

**EFFECTS OF RURAL ELECTRIFICATION ON THE GROWTH OF
SMALL AND MEDIUM ENTERPRISES: A CASE OF NAKURU TOWN
(2003-2021)**

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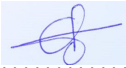
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DECLARATION

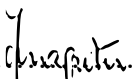
This research project is my original work and has not been submitted to any other institution for any award.

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I thank God for giving me sufficient grace to complete this project. I appreciate the positive guidance and mentorship of my supervisor, Dr. Justine Magutu and other lecturers from the Department of Political Science & Public Administration who taught me various units in classroom.

DEDICATION

I dedicate this project to my spouse Diana and children Enock, Nicole and Chumba.

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ABBREVIATIONS AND ACRONYMS

GDP	Gross Domestic Product
GOK	Government of Kenya
KPLC	Kenya Power and Lightning Company
OECD	Organization for Economic Co-operation Development
REA	Rural Electrification Authority
REP	Rural Electrification Program
REREC	Rural Electrification and Renewable Energy Corporation
SMEs	Small and Medium Enterprises

ABSTRACT

Lack of reliable electricity or reliable supply of power can be an impediment to sustainable economic growth and development of any country. The general objective of the study was to establish the effects of rural electrification on growth of SMEs in Nakuru Town. In specific terms, the focus of the inquiry was on power interruptions, accessibility to rural electrification as well as cost of rural electrification. The theory of constraint was embraced. Descriptive cross-sectional survey was adopted targeting 1000 small and medium enterprises located within Nakuru Town out of which 285 were selected through stratified random sampling. Primary data was collected through questionnaire that was administered to respondents from, the small and medium enterprises and the interview guide were used to interview key informants from Kenya Power and Lighting Company. The questionnaire was pilot tested prior to actual data gathering so as to determine validity and reliability. The analysis of the data was done through Statistical Package for Social Sciences version 24 using frequencies and regression analysis and presented through tables. Content analysis was used to process qualitative information. The findings were that 57.7% variation in the growth of small and medium enterprises in Nakuru is explained by variation in rural electrification. The study further noted that while power interruptions ($\beta = -0.490$, $p < 0.05$) and cost of rural electricity ($\beta = -.128$, $p < 0.05$) had negative but significant effect on growth of small and medium enterprises in Nakuru, accessibility to rural electrification ($\beta = 0.137$, $p < 0.05$) had positive and significant effect. The study concluded that rural electrification is a significant predictor of the growth of small and medium enterprises in Nakuru. The study recommends that the Kenya Power and Lightning Company officers in Nakuru County should monitor the frequent power interruptions in the region and establish the root causes so that appropriate response measures are undertaken to mitigate this challenge. The regional managers of Kenya Power and Lightning Company in Nakuru branch should ensure there are adequate technicians who can easily be accessed and deployed in case there are power related issues. The government of Kenya should implement the directive of subsidizing the cost of electricity and ensure the same has been fully implemented.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Globally, it is accepted that electricity enhances the quality of life by stimulating the economy, which increases the production of goods and services hence providing households with a variety of consumer products (Torero, 2015). Electricity is the main pillar to all social economic activities that a country undertakes. It is the major source of energy for most households both in urban and rural areas around the world. Most industries require electricity as a source of energy to transform inputs into outputs (Riva et al., 2018). People use electricity to light up their homes and cook. In particular, lighting of streets and homes helps to counter burglary and other criminal activities (Bos, Chaplin & Mamun, 2018). This has made it imperative for governments to pass policies to ensure access and distribution of electricity.

Rural electrification means the provision of electricity to consumers of an economy especially in remote areas. This can be done through local independent grids, national grids or through small-scale generation (Glatt, 2009). It enhances production of supply of public good and services to the rural people hence enhancing their living standards and quality of life (Oyedepo et al., 2018). Rural electrification has been undertaken by governments of different countries around the world although at different rates. Energy is one of the essential services provided by the government. For instance, in England and Wales rural electrification has provided universal access to energy for carrying out businesses (Fionnguala & Pearson, 2015).

In Germany, rural electrification has largely been attained through electricity distribution cooperatives and it has allowed smaller firms to expand their operations (Barnes, 2007). In Brazil, the overall electrification rate has increased steadily over the years; from 85% in 1990, 94.5% in 2000 and 98.7% in 2012 (World Bank, 2012). In over 50 years, China has been able to achieve 98% electrification rate by providing electricity access to over 900 million people (Barnes & Foley, 2004). In Malaysia, with 3.8% of the population living in rural areas, electrification rates in rural areas like Sabah and Sarawak are at 77% and 67% respectively (Mahmoud, 2017). In India, about 90% of the villages were estimated to access to electricity as of 2019 (Thomas et al. 2020). In Nigeria, an estimated population of 58% has access to electricity with rural electrification rate standing at 39% (Hou & Liao, 2018). In Africa, rate of rural electrification is generally low, for

instance, in Mozambique and Tanzania, rural electrification is as low as 5% of the entire population in the rural areas largely because of poor policy framework (Bhandari, Sessa & Adamou, 2020).

Lack of reliable electricity or reliable supply of power can be an impediment to sustainable economic growth and development of any country (Streatfeild, 2018). The most affected are developing economies whose development status is still low. Access to electricity in rural areas of developing economies can be a key requirement in closing the gap between the rich and the poor. According to Khatib (2006), the promotion of rural electrification and ensuring proper supply of this rare commodity in rural areas is crucial if poverty alleviation is to be experienced. The benefits of rural electrification are many and spread across many sector including education, health, agriculture and trade especially through the Small and Medium Enterprises (SMEs). For instance, lighting provides more reading hours hence improving education, the health sector also benefits since the medical service providers are able to work round the clock and use lifesaving technologies, agriculture can also benefit through irrigation schemes which promotes continuous productivity and ranges of variety of consumer products (Khandker, 2017; Barnes and Samad 2009). In addition, electricity can enable the use of electric tools and machinery and increase operation hours and hence improve efficient and productivity. A study of the benefits of rural electrification in Bhutan revealed that the adoption of rural electrification improved education, reduced fuels consumption and increased employment levels (Pattanayak, 2017).

Rural electrification also has a great impact on SMEs. Although there is no universal definition of SME, the common indicators used to identify SMEs are the number of staff and the value of turn over that is generated by the enterprise. The Micro, Small and Medium Enterprises (MSMEs) Act (2012) of Kenya defines an SME as enterprise entity generating annual sales revenue of Kshs 500-5,000,000 and employing 1-99 individuals. The definition of SME provided by the European Commission (2005) is that they are autonomous entities having 10-250 staff with sales revenues less than 50 Million EUR.

SMEs have been identified as the main beneficiary of rural electrification programs in both developing and developed countries (Saraf et al., 2018). SMEs are major pillars to sustainable economic growth and development through the creation of job opportunities and the production of variety of household consumer goods and services which contributes to the Gross Domestic

Product (GDP). According to Chong *et al.* (2019), most countries get a large share of their GDP from SMEs. A study by the Organization for Economic Co-operation and Development (OECD) on individual country's share of GDP contributed by SMEs indicated the following percentages: Germany 57%, China 60%, Japan 55.3 %, Korea 50 %, Malaysia 47.3 %, and Kenya 55% (OECD, 2017). From the same report, the share of SMEs stood at above 60% in job creation. According to Harris and Gibson (2006), SMEs have been accepted as the main booster to accelerated economic growth and development by enhancing rapid industrialization (Tajeddin, & Carney, 2018). For this reason, many countries refer SMEs as the driving force to economic development through job creation, innovation into new products, and poverty reduction mechanism. Hence, the role of SMEs in economic development can't be underrated.

In Africa, the contribution of SMEs to the economy is also of great importance. According to OECD report (2016), the contribution of SMEs to economic growth in Africa can't be underrated since on average 50 percent of jobs are created by SMEs. For instance, in Ghana 61% of the jobs are created by SMEs, in South Africa 91% and in Kenya 60% (Quartey, 2010; Murungi 2013). From these statistics, it's clear that SMEs play a big role in economic growth through the provision of necessary commodities, poverty alleviation and improvement of standard of living in Africa. However, role of SMEs in economic growth can be realized only if cheap power supply is enhanced.

The Rural Electrification Program (REP) was established in 1973 by the Kenyan government so as to subsidize the supply of electricity in rural areas in a bid to support the growth of the economy. Consequently, an agreement was entered into between the Government of Kenya and the East African Power and Lightning Company currently referred to as Kenya Power and Lightning Company (KPLC). Under this agreement, KPLC was given the role of a contractor in the rural electrification program. As of 2002, little progress had been realized by the REP since the rural electrification by then was only at 4% of the entire rural population. Due to this low progress attained, the Economic Recovery Strategy of 2003 and the Sessional Paper No. 4 of 2004 on Energy made a resolution to establish a special agency for enhancing rural electrification. This resulted into creation of Rural Electrification Authority (REA) that came into existence in 2006. REA was established through the Energy Act of 2006. Following the enactment of the Energy Act

2019, REA has now changed to Rural Electrification and Renewable Energy Corporation (REREC).

Apart from rural electricity, evidence indicates that growth of SMEs is affected by other factors. For instance, in Kenya Opinya (2015) shared that superior growth of SMEs is strongly influenced by adequacy of working capital and managerial competence of those charged with leading them. Kedogo (2013) identified key factors affecting growth of SMEs as innovation, training of employees as well as the process involved in registration of businesses. Factors affecting growth of SMEs were identified by Farrokh, Kordnaeij and Zali (2016) as managerial competence and leadership. According to Derese (2014), the age of an enterprise and initial size have negative implication on their growth.

Nakuru County started its operation in 2014 after the new constitution was promulgated in 2010 in Kenya (Kinyua, 2013). It is among 47 other counties in Kenya. The county has an estimated population of 2,162,202 as per the 2019 Census (Mutuku, Kiilu, Mathuku & Auka, 2022). Aside from Kiambu and Nairobi County, Nakuru County is classified as the third populous county in Kenya. The county hosts a number of lakes including Lake Naivasha, Elmentaita and Nakuru respectively (Mwangi, 2012). There are 11 sub counties in Nakuru County. The county has some sites of interests key one being Menengai Crater as well as Nakuru National Park that offer spectacular sites (Kamunge, Njeru & Tirimba, 2014).

