INFLUENCE OF RURAL ELECTRIFICATION ON POVERTY ERADICATION: A CASE OF TIGANIA WEST CONSTITUENCY, MERU COUNTY, KENYA.

BY

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DECLARATION

This research project is my original work and has not been presented for academic purposes in any other University.

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This research project has been submitted with my approval as the University Supervisor.

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DEDICATION

To my parents, George Mwiti Ithara and Jane Wambui Mwiti. For your support and motivation throughout to the completion of this project .

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My most heartfelt gratitude goes to God for His provision, strength and enablement towards completion of this project. Initially, my thoughts were that it would depend on my individual effort but many people gave me support, recommendations and encouragement. My sincere gratitude and appreciation goes to my supervisor, Dr. Chandi Rugendo for his expertise guidance, positive criticism and patience during the slow progress till the completion of the project. Similarly, I appreciate the contribution of all the respondents who participated in the research.

I extend my gratitude to the University of Nairobi for nurturing my academic life and giving me the opportunity to pursue the Masters degree. I also recognize the contributions of my lecturers at the Meru Extra Mural Center for what they have done in waking up what was just but a sleeping genie in me.

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ABBREVIATIONS AND ACRONYMS

IEG **:** Independent Evaluation Group

MDGS **:** Millennium Development Goals

KPLC **:** Kenya Power and Lighting Company

GDP **:** Gross Domestic Product

REA **:** Rural Electrification Authority

UNDP **:** United Nations Development Program

OECD **:** Organization for Economic Co-operation and Development

ESMAP **:** Energy Sector Management Assistance Programme

SPSS **:** Statistical Package for the Social Sciences

ABSTRACT

In the pursuit of Vision 2030 in improving the quality of life of Kenyans by the year 2030, a need arose to find out the influence of rural electrification on poverty reduction. This study assessed the role of rural electrification on poverty reduction in Tigania West constituency. Tigania West constituency is one of the five constituencies in Meru North District. It covers Tigania North, Tigania West, Tigania South and Uringu divisions. The study was guided by four objectives which are the influence of rural electrification on job creation, the influence of rural electrification on education provision, the influence of rural electrification on healthcare provision, and the influence of rural electrification on information communication and technology in Tigania West Constituency. The focus was on households that were beneficiaries of Rural Electrification Programme in the region, with information being collected from the household heads only. A sample size was 153 was calculated scientifically as a sufficient representation for a population of 2650 metered households, who were the total recipients of the electrification programme in the constituency. Stratified random sampling method was used to identify the elements to make up the sample. Because there were four divisions in the constituency, the 153 members of the sample were chosen equally from the divisions with each division contributing about 38 respondents. After deciding on the number to be taken from the four strata, the simple random sampling technique was used to get the respondents. The research tool used to collect the data was the questionnaire, administered to the sample. The descriptive research design was chosen because most of the information obtained was quantitative, making this method the most suitable for data representation, with results presented in tables with frequencies and percentages. The study found out that rural electrification enhanced empowerment of the members through information, education and health services among others. People in the community are more knowledgeable through mediums like television and the internet. It was also be concluded that through rural electrification, the quality of life of the people in the community became better, in terms of better health services, longer study hours, access to cheaper communication, easier and cleaner lighting and a more cleaner environment, free from air pollution from burnt kerosene particles.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The world summit for social development in Copenhagen Denmark held in March 1995 reported that the number of rural poor has been increasing steadily since 1980s and they currently make up one fifth of the world population. In 1998, the population of the rural population living below the poverty line was estimated to be 61% in Latin America and Caribbean, 60% in Sub Saharan Africa, 31% in Asia and 26% in North Africa and the near East. According to Khan (2000), almost 63% of the world poverty is found in rural areas, ranging from 65% to 90% in sub-Saharan Africa. Due to this, he hypothesized that rural poverty was caused by low productivity as measured by the value added per worker, as well as per capita agricultural production. In addition to this, there is a highly unequal distribution of income status of women as measured by the gender related development index, as is calculated by United Nations Development Program, total fertility rate and female literacy rate among others.

Goal one of the Millennium Development Goals (MDGs) is to eradicate extreme poverty and hunger. It was aiming towards halving the number of population living below a dollar a day between 1990 and 2015, thus reducing the population living in extreme hunger (United Nations, 2000). Kenya is ranked 128th out of 169 countries in the low income countries list in the United Nations Development Program Human Development index which measures development in terms of life expectancy, education attainment and standard of living (Eremie, 2011).

Energy plays a very important role in the development of any country and in poverty reduction of a country. This means that a secure and affordable supply of electricity is a crucial vehicle for economic development due to the wave effects to other sectors. Due to this preposition, the Government, through Kenya Power and Lighting Company (KPLC) and Rural Electrification Authority (REA), has chipped in to assist Kenyans in getting energy and especially in the rural areas that have been lagging behind in terms of economic development since as stated, access to electricity is crucial for economic development.

According to Kenya's Energy Ministry, the country is seeking $ 1 billion over the next five years to invest in new generation and transmission infrastructure to increase its installed capacity of 3190MW and meet the growing demand since electricity has become a necessity in our society today. Electricity supply lowers the cost of energy to the user resulting in an increase in consumer surplus, which is the difference between what consumers are willing to pay and what they actually pay.

Tigania West is one of the four constituencies in Meru North District. Tigania West comprises of Tigania North division, Tigania West division, Uringu division and Tigania central division. Geographically, Tigania west is mainly semi arid and especially in the western side. Tigania West has a high dependency rate and an absolute poverty of 52% (NCAPD, 2005).

1.2 Statement of the problem

The Kenya vision 2030's main target is to transform Kenya to a new modern middle-income country and to provide a high quality life to all of the citizens by the year 2030. The development projects under Vision 2030 are expected to increase demand on Kenya's energy supply. Currently in Kenya, energy costs are higher than those of their neighbors; therefore Kenya must generate more energy at a lower cost and increase efficiency in energy consumption. Therefore in respect to this, the government of Kenya is devoted to constant institutional improvement in the energy sector.

Vision 2030 also explains that Kenya is expected to raise incomes in agricultural sector as industrial production and service sector expand only by processing and adding value to products before they reach the market. This can only be accomplished through an innovative, commercially oriented and modern agriculture, livestock and fisheries sector. Such intervention is only possible through a reliable and efficient electrification project.

The Rural Electrification Authority Kenya (2011) went ahead and stated that their mandate is to offer high quality and affordable electricity connectivity in all rural areas in order to achieve high standards of customer service through advancing community participation to ensure long term sustainability and socio-economic development.

Research has been conducted by Mukumbu (2011) on distributed generation of green electricity for sustainable rural electrification and on poverty alleviation but no research has been done in Tigania West on rural electrification and poverty eradication. Therefore, it is in this respect the researcher carried out this study to cover up the gap that had been created from the past research, by finding out the influence of rural electrification in poverty reduction in Tigania West constituency.

1.3 Purpose of the study

The purpose of this study was to assess the influence of rural electrification in poverty reduction in Tigania west constituency.

1.4 Objectives of the study

This study was guided by the following objectives:

1. To assess the influence of rural electrification on job creation in Tigania West Constituency.
2. To establish the influence of rural electrification on provision of education in Tigania West Constituency.
3. To find out the influence of rural electrification on provision of health care in Tigania West Constituency.
4. To determine the influence of rural electrification on access of information in Tigania West Constituency

1.5 Research Questions

The research sought to answer the following questions;

1. What is the influence of rural electrification on job creation in Tigania West constituency?
2. How does rural electrification influence the provision of education in Tigania West constituency?

3. In what way does rural electrification influence health care provision in Tigania West constituency?

4. How does rural electrification influence the access of information in Tigania West constituency?

1.6 Significance of the study

The research was based on the preposition that if the rural poor are equipped with the necessary resources and opportunities in education, health, and environmental conservation and if the community is well empowered, the economy will benefit from reduced poverty, better living standards and economic growth. The poor communities will be able to start their own electricity driven enterprises, compete educationally with other citizens' hence improved economic status and development.

Therefore, this research was expected to be beneficial to the Rural Electrification Authority to understand how their projects impact on the rural poor towards reducing poverty. It was to help them in policy formulation and planning. This research was also deemed beneficial to the international donors and the government, for understanding how they would disburse funds for poverty reduction towards achieving the MDGs and Vision 2030. The study also opened an avenue for further research on the area.

1.7 Delimitation of the study

The study focused on Tigania West constituency. It covers Tigania North, Tigania West, Tigania South and Uringu divisions.

Tigania West is a constituency that has greatly benefited from rural electrification, and almost all the homestead electricity connections in the area can be cited as benefactors of the program. This made the choice of the constituency as an ideal indicator of the benefits of rural electrification. This is because all the influences of electricity on poverty reduction can be directly attributed to the rural electrification program.

1.8 Limitations of the study

There may be many roles of rural electrification, but this study focused on its role in poverty reduction. Also while rural electrification has covered a large area in Kenya, this study focused on only Tigania West constituency.

The study only explores the influence of rural electrification on four factors to this area, namely job creation, health provision, access to information and education provision. These four are Specific Measurable Accurate Realistic and True and can be attributed as possible effects of electrification as comprehensively explained under the Literature Review. The four factors have been cited as causes of individual and community empowerment, hence poverty alleviation.

