FACTORS INFLUENCING IMPLEMENTATION OF STREET LIGHTS IN KENYA: A CASE OF MACHAKOS COUNTY

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A Research Project Report Submitted in Partial Fulfillment of the Requirements for the Award of Master of Arts Degree in Project Planning and Management of the University of Nairobi

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DECLARATION

This research project report is my original work and has never been presented for a degree award in any other university.

Signature_____ _____ _____

EDMOND LUUSA Date

Reg. No L50/10664/2018

This research project report has been submitted for examination with my approval as the University supervisor.

Signature_____ Date_____

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DEDICATION

This work is dedicated to my wife Mary Wangeci, for her incredible support during my study.

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LIST OF ABBREVIATIONS AND ACRONYMS

CSFs	Critical Success Factors
EVA	Earned Value Analysis
IMF	International Monetary Fund
KPLC	Kenya Power and Lighting Company Limited
NP&LS	Nairobi Power and Lighting Syndicate
UN	United Nation
UNDP	United Nation Development Agency
NACOSTI	National Commission for Science, Technology and Innovation

ABSTRACT

The purpose of the study was to investigate factors influencing implementation of Street lights in Kenya; A case of Machakos County. This study was guided by the following objectives to; establish the extent to which vandalism influences implementation of Street lights projects in Machakos County; determine how monitoring and evaluation influences implementation of Street lights projects in Machakos County; to examine how Operation and Maintenance influence implementation of Street lights projects in Machakos County and to investigate how budgetary allocation influence implementation of Street lights in Machakos County. According to the studies which have been conducted none of the studies has focused Machakos County. Therefore this study intended to fill the knowledge gap on factors influencing implementation of Street lights in Kenya. Theories which were used in this study were; Instrumental Stakeholders' theory and Project management theory. This study employed a descriptive survey research design because the method has the potential to provide a lot of information from quite a large sample of individuals. The total target population was 175 with a sample size of 122. In this case the sample selected is deemed to be representative enough of the whole population and therefore valid and genuine generalizations can be made. Data was collected using questionnaires which were administered to the respondent by the researcher and his assistants. The researcher analyzed the quantitative data via descriptive and inferential statistics statistics using the Statistical Package for Social Sciences (SPSS V.25) and the findings presented in percentages, means, standard deviations and frequencies. Data analysis was guided by the correlation models. Research findings were presented in tabular format, and ruled that there is a strong correlation between monitoring & evaluation ($p=0.497>0.05$), operation and maintenance ($p=0.659>0.05$), vandalism ($p=0.978>0.05$) and weak correlation between budgetary allocation ($p=0.000<0.05$) and implementation of Street lights projects. This study therefore recommends that county governments in Kenya should involve and consult all stakeholders before the start and throughout project implementation process, introduce strong anti-vandalism measures and set enough budgets for both implementation and maintenance of streetlights.

CHAPTER ONE
INTRODUCTION

1.1 Background to the study

With the ongoing constraints in increment of cost and accountability for climate change mitigation, there is increased efforts in providing streetlights in Wales and England. The implemented efforts bare advance public health implications in both positive and negative ways. LED and computerized technology are utilized as one of the many methods of street lighting in the above named countries. This act has created 0opportunitiy for local authority to provide light for their locals with its advantage of low energy costs and the reduction of carbon emissions. Subsequently the reduction of street light may lead to massive road traffic injuries and increased crime rates at night (British Standards Institution, 2013).

Extensive literature reviews from different researchers about public concern on street lights has put into lame light that street lights are core factor to reduced crime rates. Also, increased street lighting has drastically improved road safety of all motorists and pedestrians. However, some researchers have found out that still there is a sense of insecurity during the day and also during the night hence calling upon implementation of unique mechanisms on which the street lights can be improved accordingly in order to try and curb future crimes (Beyer et all, 2009).

With the ever changing technology, Ghana has comprehended extensive need for installing of street lights. In this context, Ghana has enrolled several programs from different cities to help in the implementation and installation of street lights in the country. These programs draws their focus from the Ghanaian policy framework for street lighting in which it clearly states that both private and government sectors should work in cohesiveness with an effort of providing street lighting in the country. Therefore, the Ghanaian government is channeling all its efforts towards installation of streetlights with an aim of achieving their objective which is to ensure maximum security and road safety at night in specific areas of interests. The main aim of this process is to achieve universal access of street lighting that attains public safety and purports socio-economic

development of the citizens. However, this policy faces tremendous challenges. Lack of adequate funds to pay the bills for street lights maintenance, lack of proper maintenance mechanisms and lack of funds to cater for energy consumed poses as the main challenges (Ministry of Energy 2011).

Over the years, Kenya has been in the frontline to provide street lighting for its citizens in various cities in the country. The government has enrolled various programs in which both private and public sectors work in conjunction to provide street lighting. Provision of adequate road safety and security of pedestrians in different regions of the country is one of the key objectives employed in the implementation of the street lights. With the successful installation of the street lights, Kenya will realize socio-economic development in which there will be an improvement in road safety for both drivers and pedestrians specifically at night. It will also lead to the reduction of crime rates within the cities and the increment in business and living standards in the areas (Sustainable Business, 2012).

Subsequently, all the said street lighting implementations would not be possible if the Kenyan government could not provide an environment for development by improving its infrastructure (International Monetary Fund (IMF), 2008). With the propounding of the first electric supply company in Kenya located in Nairobi in 1908, there were a series of electric supply companies merging which led to the birth of East Africa power and Lightening Company (EAP&LC). All the years EAP&LC was the only power and lighting company authorized to supply electricity in Kenya. In the year 1954 Kenya Power company which was partially managed with EAP&LC was created to supply electricity in Kenya later on in 1983 Kenya Power Company was renamed Kenya Power and Lightening Company (Kenya Power Company, 2014).

Throughout the recent decades, several projects have been put in place to try and increase the population count of street lighting in Kenya. Subsequently, several tools have been employed to propel the success of the project and also to strengthen its management. One of the many tools utilized in this process is the sustainable livelihoods framework and project cycle management (DFID 2010) which helps the parties involved to evenly

comprehend the project process and reconsider facts that are significant to sustainability. These tools had been adopted by UNPD such as DFID and Oxfam (CCI, 2010).