There are 5000 SMEs operating in the whole of Nakuru County, out of which 910 operate within Nakuru town and its environ. This figure could be higher, given that some of the SMEs operate without being registered (Nakuru County Government, 2020). These SMEs operate in different sectors of the economy including retailing, transport and financial services among other sectors (Chemutai & Omwenga, 2017). They significantly contribute towards the growth of Nakuru County in form of revenues while generating employment to thousands of residents in Nakuru town. Most of these SMEs in Nakuru strongly rely on electricity as they operate on a daily basis (Makiche, 2016). Some of these SMEs in Nakuru that require constant electricity include barber shops, saloons and garages among others. It is against this background that the study seeks to establish the effects of rural electrification on the growth of SMEs in Nakuru town.

1.2 Statement of the Problem

Rural electrification allow SMEs to ensure steady operations, a capability that help them to generate steady revenue flows thus growth. Persistent power outages interfere with the daily operations of SMEs thus limiting growth since there would be wasted labor (Streatfeild, 2018). In Kenya, rural electrification was lounged by the government in 1973 and was it meant to foster and stir rural development through access of cheap source of energy (Moner-Girona et al. 2019). The objective of rural electrification was to invigorate the various rural based economic operations which can stimulate economic growth of the country. However, despite the notable benefits of rural electrification including the boosting of SMES, these have not been fully realized since only about 36% of the rural population in Kenya has access to electricity (Murungi, 2013).

The limited accessibility of electricity in the rural areas in Kenya has been attributed partly to corruption, poor policies in place, improper cost benefit analysis and frequent power outages during heavy rains (Murungi, 2013). The cost of accessing rural electricity is another challenge faced by the SMEs, as they seek to minimize daily expenses so that they can maximize on the profits generated (Chemutai & Omwenga, 2017). Findings from the several studies that have been done locally indicate that in most rural areas in Kenya, many SMEs have not fully integrated electricity in their operations (Mwiti, 2014; Dufe, 2015; Muthuri, 2016).

Despite the existence of many SMEs in Nakuru County not all of them have access and have fully adopted the use of electricity in their operations which is likely to affect their performance and growth. This was the basis for this study which intended to establish the effects of rural electrification on the growth of SMEs in Nakuru County in terms of the stability, accessibility and affordability of electricity. It is against this background that this study sought to establish the effects of rural electrification on the growth of small and medium enterprises using a case of Nakuru.

1.3 Research Questions

The following research questions guided the study:

1.3 Research Questions

- i. To what extent do power interruptions affect the growth of SMEs in Nakuru Town?

- ii. What is the effect of accessibility to rural electrification on the growth of SMEs in Nakuru Town?
- iii. How does the cost of rural electricity affect the growth of SMEs in Nakuru Town?

1.4 Objectives

The general objective of the study was to establish the effects of rural electrification on growth of SMEs in Nakuru Town.

1.4.1 Specific Objective

- i. To establish the effect of power interruptions on the growth of SMEs in Nakuru Town.
- ii. To examine the effect of accessibility to rural electrification on the growth of SMEs in Nakuru Town.
- iii. To determine the effect of the cost of rural electricity on growth of SMEs in Nakuru Town.

1.5 Justification of the Study

The findings of the study will be important to policy makers at REREC as they formulate relevant policies to enhance rural electrification regarding stability, accessibility and cost. The policy makers of the SMEs in Nakuru town may rely on the findings of the study to come up with relevant policies on growth of their firms in consideration of the rural electrification. The practitioners in the field of rural electrification may rely on the findings of the study to understand its implication on growth of smaller firms. These practitioners may include electricians who are able to operationalize the entire process of rural electrification process. The study would allow KPLC to have in place and implement relevant strategies and policies aimed at stabilizing the presence of electricity power across different areas in the country.

The study will be important in the field of academia by contributing to the existing literature on rural electrification particularly in relation to SMEs. The study may contribute to enriching existing academic knowledge with the importance of rural electrification in growth of the SMEs while bridging the existing gaps in literature. Some of these gaps are contextual in nature as some of the existing studies covered other countries different from Kenya.

1.6 Scope and Limitations of the Study

The study looked at rural electrification and the growth of the SMEs operating in Nakuru town. Nakuru town was selected because it has a high number of SMEs and it is among the areas that experience high level of power outages. Covering all the 5000 SMEs in Nakuru was challenge in in terms of time and financial constraints since it would be costly to travel and get information from all these firms some of which have branches in other parts of the county. To overcome this challenge, the study covered only head offices of the respective SMEs within Nakuru town. The head offices were selected because this is where all activities are coordinated from.

The study covered the period of 2003-2021. This time frame was selected because significant policies and regulations were passed within this period. These include the Economic Recovery Strategy in 2003, REA in 2006 and finally REREC following the enactment of the Energy Act (2019).

1.7 Outline of the Study

This study is organized into five chapters. The first chapter lays the foundation of the subsequent chapters by detailing the background information, statement of problem, research questions, objectives, scope and limitations as well as justification of the study. The review of literature including gaps and the conceptual framework is covered in chapter two. The methodologies and procedures used by the study to achieve the stated objectives are detailed in chapter three. The analysis presentation and discussion of the study findings is done in chapter four. Chapter five summarizes the findings of the study and gives the conclusion and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter covers the literature reviewed in line with the objectives of the including power interruption, accessibility to rural electrification and the cost of rural electrification. The theories, definition of terms and conceptual framework are also covered.

2.2 Power Interruptions

Power interruptions are unusual conditions when there is power outage and it may be caused by technical problems, climatic conditions as well as intentional efforts. Mayer and Tasch (2013) in their study on the effect of power outage on performance of SMEs asserted that SMEs mostly rely on the usage of electricity especially the manufacturing sector. The study established that power outage can immensely affect their operations. With the expansion of the welding sector, poultry keeping using modern methods and water pumping all these operations use electricity as the primary source of power (Mayer & Tasch, 2013). Power outage can prove to be a setback in the sector. Studies revealed that stable power supply is beneficial to the performance of these SMEs in the rural sector. Sufficient Energy supplies have a significant influence on economic operations (Velasquez & Pichler, 2010). This is especially true in the manufacturing sector which consumes about 15% of electricity annually (Energy Regulatory Commission, 2006). The present study seeks to establish how the outages affect the SMEs in Nakuru in terms of productivity and revenue generation.

Braimah and Amponsah (2012) conducted a qualitative survey on the effect of power blackout on performance of SMEs in Kumasi metropolis. From the survey, it was evident that on average in Kumasi Metropolis the power blackout last for more than 10 hours in a month. This result to 44% of the total SMEs not in operation while 56% seek alternative sources of power to continue with their operations costing more than 15.5 million per month to run. It was realized that these blackouts negatively affected the operations of these SMEs reducing their productivity hence reduction of profits. The study concluded that the government need to have alternatives power provision to ensure the operation of SME brings positive productivity it's required to bring. This study looked at performance of SMEs in Kumasi metropolis in India; the present study will focus on growth of SMEs in Nakuru town.

A study by Cissokho and Seck (2013) on the study of effect of power outage on performance of economic activities, found out that power outage depicted an inverse effect on productivity of SMEs, which is measured through efficiency of SMEs. However, scale efficiency of SMEs inversely influenced productivity in frequency and duration of power outages. This means that power outages adversely affects normal functioning and operations of the businesses. This study looked at performance of economic activities as the dependent variable, the present study will focus on growth of SMEs.

Khatib (2006) conducted a study of effect of unreliable electricity on performance of SMEs in Kibera, Kenya. The study revealed that lack of reliable supply of power can prove to be an impediment to sustainable economic growth and development of any country. The study concluded that the most affected are developing economies whose development status is still low. Access to electricity in rural areas of developing economies can prove to be a key requirement in closing the gap between the rich and the poor. The study focused on performance of SMEs as the dependent variable, the focus of the current study will be on growth of the SMEs.

Taiwo and Olufunke (2018) examined the effect of power interruption and performance of SMEs. The study was carried out in Nigeria with the objective of establishing the impact of electricity service quality on SMEs. The study revealed that quality electricity influenced performance of SMEs by above 50% in their financial performance as well as nonfinancial performance. The study looked at SME performance as the dependent variable, the present study will focus on SMEs growth.

2.3 Accessibility to Rural Electrification

Accessibility to rural electrification refers to the ability of people to connect their businesses with electricity as they carry out their day to day activities (Rehman & Deyuan, 2018). Dufe (2015) did a study on key factors that inform the accessibility of rural electrification in Kenyan setting. The study used a case of Naivasha Constituency. Leveraging on survey as a design, the study targeted 2,159, households out of which 221 were sampled out. The study noted that there were sound policies with regard to rural electrification although funding is not adequate. Furthermore, there was no continuous undertaking of monitoring process. Furthermore, there was also low level of participation from the public as it regarded the issues of electricity. The study established that a

majority of the participants were aware of the alternative sources of power that were in place. This study did not focus on SMEs.

Kanagawa and Nakata (2008) did a study on access to electricity and its link with socio-economic aspects. The study conducted an assessment of un-electrified rural areas in Assam state, India. This led to the development of the energy-economic model. The analysis of this model indicates that the ability of the households to receive full electrification was to be realized in the year 2012. The study concluded that access to electricity would increase the literacy rate in Assam from 63% to 74.4%. This study was done in India and not in Kenya thus creating contextual gap. Riva, Ahlborg, Hartvigsson, Pachauri and Colombo (2018) did an inquiry into access to electricity and its link with development in the rural areas. The analysis showed that electricity use is highly connected through complicated cause effect links with many decision makers. This study did not cover SMEs and merely related access to rural electricity with development and not growth.

Short (2015) used a case of Vietnam to explore the effects that arise from access and use of electricity in a rural setting. The study identified two key challenges that hindered the rural areas from productive utilization of electricity; these were inadequate knowledge on potential uses of electricity and affordability. George, George and Bahaj (2019) did an analysis of rural electrification and its role as far as entrepreneurship is concerned. It was observed that access to electricity led to an increase in average income of the households and business activities. The inquiry observed that women led businesses benefit more from access to electricity as compared to those owned by men. The dependent variable of this study was entrepreneurship which can be conceptualized differently from firm growth.

