# FACTORS INFLUENCING ACCESS TO CREDIT IN THE RENEWABLE ENERGY SECTOR: THE CASE OF BIOGAS IN KENYA

BY

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# DECLARATION

This research project is my original work and has not been submitted for the award of a degree in any other university.


Signed: ………..………………………..     Date:………………

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This research project has been submitted for examination with my approval as university supervisor.

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**Dr.Sifunjo Kisaka**

**ABSTRACT**

The purpose of this study was to assess the factors influencing access to credit in the renewable energy sector: the case of biogas in Kenya. The study was guided by the following research question: what are the factors influencing credit access for firms in the biogas sub sector in Kenya.

The research design was descriptive survey study in nature since it focused on more than one firm and it also focused on the status quo, in addition to describing the level of access by firms in renewable sector in Kenya. The target population of the study was the firms in biogas sub sector in Kenya. A sample of 48 firms was selected from all the firms using the random sampling technique and 40 of them responded satisfactorily. Both qualitative and quantitative data was collected using a questionnaire that consisted of both open ended and close ended questions. Data was analyzed using Statistical Package for Social Sciences (SPSS) and results presented in frequency tables to show how the responses for the various questions posed to the respondents. The data was then analyzed in terms of descriptive statistics like frequencies, means and percentages.

Results from the study indicated that several factors determined the access of credit by the firms. These factors include age of firm, capital invested, size of the business, financial records, risk preference and access to information. All factors had a significant effect on access to credit and hence indicated that there was a low level of access to credit.

The study concludes that firms in biogas sub sector had low access to credit from the banks. It was also possible to conclude that age of firm, capital invested, size of the business, financial records, risk preference and access to information influence the level of access to credit by renewable energy sector firms.

The study recommended for regulatory policies that are BCE or small enterprises friendly including creation of credit information and training centers. Banks should customize biogas loan products that suit BCEǿs needs. BCEs should be encouraged to form bid to guarantee each other when there is need to secure business loans.

## DEDICATION

This dedication goes to my family; my good wife Felister Ben and our beloved son Israel Mulandi who greatly inspired me to complete this course for their sake.

To my mother Priscilla Ndanu, my father Mulandi Nzuka and my sister M/s purity Mumbi for their support and encouragement.

Finally to my son Israel. may this work be an inspiration for him to seek more knowledge in the world.

# ACKNOWLEDGEMENT

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| | |
|---|---|
| **ABPP** | **Africa Biogas Partnership Programme** |
| **BCE** | **Biogas Construction Enterprise** |
| **BT** | **Biogas Technician** |
| **BDS** | **Business Development Support** |
| **DGIS** | **Directorate-General for International Cooperation** |
| **GTZ** | **German Technical Cooperation** |
| **KENBIM** | **Kenya Biodigester Model** |
| **KENDBIP** | **Kenya National Domestic Biogas Programme** |
| **KENFAP** | **Kenya National Federation of Agricultural Producers** |
| **MDG** | **Millennium Development Goal** |
| **MFI** | **Micro-Financing Institution** |
| **MoE** | **Ministry of Energy** |
| **NGO** | **Non-Governmental Organisation** |
| **NIA** | **National Implementing Agency** |
| **PID** | **Programme Implementation Document** |
| **PSDA** | **Private Sector Development in Agriculture** |
| **SACCO** | **Savings and Credit Cooperative Society** |
| **SME** | **Small and Medium size Enterprise** |
| **SNV** | **Netherlands Development Organisation** |
| **SPSS** | **Statistical Package for Social Sciences** |
| **USD** | **United States Dollar** |

## CHAPTER ONE
## INTRODUCTION

### 1.1 Background of the Study

Small and Medium Enterprises (SME's) are important for raising the economic efficiency of a country. They are breeding grounds for entrepreneurship, innovations and inventions hence a reservoir for employment. Sustainable jobs create income which in turn reduces the level of poverty. Access to credit is a key constraint for SMEs in developing countries and there is need to develop credit access indicators from an individual firm borrowerøs point of view. Despite extensive economic and financial sector reforms over the last few decades, many Sub-Saharan African countries, including Kenya still face a severe financial development gap. This is not only relative to the advanced economies but also other peer developing economies as well. A key obstacle to financial development is access of the disadvantaged to credit, which would promote economic growth at the broadest scales.

### 1.1.1   Access to Credit

World Bank report (2007), states that financial inclusion or broad access to financial services is defined as an absence of price or non price barriers in the use of financial services. It recognizes the fact that financial inclusion does not imply that all households and firms should be able to borrow unlimited amounts or transmit funds across the world for some fee. It makes the point that creditworthiness of the customer is critical in providing financial services.

The World Bank report (2007) also stresses the distinction between õaccess toø and ÷use ofø financial services as it has implications for policy makers. ÷Accessø essentially refers to the supply of services, whereas use is determined by demand as well as supply. Among the non users of formal financial services a clear distinction needs to be made between voluntary and involuntary exclusion. The problem of financial inclusion addresses the ÷involuntarily excludedø as they are the ones who, despite demanding financial services do not have access to them.

Access to finance is measured through statistics on number of deposit and loan accounts and the retail locations for banks. To measure credit access, the World Bank

collected the first set of indicators of financial access through a survey of bank regulators in countries around the world in 2005 (Beck, Demirguc-Kunt, Martinez Peria, 2007) . The bank then updated these indicators for selected countries in 2008 (õBanking the Poorö, 2008) and rolled out an annual survey starting in 2009 under the name Financial Access implemented by Consultative Group to Assist the Poor (CGAP) with the first report published in October 2009. However, this statistics do not address access of finance by individual firm borrowers.

It is easy to understand how rapid credit access facilitates economic growth. When credit is expanding, consumers can borrow and spend more and businesses can borrow and invest more. Increasing consumption and investment creates jobs and expands income and profit. Moreover, the expansion of credit tends to cause the price of assets such as stocks and property to increase, thereby boosting the net worth of the public. Eventually, however, every credit-induced economic boom comes to an end when one or more important sectors of the economy become incapable of repaying the interest on its debt (Storey, D.J 2004).

While the success of microfinance institutions (MFIs), such as Grameen Bank, has captured the attention of many economists and policy makers, some MFIs are now beset by non-repayment problems and high cost of financing. Meanwhile, most established commercial banks view the sectors targeted by MFIs as ÷unbankable.ø In fact, we are only beginning to understand the specific policies and institutions that best promote financial inclusion in environments endowed with asymmetric information, weak institutions and the absence of basic infrastructures necessary for banking (e.g., access to roads) (Chaia et al., 2011).

Recent studies such as  Honohan (2008) show that in the early 2000s, roughly 2.5 billion adults, or half of the worldøs adult population, lacked any bank account; in Sub-Saharan Africa, the setting for our study, over eighty percent of the adult population lacked an account during that same period.

### 1.1.2    Factors Influencing Access to Credit

Research studies reveal that age, capital, size, information access, risk and financial records are key factors influencing credit access by firms. Others include; Interest

rates, borrower's education level and past financial performance. These factors can be categorized into three namely; entrepreneur characteristics, firm characteristics and financial characteristics (World Bank report (2007).

### 1 .1.3    Renewable Energy Sectors

### 1.1.3.1  Energy Sources In Kenya

The three main sources of electricity generation in Kenya are hydropower, diesel thermal and geothermal plants, along with several minor sources. From 2004 to 2011, increases in electricity supply generally came from fossil fuels and geothermal. Geothermal has shown the greater proportional increase in installed capacity (58% compared to 45% fossil), despite the fact that set-up costs are significantly higher than for fossil fuels. Launched over 50 years ago, geothermal energy is only now emerging as a significant electric power resource for Kenya. Assessments of geothermal hotspots indicate an estimated potential of 7,000–10,000 MW in the Kenyan Rift Valley. By 2030, the GoK intends to tap into its rich geothermal potential, drastically increasing geothermal capacity to twice that of fossil fuels. Hydropower production is projected to remain relatively stable (Climate and Development Knowledge Network, 2013).

### 1.1.3.2        Supply, Demand and Financing of Energy In Kenya

Total current power generation in Kenya amounts to 1,479MW, with an access rate of less than 25  percent and per capita electricity consumption of 1 47 kWh (122ndin the world). The generation mix includes: 50% hydro, 35% thermal, 13% geothermal, 2% cogeneration, and others. The average retail  tariff is of 15 cents/kWh, which compares well with neighboring countries (for example, Rwanda 20 cents, Ethiopia 3 cents, Uganda 12 cents, Tanzania 8 cents). The system has been expanding at 4.2% p.a. between 2002-2011. Under the Vision 2030's Least Cost Power Development Plan (LCPDP), the ambition is to develop geothermal 5,000+MW, wind 2,000+MW, an expansion of 9.3% p.a. with USD 23 billion in renewable energy generation, USD 4.5 billion in transmission (World Economic Forum, 2012).

Kenya's ambitious clean energy development plan will require significant financing. Around 45billion USD are estimated by year 2030, of which 60% on the generation side (41.4bn USD) and the rest (3.9bn USD) for transmission. Over the next 5 years, the financing needs are estimated at around 7.3 billion USD of which around 1 billion USD for geothermal resource assessment, around 3.6 billion USD for generation, (around 2 billion USD for transmission and the rest for distribution .

Donors are deploying a range of financing tools (grants, mixed grants and loans), with concessional lending representing 98% of current donor financing. Projects range from large infrastructure projects, such as interconnectors and geothermal plants, to smaller rural electrification, technical assistance and capacity building. Around 51% of donor financing is focused on generation,20% on transmission, 13% on distribution and the remainder on other sector-wide needs (World Economic Forum, 2012).

### 1.1.3.3        Biogas Technology

Biogas technology has been tried and supported through different initiatives in Kenya since 1946 when the first biogas was put up in Nyandarua sub-county financed among others by UNDP, GTZ/PSDA, DGIS (PID, 2009). Technology is defined as people using knowledge, tools, and systems to make their lives easier and better. Biogas technology is therefore, a complete system in itself; it includes cost effective production of energy and fertilizer for the soil. Biogas technology has been recommended as one of the most appropriate renewable energy technologies for rural areas in developing countries because of the many advantages. Biogas dissemination in developing world has been promoted by many governments and non-governmental organizations, but its adoption has been slow.

Biogas is produced by methanogenic bacteria acting on bio-digestible materials in absence of oxygen in the process known as anaerobic digestion. Anaerobic digestion is basically a simple process carried out in a number of steps that can use almost any organic material as a substrate. It occurs in digestive systems, in marshes, rubbish damps and septic tanks (Harris, 2005). Biogas is mainly composed of 50 to 70 percent methane, 30 to 40 percent carbon dioxide and low amount of other gases like

Hydrogen (5-10), Nitrogen (1-2), water vapor (0.3) and traces of hydrogen sulphide (FAO/CMS, 1996).