60% of Nairobi's population is composed of informal settlements in which the occupants are havens of crime who are lacking proper sanitation, modern energy and other a vast social amenities (Un-Habitat, 2015). The research further confirmed that there was evidence of high crime rates due to poor lighting which affected business at nightfall (Kenya Power and Lighting, 2014). In this context, light slum lighting project was adopted which extensively improved the security of the slum area and also making the informal sentlements safer for the occupants. The project was a success due to the stirring committee which comprised of CDF, Nairobi city Council and private sector among others. With this in place, a population count of 33 high street lights masts were installed in different informal settlements for example Kangemi, Mathare, and Kibera among others slums in Nairobi city. The masts Served in excess of 500,000 people in 150,000 households (Mwangi, 2012).

1.2 Statement of the problem

Street lighting is a social facility which is a main indicator of the comparative socio-economic development position of a country. It contributes to improved road safety for pedestrians and drivers alike; it reduces criminal activities in the cities and towns. Streetlights also play an important role in improving the general business and living climate of urban and peri-urban areas.

Due to the lack of appropriate Community Participation, monitoring and evaluation, budgetary allocation, on implementation of street lights in Kenya some streets are not properly lit and if there are, they are mostly off due to breakdown. This has rendered most streets in the cities and towns unattainable of the benefits streetlights bring.

In Kenya, King'ara (2006) conducted a study on procedural fairness and the privatization of public services: a case study of the street lighting contract between Nairobi Council and adopt-a- light limited, Rukwaro (2006) researched on urban street design and standards in architecture while Wambugu (2014) conducted a study on formulation and

implementation of operations strategy for energy-efficient street lighting: the case of Nairobi County. However, none of the researchers considered factors influencing implementation of Street lights in Machakos County. This study therefore sought to answer the question; what factors influence implementation of Street lights in Machakos County?

1.3 Purpose of the study

The purpose of the study was to investigate factors influencing implementation of Street lights in Kenya: A case of Machakos County.

1.4 Objective of the study

This study was guided by the following objectives;

i. To establish the extent to which vandalism influence implementation of Street lights in Machakos County.
ii. To determine how Monitoring and evaluation influence implementation of Street lights in Machakos County.
iii. To examine how Operation and Maintenance influence implementation of Street lights in Machakos County.
iv. To investigate how budgetary allocation influence implementation of Street lights in Machakos County.

1.5 Research Questions

This study was guided by the following research questions;

i. To what extent does vandalism influence implementation of Street lights in Machakos County?
ii. How does Monitoring and evaluation influence implementation of Street lights in Machakos County?
iii. To what extent does Operation and Maintenance influence implementation of Street lights in Machakos County?
iv. How does budgetary allocations influence implementation of Street lights in Machakos County?

1.6 Significance of the Study

This research will be of great significance to the county governments since it would help in establishing effective ways of achieving sustainable street lighting projects. The study elaborates on the key elements to consider during implementation street light projects in their counties.

The research study was of great importance particularly to future researchers for it may enrich existing knowledge and acts as the vital source of literature review for their research studies as well as a source of secondary data reference. Future researchers may use their research to compare their findings undertaken in the same area of study over some margin of time. By these finding, other counties would benefit since their challenges are similar and the guidelines are the same.

1.7 Limitation of the study

The investigator faced challenges in gaining access to respondents in the county government due to their rules and regulations. To overcome this challenge the researcher therefore opted to administer the questionnaires then came back later to collect them. The researcher dropped the questionnaires in person or through an assistant, in the relevant offices ensuring that the selected managers had their copy.

The researcher encountered the problem of suspicion by county government's monitoring and evaluation team and staff. Some staff members remained averse to disclose information regarding the county government projects. This is due to fear that the political rivals to the government in power could use the information to their advantage. To overcome this, the researcher had an introductory letter from the University to assure and affirm that the information revealed is only for academic purpose and due confidentiality will be awarded. The researcher carried out an investigation into the background of the organization and had the necessary knowledge of what to ask and what not to.

Unavailability of some of the top management personnel of county government was another hindrance that the researcher met while collecting data. However this problem was resolved by fitting a schedule plan favouring their busy schedule or seeking other personnel in the department who were conversant with the area of study to fill the questionnaire on their behalf. In accessing online resources, some sites required membership terms in order to log in. however, the researcher preferred free online sites.

A number of the questionnaires were not returned in good time, probably because the respondent forgot, ignored or was held up in their busy calendar. To attain the good response the researcher made a follow up by paying them a visit and sending short and polite e-mails.

1.8 Delimitations

The research focused on factors influencing implementation of Street lights in Kenya. The research was conducted in Machakos County. The geographical scope was selected from the county projects that are going on in Mavoko, Machakos, Mwala and Matungulu Sub-County. The research targeted the employees of the Department of Energy and Electrification in the county government and some selected direct beneficiaries of county development projects.

1.9 Assumptions of the Study

The researcher had the following basic assumptions such as: That the respondents were willing to participate in the study; that the questionnaires administered to the respondents were to be filled and returned for analysis; that the respondent were to respond honestly to the questions in the instrument.

1.10 Definition of Keyterms

Evaluation Is the process of systematic collection, analysis and interpretation of project related data that can be used to understand how the project is functioning in relation to the project objectives.

Factors Influencing Substance forces or concepts which are measurable are expressing the expected outcome.

Implementation Is the process of putting a decision or plan into effective execution.

Maintenance Is the process of preserving a condition or situation or the state of being preserved.

Street lights Is a standalone raised source of light in highly populated urban areas or shopping centers.

Monitoring Is a continuous and periodic review, and overseeing of the project to ensure that input deliveries, work schedules, target output and other required actions proceed according to the project plan.

Operations Is responsible for managing the resources needed to produce the company's products and services and furthermore specifies the design and use of these resources to support the business strategy.

Project Is an individual or community oriented venture that is deliberately arranged and intended to accomplish a specific point.

Vandalism Is the willful or malicious destruction, injury, disfigurement, or defacement of property.

1.11 Organization of the study

This Report was outlined into five parts:

Chapter one focused on the introduction of the study, background of the study, statement of the problem, purpose of the study, research questions, and significance of the study, delimitations, limitations, and assumptions of the study. It also defined significant terms as they are used in the study.

Chapter two was the literature review of the vandalism, Monitoring and Evaluation, Operation and Maintenance and budgetary allocation. It also focused on the independent and dependent variables and how they relate to each other which were shown in the conceptual framework.

Chapter three focused on research methodology which covers research design, target population, sampling procedure, data collection instruments, methods of data collection, validity and reliability of the instruments, ethical considerations, Operationalization of variables and methods of data analysis.

The fourth chapter consist of data analysis, presentation and interpretation, while the fifth chapter consist of an introduction, summary of findings, and discussion of findings, conclusions, recommendation and suggestion for further research.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This review of the literature helped the scholar to comprehend extensively the topic of study, it therefore focuses on the following areas; Implementation of street light, vandalism, Monitoring and evaluation, Operation and Maintenance and Budgetary allocation on implementation of Street lights projects.