Rehman, Deyuan, Chandio and Hussain (2018) did a study on rural access to electricity using the context of Pakistan. The nexus between the variables was explored through cointegration. The study observed that accessibility to rural electricity is positively linked the growth of the economy. It was recommended from this study that Pakistan need to pay additional attention to increasing the generation of more electricity using varied sources that include hydroelectric, biomass, gas, oil and solar as well as wind. The present study focused on access to rural electricity and the link with growth of SMEs. Stern, Burke and Bruns (2019) conducted a study on access to electricity and the development of economy. It emerged from the analysis that accessibility and usage of

electricity are strong and positive correlates of economic development. Kasperowicz (2014) focused on Poland to carry out an analysis of access and consumption of electricity on the growth of the economy. Covering the period 2000-2012, the study observed that accessibility and consumption of electricity are strong predictors of the growth of the economy. The present study is motivated to explore the link between rural electrification and SME growth.

2.4 Cost of Rural Electricity

Robert and Gopalan (2018) in the study of rural electrification indicated that rural electrification involves costs in terms of household connection, grid construction, operation cost and maintenance cost, as well as generation and transmission. The study revealed that in rural areas, the cost are normally high due to the fact that the terrain is poor as well as low energy demand due to economic status of rural household which treats electricity as a luxury (Bos, Chaplin & Mamun, 2018). Additionally, the distance of transporting electricity materials over long distances increase the cost as well which hamper rural connectivity, transmission cost related losses are also increased due to household cost of generation and transmission.

In Bangladesh, Khandker, Barnes and Samad (2017) conducted study on estimating the cost of rural electrification using secondary data collected from government performance report. The study found out that estimated power cost per household electrification was high and this may not be sustainable especially to the end users. This study was done in Bangladesh and not in Kenya and it was also not done among SMEs.

Andriamaro *et al.* (2018) examined the consideration in assessing the costs and benefits of any government program as the opportunity cost in the energy sector. The study employed panel data between India and Bangladesh looking at a wide range of government spending on rural electrification as well as many other public utilities. It was shown that any form of expenditure by the government played a role in lowering the rates of poverty. It was shown that spending on improvement of power play a role in lowering rates of poverty in rural areas. However, this study did not cover the SMEs hence the gap.

2.5 Rural Electrification and the Growth of Small and Medium Enterprises

Litzow (2017) conducted a study on the impact of rural electrification in Bhutan. The study employed secondary data collected from survey done by Bhutan on living standards survey. The results revealed that adoption of rural electrification has led to the reduction of fuel consumption. In addition, rural electrification increased employment levels. In the overall, in Bhutan rural electrification indicated a positive success in the period of study showing a positive effect of educational growth and nature preservation as a result it improved rural households. This study did not cover SMEs unlike the focus of the present study.

Kohlin *et al.* (2015) did an evaluation of rural electrification in remotely established regions. It was noted that access to electricity can enhance the level of employment and productivity as well as the levels of income. The study noted existence of lower evidence that electrification enhances the outcomes at firm level. The other far reaching implications of enhancing rural electrification include environmental related concerns include the need to curb pollution. However, this inquiry failed to link rural electrification with SMEs.

Khandker *et al.* (2009) examined the benefits derived from rural electrification. The results revealed that the benefits of electricity range from lighting, which extends the working hours. The main sectors which electricity benefits largely is education, health and agriculture. Lighting provides more reading hours hence improving education, health also benefits since the medical service providers are able to work round the globe to enhance the life saving techniques, in addition to this agriculture can benefit through irrigation schemes which promotes continues productivity and ranges of variety of consumer products. The present study will study will bring out the benefits of electricity for SMEs.

Okefe (2009) conducted a study on the effect of rural electrification on performance of SMEs in Nigeria. The study found out that growth of SMEs was associated with existence and access to modern energy which increased production through expansion of time of work. On the other hand, existence of basic infrastructure also contributed to the same. Growth and productivity of these SMEs was directly linked with increase in infrastructure and cheap and accessible modern power supply. However, slowness of extending this electrification to other parts of Abuja and off-grid resulted to the slow on lack of venture to more productive businesses additionally, regular power

interruptions proved to be an obstacle but many SMEs have opted for other alternative sources of energy to substantiate their production. This study looked at performance; the present study will look at growth of SMEs as the dependent variable.

Ouma (2013) assessed rural electrification and growth of SMEs in Mbita town. The study noted existence of a direct link between rural electrification and firm growth. However, the gap created by this study is that it was conducted in Mbita, Homa Bay County and not Nakuru. Dinkelman (2011) analyzed rural electrification and its implication on employment in the context of South Africa. The study showed that rural electrification increase employment by ensuring women is released from production at the home level to establishment of micro enterprises. Olanrele (2020) analyzed rural electrification and its implication on welfare at the household level in Nigeria. The study noted that a raise in access to electricity grid is associated with an increase in the level of household per capita. Kariuki (2016) examined the role played by rural electrification on performance of micro enterprises operating in Muranga. The study established distance from the market and amount of invested capital have a significant connection with profitability of the enterprises

Many studies indicate that there are several factors that determine the impact of rural electrification on the performance of businesses and these include proper planning, good technological progress, proper monitoring and evaluation, appropriate corrective measures all determine effective rural electrification (Bekker Nanka, 2010; Odhiambo, 2013, Kemausuor *et al.*, 2012; Robert, & Gopalan, 2018)). On the other hand rural electrification increases productivity in any sector from manufacturing and production of modern commodities (Litzow 2017; Kohlin *et al* 2015; Khandker *et al* 2009).

Power interruption has been seen as a setback in performance of SMEs in rural areas which interrupt production since most economic activities in modern economy uses electricity (Mayer and Tasch, 2013; Braimah and Amponsah, 2012; Cissokho and Seck, 2013). Additionally, due to cost electrification has not reached the target hence hampering performance of SMEs in rural areas (Barnes, 2007; Khandker and Samad, 2009; Andriamaro *et al* 2018). Although all these study have indicated mixed outcome, they however have indicated that proper electricity supply enhances performance of SMEs in rural areas.

In Kenya, a study by Mutunga, Were and Ogada (2018) on the evaluation of the challenges hampering vision 2030 found out that lack of proper rural electrification leads to poor performance of poverty alleviation projects. This process of rural electrification has been undergoing monitoring and evaluating on what are the profitable cases of these accessible energy in term of development projects that can be realized by the SMEs in the rural areas (Bagoury, & Yousef, 2018). This process creates employment as well as improving the living standards of the population. Throughout, the government has been evaluating how costs and benefits of this electrification can be measured through profitable variables ranging from SMEs access to electricity to households connected with electricity (Modu *et al* 2018). However, impact of rural electrification on operations of SMEs has also not been evaluated in rural Kenya especially in Nakuru County. Thus, this study is meant to mitigate the Gap. This study adopted quantitative and qualitative techniques to evaluate the impact of rural electrification. This study adopted qualitative technique to gauge the impact of rural electrification.

2.6 Growth of Small and Medium Enterprises

The study conducted by Gupta, Guha and Subramanian (2020) focused on growth of SMEs and the role that internal and external factors play. The review of literature indicates that all SMEs undergo various stages of growth (also called lifecycle). The study observed that all SMEs should start operations, grow and encounter a number of challenges before they get to mature and decline. Meressa (2020) conducted a study on SME growth and the associated growth factors. The focus of the study was on firms in Ethiopia. The study embraced explanatory research design with gathering of information being done through survey questionnaire. The study sampled 220 firms. It emerged from the analysis that growth of SMEs allow them to remain viable and compete in a turbulent environment. The study noted that SME growth enables them to open up more employment opportunities and earn above average industry returns. The study conducted by Kivinda (2018) placed focus on growth of the SMEs and the implication to the development of the economy in Kajiado. The study noted that growth of the SMEs would lead to an improvement in lifestyle, reduce the level of unemployment while reducing the level of poverty. O’Gorman (2001) did an analysis of growth of SMEs and how the same can be sustained. The study noted that growth allow SMEs to effectively compete in a highly concentrated industry.

2.7 Theoretical Framework

The study was guided by the theory of constraint and the theory of the firm. The justification of using these two theories is that while rural electrification as the main independent variable of the study was anchored on theory of constraint, the dependent variable being SME growth was underpinned by the theory of the firm.

2.7.1 Theory of Constraint

The study was anchored on the theory of constraint that was advanced by Goldratt (1984). This theory states that every system must have at least one factor restraining its output (Reason, 2016). A constraint is an action that provides limitation towards performance and thus growth of the firm. The theory holds that there exists at least one constraint that limits the attainment of growth objectives in the firm. Instead of focusing on individual processes and component, the theory advocates for the need to utilize a constraint in a manner that is effective. When a firm focuses on what retards growth and make an improvement on the identified issue, this would result into an improvement in profits and in turn help the firm to achieve growth. Firms including SMEs are viewed as systems having departments that are interconnected and they require steady supply of electricity in order to achieve integration for better growth.

This theory focuses on the weak point of the system in order to establish and improve performance of firms in terms of productivity. Friedman and Phan (2017) employed the theory in checking how in production, constraints can be reduced to enhance efficiency. However, the theory has its own limitation in that it only addresses the current time issues for the business while it fails to solve the long terms issues likely to affect growth of the firm. It checks the actual situation in the current context in short-run period thus not solving long run issues. Thus in case of solving long terms issues a different theory must be employed.

This theory is relevant to this study since it tackles the problem associated with impact for rural electrification and growth of SMEs in rural area which the study is based on. The study analyzed how such issues as cost and power outages act as constraints of rural electrification and how they impact on the growth of the SMEs in Nakuru. This theory argues that by identifying the most relevant constraint, an SME would be in position to address the same issue identified and this is likely to enhance growth.

2.7.2 Theory of the Growth

The proponent of this theory was Penrose (1959) and argues that SMEs are faced with a strong incentive to realize growth. SMEs seek to grow so that they can be in position of creating value from their unused resources that in turn would lead to creation of other new resources. Managers who spent much time reflecting on growth of their SMEs divert their focus and attention from generating greater operating efficiency. However, realization of too much growth above the optimal level would result into a situation where any marginal increase in growth would increase the operating costs in the SMEs. Although growth is associated with economies of scale, fast growing SMEs are associated with higher operating costs relative to the slow growing ones. One of the operating cost that highly growing SMEs are likely to incur is the costs of accessing electricity. Definitely, as the SME grow, more departments are created and coordination between them seamless would require electricity and thus increased costs of power.

