$ where $Y=\text{access to private financing}$, $\beta_0=\text{a constant}$, $X_3=\text{long term debt financing constraints}$ and $\beta_3=\text{effect of } X_3 \text{ on } Y$. 

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Table 4.20: ANNOVA for Long-term Debt Financing Constraints

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>1.560</td>
<td>1</td>
<td>1.560</td>
<td>6.135</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>7.874</td>
<td>31</td>
<td>0.254</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>9.434</td>
<td>32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing for water infrastructure

b. Predictors: (Constant), Long-term debt financing constraints

Source: Primary Data (2019)

The results in the coefficients Table 4.21 indicates that constant $\beta_0 = 3.712$, and $\beta_3 = -0.675$ and therefore the linear regression model is $Y=3.712-0.675X_3$ or Access to private financing=$ 3.712-0.675x$ Long term debt financing constraints. This means that with all other variables being held constant, increasing long term debt constraints by one unit, access to private financing will be significantly affected by -0.675 units. Long-term debt financing constraints was a significant predictor of access to private financing (Beta = -0.678, $p=0.002 <0.05$).

Table 4.21: Model Coefficients for Long-term Debt Financing Constraints

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>3.712</td>
<td>0.334</td>
<td>5.057</td>
<td>0.000</td>
</tr>
<tr>
<td>Long-term debt financing</td>
<td>-0.675</td>
<td>0.161</td>
<td>-3.090</td>
<td>0.002</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing for water infrastructure

Source: Primary Data (2019)

A composite linear regression analysis was done to investigate the extent to which fiscal policy constraints, financial sustainability constraints, and long-term debt financing constraints affect access to private financing for water infrastructure projects. The results
from the model summary Table 4.22 indicates that \( R = -0.699 \) meaning that the relation between the three variables is strongly negative.

The adjusted R-square = 0.479, an indication that the included explanatory variables explained only 47.9% of the variations in access to private financing for water infrastructure. The other explanatory variations not in the model explain the remaining 52.1% variations in access to private financing for water infrastructure. From this study it is evident that at 95% confidence level, the variables produce statistically significant values and can be relied on to explain access to private financing for water infrastructure in Kenya.

Table 4.22: Regression Composite Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-0.699a</td>
<td>0.489</td>
<td>0.479</td>
<td>0.3017</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Long-term debt financing constraints, Fiscal policy constraints, Financial sustainability constraints in water projects

**Source: Primary Data (2019)**

The results from the ANOVA Table 4.17 indicates that the linear regression model is significantly of good fit at \( (F=7.197, \ p=0.004<0.05) \).

Table 4.23: ANNOVA for Composite Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>1.964</td>
<td>3</td>
<td>0.655</td>
<td>7.197</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>2.639</td>
<td>29</td>
<td>0.091</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4.603</td>
<td>32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing
b. Predictors: (Constant), Long-term debt financing constraints, Fiscal policy constraints, Financial sustainability constraints in water projects

**Source: Primary Data (2019)**

The results in the model coefficients Table 4.24 indicates that constant \( \beta_0 = 3.865 \), and \( \beta_1=0.094 \), \( \beta_2=-0.192 \), \( \beta_3 = -0.629 \) and \( \epsilon = 0.176 \). The results also found that fiscal policy constraints (Beta = 0.213, \( p >0.05 \)), financial sustainability constraints in water projects (Beta = -0.227, \( p >0.05 \)) were not significant predictors of access to private financing for water infrastructures. Long-term debt financing constraints was a significant predictor
(Beta = -0.626, p <0.05). Therefore, the linear regression model is $Y = 3.865 + 0.094X_1 - 0.192 X_2 -0.629 X_3 + 0.176$.

