

**THE EFFECTS OF RURAL ELECTRIFICATION ON THE GROWTH OF
SMALL AND MEDIUM ENTREPRISES IN MBITA TOWN**

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DECLARATION

This thesis is my original work and has not been submitted, presented in any other way to any academic institution for any academic award.

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DEDICATION

I dedicate this work to my father David Ragwanda, my mother Millicent Atieno, my brothers May Odhiambo and Samuel Owino, fiancée Irene Maina and great friend Martin Luther Okore for their overwhelming support. Above all, to the Almighty God for the gift of life.

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ABBREVIATIONS

| | |
|---------|--|
| GDP | Gross Domestic Product |
| GDC | Geothermal Development Company |
| ERC | Energy Regulation Commission |
| GOK | Government of Kenya |
| KETRACO | Kenya Electricity Transmission Company |
| MDGs | Millennium Development Goals |
| REA | Rural Electrification Authority |
| RELF | Rural Electrification Levy Fund |
| SMEs | Small and Medium Enterprises |

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ABSTRACT

This study sought to investigate the effect of national grid connection to the SMEs in Mbita town. Findings from various studies have indicated that many SMEs have embraced various strategies in their effort to improve productivity but the source of power to run modern machinery remains a challenge, resulting in well-formulated SMEs that fail at the effort of trying to expand or add value to their existing products and services. This study departed from the previous studies looking into several causes of rural underdevelopment but instead endeavoured to establish the impact that connection to the national grid had on the SMEs. To achieve the main objective, a descriptive survey of SMEs in Mbita town conducted from a population frame of 280 businesses operating in and around Mbita town. The target population was all the SMEs in town plus its environment. Statistical inferences using correlation and regression analysis indicated that a high reliability was achieved by the data collection instrument. Both tests of correlation using asymptotic significance indicated a strong relationship between connection to the national grid and value addition services in the town. The study recommends that the government in concert with electricity service providers to reduce installation costs as well as introduce subsidies to help more SMEs connect to the national grid. Awareness campaigns were also recommended on the advocacy to help more people connect to the national grid. This enabled a conclusion to be made that connection to the national grid was the motivation for value addition services as well as expansion of SMEs in Mbita town.

CHAPTER ONE

INTRODUCTION

1.1 Background

The world has seen significant progress in bringing electricity to remote rural areas. Central to this has been the role of governments, especially from developed nations, where efforts have been put to help bring electricity and improve living standards of people living in rural locales. The United States, for example, rolled out rural electrification programmes as early as 1930s as a way of improving growth rates of its suburbs and helping to create a more integrated national market (Malone & College, 2010). Similarly, it has and continues to be the intention of other governments around the world to increase the use of electricity in rural and peri-urban areas.

Governments have supported the development of rural electrification programmes on their own or through partnership with private electricity utility firms as a way of providing energy to rural areas. Despite the pivotal role that energy, particularly electricity plays in national economic development and providing services that in turn enhance social development, developing countries have not achieved much when compared to developed nations that flagged off rural electrification programmes in early years.

The cost and difficulty of providing electricity to rural areas in developing countries has left an estimated 1.6 billion people worldwide without the benefits of electricity (Barnes, 2012). Despite the substantial progress made towards the realization of sustainable development in the last decade, availability, accessibility and affordability of electricity for all people is still a major challenge around the world. Rural electrification has been recognized as a key ingredient in poverty reduction and the enhancement of social and economic development. In

the past decades, access to electricity in the rural and peri-urban areas has been a key challenge and this has in turn led to slow social and economic development (Sachs, 2005).

Insufficient attention to rural electrification in the Kenya by the government has contributed to the widening gap in electricity access between the rural population and urban population (Abdullah and Markandya, 2012). The trend has occurred in almost all the developing countries where the respective governments have struggled with the issue of low electrification rates in their rural areas. Electricity use in rural areas can be categorized as household electricity, electricity for agriculture and electricity for small and medium enterprises (Karekezi and Kithyoma, 2002). According to Tuntivate (2011), access to electric lighting in rural areas can increase the quantity and quality of agricultural products and the use of electricity powered tools and equipment such as refrigerators and freezers can make it possible for small and medium enterprises to produce more goods and services.

There is a general consensus that small and medium enterprises are crucial in the socio-economic development of a nation. This is attributed to the fact that small and medium enterprises contribute significantly to a country's gross domestic product (GDP) through the consolidation and mobilization of scarce resources to the needs and demands of fragmented domestic markets (Sachs, 2005; Kirubi, 2006). Similarly, the small and medium sector enterprise sector has been recognized as key enabler and contributor to employment, innovation and economic dynamism hence playing a crucial part in the growth of healthy economies. However, most small and medium enterprises in developing countries have encountered several challenges and inadequacies such as technological backwardness, low production efficiency and poor quality of products (World Bank, 2003). Compared to larger firms, small and medium enterprises suffer from various infrastructural challenges that hamper their growth and development.

However, the governments of most developing countries have recognized the positive contribution of small and medium enterprises to the economy and have since began to develop several policy initiatives geared towards the growth and expansion of small and medium enterprises and for the improvement of their technological capability and market competitiveness (Tuntivate, 2011). The promotion of small and medium enterprises is considered as a vital and pertinent strategy to sustainable development, alleviation of poverty, increasing employment and raising the standards of living (Mbatia, 2005). One of the policy measures that developing countries are currently pursuing in a bid to enhance growth and expansion of SMEs is electrification of rural areas. In the last decade, Kenya has embarked on a national policy aimed at building the capacities of SMEs through the rural electrification projects (Abdullah and Markandya, 2012).

Since 2003, the government of Kenya embarked on a robust rural electrification projection that is aimed at providing electricity to the rural population. The rural electrification project in Kenya was boosted through the creation of Rural Electrification Authority (REA) in 2006 that has devised a raft of strategies involving the use of grid and off-grid supply systems through diesel stations and other renewable energy sources such as wind, solar and biogas (Rural Electrification Authority, 2013). Recent statistics indicate that rural electrification in Kenya increased from 4 percent in 2003 to 12 percent in 2010. While estimates of the new connection rate in the last two years are difficult to confirm, it appears that the new rural electrification rate has surpassed 15 percent and this represents more than 12,904 public institutions in rural areas namely, trading centres, public secondary schools and health centres (Ondari, 2010).

The goals of Vision 2030, namely, poverty reduction, economic growth, job creation, education and health cannot be achieved without adequate, affordable and reliable electricity across the country. Electricity is one of the primary drivers of all sectors in Kenya including small and medium term enterprises and hence the need to provide electricity to every part of the country (Ng'ang'a, Onyango and Kerre, 2009). The government of Kenya has re-affirmed its commitment to promoting small and medium enterprises in the country due to their significant contribution to the national GDP and employment. The government commitment to enhancing the growth of SMEs in Kenya include the strengthening of financial and non-financial markets to meet the demand of SMEs, strengthening institutional support for employable skills and business and reducing critical investment constrains on SMEs. This is evidenced by the major strides that the government has taken to invest in electricity, water and roads in various parts of the country.

Consequently, the government of Kenya has made deliberate efforts to decentralize most of its development project in the recent years. Most of these development projects are aimed at meeting the Millennium Development Goals (MDGs) and Vision 2030. In order to advance development of projects at lower levels, the government has instituted various devolved structures and funding regimes such as Constituency Development Fund (CDF), The Local Authority Transfer Fund (LATF), the Road Maintenance Fuel Levy Fund, Rural Electrification Fund, the Water Service Trust Fund, and the Poverty Eradication Fund among others. Through the Rural Electrification Levy Fund, trading centres and smaller towns distributed across Kenya have received electricity. Mbita is one of the towns in Kenya that has benefited from the devolved fund from government through the Rural Electrification Levy Fund.

According to latest data from REA, Mbita received a total of 17.09 million shillings in the previous financial year (13.39 million shillings, equal budget allocation and 3.69 million shillings, pro-poor budget allocation) for electricity connectivity in all areas within Mbita constituency in order to achieve long term sustainability and socio-economic development (Rural Electrification Authority, 2013). As a result of funding from the government through REA and renewed priority to rural electrification and provision of electricity services, most areas in Mbita constituency including Mbita town have benefited. Rural electrification has gone well in Mbita as evidenced by the usage of power in homes, schools, business enterprises and government institutions. Currently, electricity is supplied in Mbita through off-grid (private entities) and grid sources (government /public).

1.2 Statement of the Problem

In spite of the importance, contributions and potential of micro-enterprises in the Kenyan economy, there are several factors that impact on their growth. One of the factors, is connectivity to grid electricity services, because without available and reliable electricity services there is no possibility of utilizing modern electrical appliances, such as fridges, gas cookers, welding kits, and machinery which may pave the way for small and cottage industries. There is also no convenient lighting in businesses such as bars and retail shops, which reduces the number of customers.

Rural areas continue to be the home to majority of the population in Kenya and also the hub of small and medium enterprises. The lack of electricity supply affects close to ninety (90) percent of the population (Abdullah and Markandya, 2012). Despite, the impressive gains the government has made in providing electricity to populations living in rural areas, Mbita has not yet achieved the universal electricity coverage and even in areas where the rural

electrification program have been rolled out fully, a section of the population have not shifted. Consequently, reliable data on the impacts of rural electrification program on businesses and trends on the productive use of electricity in Mbita are not available. The government of Kenya together with other private partners and donors has played a crucial role in the provision of electricity to rural areas in a bid to spur human, social and economic development in the country. Rural electrification has been identified as a key stimulant of small and medium enterprises in rural areas. The government of Kenya through its energy utility agency, the Rural Electrification Authority (REA) committed itself to providing electricity to all trading and health centres in rural Kenya by June 2013 (Rural Electrification Authority, 2013). Rural electrification may create opportunities for small and medium business activities in rural areas to grow and flourish.