Another argument of this theory is that firms require resources in order to realize superior growth. These resources are assumed to have some unique characteristics that rareness, non-substitutability and inimitability (Dierickx & Cool 1989). Example of resources is funds (financial resources) that SME can be examined in order to determine the direction of growth. These weaknesses are also called constraints and have already been discussed in the theory of constraints. Penrose (1959) theorizes that economies of growth and not advantages linked with an increase in size drive and inform the SME to grow.

In the present study, growth of SMEs was the dependent variable. This theory was found relevant as it was used to underpin this variable. According to this theory, excessive growth increases the operating costs in the firm like the cost of accessing electricity. The theory further indicates that SMEs can grow by leveraging the bundle of resources that include finances.

2.8 Definition and Operationalization of Terms

Access to rural electrification: This is the process being connected and utilization of the sources of power in carrying out activities (Kanagawa & Nakata, 2008). In this study, this term is used to refer to the ability of the SMEs to get connection of electricity that is required for day to day running of the business.

Cost of rural electrification: This refers to the costs incurred by the consumers of electricity (KPLC, 2019). The consumers are required to buy electricity tokens so as to utilize power (KPLC, 2020). In this study, this term refers to expenses incurred by the SMEs to benefit from electricity as well as for connection of power by consumers.

Growth of the SMEs: This is the expansion in size of the firm by opening up more branches (Barney, 2001). Just as the living organisms, business also go through stages of birth, they grow, get mature and perhaps die (Gancarczyk & Zabala-Iturriagagoitia, 2015; Chemutai & Omwenga, 2017). In this study, this term refers to creation of jobs, innovation and creation of new products in the firm and all of these would lead to an increase in overall output.

Power Interruptions: Power interruptions are unusual conditions when there is no electric power and it may be caused by technical problems, climatic conditions as well as intentional efforts (Braimah & Amponsah, 2012). In this study, this term refers to frequent blackouts that are occasioned by different factors.

Rural Electrification: This is a paradigm shift in extremely remote areas where electrical power is available for use as opposed to old times when such privileges were limited to urban centers (Litzow, 2017). In this study, this term refers to efforts made to ensure that population living in remote areas have access to electricity as a source of power.

Small and Medium Enterprise are operationalized in terms of number of staff in place, the revenues and the assets owned by the enterprise. In Kenya, SMEs have staff within a range of 1-99 (MSE Act, 2012).

2.9 Conceptual Framework

Figure 2.1 indicates the main independent variable is rural electrification which is represented by power interruption, accessibility to rural electrification and the cost of rural electricity. The dependent variable on the other hand is the growth of SME, represented by three indicators

covering job creation, innovation and creation of new products. This study sought to provide the relationship between power interruption, accessibility to rural electrification and the cost of rural electricity in view of the growth of the SMEs operating in Nakuru town.

The assumption is that rural electrification will lead to the growth of the SMEs which means there will be job creation meaning that the SMEs will employ more people who will be innovative to create more products and thus increase the sales revenues. However, if there is frequent power interruptions it may not have the expected positive results like increased sales revenues. Power interruption would mean lost manpower that would lower the products created by the SMEs which in turn may lower the sales revenues generated. Power interruption would require SMEs to invest in alternative power sources like solar energy or biogas in order to facilitate continuous creation of new products without interruptions. When there is power outage, the risk of burglary would increase that would necessitate insurance costs which would increase the operating expenses and thus a reduction in sales revenues generated.

When rural electrification is accessible to SMEs, more new products would be created thus high growth is likely to arise. If the technicians at KPLC are always available and can be accessed easily, resolving of any electricity related issue and complication like power interruption can easily be done assuring SMEs of steady creation of new products which would be sold to increase the sales revenues generated. Proximity to power grid system would make it easy for SMEs to be connected and it would be less costly which would translate to reduced costs and thus more sales revenues. SMEs those are located close to power grids or near KPLC offices can be easily accessed by the electricity technicians in case of urgent electricity problems that would slow down operations if not urgently addressed. SMEs that is located in areas that have highly developed infrastructures like schools, hospitals, banks as well as boosters enjoy some advantages like quick response to electricity related issue by KPLC staff and thus likely to enjoy rural electrification benefits that would lead to superior growth compared to those SMEs located in remote and under-developed areas.

The cost of rural electricity is treated as operating expenses which can reduce the revenues generated thus slowing down the growth of the SME. High costs of installing electricity can be a hindrance towards uptake and utilization of rural electricity by SMEs. An SME that incur costs to

repair and maintain electric facilities like bulbs enjoy greater benefits of reduced risks of electric shocks which in turn may provide safety assurance to employees to work and generate more sales. Increasing the costs of tokens would create a public outcry and may increase the operating costs to an SME that seeks grow and generate more sales revenues. When the transaction costs of buying electricity tokens are high, some SMEs would even opt not to buy the tokens and this may result to lost manpower in turn reducing the products created.

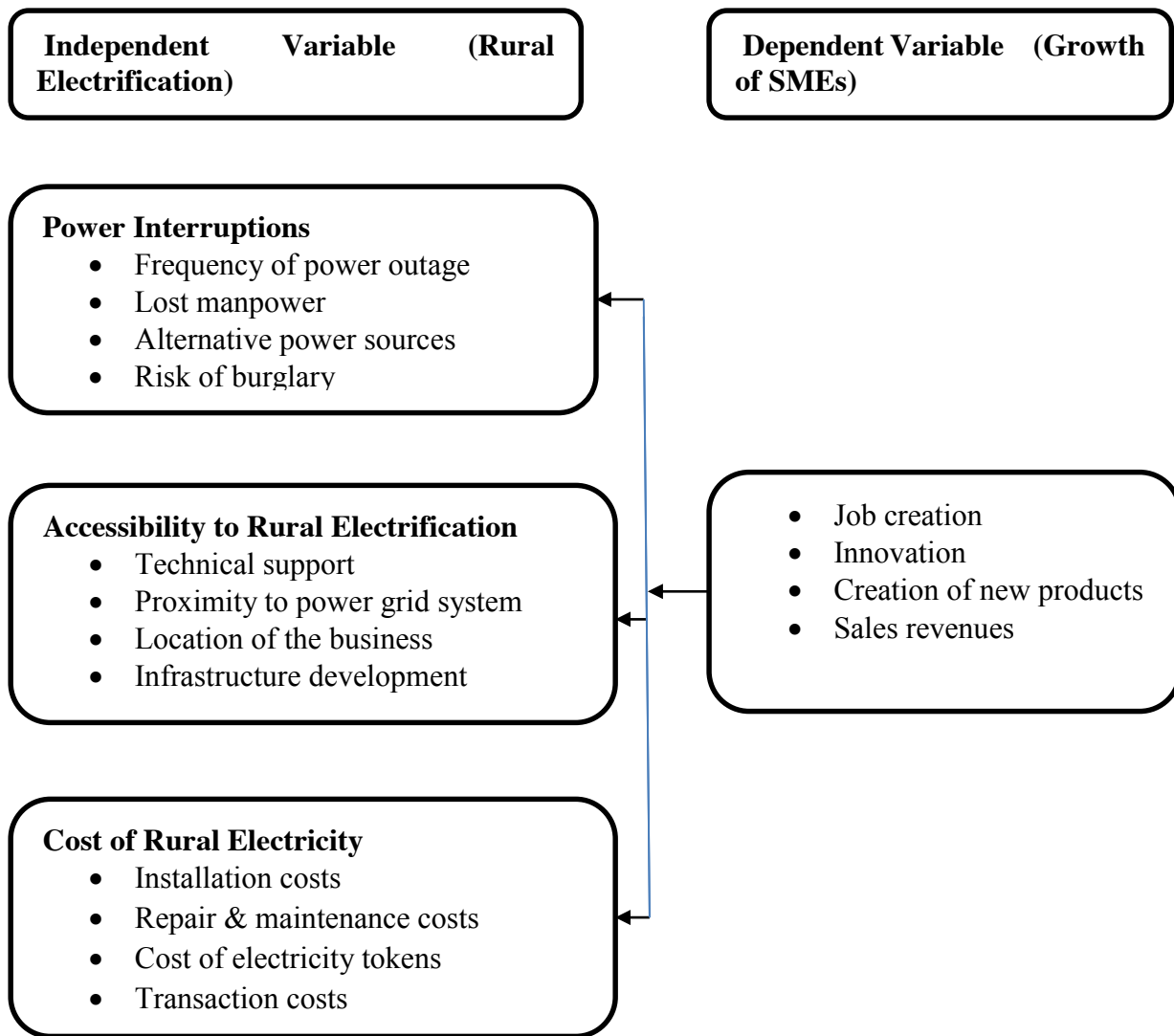


Figure 1: Conceptual Framework

2.10 Research Hypotheses

The study sought to test the following hypotheses:

H₁: Power interruptions have significant effect on the growth of SMEs in Nakuru Town

H₂: Accessibility to rural electrification has significant effect on the growth of SMEs in Nakuru
Town

H₃: Cost of rural electricity has significant effect on the growth of SMEs in Nakuru Town.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The methods and procedures used by the study to the stated objectives are discussed in this chapter. The chapter consists of the following sections; the research design, targeted population, sampling techniques and sample size, data collection and analysis methods.

3.2 Research Design

A research design details the steps which are adhered to by the study so as to actualize the stated objectives (Creswell, 2012). Research design includes the structure and plan that was used in the study in order to answer the research questions. This study was conducted using a descriptive cross-sectional survey. The design was cross sectional because information was collected from respondents at a single point of time. This design is crucial in describing and in defining the concept so as to build a case for or against some issue (Cooper and Schindler, 2003). It also indicates accurate events, profile of people and situations (Kothari, 2000).

3.3 Population of the Study

According to records from the Nakuru County and a survey by Chege, Wanyoike and Kwasira (2014), there were 5000 registered SMEs (Nakuru County survey, 2020) out of which 1000 are located within the Nakuru Town. SMEs can be classified into three sectors: General Trade, Transport and Communications, Agriculture. The study targeted 1000 SMEs as illustrated in Table 3.1 below.

Table 3.1: Target population

Classification of SMEs by sectors	Population
General Trade	394
Transport and Communications	252
Agriculture	354
Total	1000

Source: Nakuru County (2020)

3.4 Sampling Techniques and Sample Size

This study employed stratified random sampling technique, so as to allow selection of items from the target population forming a sample. The rationale of using stratified random sampling is that SMEs from different sectors were homogenous. Efforts were made to subdivide the targeted population into strata for generating sample. The rationale for using stratified random sampling is because it was scientific and it gave an opportunity for every element in the population to be selected.