2.2 Implementation of Street lights projects

Street lighting dates back during the Roman and greek civilization in which oil lamps were heavily utilized as the sole method of lighting the streets. The oil lambs were characterized with dim lighting which was equally long lasting. The oil lamb subjected the lamb-lighter to a cumbersome job in which he/she could go round the city lighting the oil lambs. Hopefully there was a new method invented in which the lambs were automatically lighted by ignition when the gas was activated (Kenya Power Company, 2014).

As the implementation of street light proceeds, innovations are progressed; high-intensity discharge lamps were created and are still commonly used for today's lighting needs. Street lights are made up of a number of features. Firstly, a structural system consisting of poles and the pole's foundation; secondly, the electrical system consisting of lamps, ballasts and service cabinets (fuse box); and lastly, the optical system made up of a luminaire (New York City Global Partners, 2011).

The implementation of street lighting was marinated with several aspects which accommodated the fact that there was difficulties in the comprehension and measurement of implementations in which it affected the solutions. There was a worldwide testing of practical challenges affecting the implementation by practioners (Akaki, 2009).

With the onset of devolving responsibility among the developing countries, implementation of street lighting has remained to be a mountain climb since it's only implemented in cities. To respond to this challenge of implementation, the government heavily utilized specific technologies which were cost effective, readily available, low maintenance cost and simple to use (Bastakoti, 2009).

The most obvious reasons for low number of Implementation of street lighting projects included; selection of inefficient street lamps, poor design and maintenance practices (Mandri-Perrott, 2012). Existing street lights could be retrofitted or replaced to increase energy efficiency. To retrofit was to add a component or accessory to something that already existed. The decision to retrofit or to replace new street lights could be based on the purpose and lighting requirements of the roadway, age of existing lighting infrastructure and whether existing poles could be used with replacement of luminaires or new poles had to be put up (New York City Global Partners, 2011).

2.3 Vandalism on implementation of Street lights projects

Vandalism is all processes that degrades the value of a property either through disfigurement, graffiti and destruction of properties among others (Hualiang et al., 2012). Several studies draws their point of argument on how vandalism is associated with other problems such as increased crime rates. This studies solely employ monotonous methods to measure the effect of the design variables on the identified problems. In this study, vandalism is tagged as a distinct social problem hence there is no merging of vandalism with other problems like crime types and age, targets of the act and the motives (Hillier and Shu, 2000).

Vandalism has led to extensive construction of even taller and strong multi-storey structures in the western countries after the serious damages made by the Second World War.

The federal government of the United States have tagged vandalism as an expensive problem which is on a high rise. With this in place, the government has formulated different measures to combat this problem especially the graffiti vandalism. With the

current statistics, vandalism has increased tremendously in the western countries which in turn poses a great threat to the countries properties (UAE Interact, 2008). The study majorly associated multi-storey buildings that are located in the U.E.A (Callinan, 2002)

In many studies, majority of the decision made about the effectiveness of design feature of vandalism are drawn from subjective observation. In moist of the cases the researchers have been accused of lack of rigor in their findings. This statement is in line with a study carried out by Hillier and Shu (2000) on 'Utopia on Trial' in which they found out that the books results had no correlation of design variables and vandalism.

2.4 Monitoring and evaluation on implementation of Street lights projects

Many researchers have conducted extensive studies to try and explain the significance of the approach used in M&E towards the effectiveness of project monitoring and evaluation. This review has outlined specific approaches namely; status assessment, effectiveness measurement and accounting and certification as some of the key approaches that should be applied by managers and monitoring team (Stem et al (2005). A country like Saudi Arabia lacks appropriate and sound evaluation framework and general lack of identification and selection of a sub-criteria for selecting a framework. Lack of evaluation framework poses a great challenge to the success of the project (Alotaibi (2011). in his research, (Mladenovic et' al (2013) implemented a two layer approach for the assessment of private-public partnership projects in which the first part was evaluation of the project objective as from the ideologies of each stakeholders. The approach mainly focused on the level of service for users, project effectiveness and the value of money in the public sector and profit margin for private sectors. The second approach was the implementation of Balanced score cards which further evaluates the projects in four perspectives which are; customer, internal business process, learning and growth and lastly financial perspective. Evidently, balanced score card approach perfectly fitted in the process of evaluation of project success, monitoring and measuring the accountability of e-government in Jordan (Alhyari et' al (2013).

Logical framework remains the main tool utilized by both government and non-governmental sectors for effective project management through planning and monitoring

of development projects (Middleton, 2005; Martinez, 2011). This is further confirmed by Hummel Brunner, R. (2010) in his study, where he basically outlines how log frame is impermeable to critics. To add to this, he further clarifies that, despite log frame having limits and weaknesses, many organization still utilize it as the main approach of planning and monitoring tool due to its advantages on simplicity and efficiency in collection and reporting of data. On the other hand, Myrick (2013) communicates his finding confirming that a pragmatic approach is the best approach to carry out M&E although in the real world its implementation may subject the practitioners to a lot of limitations and constraints. He further cements the argument by saying that any approach is ideal for implementation only if the approach houses all the principles of M&E in its reporting tools.

There are other mentionable approaches that are implemented in M&E. fuzzy logic model, miscellaneous methods and stochastic methods are among these methods. With remarkable accuracy, flexibility and adaptability, the Malaysian government has promoted the implementation of Earned Value Analysis (EVA) to foresee the countries Project management. EVA stands out as one of the main utilized approaches in this category due to its remarkable advantages [over the other methods (Abdul-Rahman, Wang, & Muhammad, 2011).

2.5 Operation and Maintenance on implementation of Street lights projects

Both service and manufacturing industries have adopted measurement of maintenance performance as one of their essential thinking platform. Due to several evolutions in projects in terms of outsourcing, separation of assets between the owners and the managers among others, measurement of maintenance performance is becoming more critical to control and evaluate. With the changing technological world, several projects are using software in conjunction with other professionals from other specific area to manage decisions on asset management and maintenance. In this context, it is important for industries to implement repair and maintenance of projects so as to realize economic viability and a long-term value creation among others. Implementation of maintenance process is significant in project management since it provides room for controlling and

monitoring correct actions towards minimization and elimination of safety risks and promoting efficiency and effectiveness towards asset maintenance (Kumar, 2013).