It is projected that well planned, carefully targeted and effectively implemented rural electrification programs have the potential of opening up opportunities for low income rural people to increase their income and thereby accelerating rural development (World Bank, 2008). However, previous do not seem to focus on the impacts of rural electrification on the growth of small and medium enterprises in Kenya. Not all enterprises are able to use electricity services for income generation activities. Consequently lacking reliable data and information about significant positive impact of electricity services on micro-enterprises may limit the room for entrepreneurs to choose this type of modern energy for productive activities. Moreover, lack of data and information on the linkages between electricity services and SME development may have effects on national policy strategies to combat poverty as most of the rural poor depend on small and micro-enterprises for income generation (Sawe, 2004). This study therefore seeks to assess the effects of rural electrification on the growth and expansion of small and medium enterprises in Mbita town. To a large extent, empirical

evidence on the impacts of rural electrification on small and medium enterprises is lacking yet there is a compelling factor that electricity service has both direct and indirect effects on small and medium enterprise development.

1.3 Objectives

The overarching objective of the study is to assess the effects of rural electrification on the growth of SMEs in Mbita Town.

1.3.1 Specific objectives of the study

1. To find out the multiplication of SMEs due to rural electrification program in Mbita town.
2. To establish the new services by SMEs as a result of value addition influenced by electricity uptake
3. To determine how rural electrification has enhanced efficiency in SMEs operations

1.4 Research Questions

1. To what extent has the rural electrification program contributed to the increase of small and medium enterprises in Mbita town?
2. What new services have resulted from value addition by SMEs due to rural electrification ?
3. What are the effects of rural electrification on the operations of SMEs?

1.5 Scope and Limitations of the Study

Rural electrification program has been undertaken in various rural towns and trading centres across the country. The study focused on the effects of rural electrification programme on small and medium enterprises that were connected to grid-based electricity and other SMEs that relied on off-grid electricity power supply in Mbita Town. The effects under consideration in the study only included new services as a result of value addition, efficiency in operations and numerical multiplication of SMEs.

However, the study did not include effects of rural electrification on income. It was also confined to small and medium enterprises located in Mbita town that employed less than ten workers hence the study did not consider enterprises that had ten employees and above due to financial and time constraints.

1.6 Justification of the Study

It is evident that the government has played a crucial role in the provision of electricity in most rural parts of Kenya. Consequently, the private sector has also contributed immensely in the electrification of rural areas. The inclusion of the private sector in the study is premised on the fact that electricity service and provision has been monopolized by state owned utilities and to an extent, they have failed to meet the needs of most rural populations. This has therefore created opportunities for the private sector and other donors to work in the rural electrification field as independent power producers and service providers. The government through its electricity sub sector utilities such as the Kenya Electricity Generating Company (KenGen), Kenya Power, Kenya Electricity Transmission Company (KETRACO), Rural Electrification Authority (REA), Energy Regulation Commission (ERC) and Geothermal Development Company (GDC) has played vital role in the provision of electricity in all parts

of Kenya. In particular, REA continue to operate various programmes aimed at fostering rural electrification in the country.

This study therefore seeks to assess the effects of such electricity provision initiatives by the government and the private sector on the growth and expansion of small and medium enterprises. The study is further justified that small and medium enterprises located in rural settings including Mbita have and continue to use electricity in their rural settings to generate income. As mentioned earlier, Mbita is one of the areas in Kenya that has benefited from the rural electrification funding program from the government. The study is hence timely and important to assess whether residents of Mbita are using the electricity productively, more so with regards to small and medium enterprises. A detailed evaluation of the impacts of rural electrification program in Mbita will therefore play integral role in the provision of reliable data and trends in small and medium enterprise electricity use. Since Mbita is a beneficiary of the rural electrification program, the study will assess the impact that the scheme for rural electrification has had on small and medium business development and income generating activities.

The outcome of this study can be used by policy makers in further formulation of rural electrification programs aimed at expanding the business prospects of rural communities through SMEs growth. This study can influence and encourage rural people and promote the productive use of electricity in generation of income through small and medium enterprises. Finally, there exist compelling evidence linking rural electrification to growth and expansion of SMEs. This study can therefore shed more light on the productive role of rural electrification and thereafter providing the foundation for future policy making during rural planning and development initiatives

1.7 Definition of Significant Terms

Small and Medium Enterprises (SME) – In this study, the term Small and Medium Enterprise will refer to small business employing less than ten people. They may or may not have formal structures and books of accounts.

Grid power supply – power supply sourced/ connected from electricity grid

Off-grid power supply – power supply sourced from other sources that are connected to the electricity grid.

Population– This will be a complete list of all SMEs operating within Mbita town

SME owners – the registered proprietors of SMEs within Mbita town

Sample– This refers to a representative portion of SMEs from the population

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

According to recent research studies, more than 1.6 billion people in the world are without electricity and majority of these people are in rural areas of the developing world, where the pace of electrification remains slow (Barnes, 2012). Rural electrification forms an important part of the infrastructure of a country, although the infrastructural economic plans for developing countries have not given it more priority. In various developed and developing countries, rural electrification has been successful in stimulating development. Electricity is one of the primary inputs for economic and social development since its provision is crucial for improving living standards, supporting development and fostering social activities (United Nations, 2005).

2.2 Literature Review

2.2.1 Electricity, Economic Growth and Poverty Reduction

The need for increased investments in rural infrastructure and other key public service that are necessary for achieving growth and reducing poverty in rural areas has been underscored by various stakeholders. Singh and Ali (2001) have reiterated that government expenditure on rural telecommuncations, electricity and roads can have substantial impact on rural poverty reduction. It is estimated that more than two billion people live today in energy poverty, without the benefits of electricity. Rural electrification has gained prominence in recent years with the heightened interest in infrastructure in relation to the core part it can play in improving welfare and reducing poverty (Fishbein, 2003; Singh and Ali, 2001; WorldBank, 2008). In the last two decades, poverty reduction has been a major policy focus in the

development circles. Consequently, the international development agencies have officially recognized poverty as a core issue and this is evidenced by putting poverty as one of the millennium development goals. This is a sure recognition that infrastructure has a close relationship to the level or stage of development of a particular country. The role of modern energy in poverty reduction has been documented by various studies. Ondari (2010) asserts that no country in the developing world has ever achieved 8 – 10 percent annual growth that is required to reduce poverty without modern energy. The highest poverty levels in rural areas of Kenya highlight the importance of investing in basic infrastructure such as electricity, as part of the national development agenda (Otieno and Awange, 2006).

Electricity as consumption and an intermediate good has been linked to income growth and therefore a causal relationship exists between income and infrastructure (Cook, 2012). Rural electrification promises a brighter future for many rural communities and in the long term, the benefits of providing electricity to poor households can be high. Research study outcomes have given evidence indicating the positive relationship between electricity consumption and gross domestic production and this correlation has been reflected by the relationship existing between the electrification rate in a country and the percent of households who are living above the poverty line of two dollars per day (Kirubi, 2006; Tuntivate, 2011).

Whereas demand for energy in urban areas is high due to large commercial enterprises, the energy demands of commercial sector, small industry and communities in the rural areas follow similar evolutions to those of households as economic activity increases (World Bank, 1996). Electricity is an important condition for the development of rural businesses and that under the right circumstances it can result in significant economic growth. As evidenced by the existence of numerous research studies, the social and economic benefits of electrification have been researched over the last two decades. Barnes (2012) established in his review that

in households with electricity, people have enhanced chances of undertaking activities that require higher levels of lighting as opposed to households with no electricity. Consequently a research study conducted by Singh (2009) found that businesses in rural areas of developing countries with access to electricity such as home businesses, small commercial shops, grain mills, saw mills, coffee and tea processing, brick kilns and other small scale enterprises can benefit from rural electrification programmes.

In his book “*Rural Electrification and Rural Development*” Cook (2012) points out that the effect of rural electrification on small businesses should be determined by the nature of the local community, the complimentary programs and the ability of rural entrepreneurs. He further emphasizes that although electricity is an important and essential input that can spur and help in the development of small industries, the other complementary conditions such as access to good rural markets and adequate credit should also be considered. The sentiments are further buttressed by (Otieno and Awange, 2006) who opines that since the above complimentary conditions are not uniformly distributed in all rural areas, the anticipated growth of enterprises in rural areas provided with electricity can be slow.

Rural areas without electricity have worse record of business development when compared to rural areas provided with electricity. A study conducted by World Bank in Philippines revealed that small home businesses were more active in areas with electricity (World Bank, 2008).

Rural electrification has the potential of improving the quality of life of rural life in various ways. The energy demand is rapidly growing throughout the developing world where there is increased need for energy to support various services like domestic and small scale services (Abdullah and Markandyab, 2012; Barnes, 2012). In order to enhance electricity access to rural areas, several of the developing countries have undertaken a number of policy and

institutional initiatives. However, Rural electrification programs in developing countries have faced major obstacles that are associated with low population densities in rural areas that has resulted in high capital and operating costs for electricity companies, low electricity consumption as a result of poor consumers (Singh and Ali, 2001), interferences on the orderly planning and running of the electricity by politicians always insisting on favoring constituents and interference by local communities and individual farmers in providing way for the construction and maintenance of electricity lines (Barnes, 2012). Consequently, the quality of electricity services proposed for rural areas in developing countries often fall short of those provided to urban areas. This is evidence in the form and number of brownouts and blackouts, power interruption and fluctuating power quality (World Bank, 2003).

Although developing countries are still lagging far behind in relation to the provision of electricity to its rural population, several of the emerging economies have successfully provided electricity to their rural populations. For instance, over 90 percent of rural people have access to electricity supply while in Costa Rica, more than 95 percent of the rural population receives electricity supply from cooperative and government energy agencies (United Nations, 2005). Similarly, more than 95 percent of the rural households in Tunisia have access to electricity supply (World Bank, 2008).

In Kenya, the government has fostered rural electrification in the country using grid and off-grid supply through diesel stations or renewable energy sources such as the solar, wind and biogas. The Rural Electrification Authority (REA) that was established in 2003 has been on the fore front in the provision of the electricity to rural populations (Abdullah and Markandyab, 2012). The government continues to connect electricity to most public institutions in the rural areas such as trading centers, public secondary schools and health centers due to their significant role in achieving rapid growth (Ondari, 2010). Contrary to earlier speculation that the future of rural electrification in Kenya is bleak (Otieno and

Awange, 2006), it can be clearly stated that it has greater prospects given the increased commitment from the government to expand the process.