3.4.1 Sample Size

The sample size of the study was 285 and was determined through the following formula by Yamane (1967):

$$n = N / (1 + Ne^2)$$

n = is the desired sample size (when population is less than 10,000)

N = is the target population

e = is the acceptable margin of error estimated at 0.05 (at 95% confidence interval)

Therefore, sample size (n) = $1000 \div (1 + 1000(0.0025))$

$$= 1000 \div (1+2.5)$$

$$= 1000 \div 3.5$$

$$n = 285 \text{ respondents}$$

This was proportionately allocated based on the population size of each stratum as shown in Table 3.2 below.

Table 3.2. Sample size

Classification of SMEs by sectors	Population	Sample Proportion	Sample size
General Trade	394	$394/1000*100=39.4\%$	$39.4\%*285=112$
Transport and Communications	252	$252/1000*100=25.2\%$	$25.2\%*285=72$
Agriculture	354	$354/1000*100=35.4\%$	$35.4\%*285=101$
Total	1000		285

Source: Nakuru County (2022)

In addition to the respondents in Table 3.2, the study also targeted 2 officials from KPLC and 1 official dealing with SMEs from Nakuru, adding up to 3 KIs. The selection of these KIs was done through purposive sampling.

3.5 Data Collection

Information for the study was gathered in its first hand and auxiliary form. Auxiliary information was sought from journals while firsthand information was collected through the use of a questionnaire and the interview guide. The questionnaire constructed by the researcher was divided into sections in line with the specific objectives. The first section captured the demographics while the second section asked questions on power interruptions. Information on accessibility to rural electrification was captured in third section, information on cost of rural electricity in fourth section and information on growth of SMEs in the fifth section of the questionnaire respectively. The essence of selecting a questionnaire as a tool for gathering information is because it takes less time to gather the information (Owens, 2002). While questionnaire was administered among the respondents drawn from the SMEs, the interviews were administered among 2 officials from KPLC and 1 official dealing with SMEs from Nakuru County. Thus, a total of 3 KIs were interviewed.

3.6 Validity and Reliability of Instruments

Validity and reliability of the questionnaire were determined through a pilot study that was conducted among 10 respondents from SMEs outside Nakuru. These respondents who participated in the pilot study were purposively selected and were excluded from the final study to avoid biasness.

3.6.1 Validity of Instruments

The study tool is said to be valid when it indicates that which it is designed to show. Such a tool seeks to play a role which it was designed to play (Kombo & Tomp, 2006). It is not possible for a study tool to have 100% validity, but greater degree signifies valid tool. The supervisor reviewed the contents on the tool to ensure they are well aligned with the information reviewed in literature.

3.6.2 Reliability of Research Instruments

Reliable tools offer results that are said to be consistent, even after any successive replication (Nanchmias, 2004). Internal measure of consistency Cronbach Alpha coefficients were computed from the piloted to determine reliability of the tool with 0.7 being regarded as the threshold as pointed out in Table 1.4.

Table 3.3: Reliability coefficient

Reliability coefficient value	Interpretation
0.8 and above	Excellent
0.7-0.79	Good
0.6-0.69	Acceptable
0.5-0.59	Poor
below	Unacceptable

Source: Cronbach's α (1951)

Table 3.4 gives evidence

Table 3.4: Reliability Results

Variable	No of Items	Cronbach Alpha Coefficient
Power interruptions	6	.765
Accessibility to rural electrification	5	.859
Cost of rural electricity	5	.753
Growth of SMEs	5	.882
Average		.815

From Table 3.4, the average value of Cronbach Alpha Coefficient is given as 0.815, that of power interruption was 0.765, accessibility to rural electrification had 0.859, cost of rural electricity had 0.753 and growth of SMEs had 0.822. Since all the variables had Cronbach Alpha coefficients above 0.7, it can be deduced that a reliable scale was used in design of the questionnaire.

3.7 Data Analysis

Once data has been gathered from the field, it underwent processing to make it meaningful hence analysis. For the quantitative data, percentages were computed to provide a summary of the findings through SPSS version 24. For drawing of relevant inferences, regression analysis was utilized. Regression is an inferential analytical technique that allows the researcher to draw

inferences in regard to the link between the variables. It is the ideal analytical technique that can be applied in studies that have hypotheses which need to be tested to draw deductions. The key outputs that can be generated from regression analysis include the model summary and the beta coefficients with respective p-values that determine the significance of the variables.

$$PO_t = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon_t$$

Where;

PO_t = Growth of small and medium scale enterprises over time,

β_o = Constant, $\beta_1 + \beta_2 + \beta_3$ = Coefficients of determination of the independent variables,

X_1 = Power Interruption

X_2 = Accessibility to rural electrification

X_3 = Cost of rural electrification

ε = Error term.

For qualitative information, content analysis was utilized during analysis. Presentation of the evidence was supported by Tables.

3.8 Ethical Considerations

To ensure ethical consideration, a letter of approval and all the necessary study authorization documents were secured from the University of Nairobi. Informed consent from every participant was sought before data was collected in case where there is no consent of the respondent, data was not requested. In order to protect the identity and confidentiality of the respondent, they were not required write their names and researchers. Confidentiality was assured to the respondents and maintained throughout the study. The participants in the study were made aware of the procedures and the possible harm of taking part in the inquiry in advance before being administered with the study tools. Those who objected were free to be excluded from taking part in the study. All the information obtained through the review of literature from

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter analyzes, presents and discusses the findings of the study. The chapter is divided into the following sections: response rate, demographic information, descriptive statistics and regression results.

4.2 Response Rate

A total of 285 questionnaires were administered to owners of SMEs in Nakuru town out of which 205 were dully filled and returned. This was equivalent to a response rate of 71.9%. This response rate is considered adequate in line with Babbie (2010) who observed that an above 70% response rate is good for analysis and presentation of the results in a research study. The researcher had also purposed to interview three personnel. One from Kenya Power, and one from County Government and one SMEs representative, out of which the three were interviewed hence 100% response.

4.3 Demographic Information

The study gathered demographic information of the respondents concerning their gender, level of education, position held and years of operation of the enterprises. The results are presented in Tables 4.1- 4.4.

Table 4.1: Distribution of Respondents by Gender

	Frequency	Percent
Male	160	78.0
Female	45	22.0
Total	205	100.0

Source: Author (2022)

While 78% of the respondents were male, only 22% were female. This implies that h there are more male than females probably because of differences in possession of capital needed to start the SMEs.

Table 4.2: Level of Education of Respondents

	Frequency	Percent
No formal education	6	2.9
Primary education	12	5.9
Secondary certificate	23	11.2
College certificate & diploma	78	38.0
Bachelors	63	30.7
Masters	23	11.2
Total	205	100.0

Source: Author (2022)

The findings in Table 4.2 indicate that while 38% of the respondents had college certificates, 30.7% had degrees, 11.2% had secondary certificates, 11.2% others had masters, 5.9% had primary education and 2.9% had no formal education. This implies that respondents who took part in the study were educated and had an understanding of the rural electrification and its implication on growth of their firms. It also implies that the SMEs attracted people of all levels of education.

Table 4.3: Position held by Respondents

	Frequency	Percent
Manager	83	40.5
Owner	122	59.5
Total	205	100.0

Source: Author (2022)

The findings in Table 4.3 show that while 59.5% of the respondents were owners of their firms, 40.5% were managers who had been employed to manage the business. This implies that they were in direct control and management of their respective and this allowed them to gain in-depth understanding of the issues the firms faced like power interruptions and the costs of rural electrification among other issues like power outages, which were central in the present study.

Table 4.4: Years of Experience

	Frequency	Percent
Less than 5 years	6	2.9
6-10 years	23	11.2
11-15 years	47	22.9
16-20 years	102	49.8
Over 20 years	27	13.2
Total	205	100.0

Source: Author (2022)

Table 4.4 indicates that while 49.8% of the studied SMEs had been in operation for 16-20 years, 22.9% for 11-15 years, and 13.2% for over 20 years, 11.2% for 6-10 years and 2.9% for less than 5 years. This means that the SMEs that were covered had been in operation for a significant period of time. The longer these SMEs have been in existence, the more likely it is that they can assess the impact of power interruptions on their growth.

4.4 Descriptive Statistics

The subsequent sections are set out to detail the findings of descriptive statistics guided by frequencies on the objective variables of the study.

4.4.1 Power Interruptions and the Growth of Small and Medium Enterprises

The study sought to determine the incidences and frequency of power interruptions and the findings were determined and summarized as shown in Table 4.5.

Table 4.5: Incidences and Frequency of Power Interruption

		Frequency	Percentage
Has your firm ever experienced power outage since it started the operations?	Yes	142	69.3
	No	63	30.7
If yes in question, how frequently do these power outages occur?	Hardly	12	8.3
	At time	43	30.7
	Frequently	87	61.0

Source: Author (2022)

From Table 4.5, respondents were requested to indicate if their firm had ever experienced power outage since it started the operations. The findings indicated that 69.3% of the respondents indeed agreed that they had experienced power interruptions at some point. The implication of power interruption is the business' daily operations were affected through lost man-hours and consequently loss of profits. However, 30.7% others disagreed. An interview with a representative from KPLC confirmed that indeed, several incidences of power outages had been reported and effectively handled by the available technicians.

The study probed further to understand the frequency at which the power outages occurred. From the findings, 61% of the respondents indicated that power interruptions occurred most frequently. This means that the daily operations of the studied firms were interrupted frequently because of constant power outages which contributed towards reduced productivity. A follow up with the KPLC representative through an interview indicated that there were additional factors beyond their control that contributed towards frequent power outages i.e. severe weather – high winds, lightning, rain or flooding. During a storm, power poles are vulnerable to lightning strikes while strong winds can snap off tree branches and down power lines. Another cause of frequent power interruption is the persistent earthquakes in the Rift Valley region that greatly contributed to power loss.

