

**FACTORS INFLUENCING THE IMPLEMENTATION OF RURAL
ELECTRIFICATION PROGRAMME IN RURAL AREAS; A CASE OF KILIFI
COUNTY**

BY

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DECLARATION

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

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DEDICATION

I wish to dedicate this report to my brother Pascal for his assistance, love and encouragement and my daughter Cindy for her understanding.

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I dedicate this work to my Father in heaven for seeing me through my years of University education. His Grace has been sufficient and has brought me this far and I am grateful. My deepest appreciation goes to my supervisor, Mr. John Bosco Kisimbi for his patience, guidance and constructive criticisms that helped me stay focused from the beginning of this work to the end. I thank all the lecturers who taught me during the Master of Arts degree programme and my dear classmates who contributed immensely in the group work and discussion.

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ABBREVIATIONS AND ACRONYMS

FDA -	French Development Agency
CCK -	Communications Commission of Kenya
DFID-	Department for International Development
EIA-	Environmental Impact Assessment
ESCO-	Energy Service Company
ESMAP-	Energy Sector Management Assistance
FSN-	Fonds de solidarite' Nationale
GDC-	Geothermal Development Company
GEF-	Global Environment Facility
HDI-	Human Development Index
IAP-	Indoor Air Pollution
IDA-	International Development Agency
IDCOL-	Infrastructure Development Company Limited
IDP-	Integrated Development Plan
KETRACO-	Kenya Electricity Transmission Company
KFW-	Kreditanstalt Fur" Wieder Auf Bau
KNBS-	Kenya National Bureau of Statistics
KPLC-	Kenya Power and Lighting Company
MDE-	Ministry of Economic Development
MDG-	Millennium Development Goals
NREL-	National Renewable Energy Laboratory
PEA-	Provincial Electrification Authority
PRD-	Programme Regional de De'veloppement
PSR-	Public Service Reforms
RE-	Renewable Energy
REA-	Rural Electrification Authority
REB-	Rural Electrification Board
REP-	Rural Electrification Programme
REDP-	Renewable Energy Development Programme
REPLF-	Rural Electrification Programme Levy Fund
RET-	Renewable Energy Technologies
SSA -	Sub-Saharan Africa
UN-	United Nations
UNCED-	United Nations Conference on Environment and Development
UNECA-	United nation Economic Commission for Africa
WSSD-	World Summit on Sustainable Development

ABSTRACT

The Government has invested in rural communities with a sole aim of improving the social and economic lives of those living in the rural areas. This is through programme and projects such as rural electrification. These projects are expensive both in design and implementation. One of these areas that have been earmarked by the government is Kilifi County. The question is whether these projects deliver the desired outcome. The purpose of this study was therefore to find out factors that influence the implementation of rural electrification programme in Kilifi County. The objectives of the study were, to assess the influence of institutional reforms on implementation of rural electrification, to examine the influence of millennium development goals on implementation of rural electrification programme, to determine the extent to which public participation influence the implementation of rural electrification programme and to assess the influence of political support on implementation of rural electrification programme. The study adopted a descriptive design of the implementation. The target population was 100 respondents which included trading centers, schools and dispensaries connected or already identified to be connected spread through the constituencies in Kilifi County and that are likely to benefit through the programme. The stratified randomized sampling design was used. Data collection was carried out through questionnaires and drop and pick method was used to distribute the questionnaires. The data was analyzed quantitatively using statistical package for social sciences and presented through tables showing frequencies, percentages, means and chi-square. The findings that were made as follows: - Donor funding was the major attribute of improvement from institutional reforms that contribute to an improvement of rural electrification programme, Enhanced universal primary education which is a major goal to achieving MDGs was voted the best of the Millennium development goals achievements as a result of implementation of REP, On ways in which public participation has influenced implementation of REP, community empowerment was voted to be the best influence of public participation on REP and the study revealed that 49.4% of the respondents think that the level of political support is Medium. The study recommends that Institutional reform measures that include integration of Rural electrification with rural development to ensure maximization of the benefits of electrification and to facilitate increased electricity demand should be put in place. In this regard, rural development should facilitate the development of rural businesses and complementing infrastructure and services such as roads, water supply, schools and health services. The study also recommends an urgent need to establish reliable databases on the electrification of the poor. This is absolutely essential for monitoring rural electrification programmes to ensure they are aligned to the millennium development goals and vision 2030. Communities must also take a greater role and responsibility in Rural electrification activities. This can be achieved by engaging and involving community members in rural electrification programmes such as construction of lines, granting of way leaves permission through their land for electricity lines construction. Regulators must also ensure consumer protection through price regulation and enforcement of performance standards. The performance of the electrification agencies should be evaluated by the number of new connections, particularly in poor rural areas. Significantly, higher rural electrification targets than those currently set should be established. The targets should include explicit and ambitious goals for the electrification of the poor.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Rural Electrification involves the supply of electricity to rural areas or areas away from main cities and towns. Rural areas are usually characterized by low population densities with scattered clusters of premises. Poor communities usually inhabit rural areas in most developing countries. Consequently, rural electricity supply systems are mainly characterized by dispersed consumers, low consumption and low load factors (Zomers, 2001). Access to electricity is a basic indicator to development potentially contributing to income generation, improved educational and health outcomes, gender equalization and a host of other welfare improvements (Cabraal et al., 2005; World Bank, (1996); International Energy Agency, (2004); Goldenberg and Johansson, (1995). The positive effect of rural electrification programme in the United States attracted the third world countries to implement the programme as a strategy of alleviating poverty. The first power station was in Jamaica in 1892, Sri Lanka 1895, Senegal and India in 1897. However, subsequent progress in the third world was slower. For instance, in Africa and Asia, only 5% to 15% of the rural population benefits from electricity, (Republic of Kenya 1993:142). In many literatures related to condition of energy consumption in rural areas of developing countries, the term energy access is used to refer to the situation where people can secure the modern energy, which is commonly consumed in developed countries, at affordable prices (Bhattacharyya, 2006, in press; Spalding-Fecher et al., (2005).

The definition of the term energy poverty is, then, the situation in which energy access is not established yet (Pachauri et al., 2004; Sagar, 2005). The most commonly cited figures on the lack of access to energy indicate that there are about 2 billion people without adequate access to clean cooking energy and about 1.7 billion people are without access to electricity WEA, (2000). Information on access to electricity is somewhat better as detailed country-wise electricity access information can be found in IEA (2002). This source suggests that about 1.64 billion or 27% of the world's population did not have access to electricity in 2000. It can be observed that more than two-thirds of those lacking electricity access are concentrated in 12 countries, 3 mostly located in South Asia and Africa. India alone accounts for more than 35% of the world's population without electricity access, making it the largest contributor to the problem in the

world. Electrification will be necessary for refrigeration of vaccines or lighting to improve evening study conditions (Modi et al., (2006).

South Africa's electrification programme is remarkable by most measures. Prior to 1990, less than a third of the population had access to electricity. The UNDP's Human Development Index (HDI) for South Africa in 1988 indicated that while white South Africans ranked above average by comparison to industrialized countries, black South Africans ranked with low income developing countries Stats SA,(2000); the poorest 20% of the South African population between 1987 and 1994 ranked 33% lower than the developing country average, and markedly lower than the same segment in middle-income developing countries with similar average incomes to South Africa (Stats SA, 2000, p. 103). The first significant attempts to quantify energy use in low income households were documented by Eberhard (1984, 1986); this work was influential in the work of Dingley (1987, 1990), who proposed the idea of a national electrification programme. The social crisis faced by the apartheid state at the end of the 1980s, coupled with the dramatic political changes occurring with the beginning of the negotiation process, resulted in the rapid formulation of electrification as a definable problem in the beginning of the 1990s.

During the 1990s the dominant planning assumption was that 80% of households would be electrified by 2012; however, in his 2004 State of the Nation Address, President Mbeki stated that "with a strengthened local government working with our state enterprise, Eskom, we will, within the next eight years, ensure that each household has access to electricity" (Mbeki, 2004). Total households versus total electricity connections since 1991, and Department of Mineral and Energy (DME) future connection targets adapted from (Bekker et al., 2008). In the late 1990s, the state took the decision to fund the capital cost of the programme entirely from the fiscus, through a National Electrification Fund (Eskom, 2001).

The electricity industry in eastern Africa was characterized by a monopoly structure, dominated by vertically integrated, state-owned power utilities. This is true for almost all countries, with the exception of Uganda and Kenya, which have recently unbundled their power utilities. This monopoly structure is thought to be a large contributor to the under-performance of the region's power utilities. With the exception of Mauritius, power sector institutions are mainly characterized by unreliability of power supply, low capacity utilization and availability factor, deficient maintenance, poor procurement of spare parts, and high transmission and distribution losses. Again, with the exception of Mauritius, all eastern African countries record national

electrification levels of 10 % or less) This is very low compared to other developing regions such as Asia and Latin America, where many countries record an electrification level as high as 70 % [Shrestha et al., 2003].

In Kenya, Rural electrification programme was launched in 1973 to support both non-economic and commercial schemes in the rural areas with KPLC acting as the managing agent on behalf of the government. The programme is funded by the government, KPLC and donor countries. For instance a total of Kshs 952 million was spent during the financial year 2000/2001 including shs 772 spent on phase 2 of the Spanish funded project. This brought the cumulative capital expenditure of the programme to about Kshs 6 Billion since its inception, Republic of Kenya, (1999:7).

Despite efforts from donor countries and the ministry of Energy to provide the rural areas with electricity, the programme since its inception in 1973 has not been successful and only 3.8% of rural households have access to electricity, KPLC, (1996:60) In general, rural-dwellers in East Africa are worse off than their urban counterparts. This can be demonstrated by comparing the expenditure and proportion of those living under the respective World Bank-defined poverty thresholds of US\$ 1 and US\$ 2 a day per capita. For example, in Kenya, rural households spend much less than their urban counterparts. Estimates from the 1997 Welfare Monitoring Survey conducted in Kenya show that rural areas in Kenya have a mean monthly household expenditure of approximately US\$ 63.82.

The absolute poverty line for rural areas used by the same survey stood at US\$ 94.87[6]. In contrast, for urban areas, the absolute poverty line stood at US\$ 147.80[7] with a mean monthly household expenditure of approximately US\$ 151.56. This implies a significantly higher prevalence of poverty in rural areas compared to urban areas, where the mean household expenditure is above the absolute poverty line. This higher poverty level in the rural areas is also confirmed by a recent UNDP report on Kenya UNDP, (2001), which showed that agriculture accounts for 90 % of rural incomes in Kenya, yet contributes only 9 % of the total private and public sector earnings in the country. Consequently, the rural populations, the majority of whom are employed in agriculture, have much lower earnings.

A review of the amended Kenyan and Ugandan Electricity Acts reveals that the Kenyan Act addresses the question of “access” only to a limited extent. For example, rural electrification is mentioned in only three “miscellaneous” paragraphs of the Kenya Electricity Act -- a clear

indication of limited policy interest. The Kenyan Electricity Act amended in 1997 empowers the Minister of Energy to re-establish the Rural Electrification Programme Fund to support electrification in rural areas and other areas considered economically unviable for electrification by public electricity suppliers. Furthermore, the Minister may impose a levy of up to 5 % on all electricity consumed in the country, the proceeds of which go into the Rural Electrification Programme Fund.

The major limitation of the Act is that it is explicitly not in favour of subsidies (which would, otherwise, benefit the poor). It stipulates that Republic of Kenya, (1997):“All rates or tariffs charged by a public electricity supplier for electrical energy supplied ... shall not give any undue preference or be discriminatory.” the *de facto* distribution monopoly enjoyed by the Kenya Power and Lighting Company (KPLC) limits the increase in rural electrification.

The fact that KPLC holds distribution licenses covering most of Kenya, if not the whole of it, implies that no other entity can establish a rural mini-grid or decentralized system without express permission from KPLC. Given that KPLC was only recently salvaged from near-bankruptcy by the government Mogusu, (2004), it is likely to take a while for the utility to upgrade its overloaded distribution system before embarking on the improvement of its rural electrification programme. At the prevailing rural electrification rates, even the government’s very modest target of 10 % by 2012 was not realized. Projections computed by the authors based on the historical annual average electrification rate of 16 % (1996-2002) showed that by the year 2012, the government’s 10 % target for rural electrification levels were not met. A key contributor to the failure of Kenya’s Rural Electrification Programme which was also headed by a Permanent Secretary from the Ministry of Energy MoE, (2003). The Electricity Act also appears not to provide for “ring-fencing” of the funds allocated for rural electrification. As witnessed in the Kenyan case, inadequate protection of the Rural Electrification Fund hobbles attempts to reach the poor. Another important aspect not adequately addressed by the Act is that it does not explicitly provide for the representation of the poor on the Rural Electrification Board.