The study took Tigania West Constituency as the unit of study as outlined in the Scope of the Study. The study also used sampling instead of a survey of the entire population in the area as a mitigation of time management, and also response to time and financial cost.

There was a deliberate choice to look at only four factors that can be attributed to being influenced by rural electrification and therefore possibly lead to poverty alleviation in the highlighted community. There are other factors that electrification can influence, but these were deemed as the encompassing in the area under study and easy to identify.

There are other factors that can be cited as a necessary prerequisite to poverty alleviation, but for rural electrification, but could not be covered because of the reasons cited above. That limits the research in terms of covering all possible influences of rural electrification and therefore also limits the study to poverty alleviation.

1.9 Assumptions of the study

This study assumed that the respondents answered the questions correctly and honestly and that the sample represents the population. Also, the respondents would return there questionnaires in good time to ensure that the study was complete within the timeline set for this. The other assumption was that the sample size and the choice of respondents chosen were adequate to come up with critical inferences.

1.10 Definition of significant terms

Absolute Poverty Level: It is a level of poverty as defined in terms of the minimal requirements necessary to afford minimal standards of food, clothing, health care and shelter.

Access to Information: - The mode of getting news and/ or other knowledge for the people of Tigania West, whether oral, print, electronic or digital.

Community Empowerment: - Community empowerment refers to the process of enabling communities to increase control over their lives. It mainly entails the

Process of enhancing community participation in development through information and capacity enhancement.

Education Provision: The routine running or operation of formal training institutions at the

Primary, Secondary or Tertiary level which encompasses tuition hours, study times for their students and other study related activities.

Health Care Provision: The presence and operation of Medicare institutions, including the

general extent to which they can provide curative services that would rely on electricity availability as per the classification of the institution.

Job Creation: Process of using skill or imagination to start up an enterprise or to create employment towards income generation using available resources.

Poverty Line : The poverty threshold, or poverty line, is the minimum level of income deemed necessary to achieve an adequate standard of living in a given country. The common international poverty line has in the past been roughly one United States of America Dollar a day.

Poverty reduction: Poverty reduction is any process which seeks to reduce the level of poverty in a community, or amongst a group of people or countries.

Quality of life: This is the well-being of people. Its more concerned with the quality of life that includes factors such as the quality of the environment (air, soil, water), level of crime, extent of drug abuse, availability of essential social services, as well as religious and spiritual aspects of life.

Rural poverty: Rate of poverty in the rural areas.

Rural Electrification: - A Kenyan Government project aimed at providing electrical connections to the rural areas.

1.11 Organization of the study

The research project is organized in five chapters .Chapter One is the Introduction, which highlights the background of study, gives a statement of the problem being studied, states the objectives of the study with the research questions that arise, has a justification of study followed by arguing the possible significance of study, has the basic assumptions of the study, limitations and delimitations of the study, defines significant terms and outlines how the study is organized.

Chapter Two is the Literature Review which supports of the study by citing past works of research on the topic. It also gives a detailed review of available literature on rural electrification and its possible influence on poverty alleviation globally, narrowing down to the domestic level. It also focuses on the effects rural electrification on job creation, health care provision, provision of education and access of information, and then ties all these factors to poverty alleviation.

Chapter Three explains the research design, sampling procedure and sample size, target population, research instruments their reliability and validity. Data collection procedure and analysis method will be done qualitatively using descriptive method and quantitatively using

statistical methods. Ethical considerations have been captured and Operationalization of Variables concludes this chapter.

The fourth chapter is the Data Presentation Analysis and Interpretation Chapter. It entails presenting data in tabular form and therefore analyzing it for the purpose of interpreting in a manner sensible for the study. This is the data that is collected by the tools of the study from the respondents.

The final chapter is the Summary of Findings, Conclusions and Recommendations. Here, the interpreted data is therefore summarized and conclusions are drawn in line to the objectives of the study that were the guiding rails to the research. Finally recommendations are made using these conclusions and suggestions for further research are stated.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on the role of rural electrification on poverty alleviation. The first section reviews both empirical and theoretical literature on poverty and rural electrification, while the second section reviews the conceptual framework with a summary of the conceptual framework.

2.2 Concept of rural electrification and poverty reduction

Energy is one of the basic needs of today's society. The link between energy and development was strongly underlined by Johannesburg WSSD where access to modern energy was recognized as indispensable in poverty reduction (Wilkes, 2005). Wilkes claimed that one third of the world population has no access to modern energy and especially to electricity.

Improving the livelihoods of people living in the remote rural areas through provision of an energy service brings a range of benefits some of which will be re- channeled into the rural services company to ensure its long viability at the same time slowing down the inevitable demographic movement of people towards the cities (Wilkes, 2005).

The World Bank has been financing Rural Electrification in different areas like Asia, Africa and Latin America. Its support on rural electrification has focused on outputs-building infrastructure and institutions. The World Bank has made loans for power generation transmission and distribution since its earliest years for instance by the 1980s it was lending substantial amounts for expanding coverage into rural areas (Wilkes, 2005).

However, the 1994 Independent Evaluation Group (IEG) report on rural electrification in Asia cast doubt on these investments arguing that the rates of return were low because many of the claimed benefits were not realized and that the costs of these programs imposed a financial burden on the provider. Other studies by the same group in later years have confirmed otherwise with the IEG 2012 giving differing with this past study.

2.2.1 Uses of Electricity

The data in Table 2.1 represents the findings of a study by Independent Evaluation Group (IEG) (2012) on the usage of rural electricity in Asia.

Table 2.1: Uses of electricity

Categories of Electricity Use	Percentage Use Before 1995	Percentage Use in 2012
Residential	85	90
Agriculture	30	70
Commercial	20	30
Small and Medium Enterprises	50	60
In Public Places	10	45

The data shows that there was growth in use of rural electricity in the five sectors covered, with the highest sector being agriculture, which witnessed a growth from 30% to 70%. But for commercial enterprises which had an utilization rate of 30% and public areas with 45%, the remaining three sectors had an above average use of electricity with Small and Medium enterprises having 60%, and residential sections having the highest adoption at 90%.

The Independent Evaluation Group (2012) found out that connections of rural electricity can be harnessed for agricultural use, usually irrigation, or for commercial use, like in retail and restaurants, or it can be uses in public or social facilities and for lighting. Most rural electrification was found out to support residential connections with a small number exceptions being focused on agricultural connections.

2.3 Rural Electrification on Poverty Alleviation

Quality of life is defined as the general well-being of an individual or of a society. According to IEG report (2008) rural electrification greatly improves the quality of life of a society and individuals. Lighting alone brings benefits such as increased study time and improved study environment for school children, extended hours for small businesses and greater security. Apart from lighting, electrification brings in both entertainment and information through television and other media. IEG report (2008) argued that the people who live in the rural areas greatly appreciate these benefits and are willing to pay for them at levels more than sufficient to cover costs.

The dominant use of electricity in rural households is lighting. All households use it for this purpose and many use little electricity for anything else. The next common use according to a survey by IEG (2008) is entertainment through television. Lighting and television account for at least 80% of rural electricity consumption and thus the bulk of the benefits delivered by electrification

Fluitman (1983) posits that electricity in the rural areas is rarely used for cooking, with exceptions of few areas like East Asia who use Rice cookers often. Fans and Iron boxes are also used by minority consumption in the rural areas. He continued to argue that the pattern of use has implications for the benefits from rural electrification in that the potential benefits to be gained from displacing firewood or kerosene stoves are not realized in the vast majority of cases. However IEG report (2008) claimed that electricity provides more and better lighting at lower cost than the next alternative available kerosene lamps for most households.

Howard claimed that a positive impact of rural electrification on service provision comes from the greater willingness of health and education workers to stay in communities that have electricity. Most civil servant turn down job offers in places without electricity hence rendering the rural poor disadvantaged. However Howard also explained that the lack of large scale productive uses for rural electricity remains a constraint on the financial viability of rural electrification because of low load factors resulting from consumption being heavily concentrated in the evening peak hours.

2.3.1 Rural electrification and Environmental conservation

Eremie (2011) posits that there is a strong linkage between poverty and environmental degradation, particularly air pollution, poor water management, land degradation among others. The use of traditional solid fuels such as fuel from wood crop residue and dung exposes people especially women and young children to indoor pollution, which has consequent health risks mainly acute lower respiratory infections and low birth weight, infant mortality and tuberculosis which are identified mainly with the poor (Kulsham, Barnes and Cropper, 2005).

A review by the Independent Evaluation Group showed that exposure of indoor cooking using traditional methods increased the risk of premature deaths by a factor between 2% -5% in addition to the claim, Kulsham et.al (2005) explained that these diseases caused by indoor air

pollution cause between 1.6 – 2 million deaths each year with more than half of them among children younger than 5 years. This implies that in principle, rural electrification can tackle both the issue of promoting good health through reduced indoor air pollution and reducing the time burden on women on fuel collection.