In order to achieve maximum utilization of production capacity and resource maintenance, managers should formulate and implement both preventive and corrective maintenance tasks in the projects. Planning is a vital process in all maintenance activities. This enhances the effective utilization of maintenance resource by implementing standard procedures.

The procedures should ensure that there is effective interval of inspection, repair and adjustments. To add to this, the planning procedure should ensure that all activities are completed effectively. Subsequently, in order for any hired craftsperson to be able to complete a task within a minimum time and at low cost, standard maintenance procedures (SMPs) should be communicated. Also, there should be high commitment to the Standard Operating Practice (SOPs). There should be a platform in which the work force receive adequate training to enable them to skillfully complete their duties. In addition, all maintenance workforce should follow standard practices and wholesomely support continuous improvements under the supervision of maintenance management. Generally, the significance of power plant performance has a poor reputation to industry outsiders, though it is among the core factors that could have important role in the future of our planet (Kariuki, 2015).

Over the decades there has been an increment in the recognition that different projects require different approach to their management by ensuring that management procedures are tagged to the requirements of the specific project (Crawford et al, 2011) and that managers of the specific projects are selected considering their competencies (Mulle & Turner, 2012). With the increase in the globalization of performance and maintenance project, there is evidence of intercultural challenges among project managers (Mulle & Turner, 2014). There is evidence of recognition of these diversification of project management by various professionals in which the project literature states in agreement that there is two components of project success (Jugdev & Mulle, 2012).

Construction industries that face high competitions are currently valuing the need of achieving project success, although in developing countries such as Kenya, it has remaind to be a mountain climb when it comes to completion of complex construction projects. (Swan & Khalfan, 2012).

2.6 Budget allocation on implementation of Street lights projects

All projects cannot run without a budget. Budget is the fund allocated for smooth running of a project to achieve its objective. The spending plan enables the administration to have a deeper understanding on how the budget funds were used in each development stage (Naidoo, 2011). Budget interconnects both capital and working ventures while the planning framework energizes decisions that affects the fulfillment of the set objectives (Naftal, 2010). To validate the arguments above, it is significant to marinate planning with measures that enhance proficiency. Spending procedures provides ideal gathering for recognizing effective openings (Donaldson and Lipsey, 2010).

Lack of assets influences low quality in terms of monitoring and assessing of a project (2012). In order to achieve quality M&E, the project developers should set aside adequate capital in terms of money and HR as soon as the project plan is being laid. The general expense accommodates both the budgetary and the HR for assessments and observation purposes to safe guard the utilization of extra costs (UNDP, 2009).

In order to achieve a meaningful and viable project budget, the budget must meet several cooperate considerations conditions namely; should be controlled with the executive management, should linked with the resources available and should be up to date with the plans of the project (Nyandemo (2010). Additionally, the coordination of strength into capital task assessments is exceptionally attractive (Adan, 2012). Flexible frameworks decrease; the probabilities of disappointment; the outcomes of disappointment, for example, passing and wounds, physical harm, and negative financial and social impacts; the ideal opportunity for recuperation (Aigner, Flora, Tirmizi and Wilcox, 1999).

A key capacity of getting ready for M&E is to evaluate the expenses, staffing, and different assets required for M&E work. It is imperative for M&E pros to say something regarding M&E spending needs at the undertaking configuration arrange with the goal

that assets are designated particularly to M&E and are accessible to execute key M&E assignments (Macharia, 2013).

Many countries around the world are living below the MDG target. Most of this countries are located in Africa and Asia continents due to the high population of developing countries. This countries face challenges in providing sound sanitation and the required WSS infrastructure. Definitely this countries are not able to meet the WSS infrastructure requirement since it heavily depends on the financial stability of a given country. Many governments have opted to use PPs to enhance the increment of capital platform for the WSS services (USAID, 2007).

It has remained to be a mountain climb for South Africa to attain the MDG since they continuously face budget constraints South (Africa Government (2014). Other African states like Nigeria have implemented process that influence the WSS provision through resource mobilization to enhance the accumulation of funds to purchase required materials like pipes and to hire skilled personnel to implement the WSS provision. According to the Government of Nigerian (2010) it stated that, for a real Nigerian economy, there must be sourced funds to fund the otherwise troubled water sector starting from the Kano area to the Abuja state. The Nigeria MDG Office evaluates that US$2.5 billion is required every year to meet the water supply and sanitation focuses in the vicinity of 2007 and 2015 a normal US$15 per capita (Duncan and Williams, 2010).

In Kenya, Kagai (2012) comments that changing the street from Nairobi to Thika town into a super roadway was one of Kenya's first huge scale transportation foundation ventures. Subsidized Chinese Government, the budget was initially Kenya Shillings 27 Billion but upon completion it had consumed Kenya shillings 31 Billion. The project exceeded its financial plan by 4 billion because of swelling and extra highlights that changed the outline work. Despite the budget overrun the project was termed a success. Therefore, the project budget venture spending plan ought to give a reasonable and sufficient arrangement for M&E occasions. To build a realistic budget the following are suggested to be taken into consideration: listing all M&E errands and general obligations, investigate the important things related with each assignment, and decide their cost.

2.7 Theoretical Framework

Several theories have been formulated on implementation of projects. The instrumental Stakeholders' theory was integrated with community participation and Monitoring and evaluation variables while Project Management theory was integrated with Operation and Maintenance and Budgetary allocation variables used in this study and are discussed below.

2.7.1 Instrumental Stakeholders' Theory

The origin of the stakeholder concept lied in the business science literature (Freeman, 1984). The instrumental stakeholder theory focused on how stakeholders' value could be applied to improve corporate performance and efficiency. It treated stakeholders as means to an end. This theory legitimized the claims of stakeholders on the grounds of stake holding as an effective means to improve efficiency, profitability, competition and economic success. This view was expressed by Campbell who supported stakeholder theory not from a leftwing reason of equity, but because it was fundamental to understanding how to make money in business (Letza & Sun 2012).

In many occasions, authors have shared their different opinions regarding how cooperation of stakeholder groups influence the business success and corporate survival. This corporation influenced the acknowledgement of stakeholders interests (Patrick, 2014).

Subsequently, all the scholars had a different definition of the concept although they all rotated in one principal. In this context, the operating company should put into consideration all the interests of people affected by the policy of the company's operations (Frederick et al., 1992). The stakeholder's concept entails three core factors which are; relationship of the company with the actors, the stirring committee and other actors Clarkson (1995),

With the extensive differentiation in definition of the concept by several scholars, many studies settled for freeman definition that parties involved in a project can be influenced

by the organizational objectives. In this context, all the involved parties can be stakeholders.