Where:

$Y$ = Dependent variable access to private financing for water infrastructure projects

$\beta_0$ = Constant of regression

$\beta_1, \beta_2, \beta_3$ = Coefficients of $X_1, X_2$ and $X_3$ respectively

$X_1$ = Fiscal policy constraints

$X_2$ = Financial sustainability constraints in water project

$X_3$ = Long-term debt financing constraints

$\varepsilon$ = Error term of the model

The regression model shows that for every unit increase in fiscal policy constraints, a 0.094 unit increase in access to private financing is predicted, holding all other variables constant. For every unit increase in financial sustainability constraints in water project, we expect an approximately -0.192 unit decrease in the access to private financing, holding all other variables constant. Finally, for every unit increase in long-term debt financing constraints, we expect a -0.629 unit decrease in the access to private financing for water infrastructure projects, holding all other variables constant.

The model also shows that an increase in financial policy constraints by 0.094, decrease in financial sustainability constraints in water projects and long-term debt financing constraints by -0.192 and -0.629 respectively, would lead to increase in access to private financing for water infrastructure in Kenya by 1 unit. The results show that all the independent variables have negative relationship with the dependent variable (access to private financing for water infrastructure) except fiscal policy constraints which has a positive relationship.

**Table 4.24: Composite Model Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.865</td>
<td>0.176</td>
<td>4.981</td>
</tr>
<tr>
<td>Fiscal policy</td>
<td>0.094</td>
<td>0.073</td>
<td>0.213</td>
<td>1.290</td>
</tr>
<tr>
<td>Financial sustainability</td>
<td>-0.192</td>
<td>0.150</td>
<td>-0.227</td>
<td>-1.284</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>-0.629</td>
<td>0.172</td>
<td>-0.626</td>
<td>-12.537</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Access to private financing
Source: Primary Data (2019)

4.6 Chapter Summary

The chapter presented the results and findings of the statistical analysis of the data collected using the survey questionnaires. The descriptive and inferential statistics were used in the analysis on the objectives as follows; effect of fiscal policy constraints, effect of financial sustainability constraints and effect of long-term debt financing constraints on access to private financing for water infrastructure. The results and findings were presented in tables. The next chapter presents the discussion, conclusions and recommendations.
CHAPTER FIVE

5.0 DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The presents the discussion, conclusions on the constraints affecting access to private financing for water infrastructure in Kenya. The discussion was done in comparisons to the literature review. The chapter also gives the recommendations for improvement for the specific objective and lastly recommendations for further study.

5.2 Summary

The general objective of this study was to investigate the constraints affecting access to private financing for water infrastructure in Kenya. The study was guided by the following specific objectives; to establish the effect of fiscal policy constraints on access to private financing for water infrastructure; to examine the effect of financial sustainability constraints in water projects on access to private financing for water infrastructure; to determine the effect of long-term debt financing constraints on access to private financing for water infrastructure in Kenya.

The explanatory research design was used in this study. Since there are no many organizations in Kenya that deal with water financing, the number of water infrastructure financing experts is small in the country. Therefore, census method was used to study the entire population of 37 experts drawn from KIFFWA, IFC, BFA, The World Bank, AfDB, AFD, WASREB, WSTF, and KfW. The sampling technique used in the study was non-probability sampling using purposive judgmental sampling, and structured open and closed ended questionnaire. The questionnaires were administered to the respondents between the months of November and December 2018. The researcher received back 33 questionnaires from the respondents representing a response rate of 89 percent. Statistical analysis of the responses was done in SPSS using both descriptive statistics (mean, standard deviation, frequencies and percentages) and inferential statistics (correlation and regression analysis). The findings were presented in tables.

The study showed that majority of respondents strongly agreed that long-term debt financing constraints affected access to private financing for water infrastructures and that financial sustainability constraints affected access to private financing for water
infrastructures while they were of neutral view that fiscal policy constraints affected access to private financing for water infrastructure.