Table 1.1. Budgetary allocations in Kshs for Kilifi County

Year	Budgetary allocations in Kshs (Millions) for Kilifi County
2003/2004	9
2004/2005	77
2005/2006	40
2006/2007	79
2007/2008	45
2008/2009	95

Source: Rural Electrification Authority, 2009, Master plan for Kenya.

1.2 Statement of the problem

Rural areas in developing countries are characteristically poor but provide the means of livelihood for majority of the population. Studies on rural energy show that wood and fuel contributes to over 80% of total energy supply and its scarcity often precipitates excessive de-forestation and the consequent undesirable ecological effects, World Bank report, (1978). In Kenya, over 80% of the population lives in the rural areas. It is also the rural area where most of the 14 million poor Kenyans are found. According to the welfare monitoring survey, the prevalence overall poverty rate is 53% of the rural population while in the urban areas it is 38%, (Republic of Kenya 1997:2) Notably, it is also in the rural areas where a large proportion of Kenya's labour force is based. According to the 1999 population census, out of a total labour force of 10.3 million people, about 82% are based in the rural areas, (Republic of Kenya 2002:50). This shows that it is very important to implement a programme that will help in poverty alleviation where the majority and most productive people are affected.

In Kenya, 46% of the urban and 38% of the rural households have access to electricity. Household consumption averages 844kwh in urban and 544kwh in rural areas, (Republic of Kenya, (2002: xiii-iv). This clearly shows that the poor who are the majority in the rural areas lack access to electricity. This means that the benefits accrued from electricity do not reach them. It only impacts on the few rich people found in the rural areas. Given this background, it was imperative to find out the factors that influence the implementation of rural electrification programme so as to enhance the livelihoods of the rural poor.

1.3 Purpose of the study

The purpose of the study was therefore to examine the factors that influence the implementation of rural electrification programme in rural communities in Kilifi County and come out with results that can help in policy planning and improve livelihoods in the area.

1.4 Objectives of the study

The study was guided by the following objectives;

1. To assess the influence of Institutional Reforms on implementation of rural electrification programme in Kilifi county
2. To examine the influence of Millennium Development Goals Achievement on implementation of rural electrification programme in Kilifi County
3. To determine the extent to which Public Participation influence the implementation of rural electrification programme in Kilifi County
4. To assess the influence of Political Support on implementation of rural electrification programme in Kilifi County

1.5 Research Questions

The study answered the following research questions

1. How do institutional reforms influence the implementation of rural electrification programme?
2. How do millennium development goals achievements influence the implementation of rural electrification programme?
3. To what extent does public participation influence the implementation of Rural electrification programme?
4. To what extent does the influence of political support influence the implementation of rural electrification programme?

1.6 Research Hypothesis

Here, the researcher outlined the hypotheses that were tested during the study.

H1=There is a significant relationship between institutional reforms and the implementation of rural electrification programme.

H1=There is a significant relationship between the millennium development goals achievement and implementation of rural electrification programme.

H1=There is a significant relationship between public participation and the implementation of rural electrification programme

H1=There is a significant relationship between political support and the implementation of rural electrification programme.

1.7 Rationale of the study

This study is justified since it will help in filling the knowledge gap existing in the field of Rural electrification. Many studies have been done in Kenya pertaining to Rural electrification programme but few articles exist that study rural area of Kilifi County.

1.8 Significance of the study

The study will benefit the government (Ministry of planning and Devolution)in planning and forecasting the demands and needs of the county as they foster to attain Vision 2030 goals whose one of its aims is to provide extensive rural electrification programme. This will facilitate intensifying the programme to enhance access to electricity by the rural folks and allocations of funds to the programme by government depending on the level of connectivity already achieved.

The study will also be of significance in increasing the number of households that can have access to electricity due to the government effort to increase the funds allocated to specific counties to ensure that the programme is a success. This can be achieved through pilot studies that are usually done before implementation of the project. For instance the ongoing pilot study and electrification of rural primary schools in preparation of the rolling out of the lap top project by the Rural Electrification Authority charged with the mandate of ensuring that as many

primary schools are connected to guarantee the success of the programme so that primary pupils can use the lap tops pledged by the government powered by electricity.

The study will also be significant to researchers who plan to carry out their studies in the same line as a reference point and to improve their theory of knowledge in analyzing their research findings and filling in the gaps. The researcher will also have increased her body of knowledge by successful completion of this research project.

This information will be used to attract and inform the investors in the area of the benefits they are likely to find in the region and the likely constraints and challenges so that they are better positioned to deal with them rather than if they do not know they exist.

1.9 Basic assumptions of the study

It was assumed that the information given by the respondent was true, trust worthy and valid in order to make reasonable conclusions that can be used in planning purposes for the benefit of the reasons that the research was done.

It was also assumed that the questionnaires sent to the respondent was filled correctly and adequately and returned back to the researcher in good time for analysis of the data.

It was assumed that the instruments of data collection were valid, representative and were able to collect the desired information.

1.10 Limitations of the study

Time limitation

Since the study was to be done during the day and the researcher was also working, there was time limitation as the researcher had to strike a balance between work and carrying out the study in order to achieve both set goals. Therefore the study was carried out with in a limited period of time.

Transportation strain

Kilifi County is a vast area .Therefore the researcher used boda boda in areas that are not easily accessible by matatu instead of hiring a taxi to cut down on cost.

Unfavorable weather conditions

The coastal area is generally hot and dry and covered with a lot of dust. Due to this fact, the researcher had to choose appropriate time in the morning before the sun becomes too scorching and the wind too heavy to hamper the research. The respondents also are more active in the morning hours when they are still fresh. The problem of dust was countered by use of dust masks. The researcher armed herself with a raincoat so that her data collection process was not interrupted by the rains.

Illiteracy among the respondents

Because some of the respondents were illiterate, the researcher employed the services of a local to act as a translator to be able to get information from respondents who had valid information but could not speak the same language as the researcher. This was to enhance data collection process. The translator was also to act as security because they understand the community and the environment too well.

1.11 Delimitations of the study

Wider scope of coverage

Kilifi County is a vast area and therefore the researcher had to travel wide and far to cover the stratified constituencies of Kilifi County to obtain a reasonable sampling size so that the findings are generalizable. The researcher therefore employed the use of boda boda to ensure that she accessed areas that were not accessible by the vehicles due to the poor road network in some areas such as Mbuyuni primary.

Getting access to the public that needed to respond to this study proved also to be a challenge. Some of the respondents tended to have a busy schedule that did not allow them to be available to answer the questions at hand. This is because some of the respondents were key stake holders in the county. The researcher therefore employed drop and pick method for the questionnaires.

1.12. Definition of Significant terms used in the study

Rural electrification-This is believed to be an act of taking electricity to the rural folks to lighten up the rural areas with a view to devolve the electricity even to remote areas.

Rural electrification programme-This is a long term plan meant to accelerate electricity connection to the rural areas within a specified period of time to electrify the rural areas.

Millennium development goals achievements- These are development targets set by a government with an aim of improving the livelihoods of a nation to achieve a specific goals with in a period of time.

Institutional reforms-These are structures and procedures put in place to facilitate accountability, checks and balances with in a functioning government operations to curb non conformities in their operations.

Political support-This is the ability of the government to provide the necessary resources, moral and technological support in implementation of the rural electrification programme.

1.13 Organization of the Study

The study was organized such that the proposal level entailed chapter one to three while the main research covered from chapter one to five.

Chapter one is the introduction which includes the background of the study, statement of the problem, purpose of the study, research objectives, research questions, research hypothesis, significance of the study, basic assumptions of the study, limitations of the study, delimitations of the study and definitions of significant terms. Chapter two presents the literature review which looked at the themes of the objectives, theoretical framework, conceptual framework, gaps in the literature reviewed and the summary of literature review. Chapter three outlines the research design, target population, sample size and sampling procedures data collection instrument, data collection procedures, data analysis techniques, ethical considerations and operational definition of the variables. Chapter four contains data analysis presentations and interpretations. Chapter five presents summary of the findings, discussions, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature where the rationale of Rural Electrification Programme was discussed. Special attention was paid to the variables of study that is factors influencing the implementation of Rural electrification programme in rural communities in Kilifi County, Kenya. This review provides an in depth analysis of literature, To assess the influence of institutional reforms on implementation of rural electrification programme in Kilifi county To examine the influence of millennium development goals on implementation of rural electrification programme in Kilifi County, To determine the extent to which public participation influence the implementation of rural electrification programme in Kilifi County, To assess the influence of political support on implementation of rural electrification programme in rural communities in Kilifi county. It also gives a summary of the literature review.

2.2 The rationale of rural electrification programme in developing countries

The critical role played by energy in achieving sustainable development is now well recognized and the extreme form of disparity existing in the world in terms of production, consumption and access of energy is considered as a major concern. This has been highlighted in the recent past by the UN and other world bodies as evidenced from WEC (2001) and WEC (2000), DfID (2002), and IEA (2002)), and received global attention at the Johannesburg Summit in 2002.

Access to energy has been identified as a major challenge and there appears to be a consensus that 'provision of affordable, reliable, and socially acceptable energy services' is a prerequisite for achieving the Millennium Development Goals (WEHAB, 2002). Electrification rates vary significantly across countries in the Asia and Pacific region.

Almost 100% of the population in countries such as Singapore and Thailand have access to electricity, over 80% in countries such as Singapore, Malaysia, Thailand, the Marshal Islands, China, Fiji, Micronesia, and Tonga, less than 45% of the population in countries Bangladesh, Cambodia, Myanmar, Nepal Solomon Island and Kiribati, and less than 20% of the population in countries such as Bhutan, Cambodia, Myanmar, and the Solomon Islands.

Typically, South and South East Asian countries are characterized by high density populations with about 59.2% and 37.8%, respectively, of their total populations not yet having access to electricity.

Rural electrification programs using Renewable Energy (RE) tend to be characterized by scattered low-income consumers, high upfront equipment costs and decentralized electricity supply grids that are gradually being extended. These are regarded as the main reasons for low rate of rural electrification. Institutional weaknesses and the limited availability of financing are also regarded as factors that affect rural electrification programs in developing countries. Other barriers that affect rural electrification using renewable energy technologies (RETs) in developing countries included the high cost of transmission and distribution, low electricity demand, low consumption and over dependence on donors. Another very common problem for electrification in developing countries is that grid extension projects are often undertaken for political reasons rather than on the basis of economically rational decision making.

In Bangladesh, for example, early solar electrification programs undertaken by the Government through the Rural Electrification Board (REB) in 1996 were abandoned due to an election commitment by the energy minister to extend the grid electricity to the areas. In Bangladesh only 32.5% of the population has access to electricity and most of those without access to electricity live in the remote parts of the country. Even in those areas where electricity is provided, electricity supply is unreliable.

To provide electricity for those without access to electricity, a program has been developed by the Infrastructure Development Company Limited (IDCOL) with the help of the World Bank. The objective of the program is to affect a 'change in livelihoods in remote rural areas of Bangladesh through providing access to electricity'. The program was commenced in 2002 and is ongoing. It is funded by the International Development Agency (IDA), Global Environment Facility (GEF), Kreditanstalt für Wiederaufbau (KfW), Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and the World Bank. The target groups were those with lighting expenses around US\$1.5–2 and the initial target was to install 50,000 solar home systems (SHS) by 2008. The total number of systems installed to date is over 93,600, of this, 76% are household users, Renewable Energy (2009)

In many literatures related to condition of energy consumption in rural areas of developing countries, the term “energy access” is used to refer to the situation where people can secure the modern energy, which is commonly consumed in developed countries, at affordable prices (Bhattacharyya, (2006), in press; Spalding-Fecher et al., (2005)). It is revealed that electric lighting appliances such as an incandescent bulb, fluorescent tube and CFL are widely adopted by the rural households of Assam, India. This means that, even including costs of electricity-generating technologies and fuels, the cost of the lighting appliances attains cost effectiveness in the rural areas, where presently the households are completely dependent on kerosene for lighting and there is no facility or equipment to generate electricity. In fact, it is reported that the real cost of energy, which poor rural households expend, is higher than that of electricity (ESMAP, 2000; IEA, 2003).