2.2.2 Small and Medium Enterprises and Infrastructure Nexus

There is a large and growing body of literature on the role of micro, small and medium enterprises in the growth of per capita income for various national economies. The strategic importance of small and medium enterprises (SMEs) in national economic development is widely recognized in both the developing and developed countries (Moha, Abdullah and Bakar, 2000). Recent research has also suggested that small and medium enterprises play an integral role in promoting economic growth in developing countries.

In all countries in the Asia-Pacific region, SMEs occupy a prominent position in their development agenda and this can be evidenced by substantial resources and efforts from the public sector that have been directed at the promotion of SMEs potential and growth (Moha, Abdullah and Bakar, 2000). The growth of micro, small and medium enterprises is positively associated with the existence of basic infrastructure such as roads, modern energy and information and communication technology. In rural areas, lack of adequate infrastructure such as electricity, transport, communication and availability of other complementary services such as inputs, access to markets and credit support agencies is a major impediment to the development of enterprises (Singh, 2009; Fishbein, 2003). Due to the significant role that SMEs play in enhancing the national economic development in various developing countries, national infrastructural policies continue to be formulated and developed in order to expand their coverage and overall contribution.

2.3 Theoretical Framework

2.3.1 Individual Agency Theory

Layder (2010) in his book ‘understanding social theory’ elaborates on Anthony Giddens understanding of what is individual agency. This paper adopts such understanding .He writes ‘all human action ... implies power – the capability of producing an effect ... it is the ability to make a difference in and on the social world, of transforming the circumstances in which one finds himself , that is perhaps the essential feature of human action..’ Furthermore Armatya Sen in his book ‘*Development as freedom*’ again reiterates the importance and pivotal role of human action. He asserts that individual agency is ultimately, central to addressing these {challenges of mankind (Sen,1999).

Availability of electricity in rural areas can increase the productivity and profitability of existing micro-enterprises, play significant role in establishing new microenterprises and also reducing the barrier to the creation of new micro-enterprises. However, this can only happen if rural entrepreneurs unearth the opportunities that rural electrification brings forth since rural electrification strengthened many small and medium sized enterprises that are established in rural areas.

C. Wright Mills in his book ‘*the sociological imagination*’ uses what has come to be widely quoted analogy to explain this theory perhaps by default. He gives a hypothetical society of a given population, say 100, and then goes ahead to mention that in the entire population, only two people are unemployed. The reason for the unemployment, as he surmise, becomes the temperaments of the individuals in question (Mills, 1959). Temperaments here mean the skills, capabilities or mental dispositions etc. the said individuals possess. The gist of the matter being is that their lack of employment has nothing to do with the society but them. He goes ahead to question that if perhaps given the said population, 90 people are unemployed, where then is the problem? Perhaps as he surmises again the problem this time round is in the

societal structures. What opportunities are available and to whom these opportunities are available?

To derive C Wright Mills assertions within the context of this paper is to ask whether in the presence of Rural electrification in Mbita and Othaya yields the same effect/impact with similar population in terms of SME's output. To explain this further, is by comparing how people in Mbita in this case the entrepreneurs develop and implement new ideas to utilize the rural electrification opportunity in comparison with other areas with the same opportunity. That notwithstanding, SME outputs within Mbita area can still not have desired effects among everyone. Not everyone harnesses the opportunities available.

2.3.2 Anthony Giddens' Structuration Theory

Giddens in his book *'New Rules of Sociological Method'* (1976) outlines the Structuration theory. The gist of the theory is an affirmation of both the roles of structures of society and individual agency in bringing about change. He contends, and rightly so, in the opinion of this paper, that structures alone are not sufficient to bring about the desired change (Giddens, 1976). See above illustrations of the spectacular challenges faced by the World Bank SAP interventions and how many rural areas in Kenya have had access to rural electrification but have not had substantial Effect on the SMEs therein.

He sees desired change as a product of the duality of structures and actions i.e. both contribute to the desired change. In the context of this paper, SMEs offers an opportunity co relational to rural electrification program in Mbita and are only positively realized if the people of Mbita make a willful decision to harness such an opportunity. Willful decision to harness an opportunity cannot exist without the presence of the opportunity that the structures present.

2.3.3 Development as Freedom Theory by Armatya Sen

The question that follows such exposition of theories as presented above is why then does development not take the trajectories as intended by policy makers given the understanding of the theory and practice of Structuration? Armatya Sen argues that individual agency is not real if the freedom is absent or in other words constrained freedom cannot realize desired development trajectories. In his book 'Development as Freedom' (1999) he outlines what he sees to be freedoms, which entail rights such as education, life and public participation.

This paper identifies with this theory in realization that no matter what effort is exerted to harness opportunities presented by structures, if the said effort is not informative, free or in an environment that is secure, then that effort is wasted and cannot yield great results. What baffles at this point is what Armatya's conceptualization of development is, given the growth levels witnessed in countries that are deemed to be constraining freedoms such as China and more near and Rwanda. The question is, are Mbita people free to use the opportunities that come with the rural electrification? Have all the enabling components such as political goodwill positive enough and in support of the developmental initiatives influenced by rural electrification programme.

2.3.4 Empirical Literature

A study carried out by Leegwater and Shaw (2008) found out that developing countries with larger share of small and medium enterprises have higher economic growth when compared to their counterparts. The recognition of the integral role that SMEs play in national economic development is as a result of their perceived importance in enhancing forward and backward linkages in economically diverse sectors of the economy (Nummela, 2010; Ng'ang'a, Onyango and Kerre, 2009). According to Vandenberg (2009) SMEs can enhance economic development in developing countries by employing more workers per unit of

capital when compared to large enterprises and can contribute towards the achievement of more equal income distribution in society. Rural areas without electricity have worse record of business development when compared to rural areas provided with electricity.

A study conducted by the World Bank in the Philippines revealed that small home businesses were more active in areas with electricity (World Bank, 2008). Evidence from a number of national-level studies shows that rural electrification provides similar results. Rural electrification has the potential of improving the quality of life of rural life in various ways. The energy demand is rapidly growing throughout the developing world where there is increased need for energy to support various services like domestic and small scale services (Abdullah and Markandyab, 2012; Barnes, 2012). In order to enhance electricity access to rural areas, several of the developing countries have undertaken a number of policy and institutional initiatives. However, Rural electrification programs in developing countries have faced major obstacles that are associated with low population densities in rural areas that have resulted in high capital and operating costs for electricity companies; low electricity consumption as a result of poor consumers (Singh and Ali, 2001); interferences on the orderly planning and running of the electricity supply by politicians always insisting on favoring constituents; and interference by local communities and individual farmers in providing space for the construction and maintenance of electricity lines (Barnes, 2012).

Similarly, a survey conducted in all countries in the Asia-pacific region, SMEs occupies a prominent position in their development agenda and this can be evidenced by substantial resources and efforts from the public sector that have been directed at the promotion of SME potential and growth. The growth of micro, small and medium enterprises is positively associated with the existence of basic infrastructure such as roads, modern energy and

information and communication technology (Moha, et al (2000). In rural areas, lack of adequate infrastructure such as electricity, transport, communication and unavailability of other complementary services such as inputs, access to markets and credit support agencies are major impediments to the development of enterprises (Singh, 2009). Due to the significant role that SMEs play in enhancing national economic development in various developing countries, national infrastructural policies continue to be formulated and developed in order to expand their coverage and overall contribution. Various governments ,especially from developing countries are increasingly carrying out programs that are focused on helping micro, small and medium enterprises that make up the bulk of business in rural areas and where most of the poor live, to develop more profitable and efficient enterprises (World Bank,2008).

A study focusing on the effects of rural electrification in Abuja state in Nigeria, conducted by Abegio and Okefe (2009) revealed the growth of micro, small and medium enterprises is positively associated with the existence of basic infrastructure such as roads, modern energy and information and communication technology. Infrastructure affects growth through a number of channels both direct and indirect. The most evident direct link is often through the productivity effect, where an increase in the quantity of infrastructure is expected to raise the productivity of other factors. On the other hand, the slowness to extend electricity to rural areas in a wide range of developing countries either through grid extension and off-grid or stand-alone grid approaches have resulted in slow or zero growth of business ventures.

Consequently a study conducted by Singh (2009) found out that businesses in rural areas of developing countries with access to electricity such as home businesses, small commercial shops, grain mills, saw mills, coffee and tea processing, brick kilns and other small scale

enterprises can benefit from rural electrification programmes. Rural areas without electricity have worse record of business development when compared to rural areas provided with electricity.

Recent research has also suggested that small and medium enterprises play an integral role in promoting economic growth in developing countries. A study carried out by Leegwater & Shaw (2008) found out that developing countries with larger share of small and medium enterprises have higher economic growth when compared to their counterparts. With lesser share of SME's recognition of the integral role that SMEs play in national economic development is as a result of their perceived importance in enhancing forward and backward linkages in economically diverse sectors of the economy (Ng'ang'a, and, Onyango 2009; Kerre, Nummela, 2010). According to (Vandenberg, 2009) SMEs can enhance economic development in developing countries by employing more workers per unit of capital when compared to large enterprises and can contribute towards the achievement of more equal income distribution in society.

2.4 Conceptual Framework

Conceptual framework (Reichel and Ramey, 1987, Mugenda and Mugenda, 2003) is defined as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation. It is a hypothesized model identifying the module under study and the relationship between the dependent and independent variables. Such a framework is intended as a starting point of reflection about the research and its context. When the conceptual frame work is clearly articulated, it has potential usefulness as a tool to support research and therefore to assist the researcher to make meaning of subsequent findings. The above conceptual framework will be used in this study, the independent variables are rural electrification program, uptake of electricity services and challenges of

utilizing electricity productively. Growth and expansion of SMEs is the dependent variable in this study, how does growth and expansion of SMEs vary based on the independent variables.