Table 4.6: Perceptions of Respondents on Power interruptions

	strong disagree	disagree	neutral	agree	strongly agree
The frequent power outages affect the daily sales revenue generated by your business	0.0%	6.3%	15.6%	72.2%	5.9%
Power outage is a frequent challenge to your business	2.4%	17.6%	15.6%	40%	24.4%
There is lost man-hours in your business whenever there is power interruption	0.0%	15.1%	8.8%	66.3%	9.8%
The lost man-hours is a loss to your business	0.0%	3.4%	25.4%	58.5%	12.7%
The firm has incurred an additional cost of investing in alternative sources of power	0.0%	2%	17.1%	66.8%	14.1%
The risk of burglary may increase whenever there is power interruption	0.0%	21.5%	9.3%	64.4%	4.9%

Source: Author (2022)

The findings in Table 4.6 indicate that a majority at 78.1% of the respondents agreed that frequent power outages affected the daily sales revenue generated by their businesses, 15.6% were neutral, and 6.3% disagreed. When there is power interruption, the operations of most of the SMEs like Cybercafés, welding sector, poultry keeping that require electricity as the primary source of power are adversely affected. This in turn affects their daily revenues and negatively impact expected growth of the businesses. These findings were reinforced by the views shared by the KI from the County Government of Nakuru who observed that the revenues generated by the SMEs in the County had not been stable because of the fluctuation in tax revenues that were collected and this was attributed to an interplay of a complex of factors power interruption being one of them. This means that power interruption affected the sales revenues generated by the SMEs that in turn impacted on tax revenues collected by the county government. This finding is supported by Mayer and Tasch (2013) who in their study asserted that SMEs mostly rely on the usage of electricity especially the manufacturing sector and thus power outage can immensely affect their operations. This is further supported by Cissokho and Seck (2013) who established that power outage depicted an inverse effect on productivity of SMEs. A study by Velasquez & Pichler (2010) also asserted that sufficient energy supplies have a significant influence on economic operations of SMEs. This is especially true in the manufacturing sector which consumes about 15% of electricity annually (Energy Regulatory Commission, 2006).

On whether power outage was a frequent challenge to the businesses, 64.4% of the respondents were in agreement 17.6% disagreed while 2.4% strongly disagreed. This means that power outage occurred frequently and it adversely affected the operations of the studied firms. The responses from the KI from the County Government of Nakuru indicated that in most surveys that had been conducted among the SMEs at the County level, frequent power outages had been reported as among the top challenge that these businesses faced and which impacted negatively on their viability. The response from the KPLC officer from the interview similarly showed that power outage had frequently reported by customers in the region and the technicians handled the same. The finding is corroborated by Braimah and Amponsah (2012) who conducted a qualitative survey on the effect of power blackout on performance of SMEs in Kumasi metropolis and observed that on average in Kumasi Metropolis the power blackout last for more than 10 hours in a month.

On lost man hours, 66.3% of the respondents were in agreement that there was lost man-hours in their business whenever there was power interruption, 15.1% disagreed, 9.8% strongly agreed and 8.8% were neutral. This implies that power interruption contributed to reduced productivity because no activity is undertaken when electricity was not available. An SME representative interviewed shared that in deed, power outage and interruption disrupted the normal daily operations of the enterprises and the persistence of the situation for a long period of time like for instance a day could mean employees staying idle thus increasing the lost hours that could otherwise have been utilized productively for better performance of the businesses. This finding is supported by Khandker (2017) who shared that lighting provides more reading hours hence improving education, the health sector also benefits since the medical service providers are able to work round the clock and use lifesaving technologies.

On whether the said lost man-hours was a loss to the business, 58.5% of the respondents agreed, 25.4% were neutral, 12.7% strongly agreed and 3.4% disagreed. This means that power interruption contributed towards lost man-hours that in terms increased the expenses incurred by the studied firms. This perhaps contributed to missing targets and the SMEs also paid people who had not actually worked. These findings were echoed by one KI who shared that lost man hours occasioned by power interruptions increased the losses of the businesses and this trickled down to reduction in the tax revenue that was collected at the County level. The finding is consistent with Barnes and Samad (2009) who indicated that lighting provides more reading hours to allow businesses to increase their marginal revenues as a result of operating for an additional hours.

The study noted that 66.8% of the respondents shared that their firm had incurred an additional cost of investing in alternative sources of power, 17.1% were neutral, 14.1% strongly agreed while 2% disagreed. Some of these alternative sources of energy included solar energies and generators that are driven by diesel. Thus, the frequent power interruptions increased the costs in the firm. When there is an interruption or outage of power, the businesses are compelled to look of alternative sources in order to meet their required quotas of production. This finding is supported by Braimah and Amponsah (2012) who noted that power blackout result to 44% of the total SMEs not in being in operation while 56% seek alternative sources of power to continue with their operations costing more than 15.5 million per month to run.

On whether the risk of burglary increased whenever there was power interruption, a majority at of the respondents at 64.4% agreed, 21.5% disagreed, 9.3% were neutral and 4.9% strongly agreed. This implies that power interruptions increased security concerns that perhaps forced most businesses to close off early because chances of robbery were high. This finding is supported by the views shared by the KI who noted that a number of cases of burglary had been reported by some owners of the small businesses in Nakuru and that the County Policing Authority was working on a relevant strategy to counter the same. The KI further disclosed that several areas within the County had been lightened up and relevant security measures like CCTV camera had been installed in some urban centers within the county to reduce these incidences of burglary which mainly occur during outages, therefore reversing the gains already achieved. According to Bos, Chaplin and Mamun (2018), people use electricity to light up their homes, streets and homes help to counter burglary and other criminal activities.

4.4.2 Accessibility to Rural Electrification and the Growth of Small and Medium Enterprises

Table 4.7 is a summary of the perceptions of respondents on accessibility to rural electrification.

Table 4.7: Perceptions of Respondents on Accessibility to Rural Electrification on SMEs growth

	strong disagree	disagree	neutral	agree	strongly agree
Your business is closely located to the power grid system	0.0%	16.1%	16.6%	58.5%	8.8%
Your business can easily access KPLC offices for connection and technical support	0.0%	56.1%	10.7%	13.7%	19.5%
It is easy for your business to access KPLC technicians whenever there are electrical concerns	0.0%	57.1%	25.9%	3.9%	13.2%
Location of this business is easily accessible	0.0%	1.5%	34.6%	42%	22%
The existing road network allow for easy access to your business	0.0%	27.8%	2.4%	60%	9.8%

Source: Author (2022)

The study sought to establish if the businesses were closely located to the power grid system and how this affected accessibility to rural electrification. From the results, 58.5% of the respondents agreed, 16.6% were neutral, 16.1% disagreed while 8.8% strongly agreed. The advantage that comes with close proximity of the business to power grid is reduction in costs of initial installation of electricity to the business premises. Electricity connection of business that is located near the grid is far cheaper as compared to businesses that are located far away from the grid. An interview with a KPLC officer indicated that although close location of the business to power grids was beneficial in terms of reduced installation costs, the dangers are evident in the event that the grid collapses, the premises could greatly be affected.

On whether it was is easy for businesses to access KPLC technicians whenever there were electrical issues, 57.1% of the respondents disagreed, and 25.9% were neutral, 13.2% strongly agreed and 3.9% agreed. A majority of 70.3% indicated that KPLC technicians were not easily available whenever the businesses faced electricity related issues. This finding was confirmed by the responses from the KI from KPLC who admitted that one key challenge that the corporation faced was inadequate number of technicians to meet the growing demands of services in the entire County. Due to the inadequate capacity of technicians at KPLC, scheduling was done and this explained why there are inordinate delays in responding electricity problem faced by the consumers in some areas. According to the KI, further delays were due to logistical arrangement to transport equipment or spare parts outside the country or from the headquarter in Nairobi which involves a lot of bureaucracy.

The findings on whether the businesses could easily access KPLC offices for connection and technical support were that 56.1% of the respondents disagreed, 19.5% strongly disagreed, 13.7% agreed and 10.7% were neutral. This implies that some of the businesses were located in remote and rural areas away from urban centers where KPLC offices cannot be accessed. The responses from the KI were that there was a regional KPLC office in Nakuru that served the entire region. As such, the KI observed that it would be hard for the customers in remote areas to access the office due to the long distance and the travel expenses involved. The KI however disclosed that to deal with the challenge of physical access to the KPLC offices in Nakuru, additional measures had been in place to adopt social media platforms like Facebook and Twitter besides the email address where customers could channel their inquiries for the desired response. These findings are

consistent with Riva et al., (2018) who did an inquiry into access to electricity and its link with development in the rural areas and showed that electricity use is highly unified and connected through complicated cause effect links with many decision makers

On whether the location of the business was easily accessible, 42% of respondents were in agreement, 34.6% were neutral, 22% strongly agreed while 1.5% disagreed. This implies that whenever there was a power related challenge in the business premises, the technicians could easily access the enterprises for carrying out desirable corrective action to restore power. The findings from the interview with an SME representative pointed out that indeed, most of the businesses that had been registered with the County were accessible and it was easy to monitor their operations and obtain tax revenues from them. The KI further disclosed that inaccessible businesses were mostly unregistered and were mostly running underground operations in informal sectors. Dufe (2015) did a study on key factors that inform the accessibility of rural electrification in Kenyan setting and noted that there was no continuous undertaking of monitoring process.

The findings on whether the existing road network allowed for easy access to the businesses indicated that 60% of the respondents agreed, 27.8% disagreed, 9.8% strongly agreed and 2.4% were neutral. This means that the businesses under consideration could easily be accessed by the parties concerned with electricity like technicians just in case there was a technical challenge. The KI from the County reported that efforts had been made to improve the existing road networks by the Ministry of Public Works at the County level. According to the KI, improving the road network by maintaining and creating new ones by the County of Nakuru was meant to open up the remote areas and increase access to market so as to spur trade. These findings are in line with those of George and Bahaj (2019) who observed that access to electricity lead to an increase in average income of the households and business activities.

4.4.3 Cost of Rural Electricity and the Growth of Small and Medium Enterprises

The findings of descriptive statistics on cost of rural electricity were determined and summarized as shown in Table 4.8.