Improvement in indoor air quality can also come about through changing the lighting source. Kerosene lamps according to Kulsham et. al (2005) emits particles that cause air pollution. These are usually measured by the concentration of the smallest particles per cubic meter (pm10). Burning a liter of kerosene emits PM 51 microgram per hour which is above the World Health Organization 24 hour mean standard of PM10 of 50 micrograms per cubic meter. The extra risk of respiratory sickness from exposure to these levels of PM10 leads to an up to an average of 3.5 lost adult work days and an additional under five years mortality of 2.2%. Therefore substituting electricity lighting for kerosene lamps has a quantifiable health benefit if $ 2.50 per households as explained by Kulsham et. al (2005).

2.4 Rural electrification on job creation

Hyman (1996) explained that the ability of an economy to create job opportunities for a growing population depends on the rate of growth of the economy. Normally there are periods of recession whose effects tend to offset occasionally by boom periods which the economy exceeds it's potential. The actual economic growth produce depends on the growth of the potential of the economy to produce goods and services.

Chaaban (2010) in the United Nations Development Program (UNDP) regional bureau for African and countries research paper series, showed that more than 80 million people currently live in conflict- affiliated and poor countries where unemployment rates are more than double the African worlds overall average. He found out that the employment challenges facing the African countries are as a result of the significant demographic challenges which are directly affecting labor market prospects, especially in poor and conflict- affiliated countries.

Many African governments in the past and few years have embarked on a series of economic reforms to boost growth and reduce unemployment rates. However, Chaaban (2010) advised that African countries can tackle labor market challenges by re-aligning goals with

expectations and that achieving higher rates of job creating economic growth should always remain a primary priority. Chaaban observed that the government actions to reduce the unemployment rates will be more effective if a distinction is made between voluntary and involuntary employed and that the African countries can do more to enhance incentives to work and establish on environment conducive for job creation. This can be done by promoting competitiveness, establishing linkages between the unemployed and where jobs are, increasing women's employment incentives, revisiting costs and benefits of emigration and providing more social protection for the poor and unemployed.

According to the commission of European communities (1997) the unemployment rates in rural regions are similar to or higher than in urban regions. However they observed that the capacity of rural areas to maintain or create jobs will always have a major impact on the unemployment rate and or migration flows.

The Organization for Economic Co-operation and Development OECD (1996) claimed that rural electrification in Kenya has considerable efforts in enhancing employment opportunities and in creating strategies that stimulate entrepreneurship for new and existing firms, new products, new markets and better business practices. They justified this by stating that small indigenous firms have replaced subsidized branch plants as the most likely source of new employment in rural lagging areas, due to reasons of effectiveness and tight budgets. Dimara and Skuras (1999) and seconded by the commission of European communities (1997) added that job creation and diversification of economic activities in rural areas are a major objective of rural development policies around Europe.

Cogill et al (2009) came up with an argument that in rural areas, rural electrification policies do not aim exclusively at job creation but are rather a great support mechanism aiming at improving the competitive position of Micro or small and medium enterprises. However they claimed that when the point comes at measuring efficiency of rural electrification projects, policy makers are more interested at measuring the effects of such schemes on job creation.

Rural electrification provides a domino effect when it comes to job creation .The irony of these projects is that they are introduced to electrify the very communities in which they also energize careers for the community. The program encourages growth from within a particular

region where territorially the immediate region is empowered. While the program is not limited to rural areas, the outlying areas are the most under resourced and are therefore primarily positioned to enjoy the benefits of such interventions (Cogill et al 2009).

Cogill et al (2009) came up with a summary of the domino effect which is explained as thus. When an area is electrified, people start using electrical power. There is then a sudden demand for house wiring, appliances are then bought and are repaired, and leading to numerous electrified training opportunities. Services then cascade to include SME development, and the cycle goes on and on.

Unemployment in Kenya is not on the decline and it is actually growing at an alarming rate. The government is fully supportive of projects taking place in community areas where local labor is employed on such projects. However in most instances, local labor are not skilled for such projects resulting in either them missing the opportunity or else being employed on menial work leaving them with no substantial skill once the project is completed.

Cogill et al (2009) noted that throughout South Africa there is a growing demand for housing and infrastructure development. The government set aside billions of Rand in various initiatives for the fast tracking and development of basic needs within the communities. As part of their drive, they are encouraging job creation opportunities. Municipalities have been placed to deliver such programs and initiatives due to their infrastructure and internal mechanism. They continued to observe that many programs linked with electrification particularly in North West province have been conducted and in almost all cases learners have been offered employment or participation in further projects. Great opportunities exist for local people trained as a result of the demand created through rural electrification projects which includes; electrical appliance repairs, domestic refrigeration and electrical repairs, maintenance and extractions. Most of these projects have a base element of services that can be rendered by individuals with limited skills and expertise. The services are assigned to local labor with the provision that the individuals are productive after training to deliver the designated service.

In line with vision 2030 the government of Kenya has prioritized its support to assist in the establishment of small businesses. Kenya Power and lighting company has been actively

involved in this program often having been the catalyst behind many newly established successful small businesses like electrical and appliance repair, welding, catering among others.

Garbaldi et al (2000) claimed that over the past decade the United States has been very successful at creating jobs. Some other industrial countries have lagged behind.

Independent Evaluation Group (IEG) (2008) claimed that rural electrification does not drive industrial development but it provides a drive to home businesses, even though few households use electricity for productive purposes, IEG's analysis shows that the number of enterprises grows as a result of electrification and that these enterprises grow as a result of electrification since these enterprises operate for more hours. There is therefore, according to IEG (2008) a positive impact on household income

Independent Evaluation Group (IEG) (2008) attested to that rural electrification in most countries like Indonesia has a strongly link to the promotion of high yield varieties of crops and the spread of irrigated agriculture, facilitated by water pumps with subsidized or free electricity. IEG claimed that support for industrial development has been limited even in countries that have rural based industries. However, small scale enterprises including home businesses are more plausibly influenced by the availability of electricity. Rural electrification has therefore been able to increase both the number of businesses and the hours they open in the rural areas.

2.5 Rural electrification and Health Care Provision

Health facilities benefit directly from rural electrification in two broad ways according to IEG report (2008); by having longer opening hours and by having equipment that requires electricity. IEG analysis of health facility survey data for Kenya and Bangladesh found out that electrified clinics were open for an average of one hour longer each day. The most commonly claimed benefit for health clinics for electrification, according to IEG (2008), is that it helps in preservation of cold chain vaccines which are sensitive to both heat and cold and always need to be kept 2^0 and8^0 from the point of manufacture to the point of use. To maintain a store of vaccine in the rural areas, health clinics need refrigerators, which are most easily and cheaply operated by electricity. This implies that rural electrification can help to

bring down the cost of providing immunization and be part of the routine services offered by a clinic.

According to Hutton (2006) the health benefits of rural electrification operate through channels such as improvement of health facilities , better health from cleaner air as households reduce use of polluting fuels for cooking, lighting and heating. Improved health according to Hutton is also due to improved health knowledge through access to television and better nutrition through the media.

2.6 Rural electrification on Education

Rural electrification is also said to affect time use in a variety of ways like watching television, greater participation in community activities and socializing, reducing time spent on household work hence increasing time spent reading or for children to work on homework. Electricity makes it possible to increase waking hours to increase competitiveness of the rural poor with their rich or urban counterparts.

The main channels through which electrification may affect education are by improving the quality of schools either through provision of electricity dependent equipment like computers, or increasing teacher quality and quantity. The other channel is in the time allocation at home with increased study time though availability of television may decrease that time, it is likely to provide more educative benefits.

A study by Energy Sector Management Assistance Programme (ESMAP) (2003) found out that children in electrified households have higher education levels than those without electricity.

2.7 Improved Information communication and technology

Tregarther and Rittenberg (2000) defines technology as the knowledge that can be applied to the production of goods and services. Technological change is the development of new goods and better ways of producing goods and services. According to Parkin (1999) growth accounting explains that to achieve faster economic growth we must either increase the growth rate of capital per hour of work or increase the pace of technological advance.

Technology has helped people gain control over nature and to build civilized way of life. Through the ages technologies has benefited people though increased production of goods and

services i.e. development have accrued in manufacturing mining information technology and other industries improved production i.e. products are produced by machines every product produced by the company will be standardized. Today the use of machines has largely replaced hand labor in factories many factories use mass production techniques which require power technology.

Electricity has played a big part in enhancing information communication and technology in rural areas, like in usage of computers, television sets, machines e.t.c. which have been attested by Parkin (1999) to making life much easier for the poor in rural areas hence alleviating poverty.

2.8 Rural electrification on Community Empowerment

The fact that rural communities have not been able to benefit fully from the growth of the Kenyan Economy is a clear indication that there is need for outside assistance to assist in moving towards sustainable economic development, to help rural communities into a self-sustaining development path by helping them to help themselves (Hamyaran, 2006)

Community empowerment needs sustainable empowerment; this implies increasing the average income per capita equitable distribution of income, higher standards of living for all groups and sustainable use of scarce resources. Hamyaran (2006) explained that, the concept of community empowerment represents the current state of thinking along a path of accumulated development knowledge and experience. Attempts by the national government to modernize rural populations with the assistance of international organizations leads to thousands of projects but usually little tangible achievements, such dependent usually reduces empowerment.

Hamyaran (2006) claimed that community empowerment is one of the alternative approaches advocated by development practitioners. It usually refers to the process of enhancing a group's capacity to make effective choices and transform those choices into desired actions into outcomes. Therefore community empowerment is more about how to involve communities in the development process rather than about development process itself. Therefore, community empowerment must be used alongside other development strategies to improve livelihoods in rural areas Alsop and Heinsohn, (2005).