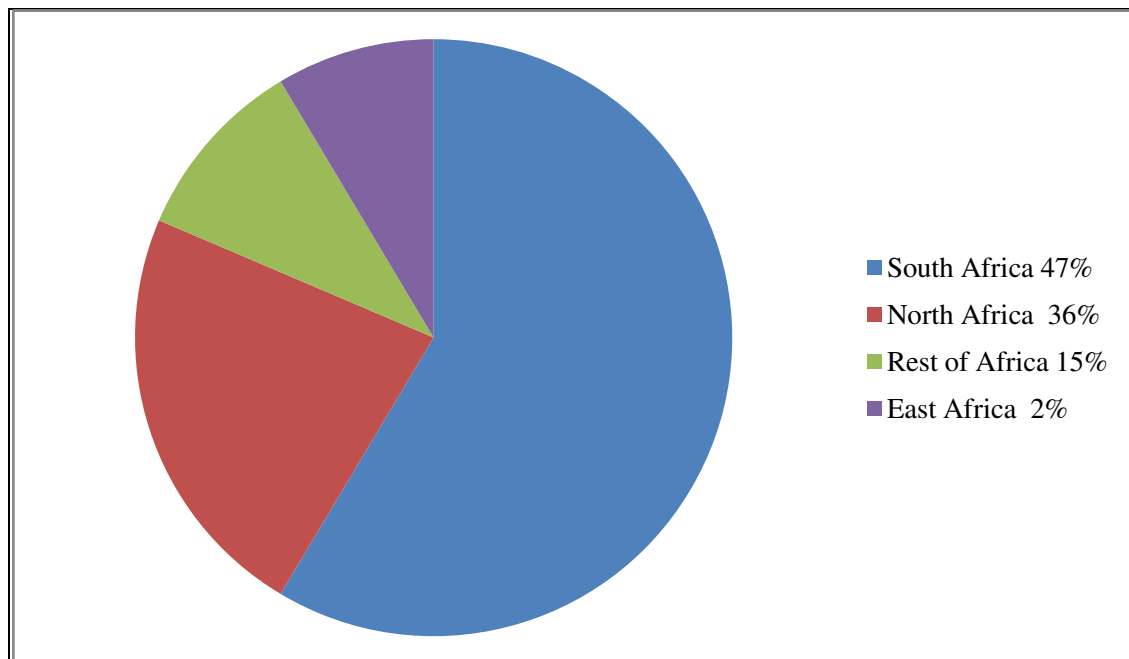
However, in reality, large initial investment on the electric lighting appliances and generating technologies prevents the households from improving the energy access. For the supply side, private sectors must be fully incorporated into the countries’ development strategies. Financial sources of governments of developing countries are limited and huge investment, US\$ 197–395 billion (Spalding-Fecher et al. 2005). Public expenditure of the government is to be spent on billion, is needed to provide energy according to the estimation by constitution of a market performing efficiently and establishment of institutions. Here, the institution is one of the basic concepts to succeed in assistant programs, and fundamental and indispensable structure of society toward development (Akiyama et al., 2003).

In South Africa, for energy access issues, as a key instrument for financing the access, a new Global Energy Access Fund was proposed (South Africa, (2002)). It included distribution investment, and related capacity building; grant funding for feasibility studies and capacity building; seed funding for innovative delivery models; and micro financing for entrepreneurs, particularly for women (Spalding-Fecher et al., (2005)).

The UNDP’s Human Development Index (HDI) for South Africa in 1988 indicated that while white South Africans ranked above average by comparison to industrialized countries, black South Africans ranked with low income developing countries (Stats SA, (2000)); the poorest 20% of the South African population between 1987 and 1994 ranked 33% lower than the developing country average, and markedly lower than the same segment in middle-income developing countries with similar average incomes to South Africa (Stats SA, (2000)).

A disparity was also seen in access to basic services and infrastructure, including electricity. The 1996 census, the first census in South Africa that surveyed the whole population, indicated only 58% of the country's population had access to electricity, and only one in four non-urban black South African households was electrified, as opposed to 97% of non-urban white households Stats SA, (2000). The supply segment of the electricity industry in eastern Africa is relatively small compared to that in other regions of the African continent. Eastern Africa contains only 2 % of the total installed capacity in Africa. As shown in Figure 1, North and South Africa contribute 83% of the total installed capacity, while the rest of the countries account for 15%. Electricity production in eastern Africa is heavily dependent on hydro, with close to 73% of the production coming from large and small hydro generating units. The balance is shared between thermal generating units, geothermal and bagasse-based cogeneration.

Figure 1 Share of installed capacity in Africa (2000)



Sources: World Bank, (2003b); IEA, (2002); AFREPREN, (2004)

2.3 Influence of institutional reforms in the implementation of rural electrification programme

The UNDP's Human Development Index (HDI) for South Africa in 1988 indicated that while white South Africans ranked above average by comparison to industrialized countries, black South Africans ranked with low-income developing countries Stats SA, (2000); the poorest 20% of the South African population between 1987 and 1994 ranked 33% lower than the developing country average, and markedly lower than the same segment in middle-income developing countries with similar average incomes to South Africa Stats SA, (2000).

The main barriers to widened access to electricity in the late 1980s were institutional and political. Both barriers were swept away by the democratic transition in the early 1990s, which provided not only a fundamental shift in the political landscape, but also an unusual institutional environment for policy making.

During the initial negotiation process, much policy making moved from the state to stakeholder forums, as anti-apartheid political groupings began to change the content and scope of the policy agenda significantly.

The period 2000–2001 saw the confluence of a number of different developments that resulted in policy shifts that significantly changed the institutional basis of the electrification programme. This involved the post-transition development of policy frameworks in a number of spheres, including energy policy, public enterprises (key policy framework published in 2000), local government (restructured in 2000), and spatial development (the Integral Sustainable Rural Development Programme and Urban Renewal Programme were announced in 2001, and the Integrated Development Plan framework implemented in IDP (2001).

The final policy shift in the electrification programme occurred from 2004, and focused on the date 2012. During the 1990s the dominant planning assumption was that 80% of households would be electrified by 2012; however, in his 2004 State of the Nation Address, President Mbeki stated that why with a strengthened local government working with state enterprise, Eskom, will, within the next eight years, ensure that each household has access to electricity Mbeki, (2004)

Current estimates of the proportion of total households in South Africa with access to electricity vary quite widely, from around 64% to over 80%. An estimated 6.9 million additional households needed to be electrified by March 2013 to achieve universal access. This means that around 1.15 million households will need to be connected per year, which is almost double the roughly 575,000 households targeted per year by the DME's Universal Access Plan (DME), (2007).

Power sector reforms involving corporatization/commercialization of the power utilities have significantly improved the financial performance of the state-owned utilities. The introduction of new management teams has also improved the financial performance of utilities. For example, in Uganda, the former Uganda Electricity Board had for a long time consistently registered huge financial losses. However, a change in management led to a Ushs.4 billion profit and an increase of 20 % in debt collection Bidasala, (2001) in under two years rural communities throughout the island Veragoo, (2003). With regard to reforming the legal and regulatory framework, only two countries, Uganda and Kenya, have established independent regulatory agencies.

However, in 2001, Tanzania passed an Act of Parliament for the establishment of the Electricity and Water Utilities Regulatory Authority, which is yet to be constituted. Ethiopia established the Electricity Agency in 1997.

Unlike the Ugandan and Kenyan regulatory agencies that could be considered 'independent', the Electricity Agency in Ethiopia was designed to work closely with its parent ministry, the then Ministry of Mines and Energy Teferra, (2002).

The Government of Uganda is, however, in the process of implementing the Energy for Rural Transformation Project whose objective is to increase rural electrification levels to about 10 % by the year 2012 Okumu, (2003). This target is too low given that at the end of the next 10 years, the vast majority of the poor (90%) will still have no access to electricity. Data from other African countries (South Africa, Zimbabwe and Ghana) show that for the same period of time (or even shorter), it is possible to achieve much higher increases in electrification levels. For example, South Africa recorded an 18 percentage point increment in 7 years; Zimbabwe's rural electrification increased by 19 percentage points in 8 years, and Ghana's rural electrification went up by 30 percentage points in 10 years NER, (2003); Gboney, (2001); Kayo, (2002); Dube, (2002).

The practice of linking improved access to licensing has been successfully implemented in the mobile telecommunication sector in Kenya. Operators are licensed on the basis, among other prerequisites, of a demonstration of their ability to significantly increase the number of mobile telephone connections and the geographical coverage. The license awarded to successful operators includes a target number of new connections and geographical coverage over a specified period. Subsequent renewal of the operator's license largely depends on the extent to which the operator has met the initial target CCK, (2003). With the exception of Zimbabwe, the key driver for high national electrification levels was rigorous and well-managed rural electrification programmes. In some countries, the increase in rural electrification levels was higher than that of the national level. For example, in South Africa, rural electrification levels rose from 21 % to 50 % in seven years (1995-2002), indicating an increase of 29 percentage points compared to an increase of 18 percentage points at the national level NER, (2002).

The emerging of reforms in the power sector in the form of commercialization, structural changes and privatisation, and the relative success of the reforms in pioneer countries, Chile and United Kingdom (England and Wales) stimulated adoption of the reforms in many countries Wamukonya, (2003b). Further, financing institutions such as the World Bank and the International Monetary Fund believed that the reforms could help improve technical and financial performance of the power sector.

As such, the World Bank started incorporating conditions for reforms in lending agreements to the power sectors in developing countries World Bank, (1993).

The current wave of Public Service Reforms (PSR) started in the late 1970s in Chile Wamukonya, (2003b). The reforms are based on market theories where by electricity is treated as a commodity as opposed to the long-standing view that electricity is an integrated service Byrne and Mun, (2003). Proponents of reform argue that governing the electricity industry according to market dynamics rather than social-political considerations could result in a more efficient operation.

The nature and extent of PSR vary depending on the circumstances in a country and on regional influence. Generally, the reforms amount to structural changes and/or privatization. Structural changes include vertical and horizontal unbundling or mere separate accounting of segments of power supply. For developing countries, actors like the World Bank contend that the main areas of reform are corporatization and commercialization of state owned power companies, introduction of competition, establishing independent regulatory bodies and opening the sector for private participation World Bank,(1993).

A review of literature World Bank, (1993); Bacon and Besant-Jones, (2001); Wamukonya, (2003a); Bhagavan,(1999a),Ranganathan, (1992) Kessides, (2004) reveals that proponents of PSR such as the World Bank argue that improvements in the power sector brought about by reforms could avail more resources to RE. Liberalization introduces new private players in the market with potential for competition, increased investment and introduction of new management and technical skills. Some proponents of reforms argue that the reforms further provide an opportunity for policy makers to change institutional arrangements that have failed to facilitate increased access to electricity in rural areas of developing countries in the last two decades. For instance, utilities as agents for RE have limited capacity to integrate RE with end-use demand enhancing components such as agricultural extension services, business development and social services (health and education). As Ramani (1992) observes, utilities have tended to focus on grid extensions even where decentralized systems are more suitable.

By 2004, nearly all developing countries had implemented some reforms with countries in Latin America taking the lead in the reform process GNESD, (2004). Argentina initiated reforms about 1990 and privatized the power companies in 1992/1993. It was only in 1995 that the country implemented a far-reaching programme for electrification of isolated rural areas Bouille et al., (2002). The reforms in Sub-Saharan Africa have been quite diverse with some countries taking significant measures while others have been more cautious and slow to reform. Karekezi and

Kimani (2002) observe that over 20 African countries had initiated PSR by 2001. Most countries implemented reforms in the mid to late 1990s.

However, Kenya did not establish nor did the country have a dedicated RE agent prior to the reforms Nyoike, (2002). Senegal is one of the countries in Africa to have embarked on major reforms. Zambia liberalized the power sector in 1995 and had privatized parts of the distribution system by 1997. The law establishing the regulator was enacted in 1995 although the regulatory body only started operating in 1997. However, following unsuccessful privatization in other sectors of the economy, the country decided not to privatize but commercialize the state-owned power company in the country. While RE was part of the initial reform programme through the setting up of a RE fund in 1995, a dedicated RE agent was only established in 2003 Haanyika, (2004). Most Asian countries had by 2004, implemented market reforms in their power sectors. Most of the countries had established dedicated electrification bodies and appropriate supportive legislation TERI, (2004).