It takes 162 cows, 568 pigs, or 4 adult humans to supply adequate daily feed-stocks for a single-household bio-digester (Brown, 2006). The daily input of dung and urine from a single cow produces 162 kilowatt- hours of electricity or 869 kilowatt hours of heat. In most African applications, a household biogas installation provides sufficient energy for cooking and some lighting. Production of energy is influenced by factors such as microbes, plant design, construction materials, climate, chemical and microbial characteristics of inputs, and the inter-relationships among these factors (FAO/CMS, 1996).

### 1.1.3.4 Benefits of Biogas Technology

Biogas has been acknowledged as being simple and cheap technology; it does not require imported knowledge or components and also is suitable for family and/or village scale use. Biogas is among the renewable non-conventional fuel technologies, which involves anaerobic digestion of biomass to yield biogas and organic slurry. In addition to gas production all disease causing organisms are eliminated making the effluent safe for disposal or reuse as manure for crop production. Biogas is one of the few technologies that utilize wastes as valuable resources and improves sanitation (Rajeswaran, 1983).

Other benefits of biogas technology include reducing womenøs workload, saving time consumed for firewood collection and increase of income by saving money spent for purchase of other energy sources (Rutamu, 1999). Furthermore according to Rajeswaran (1983), biogas can be used for heating, cooking, and to operate an internal combustion engine for mechanical and electric power. For engine applications it may be advisable to scrub out hydrogen sulfide (a highly corrosive and toxic gas). Very large-scale system/producers may be able to sell the gas to natural gas companies but this may require scrubbing out the carbon dioxide. Material drawn from the digester is called sludge, or effluent. It is rich in nutrients (ammonia, phosphorus, potassium, and more than a dozen trace elements) and thus is an excellent soil conditioner.

**1.1.3.5      Challenges of Biogas Technology**

Some of the challenges associated with biogas systems include; High initial investment costs with a domestic plant costing an average of Kenya shillings 85,000 to install. There is low awareness of the technology among the biogas potential markets in kenya and thus most BCE firms consider biogas as an alternative to other competing sources of income. Biogas associations and institutions are still in the formative stage characterized by low managerial and operational capacity and weak infrastructure. Access to biogas loans is limited and this is presumed to be fueled by various factors including, lack of savings to boost borrowing capacity, high transaction costs, high interest rates, farmers negative attitude towards loans, lack of a revolving fund, and financial institutionsø perception of rural based biogas firms and farmers as un-credit worthy.

**1.1.3.6      The Main National Biogas Institution In Kenya**

The Kenya National Domestic Biogas Programme (KENDBIP) is hosted by Kenya National Federation of Agricultural Producers (KENFAP) with capacity building support provided by Netherlands Development Organization (SNV) and fund management support of the Humanistic Development Organization (HIVOS) under the African Biogas Partnership Programme (ABPP). The goal of KENDBIP is to improve the livelihoods and quality of life of rural farmers in Kenya through exploiting the market and non-market benefits of domestic biogas. During the first phase (2009 ó 2013), the programme is envisaged to support the construction of 8000 domestic biogas installations of specified fixed-dome design referred to as KENBIM.

The purpose of the programme is to develop a commercially viable domestic biogas sector. Therefore the Programme implementation follows the technical potential for domestic biogas from 2009; it aims at stimulating access to credit for biogas construction and requisite appliances from financial institutions. It also involves regional vocational training institutes to provide short-term biogas courses at construction and supervision level hoping that the course will be fully incorporated within the institute curriculum and the institute act as õknowledge brokerö in its catchment area.

The programme has been collaborating with relevant appropriate partners to provide business development support (BDS) to the emerging biogas construction enterprises. The programme has been stimulating gender inclusion in all programmes activities as per the project design and through its Implementing Partner Infrastructure it has been delegating with responsibilities and matching resources to develop a commercially viable biogas sector in their catchment area. KENDBIP encourages sector development, implying close cooperation of all relevant stakeholders (Government, Civil Society and Private sector) in the sector at all levels (micro and macro) whereby those stakeholders are sufficiently equipped to fulfill the necessary functions.

## 1.2    Problem Statement

Biogas technology has many benefits at the household level. It provides a clean smoke free kitchen environment which reduces incidences of health related complication. It saves on labour and time required for collecting fire wood. It also helps to reduce deforestation and mitigation to climate change (PID, 2009). However, financing biogas sector in Kenya has been inadequate. Micro finance institutions do not have a biogas specific credit product though they have general development product which could be used for biogas construction but their terms may not be conducive to biogas clients. To stimulate the demand for domestic biogas installations, biogas sector actors should stimulate access to credit facilities for BCE firms to expand their business and farmers to cope with the relative high investment costs of construction.

Research has shown that access to credit has a positive impact on growth at both a household level and at a national level (Burgess and Pande, 2004; Klapper, Laeven and Rajan, 2004; Dehejia & Gatti (2002), Beegle, Dehejia & Gatti (2003), and Jacoby (1994). However, studies such as Kumar and Fransico (2006), Levine (2004), Pandula (2011) have also pointed out that SMES face constraints when accessing credit.  In addition, studies have shown that there exist various factors that affect firmøs access to credit. For instance, Storey (2004) specifically looked at age, capital investment, track record, work experience and social background of the owner when accessing credit from banks. Another study by Whincop (2001) attempted to assess how the entrepreneurial financial gap can be bridged and therefore investigated the firm

characteristics such as size, age of the business, legal status, financial performance indicators such as profit and fixed assets base. This indicates that the proper conceptualization of the factors influencing the use or access of bank credit by firms should at least take into consideration three types of characteristics namely; entrepreneur characteristics, firm characteristics and financial characteristics.

Studies on credit access seem to concentrate on the SMEs in service sector which leaves knowledge gap as far as the renewable energy sector is concerned. There is a paucity of studies on the factors affecting credit access for firms in biogas sector in Kenya and the researcher was not aware of any study that has been done on the study. This study therefore sought to bridge this knowledge gap by assessing the factors influencing credit access for firms in the biogas sector in Kenya. Specifically, this study attempted to answer the following research question: what are the factors influencing credit access by firms in the biogas sector in Kenya?

## 1.3    Objectives

The objective of the study was to establish the factors influencing credit access for firms in the biogas sub sector in Kenya.

## 1.4     Importance of the Study

The study will be beneficial to various parties namely the BCE firms, the regulator in charge of banks and MFIs, general public and scholars. The beneficiaries of loans will find this study useful as they will learn from shared experiences on the issues relating to factors influencing credit access. The micro credit industry will use this study as an eye opener of the challenges facing the firms who were their past, present and prospective clients. Consequently, they might adopt institutional remedies to curb these challenges.

Policymakers and planners have become acutely aware of the economic significance of men and women's productive activities and the nature of their contribution to income generation. The findings of this study are expected to provide the policy makers with a platform to formulate policies that would enhance productivity and growth in line with Vision 2030. The study will act as a blue print for NGOs and poverty reduction agencies as they increase their efforts to alleviate poverty in Kenya

and the world at large through micro finance. This study will be a valuable addition to literature review as scholars of business, political economy and finance may use it to broaden their knowledge of issues relating to microfinance.

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1    Introduction

The chapter discusses the theoretical literature in depth in order to give the study a theoretical underpinning. Section 2.2 will discuss the theoretical review and has subsections 2.2.1 which will discuss credit rationing theory and 2.2.2 where the financial inclusion/exclusion theory will be discussed.  Section 2.3 will explore the empirical literature with an aim of uncovering what has been done on the area and identification of the missing contextual and conceptual knowledge gaps. Section 2.4 will discuss factors affecting financial inclusion in Kenya in order to give a local perspective to the discourse on financial inclusion. Section 2.5 is a summary of the chapter and it highlights all the main points identified in the literature.

## 2.2.    Theoretical Framework

This section explores the various theories that can explain the determinants of credit access to BCE firms. Several theories were advanced; these include;

## 2.2.1    Credit Rationing Theory

An increasing body of analytical work has attempted to explain the functioning of credit markets using new theoretical developments.  Challenging the paradigm of competitive equilibrium, they have explored the implications of incomplete markets and imperfect information for the functioning of credit markets in developing countries. These provide a new theoretical foundation for policy intervention. According to Stiglitz and Weiss (1981) interest rates charged by a credit institution are seen as having a dual role of sorting potential borrowers leading to adverse selection, and affecting the actions of borrowers leading to the incentive effect.

Interest rates thus affect the nature of the transaction and do not necessarily clear the market. Both effects are seen as a result of the imperfect information inherent in credit markets. Adverse selection occurs because lenders would like to identify the borrowers most likely to repay their loans since the banksø expected returns depend on the probability of repayment.  In an attempt to identify borrowers with high

probability of repayment, banks are likely to use the interest rates that an individual is willing to pay as a screening device. However, borrowers willing to pay high interest rates may on average be worse risks; thus as the interest rate increases, the riskiness of those who borrow also increases, reducing the bankøs profitability. The incentive effect occurs because as the interest rate and other terms of the contract change, the behavior of borrowers is likely to change since it affects the returns on their projects.

Stiglitz and Weiss (1981) further shows that higher interest rates induce firms to undertake projects with lower probability of success but higher payoffs when they succeed leading to the problem of moral hazard. Since the bank is not able to control all actions of borrowers due to imperfect and costly information, it will formulate the terms of the loan contract to induce borrowers to take actions in the interest of the bank and to attract low risk borrowers. The result is an equilibrium rate of interests at which the demand for credit exceeds the supply. Other terms of the contract, like the amount of the loan and the amount of collateral, will also affect the behavior of borrowers and their distribution, as well as the return to banks. Raising interest rates or collateral in the face of excess demand is not always profitable, and banks will deny loans to certain borrowers.

Bell (1990) demonstrates that incomplete information or imperfect contract enforcement generates the possibility of loan default and eventually problems of credit rationing. The result is loan supply and implicit credit demand functions, both of which are simultaneously determined. The role of risk in allocation of credit through its effect on transaction costs, therefore, becomes important in incomplete credit markets. Accordingly, where default risk exists, with an upward sloping supply curve, lenders offer borrowers only a choice of points on the supply curve, and borrowers are restricted to these points. It is impossible to identify the loan demand schedule using the observed loan amounts since these only reflect the existing supply.

The credit demand function can only be interpreted from the borrowerøs participation decision, i.e., the decision to borrow or not, and from which sector to borrow. Such a decision will depend on, among other things, the borrowerøs economic endowment and opportunities. The credit demand schedule identification problem therefore implies the existence of credit rationing (Elhiraika and Ahmed, 1998). The absence of

supply for credit creates a lack of demand expressed in low revealed demand. Again, due to market failure in the credit market, the transaction cost involved in obtaining credit is considered greater than the utility, prompting entrepreneurs to switch profits between activities as a way of financing working capital. This also explains the existence of informal credit markets alongside formal credit institutions.