World Bank (2002) noted that a critical aspect of the empowerment agenda is to reduce inequality by broadening the human capabilities through basic education, health care, environmental conservation, together with adequate arrangement for social protection and improving distribution of tangible assets such as land or access to capital which are electricity driven elements. The link between empowerment and development according to World Bank (2002) is based on a tenuous hypothesis that freeing communities to make their own choices will lead them towards development. Empowerment however happens to be more about enhancing an individual or group's capacity to make effective choices. Development entails managing community resources and capacity to ensure more satisfaction of communities' needs for present and future generation.

The World Bank went ahead and presented the elements of empowerment as access to information. They said that informed citizens are better equipped to take advantage of opportunities, access services, understand rules and regulations and exercise their rights. ICT which is an initiative or rural electrification plays an important role in ensuring access of information. The other element stated by World Bank is inclusion and participation of community members. This ensures that opportunities for all members of a community to participate in decision making is critical to ensuring that the use of public resources builds on local knowledge and priorities and bring about local commitment to change. This ensures changing rules so as to create space for people to debate issues and participate in setting priorities and delivery of basic services. The third element is accountability, this is where program administrators are held accountable for their policies actions and performance and use of funds. This is also enhanced by availability of electricity through television, computers among others to where information is disseminated.

2.9 Conceptual Framework

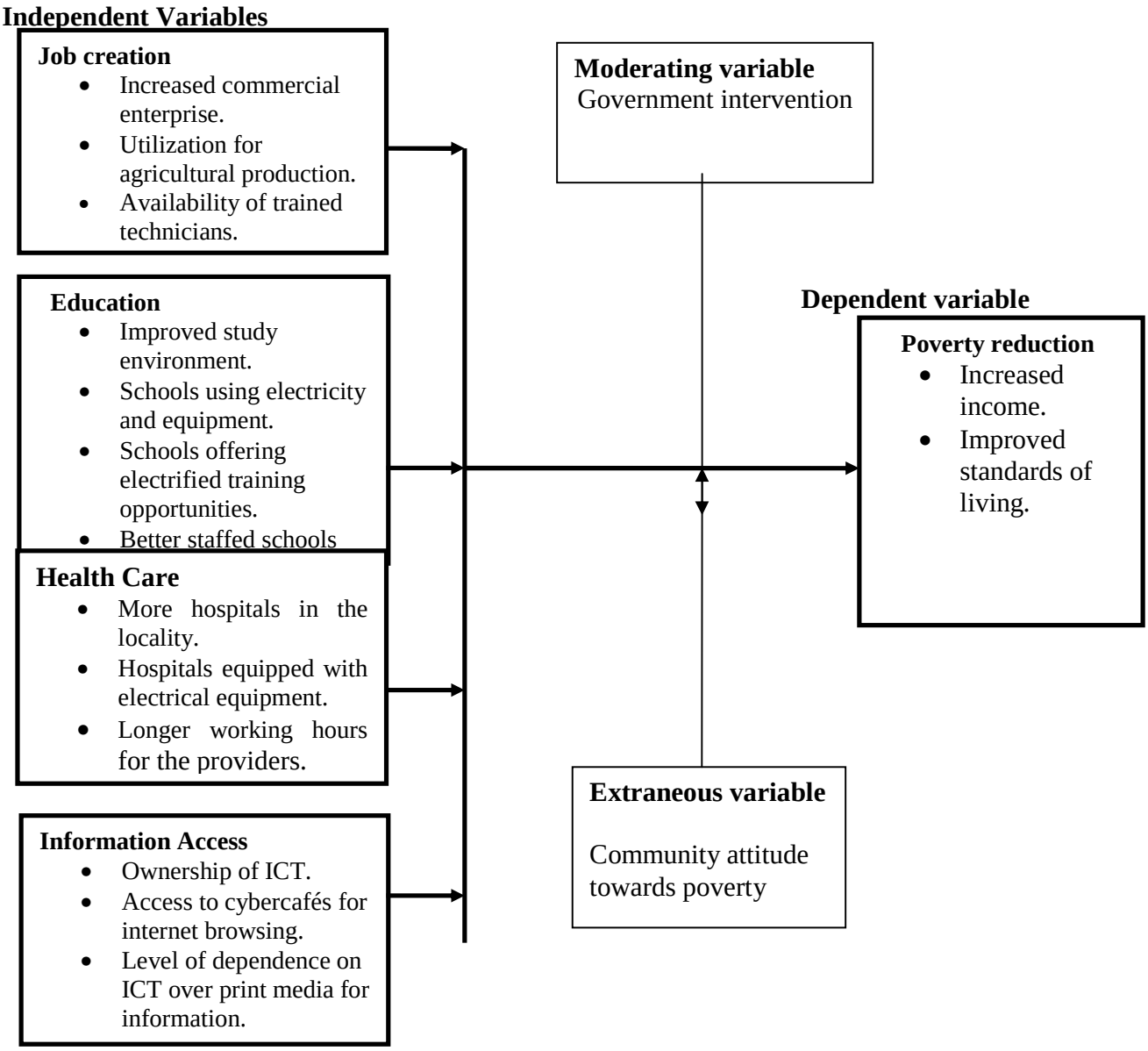

Figure 1: Conceptual Framework

2.11 Discussions on the Conceptual Framework

It has been argued in this chapter that rural electrification greatly improves the quality of life for the rural poor. Lighting alone brings benefits such as increased study time and improved study environment for school going children. It enables extended hours for small businesses

and provides greater security for these businesses. However as Independent Evaluation Group (IEG) (2000) states, rural electrification brings more than just lighting; it provides an opportunity for entertainment and information which enhance empowerment of the rural community, through empowerment it increases the competitive advantage of the poor in the rural areas hence reducing poverty in these areas.

Rural electrification has been a wheel to job creation in the rural areas not just in the formal and informal employment but also in self employment through enterprise growth, extended hours of working, increasing the scope of business among others. It has enhanced improved welfare including ease of communication by use of computers, entertainment, and improved education and health services and also in conserving the environment which is important for better living standards.

Other variables that enhance the reduction of rural poverty are government intervention as the moderating variable, since it is the same in all other projects that aim towards poverty reduction and the international community intervention. The community's attitude towards the project is also a variable that may alter the project from achieving its goal of poverty reduction though it is at the background and it is not easy to measure (Independent Evaluation Group (IEG) 2000).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents a description of the research methodology that this study used. It discusses the design, target population, sample and sampling procedures, study instruments, data collection and data analysis. Wherever necessary and appropriate, the presentation and discussion in each section is backed by justification based on the expert opinion of other scholars.

3.2 Research design

A research design is the arrangement of conditions for collection and analysis of data in manner that aims to combine relevance to the research purpose with economy in procedure. It is the conceptual structure within which research is conducted. It stipulates the blue print for collection, measurement and analysis of data (Kothari 2003). In this study descriptive research design was be employed. The reason for selecting descriptive research design is that design describes the state of affairs as it exists at present; in this case the researcher has no control over the variables. One can only report what is happening or what has happened. Also descriptive research design provides an opportunity to gather detailed data that give explanation to research questions and logically structure the inquiry into the problem of study, Marsh (1982)

3.3 Target population

The target population of this study was the household heads of Tigania West Constituency who have benefited from rural electrification in the last seven years. The total households are approximately 2,650 according to the Kenya Power and Lighting Company database (2011). The location was chosen because there was sufficient data from the KPLC database about the households that had benefited from the rural electrification program. This was an area that almost all the household with electricity were direct beneficiaries from this program, therefore any benefit of having electricity could therefore be attributed directly to the program. The

constituency was also close to the researcher, so it was deemed to be convenient in data collection, in terms of the time available and the cost involved in data collection.

3.4 Sample and sampling procedures

A sample size of 153 respondents was chosen by applying the following formulae:

$n = N/ \{1+ N (e^2)\}$,

Where n is the sample size,

N is the population size,

e is the confidence level.

Using 92% confidence level, the sample size will be:

$2650/ \{1+ 2650 (0.08^2)\} = 153$

Therefore this study used a sample size of 153.

Stratified random sampling method was used to identify the elements to make up the sample. The four divisions in the constituency were used as stratums for sampling.

Stratified random sampling was used as it gives each sampling element equal chance of selection and it also avoids clustering of selected elements in one point. The selected number in each stratum was arrived at depending on the stratums population in relation to the target population and sample size.

Table 3.1 Sample Size and Procedure.

Division	No. of metered households	% in relation to target population	Number of selected households
Tigania North	551	21	32
Tigania west	586	22	34
Tigania south	821	31	47
Uringu	692	26	40
Total	**2650**	**100**	**153**

3.5 Data collection instruments

This study used questionnaires with both open and closed-ended questions for the purpose of inquiry. The questionnaires were deemed to be the best method to gather large amount of information in a cost effective and timely manner. They collected primary data that was be used for its proximity to the truth and control over error (Cooper & Schindler 2003).

A self-completion questionnaire with closed ended question was developed. According to Bryman and Bell (2003), close- ended questionnaires have an advantage over open ended questionnaires, in that they are easy to process answers, and they enhance the comparability of answers making them easier to show the relationship between variables.