The findings showed that fiscal policy constraints had a positive but not statistically significant correlation with access to private financing for water infrastructure projects and that financial sustainability constraints in water projects had a negative but not significant correlation with access to private financing for water infrastructure. However, the study revealed a strong negative and significant correlation between long-term financing constraints and access to private financing for water infrastructure projects. The results of the regression analysis indicated that fiscal policy constraints indicated that it affects access to private financing for water infrastructure. For financial sustainability constraints, financial sustainability constraints affect access to private financing for water infrastructure. The analysis for long term debt financing constraints show that, long-term debt financing constraints affect access to private financing for water infrastructure.

5.3 Discussion

5.3.1 Fiscal Policy Constraints and Access to Private Financing

Private financing of water infrastructure is a wide and diverse array of institutions which seek to furnish investment capital for water (Malik, 2013). The capital provision for water services is arranged through publicly managed budgets, typically in corporatized utilities and water and irrigation agencies, because of water’s public function and the inherent characteristic of water services that make them monopolistic. Financing is often mobilized as debt or equity and is often complemented with a larger or smaller subsidy from the national or local tax base.

The findings of the study indicated that employees were of the neutral view that fiscal policy constraints affected access to private financing for water infrastructures and established that, majority of respondent partially agreed that lack of tax exemption (VAT and excise duty) on water projects developed through private financing was a major fiscal constraint effecting access to private financing (Croce, 2014). Water security is the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability. Large infrastructure projects like transport, water and sewerage usually have longer payback periods, and in
some cases, the stream of revenues is not enough to repay the cost of the private investment. To make such infrastructures attractive to private investors, the government may provide tax relief in form of incentives (Croce, 2014).

The results are supported by Basílio (2017) who found that the VAT in an investment project increases the tax burden to private investors and make such projects unattractive for private investment. Inadequate water management (in the form of poor policies, weak organization and reluctance of water users to pay for the service) is a drag on health and wellbeing, and on the economy. VAT is considered the third most important source of government revenue after social security contributions and personal income taxes. The concept of VAT is considered as one of the best ways of providing incentives for increasing productivity and industrialization through few exemptions (Hasan, 2015; Okoye et al., 2013). Water security is the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.

The results showed that lack of corporate tax holidays for water projects developed through private financing was ranked second in fiscal constraints. Majority of the respondents were of the neutral view that lack of corporate tax holidays for water projects developed through private financing had a minimal effect on access to private financing. The findings are in line with the assertions of Gebremedhin and Saporna (2016) who established that tax holiday on investment in Ethiopia were not very effective. However, the effectiveness of the tax holiday in attracting private financing in public infrastructure varies from country to another. According to Yang, (2018) in Indonesia tax holiday proved to be an effective mechanism in attracting private investment. Gebremedhin et al. (2016) empirical analysis of impact of tax holiday on investment in Ethiopia finds a significant positive correlation but not effective due to short period given and risk of abuse by taxpayers.

The level of public debt was ranked lowest among the fiscal constraints other fiscal policy constraints. The findings collaborated to the study by Lidiema (2018) which established an insignificant effect of level of public debt to private investment. The results mean private investors have little concern about the level of public debt when they are making investment decision in water infrastructures. The results further showed a positive and insignificant
correlation between fiscal policy constraints and access to private financing. This means fiscal policy constraints did not influence the access to private financing for water infrastructure in Kenya. Akram (2015) studied the consequences of public debt on economic growth and investment in Philippines for the period 1975-2010. The autoregressive distributed lag technique design method was used. The study established a negative relationship between external debt and investment due to debt overhang. The study also found a negative relationship between domestic debt and investment due to crowding out effect.