### 2.1.2   Financial Inclusion Theory

Financial inclusion refers to the process of ensuring access to appropriate financial products and services needed by all sections of the society in general and vulnerable groups such as weaker sections and low income groups in particular, at an affordable cost, in a fair and transparent manner, by mainstream institutional players (Chakrabarty, 2011). An inclusive financial sector that provides =accessø to credit for all =bankableø people and firms, to insurance for all insurable people and firms, to savings and payment services for everyone (United Nations 2006 b). Inclusive finance does not require that everyone who is eligible use each of the services, but they should be able to choose to use them if desired.

Worldbank (2008) has classified financial access barriers into four main categories; physical barriers, lack of documentation barriers, affordability barriers and lack of appropriate products and services. For Geographic access, branches have been the traditional bank outlet, hence geographic distance to the nearest branch, or the density of branches relative to the population can provide a first crude indication of geographic access or lack of physical barriers to access (Beck, Demirguc-Kunt and Martinez Peria (2007).

Limiting eligibility and documentation requirements is another barrier to access. For example banks in Albania, the Czech Republic, Mozambique, Spain and Sweden demand on average only one document to open a bank account, whereas banks in Tobago, Uganda and Zambia require at least four documents, including an identity card or passport, recommendation letter, wage slip and proof of domicile (Worldbank,2008). Given the high degree of informality in many developing countries, only a small proportion of the population can produce these documents.

Kempson et al (2004) report that financial exclusion is most prevalent amongst those on low incomes. Unemployed people living on social security payments from the state are therefore especially vulnerable, as are low income households from ethnic minority communities who may also have relatively low levels of engagement with the financial services industry. Kempson et al (2004), supported by evidence from the Family Resources Survey 2002-2005, report that uptake of financial products and services is lowest amongst African-Caribbean, Black, Pakistani and Bangladeshi households in the UK. However, for some members of these groups religious beliefs may provide a partial explanation for this apparent exclusion.

## 2.3    Empirical Literature

### 2.3.1    Entrepreneurial Characteristics and Access to Credit

Storey (2004) conducted a study on racial and gender discrimination in the micro firmøs credit market and demonstrated evidence from Trinidad and Tobago.  The study was built upon human capital theory and specifically looked at education, age, work experience and social background of the owner when accessing credit from banks. Deakins, et al (2008) conducted a study on SMEs access to finance and specifically on whether the debt finance gap still existed. The authors suggested that demand side factors that affected SMEs access to bank finance were due to fear of outright rejection and receiving less than what they expected.  Deakins et al (2008) also cites Fraser (2005) who asserted that willingness to approach, feeling discouraged from applying because they expect to be rejected was a demand side factor for credit access.

Pandula (2011) conducted a survey into the SMEs access to bank finance with a focus on a developing economy (Sri Lanka). The author used a Chi square statistic to assess whether the determinants of access to credit is significantly different among the credit rationed firms and not rationed firms. The chi square results indicated that, education of the entrepreneur and having membership with business association are associated with access to bank finance. Somewhat unexpectedly, all other factors identified in the study did not show any association with access to credit.

### 2.3.2 Firm Characteristics and Access to Credit

A study by Whincop (2001) attempted to assess how the entrepreneurial financial gap can be bridged and therefore investigated the firm characteristics such as size, age of the business, legal status and financial characteristics such as profit, fixed assets base. Kumar and Francisco (2005) conducted a study on enterprise size, financing patterns and credit constraints in Brazil. Specifically, the authors investigated the importance of firm size with respect to access to credit, relative to firm performance, and other factors which may affect creditworthiness, such location, or the industrial sector to which the firm belongs. The principal findings were that size strongly affects access to credit, compared to performance as well as other variables, suggesting quantitative limitations to credit access. Looking at short-versus long-term loans, the impact of size on access to credit was greater for longer-terms loans.

Kumar and Francisco (2005) conducted a study on enterprise size, financing patterns and credit constraints in Brazil. The authors argued that looking at short-versus long-term loans, the impact of size on access to credit was greater for longer-terms loans. Finally, examining the role of financial constraints relative to other constraints faced by the firm, it was found however that credit access constraint may have a less significant differential impact across firms of different sizes than other constraints though cost of finance as a constraint is very important.

Deakins, et al (2008) conducted a study on SMEs access to finance and specifically on whether the debt finance gap still existed. The authors suggested that demand side factors that affected SMEs access to finance from the bank included age of the firm with younger firms experiencing lower access, size of the firm with smaller firms experiencing lower access to credit, access to collateral, and geographical location with rural SMEs experiencing lower access to finance than urban SMES.

Firm size is one of the important variables in literature related to access to credit. Numerous studies have discussed that small and medium enterprises are financially more constrained than large firms. For example Pandula (2011) noted that when the company is smaller, the restrictions on credit are greater. Further research has demonstrated that small firms usually do not have audited financial reports, are owned and operated by the entrepreneur himself and there is no such legal requirement to

regularly report financial information. In addition smaller firms have less assets to offer as collateral as compared to larger firms.

Ajagbe (2012) analyzed determinants of access and demand for credit by small scale entrepreneurs from Oyo State in Nigeria. The empirical result showed that the respondentøs age, membership of a social group, value of asset, education and the nature of the credit market are the major determinants of credit access and demand among respondents.

### 2.3.3    Determinants of Access to Credit

A study on the determinants of credit rationing among formal and informal lenders was conducted by Zeller (1994) in Madagascar. The regression results showed that the probability of applying for informal credit increases with age, years of education, and number of sick days of household during the recall period. On the other hand, the probability of being credit constrained by the informal lender increases with age, and years of education. The study also identified the leverage ratio of household as the most important determinant for loan rationing. Physical collateral plays a minor role in credit rationing.

Berger and Udell (2004) conducted a study on how SMEs can overcome growth constraints. The authors argued that the availability of external finance for small and medium enterprises (SMEs) is a topic of significant research interest to academics and an issue of great importance to policy makers around the globe. However, Berger and Udell (2004) also asserted that a conceptual framework of factors affecting SME credit availability should focus on national financial institution structures and lending infrastructures and the way in which these elements of the financial system affect SME credit availability.  By financial institution structure, the authors meant the market presence of different types of financial institutions that provide credit, as well as the competition among these institutions. By lending infrastructure, the authors meant the rules and conditions set up mostly by governments that affect financial institutions and their abilities to lend to different potential borrowers. The authors further argued that differences in the financial institution structure and lending infrastructure may significantly affect the availability of funds to SMEs by affecting the feasibility with which financial institutions may employ the different lending

technologies in which they have comparative advantages to provide funds to different types of SMEs.

Kumar and Francisco (2005) conducted a study on enterprise size, financing patterns and credit constraints in Brazil. Looking at the ownership of the lending institution, it was found that public financial institutions are more likely to lend to large firms than to small firms.

Deakins et al (2008) indicated that supply side factors that affected access to finance included lack of business performance and credit worthiness information about the borrower, policy and practices of banks affected access to finance, banking structure (existence of subsidiaries for referral). Specific bank practices and policies include the 5 Cs of lending. The 5 Cs of lending include collateral, character, capacity, capital, conditions. The 5 Cs are most commonly used models by banks in evaluating lending propositions. The 5Cs model looks at a range of aspects associated with lending covering both the finance being sought as well as the characteristics of the borrower. Character stands for the characteristics of the borrower such as honesty and trustworthiness, Capacity considers ability to pay in terms of acquired skills and experience, Capital measures the net value of the entrepreneurs in terms of assets and liabilities, Collateral is the security required in lending which acts as a cushion against borrower's inability to repay the loan / credit. Conditions are those set by the bank such as turnovers levels and profitability, Purpose of loans which refers to the need for the requested amount, period of business operations, Amount which refers to adequacy of the credit, Repayment which refers to source and timing to repay back the credit (Binks, & Ennew, 1996).

Ugbomeh (2008) investigated determinants of loan repayment performance among women self-help groups in Bayelsa State, Nigeria. The estimated regression model indicated that women as household heads, interest rate, household size, price stability of farm proceeds, and commitment to self help groups significantly affected loan repayment of women farmers in the group. Oboh (2009) examined the socio-economic determinants of farmers' loan size in Benue State, Nigeria. The result shows that annual income, distance from the farmer's resident to credit source, farm

size and previous loan status were significant factors that encouraged larger loan size to farmers.

Henri-Ukoha et al. (2011) studied determinants of loan acquisition from the financial institutions by small-scale farmers in Ohafia agricultural zone of Abia state, Southeast Nigeria. Factors that influenced the amount of loan disbursed by the financial institutions were age of the farmers, level of education, farming experience and farm size. Oboh and Kushwaha (2009) studied the effect of socio-economic and demographic factors on the rate of credit allocation to the farm sector by arable crop farmers in Benue State, Nigeria. Empirical result reveals that factors that affect the rate of credit allocation to the farm in the study area were; age, education, farm size, household size, length of loan delay and visitation by lenders.

Lawal et al. (2009) found that a direct relationship exists between social capital and credit access, and that membership and cash contribution in the associationsø by the farming households drives access to credit positively for productivity and welfare. According to development professionals, the lack of access to credit by poor rural households has negative effect on farm business expansion.

Akudugu (2012) estimated the determinants of credit demand by farmers and supply by Rural Banks in the Upper East Region of Ghana. Semi-structured questionnaire complemented by key informant interviews and focus group discussions were used in gathering data from 250 farmers in 5 districts of Upper East Region. The logit model was used to estimate the determinants of credit demand by farmers and the Tobit model used to estimate the determinants of credit supply by Rural Banks. The findings showed that age of farmers, gender and political affiliations among others were the main determinants of credit demand by farmers. Type of crop grown, farm size and the amount of savings made were some determinants of credit supply by the Rural Banks.

## 2.4    Credit Access in Kenya

Credit constraints operate in variety of ways in Kenya where undeveloped capital market forces entrepreneurs to rely on self-financing or borrowing from friends or relatives. Lack of access to long-term credit for small enterprises forces them to rely

on high cost short term finance. There are various other financial challenges that face small enterprises. They include the high cost of credit, high bank charges and fees. The scenario witnessed in Kenya particularly during the climaxing period of the year 2008 testifies the need for credit among the common and low earning entrepreneurs.

Numerous money lenders in the name of Pyramid schemes came up, promising hope among the ‒little investors,ø that they can make it to the financial freedom through soft borrowing. The rationale behind turning to these schemes among a good number of entrepreneurs is mainly to seek alternatives and soft credit with low interest rates while making profits. Financial constraint remains a major challenge facing SMEs in Kenya (Wanjohi and Mugure, 2008).

Ngøeno et al. (2011) studied farmersø inaccessibility to agricultural credit in Nyandarua District, Kenya. The study established that socio-economic constraints such as age, gender, household size, farm income, collateral and awareness are critical determinants of access to credit.

Lack of access to credit is almost universally indicated as a key problem for SMEs (including Biogas entrepreneurs) in Kenya. In some cases, even where credit is available, the entrepreneur may lack freedom of choice because the lending conditions may force the purchase of heavy, immovable equipment that can serve as collateral for the loan.