2.5.1 Growth of SMEs

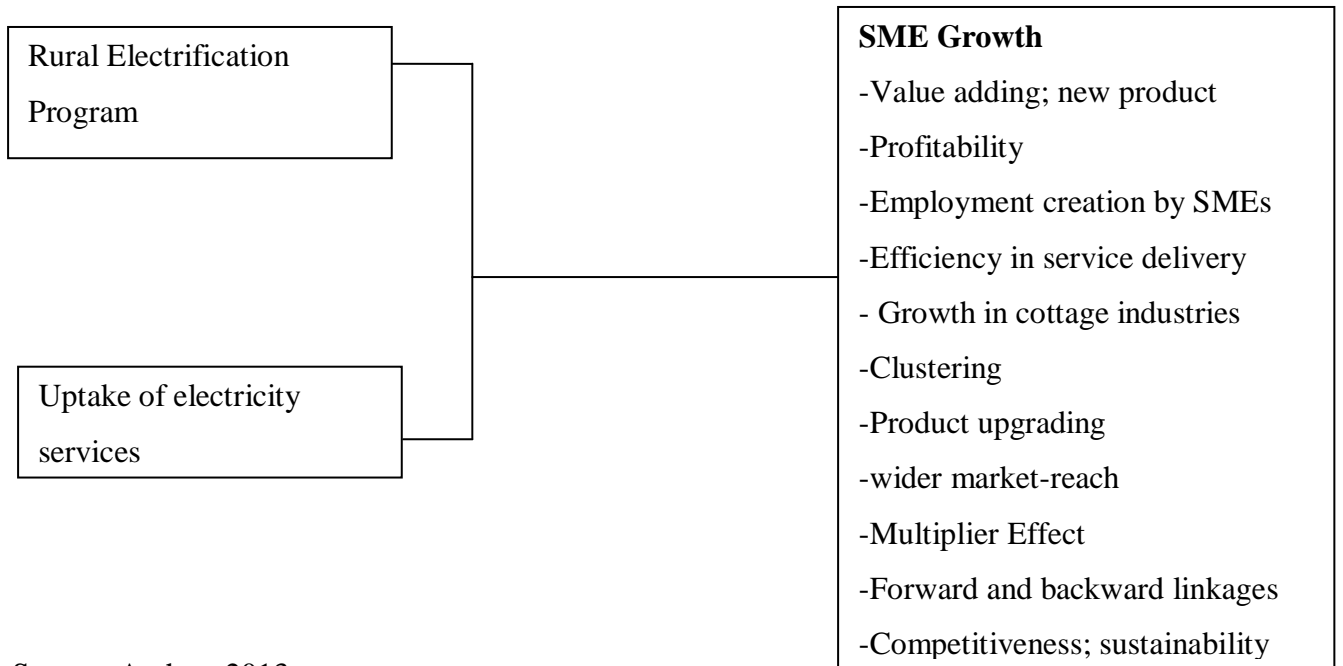
It is a general consensus that SMEs have an important role in contributing to socio-economic development and poverty reduction. Growth can also be viewed in relation to employment, since small and medium enterprises, constitute a major source of employment and generate significant domestic and export earnings. Since SMEs have great potential for job creation, their growth gradient can also be based on the employment opportunities that such enterprises create. Rural electrification access can improve the quality of life, rural productivity and profitability of SMEs.

Uptake in electricity has the potential of creating new opportunities and a more level playing for SMEs owners to enhance and expand their business. Consequently, concerted efforts to support SMEs through access to electricity service can play integral role in terms of business growth as a result of network and cluster development. Furthermore, as a result of the clustering of SMEs in township and populations centres, the urgent needs of such areas can be met and addressed effectively. Growth of SMEs can also be based on the extent of forward and backward linkages that are linked to such enterprises. On the other hand, uptake of electricity can spur growth of SMEs in terms competitiveness and further accelerating the shifts towards more sophisticated and value added industrial structure through technology development and, product upgrading quality improvement. Moreover, SMEs can enhance their market competitiveness at home and abroad through electricity access and further opening new avenues and opportunities for growth.

The diagram below demonstrates how rural electrification programme and uptake of electricity services is affecting SME growth in Mbita town, this is summarised in a conceptual framework.

Independent Variables

Dependent Variable



Source: Author, 2013

Figure 2.1: Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methods that were used in the study. It explains the research design, the study population, sampling method and procedures, data collection procedures and instruments, data analysis, reporting and ethical issues.

3.2 Site Description

Mbita district has an estimated area of 211 square kilometers. Mbita is divided into into four administrative divisions, namely, Mbita town/point, Rusinga Island, Mfangano and Lambwe. The settlement pattern in the district is determined mainly by the agricultural potential and closeness to the lake. The study focused on Mbita point town which is the designated headquarter of the district and by default the major commercial hub of the district. Mbita point town has various entrepreneurial opportunities in the service industry such as banking, health facilities, government services and institutions, small scale trade and other social amenities.

Mbita town has seen significant infrastructural growth in the last few years. Central to this have been the improvement of the road network, mainly Homa-Bay-Mbita town and access to electrification. The town and its environs is currently connected to the national grid and this has led to the development of small-scale industries and establishment of welding units, fish cooling plants, mechanical works, information technology and other business ventures (GOK, 2010).

During the study all the 280 small and medium enterprises that are located within Mbita town were sampled.

3.3 Research Design

This research problem was studied through the use of a descriptive research design. According to Cooper and Schindler (2003) a descriptive study is concerned with finding out the what, where and how of a phenomenon. This study therefore enabled the generalizing of the findings from all SMEs and the effect it had on their growth. The main focus of this study was quantitative in nature. However some qualitative approach was used in order to gain a better understanding and possibly enable a better and more insightful interpretation of the results from the quantitative study.

3.3.1 Type of Data

This study sought for information relating to the present and historical performance status of the SMEs in Mbita town. Specifically, the research aimed to establish the employment history, the history of product value addition by the SMEs, history of efficiency of service delivery, profit history, product upgrading history, forward and backward linkages by the SMEs, growth in cottage industry, and market reach by the SMEs

3.3.2 Data Collection Instruments

Both Primary and Secondary data was collected. The data collection instrument used was a questionnaire. The items in the questionnaire were structured (closed ended) and unstructured (open ended) developed by the researcher. The structured questions measured the subjective responses to clarify the objective responses and at the same time, enhanced formulation of recommendations of the study.

3.3.3 Data Collection Methods

The data was collected through administration of questionnaires to the respondents by researcher and the research assistants. The research assistants had prior training on the data collection exercise by the researcher. Alongside the questionnaire, direct observation was employed during data collection in this study.

3.4 Sampling

In this study, the population entailed a survey of all small and medium enterprises operated within Mbita town. According to Town Council of Mbita Point enterprise database 2012, Mbita town has a total of 280 small and medium enterprises (Town Council of Mbita Town, 2012). The researcher sought to do a survey on all the 280 SMEs in the town.

3.5. Units of Analysis and Observation

According to Mugenda and Mugenda (2003) units of analysis are units that are designed for purposes of aggregating their characteristics in order to describe some larger group or abstract phenomenon. Nachmias and Nachmias (1996) describe the units of analysis as the most elementary part of the phenomenon to be studied. To Singleton et.al (1988) they are “what or whom to be analyzed”. In this study, the unit of analysis was the small and medium enterprises while the unit of observation was owner of SME within Mbita constituency.

3.6 Data Analysis and Presentation

According to Miles and Huberman (1994) data analysis is an iterative process. Data analysis consists of three activities: Data reduction, Data display, and Conclusion drawing/verification”. In data reduction, this process is applied to qualitative data and focus remains on selection, simplification and transformation of data. In this continuous process the data is organized throughout the research to draw and finalize a conclusion (Miles and

Huberman, 1994). In this research, the data was reduced from critical elements in implementation of rural electrification.

In data display the data was displayed in an organized form and the data had to be put into an order to easily draw the conclusion. Tables and graphs were used to indicate distinct frequencies of various factors. Also applied were means, standard deviation and tests of chi-square to ascertain the relationship between the dependent and independent variables.

3.7 Ethical Issues

Confidentiality: The participants were guaranteed that the identifying information would not be made available to anyone who was not involved in the study and it would remain confidential for the purposes it was intended for.

Permission: The researcher sought permission to carry out the research from the Mbita County Council.

Informed consent: The prospective research participants were fully informed about the procedures involved in the research and were kindly asked to give their consent to participate.

Anonymity: The participants remained anonymous throughout the study and even to the researchers themselves to guarantee privacy.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

The main objective of the study was to assess the effects of rural electrification on the growth of SMEs in Mbita Town. The study focused on small and medium enterprises located in Mbita town that are connected to grid-based electricity and other SMEs that rely on off-grid electricity power supply. The chapter is arranged in thematic form starting with the demographic characteristics followed by individual variables and finally the interpretations of the findings.

4.2 Reliability and Validity of Instrument of Study

Prior to embarking on field work, the instrument for data capture was tested for two major features. First, it was tested to determine how valid the responses it would produce were. This was done through face validity in which departmental lecturers and experts in the field of statistics used face validity to determine its suitability. According to Nachmias and Nachmias (2006), face validity is valuable for field studies that involve enumeration of discrete items. The instrument was thus found to be valid for field use.

For reliability, the study relied on Cronbach's alpha coefficient test. Coopers and Schindler (2009) recommended the test and supported Kothari's threshold of 0.70 as the most appropriate alpha coefficient to use as a reliable instrument. A mock study with results in table 4.1 indicate that all the three variables of the study had reliable items on the study questionnaire and hence the instrument was found fit for field study.