Fiscal policy constraints affected access to private financing for water infrastructure which was not a significant predictor for access to private financing. The composite regression analysis confirmed that fiscal policy constraints did not have a statistically significant influence on access to private financing for water infrastructure. This was in disagreement with the findings of McKinsey (2009) analyzed supply and demand of financing for water infrastructure investment world-wide, distinguishing by source, sector and region. Of the US$2.5–3 trillion a year invested in infrastructure, the private sector, i.e., institutional investors and corporations, accounts for US$1–1.5 trillion. The institutional investors furnished about $350 to $400 billion for annual infrastructure spending and usually invested as part of a broader portfolio. Most investment went to telecoms and energy and only about 5–10% to water. Water insecurity depresses economic development: by approximately US $260 billion annually from inadequate WSS, US $120 million from urban property damages and US $94 from underperforming irrigation and excluding environmental damage and other non-monetized.

5.3.2 Financial Sustainability Constraints and Access to Private Financing

Financial sustainability refers to the ability to manage funding so it can meet its spending commitments both now and, in the future (Bowman, 2011). Pricing of water structure is a set of procedural rules used to determine the monthly bills for water users in various categories or classes. However, maintaining the ability to be financially agile over the long term may be especially important for water projects, given that many of them serve high-need communities that require consistent and continually available services. The results of the study showed that financial sustainability constraints affected access to private financing for water infrastructures and persistent revenue losses through registered in water utilities was found to a major financial sustainability constraint that limited access to private
financing for water infrastructure in Kenya. This indicated that most of water utilities registered heavy losses which discourages the private investors from financing water infrastructures.

The results of the study further indicated that lack of political will to adjust water tariffs as the second financial sustainability constraints in water project limits access to private financing for water infrastructures. This was in disagreement with the findings of OECD, (2009) where they posited that water pricing provides revenues to water utilities which can be used for reinvestment, maintenance, improvement and extension of water supply and sanitation infrastructure. The water tariff policy should ensure water tariffs are sufficient to cover all the direct economic and financial costs of water supply and sanitation investment. This showed that adjustment of water tariff is very sensitive to politics considering that amount of revenue generated from sale of water depends on tariff pricing. The two results agree with findings by Van den Berg (2015) discussed in the literature review.

The findings indicated that water tariff structure was ranked third financial sustainability constraints that affected access to private financing for water infrastructure. This meant that majority of the respondents agreed that water tariff affects access to private financing. The study results are supported by WASREB (2015) where they pointed out that Kenya operates under tariffs that can hardly cover their operation and maintenance costs. Transaction cost involved in water infrastructure projects was ranked the least financial sustainability constraints in access to private financing for water infrastructure. According to Whittington et al. (2006) water projects require large initial capital and therefore they get exposed to high transaction costs including bribery and kickbacks.

The findings showed that high transaction costs may make water projects unsustainable and discourage potential private investors who may not be willing to give bribes and kickbacks. The results further showed a negative but not significant relationship between financial sustainability constraints and access to private financing. This meant that fiscal constraints did not influence the access to private financing for water infrastructure in Kenya. Dagdeviren (2016) examined the empirical validity of Williamson’s propositions of transaction costs approach in the context of private participation in water and sanitation sector. The study found that literature does not provide any concrete measure of the extent of transaction costs under private and public ownership in water sector. However, there is anecdotal evidence suggests that transaction costs might be higher under private models.
The results of the study indicated that financial sustainability constraints affected access to private financing for water infrastructure. Financial sustainability constraints in water projects were not a significant predictor of access to private financing. The composite regression analysis further revealed that financial sustainability constraints in water projects did not have a statistically significant influence on access to private financing for water infrastructure. This was supported by the findings of Guerrini et al. (2011) who studied the relationship between revenue and water tariff in water utilities from different areas of Italy. The study found a positive correlation between water tariff and generated revenue. Fogel et al. (2014) argued that relatively high tariff provides enough revenue that enables water utility to finance water infrastructures to supply majority of its citizens. Ameyaw et al. (2013) empirical study found that water tariffs determine the amount of revenue and profitability of water utilities in Ghana. However, the water tariffs in Ghana are quite low making water projects financially unviable.