A total of 153 questionnaires, containing questions to cover the statistics contained in the operational framework were issued and distributed by the researcher to the respective respondents with request to fill the information required. The qualitative variables were measured by use of a five-point likert-type response scale, anchored at 5- strongly agree to 1- strongly disagree.

Secondary data will be obtained, mainly from the library, World Wide Web, journals and print media.

3.6 Data collection procedure

After clearance by the supervisors the questionnaires were distributed by the research assistants to the sampled urban farmers. A copy of the transmittal letter and authority letter

from the government to carry out research was attached to each questionnaire in order to create confidence in case the respondents doubted the intent for the study. The questionnaires were collected after one week in order to give the sampled farmers ample time to fill them. The collected questionnaires were then be categorized as per the themes of the study in preparation for analysis.

3.7 Reliability of the instrument

According to Fraenkel et al (2008) instrument reliability refers to the consistency of the results obtained for each individual from one administration of the instrument to another and from one set of items to another. In this research the instruments reliability was ensured through subjecting them to split half method test to ensure the consistency of the information gotten.

3.8 Validity of the instrument

Validity is the accuracy and meaningfulness of inferences which are based on the research results. Validity is the degree which results obtained from the analysis of the data actually represent the phenomenon understudy (Mugenda and Mugenda 1999). To enhance validity of the questionnaires the instruments were reviewed under the supervision of the research supervisors in order to ensure they capture valid and reliable information. The pilot group was selected from the neighboring Tigania East constituency which was deemed to have similar attributes to Tigania West. This was to help in making adjustments to ensure that data collection tools were actually going to measure what was intended. Test re-test were carried out later to confirm that changes had achieved desired results. Also the questionnaires pre-tested to ensure their validity. Also research assistants were trained by the researcher on how to administer the questionnaires.

3.8 Data Analysis techniques

Data analysis is categorizing, manipulating and summarizing data obtained to answer research questions (Kerlinger, 1973) After data collection, all the questionnaires were coded as part of the data editing in order to eliminate unusable data, interpretation of ambiguous answers and contradictory data from related questions.

A coding scheme was developed for the responses to each question. The coding scheme facilitated the development of an appropriate data structure to enable its entry into the computer. The study used data entry and storage by the use of Statistical Package for the Social Sciences (SPSS) then data was analyzed using descriptive statistics.

3.9 Ethical Considerations

There was need to get an informed consent from the respondents before the actual research was conducted. This ensured that the aims and objectives of the research were explained before undertaking the research to assist in arriving at permission from the respondents as well as utmost confidentiality about the respondents be assured. The researcher got authorization from the National Council for Science and Technology.

3.10 Operationalization of variables

These are the variables that influence electricity connection and poverty reduction. These include poverty reduction, access to rural electrification, rural electrification and education and rural electrification and health care.

Table 3.2: Operationalization of Variables

Objective	Type of variable	Indicators	Measure	Level of scale
Poverty reduction in Tigania West constituency	Dependent variable	Income per capita Environmental conservation Improved standards of living	Wages/Salaries/Returns, size of bills, disconnection frequency. Cooking fuel, lighting. Ownership of appliances, source of information and entertainment.	Nominal
To assess the role of rural electrification on job creation in Tigania West constituency.	Independent variable	Increased commercial enterprise. Utilization in agricultural production. Availability of trained technicians	Number of people in trade, utilization of electricity in the trade, for security, hour the businesses close. Utilization for irrigation, new technologies, animal husbandry, processing of raw agricultural produce. The proximity and access to competent repairmen, what type of maintenance can be handled locally.	Nominal

To examine the role of rural electrification in education Tigania West constituency.	Independent variable	Improved study environment. Schools having electrical equipment. Schools offering electrified training	Use of electric lighting for study. Proximity and access to schools with using electrical facilities e.g. computers and labs. Access of specialized training colleges in the area, demand for the same from domestic needs.	Nominal
To find out the role of rural electrification on health care in Tigania West constituency.	Independent variable.	Health care facilities in the locality. Health facilities with electrical equipment. Longer working hours in the health centers.	What type of health care facilities is in the locality, proximity. Health facilities with electricity, procedures that can be handled at the health centres, and medication available, i.e, refrigerators. To what time can you get medicare, are the staff housed within the facility compound, number of staff in the establishments.	Nominal

Access to information	Independent variable	Ownership of ICT Access to the net Dependence on either print or electronic media	Do they own phones, televisions, and computers. Are there cybercafés present? Frequency of use of the net, where they get the bulk of their news, information, prevalent mode of information access.	

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

The purpose of this chapter is to present the analysis and interpretation of the data collected. The data was analyzed from the questionnaires using Statistical Package for Social Sciences (SPSS).The findings were then presented in tables, frequencies and percentages.

4.2 Questionnaire return rate

One hundred and fifty three (153) questionnaires were distributed by the researcher and assistant to residents of Tigania West constituency, who have benefited from rural electrification in the last seven years. There was a 100% return rate since the data was collected early enough and in the evenings, when there is a likelihood of finding people in their homes.

4.3 Demographic Profile of the Respondents

The researcher collected demographic data from all the sampled residents of Tigania West constituency, for it was important to establish a basis on which the study is pegged upon. This enabled the information collected to be relevant. The demographic details include the sex, age, education level and marital status of the respondent

4.3.1 Distribution of respondents by gender.

The gender of the respondents was sought, and the findings analyzed and presented on table 4.1.

Table 4.1: Distribution of Respondents by Gender

Gender	frequency	% (percentage)
Male	69	45.1
Female	84	54.9
Total	**153**	**100**

Table 4.1, indicates the respondents sex where 45.1 percent were men and 54.9 percent were women. This shows that the respondents were almost equal in distribution between the two sexes, with women taking a slight dominance. The research therefore hoped to generate data that is representative of both sexes due to this distribution.

4.3.2 Distribution of the Respondents by Age

The age of the respondents was analyzed and their age distribution represented in Table 4.2

Table 4.2: Distribution of the Respondents by Age

Age	Frequency	% (percentage)
Below 25 Years	17	11.1
26-35 Years	46	30.1
36-45 Years	39	25.5
Above 46 Years	51	33.3
Total	**153**	**100**

Table 4.2 indicates that 33.3 percent of the respondents were above 46 years of age while 25.5 percent were aged between 36-45 years. 30.1 percent were aged between 26-35 years while 11.1 percent were aged below 25 years. It was evident from the above analysis that majority of the respondents were above the youthful age (36 years and over). This could be attributed to the fact that the study focused on the household heads, and that is the expected distribution in Tigania West. The young are still dependants and not household heads.

4.3.3 Marital status

Table 4.3 shows the marital status of the respondents.

Table 4.3: Distribution of respondents by marital status

Marital status	Frequency	% (percentage)
Married	93	60.8
Single	31	20.2
Divorced/separated/widowed	29	19.0
Total	**153**	**100**

Table 4.3 shows that 60.8 % of the respondents were married, 20.2 % were single, while only 19.0 % of the respondents were divorced, separated or widowed. The majority being married means that these are more than a one person household, therefore impact the benefit of poverty reduction to a greater part of the population per house hold.

4.4 Education qualification

There was a need to establish the highest formal education levels attained by each of the respondents of Tigania West, and the data obtained is presented on Table 4.4.

Table 4.4: Distribution of respondents by Education qualification

Education level	Frequency	% (percentage)
None	0	0
Primary	49	32.0
Secondary	33	21.6
College	46	30.1
University	25	16.3
Total	**153**	**100**

Table 4.4 indicates that 30.1 percent of the respondents had college education as their highest education qualification while only 16.3 % of them were university graduates. However, it is evident that majority of the respondents had a post primary school education, which is cited as a prerequisite to adoption of ideas. The 46.4 % with a tertiary education would be equipped in a trade skill for income generation. The above analysis is evident of a literate population within Tigania East constituency.

4.5 Number of Dependants

The the study sought to find out the general number of dependents per household and findings were shown in table 4.5.

Table 4.5: Distribution of respondents by Number of Dependants

Dependents	**Frequency**	**% (percentage)**
0-2	66	43.1
3-5	70	45.8
More than 6	17	11.1
Total	**153**	**100**

Table 4.5 shows that 43.1% of the respondents had 0-2 dependants while only 11.1% had more than 6 dependants. 45.8 percent of the respondents had 3-5 dependants. It was evident from the analysis above that majority of the respondents had more than 3 dependants. This could be attributed by high proportion of nuclear families within Tigania West.

4.6 Number of Dependants Aged 18 Years and Above

A further analysis of the study findings was conducted to determine the number of respondents with dependants aged above 18 years. Table 4.6 presents the data on households with dependants that are 18 years and above**.**

Table 4.6: Distribution of respondents by number of Dependents above 18 Years

Dependants	Frequency	% (percentage)
None	97	63.4
1-2	36	23.5
3-4	20	13.1
Total	**153**	**100**

Table 4.6 shows that majority of the respondents 63.4% had no dependant over 18 years which is an indicator of having an extra support. When measuring the level of poverty it is believed that children under the age of 18 years are more dependent on the family than those over 18 years old.

4.7 Job Creation

This section highlights the results of the findings on the occupation of the residents, their income and its relation with electricity connection.