## 2.5    Summary

Biogas technology has many benefits at the household level. It provides a clean smoke free kitchen environment which reduces incidences of health related complication. It saves on labour and time required for collecting fire wood. It also helps to reduce deforestation and mitigation to climate change (PID, 2009). However, financing biogas sector in Kenya has been inadequate. Micro finance institutions do not have a biogas specific credit product though they have general development product which could be used for biogas construction but their terms may not be conducive to biogas clients. To stimulate the demand for domestic biogas installations, biogas sector actors should stimulate access to credit facilities for BCE

firms to expand their business and farmers to cope with the relative high investment costs of construction.

Research has shown that access to credit has a positive impact on growth at both a household level and at a national level (Burgess and Pande, 2004; Klapper, Laeven and Rajan, 2004; Dehejia & Gatti (2002), Beegle, Dehejia & Gatti (2003), and Jacoby (1994). However, studies such as Kumar and Fransico (2006), Levine (2004), Pandula (2011) have also pointed out that SMEs in general face constraints when accessing credit. In addition, studies have shown that there exist various factors that affect firms access to credit. For instance, Storey (2004) specifically looked at education, age, work experience and social background of the owner when accessing credit from banks. Another study by Whincop (2001) attempted to assess how the entrepreneurial financial gap can be bridged and therefore investigated the firm characteristics such as size, age of the business, legal status and financial characteristics such as profit, fixed assets base. This indicates that the proper conceptualization of the factors affecting the use or access of bank credit by firms should at least take into consideration three types of characteristics namely; entrepreneur characteristics, firm characteristics and financial characteristics.

Studies on credit access seem to concentrate on the SMEs in the service sector which leaves knowledge gap as far as the renewable energy sector is concerned. There is a paucity of studies on the factors affecting credit access for firms in biogas sector in Kenya and the researcher is not aware of any study that has been done on the study. This study therefore wishes to bridge this knowledge gap by assessing the factors affecting credit access for firms in the biogas sector in Kenya. Specifically, this study attempts to answer the following research question: what are the factors affecting credit access for firms in the biogas sector in Kenya?

From the literature review above it is informative that age , size, capital investment, financial records, information access and risk preference of entrepreneurs are key determinants of credit access by firms. The researcher therefore will be seeking to establish the relationship between these factors among others and how they influence access to credit in the renewable energy sector in Kenya and particularly as they can be applied in the biogas subsector.

# CHAPTER THREE
# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter outlines in detail how the research was conducted. It reviewed the population of interest, the sampling technique, measurement and details of the variables used. An outline of the method used to ensure validity and reliability of the instrument was also outlined.

## 3.2 Research Design

Research design refers to how data collection and analysis are structured in order to meet the research objectives through empirical evidence (Chandran, 2004; Cooper and Schindler, 2006).

The current study took a descriptive survey design. A descriptive survey design was appropriate for this study since the study focuses on more than one Biogas Contractor Enterprise (BCE) firms.

## 3.3 Population

A population refers to an entire group of individuals, events or objects having a common observable characteristic (Mugenda & Mugenda, 2003). The population of the study was all the 477 firms operating as biogas enterprises in the biogas sub-sector in Kenya.

## 3.4 Sample

A sample is a subset of a population (Cooper and Schindler, 2006). According to Mugenda and Mugenda (2003), a sample size of 10% or more is ideal for research purposes. Therefore, this study took 10% of 477, which brought the sample size to 48 firms. The sample selection took a random approach targeting proprietors or senior managers of the BCE firms partnering with KENDBIP in the biogas sector. There are **477** BCE firms operating in Kenya in partnership with KENDBIP.

## 3.5     Data and Data Collection

Both quantitative and qualitative data was collected, hence calling for primary and secondary data sources.  Both forms of data are required, where practicable, for purposes of gaining a deeper insight and a better interpretation of the collected data.

Primary data was collected by a survey method using the questionnaire as the main research instrument. The questionnaire consisted of both closed and open ended – ended questions. The questionnaire was also divided into two parts i.e Firms characteristics  and Factors influencing credit access.

The open ended parts of the questionnaire allowed collection of qualitative data that helped explain aspects of quantitative data.

The reliability and validity of the instrument was tested using an internal consistency measure (Cronbach's Alpha (  )).The standardized Cronbach's alpha was defined as:

$$\alpha = \frac{N.\bar{C}}{\left[\bar{V} + (N-1).\bar{C}\right]}$$

Where N is the number of components (items or testlets), $\bar{v}$ equals the average variance and $\bar{c}$ is the average of all covariances between the components (i.e. average Pearson correlation coefficients between the components).  The recommended value of 0.7 was used as a cut–off of reliabilities

A pilot study was also undertaken on at least five (5) firms to validate the questionnaire.  This enabled the researcher to amend the questionnaire so as to accurately capture the data.

## 3.6     Data Analysis

The questionnaires were coded and data entered into Statistical Package for social sciences (SPSS17) for cleaning, analysis and interpretation in line with the aim of the study, namely õFactors Influencing Access to Credit in the Renewable Energy Sectorö

Descriptive and inferential statistics were employed in the analysis to find out on the research objectives.

The strength of the relationships was tested using p values. P values of less than 0.05 signified that age, capital, size, access to information, risk preference and financial records of the BCE firm are significant determinants of credit access.

A regression model was also used;

## 3.6.1   Conceptual Model

The conceptual model was deduced from the literature review which indicated that age, capital, size, information access, risk and financial records are key factors influencing credit access by firms.

The model is as follows;

$CA = f (AB, K, S, AI, RP, FR, e)...........(Equition I)$

Where,
   CA= Credit Access
   AB= Age of Business
   K=capital invested
   S=size of business (number of employees)
   AI= Access to information
   RP= Risk Preference
   FR=Financial Records
   e- Error term

The variables were measured as explained in section 3.6.1.2 below. The basis of the model is as explained in section 3.6.2 below.

### 3.6.1.1 Expected Hypothetical Relationships

The expected/ hypothetical relationships about the independent variables are as follows;

Age of business was expected to have a positive relationship with level of credit access Deakins, et al (2008).Ho-1

Capital invested was expected to have a positive relationship with level of credit access (Ajagbe 2012, Kumar and Francisco 2005). Ho-2

Size of business was expected to have a positive relationship with level of credit access, (Whincop 2001).Ho-3

Access to information was expected to have a positive relationship with level of credit access, (World Bank 2008).Ho-4

Risk preference was expected to have a positive relationship with level of credit access, (Bell 1990).Ho-5

Financial records were expected to have a positive relationship with level of credit access (World Bank 2008).Ho-6

### 3.6.1.2    Operationalization of Variables

Credit Access was measured through five (5) statements. A 5 point likert scale was used to measure the level of inclusion. A Likert score of 4 or 5 indicated a high level of financial inclusion while a likert score of 1 or two indicated a low level of financial inclusion.

Age of the Business was measured using 4 levels namely less than 1 year, 1-3yrs, 3-5yrs, over 5yrs years. The expected relationship was positive. As age increases, credit access increases.

Capital invested was measured using four quintiles namely kes 0 to kes 25,000 ,kes26,000 to kes 75,000, Kes 76,000 to kes 150,000, and Kes 151,000 and above. The expected relationship was positive. As capital invested increases, credit acess increases.

Size of the business was measured using three categories namely: 0-5 employees, 6 to 10 employees, over 10 employees. Size of business is expected to have a positive relationship with level of credit access.

Access to Information was measured by three categories: High Access, Moderate Access and Low access. Access to information is expected to have a positive relationship with level of credit access.

Risk preference was measured by three categories: Highly comfortable, Moderate comfortable and not comfortable at all. Risk preference was expected to have a positive relationship with level of credit access

Financial records were measured by a binary response: Yes or No. Keeping financial records was expected to have a positive relationship with level of credit access.

### 3.6.2 Empirical Model

The basis of this model was the empirical literature which demonstrated that the independent variables have a significant effect on credit access of SMEs. The Model is as follow

Credit Access (CA) $= \alpha 0 + \alpha_1 AB + \alpha_2 K + \alpha_3 S + \alpha_4 AI + \alpha_5 RP + \alpha_6 FR + e_{t......(Equition II)}$

The strength of the relationships was tested using p values. P values of less than 0.05 signified that age, capital, size, access to information, risk preference and financial records of the BCE firm are significant determinants of credit access.

# CHAPTER FOUR
# DATA ANALYSIS AND PRESENTATION

## 4.1    Introduction

The chapter discusses the data collected during the research was analyzed and reported. Section 4.2 will discuss the summary statistics and will have subsections 4.2.1 which will discuss nature of business, 4.2.2 will discuss Legal registration, 4.2.3 discussed age of the firm, 4.2.4 discussed level of education, 4.2.5 discussed position held in the firm, 4.2.6 discussed capital invested, 4.2.7 discussed number of employees, 4.2.8 discussed financial records, 4.2.9 discussed risk preference, 4.2.10 discussed access to information, 4.2.11 discussed level of access. Section 4.3 will explore the inferential statistics which will have subsections 4.3.1 which will cover bivariate correlations and 4.3.2 which will discuss the regression analysis. Section 4.4 will present the discussion. Section 4.5 is a summary of the chapter.

## 4.2    Summary Statistics

### 4.2.1 Response Rate

The level of response is as analyzed in Table 4.1 below.

**Table 4.1 Response Rate**

| Response Rate | frequency | percent |
|---|---|---|
| Returned | 40 | 83% |
| Unreturned | 8 | 17% |
| Total | 48 | 100% |

Source: Authors Computation

A total of 40 responses/Questionnaires were received out of a possible 48 Questionnaires. This a response rate of 83%. The unsuccessful response rate was 8 questionnaires (17%). According to Mugenda and Mugenda (2003), a response rate of more than 50% is adequate for analysis. Babbie (2004) also asserted that a return rate of 50% is acceptable for analysis and publishing. He also states that a 60% return rate is good and a 70% return rate is very good. The achieved response rate was almost 70% which implies that the response rate was very good.

### 4.2.2 Nature of Business

The respondents were asked to indicate the nature of the business firm. The findings are presented in Table 4.2 below.

**Table 4.2 Nature of the Business**

| Nature of business | Frequency | Percent |
|---|---|---|
| Biogas construction only | 9 | 22% |
| Biogas construction and appliances | 20 | 50% |
| Biogas and Solar installation | 11 | 28% |
| **Total** | **40** | **100%** |

Source: Authors Computation

Results in Table 4.2 shows that 50% of the respondents indicated the nature of business firms was Biogas construction and appliances, 28% indicated Biogas and Solar installation and 22% indicated Biogas construction only. This is an indication that majority of firms in this sector are engaged in biogas construction and appliances distribution because the two activities are complementary.

### 4.2.3 Legal Registration

The respondents were asked to describe the form of legal registration for their business. The findings are presented in Figure 4.1 below.