The findings disagreed with that of Junior et al. (2011) who studied the empirical relationship between transaction cost and investment decision. Regression was used to study data from 35 countries for period 2001-2007. The study found a negative correlation between transaction cost and investment rate. Attracting private investment in water infrastructure, low cost recovery tariffs is recommended which allows and provides market signals so that decisions to consume water are fully reflective of the associated costs. WSP (2012) assert that the need to attract private capital leveraging is interlinked with the need for cost recovery pricing as a stronger financial performance will allow access to revenue sources such as commercial debt finance.

5.3.3 Long-Term Debt Financing Constraints and Access to Private Financing

The study findings showed that majority of respondents strongly agreed that long-term debt financing constraints affected access to private financing for water infrastructures. Employees agreed that lack of long-term bank loans that matches long payback period in water projects limits access to private financing for water infrastructure projects. The findings agree with Annamalai et al. (2016) and OECD, (2010) where they indicated that water infrastructure projects involve huge initial capital, and long payback periods that make many commercial banks fear to provide long-term loans. Beck (2016) pointed out that access to long-term finance is considered as one of the critical financial challenge in developing countries.
facing policy makers. Lack of long-term finance is linked to increased infrastructure need and low private investment in developed as well as developing countries.

The results of the study indicated that that commercial banks lacked adequate credit enhancement mechanisms to reduce perceived bank lending risks. The findings were in agreement with the results of study by Goksu et al. (2017) who found that many of the commercial banks in developing countries lacked certain credit enhancement mechanisms to reduce perceived risks associated with the water infrastructure projects. This is in line with the results if Demirgüç-Kunt et al., (2017), where they indicated that firms that operate in a business environment where the availability of long-term finances is limited tend to be disadvantaged when it comes to their long-term investment projects. When a firm decides to only use short-term debts to finance long-term investment, this introduces liquidity risk. Cowling et al., (2016) argue that since the global financial crisis in 2007-2008, banks have been reluctant to finance long term debts in public infrastructure projects.

The findings of the study showed that numerous conditions required to be fulfilled at the time of actual loan take-out in commercial banks affected access to private financing for water infrastructures. The findings concur with the OECD (2010) who result showed that many of the banks in developing countries provide strict conditions that must be met to access financing. The results show that majority of private investors are not able to access the bank loans due to the stringent conditions. This bureaucracy may lengthen the time of between application and acquiring loans. Mukoya et al., (2015) noted that banks in the developing countries are also reluctant to extend long-term credit to private business due to the changes in regulatory, and loan maturity policies. Jin (2012) argues that the uncertainty in the PPP infrastructure projects increases the risks and consequently the transaction costs. This discourages many private investors from investing in such capital-intensive infrastructure. Takeshima et al. (2010), study finds that the unobserved transaction costs can be as important as the factors determining the profitability of assets and emphasizes the importance of reducing transaction costs to provide the environment for higher returns from investment.

The findings further indicated that banks are viewed as potential source of finance for water infrastructure is and which in Kenya they do not lend for periods beyond seven years, whereas the useful life of water assets is often much longer and; water assets provide limited collateral to lenders because they have little liquidation value (World Bank, 2015).
The water utilities also lack adequate or have unreliable data needed to assess credit worthiness required by the commercial banks. Banks view water infrastructure as being too risky for them due to difficulties with increasing the tariffs, inefficiency and wide-spread corruption. In addition, many commercial banks in developing countries are unwilling to compete with the development banks and development financial institutions which offer finance to water infrastructures on more favorable terms and interest rates (OECD, 2010).

The findings showed that lack of sufficient and varied pool of bankable water projects for mezzanine financing affect access to private financing for water infrastructure. The findings correspond to that of Goksu et al. (2017) who established that majority of the middle-income countries are unable to come up with bankable water projects that are appealing to private investors. The results showed that low yield potential of water bond compared to conventional bond is a constraint to accessing to private financing for water infrastructure. They also agreed that green bond has low yield potential compared to the conventional bond. This means that majority of private investors were not willing to invest in water bond but instead invest in conventional binds which have good returns. The findings agree with Zerbib (2018) where he indicated that yield premiums between green bond and conventional bonds was found to have lower yield potential.