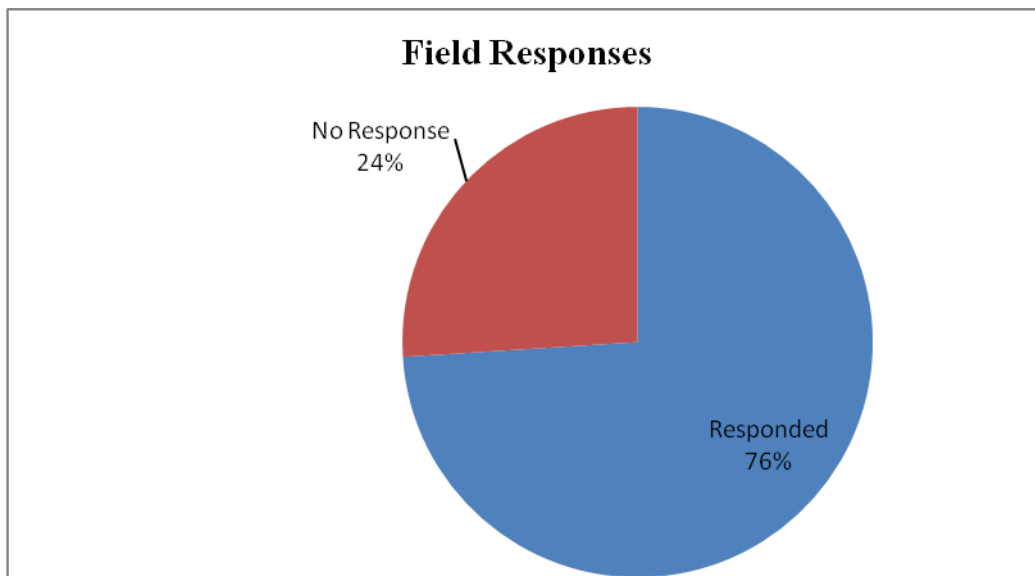
Table 4.1: Reliability of Study Instrument

| Variable Section of Questionnaire | Number of items | Cronbach's alpha coefficient |
|--|------------------------|-------------------------------------|
| Extent of electrification | 5 | 0.814 |
| Products resultant of electrification | 1 | 0.792 |
| Effects of powering rural economy | 8 | 0.883 |

4.3 Response Rate

The study, targeted 280 businesses in Mbita town. Observed results in figure 4.2 showed that a response rate of 76% was achieved with 24% of the targeted sample not responding. The response rate was quite high as statistical scholars including Nachmias and Nachmias (2006) as well as Kothari (2004) have recommended a response rate of at least 51% in an open study. Singh and Ali (2001) achieved a response rate of 63.2%, Sawe (2004) had 57.9%, Kirubi (2006) achieved 70% while Ondari (2010) managed to get a response rate of 67%. All the scholars carried out studies concerning rural electrification in different locations.

Figure 4.1 : Field response rate from Mbita town



4.4 Respondents' Demographics

The study focused on SME business persons in the town and its environments. Three factors were enumerated to give a concrete reference to all data as recommended by statistics scholars including Kothari (2004) and Mugenda and Mugenda (2003). These were age, gender and academic qualifications. From results in table 4.2, there was a majority (57.9%) males and minority (42.1%) females. In terms of age, the majority of respondents (69.2%) were in the 18-35 age group, while 29.9% were aged over 35 years and only one case of below 18 year (0.9%) was noted. The characteristics although not interest of the study gave meaning to the field of study and indicated that the respondents were people capable of reading and writing as well as participating in the study as mature people. Nachmias and Nachmias (2006) have indicated that respondents of a study must be described in clearly regardless of whether the description is significant to the main objective of the study. This gives credence to the data as it shows the data was collected from respondents whom we can physically relate to or figure out. The disparities in gender, age and academic qualifications

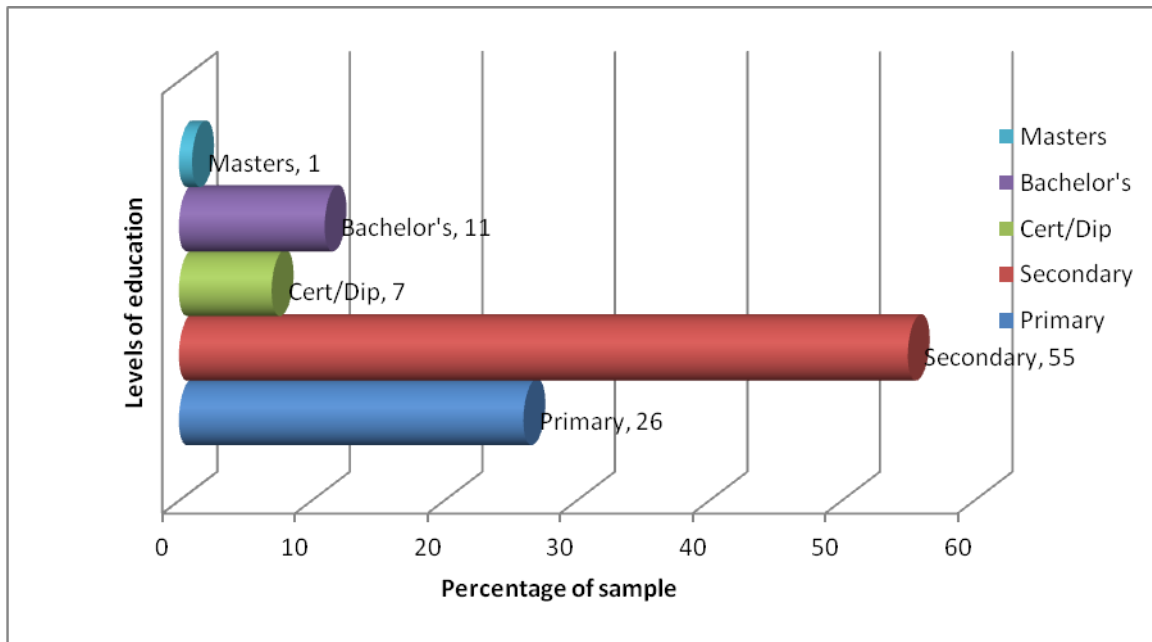
were however not a major concern for the study and were used here to corroborate what statisticians have recommended by giving tangible evidence of the respondents in any given study.

Table 4.2: Respondents Characteristics

| Age group | | Gender of respondent | | Total |
|-----------|------------|----------------------|--------|--------|
| | | Male | Female | |
| <18 | Count | 2 | 0 | 2 |
| | % of Total | .9% | .0% | .9% |
| 18-35 | Count | 77 | 71 | 148 |
| | % of Total | 36.0% | 33.2% | 69.2% |
| >35 | Count | 45 | 19 | 64 |
| | % of Total | 21.0% | 8.9% | 29.9% |
| Total | Count | 124 | 90 | 214 |
| | % of Total | 57.9% | 42.1% | 100.0% |

For levels of education, the target population was as good as the standards required in Kenya to be entrepreneurial. The results in figure 4.2 indicate that respondents had a 54.7% attainment of secondary school education followed by 26.2% primary school leavers. The post-school levels had 7.0% in certificate and diploma attainment, 11.2% at Bachelor's degree level and a paltry 0.9% had attained Master's degree level of education. Cumulatively, a high majority 99% had attained the universal primary education which is a great achievement as sought by Kenya's blue print development strategy, Vision 2030 (GoK, 2007).

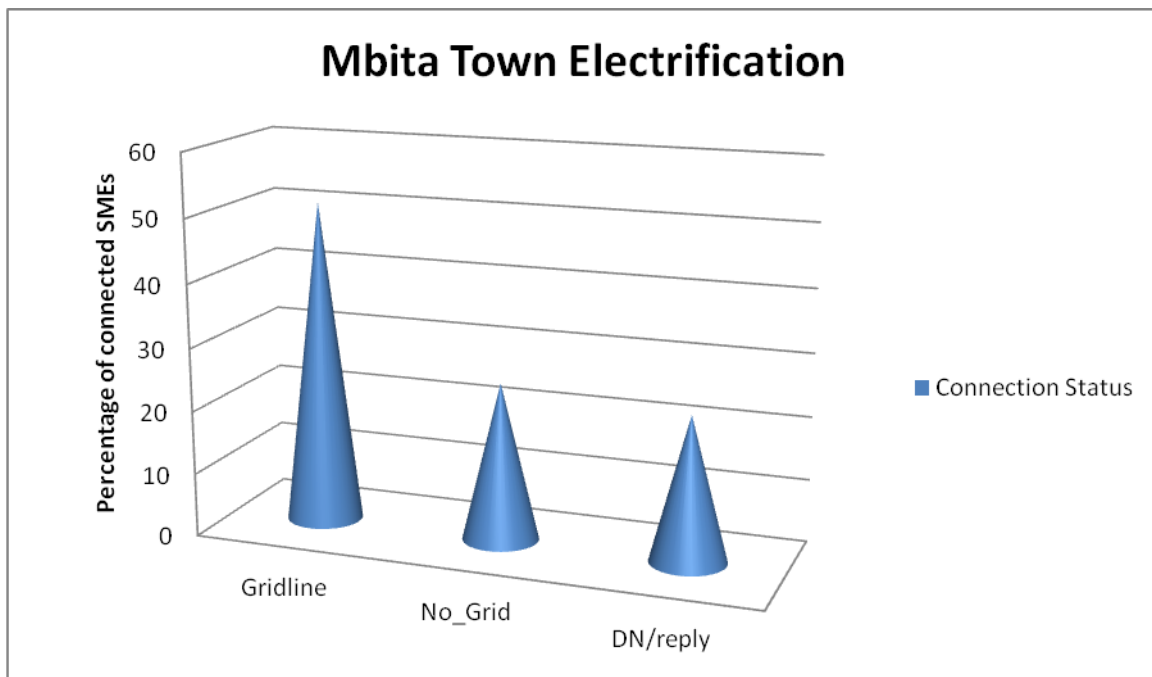
Figure 4.2: Levels of Education of Respondents



4.5 Rural Electrification Program

The rural electrification program was first tested by ascertaining how many people had achieved a connection to the national grid. This is described as the direct connection of electricity supply to the consumer from Kenya Power connection. Accordingly, results in figure 4.3 indicate that 51% of the respondents were connected to the grid, with 25% indicating no connection to the national grid while 24% gave no response to their status of electricity connection. The results are in support of the various scholars who have observed that there is slow progress in the country's effort to make the rural areas connected to the national grid. Both Numela (2010) and Ng'ang'a and Onyango (2009) found that rural electrification was very scantily covered. Similar findings are also recorded by Abiego and Okefe (2009) as well as Leegwater and Shaw (2009) when they noted that even though people might be in reach of national grid lines, connection to the same was not easy in the rural populations. While the situation in Mbita is perhaps not as critical as in other rural areas in Kenya, it does appear that access to electricity by most enterprises is far from perfect.