**Figure 4.1 Legal Registration**
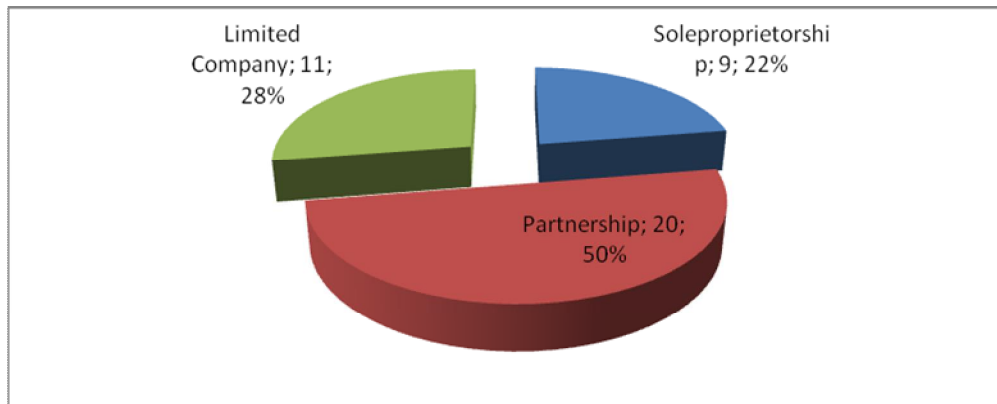


Source: Authors Computation

Results in Figure 4.1 indicated that majority 50% of the respondents were in partnership, while 22% of the respondents indicated sole proprietorship and 28% of

the respondents indicated limited company. This is an indication that most of the BCE firms are still under the direct control of the owners.

### 4.2.4   Age of Firm

The respondents were asked to indicate the length their business has been in existence in this market. The findings are presented in figure 4.2 below.

**Figure 4.2 Age of the Firm**
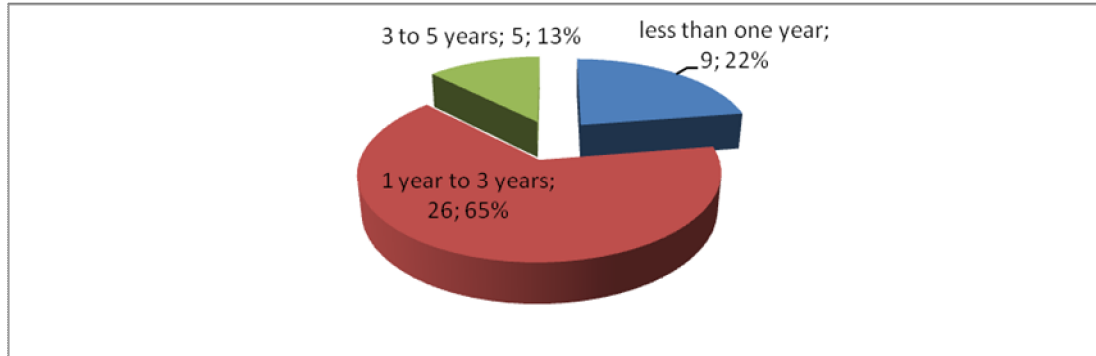


Source: Authors Computation

Results in figure 4.2 revealed that majority 65% of the respondents had been in the business for a period of between 1 to 3 years while 22% indicated that they had been in the business for a period of less than one year and 13% of the respondents indicated that they had been in the business for a period of between 3 to 5 years. The findings imply that the firms were very young just as the subsector is.

### 4.2.5   Level of Education

The respondents were asked to indicate their level of education. Figure 4.3 indicates the findings

**Figure 4. 1 Level of Education**
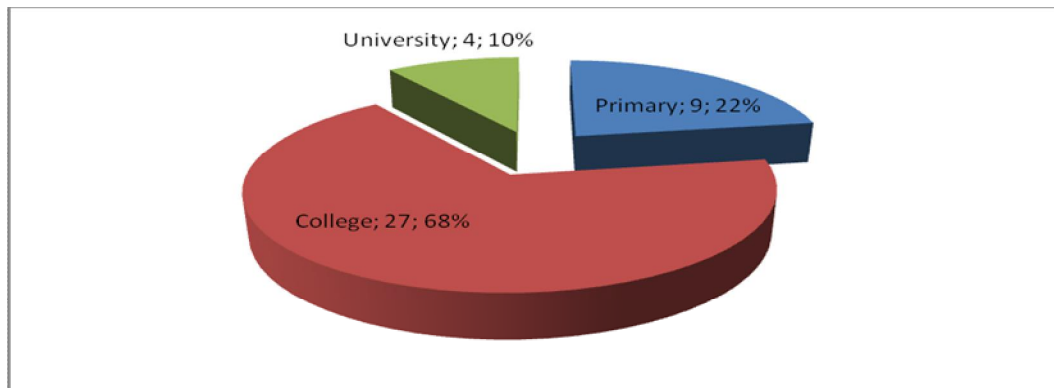


**Source: Authors Computation**

Results in figure 4.3 reveal that majority 68% had reached college level, 22% had reached primary level and 10% had reached university level. These results imply that the respondents had high academic qualifications and therfore understood the issues in question very well.

**4.2.6   Position Held**

The respondents were asked to indicate the Managerial position held in the business firm. Findings are presented in Table 4.3 below.

**Table 4.3 Position Held**

| Position | Frequency | Percent |
|---|---|---|
| Middle level | 9 | 22 % |
| Senior Level | 31 | 78% |
| Total | 40 | 100% |

Source: Authors Computation

Table 4.3 indicates that majority (78%) of the respondents are in senior management level and 22 % were in middle management level. This implies that most of the respondents are the founders or proprietors of the firms.

**4.2.7   Capital Invested**

The respondents were asked to indicate the amount of capital invested in their business. The findings are presented in Table 4.4 below.

**Table 4.4 Capital Invested**

|  | Frequency | Percent |
|---|---|---|
| Kes 0_____ kes 25,000 | 24 | 60% |
| Kes26,000 ókes 75,000 | 13 | 33% |
| Kes 76,000_kes 150,000 | 3 | 7% |
| Total | 40 | 100% |

Source: Authors Computation

Results in Table 4.4 revealed that majority 60% of the respondents indicated they had invested less than 25,000 shillings, while 33% of the respondents indicated kes 26000 to 75000 and finally 7% of the respondents indicated Kes 76,000 to 150,000. These results imply that the respondents had low capital invested and therefore this may have contributed to the low level of credit access.

**4.2.8    Number of Employees**

The respondents were asked to indicate the number of employees employed in their businesses. Figure 4.4 indicates the findings

**Figure 4.4: Number of Employees**
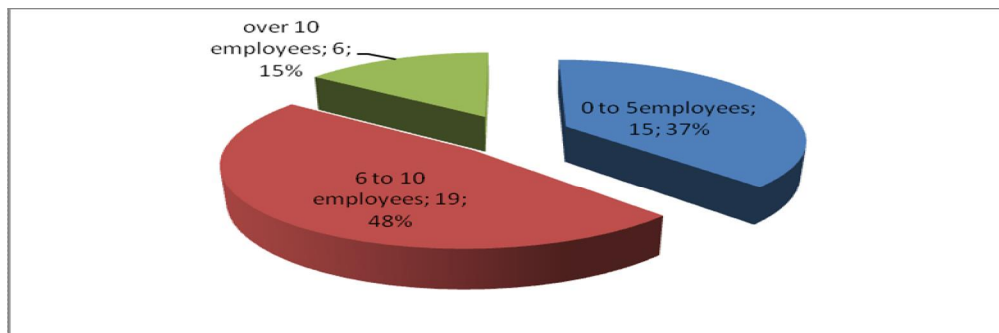


Source: Authors Computation

As illustrated in Figure 4.4, majority 43% of the respondents indicated they had 6 to 10 employees, while 42% of the respondents indicated they had less than 5 employees and 15% of the respondents indicated they had over 10 employees. The findings imply that majority of the respondents had small business in size and these may have contributed to the low credit access levels.

### 4.2.9   Financial Records

The respondents were asked to indicate whether they keep financial records for their businesses. The findings are presented in Figure 4.5 below.

**Figure 4.5 Financial Records**
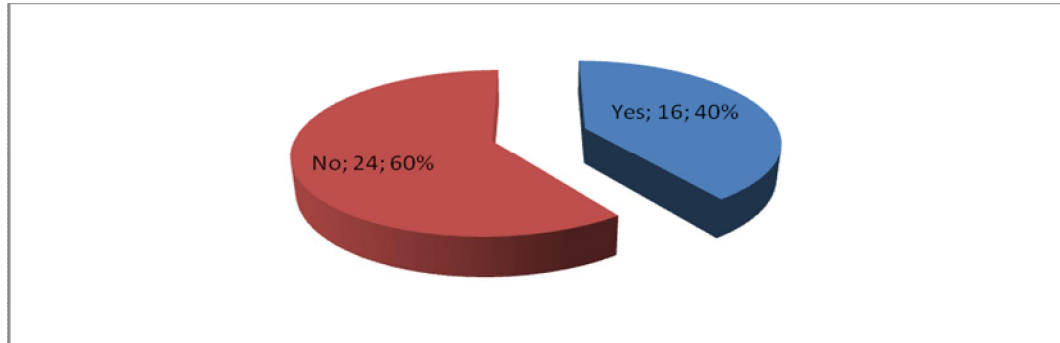


Source: Authors Computation

Results in Figure 4.5 revealed that majority 60% of the respondents did not have financial records while 40% of the respondents had financial records. The findings imply that majority of the respondents had no financial records and these may have contributed to the low credit access levels.

### 4.2.10  Risk Preference

The respondents were asked to indicate the extent to which they are comfortable with the risk of taking a bank loan. The findings are presented in Figure 4.6 below.

**Figure 4.6 Risk Preference**
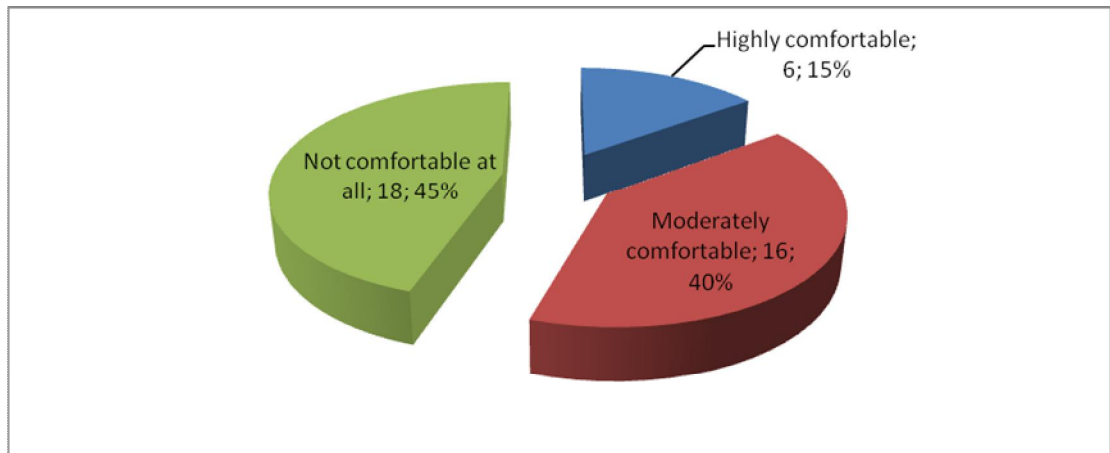


Source: Authors Computation

Results in figure 4.6 indicated that 45% of the respondents were not comfortable at all, while 40% of the respondents were moderately comfortable and 15% of the respondents were highly comfortable. The findings imply that the firms find it difficult to access loans because there are so many requirements needed for any firm to provide as collateral. The other reason the respondents indicated as reasons why they are not comfortable in accessing loans is the fear of the unknown if they business fails how would they pay for the loan.