In Thailand for instance, the Provincial Electrification Authority (PEA) responsible for RE, implemented a 25-year ‘‘National Plan for Accelerated Rural electrification’’ in 1974 and a dedicated office for RE was established within the PEA (AIT, 2004). In Vietnam, the major reforms in the power sector were started in 1995. The main objective of RE was to enhance food production in rural areas of the country (AIT, 2004).

Whereas international financing institutions strongly recommended privatization as a reform measure, a significant number of countries in Sub-Saharan Africa failed to find suitable private buyers for public utility companies. For instance, the privatization of the Senegalese utility, SENELEC was twice aborted in 1999 and in 2001 before being finally put-off. On initial privatization, the new private owners could not increase capacity to curb the frequency and duration of blackouts as required in the conditions of sale forcing the Senegalese government to withdraw the sale. In the second instance, the government could not find a suitable buyer Wamukonya and Fall, (2003). Case studies on electrification in Africa by (GNESD 2004) show that market oriented PSR affect the rate of RE negatively.

For instance, the RE rate in Kenya reduced from 16.1% in 1993 to 7.7% in 2001. Overall access to electricity in Kenya was 5.5% in 2001 while access in rural areas was only 0.8%. In Senegal, access to electricity in rural areas increased from 5% in 1996 to 8.3% in 2001. Zambia did not seem to record any significant improvement in the level of access to electricity in rural areas

between 1990 and 2000. The access level remained at about 2% while the rate fell well below the population growth rate of 2.5% per annum (Haanyika, 2004). Studies by Bacon and Besant-Jones (2001) indicate that involvement of the private players in the power sector somewhat increased private financing. Similarly, (Kessides, 2004) indicates that developing and transitional economies experienced an increase in annual private investments in electricity projects from US\$1.3billion in 1990 to US\$48.7 billion in 1997 with most of the investments going to early reforming countries in Latin America.

2.4 Examining the influence of millennium development goals achievements on implementation of rural electrification programme.

The MDGs are the numerical target that should be met by the year 2015 and were adopted at the UN General Assembly in 2000. The MDGs consist of eight goals as shown below (UN, 2006): Eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability; and develop a global partnership for development. The Department for International Development (DFID) of the United Kingdom mentions links between energy and the MDGs, classifying into direct and indirect contributions (DfID, 2002).

The critical role played by energy in achieving sustainable development is now well recognized and the extreme form of disparity existing in the world in terms of production, consumption and access of energy is considered as a major concern. This has been highlighted in the recent past by the UN and other world bodies (as evidenced from (WEC 2001) and (WEC 2000),(DfID 2002), and (IEA 2002), and received global attention at the Johannesburg Summit in 2002. Access to energy has been identified as a major challenge and there appears to be a consensus that 'provision of affordable, reliable, and socially acceptable energy services' is a prerequisite for achieving the Millennium Development Goals (WEHAB, 2002).

Another key linkage is the role energy services can play in substituting for labor in areas where labor shortages exist as a result of HIV/AIDS. Research in Kenya Muchena et al. (2005), and on the impact of AIDS on available labor for the livestock Engh et al. (2000), non-timber forestry (Barany et al. 2001), and other agricultural sectors, shows dramatic labor shortages throughout sub-Saharan Africa, even in densely populated areas such as Kisii in Kenya (800 persons km⁻²). As a result of labor shortages, food shortages are reported as well, for example in Zimbabwe

(UNAIDS 1999). While there is no MDG on energy, access to energy services, especially by poor people and communities, is essential to reaching all of the MDGs. More and better energy services are needed to end poverty, hunger, educational disparity between boys and girls, the marginalization of women, major disease and health service deficits, as well as environmental degradation.

2.5. Public participation as an influence to implementation of rural electrification programme

Public participation may be defined as the involvement of individuals and groups that are positively or negatively affected by a proposed intervention for example (a project, a programme, a plan, a policy) subject to a decision-making process or are interested in it. Levels of participation in impact assessment vary, from passive participation or information reception (a unidirectional form of participation), to participation through consultation (such as public hearings and open-houses), to interactive participation (such as workshops, negotiation, mediation and even co-management). Different levels of public participation may be relevant to the different phases of an impact assessment process, from initial community analysis and notice of the proposed intervention, to approval decision making, to monitoring and follow-up (André et al., 2006).

Community participation is a process whereby people who are to benefit from local development influence the direction and execution of activities rather than merely receiving a share of the benefit. This means they take an active role in identifying their needs, prioritizing those needs, mobilizing internal and external resources and implementing activities towards achieving their objectives, (Aworti, 2008) Rural electrification can benefit greatly from the involvement of local communities or suffer from its absence. Setting up rural electrification community to represent the local community can do much to smooth the implementation of the program. The committee can play a crucial role in helping assess the level of demand, educating consumers in advance, and encouraging them to sign up for a supply and promoting the wider use of electricity, Barnes and Foley, (2004).

In Bangladesh, consumer meetings were held before the arrival of the electricity supply, helping to avoid costly and time consuming disputes over rights of way and construction damage. Community contributions in cash or kind were often the decisive factor in bringing areas within the scope of rural electrification in Thailand. The efforts to recruit customers made by parish

rural electrification committees in Ireland ensured that the utility received an adequate return on its investment and contributed to the rapid implementation of the country's rural electrification program. Different levels of public participation may be relevant to the different phases of an impact assessment process, from initial community analysis and notice of the proposed intervention, to approval of decision making, to monitoring and follow-up Andre' et al., (2006) When governments enable the public to participate in decision making, they help meet the society's goal of sustainable and environmentally sound development.

As a result of public participation the process of decision making up to and including the final decision, becomes more transparent and legitimate. Public debate on proposed activities among all interested groups at an early stage of decision making may prevent or mitigate conflicts and adverse environmental consequences of the decisions with trans- boundary impacts United Nations,(2006).

According to Moser (1989), community participation is essential in ensuring sustainability of community projects since local people and their legitimate organizations are able to develop the needed capacities to transform community development process beyond the short term interventions. Community participation is therefore a means through which local self-reliance is stimulated thus reducing dependency on the outside agencies (Comwell, 2008). Principle 10 of the Declaration of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro Brazil, (1992) emphasizes that environmental issues are best handled with the participation of all concerned citizens, at the relevant level. Agenda 21 adopted by UNCED recognized the important role of public participation in Environmental Impact Assessment (EIA) in achieving sustainable development item 23.2 (Agenda 21).

The World Summit on Sustainable Development in Johannesburg, South Africa, in 2002 developed further these provisions (United Nations, 2006). The principles promoted by these conferences are fully integrated into the provisions of the UNECE Convention on Environmental Impact Assessment in a Trans boundary Context, which came into force in 1997 United Nations, (2006).

2.6. Political support as an influence to the implementation of Rural electrification programme

The electricity market involves a complex system where: economic, technical, institutional, financial, social, political and environmental factors influence the demands of the different consumers. Amongst all these factors, the institutions for the delivery of electricity services and the provision of finance to customers greatly affect these markets. In this context, policy refers to any new laws or regulations that: promote, accelerate or improve electricity services among rural populations. When a government policy seeks to promote access to renewable energy sources, it needs to influence factors such as: affordability, disposable income, availability and high quality of modern sources. (Barnes et al. 2005).

Like most countries in sub-Saharan Africa (SSA), Kenya is not an exception in facing energy dilemmas – one of the key obstacles to the shift to modern energy consumption is the limited access to electricity for households, particularly in the rural areas. The overall electrification rates in SSA (2000) stand at 23%, with the urban and rural area figures standing at 51% and 8% respectively IEA, (2002).

However, Kenya has electrification rates below the SSA average with 14% overall connection and a breakdown of 42% and 4% for urban and rural areas respectively Kenya National Bureau of Statistics (KNBS) 2000). One reason for this low level of electrification in rural areas is the lack of available finance to cover capital and operating costs for generation, transmission and distribution of electricity, which are higher than in urban areas. Moreover, the high connection costs coupled with low consumption of electricity and low incomes among rural households are further obstacles to the electrification of these households.

Most rural households consume traditional energy sources derived from woodfuel, charcoal, agricultural residues and cow dung. In fact, the dominant energy source for non-electrified households in Kenya is primarily wood fuel and charcoal. Wood fuel provides 70% of the energy for all sectors in the country, except for the transport and commercial sector. Its use is common among households in rural areas, because it is relatively cheap and widely available and in fact 80% of these households consume this type of fuel. The impact of these traditional fuels on rural households includes adverse effects, such as: indoor air pollution (IAP), poor lighting and deteriorating environmental and economic well-being. It has been reported that households are

willing and able to pay, on average, about US\$3-US\$10 per kWh for improved energy services based on renewable energy resources including biomass Kammen and Kirubi (2008).

Another initiative promoting electricity access in the rural areas is “*Umeme Pamoja*”, which translates as “Electricity Together”. This campaign aims to establish a joint group of households, so as to connect them collectively to the grid, thus saving costs. This scheme is financed by the group settlement electrification schemes created by the KPLC. According to them, this scheme is aimed at making electricity connection easier, affordable and faster (KPLC 2006). The REPLF is one of seven decentralized operational funds in Kenya aimed at alleviating socio-economic disparities at the local level. Innamely the rural electrification programme levy fund (REPLF), this is charged to all electricity users nationwide.

Table 2.1 Government funding for Rural Electrification Projects in Kshs Millions

SOURCES	PERIOD /Kshs in Millions			
	1973/74-2002/03	2003/04-2010/2011	Total	Percentage
Internal	4,271	31,475	35,746	80
External	2 994	5 883	8 877	20
Total	7,265	37,358	44,623	100

Source: (Ayieko, 2011) Kenya.

2.7 Conceptual framework

Conceptual framework outlines the dependent, independent and moderating variables as discussed in the literature review and elaborated in figure 2. It helps one to understand the relationship between the variables of study.

Figure 2 conceptual frame work

Independent Variable

Institutional reforms

- Improved Policy formulation and mature supportive government structures
- Effective and realistic government expectations

Influence of MDG's achievement on REP

- Reduced environmental degradation
- Poverty reduction
- Enhanced care and reduced infant mortality

Influence of public participation on implementation of REP

- Community empowerment
- Participatory decision making
- Self-sustainability and creation of employment
- Reduced dependency on central government