Figure 4.3: Connectivity to National Grid in Mbita Town



Key: DN/reply- Did not reply or gave no responses

4.5.1 Usage of Electricity in Mbita Town

In determining what rural business people did with their connection to the national grid, the study sought to find out what kind of business the respondents were engaged in. Results from the field as shown in table 4.3 indicate that many types of business were carried out in the town. However, the study focused on the type of business that was directly connected to the grid line and hence the case where 71 businesses that participated in the study could not indicate the type of business they were involved in but instead gave their views on the suitability and perceived usefulness of the connection to national grid line. The most prevalent SME was found to be electronics shops with a minor majority of 28% followed by retailing at 19.6% and in third position were two enterprises of barber/salon and welding at 12%. Other noted businesses included cybercafés at 9.1% and bar/pub/night clubs at 7%. The least practiced enterprises included Butchery and Bottle Store with 1% and 1.4% score respectively. Following the Lyder (2010) theory, the findings are in clear support of

effect and action following some form of empowerment to the people. In this case, the grid line connection has definitely ignited the people into some form of action meaning that the grid power connection had a positive effect.

Table 4.3: SME Connectivity to National Grid

| SME types | | Frequency | Valid Percent | Cumulative Percent |
|------------------|---------------------|------------------|----------------------|---------------------------|
| Valid | Retailing | 28 | 19.6 | 19.6 |
| | Bottle store | 2 | 1.4 | 21.0 |
| | Grinding mill | 4 | 2.8 | 23.8 |
| | Cybercafe | 13 | 9.1 | 32.9 |
| | Butchery | 1 | .7 | 33.6 |
| | Welding | 18 | 12.6 | 46.2 |
| | Barber shop/Salon | 18 | 12.6 | 58.7 |
| | Pub/Bar/club | 10 | 7.0 | 65.7 |
| | MPESA | 9 | 6.3 | 72.0 |
| | Electrical Shop | 40 | 28.0 | 100.0 |
| | Total | 143 | 100.0 | |
| | Non-Grid Businesses | 71 | | |
| | Total | 214 | | |

4.5.2 Rise of Business with Connection to Grid

In ascertaining whether the rural electrification was associated with the increase or rise in the number of businesses in the town, the research sought to establish how SMEs operated before and after the electrification programme was initiated in the rural town of Mbita. A test of chi-square was established to ascertain that the emergence of new businesses was as a result of grid power connection and not mere chance. The aim of a chi-square test according to Kothari (2004) is to establish that a relationship between two events is not by chance but by the forces between those events. Using Pearson's chi-square test with a 95% confidence level, the results with Asymptotic significance less than 0.05 are the ones to indicate a strong relationship while those equal to or greater than 0.05 are rejected as being not related. In

other words, there is a 95% confidence in the results acquired to explain the relationship between independent variables and the dependent variable. Pearson's chi-square value must be positive in order to enable discussion of the result for the study. Results in table 4.4 indicate that indeed several businesses were dependent on the introduction of grid line electricity. The SMEs with asymptotic significance of less than $p=0.05$ showed that there was at least a 95% likelihood that the SME was strongly related to the connection of the national grid. Such businesses included electrical shops (0.012), Mpesa (0.014), Welding (0.001), cybercafé (0.003) and grinding mill (0.014). The SMEs with mild relationship to the grid line connection included pubs and bars or clubs with asymptotic significance of 0.032 and retailing with asymptotic significance of 0.041. There were other SMEs that showed little relationship to the connection of national grid even though the owners were now connected to the national grid. These included Bottle stores (0.072), Bookstores, Butcheries (0.063) and those selling of second hand clothes (0.075). All the Asymptotic values for the SMEs was greater than the threshold of $p=0.05$.

There is a strong evidence to suggest that availability of electricity in Mbita town has led to the rise of business enterprises. Access to even limited amounts of electricity for microenterprises in rural areas can be important to establishment and growth of businesses.

The results corroborate what other scholars including Moha et al (2000) and Barnes (2012) who concluded that the SMEs found in rural areas are bound to be boosted if any new form of power is discovered or introduced. Similarly, the World Bank (2008) established that businesses could thrive if grid line connection is availed. This was also supported by Vandenberg (2009) who concluded that economic activities were most likely to spring up if connection to the national grid was accessible. The main theory supporting this development is Giddens (1976) structuration theory by which the individuals in a society support structures in place in order to see a turn-around of events for the betterment of living.

Table 4.4: Relationship of SME to Grid Connection

| Specific SME | | Chi-square | Df | Pearson's Asymp.Sig. (p=0.05) |
|---------------------|-----------------|-------------------|-----------|--------------------------------------|
| Valid | Retailing | 0.423 | 1 | 0.041 |
| | Bottle store | 2.193 | 4 | 0.072 |
| | Grinding mill | 2.174 | 2 | 0.014 |
| | Cybercafe | 3.103 | 2 | 0.003 |
| | Second hand | | | |
| | Clothings | 2.012 | 3 | 0.075 |
| | Butchery | 4.221 | 2 | 0.062 |
| | Welding | 0.934 | 3 | 0.001 |
| | Barber | | | |
| | shop/Salon | 1.249 | 4 | 0.004 |
| | Pub/Bar/club | 2.128 | 2 | 0.032 |
| | MPESA | 0.782 | 2 | 0.014 |
| | Bookstore | 1.234 | 3 | 0.081 |
| | Electrical Shop | 2.631 | 1 | 0.012 |

4.6 Rural Electrification and Value Addition by SMEs

The second objective of the study was to establish how new businesses had sprung up following connection to national grid in the rural town of Mbita. In getting the correct trend of businesses rising due to connection, the objective specifically sought to establish the products that have resulted into value addition by SMEs due to electricity uptake or connection to the national grid. Examples of value addition include, milk packaging and refrigeration where previously only hawked milk was available, cyber cafes with photocopying, printing and card making business extension where previously, only minimum cyber surfing was done; packaging of flour where initially, the diesel grinders only produced a few bags of flour for immediate use; and extended spraying and metal works where previously before connection to the grid, only metal cutting was done and the extended services leased to contractors away from Mbita town.

Various businesses that were in operation were either enhanced due to ease of connection to the national grid. According to the SME owners, one of the most affected businesses was maize grinding in which before the grid connection, there were about 5 in the town and using diesel. However, since the introduction of grid power, the electric grinders had completely taken over leaving the diesel users without much business. Another business that was heavily affected was milk retailing business in which the milk hawkers were having a field day before the installation of nation grid. Ever since the rural electrification programme kicked off, there has been a severe competition from the packed milk since the milk can be refrigerated and lasts longer than the hawked milk leaving the business of hawking milk a thing of the past.

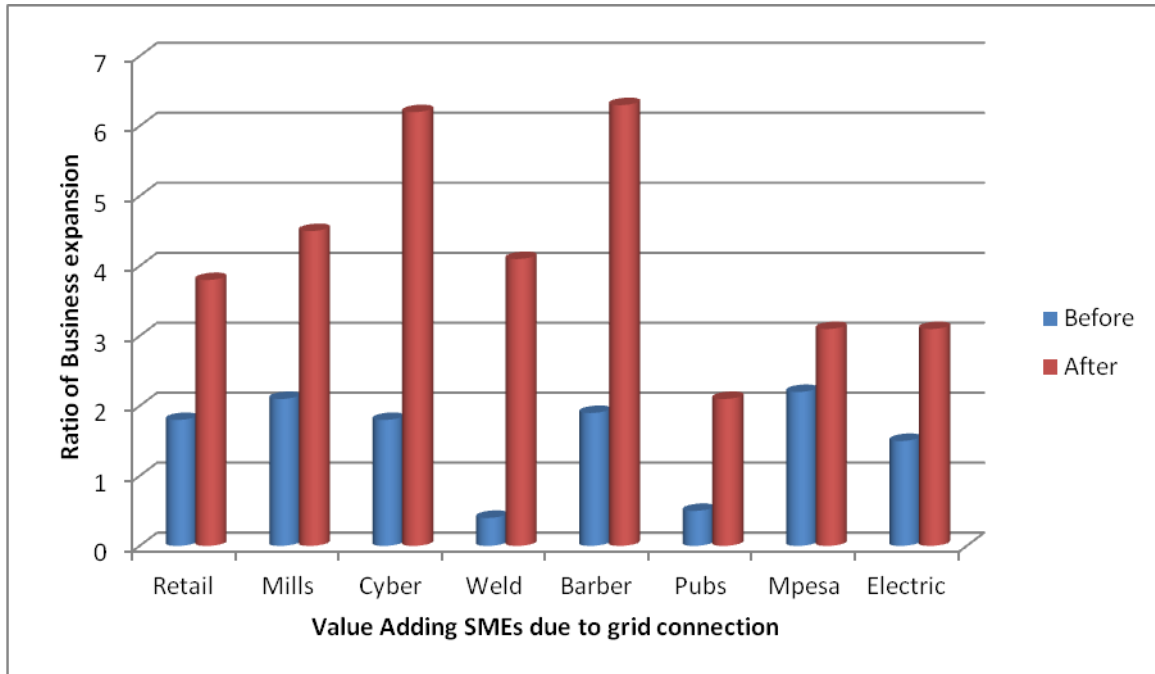
The most noticeable positive change is the value addition that grid connection has brought to the people of Mbita. Results indicate various SMEs were clearly enhanced following the grid connection.

Results in figure 4.4 indicate that before the rural electrification program, there were businesses that had remained in large state of idleness due to the difficulty of maintaining the quality and status required to produce the services. For example, photocopying and internet browsing services that were dependent on non-grid power used to be run in batch format where the operator could only operate the machines 2 or 3 times a day. However, with the introduction of the grid line connection, these services were now being run on a continuous basis with very many other competing business persons trying their luck at the business. Welding was another business that was only found in the town at 2 locations but with the introduction of the grid line power, seven other welding and electrical shops have sprung up and the competition has remained healthy both to the consumers and business providers in the

town. The services of, Retailing, Grinding mill/grain milling, cybercafé, Welding /metal working, Barber shop/ salon, Restaurant / hotel, Mpesa and Electrical shops had the most profitable value addition. SMEs owners indicated them to be the most profitable in terms of value addition ever since the introduction of grid power in the rural town.