### 4.2.11 Access to Information

The respondents were asked to rate their access to information on the types of loan products and loan requirements. The findings are presented in Table 4.5 below.

**Table 4.5 Access to Information**

| Access to Information | Frequency | Percent |
|---|---|---|
| High access | 9 | 23% |
| Moderately access | 7 | 17% |
| Low access | 24 | 60% |
| **Total** | **40** | **100%** |

Source: Authors Computation

Results in Table 4.5 revealed that majority 60% of the respondents had low access to information, while 23% of the respondents had high access to information and 17% of the respondents had moderate access to information.

The respondents indicated that they had low access to information because one has to visit the banks themselves and the cashiers are too busy hence feel offended and leave the banking halls without information about the products and services offered in the banks. The respondents also indicated that they could only get information from the banks websites and its not easy to get loans on internet banking or rather credible information on loan processes and appraisals.

### 4.2.12 Level of Access

The respondents were asked to indicate their level of access to credit. The findings are presented in Table 4.6 below.

**Table 4.6 Level of Access**

| Level of Access | Strongly disagree | Disagree | Neither agree not disagree | Agree | Strongly agree | Likert Mean | Std. Deviation |
|---|---|---|---|---|---|---|---|
| The firm is always willing to approach a bank for financing | 10% | 53% | 9% | 15% | 13% | 2.68 | 1.228 |
| My firm finds bank procedures for credit application to be simple an flexible | 13% | 53% | 10% | 25% | 0% | 2.47 | 1.012 |
| My application for finance rarely gets rejected | 30% | 43% | 7% | 20% | 0% | 2.18 | 1.083 |
| My firm is always awarded a bank loan which is adequate for my business requirements | 50% | 28% | 5% | 8% | 10% | 2.00 | 1.34 |
| My firm has a good perception of banks as a good source of finance for my business venture | 25% | 45% | 7% | 15% | 8% | 2.35 | 1.231 |
| Average Likert Mean | | | | | | 2.34 | |

Source: Authors Computation

Results in Table 4.6 revealed that majority 63% of the respondents disagreed with the statement the firm was always willing to approach a bank for financing, while 28% agreed and 9% neither agreed nor disagreed with the same statement. The findings further revealed that majority 53% disagreed and another 13% strongly disagreed bringing to a total of 66% of those who disagreed with the statement that firms find bank procedures credit application to be simple and flexible, while 25% of the respondents agreed and 10% neither agreed nor disagreed with the statement.

The findings also revealed that majority 43% of the respondents disagreed and another 30% strongly disagreed with the statement their application for finance rarely gets rejected, while another 20% of the respondents agreed and 7% of the respondents neither agreed nor disagreed with the statement.

In addition, majority 50% of the respondents strongly disagreed and 28% disagreed with the statement that their firms are always awarded a bank loan which is adequate for my business requirements, 18% of the respondents agreed and 5% neither agreed

nor disagreed with the statement. Finally, 70% of the respondents disagreed with the statement that their firms have a good perception of banks as a source of finance for my business venture, while 15% of the respondents agreed and another 8% strongly agreed bringing to a total of 23% of those who agreed with the statement and 7% of the respondents neither agreed or disagreed with the statement. The mean score for this section is 2.34 indicating that majority of the respondents disagreed with the statements on level of access to loans.

The findings agree with those in Deakins et al (2008) who cited Fraser (2005) who asserted that willingness to approach, feeling discouraged from applying because they expect to be rejected was a demand side factor for credit access.

## 4.3    Inferential Statistics and The Estimated Model

This section has analysis of the questionnaire responses using inferential statistics like correlation and the estimated regression model.

### 4.3.1   Bivariate Correlations

The study sought to establish the relationship between level of access and the independent variables (financial records, risk preference, age bracket, age of business, size of business, capital invested and access to information). First a correlation between Factors Influencing Access to Credit was done. Results are presented in Table 4.7 below.

**Table 4.7 Correlations between Factors Influencing Access to Credit**

| | | LevelofAccess | Age of firm | Capital Invested | Number of employees | Financial Records | Risk preference | Access to information |
|---|---|---|---|---|---|---|---|---|
| LevelofAccess | Pearson Correlation | 1 | .754** | .752** | .703** | .638** | .658** | .760** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 | .000 | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Age of firm | Pearson Correlation | .754** | 1 | .672** | .815** | .578** | .768** | .648** |
| | Sig. (2-tailed) | .000 | | .000 | .000 | .000 | .000 | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Capital Invested | Pearson Correlation | .752** | .672** | 1 | .762** | .921** | .814** | .915** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 | .000 | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Number of employees | Pearson Correlation | .703** | .815** | .762** | 1 | .711** | .930** | .773** |
| | Sig. (2-tailed) | .000 | .000 | .000 | | .000 | .000 | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Financial Records | Pearson Correlation | .638** | .578** | .921** | .711** | 1 | .772** | .925** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | | .000 | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Risk preference | Pearson Correlation | .658** | .768** | .814** | .930** | .772** | 1 | .825** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Access to information | Pearson Correlation | .760** | .648** | .915** | .773** | .925** | .825** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 | |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |

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

**Source: Authors Computation**

Results on Table 4.7 show that level of access was positively correlated with all the independent variables. This reveals that any positive change in age of firm, capital invested, size of the business, financial records, risk preference and access to information led to improved level of access to loans. The bivariate correlation further reveals a high and positive correlation between level of access and all the predictorsø

variables. This shows that a unit change in any of the predictor variable caused a significant change in the level of access.

## 4.3.2 Regression Analysis

In order to establish the statistical significance of the independent variables on the dependent variable (level of access) regression analysis was employed. The regression equation took the following form.

Credit access = 0.929 + 0.695 Age of firm + 0.897 Capital Invested + 1.949 Number of Employees + 1.328 Financial Records + 2.269 Risk Preference+ 1.014 Access to Information **………….(Equition III)**

The regression fitness model is as presented in table 4.8 below.

**Table 4.8 Regression Model Fitness**

| Indicator | Coefficient |
|---|---|
| R | 0.9190 |
| R Square | 0.8450 |
| Std. Error of the Estimate | 0.4530 |

**Source: Authors Computation**

Table 4.8 shows that the coefficient of determination also called the R square is 85%. This means that the combined effect of the predictor variables (age of firm, capital invested, size of the business, financial records, risk preference and access to information) explains 85% of the variations in level of access in renewable sector. The correlation coefficient of 92% indicates that the combined effect of the predictor variables have a strong and positive correlation with level of access. This also means that a change in the drivers of level of access has a strong and a positive effect on credit access level.

**Table 4.9: Analysis of Variance (ANOVA)**

| Indicator | Sum of Squares | df | Mean Square | F | P value |
|---|---|---|---|---|---|
| Regression | 36.78 | 6 | 6.13 | 29.876 | 0.000 |
| Residual | 6.771 | 33 | 0.205 | | |
| Total | 43.551 | 39 | | | |

**Source: Authors Computation**

Analysis of variance (ANOVA) on Table 4.9 shows that the combined effect of age of firm, capital invested, size of the business, financial records, risk preference and access to information was statistically significant in explaining changes in level of access to credit. This is demonstrated by a p value of 0.000 which is less than that of the acceptance critical value of 0.05.

**Table 4.10: Relationship between Access to Credit and its Determinants**

| Variable | Beta | Std. Error | t | P value |
|---|---|---|---|---|
| (Constant) | 0.929 | 0.343 | -2.707 | 0.011 |
| Age of firm | 0.695 | 0.204 | 3.403 | 0.002 |
| Capital Invested | 0.897 | 0.343 | 2.618 | 0.013 |
| Number of employees | 1.949 | 0.478 | 4.077 | 0.000 |
| Financial Records | 1.328 | 0.454 | -2.927 | 0.006 |
| Risk preference | 2.269 | 0.483 | -4.701 | 0.000 |
| Access to information | 1.014 | 0.269 | 3.773 | 0.001 |

**Source: Authors Computation**

Table 4.10 displays the regression coefficients of the independent variables. The results reveal that age of firm, capital invested, size of the business, financial records, risk preference and access to information are statistically significant in explaining the level of access to credit. This shows that all the predictor variables of the study are important in explaining or predicting the level of access to credit by BCE firms in Kenya.

## 4.4    Discussion

Results in table 4.10 revealed that the relationship between level of access and age of firm was positive and significant ($b_1$=0.695, p value, 0.002. This is because the probability value was less than 0.005. This implied that older firms were more likely to access credit compared to younger firms. The descriptive statistics reported that majority of the businesses were young and these may explain the low credit access also noted in the study. The findings agree with those in Pandula, (2011) who argued that the period a business has been in existence plays a major role in determining its accessibility to credit. Therefore in the banks checklist for assessing eligibility for a credit facility it states the business must have been in operation for at least two years. This therefore implies that those enterprises that are less than two years old in the market cannot access credit in an institution such as a bank.

The relationship between level of access and capital invested was positive and significant (b1=0.897, p value, 0.013). The relationship between level of access and access to information was positive and significant (b1=1.014, p value, 0.001). The findings agree with those in Deakins et al (2008) who indicated that supply side factors that affected access to finance included lack of business performance and credit worthiness information about the borrower, policy and practices of banks affected access to finance.

The relationship between level of access and size of business was positive and significant (b1=1.949, p value, 0.000). This implied that larger businesses in size were more likely to access credit compared to small business in size. The small size of business reported in descriptive statistics may explain the low credit access noted in the study. The findings agree with those in Kumar and Francisco (2005) who asserted that size strongly affects access to credit, compared to performance as well as other variables, suggesting quantitative limitations to credit access hence looking at short-versus long-term loans, the impact of size on access to credit was greater for longer-terms loans.