In another survey conducted by Mitchell et al. (1997) concluded that the freeman 1984 definition was broad and incorporated factors that were not realistic. In this context, freeman and Evan conducted a survey and reduced the organization environment to multilateral confinement between the stakeholders and the organization. This reduction acted as the limit of stakeholders.

Stakeholder theory therefore provided a platform in which the success of a project was influenced by the stakeholders' decision and their efforts towards the success of the project development. It also accounted for better understanding of project success and the collaboration of the parties involved in the project. The theory pointed on how stakeholder participation influence implementation of public street light development projects in Machakos County.

2.7.2 Theory of Project Management

Project management theory is broadly divide into 3 theories namely; project planning, project control and last but not least project execution. The main idea behind the panning theory is that it incorporates managerial skills and it influences the translation of resultant plan into action. Project planning theory majorly operates under 2 principles which initiates the projects plans and let on influence the transformation of the plans into reality following stipulated directions. The theory also assumes that the internal planning of an activity is the sole responsibility of the assigned party (Koskela and Howell 2002).

The deploying tasks to work places is the main dominating concept in the execution theory. This theory revolves in one principle which is when the time of the commencement of the project begins according to the plan, its authorization to commence is communicated through speech or writing. The theory assumes that all the paraphernalia required for the implementation of the project are all in place before the authorization and the task force is well comprehended to successfully complete the project according to the plan (Koskela and Howell 2002).

Lastly, the theory of project control concept states that there must be a process to be controlled. Several process can be controlled or monitored in a project plan for example, the performance measurement unit, standard of performance, project quality, project cost and time among others. The main principle dominating this theory is that, the margin between the standard and the measured values is used to correct the project process so that the required standard can be realized. The theory assumes that all the performance process are flowing flawlessly and also that the process can be effectively altered by the control limit set (Koskela and Howell 2002).

2.8 Conceptual framework

The conceptual framework shows that there are two sets of variables; independent variables and dependent variables. Independent variables include strength of Monitoring team, Monitoring and evaluation, Operation and Maintenance and Budgetary allocation while implementation of Street lights projects is the dependent variable. This relationship is affected by the Government policy as the moderating variable and political interference as the intervening variable and was not measured in this study since it influenced the dependent variable indirectly.

Figure 1: Conceptual Framework on factors influencing implementation of Street lights in Kenya.

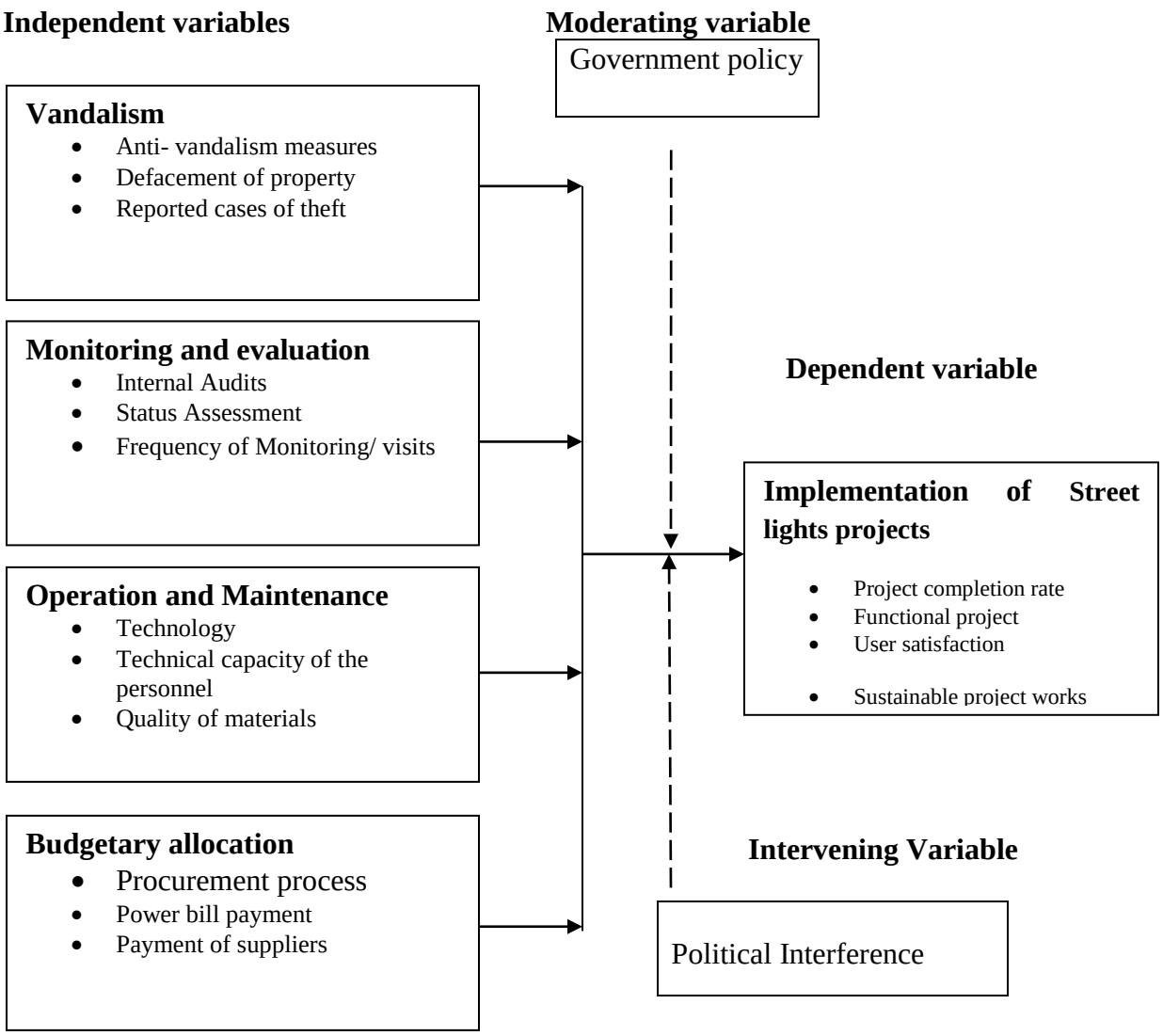

Figure 1: Conceptual Framework

The conceptual framework of this research aims to investigate factors influencing implementation of Street lights in Kenya: A case of Machakos County. There are 4 major factors identified from the conceptual framework that determine implementation of Street lights projects in Machakos County. These were classified as independent variables and they include: vandalism, Monitoring and evaluation, Operation and Maintenance and Budget allocation.