The findings showed that there was a strong negative and significant relationship between long-term debt financing constraints and access to private financing for water infrastructure. The results indicated that long-term debt financing constraints affect access to private financing for water infrastructure. Long-term debt financing constraints was a significant predictor of access to private financing and the composite regression analysis confirmed that long-term debt financing constraints had a statistically significant influence on access to private financing for water infrastructure. Fan et al. (2012) studied debt maturity choices in 39 developed and developing countries. The study found that in countries perceived to be more corrupt investors used less equity and more short-term debt whereas in countries operating under legal systems more equity and long-term debt was used. Kirch et al., (2012) in their findings showed that there was a positive relationship between debt maturity and asset maturity, growth opportunities and credit rating. Beck (2016) argued that long-term finance is sensitive to macroeconomic stability and institutional framework, which explains why we can see a prevalence of short-term and foreign currency lending in many developing countries.
5.4 Conclusions

5.4.1 Fiscal Policy Constraints and Access to Private Financing

The study concludes that fiscal policy positively affected access to private financing for water infrastructure. Achievement of fiscal policy factors is through; lack of tax exemption for projects developed through private financing; lack of corporate tax holidays for water projects developed through private financing and; the level of public debt. However, lack of tax exemption for water projects developed through private financing was found to be the major effect on access to private financing for water infrastructure projects. This is an indication that tax burden discouraged private investment in water infrastructure projects.

5.4.2 Financial Sustainability Constraints and Access to Private Financing

The study concludes that financial sustainability constraints in water projects negatively affected access to private financing. The effect was found of small extent and not significant. The study further revealed that persistent revenue losses through NRW registered in water utilities had a major effect on access to private financing. This is an indication that there is significant revenue loss recorded in many water utilities across the country through NRW. The revenue losses lower the ability of water infrastructure projects to recover the investment costs involved and make them financially unsustainable for private financing.

5.4.3 Long-Term Debt Financing Constraints and Access to Private Financing

The study concludes that access to private financing for water infrastructure was negatively affected by the long-term debt financing constraints. Long-term debt financing constraints included; lack of long-term bank loans that matches long payback period in water projects and inadequate credit enhancement mechanisms to reduce perceived bank lending risks. It can be deduced that lack of long-term bank loans that matches long payback period in water projects had a major effect on availability of private financing for water infrastructure in Kenya. However, low yield of water bond compared to conventional bonds had the least effect on access to private financing for water infrastructure.

5.5 Recommendations

5.5.1 Recommendation for Improvement

5.5.1.1 Fiscal Policy Constraints and Access to Private Financing
The study recommends that treasury should consider introducing policies on tax exemption in water projects financed through private capital. By relieving some tax burden in infrastructure projects financed through private capital/financing, more private investment will be attracted in water sector.

5.5.1.2 Financial Sustainability Constraints and Access to Private Financing

The study also recommends that the government, water utilities, and other stakeholders including the DFIs need to invest in technologies that reduces non-revenue water (NRW) in water projects. This can be achieved through investment in new technologies that helps in reduction of pipe leakages, detection of nonpayment of water bills and illegal connections. This will lead to increased revenue in water utilities, which will give the private sector a positive view about cost recovery and return on investment in water projects.

5.5.1.3 Long-Term Debt Financing Constraints and Access to Private Financing

The study recommends that the management should improve availability and access to long-term debt financing to effectively mobilize private sector into water infrastructure projects. The financial institutions should develop and introduce innovative financial long-term debt financing products that match large capital requirements with long payback periods involved in water infrastructures.