Sen (1999) argues that development cannot be achieved unless freedom is achieved and in this case, there is a clear indication that once grid connection was introduced, the constraint of having to rely on one source of unreliable energy was over. The people of Mbita were observed to value education and in their youthful ages of majority 18-35 years, energy source had constrained them from fast economic growth. They had however achieved this by having the freedom to choose the national grid and supplement it with the older, inefficient but available sources of energy like solar, kerosene lamps and car batteries. Sen's theory is thus applicable in this case as more freedom means more development in Mbita town.

Figure 4.4: Value-addition services following electrification programme



The results are indicative of the value-addition that grid power had brought in the rural town. To further confirm the value addition relationship, a chi-square test was carried out to confirm that the relationship between the new products and the value addition due to grid connection was not just by chance but due to the connection to the grid line power. Results as indicated in table 4.5 show that all the SMEs had low asymptotic significance values close to zero and hence an indication that the value addition was not due to chance but strongly related to a level of 95% confidence on the connection to national grid. It is therefore safe to conclude that SMEs had a great value addition following the introduction of grip power in Mbita town.

The results for value addition are in direct support of the findings by Sawe (2004) and REA (2013) in which there was a springing up of new SMEs and the value-addition of the present ones when new forms of power or source of energy was introduced in an environment of trade. Whereas businesses like retailing of mobile handsets was going on, it was now possible to have electrical shops and phone repairs with the connection to national grid. Similarly, the World Bank (2008) in its report noted the improvement of SMEs in rural towns and cited welding and electrical shop owners as some of those they have advised following the improvement of their businesses due to connection to national grid. Other scholars who correlated value addition products to the introduction of grid power in rural areas were Ng'ang'a *et al* (2009) and Ondari (2010). The results lead to the conclusion that the rural electrification programme is indeed responsible for value addition SMEs that have sprung up to improve the living standards of the people in Mbita town.

Table 4.5: Test of value addition - SME services

| Specific SME | Chi-square | Df | Asymp.Sig. (p=0.05) |
|------------------------------|-------------------|-----------|--------------------------------|
| Valid Retailing, | 2.881 | 3 | 0.001 |
| Grinding mill/grain milling, | 3.114 | 2 | 0.011 |
| cybercafé, | 0.891 | 2 | 0.010 |
| Welding /metal working, | 3.012 | 4 | 0.001 |
| Barber shop/ salon, | 2.004 | 2 | 0.001 |
| Restaurant / hotel, | 1.712 | 1 | 0.001 |
| Mpesa | 1.899 | 2 | 0.004 |
| Electrical shops | 3.410 | 1 | 0.011 |

4.7 Relationship between Electricity Connection and SME Growth

The dependent variable in this study was the growth of SMEs in the rural areas following the rural electrification programme. This objective sought to confirm that growth indicators were related to the rural electrification programme introduced and embraced by the SME entrepreneurs of Mbita town. Several characteristics were tested to confirm that there was

indeed a correlation between the increased growth of business and the introduction of grid line power in the rural town.

First, respondents were asked to comment on the reasons why they had problems taking on electricity and most of them indicated that connectivity costs were so high and that the reliability of the power supply was not guaranteed. Similarly, there was the question of proper costing or billing by the Kenya Power company response for distribution and billing of customers. Traders believed that the way customers of grid line were handled was not transparent as some of them indicated that the bills were too exaggerated and that no compensation was forthcoming whenever electrical appliances were damaged by the many power surges that occurred after power black-outs.

The second observation was that whereas there was new enthusiasm on the introduction of grid power, some people found it wasteful to use grid line electricity as their demand for power was minimal yet they continued to pay high costs to the company. However, efficiency was clearly on the rise as many businesses were now able to operate up to very late hours. This created opportunities for new working environments and job creation in such a manner that many people could for example work in hotels, pubs and clubs in shifts assured of security from the well-lit environment. For entrepreneurs operating the SMEs, the fact that electricity is now available has led to increased consumer draw. The small and medium microenterprises were able to access energy to provide an environment more conducive to congregation and drawing more profit from increased customer contact and sales. It has also led to the increased use of motorised vehicle wheel balancing and mechanical services for motorcycles and taxis. Results in table 4.6 in which a Likert-type scale ranging from 1 to 5 indicated various levels of growth as agreed upon by the respondents. The highest mean

attained was 4.69 in which a proliferation of SMEs took place following introduction of grid power in the town. This was closely followed by mean of 4.62 for SMEs operating longer hours than previously when they were not connected to the grid power. Another strong indicator of growth had a mean of 4.35 which was diversification of services by the business owners of SMEs. However it was notable that not many employers had taken to increasing their employees as this had a mean of 2.86.. This might also be an indication that positively, the heavy workload is drastically reduced once grid power is installed.

Still on diversification, it also evident that due to availability of electricity most SMEs especially retailers are engaging in massive product preservation. Electricity has played pivotal role in helping small and medium enterprises tremendously preserve product for retail. Furthermore, most SMEs have expanded their inventory by adding items that need refrigeration.

The two results have been in direct agreement with Giddens (1976) structuration theory and Sen (1999) theory of development as freedom. The growth witnessed is a true sign of people getting the freedom to be self reliant and hence developing themselves following the improvement power connection as key production factor. In this case, the central new input was clearly grid power installation. Other scholars who have found similar results were Singh (2009) and Leegwater and Shaw (2008) in their support for action/individual agency theory (Layder, 2010). Here the results have suggested that with the introduction of grid power, more people were taking the businesses they could not previously handle as well as reducing staff for those that required too much labour. The theories have been proved relevant as more business have sprung up and more individuals taken charge of those businesses on their own without involving a second party or agent.

Table 4.6: Growth Factors due to Grid Power Connection

| Growth factor | N | Minimum | Maximum | Mean | Std. Deviation |
|--|----------|----------------|----------------|-------------|-----------------------|
| The introduction of grid power in town has seen a proliferation of SMEs | 141 | 1 | 5 | 4.69 | .465 |
| Availability of electricity has enabled my enterprise to operate for more hours | 141 | 1 | 5 | 4.62 | .605 |
| Availability of grid power has necessitated diversification of my services | 141 | 1 | 5 | 4.35 | .776 |
| Availability of electricity has resulted in improved quality of my products/services | 141 | 1 | 5 | 4.05 | .831 |
| Availability of electricity has resulted in efficiency in my processes | 141 | 1 | 5 | 3.95 | .988 |
| Installation of grid has prompted me to have more employees | 141 | 1 | 5 | 2.86 | 1.279 |

Finally, the study sought to find out the noticeable changes that could be related to the introduction of grid power in the rural town and from the results in table 4.7 in which the Likert-type scale was used with values of 1-5, the prevalent use of machinery was the leading result having a mean of 4.14. In essence, the respondents were of the opinion that a clear increase in the numbers of machinery being used in town was a direct influence of people using grid line power. Many indications too were in place to show that previously, people were using other sources of energy including kerosene lamps in retail and other SMEs to provide light, solar energy combined with car battery to run moderate lighting systems including music players, limited cyber cafe periods and diesel engines to carry out heavy duty jobs like grinding and welding works.

The changes witnessed are also in support of Sen (1999) development theory of freedom in which people are no longer dependent on alternative sources of power which were inadequate. Even though complaints of high costs to some extent in terms of electricity bills still occur, the overall agreement is that the changes have been positively attractive to the rising entrepreneurs with their SMEs. This has led to extension of working hours for small businesses and boosted security in the town. Lighting that is provided by the electricity allowed small and medium entrepreneurs to extend their working day and generate more income. In particular, it was evident that electricity makes it possible for SMEs to extend their selling hours into evening. Welding shops were capable of using electricity from grid power to extend their operating hours and increase production.

The second factor that respondents agreed had effectively changed and been improved by the introduction of grid power connection was security which had a mean score of 4.09 with the town people showing how they were able to make telephone contacts with their charged mobile phones, stay for longer hours with well-lit premises and complete businesses into the late nights due to the feeling of safety. The result is that a huge multiplier effect has been felt with many people now getting a chance to do and produce what they can sell to the people at any time since markets are guaranteed.

However, the one item that seemed unfavourable for most of the respondents was the fact that connection to the national grid has not reduced costs. According to results in table 4.7, cost of national grid scored the least with a mean of 3.38. This is the case whereby the owners of SMEs realise that even though they can make good profits, they have to be ready to meet the cost of electricity and its associated expenses like repair and maintenance of machines that use electricity heavily and prone to breakdowns.

Many scholars have observed the changes that occur when a new input factor is introduced in the environment therefore corroborating the findings of this study. Singh and Ali (2001) concluded that the high levels of poverty in the rural areas meant that new comers to the use of grid line power had to operate below capacity thus finding the cost of grid line to be high. Similarly the World Bank (2008) recommended subsidies since according to their study, rural people found the cost of power in general to be high and hence almost difficult for them to connect to the national grid. On the other hand, Abiego and Okefe (2009) identified national grid connection as the most important factor in the development of rural communities indicating that once enterprises were linked to the national grid, they were bound to be more innovative while using alternative power sources. Their findings were also in line with Leegwater and Shaw (2008) as well as Singh (2009) both who argued that the best form of power for rural development was national grid even though connection entailed high initial costs.

Table 4.7: Changes Witnessed due to Connection to National Grid

| Change factor | N | Minimum | Maximum | Mean | Std. Deviation |
|--|----------|----------------|----------------|-------------|-----------------------|
| The introduction of grid power has led to prevalent use of machinery | 138 | 1 | 5 | 4.14 | .948 |
| Electricity has seen an enhancement of security | 141 | 1 | 5 | 4.09 | 1.158 |
| Electricity has made communication with service providers efficient with the use of technology | 141 | 1 | 5 | 4.06 | .630 |
| Availability of electricity has led to reduction of operation cost | 141 | 1 | 5 | 3.38 | 1.217 |

4.8 Chapter Summary

This chapter sought to analyse and discuss the field findings using standard statistical methods. The themes of each section were based on the study objectives in which each variable was analysed using descriptive statistics and inferential conclusions made. The various tools used to make solid conclusions were also corroborated by studies of other scholars in the subject field. The aim of the analysis was fully achieved giving way to the study conclusions and recommendations in the next chapter

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter 5 gives a summary of the entire research highlighting the conclusions, recommendations and suggestions for further research. The recommendations and suggestions are based on the findings in the previous chapters and the study objectives which relied heavily on the study questions.