The relationship between level of access and risk preference was positive and significant (b1=2.269, p value, 0.000). This implied that less risk averse firms were more likely to access credit compared to more risk averse firms. The descriptive statistics reported that majority of the respondents were not comfortable and moderately comfortable and these may explain the low credit access also noted in the study. The findings agree with those in Liu, 2008; Dercon, 2006; Boucher *et al*., 2008, and; Fletschner *et al*., (2009) who argued that producers who are more risk averse are less likely to adopt new technologies, to undertake projects that are expected to offer higher profits but expose them to more risk, or to apply for loans that may cause them to lose the collateral they own.

The relationship between level of access and financial records was positive and significant (b1=1.328, p value, 0.006). This implied that businesses with financial records were more likely to access credit compared to businesses without financial records. The descriptive statistics reported that majority of the respondents had no financial records and this may explain the low credit access also noted in the study.

## 4.5    Summary

The chapter presented the descriptive statistics first. The inferential statistics were also presented. Specifically regression results demonstrated that the determinants of credit include age of the business, size of the business, financial records, risk preference and capital invested. Findings in this chapter formed a crucial input in the next chapter (chapter 5).

Statistics show that the independent variables accounted for 85% influence of access to credit by BCE firms meaning that other related factors account for 15%. Again tests showed that all the independent variables have a statistically significant positive correlation with the level of access to credit.

Majority of respondents indicated that they are shy to approach the banks for credit for fear of being rejected or because the loan application process was thought to be discouraging to them. Majority said it was lengthy and complicated. Many of the respondents also were of the view that collateral demanded by the banks discouraged them from borrowing and increased their financial risk posed by high interest rates which is subject to compounding in the event of default, volatility of BCE business and Financial Institutionøs unfriendly loan recovery strategies.

Majority of senior managers of BCE firms are college level graduates and they have been in business for less than five year hence they lack the managerial experiences required by most banks and MFIøs to qualify for credit financing.

Lack of access to credit Information by BCE firms was also cited as a significant impediment in securing cost effective credit financing and a knowledge base is necessary to overcome such problems.

Results pointed that when the firm is small, restrictions on credit are greater. This is because small firms usually do not have audited financial reports, are owned and operated by the entrepreneur him/her self and there is no such legal requirement to regularly report financial information and in addition smaller firms have less assets to offer as collateral compared to larger firms.

# CHAPTER FIVE
## SUMMARY AND CONCLUSION

### 5.1 Introduction

This purpose of this chapter is to discuss and summarize the findings of the study and finally give conclusions and recommendations for improvement or practice. Section 5.2 discusses the summary of findings, 5.3 discusses the conclusion, 5.4 covers the limitations of the study and 5.5 discusses the recommendations for policy and further research.

### 5.2 Summary of the Study

The general objective of this study was to establish the factors influencing credit access for firms in the biogas sub sector in Kenya. A sample size of a total population of forty eight (48) respondents was drawn from all the renewable sector firms and forty (40) questionnaires were satisfactorily completed and returned. For purposes of collecting primary data, the researcher developed and administered a questionnaire and the results obtained were analyzed using Microsoft Excel and Statistical Package for Social Sciences (SPSS).

The study findings showed that 50% of the respondents indicated the nature of business firms was Biogas construction and appliances. A majority 50% of the respondents were in partnership, results revealed that majority 65% of the respondents had been in the business for a period of between 1 to 3 years while 22% indicated that they had been in the business for a period of less than one year and majority 68% of the respondents had reached college level. These results imply that the respondents had high academic qualifications and therfore understood the issues in question very well. A majority (78%) of the respondents was in senior management level and 60% of the respondents indicated they had invested less than 25,000 shillings, while 48% of the respondents indicated they had 6 to 10 employees.

The findings also revealed that majority 60% of the respondents did not have financial records, 45% of the respondents were not comfortable with borrowing risk at all, and 60% of the respondents indicated they had low access to information. More so, results

revealed that majority 63% of the respondents disagreed with the statement the firm was always willing to approach a bank for financing, 66% disagreed with the statement that firms find bank procedures credit application to be simple and flexible, while 73% disagreed with the statement their application for finance rarely gets rejected, and 78% disagreed with the statement that their firms are always awarded a bank loan which is adequate for my business requirements, Finally, 70% of the respondents disagreed with the statement that their firms have a good perception of banks as a source of finance for business venture. The mean score for this section is 2.34 indicating that majority of the respondents disagreed with the statements on level of access to loans.

Results indicate that demographic factors such as age of firm, capital invested, size of the business, financial records, risk preference and access to information are a significant determinant of level of access to credit. Regression analysis was conducted to empirically determine whether demographic factors were a significant determinant of level of access to credit and the results support this finding. Correlation results showed that level of access was positively correlated with all the independent variables. This reveals that any positive change in age of firm, capital invested, size of the business, financial records, risk preference and access to information led to improved level of access to loans. The bivariate correlation reveals a high and positive correlation between level of access and all the predictorsø variables.

Regression results indicated that the coefficient of determination also called the R square is 85%. This means that the combined effect of the predictor variables (age of firm, capital invested, size of the business, financial records, risk preference and access to information) explains 85% of the variations in level of access in renewable sector. Analysis of variance (ANOVA) results showed that the combined effect of age of firm, capital invested, size of the business, financial records, risk preference and access to information was statistically significant in explaining changes in level of access to credit. This is demonstrated by a p value of 0.000 which is less that the acceptance critical value of 0.05. Regression coefficients results reveal that age of firm, capital invested, size of the business, financial records, risk preference and access to information are positive and statistically significant in explaining the level

of access to credit. This shows that all the predictor variables of the study are important in explaining or predicting the level of access to credit in Kenya.

## 5.3 Conclusion

As demonstrated by the findings of the study, BCEs face a "liability of smallness." Because of their size and resource limitations, they are unable to successfully develop new technologies or to make vital changes in existing ones. Still, there is evidence that BCEs have the potential to initiate minor technological innovations to suit their circumstances. However, for BCEs to fully develop and use this potential, they need specific policy measures to ensure that technology services and infrastructure are provided.

Also, following the study findings it is possible to conclude that BCEs have low access to credit from the banks. It was possible to conclude that financing biogas sector in Kenya has been inadequate. Micro finance institutions do not have a biogas specific credit product though they offer general business loans which could be used by biogas construction enterprises to access business capital but their terms may not be conducive to the biogas sector. It was also possible to conclude that age of firm, capital invested, and size of the business, financial records, risk preference and access to information influence the level of access to credit by firms in the renewable sector (BCEs).

Specifically the study results demonstrated that the determinants of credit include age of the business, size of the business, financial records, risk preference and capital invested and that these factors account for 85% influence of access to credit by BCE firms meaning that other related factors account for 15%. Again tests showed that all the independent variables have a statistically significant positive correlation with the level of access to credit.

It is worth stating that BCEs have the potentiality of transforming the economy of the nation. As such, every effort should be made to boost their growth especially through access to credit finance.

## 5.4 Limitations of the Study

The sample size of 10% or 48 BCE firms though representative was a limitation to the accuracy and representativeness of the study findings. A census would have been the best option and would have been the most representative. However, a census would not have been technically and economically efficient based on time and funds available.

Noise was also identified in some of the questionnaires which could reduce the accuracy of the findings, however such questionnaires were considered unsatisfactory and hence not analyzed.

Some respondents said they lacked time to answer to the questionnaires due to the hectic nature of their jobs. To overcome this limitation, care was taken to replace the non-cooperative respondents with cooperative ones from the same target group.

Another limitation of this study was the level of cooperation from respondents. Some respondents were not cooperative as they were not sure how we intended to use the data. To overcome this limitation, the researcher presented the respondents with introduction letters from the university to allay their fears. The researcher also ensured that the respondents were assured of confidentiality.

In addition, it may not have been possible to ensure that all the respondents were honest about their responses, however care was taken to explain to the respondents that honesty was important as the report would be valuable to many parties.

Finally, some of the questions were sensitive e.g level of capital invested as well as work force levels. Consequently, a truthful response is suspect. To overcome this limitation, the researcher assured the respondents of the confidentiality and that none of the information will be disclosed without prior consent from the BCE firms.

## 5.5 Recommendations

### 5.5.1 Recommendations for Policy

One major question we should pose is: what solution can be offered to the plight of Biogas contractor enterprises in Kenya? For one, policies should aim to encourage and promote the development of local technologies such as the biogas technology. Emphasis should be on the promotion of the local tool industry to reduce reliance on imports of biogas appliances.

To begin with, research and development institutions that are publicly funded should be encouraged to target the technology needs of BCEs.

Secondly, the problem of access to information may be attributed to the inadequacy of BCE support institutions. This points to the need for a supportive policy to encourage the establishment of documentation centers and information networks to provide information to BCEs at an affordable price.

Thirdly, the government should come up with training centers for training managerial and technical courses for the small enterprises such as BCEs. Equally, there should be business information centers.

Fourthly, government should come up with proper regulatory policies that are BCE or small enterprises friendly since many of what we have in Kenya, frustrates every effort of a junior entrepreneur. The policies we have seem to care for the well-established businesses.

Since majority of small enterprises lack finance, government should establish friendly small loaning system. This would include low interests rates to ensure the continuity of these businesses. Micro financing institutions should customize their products and services they offer to BCEs so as to have all clients enclosed in their loan portfolio.

Lastly, formation of business groups for BCE businesses should be encouraged to form a bid to guarantee each other when there is need to secure business loans.

### 5.5.2 Recommendations for Further Research

The researcher dealt with only the above six factors that influence accessibility to credit facility by BCE firms in the biogas sub sector of the renewable energy in Kenya.

There is need to research on other related factors and even use other methods of study to see whether the similar result can be realized.

This research concentrated on the Biogas Contractor Enterprises (BCE) firms only and there is need to have a wider research on factors influencing credit access targeting all actors in the renewable energy sector in Kenya to compare the findings.

The researcher recommends further studies on the access of informal credit by BCEs. Such study should focus on the factors that influence the formation of informal business clubs such as merry go rounds and un registered SACCOs.

Future studies should also focus on the financial management practices of BCE firms or generally firms in the renewable energy sector. This is because proper working capital management may influence the growth, profitability and the consequent ability to access finance from all sources.

**REFERENCES**

Ajagbe FA. Analysis of Access to and Demand for Credit by Small Scale Entrepreneurs. Evidence from Oyo State, Nigeria. Journal of Emerging Trends in Economics and Management Sciences (JETEMS). 2012;3(3):180-183.

Akudugu MA. Estimation of the Determinants of Credit Demand by Farmers and Supply by Rural Banks in Ghana‟s Upper East Region. Asian Journal of Agriculture and Rural Development. 2012;2(2):189-200.

Beck, T., Demirguc-Kunt, A. and Martinez Peria, M.S. 2007. Reaching Out: Access to and Use of Banking Services Across Countries, *Journal of Financial Economics*, forthcoming.

Beegle, Dehejia & Gatti; 2003, õ*Child Labor, Income Shocks and Access to Credit*ö, World Bank mimeo

Bell, C. 1990. Interactions between institutional and informal credit agencies in rural India. *World Bank Economic Review*, 4 (3), 297ó327.