5.5.2 Recommendations for Further Research

The study only considered just few variables of constraints affecting access to private financing for water infrastructures in Kenya. Therefore, the study recommends use of other variables constraints such as financial risks for further research. A research should be done on constraints/challenges affecting access to institution capital (commercial banks, insurance firms, pension funds etc.) for development of water infrastructure projects in Kenya.
REFERENCES


Basilio, M. (2010). The determinants of private sector and multilateral development agencies participation in infrastructure projects. *Technical University of Lisbon, School of Economics and Management (ISEG)*.


Mugenda, M.O., & Mugenda M. G. (2003). Research methods: quantitative and qualitative approaches; African Centre for Technology Studies (ACTS), Nairobi, Kenya


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APPENDICES
APPENDIX I: INTRODUCTION LETTER

James Kigutu
United States International University-Africa,
P.O. Box 14634 – 00800, Nairobi
November 13, 2018

Dear Respondent,

RE: RESEARCH QUESTIONNAIRE

I am a student at United States International University-Africa (USIU-A) pursuing Master of Business Administration (MBA). I am currently undertaking a research study entitled “CONSTRAINTS AFFECTING ACCESS TO PRIVATE FINANCING FOR WATER INFRASTRUCTURE IN KENYA”, as partial fulfillment of the requirements for the award of the Degree of Master of Business Administration.

In this regard, I am asking for your precious time, and effort to answer all the questions in the questionnaire that are important and helpful for the completion of the study.

Rest assured that all data/information gathered will be treated with utmost confidentiality and will be used for academic purposes only.

Thank you for your support and cooperation.

Yours sincerely,

James Kigutu
APPENDIX II: QUESTIONNAIRE

CONSTRAINTS AFFECTING ACCESS TO PRIVATE FINANCING FOR WATER INFRASTRUCTURE IN KENYA

The set of questions in this questionnaire are intended for the assessment of constraints affecting access to private financing for water infrastructure in Kenya.

The data that you provide in the following sections will only be used for this research study, published in aggregated form and therefore no individual will be identifiable. All your answers will be kept strictly confidential and none will be passed to third parties.

The researcher requests respondents to complete this questionnaire honestly and to the best of their knowledge.

Section I: General Information

Kindly answer all the questions by ticking in the boxes provided after each question or by filling in the spaces provided

1. Gender
   □ Male
   □ Female

2. Which organization do you work for?
   ………………………………………………………

3. Title / position……………………………………………………………………………..

4. The organization you work for is in which of the following sector?
   □ Public sector (e.g. government parastatal)
   □ Private sector (e.g. businesses investment, development finance institution)
   □ Not-for-profit sector
   □ Other

5. Years in the organization
   □ Less than 2 years
   □ 2 – 5 years
   □ 6 – 9 years
   □ 10 – 13 years
   □ Over 13 years
6. What is your highest level of education?
   ☐ Doctorate degree
   ☐ Master’s degree
   ☐ Bachelor’s degree

7. How many years is your experience in water infrastructure financing and investment?
   ☐ Less than 2 years
   ☐ 2 - 5 years
   ☐ 6 - 9 years
   ☐ 10 - 13 years
   ☐ Over 13 years

Section II: Fiscal Policy Constraints Affecting Access to Private Financing for Water Infrastructure in Kenya

8. Please indicate the extent to which you agree that the following fiscal policy constraints affect access to private financing for water infrastructure in Kenya, where 1=Strongly Disagree, 2= Disagree 3= Neutral, 4 = Agree, 5= Strongly Agree. Tick on the appropriate box.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Lack of corporate tax holidays for private financed water projects</td>
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<tr>
<td>b) Lack of tax exemption (VAT and excise duty) for private financed water projects</td>
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</tr>
<tr>
<td>c) Level of public debt</td>
<td></td>
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</tr>
</tbody>
</table>

9. Please state any other aspect of fiscal policy constraints(s) which is not mentioned herein that you think affect access to private financing for water infrastructure in Kenya.