4.7.1 Occupation of the Respondents

The study sought to find out the main economic activity of the respondents and the data collected is in Table 4.7.

Table 4.7: Distribution of respondents by Occupation

Occupation	Frequency	% (percentage)
Employment	34	22.2
Business Enterprise	94	61.5
Agriculture	13	8.5
Student	12	7.8
Total	**153**	**100**

Table 4.7 indicates that 61.5% of the respondents were in business enterprise while only 8.5% of them were in agriculture. The study was also able to incorporate into it 7.8% of students. It was clear that majority of the respondents derived their income from businesses. From the analysis above, it was also very important to note that a significant proportion of 70% had informal sources of income (business enterprises and agriculture). In relation to the dependant variable under study, it is evident that demand for electricity within Tigania West is quite high. It is however not very certain if the electrification within Tigania Westt would influence the prevalence of such businesses.

4.7.2 Electricity Connection in Commercial Enterprise

The study sought to find out the adoption of electricity in commercial enterprises by the business people, and the results are in table 4.8.

Table 4.8: Commercial Enterprise Connected to Electricity Grid

Responses	Frequency	% (percentage)
Yes	71	75.8
No	23	24.2
Total	**94**	**100**

Table 4.8 shows that the majority (75.8%) of the respondents who ran commercial enterprises had electricity connections to their businesses while only 24.2% of them did not have this. The high proportion of respondents reporting business connections to electricity could be attributed by the high proportion of business enterprises within the area under study.

4.7.3 Businesses that Depend Directly on Electricity

There was a need to find out how many businesses in the constituency ran operations that were pegged on there being electricity. Table 4.9 has this information.

Table 4.9: Businesses that are Dependent on Electricity

Response	Frequency	% (percentage)
Yes	42	44.4
No	52	55.6
Total	**94**	**100**

Table 4.9 indicates that 55.6 percent of the respondents had businesses which were not dependent directly on electricity for their operations while a lesser but almost equal percentage of 44.4% had businesses that needed electricity for operation. The small proportion of respondents reporting businesses not fully dependent on electricity could be attributed to the fact that majority of the businesses operate within day time hours and thus the need for electricity became less.

4.7.4 Business Closing Times in the Locality

The study sought to find out the hours of operations of businesses within the locality and the findings were as shown in Table 4.10.

Table 4.10: respondents business Closing Times in the Locality

Responses	Frequency	Percentage
5.00 pm	0	0
6.00 pm	9	5.9
7.00 pm	33	21.6
8.00 pm	90	58.9
9.00 pm and beyond	21	13.6
Total	**153**	**100**

Table 4.10 shows that majority of business enterprises (72.5%) operated beyond 8.00 pm. This could have been attributed to the fact that occasional dependency of most business enterprises on electricity could be experienced as reported by 75.8% who reported dependency on electricity.

4.7.5 Trained Support for Electrical Appliances

Table 4.11 shows the responses on the availability of trained personnel to maintain their electrical appliances.

Table 4.11: Training Support for Electrical Appliances

Knowledge	Frequency	% (percentage)
Yes	29	19.0
No	28	18.3
Don’t Know	96	62.7
Total	**153**	**100**

Table 4.11 shows that only 19% of the respondents had been trained in electrical appliances with 18% reporting the contrary. However, a majority of 62.7% did not know about any training on electrical appliances at all. The above findings is relative to the fact that majority of the business had little technical support on electrical appliances in case of any need.

The study tested the variable using the Chi-square test and the results are summarized in the table 4.12.

Table 4.12: Chi-square Results on the incomes in relation to electricity connection

	Chi-square value	**Df**	**Asymp. Sig. (2 sided)**	**Monte Carlo Sig. (2 sided)**	**Cramer's V Value**
Occupation of respondents	55.468	30	0.003	0.024	0.250
Electrical connection on business	*48.177*	*20*	*0.383*	*0.378*	*0.209*
Business dependency on electricity	58.100	24	0.000	0.001	0.315
Training support of electrical appliances	25.434	24	0.000	0.005	0.262

Table 4.12 indicates that in three out of four cases the results yielded a < 0.05 therefore the null hypothesis is rejected. In all cases the data sets contained cells with an expected count of less than five, therefore it was unclear as to whether the standard asymptotic calculations of the significance level had been met. The researcher therefore computed the Monte Carlo statistic at the 95% confidence interval in place of the exact statistic since the data sets were too large for the exact value to be calculated.

Mehta and Patel (1989) recommend the use of the Monte Carlo method in cases where the exact value cannot be calculated as it provides an unbiased estimate of the exact value without the requirements of the asymptotic method. The Monte Carlo statistic lends support to the Chi-square results. The researcher therefore concluded that of all sub variables computed above, business dependency on electricity and electricity connection in the business enterprise are the indicators that had a significant influence on incomes of respondents within the aforementioned communities.

4.8 Education Provision

This section seeks to identify the influence of electricity on education provision in Tigania West Constituency.

4.8.1 Types of Institutions Present in the Constituency

The researcher wanted to find out the institutions available and the category of these institutions, and the data collected is represented in Table 4.13.

Table 4.13: Types of Education Institutions Present in Tigania West

Type of institution	Frequency	Percentage
Primary schools	89	58.3
Secondary schools	55	35.9
Tertiary institutions	9	5.8
Total	**153**	**100**

Table 4.13 reveals that 58.3% of the respondents confirmed that primary school were the most pronounced types of education institutions present in Tigania East. Secondary institutions were reported at 35.9% while tertiary institutions were at 5.8%. The above findings were relative of the fact that majority of the education institutions found in the study area were primary schools. However, the drop in percentage of the education institutions from primary to secondary and tertiary were indicative of the low transitions rates from primary top secondary top tertiary institutions. This clearly showed that quite a huge number of learners could not find enough space for accommodation when they finished primary schools.

4.8.2 Levels of Connections of Primary schools to Electricity.

The respondents gave the information in Table 4.14 as the connection levels of primary schools in there locality.

Table 4.14: Primary schools Connected to Electricity

Responses	Frequency	Percentage
All Connected	2	1.3
Most Connected	25	16.3
Half Connected	72	47.1
Most not Connected	43	28.1
None Connected	11	7.2
Total	**153**	**100**

Table 4.14 shows that 47.1% of the respondents supported that majority of the primary schools were half connected with electricity in Tigania West. It was however imperative to deduce that majority of the primary schools (64.7%) had electricity installed within the school while 7.2% had an indication of no electricity connection at all. The above analysis is indicative of the fact that majority of the primary schools in Tigania West enabled learners to use electricity for enhancing their learning sessions.

4.8.3 Level of Secondary Schools Connection to Electricity.

Table 4.15 shows the electricity connection levels for secondary schools in the locality as given by the respondents.

Table 4.15: Secondary schools Connected to Electricity

Responses	Frequency	Percentage
All Connected	35	22.9
Most Connected	56	36.6
Half Connected	40	26.1

Most not Connected	22	14.4
None Connected	0	0
Total	**153**	**100**

Table 4.15 indicates that majority of 85.6% of the secondary schools have electricity connections with only 14.4% of the secondary schools in Tigania West having no electricity connections. As it is the case with the primary schools, it was evident that learners in most secondary schools in Tigania West enjoyed electricity during their learning sessions.

4.8.3 Level of Connection for Tertiary Institutions

The level of electricity connection for tertiary institutions is represented in Table 4.16.

Table 4.16: Level of Tertiary Institutions Connection to Electricity

Responses	**Frequency**	**Percentage**
All Connected	90	58.1
Most Connected	55	35.9
Half Connected	7	4.6
Most not Connected	0	0
None Connected	1	0.6
Total	**153**	**100**

Table 4.16 shows that 99.4% of the tertiary institutions in Tigania West have electricity connections with only 0.6% reporting the contrary. It was prudent to say that Tigania West education institutions have electricity connections to provide a conducive learning environment for their learners.

4.9 Influence of Electricity on Health Provision

This section highlights the findings of the analysis on health care availability and provision as influenced by electricity availability.

4.9.1 Type of Health Facility Present

The researcher was interested in the heath care available to the respondents, and therefore sought to find out the type of health care centres there were in the area. The results are published in Table 4.18.

Table 4.18: Type of Health Facility Present

Type	Frequency	% (percentage)
Hospital	31	20.3
Health center	60	39.2
Dispensary	41	26.8
Mobile Clinics	21	13.7
Total	**153**	**100**

Table 4.18 shows that 39.2% of them accessed health care from health centers and 26.8% of them had access to a dispensary. While 20.3 percent had access to hospitals and 13.7 percent to mobile clinics.

4.9.2 Connection of Health Facility to Electricity

Table 4.19 shows the connection of the available health facilities to electricity.

Table 4.19: Distribution of respondents by Connection to Electricity

Responses	Frequency	Percentage
Hospitals	107	69.9
Health Centres	81	52.9
Dispensaries	40	26.2
Total	**153**	**100**

Table 4.19 shows that 69.9% of the respondents said that the health facilities they visited were connected with electricity while 29.1% said that they were not connected.

4.9.3 Challenges of Health Care Institutions

The study asked the greatest challenge faced by Medicare providers and got the information on table 4.20.