Influence of political support

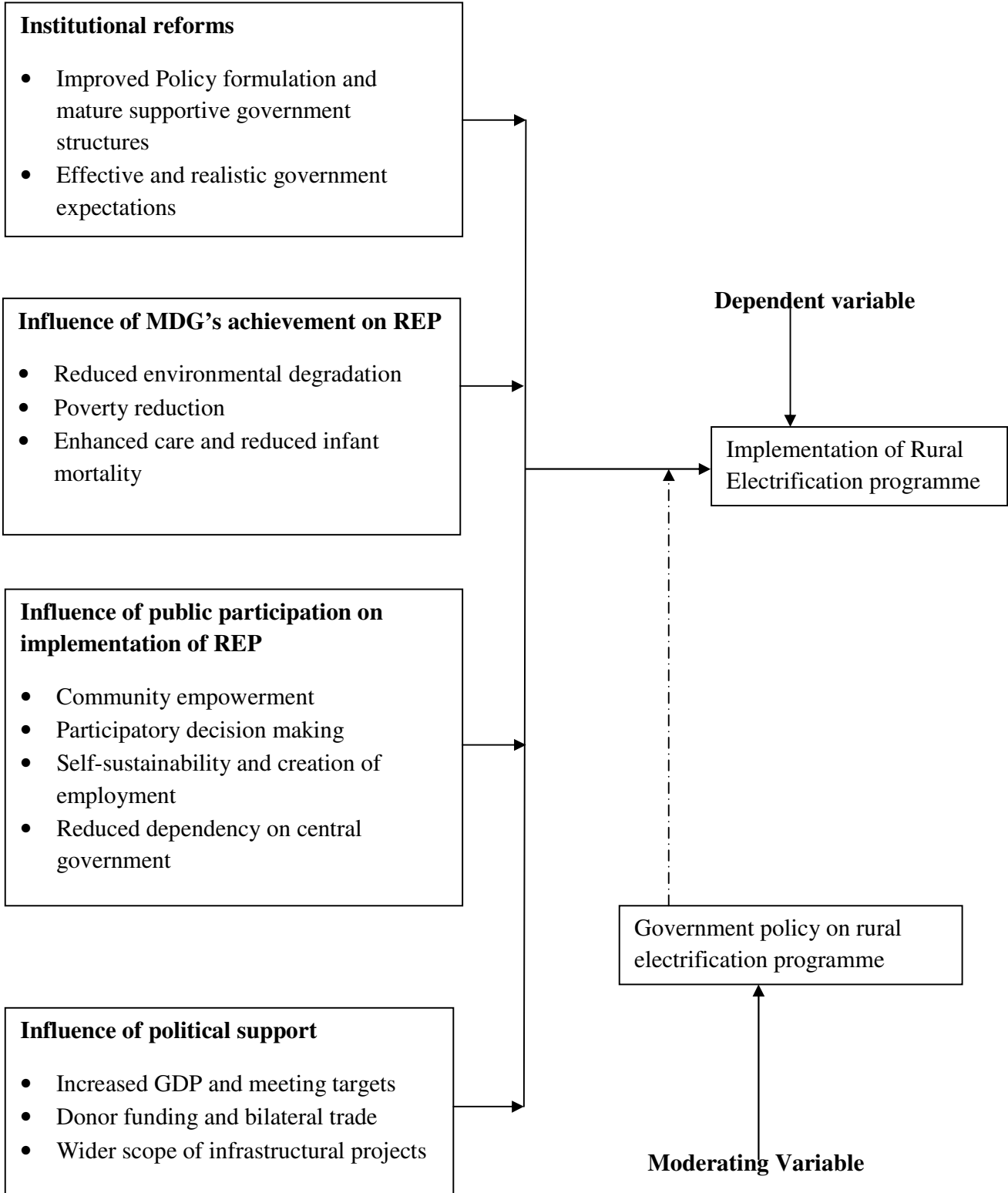
- Increased GDP and meeting targets
- Donor funding and bilateral trade
- Wider scope of infrastructural projects

Dependent variable

Implementation of Rural Electrification programme

Government policy on rural electrification programme

Moderating Variable



2.8 Explanation of relationships of variables in the Conceptual Framework

From the above diagram we can make the following inferences.

2.8.1 Institutional reforms

Institutional issues are widely considered important to the performance of policy (Gupta et al., 2007, Nicholls et al., 2014, Richter, 2012, Barnes, 2007), particularly in developing countries (Bell, 2002). Econometric analyses have further found that the 'level of institutional development and 'government effectiveness have a significant impact on RE levels in SSA specifically (Nanka-Bruce, 2010, Onyeji et al., 2012). Despite this policy design and evaluation commonly neglect the effects of political processes and institutional operations, leading to unrealistic expectations of policy performance (Richter, 2012, Stephan and Paterson, 2012, Nicholls et al., 2014, Ilskog and Kjellström, 2008). Substantial empirical research has demonstrated that incompatibility between policy design and the institutional environment is a key cause of dissonance between anticipated and realized policy outcomes (Theesfeld et al., 2010). Institutional reform increases the funds allocated to rural electrification programme thus ensuring that the project covers a vast area meeting the needs of the rural people there by creating employment, opening up industries and expansion of agricultural activities in the rural areas and in the long run resulting to development of rural communities.

2.8.2 Millennium development Goals achievements

Implementation of REP is instrumental in achieving millennium development goals that is significant in realizing sustainable development. Through renewable energy such as electricity, the society benefit from reduced infant mortality, enhanced standards of living, reduced death rates due to improved health services, enhanced standard of education, improved technological advancement through infrastructure and expansion in industrialization which in effect enhances the gross domestic profit of an economy. Technological development as a result of implementation of REP also expands industries, improved technological skills, creates employment, spur up economy of rural areas, improves infrastructural system of a society, enhances telecommunication system and reduces the drudgery of human labour. Low commercial energy use is also correlated with high infant mortality, illiteracy and fertility, and with low life expectancy UNDP (2000).

A recent United Nations Economic Commission for Africa report UNECA, (2004) finds the current energy infrastructure in many African countries to be simply insufficient to support export diversification and ultimately sustainable economic development.

The increased productivity of human capital provided by energy services is evident in the developed world. For example, electricity can allow people to operate computers and file servers, and use telephones and the Internet, which can in turn lead to a large increase in the productivity of human labor.

Case studies show that access to modern energy services can greatly improve the profitability of these businesses as well as the quality and quantity of the traded product (Misana and Karlsson 2001). For example, in West Africa, motorized mills increased the daily production of Shea butter by 200 percent, decreased fuel wood consumption for processing, and increased incomes significantly.

2.8.3 Public participation

Brett (2003) presents the role of participatory theory in managing development projects and programmes in poor countries. He notes that participation has emerged in response to global demands for greater individual and social control over the activities of state and private agencies, and especially to the manifest failures of traditional 'top-down' management systems in less developed countries (LDCs).

Drawing from Midley (1986) and Rondinelli (1991), Muhangi (2007) points out that the rationale for community participation has been thought to include being a means of enhancing empowerment, enhancing responsiveness to people's real needs, instilling a sense of ownership of programmes by the local people, promoting sustainability, and making programmes cheaper by allowing mobilization of local resources. Participation is also believed to promote more equitable distribution of the benefits that accrue from development activities.

Brett (2002) puts much emphasis on the issue of participatory groups and rural development. He calls for a more people-centered development practice that emphasizes the need to strengthen institutional and social capacity supportive of greater local control, accountability and self-reliance. He notes that a high priority is placed on a process of democratization; people are encouraged to mobilize and manage their own local resources, with government playing an enabling role. Public participation intensifies empowerment of the people,

encourages participatory decision making where everybody is involved since they keep a breast with what happens in the ground and encourages bottom approach on handling of issues and reduces dependency from the central government, creating employment for the people which results in self-sustainability.

2.8.4 Political support

Strong, sustained political support is crucial for ambitious RE programmes, since governments are responsible both for creating a sufficiently attractive investment environment and for ensuring policy targets marginalized customers Onyeji et al., (2012). However, faced with numerous urgent socioeconomic demands, and given the relative expense and investment risk of RE, many SSA governments have not prioritized spending in the area Onyeji et al., (2012), Massé, (2010). Further, efforts to streamline energy access projects have been hampered by political meddling. Government officials and private sector companies have been accused of corruption and collusion in projects led by IPPs in Kenya, Tanzania, Uganda and Zimbabwe Karekezi and Kimani, (2002) as well as Senegal Ndoye, (2013), Joe, 2013, Diatta, (2012), IIC2, (2012). Electoral ambitions are thought to influence the selection of communities to be electrified in Tanzania and Mozambique Ahlborg and Hammar, (2012) and under Senegal's historical electrification model INGA3, (2012). Political support by the government also ensures that the necessary technical knowhow that is essential for construction and distribution of lines is provided for.

2.9 Summary of Literature and Gaps in the literature

It is evident from previous studies that rural electrification is vital for the livelihoods of people in the rural areas. Various countries have adopted variety of policies to increase implementation of electricity in rural areas and to maintain the already constructed lines in the rural areas.

From the studies reviewed, it has been observed that if the implementation of the programme is to be of benefit to the society, all the concerned parties must actively participate and policies and structures must be put in place to support this course of action.

The literature reviewed does not vividly state the significant factors that contribute to the massive implementation of the rural areas towards achieving Vision 2030 which is one of Kenya's major goals with electricity as the contributing factor. For example, the Electricity Act appears to place some emphasis on rural electrification. However, it only provides for a rural

electrification agency resembling the conventional rural electrification programmes which have been unsuccessful elsewhere, such as in Kenya and Zambia. For example, the Rural Electrification Board (REB) is headed by the Permanent Secretary in the Ministry of Energy and Mineral Development (MEMD). This not only limits the autonomy of the board but could also stifle its performance, given that the person heading the institution provides inputs on a part-time basis. This has been considered a key contributor to the failure of Kenya's Rural Electrification Programme which was also headed by a Permanent Secretary from the Ministry of Energy MoE, (2003].

In Kenya for example, the permanent secretary in the ministry of Energy which is in charge of Rural electrification Authority entrusted with acceleration of electrification in the rural areas is not an insider and therefore offer his services on a part time basis and barely has enough experience in the field. This study therefore sought to address this gap and therefore sought to establish the factors influencing the implementation of rural electrification programme in rural areas in Kilifi County.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology which was used to carry out the study. The chapter includes; research design, target population of study, sample design, data collection instrument, data collection procedures, data analysis techniques, ethical considerations and operational definition of the variables.

3.2 Research design

The research design that was used in this study was descriptive survey design. According to Mugenda and Mugenda (2003), this method is used in studies that cover large population by selecting and studying the sample from the population to discover their characteristics. Most information on the households is collected using this method. It attempted to find out the influence of the implementation of rural electrification programme in rural areas with a specific focus in Kilifi County. Primary data from surveys and secondary data from government, institutions, hospitals, schools dispensaries that have been beneficiaries from the programme were used in the study.

3.3 Target population of study

The target population of the study included dispensaries, trading centers primary and secondary schools both electrified and unelectrified which had been beneficiaries and those who had already been identified to benefit from Rural electrification programme.

Table 3.1 Target Population

Facilities	Trading centers	Schools	Health centers	Total
Electrified	122	80	54	256
Unelectrified	170	69	56	295
Total	292	149	110	551

Source: REA Oungo, (2014), Summary of electrification status of public facilities identified in Kilifi County.

3.4 Sample size and sampling procedure

The sample size was determined using Yamane's formula with an error of 5% with a confidence coefficient of 95 % (Yamane, 1967)

3.4.1 Sample size

It was unnecessary to sample each household and community which benefited from rural electrification (Bulmer and Warick, 1983). The choice of the sample size was determined by the interplay amongst the following key factors: the characteristic and size of the population, sampling frame, and time, budgetary and logistic constraints. The socio-economic characteristics of rural households are assumed to follow a normal distribution pattern (Devi, 1997). The sample size was calculated based on Yamane's formula. (Yamane, 1967)

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

Where;-

n= Sample size

N=the size of the population

e =the error of 5% points

With a population of 551 as shown in table 3.3.1 above, the following sample size was deduced.

$$n = \frac{551}{1 + 551 * (0.05 * 0.05)}$$

$$= \frac{551}{1 + (551 * 0.0025)}$$

$$= \frac{551}{2.3775}$$

$$= 231.71$$

232 Respondents

The correct sample size for the research was 232 respondents. However due to the homogeneity of the sample size for the research project, the researcher used a sample size of 100 respondents, 40 of which were schools, 30 trading centers and 30 health centers from Kilifi county who had been electrified or already identified to be electrified.

3.4.2 Sampling procedure

Mugenda and Mugenda (1999) defines sample as a small group obtained from the accessible population while sampling is a process of selecting a number of individuals for a study in such a way that the individual selected represent the large group from which they are selected. In this study report, stratified random sampling and purposive sampling procedures was used. Stratified random sampling was used to obtain a representative sample of the population of study because the trading centers, schools and dispensaries are stratified into constituencies. Purposive sampling was used for selecting the key informants who had the information needed in the study.

Table 3.2 Respondents in category

Constituency	Trading center	Dispensary	School	Respondents in each
Ganze	4	4	8	16
Kaloleni	4	4	5	13
Magharini	4	4	5	13
Malindi	4	4	5	13
Rabai	4	4	5	13
Kilifi south	5	5	6	16
Kilifi North	5	5	6	16
Total	30	30	40	100

The study employed stratified sampling technique because this was the best method of ensuring that all the different classes of the population are captured since the constituencies are different.

Table 3.3 Key informants

Key informants	Number
Dispensary superintendents	4
Medical officers	4
Senior teachers	4
School heads	4
Trading center council clerks	4
Trading center stall owners	4
Total number of key informants	24

3.5 Data collection Instruments

Questionnaires were used as the main tool for collecting primary data from the respondents. Secondary data was obtained from reports and publications. Questionnaires are data collection instruments which are administered to the respondents so that they can put marks on it in response to the questions asked.

3.5.1 Pilot testing of the instruments

In addition, a pilot study was conducted. Pilot testing is the process of subjecting the research instrument to a trial to determine its reliability in giving the right data in a given study area. This was done by administering the instrument to a sample with similar characteristics. Piloting was conducted in one health centre, trading centre and school. The pilot results were used to make the questions clearer and to remove ambiguous questions. It was used to improve the questionnaires.