The implementation of Street lights projects in Machakos County was the dependent variable that was greatly influenced by the six independent factors/variables as shown above. This relationship was influenced by Government policy as the moderating variable and political interference as the intervening variable.

2.9 Summary of Literature Review and Knowledge Gaps

The table below shows the summary of literature review and knowledge gaps encompassing the variable, Author & year of study, title, finding, and knowledge gap.

Table 2.1: Summary of Literature Review and Knowledge gaps

Variable	Author & year of Study	Title	Findings	Knowledge Gap
Implementation of Street lights projects.	Kenya Power Company, 2014	Determining the critical success factors (CSFs) which contribute to Street lights project success.	Finding of this study is that, despite knowledge that effective M&E is a major contributor to project success; there are still project failures in Kenya.	Application of this in Street lighting in Machakos County, Kenya.
Vandalism	Hillier and Shu, 2000	Factors influencing the design variables on crime and vandalism	Findings revealed that, vandalism is considered as a distinct type of social problem differing from other social problems such as	Assessment of the situation in Street lighting in Machakos, Kenya and determine level of vandalism and

			crime in terms of the type and age of perpetrators, targets of the acts, and motives for the acts.	its contributing factors
M&E	Stem et al (2005)	To investigate some of the monitoring and evaluation approaches that may be applied by project managers and monitoring teams	Finding revealed that basic research, accounting and certification, status assessment and effectiveness measurement are m&e approaches	Relevance of this findings in Street lighting in Machakos County , Kenya
Operation and Maintenance	Kumar, 2013	To investigate the importance of power plant performance	Finding revealed that Standard maintenance procedures (SMPs) should be written so that any qualified craftsperson can successfully complete the task in the minimum required time and	The existence of such or similar operations in Machakos county's Street lights projects and how well they are functional

			at minimum costs. Adherence to standard operating practices (SOPs) is also essential. The workforce must have the training and skills required to complete their assigned duties.	.
Budget allocation	Naidoo, 2011	To investigate an extensive spending plan furnishes administration with a comprehension of how supports was used and exhausted after some time for activities or operations	Finding revealed that it is vital to supplement planning with strategies that deliberately enhances proficiency	Checking the situation in Machakos County with a different perspective.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives an overview of the research design, target populations, size of the sample and sampling procedure, data collection tools and data analysis and ethical considerations.

3.2 Research design

This research used descriptive study research design. Descriptive study design focuses on the institution of objectives, the design of data gathering instruments, the gathering of data, processing and analyzing data and reporting findings (Mugenda and Mugenda, 2003). A descriptive survey involves administering questionnaires to individuals by mail, telephone or in person. This research design method was used because the method has the potential to provide a lot of information from quite a large sample of individuals. By employing this study design, quantitative data was collected from a cross-section of Top management, M&E Staff, Electrical Technicians and Market chairmen.

3.3 Target Population

A Population is the collection of people, services, and group of things, households and events among others that are being investigated (Ngechu (2014). In Machakos County, there are over 800 completed and operational streetlight projects in Machakos County. This study fixated on Machakos, Mavoko, Mwala, Kangundo and Matungulu Sub-Counties.

The study was explicitly on the Department of Energy and Electrification - County Government of Machakos. There are 25 attached employees at the department; 5 top management staff, 2 M&E staff and 18 Electrical Technicians. 150 Market chairmen were picked as project beneficiaries giving a total target population of 175 respondents in four categories.

Table 3.1: Target Population

The table below shows the target population which consists of employees at the department of energy, top management staff, M&E staff, Electrical Technicians and market chairmen. The total target population was 175.

Stakeholders	Total Population	Percentage%
Top management staff	5	3
M&E Staff	2	1
Electrical Technicians	18	10
Market chairmen	150	86
TOTALS	**175**	**100**

Source: Department of Energy and Electrification Machakos County (2018).

This definition ensures that population of interest is homogeneous. Population studies are more representative because everyone has equal chance to be included in the final sample that is drawn according to Bryman (2016).

3.4 Sample size and sampling procedure

A sample is a group in the research study in which information is obtained while sampling is the act of choosing these individuals. It is the selection of respondents that are chosen in a manner that they characterize the total population. (Kothari, 2007).

3.4.1 Sample size

The selection of a sample size is a significant stage in every research to avoid wastage by not being too large and to give confidence to the results of the study by not being too small (Kothari, 2009.)

Out of 175 target population, a sample size of 122 was selected by use of a simplified formula provided to calculate sample size (Yamane 1967) with 95% confidence level.

Formula $n= N /1+N (e)^{2}$ Where;

n = the desired sample size

N= the estimate of the population size.

e = Probability of error (i.e. the desired precision, e.g. 0.05 for 95% confidence level)

Thus $n=175/1+175(0.05)^2$

n= 175/1+0.4375.

n= 122 respondents.

Table 3.2 Sampling Frame

The table below shows the sampling frame which consists of employees at the department of energy, top management staff, M&E staff, Electrical Technicians and market chairmen. The sample size is 122.

Stakeholders	**Total Population**	**Sample Size**	**Percentages%**
Top management staff	5	3	60.0
M&E Staff	2	1	50.0
Electrical Technicians	18	13	72.2
Market chairmen	150	105	70.0
TOTALS	**175**	**122**	**69.7**

This formed 69.7% of the target population which shows the sample is representative enough for generalization of the findings. According to Mugenda and Mugenda (2003), the sample should be small enough to be economical in terms of expenses on time, money and data analysis and ensure representation of all in the population proportionately. This is illustrated in table 3.2.

3.4.2 Sampling Technique

The study used both probability and non-probability sampling design in selecting the sample. Simple random sampling was used in probability design to sample Market chairmen. Sample sizes of 105 market chairmen were selected. In non-probability design purposive sampling was used to sample the 3 Top management staff, 1 M&E Staff, and 13 Electrical Technicians in the department of Energy and Electrification.

The primary consideration in purposive sampling is deliberating who can best provide information to achieve the objectives of the study (Kumar, 2005).

3.5 Research Instruments

A questionnaire was the main tool used for gathering of data and other relevant information to the study. A structured questionnaire was administered to the 122 respondents. The questionnaires had six sections consisting of questions on demographic characteristics, Vandalism, Monitoring and Evaluation, Operation and Maintenance, budgetary allocation and implementation of Street lights projects. A questionnaire was used to collect data from Top management staff, M&E Staff, Electrical Technicians and Market Chairmen.