Table 4.20: Major Challenges of Health Care Institutions

Type	Frequency	% (percentage)
Lack of Medication	53	34.6
Level of Treatment Available	47	30.7
Staffing	38	24.8
Hours of Operation	15	9.8
Total	**153**	**100**

Table 4.20 indicates that a significant proportion (34.6%) of the respondents had lack of medication as the major challenge facing health care institutions in Tigania West. Level of treatment available was reported as a major challenge at 30.7% while staffing was major at 24.8%.Iit was however important to note that only 9.8% reported the hours of operation as a major challenge facing health care institutions in Tigania West.

4.9.4 Frequency of Access to Medicare

Table 4.21 shows the frequency of the respondents to seek medication out of their constituency with electrification as compared to before.

Table 4.21: Access of Medical Care locally

Response	Frequency	% (percentage)
Always	62	40.5
Many Times	43	28.1
Moderately	29	19.0
Not Often	19	12.4
Never	0	0
Total	**153**	**100**

Table 4.21 indicates that majority (68.6%) had access to medical care locally. It was however important to note that only 12.4% did not often have access to local medical care. These are possibly the ones that reported to have staffing as their major challenge.

4.9.5 Neighbors Accessing Medicare Locally.

The study wanted to establish how many of the community members had access to the localized health care, and the findings represented in table 4.22.

Table 4.22: Neighbors Access of Medical Care locally

Response	Frequency	Percentage
All	116	75.8
Many	37	24.2
Average	0	0
Few	0	0
None	0	0
Total	**153**	**100**

Table 4.22 reveals that 100% of the community members had access to the localized health care.

4.10 Information Access

This section covers the influence of rural electrification on access of information.

4.10.1 Ownership of Communication Devices.

The respondents were asked which of the following communication devices they owned, and Table 4.24 presents the information gathered.

Table 4.24: Devices Ownership

Response	Frequency	Percentage
Mobile Phone	140	91.5
Television	47	30.7
Computer	7	11.1
Others	1	0.6
Total	**153**	**100**

Table 4.24 indicates that 91.5% of the respondents reported to own mobile phones while 30.7% owned television sets. Computers were owned by a significant proportion of 11.1%. The above analysis was evident that residents in Tigania West owned a variety of electronic items, especially mobile handsets. With this in mind, it was quite clear that electricity within Tigania West had quite a vital role in enhancing information and communication.

4.10.2 Access to the Internet

Table 4.25 has the information on how the respondents accessed the net.

Table 4.25: Distribution of respondents by Access to the Internet

Response	Frequency	Percentage
Mobile phone	10	6.5
Cyber café	7	4.6
Don't access	136	88.8
Total	**153**	**100**

Table 4.25 shows that only 11.i% of the respondents has access to internet, either on their mobile handsets or through internet cyber café. The findings could have been attributed by the fact that most of the mobile handsets did not have access to internet.

4.10.3. Medium for Access of Information

The study sought to find out how people generally accessed information, and figure 4.25 has this information**.**

Table 4.25: Medium for Access of Information

Response	Frequency	% (percentage)
Word of Mouth	123	80.4
Radio	153	100
Print	38	24.8
Television	60	39.2
Internet	12	7.9

Table 4.25 indicates that 24.8% accessed information through print media. Televisions and internet were also used as media for information access by 39.2% and 7.9% respectively. With reference to the analysis above, it could be clear that electricity was vital for access to

information since majority of the media of information exchange required electricity to operate.

4.10.4 Type of Medium Available to You

The type of medium available to the respondents is presented in Table 4.26.

Table 4.26: Distribution of respondents by Media Accessible

Response	Frequency	% (percentage)
Television	98	64
Radio	153	100
Print	38	24.8
Internet	17	11.1

Table 4.26 shows that Radio happens to be the type of medium of information access available to many of the respondents in Tigania West. With almost every homestead having a radio, it was important to note that information sharing was quite very easy and uniform. It was also prudent to deduce that majority of the respondents did not embrace print and internet media.

4.10.5 Influence of Electrification on Media Use

Table 4.27 presents the information on how electrification influenced media use.

Table 4.27: Electrification Influenced Media Use

Response	Frequency	percentage
Yes	99	64.7
No	54	53.3
Total	**153**	**100**

Table 4.27 reveals an overwhelming majority accepting that electrification influenced media use as reported by 64.7% of the respondents.

A confirmation test was conducted through considerations made by Mehta and Patel (1989) on the use of the Monte Carlo method in cases where the exact value cannot be calculated as it provides an unbiased estimate of the exact value without the requirements of the asymptotic method. During this test, the Monte Carlo statistic was absorbed to lend support to the Chi-square results. At the end of the test, the researcher made his conclusion that of all sub variables computed below, influence of electrification is the indicator that had a significant influence on media use in Tigania East.

Table 4.28: Correlation between electrification and media use

	Electrification	**Media use**
Electrification	1	0.689
Media use	0.689	1
No. of respondents	153	153

The researcher sought to find out if electrification had a significant influence on the media use. The study utilized the Pearson correlation co-efficient in establishing the relationship between the two variables. There was a positive correlation of 0.689 between electrification and the subsequent use of media within the area under study. Similarly, it was evident that respondents had enough access to electricity on their electrical appliances they were using hence the 100% of respondents reporting to have used Radio as a media of information exchange and communication.

4.11 Poverty Alleviation

This sections looks at the measures of poverty alleviation and Table 4.29 presents the information as found out by the study.

Table 4.29: Distribution of respondents by poverty Alleviation (Figures in Percentages)

Question	**Strongly Agree**	**Slightly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
Electricity has improved my income	18	60	41	22	12

Electricity is the major source of power in my homestead	51	71	17	10	4
Electricity is my choice in cooking	1	2	4	13	133
My lighting is mostly from electricity	153	0	0	0	0
I have appliances that rely on electricity	153	0	0	0	0
Electricity is pivotal in my homestead for education and entertainment.	27	69	30	18	9

Poverty alleviation was a significant variable to determine in the rural electrification program in Tigania West. Specific indicators were measured to determine the validity of the variable from the electrification.

A likert scale was herein applied to directly test the influence that the variable had by determining the strengths through their indicators.

It was likely found to be evident that electricity was used for the source of income by the respondents. In as much as 60% slightly agreed on this at the likert scale, a significant strength was given by 18% who strongly agreed on the scale thus pushing the strength to 78%.

In another indicator, electricity was perceived to be the major source of power in many homesteads. This received a lot of strength from majority of the respondents on the scale.

With another majority of the respondents having appliances that relied on electricity, and another bigger proportion agreeing on the scale that electricity was pivotal in homestead for education and entertainment, it was quite difficult for the test results to reject the null hypothesis. This therefore implied that rural electrification held the lives of majority of the respondents in Tigania West, and thus influenced in income levels, education, and healthcare provision and also helped alleviate poverty.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, discussions, conclusions and recommendations that were made from the study. It also suggests areas of further research.

5.2 Summary of the findings

This section provides a summary of the findings of the study which were derived from the objectives of the study and the research questions which were formulated to help in the investigations.

5.2.1 Influence of Rural Electrification on Job Creation in Tigania West Constituency.

61.5% of the respondents engaged in business enterprise, out of which 75.8 % had electricity connection with 44.4 % of them pegged on electricity for operation.

5.2.2 The Influence of Rural Electrification in Provision of Education in Tigania West Constituency.

64.7% respondents indicated that most primary schools were connected to electricity, 85.6% for secondary schools and 99.4% for tertiary institutions. The hypothesis testing implied that rural electrification is significantly related to the provision of education

5.2.3 The Influence of Rural Electrification on Healthcare Provision in Tigania West Constituency.

69.9% of the respondents said that the health facilities they visited were connected with electricity while 29.1% said that they were not connected.

5.3 Discussion of the findings

This section discusses the findings of the analyses if this study, based on the objectives and the research questions.

5.3.1 Role of Rural Electrification on Job Creation.

The study found out that 44.4 percent of the business depended on electricity for their operations and that majority of these businesses as indicated by 72.5 percent extended their working hours with more than four hours after 5 pm. The study also revealed that 61.5 percent of the respondents had started business enterprises due to electricity connection and others increased their production as a result of extended working hours and ease of operation due to use of machines. The study also discovered that electricity connection had led to opening of more businesses in the community. Some of these businesses include cyber cafes, Salons, Posho mill, Barber shops among others, which were now more effective and productive with electricity connection. The majority of the respondents agreed to that their income was now improved with electricity connectivity in the community. This is in line with the organization for Economic Co-operation and development OECD (1996) which observed that the rural electrification in Kenya had made great efforts in enhancing employment opportunities and creating strategies that encourage entrepreneurship for new and existing firms. Therefore, the study is in agreement with the claim by Dimara and Skuras (1999) and the commission of European communities (1997) that job creation and diversification of economic activities was a major objective of rural development policies, in which rural electrification is one of them. Moreover, IEG (2008) added that rural electrification had not only increased the number of businesses open in the rural community, but also increased the hours in which the businesses are open.