Table 4.8: Perceptions of Respondents on Cost of Rural Electricity

	strong disagree	disagree	neutral	agree	strongly agree
It is costly to install electricity	0.0%	14.6%	8.8%	66.8%	9.8%
This business incurs costs in repairing electric machines	0.0%	3.4%	26.3%	57.6%	12.7%
This business incurs some costs to maintain steady supply of electricity	0.0%	2%	17.1%	66.3%	14.6%
Electricity has led to reduction of operation cost	0.0%	21.5%	8.3%	66.3%	3.9%
The electricity bill is high	0.0%	14.6%	10.2%	59%	16.1%

Source: Author (2022)

The findings in Table 4.8 indicate that 66.8% of the respondents agreed that it costly to install electricity, 14.6% disagreed, 9.8% strongly agreed and 8.8% were neutral. This means that the studied businesses incurred significantly costs when installing electricity. In other words, the installation of electricity required a significant amount of outlay on the side of the businesses. A follow up with a KPLC officer through interview showed that in deed it was expensive to install electricity and especially for small startup business. The key informant observed that for rented businesses, these initial costs of installing electricity will have already been borne by the landlord but the same is passed down to the business owner who bear the subsequent burden who will then pass the same to the final consumers. These findings are supported by Robert and Gopalan (2018) in the study of rural electrification who indicated that rural electrification involves costs in terms of household connection, grid construction, operation cost and maintenance cost, as well as generation and transmission.

Regarding the costs of repairing electrical machines, 57.6% of the respondents agreed that their businesses incurred costs in repairing electric machines, 23.6% were neutral, 12.7% strongly agreed and 3.4% disagreed. An interview with a KPLC officer indicated some of parts of electric machines to that may need repairs or replacing include meter boxes, switches, bulbs and cables wires that may be faulty. The KI reported that buying these assorted equipment attract significant

amount of money on the side of the business which was an additional expense. This finding is supported by Andriamaro et al. (2018) who examined the consideration in assessing the costs and benefits of any government program as the opportunity cost in the energy sector as opposed another sector and observed that spending on improvement of power play a role in lowering rates of poverty in rural areas.

As to whether the business incurred some costs to maintain steady supply of electricity, 66.3% of the respondents agreed, and 17.1% were neutral, 14.6% strongly agreed and 2% disagreed. In some areas, there are well trained but unemployed electrical technicians who play an instrumental role in the society whenever there is a power outage that they can easily handle for the well-being of the community. In doing so, they get some fee from the businesses that work collectively together and this could explain some of the costs that the SMEs incurred in maintaining steady supply of electricity. An interview with a KPLC officer indicated another possible cost incurred by the businesses in maintaining a steady supply of electricity as the time that are wasted whenever there was maintenance of the power grid system by the KPLC staff. The KI observed that during such an exercise, electricity had to be switched off intentionally for the period the exercise will take place up to completion and this represented lost man-hour and revenues to the businesses. The result is supported by Bos, Chaplin and Mamun (2018) who shared that in rural areas, the cost are normally high due to the fact that the terrain is poor as well as low energy demand due to economic status of rural household which treats electricity as a luxury.

As to whether electricity had led to a reduction in operation cost, 66.3% of the respondents agreed that electricity had led to reduction of operation cost, 21.5% disagreed, 8.3% were neutral and 3.9% agreed. The possible explanation of this observation could be the fact that electricity allows the businesses to adopt automation of processes and activities executed on a daily basis. The advantage of automating processes among the businesses is that it reduces the number of staff which in turn translates to reduced wage bill which is an operational cost to the business. Several activities that can be handled by various employees can simultaneously be executed through automated devices in place. Similarly, automation allows the businesses to realize mass production of standardized products and services of similar quality. This go a long way to improving the quality of products and services in place reducing the defect rates and the costs of reworking the defects. The result contradicts Bos et al. (2018) who shared that in rural areas, costs of electricity

are normally high due to economic status of rural household which treats electricity as a luxury. The finding is further supported by Pattanayak (2017) who shared that electricity can enable the use of electric tools and machinery and increase operation hours and hence improve efficient and productivity.

The results on whether electricity bills were high indicated that 59% of the respondents agreed, 16.1% strongly agreed, 14.6% disagreed and 10.2% were neutral. This means that the businesses incurred huge amount of expenses in payment of electricity bills. It also implies that in as much as electricity contributed to a significant reduction in operating expenses of the studied businesses, itself was an operating cost. This therefore implies that the spillover-effect from reduced operating expenses that come with installation of electricity outweigh the costs that the businesses incur in terms of electricity bills. However, this is possible when the business is operating above the breakeven point and when all other operating expenses have been minimized. The finding is consistent with Khandker et al. (2017) who conducted study on estimating the cost of rural electrification using secondary data collected from government performance report and found out that estimating power cost per household electrification was high and this may not be sustainable especially to the end users.

4.5 Regression Results

Regression analysis is an inferential statistical method that provides insights on testing of hypotheses that help to draw relevant inferences (Yin, 2017). In this study, regression analysis was performed to draw inferences on rural electrification and their elements (power interruptions, accessibility to rural electrification and cost of rural electricity) with emphasis on how they affect the growth of SMEs in Nakuru. The results were determined and summarized as shown in Table 4.9.

Table 4.9: Summary of Regression Results

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	9.948	1.880		5.292	.000
Power interruptions	-.490	.100	-.713	-4.900	.000
Accessibility to rural electrification	.137	.053	.127	2.585	.011
Cost of rural electricity	-.128	.035	-.038	-3.657	.023
R=.760	R²=.577	Adj. R²=.571			

Source: Author (2022)

The findings in Table 4.9 show that 57.7% variation in the growth of SMEs in Nakuru is explained by variation in rural electrification ($R^2=0.577$). The implication of this finding is that rural electrification is an instrumental undertaking that potentially drive the growth of SMEs. This finding is consistent with Litzow (2017) who conducted a study on the impact of rural electrification in Bhutan and revealed that adoption of rural electrification has led to the reduction of fuels consumption among businesses which translated to positive outcomes in terms of growth. Kohlin *et al.* (2015) did an evaluation of rural electrification in remotely established regions. It was noted that access to electricity can enhance the level of employment and productivity as well as the levels of income and noted existence of lower evidence that electrification enhances the outcomes at firm level. Khandker *et al.* (2009) examined the benefits derived from rural electrification and revealed that the benefits of electricity range from lighting, which extends the working hours. The main sectors which electricity benefits largely is education, health and agriculture. Okefe (2009) conducted a study on the effect of rural electrification on performance of SMEs in Nigeria and found out that growth of SMEs was associated with existence and access to modern energy which increased production through expansion of time of work. Ouma (2013) assessed rural electrification and growth of SMEs in Mbita town. The study noted existence of a direct link between rural electrification and firm growth. However, the gap created by this study is that it was conducted in Mbita, Homa Bay County that has a smaller population and fewer SMEs unlike Nakuru, which is one of the fastest growing town with high population, higher number of

registered SMEs, good infrastructure and is situated on Northern-Highway Transport Corridor leading to neighboring Countries. According to Kenya Manufacturers Association (KMA 2021), on average Nakuru County came third at a score of 35.14 percent in enhancing the business environment for MSEs after Nairobi at (65.33%) and Nyandarua at (40.48%).

Dinkelman (2011) analyzed rural electrification and its implication on employment in the context of South Africa. The study showed that rural electrification increase employment by ensuring women is released from production at the home level to establishment⁶ of micro enterprises. Olanrele (2020) analyzed rural electrification and its implication on welfare at the household level in Nigeria. The study noted that a raise in access to electricity grid is associated with an increase in the level of household per capita. Kariuki (2016) examined the role played by rural electrification on performance of micro enterprises operating in Muranga. The study established distance from the market and amount of invested capital have a significant connection with profitability of the enterprises

The first objective of the study was set out to establish the effect of power interruptions on the growth of SMEs in Nakuru Town. The findings from Table 4.9 on this objective are as follows; ($\beta = -0.490, p < 0.05$), this means that power interruptions are significant predictors of growth of SMEs in Nakuru Town. The relationship between power interruptions and growth of the SMEs in Nakuru Town was negative; this means that an increase in power interrupts retards the growth of the businesses. It means that frequent power interruption lead to losses in the businesses which would in turn slow down the pace of growth. The finding concur with Mayer and Tasch (2013) who studied the effect of power outage on performance of SMEs asserted that SMEs mostly rely on the usage of electricity especially the manufacturing sector and noted that power outage can immensely affect their operations. Braimah and Amponsah (2012) conducted a qualitative survey on the effect of power blackout on performance of SMEs in Kumasi metropolis. It was realized that these blackouts negatively affected the operations of these SMEs reducing their productivity hence reduction of profits. A study by Cissokho and Seck (2013) on the study of effect of power outage on performance of economic activities, found out that power outage depicted an inverse effect on productivity of SMEs, which is measured through efficiency of SMEs. Khatib (2006) conducted a study of effect of unreliable electricity on performance of SMEs in Kibera, Kenya and revealed that lack of reliable supply of power can proof to be an impediment to sustainable

economic growth and development of any country. Taiwo and Olufunke (2018) examined the effect of power interruption and performance of SMEs and revealed that quality electricity influenced performance of SMEs by above 50% in their financial performance as well as nonfinancial performance.

The established results as per this objective indicated a beta coefficient and p-value as ($\beta=0.137$, $p<0.05$), which infer that accessibility to rural electrification has significant effect on growth of the SMEs. In fact, the beta coefficient is positive, implying that any improvement or increase in access to rural electrification allow SMEs to effectively and efficiently carry out their daily operations to realize positive outcomes in terms of sales revenues which contributed to their growth in the long run. Thus, access to electricity is an instrumental undertaking that SMEs need in order to spur their growth potential. George, George and Bahaj (2019) did an analysis of rural electrification and its role as far as entrepreneurship is concerned and observed that access to electricity lead to an increase in average income of the households and business activities. The inquiry observed that women led businesses benefit more from access to electricity as compared to those owned by men

The focus of the study was to determine the effect of the cost of rural electricity on growth of SMEs in Nakuru Town. The findings of beta coefficients and p-values on this objective were ($\beta=-.128$, $p<0.05$), this implies that the cost of rural electricity has significant effect on the growth of the SMEs. The beta coefficient in this case was negative; an implication that any increase in the cost of rural electricity is an expense on the side of the business which erodes the amount of profits generated and may ultimately create losses to the businesses. Thus, better performance outcomes at SME level are realized when the costs of rural electricity are contained. The result concur with Khandker, Barnes and Samad (2017) who conducted study on estimating the cost of rural electrification using secondary data collected from government performance report and found out that estimating power cost per household electrification was high and this may not be sustainable especially to the end users. Short (2015) used a case of Vietnam to explore the effects that arise from access and use of electricity in a rural setting and identified two key challenges that hindered the rural areas from productive utilization of electricity; these were inadequate knowledge on potential uses of electricity and affordability.