3.5.1 Piloting of Research Instrument

Before commencing actual data collection, the questionnaires was pre-tested through a pilot study. The pilot study is a trial run, done in preparation for the main study. This helped in the developing and pre-testing of the research instruments. It also emphasizes the role of piloting in ascertaining the validity and reliability of research instruments (Babbie, 2012).

The research instruments was pretested using 12 respondents as per recommendations by Babbie (2012) who observes that a successful pilot study use 1 percent to 10 percent of the actual sample size. Since the sample size is small, the larger value of 10 percent was used in pre-testing. The pilot testing of the research instrument was conducted in Kitui County. A procedure which was used in pre-testing the questionnaire was similar to that was used in the actual study. (Mugenda & Mugenda, 2003).

3.5.2 Validity of Research Instrument

Validity majorly refers to how truthful or accurate a measurement is in terms of misunderstanding or misinterpretation of research questions and whether the research tool provides all the specification of the research objectives (Saunders et al., 2007). Validity was established through expert opinions from supervisors and literature reviews.

The collection of reliable data was a success since the researcher formulated the questionnaire under the supervision of the study supervisor and series of discussion with his colleagues. He also asked the same queries with slightly different wording in different sections of the research tool or in complementary tools to ascertain the accuracy of the instrument.

3.5.3 Reliability of Research Instrument

Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals and by using uniform testing procedures. The researcher selected a pilot group of 12 respondents from the population sample to test the reliability of the research instruments. In order to test the reliability of the instruments, internal consistency techniques was applied using Cronbach's Alpha. The alpha value ranges between 0 and 1 with reliability increasing with the increase in value. Coefficient of 0.7 is a commonly accepted rule of thumb that indicates acceptable reliability (Mugenda, 2008). The pilot data was not be included in the actual study. Reliability coefficient of the research instrument was assessed using the Cronbach'alpha (α) which is computed as follows:

$\alpha = \kappa/\kappa\text{-}1 \times [1- \sum (S^2)/\sum S^2 sum]$

α = Cronbach's alpha

κ = Number of responses

$\sum (S^2)$ = Variance of individual items summed up

$\sum S^2$ = Variance of summed up scores

3.6 Data Collection Procedures

After obtaining a research permit from University of Nairobi and the National Commission for Science, Technology and Innovation (NACOSTI). The two documents were presented to the Machakos County Energy and Electrification offices within the area of study. Two research assistants were recruited and capacity built on all the aspects of the research and data collection techniques so as to understand research objectives,

master the research tools, ethical consideration in research and to plan approaches to data collection. The data collection exercise took 10 days after which the data was processed.

3.7 Data Analysis Techniques.

After the data gathering, the scholar examined completeness, accuracy as well as the conformity of the instruments. The next step was coding of the data information with an aim of categorizing of the responses from the questionnaires into meaningful groups in order to elicit the essential pattern. The data then was tabulated in form of statistical tables to allow further analysis. The data was analyzed by utilization of descriptive statistics, which incorporated percentages and frequencies. The inferential tests were Pearson's correlation examination which was likewise be utilized to build up the connection between the factors. The relationship between dependent and independent variables was arrived at by conducting multiple regression analysis.

The results were presented in tables that allow orderly arrangement of data and describe the results of statistical analysis. Statistical Package for Social Science (SPSS) software was used to generate relevant statistics for analysis.

3.8 Ethical considerations

Researcher obtained a research permit from University of Nairobi and the National Commission for Science, Technology and Innovation (NACOSTI) and from the Machakos County Energy and Electrification. The researcher adhered to the principle of voluntary participation of respondents by giving respondents free to participate and contribute. Confidentiality was observed while undertaking this study by explaining the reasons for undertaking the study and the desire to maintain confidentiality by keeping the information confidential and using the information for research purpose only.

3.9 Operationalization of variables

Table 3.4 Operationalization of variables.

The table 3.4 shows the operationalization of variables and it consists of objectives, variables, indicators, measurement, data collection methods and Data analysis.

Objectives	Variables	Indicators	Measurement scale	Tools of data collection	Type of data Analysis	Tools of Data analysis
To establish the extent to which vandalism affects implementation of Street lights in Machakos County.	Independent variable- Vandalism	Anti- vandalism measures Defacement of property Reported cases of theft	Ordinal Nominal	Questionnaires	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson's correlation examination and multiple regression analysis
To determine how M&E affects implementation of Street lights projects in Machakos County.	Independent variable- M&E	Internal Audits Status assessment Frequency of Monitoring/ visits	Ordinal Nominal	Questionnaires	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson's correlation examination and multiple regression analysis
To examine how Operation and Maintenance affects	Independent variable- Operation and	Technology Technical capacity of the	Ordinal Nominal	Questionnaires	Descriptive Inferential	Frequencies, percentages, Mean and, Standard

implementation of Street lights in Machakos County.	Maintenance	personnel Quality of materials				deviation. Pearson's correlation examination and multiple regression analysis
To investigate how Budget allocation affects implementation of Street lights in Machakos County.	Independent variable-Budget allocation	Procurement process Power bill payment Payment of suppliers	Ordinal Nominal	Questionnaires	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson's correlation examination and multiple regression analysis
Implementation of Street lights projects in Machakos County.	Dependent variable-implementation of Street lights projects	User satisfaction Sustainable project works	Ordinal Nominal	Questionnaires	Descriptive Inferential	Frequencies, percentages, Mean and, Standard deviation. Pearson's correlation examination and multiple regression analysis

CHAPTER FOUR
DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This section communicates the findings in relation to study's objectives. The analysis was guided by specific objectives stated in the statement of problem. Questionnaires were administered to 122 respondents who included 5 top management staff, 2 M&E Staff, 18 Electrical Technician in Machakos County Energy and Electrification offices and 97 Market Chairmen in Machakos County. The first section provides the pilot test results, response rate together with respondents' demographic data. Section two covers data on vandalism and its influence on implementation of street light project, Monitoring and Evaluation and its influence on implementation of street light project, Operation and Maintenance and its influence on the implementation of street light project and Budgetary allocation and its influence on implementation of street light project. The descriptive statistics are utilized to present the findings whereas the findings are discussed in relation to output obtained from SPSS program.

4.2 Pilot Test Results

A pilot survey was carried out to evaluate the validity and reliability of the research tool. A sample of 12 respondents was selected and the return rate was 100%. All measures of both independent and dependent variables that are within the 0.7 threshold were evaluated using the Cronbach's Alpha Test. The results in the table 4.1 below show Cronbach's alpha of well above 0.7 implying that the instruments were sufficiently reliable for measurement.