3.5.2 Validity of the instruments

Validity is the extent to which a test measures what it claims to measure. It is vital for a test to be valid in order for the results to be accurately applied and interpreted. The validity of the data was checked for consistency and comparisons. Other measures taken to realize validity is proper sampling thus increasing the confidence level in the sample size, ensuring completeness of the questions, and ensuring that processes such as validation and confidentiality. Validity will also be tested using internal correlation between the related questions. Mugenda and Mugenda (2003)

contend that the usual procedure in assessing the content validity of a measure is to use a professional or expert in a particular field.

3.5.3 Reliability of the instruments

Reliability refers to the degree to which the tool was consistent in measuring and delivering the same results. This is critical since it lays firm foundation in validity of the results obtained. This study used the pilot results to remove ambiguity in all the items on the questions in the questionnaires. A thorough understanding of the variables under study was used to determine the criterion validity. A correlation coefficient to indicate the relationship between the two set of scores. Reliability can be achieved further by using test re-test method during the pre-testing period. This was achieved by engaging the same members of a group to answer the same questionnaire twice within a span of one week.

3.6 Data collection procedures

Data collection was done using data collection instrument to be able to collect as much information as possible. Communication to the respondents was done mainly in English. The researcher used drop and pick method for the questionnaires to enable the respondents have sufficient time and confidentiality while filling in the questionnaires.

3.7 Data analysis

Data processing and analysis is the categorizing, manipulation and summarizing of data so as to obtain the answers to the research questions as reported by the respondents, Kothari, (2003).

The data collected was analyzed using descriptive analysis techniques. The data was cleaned and only completed questionnaires were analyzed. All questionnaires which were incomplete were treated as no response. Data was analyzed using Chi-square test and the findings presented using frequency tables and percentages, so as to bring out the relationship between the dependent and the independent variables. Frequency distribution was given for the various key variables. The results were used to determine factors influencing the implementation of rural electrification programme in Kilifi County.

3.8 Ethical considerations

According to Mugenda and Mugenda (2003) a researcher must conform to the principle of voluntary consent where the respondents willingly participate in research.

The study took into consideration drastic measures to ensure that respondents' dignity is upheld as an ethical process. Ethics are norms governing human conduct which have significant impact on human welfare. It involves making judgment about right and wrong behavior, Ryman (2007) states that it is the responsibility of the researcher to carefully assess the possibility of harm to research participants and the extent that is possible. In this case, there was an introduction letter to all the participants. All heads of respective institutions were informed. Throughout the data collection period, voluntary participation was emphasized. Confidentiality was highly emphasized and none of the respondents had his/her name appearing on the questionnaires.

3.9 Operational definition of variables

Table 3.4 Operational definition of the variables

The table below gives the researcher's explanation of how the inferences were measured as indicated in the study.

Variable	Type of variable	Indicators	Level of scale
Implementation of REP	dependent	-	Nominal
Institutional reforms	Independent	Improved Policy formulation and mature supportive government structures Effective and realistic government expectations	Nominal
Millennium development goals achievements	Independent	Reduces environmental degradation Poverty reduction Enhances health care and reduces infant mortality	nominal
Public participation	Independent	community empowerment participatory decision making self-sustainability and creation of employment Reduced dependency on central government	Ordinal nominal
Political support	Independent	Increased GDP and meeting targets Donor funding and bilateral trade Wider scope of infrastructural projects	Ordinal nominal
Government policy	Moderating	Existing legal framework on donor funded projects and government funding	

CHAPTER FOUR

DATA ANALYSIS, PRESENTATIONS AND INTERPRETATION

4.1 Introduction

This chapter presents the data collected from the respondents. The chapter puts the data in perspective with the research questions asked and seeks to interpret it according to the socio-economic effects of rural electrification. The data analysis was done using both descriptive and inferential statistics. The data presentation and interpretation are also given;

4.2 Questionnaire return rate

The questionnaires were administered to selected trading centers, schools and dispensaries. The findings of the response rate are presented in Table 4.1.

Table 4.1: Response rate

Type of questionnaire	Tools dispatched	Tools returned	Percentage
Trading centers	30	25	83.3
Dispensaries	30	22	73.3
Schools	40	36	90.0
Total	100	81	

From the findings in Table 4.1, it is evident that of the 100 questionnaires, 81 of them were returned making the response rate 81.0%. However, the response rate for the questionnaires to the trading centers was 83.3%, Dispensaries was 73.3%, whereas it was 90% for the questionnaires of the schools.

4.3 Demographic characteristics of the respondents

The personal features of the respondents who took part in the study were captured as shown in the tables below.

Table 4.2. Demographic characteristics of respondents

Dispensaries		Trading centers		Schools	Total
Electrified/un electrified		Electrified/unelectrified		Unelectrified	
Gender		Gender		Gender	
Male	11	10		20	41
Female	11	15		14	40
Total	22	25		34	81

The personal data characteristics outlined in table 4.3 are significant in establishing factors influencing the implementation of Rural Electrification Programme in Kilifi County

Table 4.3 No. of years worked

Number of years worked	Frequency	Percent
Less than 5 years	10	12.4
6-10 years	40	49.3
11-15 years	18	22.2
16-20 years	8	9.9
Above 21 years	5	6.2
Total	81	100

From the findings, majority of the respondents (49.3%) had worked for between 6-10 years, 22.2% for between 11-15 years, 12.4% for less than 5 years, 9.9% for 16-20 years and 6.2% above 21 years.

4.4 Stages of Influence of institutional reforms on REP

The study was meant to establish the stages of influence of institutional reforms. The respondents' opinions were tabulated in the table below.

Table 4.4 Stages of Influence of institutional reforms on Rural Electrification Programme

Influence of institutional reforms on	Frequency	Percentage
Rural electrification programme		
Identification, sketching and design of Organizations to be electrified	21	25.9
During construction of lines and connectivity	40	49.4
During evaluation and commissioning of projects for handover to end users	20	24.7
Total	81	100

From the above table, it can be inferred that 49.4% think that Institutional reforms have an influence during construction of lines and connectivity stage, 25.9% at identification, sketching and design of organizations to be electrified and 24.7% during evaluation and commissioning of projects for hand over to end users.

4.4.1 Testing hypothesis on influence of institutional reforms on REP

Null Hypothesis (H₀): Institutional reforms do not have an influence on REP implementation

Alternative Hypothesis (H₁) Institutional reforms influence the implementation of Rural electrification programme.

The hypothesis was tested and calculated using Chi-square and the results were shown below

Table 4.5 Cross tabulation on influence of Institutional reforms on Rural Electrification Programme

Influence of institutional reforms on	(E)	(O)	(O — E)²(O — E)² / E
Rural electrification programme			
Identification, sketching and design of Organizations to be electrified	81	21	3600
During construction of lines and connectivity	81	40	1681
During evaluation and commissioning of projects for handover to end users	81	20	3721
Total			111.13

$$z^2 = \sum (O - E)^2 / E$$

$$z^2 = 111.13$$

D.f. =2

At 5% level of significance

$$z^2_{\alpha} = 5.991$$

Decision: Since (observed value) 111.13 is greater than (critical value) 5.991 at 5% level of significance. We accept H1 and reject Ho.

Based on the sample information, institutional reforms influence the implementation of Rural electrification programme

Table 4.6 Attributes to the improvement of REP implementation influenced by institutional reforms

Attributes to the improvement of REP implementation influenced by institutional reforms		
	Frequency	Percent
Donor funding	50	61.7
Improved policy formulation and mature government structures	10	12.4
Participatory decision making and community empowerment	11	13.6
Reduced dependency on central government through devolution of infrastructural projects	10	12.4
Total		100

The study sought to establish the influence on institutional reforms on REP. The respondents were asked to indicate their opinions that were tabulated as follows:-

50 were of the opinion that improvement of institutional reforms on donor funding was more preferable and influences implementation of REP, 11 believed that institutional reforms through participatory decision making and community empowerment through REP was preferable while 10 each thought that improved institutional reforms on policy formulation and mature government structures and reduced dependency on central government through devolution of infrastructural projects influence REP.

4.5 The rate of influence of millennium development goals on REP service delivery

The study intended to find out the rate of influence of millennium development goals on the implementation of Rural electrification programme.

Table 4.7 The rate of influence of millennium development goals on REP service delivery

	Frequency	Percent
Very high	20	24.7
Good	52	64.2
Fair	5	6.2
Poor	4	4.9
Total	81	100

From the results above 64.2% rated the influence of MDGs on REP as good, 24.7% very good, 6.2% fair and 4.9% poor. It is therefore in order to infer that the existence of millennium development goals does have an influence on REP as it enhances the expansion of the programme so that the goals can be achieved.

Table 4.8 Policies put in place to ensure MDG’s service delivery is enhanced as result of implementation of REP

	Frequency	Percent
Establishment of devolved funds for county REP implementation	25	30.9
Ring fencing of REP funds from other infrastructural projects	25	30.9
Non –political interference	10	12.4
Stringent structures and systems meant to punish defaulters who misuse the funds	10	12.4
Formulation of performance measures for institutions charged with the implementation of the programme i.e. Rural Electrification Authority	11	13.6
Total	81	100

From the results above, 30.9% of respondents think that Ring fencing of REP funds from other infrastructural projects and establishment of devolved funds for County REP facilitates MDGs to influence REP respectively, 13.6% think that formulation of performance measures for institutions charged with implementation of the programme will help while 12.4% think that non-political interference and stringent structures and systems respectively facilitates MDGs to influence REP.

4.5.1 Testing hypothesis on influence of Millennium Development Goals achievement on implementation of Rural Electrification Programme

Null Hypothesis (Ho): MDG’s achievements do not have an influence on REP implementation

Alternative Hypothesis (H1) MDGs achievements influences the implementation of Rural electrification programme

The hypothesis was tested and calculated using Chi-square and the results were shown below

Table 4.9 Cross tabulation on influence of Millennium Development Goals on REP

Policies that enhance MDGs as an influence of REP	(E)	(O)	(O — E)²	(O — E)²/ E
Establishment of devolved funds for county REP implementation	81	25	3136	38.72
Ring fencing of REP funds from other infrastructural projects	81	25	3136	38.72
Non –political interference	81	10	5041	62.24
Stringent structures and systems meant to punish defaulters who misuse the funds	81	10	5041	62.24
Formulation of performance measures for institutions charged with the implementation of the programme i.e. Rural Electrification Authority	81	11	4900	60.49
				262.41

$$z^2 = \sum (O - E)^2 / E$$

$$z^2 = 262.41$$

D.f. =4

At 5% level of significance

$$z^2_x = 9.488$$

Decision: Since (observed value) 262.41 is greater than (critical value) 9.488 at 5% level of significance. We accept H1 and reject Ho.

Based on the sample information, MDGs influences the implementation of Rural electrification programme.

Table 4.10 Existence of Improvements as a result of Millennium Development Goals achievements

Yes	55	67.9
No	26	32.1
Total	81	100

From the table above it can be inferred that a higher number of respondents 67.9% think that existence of improvements as a result of MDGs influences REP while only 32.1% think that improvements made by MDGs do not influence implementation of REP. It can thus be concluded that MDGs facilitate implementation of REP.

Table 4.11 Improvements in MDG's achievements as a result of implementation of REP

	Frequency	Percentage
Enhanced universal primary education which is a major goal to achieving MDGs	30	37
Eradication of extreme poverty and hunger and ensured environmental sustainability	15	18.5
Promotion of gender equality and empowering women	16	19.8
Reduced child mortality, improved maternal health and combating of HIV/AIDS	20	24.7
Total	81	100

It can be concluded that the highest number of respondents believe that the greatest achievement that has been made as an influence of MDGs on implementation of REP is enhanced universal

primary education at 37%, followed by reduced child mortality, improved maternal health and combating of HIV/AIDS as a result of machines that use electricity at 24.7%, promotion of gender equality and empowering women at 19.8, and the least achievement that needs to be improved on in examining the achievement of MDGs as a result of implementation of REP is eradication of extreme poverty and hunger and ensured environmental sustainability at 18.5%.

Table 4.12 Influence of high standard of public participation on REP

The study sought to find out if the percentage of response who believe that the influence of public participation on REP is of high standard.