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Section III: Financial Sustainability Constraints in Water Infrastructure Projects

10. Please indicate the extent to which you agree that the following financial sustainability constraints affect access to private financing for water infrastructure in Kenya, where 1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree. Tick on the appropriate box.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Water tariff structure</td>
<td></td>
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<td></td>
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<tr>
<td>b) Lack of political will to adjust water tariffs</td>
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<tr>
<td>c) Persistent revenue losses through NRW registered in water utilities</td>
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<td></td>
<td></td>
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<tr>
<td>d) Transaction costs involved in water infrastructure</td>
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</tbody>
</table>

11. Please state any other aspect of financial sustainability constraints(s) which is not mentioned herein, that you think affect access to private financing for water infrastructure in Kenya:

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Section IV: Long-term Debt Financing Constraints Affecting Access to Private Finance for Water Infrastructures

12. Please indicate the extent to which you agree that the following long-term debt financing constraints affect access to private financing for water infrastructure in Kenya, where 1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree. Tick on the appropriate box.
<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Lack of long-term bank loans that matches long payback period in water projects</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b) Numerous conditions required by banks to access long term loan</td>
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<tr>
<td>c) Lack of adequate credit enhancement mechanisms to reduce perceived bank lending risks</td>
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<tr>
<td>d) Low yield potential of water bond compared to conventional bonds</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Lack of sufficient and varied pool of bankable water projects for mezzanine financing</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

13. Please state any other aspect of long-term debt financing constraints(s) not mentioned herein, that you think affect access to private financing for water infrastructure in Kenya.

…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
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**Section V: Access to Private Financing for Water Infrastructure Projects**

14. Please indicate the extent to which you agree that the following statements on variables access to private financing for water infrastructure in Kenya, where 1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree. Tick on the appropriate box.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Private financing for water infrastructures projects is easily accessible</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b) Various financing products are available for water infrastructure projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Unlimited loans are available for financing water infrastructure projects</td>
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<td></td>
</tr>
</tbody>
</table>

THANK YOU FOR YOUR VALUABLE TIME AND INPUT
APPENDIX III: RESEARCH AUTHORIZATION

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Ref No: NACOSTI/P/19/56641/31989

James Kariuki Kigutu
United States International University
P.O. Box 14634 – 00800
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Constraints affecting access to private financing for water infrastructure in Kenya” I am pleased to inform you that you have been authorized to undertake research in Nairobi County for the period ending 23rd July, 2020.

You are advised to report to the County Commissioner and the County Director of Education, Nairobi County before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a copy of the final research report to the Commission within one year of completion. The soft copy of the same should be submitted through the Online Research Information System.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.
APPENDIX IV: NACOSTI PERMIT

THIS IS TO CERTIFY THAT

Ms. JAMES KANAIKE KEGUTU

of UNITED STATES INTERNATIONAL UNIVERSITY, 36509-220 Nairobi, has been permitted to conduct research in Nairobi County

on the topic: CONSTRAINTS AFFECTING ACCESS TO PRIVATE FINANCING FOR WATER INFRASTRUCTURE IN KENYA

for the period ending:
23rd July, 2010

Applicant’s Signature

CONDUCTED BY

The Science, Technology and Innovation Act, 2013


CONITIONS

1. The license is valid for the specified period.

2. The license and any rights thereunder are non-transferable.

3. The license shall include the County Governor before commencement of the research.

4. Exemption, licensing, and collection of permits are subject to

5. The license does not give authority to transfer research materials.

6. NACOSTI may monitor and regulate the licensed research project.

7. The license shall include one hard copy and upload a soft copy of their final report within one year of completion of the research.

8. NACOSTI reserves the right to modify the conditions of the license including cancellation without prior notice.

National Commission for Science, Technology and Innovation

Republic of Kenya

Serial No. A 26084

CONITIONS: see back page