5.2 Summary of Findings

The main objective of the study was to assess the effects of rural electrification on the growth of SMEs in Mbita Town. Accordingly, the study used interviews from the SMEs in Mbita town and its environs to come up with data that was cleaned and summarised before being carefully analysed to enable the conclusions and recommendations for this study. The initial analysis showed that there is a wide consensus by the people of Mbita on their acceptance and willingness to use grid power as opposed to the alternative power sources. The entrepreneurs in the rural area were indeed clear in their decision to use national grid power and that even though the cost of maintenance was said to be high, the benefits far much outweighed the costs.

It was also established that the multiplier effect in the businesses was evident with one business triggering backward and forward value chains that have made the residents experienced an improved step in their living standards. Since the driver of that change was the efficient power source, business people felt that more efforts should be made to help

people connect to the national grid line. It was clear that backward and forward linkages were increasing in the SMEs around and about the Mbita town. This has led to multiplication of SMEs in the town.

Another major finding was that efforts by the government to support the rural electrification programme were bearing fruit. Most SMEs have since introduced new services as a result of the value addition that was enabled by the electrification. Therefore more people had connected to the grid and others were also registered awaiting connection at the next opportunity in order to also add new services.

From the growth rate of activities, it was also found that many youths had got engaged in economic activities that encouraged them to be self-reliant. A positive effect of this trend was that women were now able to fend for themselves and fully participate in economic development of their families.

Lastly, SMEs have become more efficient and thus people do not have to access neighbouring towns for services. Many cottage industries including tailoring and welding as well grocery and workshops had sprung up due to the opening up of the market centres neighbouring Mbita town and the surrounding areas. To this end, even the services that had initially relied on the major towns like Kisumu are now able to be self-sustaining and repairs are done within the town of Mbita thereby speeding up the turn-around times for most activities.

5.3 Conclusions

The study came to the first conclusion that SMEs had benefited from the connection of national grid and thus the SME numbers had increased immensely and in addition they came up with new services in comparison to pre-rural electrification period. There was evidence that a large majority of the people in the area were interested in joining the connection as evidenced through the number of new applicants who are now on the waiting list of the connection process.

Another conclusion was that SME owner's and operators agreed that the grid connected businesses were more efficient in their operations than the non connected SMEs. They had improved quality of products, operated for longer hours and had faster processes. The reason cited that blocked others from the electrification programme was the prohibitory cost of connections and that the timing for those who were waiting to be connected was longer than one could have expected. The rural people have demonstrated the desire to have power sources which are reliable and easy to access. Indeed there is great potential to still connect more people to the national grid if the government plans and in particular those of the Vision 2030 are put to the effective implementation.

5.4 Recommendations

A major recommendation of the study was that the government should link with the donors like World Bank who have already acknowledged through their own studies the need for massive injection of funds to support the rural electrification programme. In other words, the government needs to be able to give incentives of any kind that will encourage the people to get connected.

Another recommendation is that the Kenya Power company should increase their maintenance services that are very necessary especially given that grid power cannot be handled by any other technical person apart from the qualified staff. Similarly, there should be more grace period for the rural people terms of repayment period since they are not used to the urban living style where deadlines on payment attract severe action like total disconnection.

5.5 Areas of Further Research

There is need to have a further study in the development of SMEs in particular the wider rural areas not just around the town environment. Similarly, the periods in which electricity is being distributed and to where it is being distributed should be well documented so that in future, a study on county level is very possible with a comparison to find out which counties in Nyanza region are best utilising the chance of being connected to the national grid. Another area of recommended study is the use of multiple stakeholders instead of using only the SMEs to make recommendations on the rural electrification program.

5.6 Implications for Policy

The study findings and conclusions have led to several implications in terms of policy, theory and practice. First, the government in their policy to serve the public with speed and quality tends to neglect the plight of rural people who tirelessly work to implement the strategic plans for example Vision 2030 and Rural Electrification. The policy here should be to take care of the wishes of both the business and non-business people in order to have effective implementation of government plans.

Second, it implies that the government should approach the rural electrification program with the strict timeliness it deserves. Involvement of all stakeholders is necessary to ensure no bad plans are included in very important development strategies like rural electrification. Finally, the government should in practice try to involve some of the retirees in planning as this would enable grievances of both the business people, the employed, the schooling groups and all others to air their suggestions and views.

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APPENDICES

APPENDIX ONE: QUESTIONNAIRE

This questionnaire is for the purpose of the research only and the information you give will be treated confidentially. Please answer all the questions provided as honestly as possible, to the best of your knowledge.

Section A: Background Information (Tick (✓) the appropriate option (bracket))

1. How old are you?
 - a) Less than 18 years []
 - b) 18-35 years []
 - c) Over 35 years []
2. Please tick against your sex
 - a) Male []
 - b) Female []
3. What is your highest academic qualification?
 - a) Primary []
 - b) Secondary []
 - c) Certificate/Diploma []
 - d) Bachelor's degree []
 - e) Master's degree []
 - f) Others (specify)

Section B: Extent to which rural electrification program has contributed to the multiplication of small and medium enterprises

3. Name of business _____

4. Are you on grid power?
- a) Yes []
 - b) No []

If No, skip to question 16>

5. What is /are the dominant use (s) of electricity at this enterprise?

.....

.....

.....

.....

.....

6. Please check appropriately: Type of SME

| Type of Enterprise | |
|---------------------------|--|
| Retailing | |
| Bottle store | |
| Grinding mill | |
| cybercafé | |
| Supply farm produce | |
| Butchery | |
| Welding | |
| Barber shop / salon | |
| Pub/ bar/ Night club | |
| Agricultural training | |
| Poultry | |
| Sewing | |
| Grocery | |
| Other (specify) | |

7. Type of enterprise and if it existed before or after rural electrification

| Type of Enterprise | Before | After |
|-----------------------------|---------------|--------------|
| Retailing | | |
| Bottle store | | |
| Grinding mill/grain milling | | |
| cybercafé | | |
| Supply farm produce | | |
| Butchery | | |
| Welding /metal working | | |
| Barber shop/ salon | | |
| Pub/ bar / Night clubs | | |
| Agricultural training | | |
| Poultry | | |

| | | |
|--------------------|--|--|
| Sewing | | |
| Grocery | | |
| Restaurant / hotel | | |
| Other (specify) | | |

Section C: New products that have resulted from value addition by SMEs in Mbita town

Please indicate whether there has been product value addition as a result of rural electrification in the following industries

| Type of Enterprise | Yes | No |
|---------------------------|------------|-----------|
| Retailing | | |
| Bottle store | | |
| Grinding mill | | |
| cybercafé | | |
| Supply farm produce | | |
| Butchery | | |
| Welding/ metal working | | |
| Barber shop/ salon | | |
| Pub/ bar/ Night clubs | | |
| Agricultural training | | |
| Poultry | | |
| Sewing | | |
| Grocery | | |
| Restaurant | | |
| Other (specify) | | |

Section D: Effects of rural electrification on operation of SMEs on in and around Mbita.

8. How many employees do you have before and after electrification program?

a) Before [] b) After []

9. After installation of grid power would you consider your profits to have

a) Improved []

b) Decreased []

c) Remained unchanged []

10. After installation, did the cost of energy:

| | |
|-----------------|--|
| Increase | |
| Decrease | |
| Remain constant | |
| Don't Know | |

11. Were you using machines before installation?

a) Yes [] b) No []

12. Do you use machines after installation?

a) Yes [] b) No []

13. What kind of energy did you use before installation?

Car Battery _____

Kerosene _____

Petrol _____

Diesel _____

solar _____

Other (s) specify _____

14. In a scale of 1 – 5 (where 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree) please indicate the extent to which you agree with the following statement
(growth)

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| Installation of grid has prompted me to have more employees | | | | | |
| Availability of grid power has necessitated diversification of my services | | | | | |
| The introduction of grid power in town has seen a proliferation of SMEs | | | | | |
| Availability of electricity has resulted in efficiency in my processes | | | | | |
| Availability of electricity has resulted in improved quality of my products/services | | | | | |
| Availability of electricity has enabled my enterprise to operate for more hours | | | | | |

15 In a scale of 1 – 5 (where 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree) please indicate the extent to which you agree with the following statement
(significant changes)

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| Availability of electricity has led to reduction of operation cost | | | | | |
| Electricity has made communication with service providers efficient with the use of technology | | | | | |
| Electricity has seen an enhancement of security | | | | | |
| The introduction of grid power has led to prevalent use of machinery | | | | | |

16. Why is the business not connected to grid-based power?

| | |
|-----------------------------------|--|
| High cost of installation | |
| High Operational Cost | |
| Other affordable source(off-grid) | |
| Others (Specify) | |

17. Do you consider businesses that are connected to grid electricity to have certain advantages over your enterprise?

a) Yes [] b) No []

If Yes, in what ways?

.....

.....

.....

.....

.....

.....

.....

.....

.....

THANK YOU FOR YOUR TIME AND PARTICIPATION

APPENDIX TWO: TIME FRAME

| | ACTIVITIES | WEEKS | | | | |
|----|------------------------------|-------|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| 1. | Data collection | | | | | |
| 2. | Data analysis | | | | | |
| 3. | Report writing | | | | | |
| 4. | Compilation and presentation | | | | | |

APPENDIX THREE: BUDGET LINE

| Items | Ksh |
|-----------------------------------|---------------|
| Research assistants and training. | 20,000 |
| Transport and accommodation | 15,000 |
| Stationery and printing services | 10,000 |
| Contingency | 5,000 |
| TOTAL | 50,000 |