	Frequency	Percent
Yes	41	50.6
No	40	49.4
Total	81	100

50.6% were of the opinion that it was of high standard while 49.4% think otherwise. In this case, it can be concluded that half of the sample believe that public participation is of a higher standard while the other half think it is not. The response is 50-50 sharing.

4.6 Ways in which public participation has influenced implementation of REP

The study sought to find out ways in which public participation influences the implementation of Rural electrification programme

Table 4.13 Ways in which public participation has influenced implementation of REP

	Frequency	Percentage
Self sustainability	5	6.2
Community empowerment	22	27.2
Creation of employment	15	18.5
Team spirit	20	24.7
Eradication of poverty	9	11.1
Increased Gross domestic profit	10	12.4
Total	81	100

From the respondents it can be inferred that public participation influences implementation of REP in the following ways. Community empowerment 27.2%, Team spirit 24.7%, and creation of employment 18.5%, Increased gross domestic profit 12.4%, Eradication of poverty 11.1% and self sustainability 6.2%.

4.6.1 Testing of Hypothesis on Influence of public participation on implementation of Rural Electrification Programme

Null hypothesis (Ho): There is no relationship between public participation and implementation of Rural electrification programme.

Alternative hypothesis (H1): Public participation influences the implementation of Rural Electrification programme. The hypothesis was tested and calculated using Chi-square and the results were as shown in table 4.16 below;

Table 4.14 Cross Tabulation on ways in which public participation influences implementation of REP

Ways in which public participation influences implementation of REP	(E)	(O)	$O - E$ ²	$(O - E)^2 / E$
Self sustainability	81	5	5776	71.31
Community empowerment	81	22	3481	42.98
Creation of employment	81	15	4356	53.78
Team spirit	81	20	3721	45.94
Eradication of poverty	81	9	5184	64.00
Increased Gross domestic profit	81	10	5041	62.24
Total				340.25

$$z^2 = \sum (O - E)^2 / E$$

$$z^2 = 340.25$$

$$D.f. = 5$$

At 5% level of significance

$$z^2 \times = 11.070$$

Decision: Since (observed value) 340.25 is greater than (critical value) 11.070 at 5% level of significance. We accept H1 and reject Ho.

Based on the sample information, public participation influences the implementation of Rural electrification programme.

4.6.2 Challenges encountered while implementing REP

The study sought to establish if there are challenges that have been encountered while implementing REP.

Table 4.15 Challenges encountered while implementing REP

	Frequency	Percent
Yes	50	61.7
No	31	38.3
Total	81	100

From the above results, 61.7% of the respondents indicated that they had challenges while 38.3% of the respondents said they do not have challenges. The respondents named poor sketching design and survey work, delay in awarding contracts for construction of lines, political interference in devolving funds for the programme as favoring some areas than others, delay in remitting money for the programme, insufficient funds to cover the scope of work to be done, shortage of material by the authorities tasked with issuing materials for the programme e.g. Rural Electrification Authority, embezzlement of funds for the programme by concerned parties, poor supervision by the authorities due to being compromised by inexperienced contractors and delay in commissioning of the lines.

4.7 The level of influence of political support on the implementation of REP

The study was intended to establish the level of influence of political support. The results were revealed as tabulated in table 4.16.

Table 4.16The level of influence of political support on the implementation of REP

Level of influence of political support	Frequency	Percent
High	25	30.9
Medium	40	49.4
Low	16	19.8
Total	81	100

The study sought to establish the level of influence of political support in implementation of Rural electrification programme. The parameters that were put into consideration and their ratings are recorded in Table 4.19

From the table 4.19, it can be seen that 49.4% of the respondents rated influence of political support as medium, 30.9% as high and 19.8% as low. These findings imply that political support does have an influence on the implementation of Rural electrification programme.

4.7.1 Testing of Hypothesis on Influence of political support on implementation of Rural Electrification Programme

Null hypothesis (Ho): There is no relationship between political support and implementation of Rural electrification programme.

Alternative hypothesis (H1): Political support influences the implementation of Rural Electrification programme. The hypothesis was tested and calculated using Chi-square and the results were as shown in table 4.20 below;

Table 4.17: Cross Tabulation on level of political support

Scale	E	O	$(O - E)^2$	$(O - E)^2 / E$
High	81	25	3136	38.72
Medium	81	40	1681	20.75
Low	81	16	4225	52.16
				111.63

$$z^2 = \sum (O - E)^2 / E$$

$$z^2 = 111.63$$

$$D.f. = 2$$

At 5% level of significance

$$z^2 \times = 5.991$$

Decision: Since (observed value) 111.63 is greater than (critical value) 5.991 at 5% level of significance. We accept H1 and reject Ho.

Based on the sample information, political support influences the implementation of Rural electrification programme.

4.7.2 Attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful.

The study sought to establish attributes that of political support that have influenced the implementation of Rural electrification programme.

Table 4.18 Attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful

	Frequency	Percent
Ring fencing of funds meant for REP	18	22.2
Support from the central government	20	24.7
Effective and realistic government structures and systems concerning REP	13	16.1
Regular donor funding and transparency and accountability in distribution of funds	20	24.7
Team work between the government and the community	10	12.4
Total		100

From the results above, 24.7% each of the respondents think that support from of the central government and regular donor funding transparency and accountability are majorly why implementation of REP is successful in areas where it has been considered successful, 22.2% think it is because of Ring fencing of funds by the political support, 16.1% believe it is because of effective and realistic government structures and systems while only 12.4% think it is because of the team spirit between the government and the community.

4.7.3 Testing of Hypothesis on Attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful.

Null hypothesis (Ho): There is no relationship between attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful and implementation of Rural Electrification Programme

Alternative hypothesis (H1): There is a relationship between attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful and implementation of Rural Electrification Programme

Table 4.19 Attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful.

Attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful.	E	O	$O - E)^2$	$(O - E)^2 / E$
Ring fencing of funds meant for REP	81	18	3969	49
Support from the central government	81	20	3721	45.9
Effective and realistic government structures and systems concerning REP	81	13	4624	57.1
Regular donor funding and transparency and accountability in distribution of funds	81	20	3721	45.9
Team work between the government and the community	81	10	5041	62.2
Total				260.1

$$z^2 = \sum (O - E)^2 / E$$

$$z^2 = 260.1$$

$$D.f. = 4$$

At 5% level of significance

$$z^2_x = 9.488$$

Decision: Since (observed value) 260.1 is greater than (critical value) 9.488 at 5% level of significance. We accept H1 and reject Ho.

Based on the sample information, the above attributes have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the summary of the findings gathered from the analysis of the data, discussion, conclusions and recommendations. The findings are summarized alongside the objectives of the study, conclusions are drawn from the study and recommendations for action and further studies are given.

5.2 Summary of findings

The study intended to establish factors influencing the implementation of Rural Electrification Authority in communities in Kilifi County.

Four main objectives were identified for investigation. They are as follows:-

Influence of institutional reforms on implementation of Rural Electrification Programme, influence of millennium development goals, and influence of public participation, influence of political support.

With regard to the research questions, the study observed that the following factors influence the implementation of Rural electrification programme as follows:

The first objective that was aimed at assessing the influence of institutional reforms on Rural electrification programme, 49.4% indicated that the influence of institutional reforms were mostly notable at connectivity and commissioning of organizations to be electrified, attributes to the improvement of REP implementation influenced by institutional reforms was as result of Donor funding by majority at 61.7%.The findings therefore imply that institutional reforms are more influential at identification, sketching and design of organizations to be electrified than during construction of lines and connectivity stage and evaluation and commissioning of projects for hand over to end users.The results from the respondents also confirmed that Donor funding was the major attribute of improvement from institutional reforms that contribute to an improvement of rural electrification programme and that improved policy formulation and mature government structures and reduced dependency on central government through

devolution of infrastructural projects does not widen the scope of implementation as much. Hypothesis testing revealed that χ^2 (observed value) 111.13 was greater than χ (critical value) 5.991 at 5% level of significance from Chi square test on influence of institutional reforms on REP thus validating the alternative hypothesis that institutional reforms influences the implementation of rural electrification programme.

The second objective was to examine the influence of millennium development goals achievements on implementation of rural electrification programme. The study established that the rate of influence of Millennium development goals achievements on Rural electrification programme was good at 64.2%. On Policies put in place to ensure MDG's achievements are enhanced as result of implementation of REP, the respondents considered establishment of devolved funds for county REP implementation and ring fencing of REP funds from other infrastructural projects to be better options both at 30.9%. On the other hand, 67.9% of the respondents believed that existence of millennium development goals had contributed to the improvement of implementation of Rural electrification programme. Enhanced universal primary education which is a major goal to achieving MDGs was voted the best of the Millennium development goals achievement as a result of implementation of REP.

Hypothesis testing proved that χ^2 (observed value) 262.41 was greater than χ (critical value) 9.488 at 5% level of significance from chi-square test. This is to affirm that millennium development goals do influence implementation of Rural electrification programme and therefore supports the alternative hypothesis.

The third objective was to determine the extent to which public participation influence the implementation of rural electrification programme. 50.6% of respondents said the influence of public participation on REP was of a high standard while 49.4% thought it is not of high standard. On ways in which public participation has influenced implementation of REP, community empowerment was voted to be the best influence of public participation on REP at 27.2% with self sustainability being the least kind of influence at 6.2%. 61.7% of respondents thought that there are challenges encountered in implementing REP and cited the following as some of the challenges, poor sketching design and survey work, delay in awarding contracts for construction of lines, political interference in devolving funds for the programme as favoring some areas than others, delay in remitting money for the programme, insufficient funds to cover

the scope of work to be done, shortage of material by the authorities tasked with issuing materials for the programme e.g. Rural Electrification Authority, embezzlement of funds for the programme by concerned parties, poor supervision by the authorities due to being compromised by inexperienced contractors and delay in commissioning of the lines.

Hypothesis testing confirmed that χ^2 (observed value) 340.25 was greater than χ (critical value) 11.070 at 5% level of significance from Chi square test on influence of public participation on REP thus validating the alternative hypothesis that public participation influences the implementation of rural electrification programme.

Finally the fourth objective was to assess the influence of political support on implementation of rural electrification programme. The study revealed that 49.4% of the respondents think that the level of political support is Medium. On attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful, 24.7% of the respondents mentioned support from the central government and regular donor funding and transparency and accountability in distribution of funds as the major attributes that has led to the success of REP implementation.

Hypothesis testing on the level of influence of political support on the implementation of REP confirmed that χ^2 (observed value) 111.63 was greater than χ (critical value) 5.991 at 5% level of significance while hypothesis testing on attributes that have been influenced by political support and contributed to the success of REP implementation in areas where it has been successful. confirmed that χ^2 (observed value) 260.1 was greater than χ (critical value) 9.488 at 5% level of significance from Chi square test on influence of political support on REP thus confirming the alternative hypothesis that political support influences the implementation of Rural electrification programme.

5.3 Discussion of findings

From the first objective which was to assess the influence of institutional reforms on implementation of Rural electrification programme, the study revealed that the influence of institutional reforms on implementation of REP is at most during construction of lines and connectivity stage. From the respondents' responses, it can also be confirmed that Donor funding was voted the best attribute towards improvement of REP implementation as influenced by

institutional reforms. The study can therefore deduce that institutional reforms attracts donor funding. This concurs with the (GoK), (2011), which states that the Government of Kenya has expressed its commitment to “continue with structural, policy and institutional reforms in the energy sector” as part and parcel of the implementation strategy of Kenya’s Vision 2030. Reform target areas include an increase in installed power generation, enhanced access to electricity, improving the operational efficiency of power utilities, facilitation of private sector investment in Kenya’s energy sector and the exploration and development of new sources of energy such as geothermal, coal and renewable energy sources to meet the energy requirements of the country for the medium term (GoK 2011). In order to reap the economic and social benefits of access to electricity and the expansion of electricity consumption, an appropriate regulatory and policy framework is essential to facilitate and catalyze the development of the electricity sub-sector. In addition, electricity sub-sector regulation should protect the interests and address the concerns of all electricity consumers and stakeholders in the electricity sector.