5.3.2 Role of Rural Electrification in Provision of Education

The study revealed that, 64.7percent of the respondents felt that after the community electricity connections they felt more informed and that electricity had enhanced their participation in development through information and capacity enhancement. This is in line with the observation by Hamyaran (2006) that community empowerment is an approach for development since community empowerment involves involving communities in the development process. World bank (2002) also added that the most vital part of empowerment is to reduce inequality through basic education, health care among others. The argument here is that once the members of the community are able to access information through channels like the internet, the television/ radio, they are more aware of their rights as citizens and hence they are able to contribute to development in more equitable manner than when they are

misinformed. The World Bank (2002) further explained that the link between empowerment and development is based on the assumption that freeing communities to make their own choices is a way to lead them towards development. An empowered community depends less on outsiders and is able to depend on themselves. The World Bank said that information is the main element of empowerment since it equips citizens with the advantage to take opportunities and to access services, to understand rules and regulations and to exercise their rights.

5.3.3 Role of Rural Electrification on Information access.

On the role of rural electrification and access to information the study found out that 91.5% owned a mobile phone and 30.7% of the respondents said that they owned a television set. Thus with access to mobile phones and television the rural people in Tigania west division are able to access information that is inaccessible to those who lack these gadgets. This concurs with IEG which indicates that rural electrification improves the quality of life of a society and individuals. They said that lighting brings about the benefits of increased study time and improved study environment of school children, extended hours for smaller business and greater society. Students now have longer study hours due to the electricity connection which was cheaper than the kerosene they used and more friendly for study time. IEG (2008) also said that electrification brought both entertainments and information through television other media. IEG (2008) reported that the people who live in the rural areas appreciate these benefits greatly that they are willing to pay for them at even higher costs. However, the report revealed that the dominant use of electricity in rural households is lighting which is evident from this study since after the electricity connection 100% of the respondents said that they used electricity for lighting.

5.3.4 Role of Rural Electrification on Healthcare Provision.

The research also unearthed that majority of the respondents representing 87% of the strongly disagree that electricity is their favorite choice in cooking. This minimized the use traditional fuels like fuel from wood and dung exposed people and especially women and young children to indoor pollution which is likely to lead to acute respiratory infections. These infections are also contributed by lighting sources like kerosene lamps.

Howard (2000) claimed that the positive impact of rural electrification on service provision came with the willingness of health and education workers to stay in communities that have electricity. The argument is that most civil servants turn down job offers in places without electricity hence making the rural poor disadvantages.

5.4 Conclusion

Based on the findings of the study, it can be concluded that rural electrification plays a significant role in poverty reduction. It is one of the primary elements towards rural poverty reduction. It is a strategy if well used can be beneficial for economic development through rural upgrading.

Rural electrification created job in the Tigania west Constituency especially in the opening of businesses and extension of working hours. Some businesses are more productive with electricity connection and therefore rural electrification has led to increase in their monthly incomes. Through opening of more businesses, employment opportunities have been created to those who are not able to afford enough capital for starting their businesses. Apart from businesses, electricity has been incorporated in farming especially in poultry farming and green houses.

Based on the findings of this study, we can conclude that rural electrification has enhanced empowerment of the members through information, education, health services among others. People in the community are more knowledgeable on their rights and they are now able to exercise them. Through mediums like television, the internet e.t.c. the people in the community are exposed to as much information and privileges as those in the towns.

We can also conclude from the study that through rural electrification, the quality of life of the people in the community has become better, in terms of better health services, longer study hours, entertainment, access to cheaper communication, easier and cleaner lighting and a cleaner environment, free from air pollution from burnt kerosene particles.

5.5 Recommendations

The recommendations made in this section are in the light of responses and in view of the research findings on the role of rural electrification in poverty alleviation. We recommend that;

1. The rural communities needs to be sensitized on the various ways they can take advantage of electricity connections to upgrade their businesses for better outcome. It is still evident that electricity is underutilized in the rural areas, ignoring some aspects like incorporating technology in their small outlets.

2. Most people in the rural areas are still ignorant on the uses of electricity in their homes apart from lighting. Therefore as the corporate and government continues to support the rural electrification initiatives, there is need to consider training sessions to introduce some of this other uses like cooking, ironing among others to the community members.

3. The bodies responsible for rural electrification program should consider strategies to make it cheaper to ensure that all the members of the community enjoy the privileges that come with theses connections and not just a portion of them.

5.6 Suggestions for Further Research

This research has concentrated on the role of rural electrification in rural poverty reduction; however there are other energy sources that can be used as complementary sources to reduce rural poverty. Therefore it is worthwhile to study the role of other sources of energy like the renewable energy in reducing rural poverty.

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APPENDIX 1

LETTER OF INTRODUCTION

KENNETH MURIITHI MWITI

P.O BOX 1650-60200

MERU

0722-217224

Dear respondent,

RE: REQUEST FOR DATA COLLECTION

This is to introduce you to an being conducted by Kenneth Muriithi Mwiti . The research topic is an investigation of the role of rural electrification in poverty reduction in Tigania West constituency District.

I kindly request for your assistance in filling the questionnaire attached to enable me complete my research. The questionnaire is strictly for academic purpose and any information offered will be treated with absolute confidentiality. Kindly give the information as accurately and honestly as possible.

Thank you in advance for your assistance.

Yours Sincerely,

KENNETH MURIITHI MWITI

Reg: L50/61033/2010

APPENDIX II

QUESTIONNAIRE

Introduction

Hello! My name is Kenneth Mwiti and pursuing my Master degree in Project planning and Management at University of Nairobi. I am conducting a study in the influence of rural electrification on poverty reduction with specific emphasis on to Tigania West. Your participation in the study is voluntary and any information that you will provide will be treated with confidentiality and will not be used for any other purpose other than the objectives of this study.

1.0 Demographic profile

No	Variable (Question)	Response category
1.	Gender	1. Male 2. Female
2.	Marital status	1. Single 2. Married 3. Divorced/ Separated/ widowed
3.	What age bracket do you fall under?	1. Below 25 Years 2. 26-35 Years 3. 36-45 4. Above 46
4.	What is your Current employment status?	1. Employed for a wage/salary 2. Self employed 3. Employed and part time student 4. Full time Student
5.	To which level have you attained formal education?	1. None 2. Primary 3. Secondary School 4. College 5. University
6.	How many dependants do you have in your house hold?	1. 0-2 2. 3-5

		3. More than 6

2.0 Job Creation

No.	Question	Response categories
1.	Which of the following is your main income generating activity	1. Employment 2. Business Enterprise 3. Agriculture 4. student
2.	If agriculture, do you use electricity for the following. (Tick where appropriate)	1. Irrigation 2. Animal Husbandry 3. Powering any farming implements
3.	If you have a commercial enterprise, do you have:	1. Electricity connection in your business? 2. Run a business that directly depends on electricity?
4.	When does the last business close in your locality?	1. 5.00 p.m 2. 6.00 p.m 3. 7.00 p.m 4. 8.00 p.m 5. Past 9.00 p.m
5.	Is there trained maintenance support for your electrical appliances in your locality?	1. Yes 2. No 3. Don't know
6.	How do you think electricity influences your occupation?	……

3.0 Education

No.	Question	Response categories
1	Which of the following institutions are in your locality	1. Primary schools 2. Secondary Schools 3. Tertiary institutions
2	How would you gauge the level of connections for Primary Schools in your locality?	1. All connected 2. Most Connected 3. Equal connected and not connected 4. Most not connected 5. None connected

3	How would you gauge the level of connections for Secondary Schools in your locality?	1. All connected 2. Most Connected 3. Equal connected and not connected 4. Most not connected 5. None connected
4	How would you gauge the level of connections for Tertiary institutions in your locality?	1. All connected 2. Most Connected 3. Equal connected and not connected 4. Most not connected 5. None connected
5	What do you think is the most important use of electricity in Schools?	……..
6	Has electricity influence the performance of schools that are connected	Yes No Don't know

4.0 Health Care Availability

No.	Question	Response categories
1.	Are the following health-care providers in your locality?	1. Hospital 2. Health centre 3. Dispensary 4. Mobile clinic
2.	Which of the health care institutions connected to electricity?	1. Hospital 2. Health centre 3. Dispensary
3.	To you, what is the greatest challenge to the health institutions?	1. Medication 2. Level of treatment obtainable 3. Staffing 4. Hours of operations
4.	How often do you have to seek medication in other localities than locally as compared before electrification?	1. Always 2. Many times 3. Moderate times 4. Not Often 5. Never
5.	How many of your neighbors are accessing medical care locally?	1. None 2. Few 3. Average 4. Many 5. All

5.0 Information Access

No.	Question	Response categories
1.	Which of the following Communication devices do	1. Mobile Phone

	you own?	2. Television 3. Computer 4. Others (Specify)……
2.	How do you access the internet?	1. Mobile phone 2. Cyber café 3. Don't access
3.	Which medium do you use mostly to get information?	1. Word of mouth 2. Radio 3. Print 4. Television 5. Internet
4.	Which of the following media is accessible to you	1. Television 2. Radio 3. Print 4. Internet ……..
5.	Has electrification influenced the media you use?	1. Yes 2. No
6.	How does electricity influenced how you access information?	……

6.0 Poverty Alleviation

No.	Item	Agreement scale				
		Strongly Agree	**Slightly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
1.	Electricity has improved my income					
2.	Electricity is the major source of power in my homestead					
3.	Electricity is my choice in cooking					
4.	My lighting is mostly from electricity					
5.	I have appliances that rely on electricity					
6.	Electricity is pivotal in my homestead for education and entertainment.					

Thank you for taking part in the interview.