4.6 Conclusion

Taking into consideration of descriptive statistics, on power interruptions 78.1% of the respondents agreed that frequent power outages affected the daily sales revenue generated by their businesses, 15.6% were neutral, and 6.3% disagreed. Key finding on accessibility to rural electrification was that 70.3% indicated that KPLC technicians were not easily available whenever the businesses faced electricity related issues. On cost of rural electricity, it emerged from descriptive statistics that 66.8% of the respondents agreed that it costly to install electricity, 14.6% disagreed, 9.8% strongly agreed and 8.8% were neutral. In regard to regression analysis, it was noted that 57.7% variation in the growth of SMEs in Nakuru is explained by variation in rural electrification ($R^2=0.577$).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the analyzed findings gives conclusions as guided by the key results and makes recommendations for policy and further research.

5.2 Summary of the Findings

From descriptive statistics, the study noted that there was power interruption on a frequent basis. Frequent power outages affected the daily sales revenue generated by their businesses as the SMEs had incurred additional costs of investing in alternative sources of power. The results further showed that there were lost man-hours in their business whenever there was power interruption which was a loss to the businesses. The risk of burglary increased whenever there was power interruption. The findings of regression analysis were that power interruptions are significant predictors of growth of SMEs in Nakuru Town. The relationship between power interruptions and growth of the SMEs in Nakuru Town was negative; this means that an increase in power interrupts retards the growth of the businesses. It means that frequent power interruption lead to losses in the businesses which would in turn slow down the pace of growth.

The results of descriptive statistics pointed out that the existing road network allowed for easy access to the businesses and majority of the businesses were closely located to the power grid system. It emerged that it was not easy for many of the businesses access technicians whenever there were electrical concerns which led to delays in productions and consequence reduction in revenue. It was also a challenge to access KPLC offices for technical support due to the long distance involved. However, to address the challenge, KPLC had introduced social media platforms like Facebook and Twitter besides the email address where customers could channel their inquiries. The established results from regression analysis as per this objective indicated that accessibility to rural electrification has significant effect on growth of the SMEs. In fact, the beta coefficient is positive, implying that any improvement or increase in access to rural electrification allow SMEs to effectively and efficiently carry out their daily operations to realize positive outcomes in terms of sales revenues which contributed to their growth in the long run.

The findings of descriptive statistics indicated that it costly to install electricity due to the necessary wiring and fixtures. It was also established that the high cost of installation and costs of maintaining steady supply of electricity can negatively affect the growth of the businesses. It was noted that electricity bills were high and that the businesses incurred costs in repairing electric machines. Cost of rural electricity has significant effect on the growth of the SMEs. The beta coefficient in this case was negative; an implication that any increase in the cost of rural electricity is an expense on the side of the business which erodes the amount of profits generated and may ultimately create losses to the businesses.

5.3 Conclusion

The overall conclusion from the results is that rural electrification is a key driver of growth of SMEs. However, the positive effects of rural electrification are eroded by the frequent power interruptions and outages experienced. These frequent power interruptions negatively affect the businesses due to the reduction in the daily production and sales revenue generated by the businesses. Whenever there are interruptions sometimes the businesses incur additional costs of investing in alternative sources of power. Other cost is in lost man-hours because employees work is interrupted. Power interruption also comes with security risks forcing the businesses to invest in more security. Power interruptions are significant predictors of growth of SMEs. Thus, frequent power interruption lead to losses in the businesses which would in turn slow down the pace of growth.

Accessibility to rural electrification is a challenge to the SMEs because not all business are located to the power grid system near a good road network. It was also established that it is not easy for businesses to access KPLC offices for technical support whenever there are electrical concerns, a problem that has been blamed on inadequate manpower and poor work plan by the KPLC. Accessibility to rural electrification has significant effect on growth of the SMEs. Any improvement or increase in access to rural electrification would allow SMEs to effectively and efficiently carry out their daily operations to realize positive outcomes in terms of sales revenues which contributed to their growth in the long run.

Rural electrification has many benefits including the reduction of the operation costs. However, these benefits can be negated by the high costs of installing and maintaining the power supply.

Besides the high electricity bills businesses incur costs in repairing electric machines. The cost of rural electricity has significant effect on the growth of the SMEs. Thus, any increase in the cost of rural electricity is an expense on the side of the business which erodes the amount of profits generated and may ultimately create losses to the businesses.

5.4 Recommendations for Policy

The study suggests the following recommendations:

- i. SME managers and owners should adopt alternative sources of energy like solar power that complete electricity so that they sustain operations even after power outage
- ii. Kenya Power and Lightning Company officers in Nakuru County should monitor the frequent power interruptions in the region and establish the major root causes so that appropriate response measures are undertaken to mitigate this challenge
- iii. The County Policing Authority in Nakuru County should work closely with local administration to prevent incidences of burglary after power interruptions especially at night. Providing adequate security coupled with steady supply of electricity would allow small businesses to extend the working hours and thus increasing their marginal revenues generated.
- iv. The regional managers of KPLC in Nakuru branch should ensure there are adequate technicians who can easily be accessed and deployed in case there are power related issues.
- v. There is need to expand and extent the KPLC presence in some remote areas to allow business owners to easily access their officers whenever there are power related issues.
- vi. The government of Kenya should come in and implement the directive of subsidizing the cost of electricity and ensure the same has been fully implemented. Continuous monitoring should be in place to this directive in place so that business owners do not incur the high costs of electricity bills.

5.5 Suggestions for Further Research

Future studies should explore additional factors that have a direct and significantly bearing on growth of these firms. Besides growth, the focus of further studies should be on other constructs like performance or even competitive advantage. This would provide the basis for comparison of the field for expansion of the existing literature.

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APPENDICES

Appendix I: Questionnaire

My name is Charles ~~Lagat Kipkurui~~, a student at the University of Nairobi Pursuing MPA. I am currently undertaking a research study titled **EFFECTS OF RURAL ELECTRIFICATION ON THE GROWTH OF SMALL AND MEDIUM ENTREPRISES: A CASE OF NAKURU TOWN**. You will be one of the respondents in this research study and any information you will share will be treated with high level of confidentiality. Feel free to contact me in case of further concerns with my details below. Thank you.

Regards,

Charles Lagat Kipkurui,

0720266466



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16 / 6 / 2022

TO WHOM IT MAY CONCERN

AUTHORIZATION TO CONDUCT FIELD RESEARCH

This is to confirm that Charles Lagat Kipkurui of Registration Number (C51/74979/2014) is a bonafide student in the Department of Political Science and Public Administration, University of Nairobi.

Charles is pursuing a Degree in Master of Public Administration. He is researching on, "Effects of Rural Electrification on the Growth of Small and Medium Enterprises: A Case of Nakuru Town".

He has successfully completed the first part of his studies (Course Work) and is hereby authorized to proceed to conduct Field Research. This shall enable the student to collect relevant data for his academic work.

It is against this background that the Department of Political Science and Public Administration, University of Nairobi requests your assistance in enabling the student to collect relevant academic data. The information obtained shall be used specifically and only for academic purpose.

The student is expected to abide by your regulations and the ethics that this exercise demands. In case of any clarification, please feel free to contact the undersigned.

Thank you.



Professor Fred Jonyo (PhD, Makerere)
Chairman,
Department of Political Science and Public Administration,
UNIVERSITY OF NAIROBI

SECTION A: GENERAL INFORMATION

1. Kindly indicate your gender

Male () Female ()

2. Kindly indicate your highest level of education

No formal education () Primary education () Secondary certificate () College certificate & diploma () Degree () Masters () other ()

3. Kindly indicate the position you hold in this business

Manager () Owner () Other..... Specify

4. Kindly indicate the number of years your business has been in operation

Less than 5 years () 6-10 years () 11-15 years () 16-20 years () Over 20 years ()

SECTION B: POWER INTERRUPTIONS AND GROWTH OF SMES

5. Has your firm ever experienced power outage since it started the operations?

Yes ()

No ()

6. If yes in question 5 above, how frequently does these power outages occur?

Hardly ()

At time ()

Frequently ()

7. Given below are statements on power interruptions. Kindly indicate your extent of agreement with these statements as far as growth of your business is concerned. Use the scale of 1-5, where 1=strong disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree

	1	2	3	4	5
The frequent power outages affect the daily sales revenue generated by your business					
Power outage is a frequent challenge to your business					
There is lost man-hours in your business whenever there is power interruption					
The lost man-hours is a loss to your business					
The firm has incurred an additional cost of investing in alternative sources of power					
The risk of burglary may increase whenever there is power interruption					

SECTION C: ACCESSIBILITY TO RURAL ELECTRIFICATION AND GROWTH OF SMES

6. Given below are statements on accessibility to rural electrification. Kindly indicate your agreement with these statements as far as growth of your business is concerned. Use the scale of 1-5, where 1=strong disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree

	1	2	3	4	5
It is easy for your business to access technicians whenever there are electrical concerns					
It is easy for your business to access technicians whenever there are electrical concerns					
Your business is closely located to the power grid system					
Location of this business is accessible					
The existing road network allow for easy access to your business					

SECTION D: COST OF RURAL ELECTRICITY AND GROWTH OF SMES

7. Given below are statements on cost of rural electricity. Kindly indicate your agreement with these statements as far as growth of your business is concerned. Use the scale of 1-5, where 1=strong disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree

	1	2	3	4	5
It is costly to install electricity					
The business incur costs in repairing electric machines					
This business incurs some costs to maintain steady supply of electricity					
Electricity has led to reduction of operation cost					
The electricity bill is high					

SECTION E: RURAL ELECTRIFICATION AND GROWTH OF SMES

8. Given below are statements on power interruptions. Kindly indicate your agreement with these statements as far as growth of your business is concerned. Use the scale of 1-5, where 1=strong disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree

	1	2	3	4	5
Availability of electricity has enabled business to invested in new products					
Availability of electricity has facilitated the production of new products					
Access to electricity has enabled this firm to maintain a steady sales revenue					
Availability of electricity has enabled my enterprise to operate for more hours					
Electricity has made the production processes more efficient					

THANK YOU

Appendix II: Interview Guide

1. Kindly indicate your gender

.....

2. Kindly indicate your highest level of education

.....

3. How has power interruptions affected the growth of SMEs in Nakuru Town?

.....
.....
.....

4. How has accessibility to rural electrification affected the growth of SMEs in Nakuru Town?

.....
.....
.....

5. How has the cost of rural electricity affected the growth of SMEs in Nakuru Town?

.....
.....
.....

Thank you