The second objective was to examine the influence of millennium development goals achievements on implementation of rural electrification programme. The study noted that rate of influence of millennium development goals on REP service delivery was good. Establishment of devolved funds for county REP implementation and ring fencing of REP funds from other infrastructural projects were mentioned by the respondents to be the most favorable Policies put in place to ensure MDG’s service delivery is enhanced as result of implementation of REP. A higher number of respondents believed that there is existence of improvements as a result of MDG’s which influences REP implementation. This is in agreement with ESMAP, (2002a), “Take joint actions and improve efforts to work together at all levels to improve access to reliable and affordable energy services for sustainable development sufficient to facilitate the achievement of the MDGs, including the Goal of halving the proportion of people in poverty by 2015, and as a means to generate other important services that mitigate poverty, bearing in mind that access to energy facilitates the eradication of poverty”

The study deduced from the third objective which was to determine the extent to which public participation influence the implementation of Rural electrification programme that there is a high standard of influence of public participation on Rural Electrification Programme. The study also confirmed that community empowerment was the best way in which public participation has

influenced Rural Electrification Programme. A higher number of respondents confirmed that there exist challenges in implementation of Rural Electrification Programme and listed some of the challenges as Insufficient funds/failure to ring fence funds meant for Rural Electrification Programme ,unrealistic targets set by government for example, lap top project, resistance by the communities due to misinformation i.e. cutting down of trees for way leave ,Embezzlement of funds by trustees and marginalization of unproductive areas during Rural Electrification Programme implementation. André et al., (2006) says that different levels of public participation may be relevant to the different phases of an impact assessment process, from initial community analysis and notice of the proposed intervention, to approval decision making, to monitoring and follow-up.

The fourth objective was to assess the influence of political support on implementation of rural electrification programme. The level of influence of political support on the implementation of Rural Electrification Programme was revealed to be medium while the attributes that have been influenced by political support and contributed to the success of Rural Electrification Programme implementation in areas where it has been successful were confirmed to be support from the central government and regular donor funding and transparency and accountability in distribution of funds. The respondents cited holding public barazas in regard to Rural Electrification Programme implementation, using county executives to enlighten people on the programme and door to door campaign on the existence of the programme by officials at the grass root level, for example chiefs to ensure that Rural Electrification Programme implementation is maintained by educating the locals through public barazas. Strong, sustained political support is crucial for ambitious RE programmes, since governments are responsible both for creating a sufficiently attractive investment environment and for ensuring policy targets marginalized customers Onyeji et al., (2012).

5.4 Conclusions

Poverty is a major obstacle for sustainable development of not only developing countries but also the entire world. One way to cope with these multidimensional aspects of poverty is to promote opportunity World Bank, (2001), and one of the opportunities is access to modern energy such as electricity.

Based on the findings, it can be concluded that comprehensive institutional reforms are detrimental to the success of the implementation of rural electrification programme especially if they are to benefit the rural poor. The performance of the electrification agencies should be evaluated by the number of new connections, particularly in rural areas. Institutional reforms in rural electrification programme aid in facilitating the implementation of electricity to the poor and streamlining the sector such that the implementation of the programme benefits exactly those who are intended to benefit from it. Institutional reform frameworks ensure continued expansion of electricity services to rural areas and protection of lower income consumers. In developing countries, the reforms are driven by the need to improve technical and financial performance, promote investment in system development and to reduce political interference in tariff setting and utility management. International financing institutions particularly the World Bank are instrumental in ensuring reforms in developing countries by imposing conditions for reforms in lending agreements for power projects.

It can also be concluded that Millennium development goals achievements influence Energy access improvement, in particular access to electricity, has huge impacts on enhanced universal primary education which is a major goal to achieving Millennium development goals, eradication of extreme poverty and hunger and ensured environmental sustainability, Promotion of gender equality and empowering women and reduced child mortality, improved maternal health and combating of HIV/AIDS. For one of the Millennium development goals, gender equality and women's empowerment, implementation of rural electrification programme directly contributes to freeing up women and girls from time-consuming housework such as laundry, cleaning, etc. by utilization of electricity. In addition, through reduction of time-consuming chores and attainment of energy services, it has indirect contributions for women to have opportunity to attend schools or educational activities as well as take part in the labor market or establish small enterprises.

Public participation on implementation of Rural Electrification Programme also empowers the community thus making them want to get more involved in programmes and projects that concern them and leading to enhanced implementation of the programme. In particular, implementation of rural electrification programme will drastically improve the quality of life of those who do not have it yet. Rural electrification enables people to not only have economic opportunities for income generation but also save their time from time-consuming drudgery and

allocate to more enjoyable or educational activities. Considering electricity as a representative of modern energy, electricity consumption has significant correlation with Gross Domestic Profit as well as Human Development Index.

The study also concludes that Political support on the other hand ensures that there is more funding for the programme, improved policy and institutional structures regarding the programme and continued support for its implementation thereby improving the lives of the citizens with no interference from the political class.

5.5 Recommendations of the study

The study recommends that for rural electrification programme to have a positive impact on its implementation, the following recommendations are deemed significant to be put in place.

Institutional reform measures that include integration of Rural electrification with rural development to ensure maximization of the benefits of electrification and to facilitate increased electricity demand should be put in place. In this regard, rural development should facilitate the development of rural businesses and complementing infrastructure and services such as roads, water supply, schools and health services.

The study also recommends an urgent need to establish reliable databases on the electrification of the poor. This is absolutely essential for monitoring rural electrification programmes to ensure they are aligned to the millennium development goals and vision 2030.

Communities must also take a greater role and responsibility in Rural electrification activities. This can be achieved by engaging and involving community members in rural electrification programmes such as construction of lines, granting of way leaves permission through their land for electricity lines construction.

Regulators must also ensure consumer protection through price regulation and enforcement of performance standards.

The performance of the electrification agencies should be evaluated by the number of new connections, particularly in poor rural areas. Significantly, higher rural electrification targets than those currently set should be established. The targets should include explicit and ambitious goals for the electrification of the poor.

5.6 Suggestions for Further studies

The study focused on factors influencing the implementation of Rural Electrification Programme in communities in Kilifi county. Comparative studies should be done on implementation of Rural electrification programme in the urban poor.

5.7 Contribution to the body of knowledge

This study contributes to the body of knowledge in as far as factors influencing the implementation of rural electrification are concerned; this is shown in Table 5.1

Table 5.1 Contribution to the body of knowledge

NO	OBJECTIVES	CONTRIBUTION
1	To assess the influence of institutional reforms on implementation of rural electrification programme	The study is a good guide to the government on which policies and institutional regulations they should revise, scrap off or streamline in order to realize a wider scope of the implementation of Rural electrification programme
2	To examine the influence of millennium development goals achievements on implementation of rural electrification programme	This study helped the government to establish if any effort is being made in achieving millennium development goals which is a stepping stone to vision 2030 and to improve on goals that are not on target
3	.To determine the extent to which public participation influence the implementation of rural electrification programme	The study portrayed the significance of involving the public in matters that concern them making them get involved and in the process empowering them to manage their own projects and encouraging participatory decision making.
4	To assess the influence of political support on implementation of rural electrification programme	This study was able to justify to the concerned authorities how political interference can retard the growth and development of projects and make people lag behind while support by the political class is considered a determining factor in growth and development of infrastructural projects.

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APPENDICES

Appendix 1: Letter of transmittal

University of Nairobi

School of continuing and distance education

Department of Extra Mural studies

P.o Box 83732-80100

Mombasa, Kenya

10TH JULY 2014

Dear Sir/Madam,

RE: WHOM IT MAY CONCERN

My name is Carolyn Odhiambo. I am a postgraduate student in the School of University of Nairobi, conducting a project research paper on factors influencing the implementation of Rural electrification programme on communities in Kilifi county.

For this purpose, your prestigious organization has been identified for study and this is to request you to kindly spare some time and fill in the enclosed questionnaire. This information will be treated with strict confidence and is purely for academic purposes and as such will not be disclosed to any unauthorized persons.

Your assistance and co-operation in this exercise will be highly appreciated.

Yours faithfully,

Carolyn A. Odhiambo

L50/60486/2013

Appendix 2: Respondents questionnaire

The aim of this questionnaire is to help in collecting data for the research project on factors influencing the implementation of Rural electrification programme in Kilifi County, Kenya. All answers will be treated with strict confidence. You are requested to answer these questions to the best of your knowledge. Thank you.

Part I (Tick the answer that applies to you and fill in the blank spaces)

1. Gender: Male [] Female []
2. Age: 20-29years [] 30-39years []
 40-49years [] 50-60 years []
3. Area of service
 a) School [] b) Trading centre [] c) Dispensary []
4. Job Title.....
5. Do you supervise others? Yes No
6. Number of years worked (Tick as applicable under each area of work)

Area of work	16-10years	11-15years	16 -20 years	More than 21years
Total number of years worked in your area without electricity				
Number of years worked in Current station with electricity				
Number of years worked in Current position				

7. Tick (√)the constituency where you are based

	Constituency	(√)
1.	Kilifi North	
2.	Kilifi South	
3.	Ganze	
4.	Kaloleni	
5.	Magharini	
6.	Malindi	
7.	Rabai	

8. Indicate your work location by ticking the appropriate one from the list given

9. When was REP implemented in your organization? _____

10. At what stage do institutional reforms have an influence on REP implementation

(a)At identification sketching and design of organizations to be electrified.

(b)During construction of lines and connectivity stage

(c)During evaluation and commissioning of projects for hand over to end users.

12. What is the level of influence of political support on the implementation of REP in your service area in your own opinion?

(a) High

(b) Medium

(c) Low

13. Has there been improvement in Millennium development goals achievements as a result of implementation of REP? Yes [] No []

14. If yes, what are the improvements so far? Select any 3

- (a) Enhanced universal primary education which is a major goal to achieving MDGs
- (b) Eradication of extreme poverty and hunger and ensured environmental sustainability
- (c) Promotion of gender equality and empowering women
- (d) Reduced child mortality, improved maternal health and combating of HIV/AIDS

15. What would you attribute to the improvement of REP implementation influenced by institutional reforms in your area of service? Tick the points that mostly apply

- (a) Donor funding
- (b) Improved policy formulation and mature government structures
- (c) Participatory decision making and community empowerment
- (d) Reduced dependency on central government through devolution of infrastructural projects
- (e) Others specify _____

16. If no improvement has been registered, what would you attribute to the cause?

- (a) Insufficient Donor funding
- (b) Lack of political support
- (c) Dependency on Central government
- (d) Stringent and ineffective government expectations

17. How has public participation influenced the implementation of REP? Tick any four.

- (a) Self sustainability
- (b) Community empowerment
- (c) Creation of employment

(d) Team spirit

(e) Eradication of poverty

(f) Increased Gross domestic profit

18. Are there any challenges that have been encountered while implementing REP?

Yes No

19. If yes, tick any 3 setbacks to support your claim.

(a) Insufficient funds/failure to ring fence funds meant for REP programme

(b) Unrealistic targets set by government i.e. lap top project

(c) Resistance by the communities due to misinformation i.e. cutting down of trees for way leave

(d) Embezzlement of funds by trustees

(e) Marginalization of unproductive areas during REP implementation

20. Mention some of the attributes that have been influenced by political support and led to REP improvement and contributed to the success of REP implementation in areas where it has been successful.

(a) Ring fencing of funds meant for REP

(b) Support from the central government

(c) Effective and realistic government structures and systems concerning REP

(d) Regular donor funding and transparency and accountability in distribution of

Funds

(e) Team work between the government and the community

21. Does influence of public participation ensure that a high standard of REP implementation is maintained?

(a) Yes []

(b) No []

22. If yes, cite 3 special examples of what is being done

(a) _____

(b) _____

(c) _____

23. If no, cite at least 2 reasons to support this assertion to support your answer

(a) _____

(b) _____

24. How would you rate the influence of millennium development goals on REP service delivery?

(a) [] Very high

(b) [] Good

(c) [] Fair

(d) [] Poor

25. If very high/good what are the reasons for it being high/good rating, give any 3 reasons.

26. If poor, what is lacking? Kindly elaborate? _____

27. What policies according to you has the government put in place to ensure MDG's service delivery is enhanced as result of implementation of REP? Tick any 3 suggestions.

(a) Establishment of devolved funds for county REP implementation

(b) Ring fencing of REP funds from other infrastructural projects

(c) Non –political interference

(d) Stringent structures and systems meant to punish defaulters who misuse the funds

(e) Formulation of performance measures for institutions charged with the implementation of the programme i.e. Rural Electrification Authority

Thank you very much for your time in responding to this question