Berger, & Udell. (2004). *A More Complete Conceptual Framework for SME Finance.* World Bank.

Binks, M. R. & Ennew C. T. (1996). Growing Firm and the Credit Constraint, *Journal of Small Business Economics*, 8 (1), 17 ó 25.

Burgess, R. and Pande R. 2005. õDo Rural Banks Matter? Evidence from the Indian Social Banking Experimentö, *American Economic Review* (95) 3: 780ó95.

Chaia, Alberto, Aparna Dalal, Tony Goland, Maria Jose Gonzalez, Jonathan Morduch, and Robert Schiff, 2011, Half the world is unbanked, Working paper, New York University

Chakrabarty K.C. 2011. *Financial Inclusion. Seminar on "Financial Inclusion: Partnership between Banks, MFIs and Communities"*, New Delhi, 14 October 2011

Chandran, E. 2004. *Research Methods: A Quantitative Approach with Illustrations from Christian Ministries*. Nairobi: Daystar University.

Climate and Development Knowledge Network (2013). õwww.cdkn.orgö

Cooper, D.R and Schindler, P.S .2006.   *"Business Research Methods",* 9th, edition. McGraw-Hill  Publishing, Co. Ltd. New Delhi-India

Cronbach, L. J. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika* 16:2976334.

Deakins, D., North, D., Balddock, R. and  Whittam , G. (2008) õ SMEsø Access to Finance".: Is there still a debt finance gap. *World Bank Economic Review*, 4 (3): 2976327.

Dehejia & Gatti. 2002, õ*Child Labor: The Role of Income Variability and Access to Credit in a Cross Section of Countries*ö, World Bank mimeo

Elhiraika, A.B. and S.A. Ahmed. 1998. õAgricultural credit under economic liberalization and Islamization in Sudanö. AERC Research Paper No. 79.

European Commission. (2005). *SME Access to Fnance.* European Commission.

FAO/CMC (1996). SD Environment: A system Approach to Biogas Technology**.** Training Manual for extension. [http://www.fao.org].

Fraser, S. (2005) Finance for Small and Medium Sized Enterprises: A Report on the 2004 UK Survey of SME Finances, Warwick Business School: Coventry

Harris, P. (2005). *Beginners Guide to Biogas*. The University of Adelaide, Adelaide [http://www.ees.adelaide.edu.au] .

Henri-Ukoha A, Orebiyi JS, Obasi PC, Oguoma NN, Ohajianya DO, Ibekwe UC, Ukoha II. Determinants of loan acquisition from the financial institutions by small-scale farmers in Ohafia Agricultural zone of Abia State, South East Nigeria. Journal of Development and Agricultural Economics. 2011;3(2):69-74.

Honohan, Patrick, 2008, Cross-Country variation in household access to financial services, *Journal of Banking and Finance* 32, 2493-2500.

Jacoby, H; 1994, õBorrowing Constraints and Progress Through School: Evidence From Peruö, Review of Economics and Statistics, 76, 151-60

Kempson. E., Atkinson. A. and Pilley. O, 2004, *Policy Level Response to Financial Exclusion in Developed Economies: Lessons for Developing Economies*, The

Personal Finance Research Centre prepared for the Department of International Development

Klapper, L. (2004). *The Role of "Reverse Factoring" in Supplier Financing of Small and Medium Sized Enterprises.* Washington Dc: World Bank.

Kumar, A., & Francisco, M.2005. õEnterprise size, financing patterns and credit constraints in Brazil: analysis of data from the Investment Climate Assessment Survey.ö *World Bank working paper No.49.*

Lawal JO, Omonona BT, Ajani OI, Oni AO. Effects of Social Capital on credit Access among Cocoa Farming Households in Osun State, Nigeria. Agric. J. 2009;4:184ó191.

Levine, R.2004. õFinance and growth: Theory and evidenceö. *NBER Working paper 10766*

Mugenda, O. M. and Mugenda, A. G. 2003. *Research Methods: Quantitative and Qualitative Approaches*, Acts Press, Nairobi-Kenya

Ngøeno V, Muiruri EJ, Nyangweso PM, Langat BK, Kipsat MJ. Farmers Inaccessibility to Agricultural Credit in Nyandarua District, Kenya. Asian Journal of Agriculture and Rural Development. 2011; 1(2):64-68.

Oboh VU, Ineye DE. Determinants of formal agricultural credit allocation to the farm sector by arable crop farmers in Benue State, Nigeria. African Journal of Agricultural Research. 2011;6 (1):181-185.

Oboh VU, Kushwaha S. Socio-economic Determinants of Farmersø Loan Size in Benue State, Nigeria. Journal of Applied Sciences Research. 2009;5(4):354-358.

Pandula. 2011. õAn empirical Invetigation of small and medium enterprises access to bank finance : the case of an emerging economy õ.

Programme Implementation Document (PID) for the Kenya National Domestic Biogas Programme 2009-2013 ;October 2009.

Rajeswaran, K. (1983). Simple Energy Technology Biogas Utilization in Tanzania. A Paper Presented at IRA Seminar held on 24 May 1983, UDSM. Service paper

No. 83/4.

Rutamu, I. (1999). Low Cost Bio-digesters for Zero Grazing Smallholder Dairy Farmers in Tanzania. *Livestock Research for Rural Development* (11) 2. [http://www.cipav.org.co.]

Stiglitz J. and Weiss. A. 1981. õCredit rationing in markets with imperfect informationö.*American Economic Review*, 71(3): 393ó410.

Storey, D.J. 2004."Racial and gender discrimination in the micro firms credit market?Evidence from Trinidad and Tobago." *Small Business Economics*, 23 ( 5), 401-22.

Ugbomeh GM, Achoja M, Ideh FO, Ofuoku AU. Determinants of loan repayment performance among women self help groups in Bayelsa State, Nigeria. Agriculturae Conspectus Scientificus. 2008;73(3):189-195.

United Nations. 2006. Building Inclusive Financial Sectors for Development.

Wanjohi, A.M. and Mugure, A. (2008). Factors affecting the growth of MSEs in rural areas of Kenya: A case of ICT firms in Kiserian Township, Kajiado District of Kenya.

Whincop, M. J. 2001. "*Bridging the entrepreneurial financing gap:Linking governance with regulatory policy."* Hants: Ashgate Publishing Company.

World Bank (2007), ─Finance for All:Policy and Pitfalls in Expanding Accessö, Policy Research Report, http//go World Bank.org

World Bank. 2008. *Finance for all? Policies and pitfalls in expanding access*. The International Bank for Reconstruction and Development / The World Bank

World Bank. 2008b. *Gender in Agriculture Sourcebook*. Washington DC.

World Economic Forum (2012), õunlocking financing for clean energy in Kenyaö Workshop, Nairobi-Kenya 15th May 2012.

Zeller M. Determinants of Credit Rationing: A study of Informal lenders and Formal Credit Groups in Madagascar. Food Consumption and Nutrition Division, International Food Policy Research Institute, Washington, D.C. U.S.A; 1994.

**Dear Respondent**,

I am a student at the University of Nairobi pursuing Master of business administration degree programme which requires submission of a Research project as part of the course. My topic of research is **factors influencing access to credit in the renewable energy: The case of biogas in Kenya** and I kindly request your cooperation to answer the questions below. Information collected through the questionnaire will be treated with high degree of confidentiality and will only be used for the purpose of the research.

**Instructions: Please tick (ç) where applicable or fill the spaces provided.**

## PART I: GENERAL DATA

1. **Nature of the business firm**

   a) Biogas construction only ☐

   b) Biogas construction and appliances ☐

   c) Biogas and Solar installation ☐

   d) Others (specify) í í í í í í í í í í í í í í í í í í í í

2. **Which of the following best describes the form of legal registration for your business?**
   a. Soleproprietorship ☐
   b. Partnership ☐
   c. Limited Company ☐

3. **Number of years the firm has been in existence**

   a) less than one year ☐

   b) 1 year to 3 years ☐

   c) 3 to 5 years ☐

   d) over 5 years ☐

4. **Highest level of education (Respondent)**

   a) Primary ☐
   b) Secondary ☐
   c) College ☐

d) University ☐
e) Other (specify)í í í í í í í í í í í

**5. Managerial position held in the business firm**
a) Middle level ☐
b) Senior Level ☐
c) Others (Specify)í í í í í í í í í í í í í í í í í í .

**PART II: FACTORS INFLUENCING ACESS TO CREDIT**

This Section is concerned with assessing the level of credit access by renewable energy (BCE) firms in the sector

6. **How much money have you invested in this business as capital?**
   a. Kes 0_____ kes 25,000 ☐
   b. Kes26,000 ókes 75,000 ☐
   c. Kes 76,000_kes 150,000 ☐
   d. Kes 151,000 and above ☐

7. **How many employees do you have?**
   a. 0 to 5employees ☐
   b. 6 to 10 employees ☐
   c. over 10 employees ☐

8. **Do you keep financial records for your business?**
   a. Yes ☐
   b. No ☐
   Which ones í í í í í í í í í í í í í ..

9. **a) To what extent are you comfortable with the risk of taking a bank loan?**
   i) Highly comfortable ☐
   ii) Moderately comfortable ☐
   iii) Not comfortable at all ☐

**b) Give reasons for your choice in (a) above with respect to Roman numbers.**

i) ……………………………………………………………………………………
……………………………………………………………………………………

ii)……………………………………………………………………………………
……………………………………………………………………………………

ii)……………………………………………………………………………………
……………………………………………………………………………………

10 .a) **How would you rate your access to information on the types of loan products and loan requirements?**

    i) High access          ☐

    ii) Moderately access    ☐

    iii) Low access        ☐

**b) Give reasons for your choice in (a) above according to Roman numbers.**

  **i)** ………………………………………………………………………………..

      ………………………………………………………………………………..

  **ii)**…………………………………………………………………………………

………………………………………………………………………………………

  **ii)**…………………………………………………………………………………

………………………………………………………………………………………

**11 a). Please mark (x) in the box which best describes your agreement or disagreement on each of the following statements.**

| Statement | Strongly disagree | Disagree | Neither agree not disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| | i | ii | iii | iv | v |
| The firm is always willing to approach a bank for financing | | | | | |
| My firm finds bank procedures for credit application to be simple an flexible | | | | | |
| My application for finance rarely gets rejected | | | | | |
| My firm is always awarded a bank loan which is adequate for my business requirements | | | | | |
| My firm has a good perception of banks as a good source of finance for my business venture | | | | | |

**b) What other sources of financing the business are available to you?**

i)……………………………………………………………………............

…………………………………………………………………………………

ii)………………………………………………………………………………..

………………………………………………………………………………

iii)………………………………………………………………………………..

…………………………………………………………………………………


**12. What other factors are hindering access to credit by your firm?**

..............................................................………………………………………………...........

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…………………………………………………………………………………………

…………………………………………………………………………………………


**Thank you**