Table 4.1 Reliability Statistics

Variable	N	Cronbach's Alpha
Vandalism	12	0.842
Monitoring and Evaluation	12	0.839
Operation and Maintenance	12	0.819
Budget Allocation	12	0.816

4.3 Questionnaire Return Rate

Out of 122 questionnaires, ninety seven (97) were recovered for the analysis. This gave a response rate of 80%. This return rate agrees with the discoveries by Mugenda and Mugenda who showed that a reaction rate more noteworthy than 70% is great. Subsequently the reaction rate was agreeable. The response rate is shown on Table 4.2.

Table 4.2 Response Rate

Category	Frequency	Percentage%
Respondent	97	80
Non-respondents	25	20
Total	**122**	**100**

4.4 General Information

Under this section, some of the basic information regarding the respondents was asked to establish the grounds for the study.

4.4.1 Respondent's Gender

In the study, the researcher asked the respondents to indicate their gender. The responses were as follows.

Table 4.3 Distribution of respondents by Gender

Categories	Frequency	Percentage %
Male	54	55.7
Female	43	44.3
Total	**97**	**100**

As per the results, majority of the respondents were male with a percentage of 55.7% and that of females was 44.3%. Furthermore, this results may also be important in influencing implementation of streetlight as women begin to share in the burden of management (Badiru, 2012). This shows that there were slightly more male stakeholders involved in

street lighting projects in Machakos County than the female, thus an indication that gender balance was observed.

4.4.2 Level of Education

In this study, the respondents were asked to indicate their highest level of education. The results were as follows.

Table 4.4 Level of Education

Categories	Frequency	Percentage%
Certificate	25	25.8
Diploma	8	8.2
Bachelor's degree	22	22.7
Post graduate degree	0	0
Others	42	43.3
Total	**97**	**100**

As per the outcome, 25% of the respondents indicated that they possessed a certificate, 8% possessed Diploma, 22% of the respondents indicated that they held an undergraduate degree and42% indicated that they held others levels. According to Murphy and Myors (2004), education level determines the respondents' ability to comprehend the survey questions. This implies that respondents were in a position to understand factors influencing implementation of street light projects in Machakos County, Kenya.

4.4.3 Age Level

The study sought data on age level of respondents. Table 4.5 shows the age level of respondents.

Table 4.5 Respondents' Age levels

Age (years)	Frequency	Percentage%
18-23	4	4.1
24-29	23	23.7
30- 35	19	19.6
36-40	13	13.4
41 and above	38	39.2
TOTAL	97	100

The study findings revealed that 4.1% of the respondents were of age bracket 18-23 years, 23.7% were between 24-29 years of age, 19.6% were between 30-35 years of age. 13.4% were between 36-40 years of age and 39.2% were 41 years and above. The findings therefore reveal that majority of the respondents were above 30 years and thus had knowledge regarding the factors influencing implementation of street light projects in Machakos County, Kenya.

4.4.4 Distribution of respondents by the occupation

The study sought data on occupation level of respondents. Table 4.5 shows the occupation level the respondents.

Table 4.6 Respondents' occupation levels

Rank	Frequency	Percentage (%)
Management level	5	5.2
M& E Staff	2	2.1
Technician	12	12.4
Market Chairman	78	80.4
TOTALS	**97**	**100**

Study shows respondents composition by the occupation in the street light project, 5.2 % were Management level, 2.1% were M& E Staff, 12.4% were Technicians and 80.4% were Market Chairmen. Barnes (2003) who sates that breakdown of projects is the main

cause of implementation failure and it needs technical know-how of r projects. The findings therefore reveal that majority of the respondents were fully engaged in the street light projects in Machakos County, Kenya.

4.5 Vandalism and implementation of street light projects

This section shows the results of the respondents' opinion regarding to the extent of vandalism, rating of anti-vandalism measures and statements on vandalism.

4.5.1 Vandalism

The respondents were requested to indicate the extent they felt vandalism influenced implementation of street light projects in Machakos County and responses are as follows.

Table 4.7 Vandalism

Vandalism	Frequency	Percentage
Very great extent	8	8.2
Great extent	54	55.7
Moderate extent	11	11.3
Low extent	20	20.6
Very low extent	4	4.1
Total	**97**	**100**

The analysed data revealed that 55.7% of the respondents felt that to a great extent vandalism influenced implementation of street light projects and 8.2% of the respondents felt that to a very great extent vandalism influenced implementation of street light projects. In addition, 11.3%, 20.6% and 4.1% of the respondents felt that to a moderate extent, low extent and less extent respectively, vandalism influenced implementation of street light projects. Barnes (2003) who sates that breakdown of equipment is the main cause of non-functionality of relatively new projects.

This implies that most of the respondents were in agreement that, to a great extent vandalism influenced implementation of street light projects.

4.5.2 Rating of anti-vandalism measures

The respondents were asked to rate the anti-vandalism measures put in place during implementation of street light projects in Machakos County and responses were as follows.

Table 4.8 Anti-vandalism measures

Vandalism	Frequency	Percentage
Excellent	9	9.3
Good	21	21.6
Neutral	30	30.9
Fair	37	38.8
Total	**97**	**100**

The analysed data revealed that 38.8% of the respondents rated the anti-vandalism measures put in place as fair, 30.9% of the respondents rated the anti-vandalism measures put in place as neutral and 21.6% of the respondents rated anti-vandalism measures put in place during implementation of streetlight projects as good. In addition, 9.3% of the respondents rated the anti-vandalism measures put in place during implementation of street lights as excellent; this implies that most of the respondents rated anti-vandalism measures put in place during implementation of street lights as fair.

4.5.3 Statements on vandalism

The researcher requested the respondents to rate the degree of measurement concerning vandalism and implementation of street light projects. The responses are indicated in Table 4.9.

Table 4.9 Statements on vandalism

Agreement Strength of N							Mean	Std. Deviation
Vandalism	**1SD**	**2D**	**3N**	**4A**	**5(SA)**			
Vandalism rating is significantly high	9	19	18	39	12	97	3.27	1.186
Anti- vandalism measures are put in place	33	31	14	12	7	97	2.29	1.274
There is no defacement of property in the implemented projects	2	34	28	20	13	97	3.08	1.087
During project implementation, the community is consulted adequately	10	28	13	33	13	97	3.11	1.257
There are no reported cases of theft from the community during project implementation	9	5	15	35	33	97	3.30	1.230

The study results indicated that, a large number of participants were in disagreement that Anti- vandalism measures are put in place as shown by a mean score of 2.29 and SD of 1.274, there were reported cases of theft from the community after commissioning of Projects as shown by a mean score of 3.30 and SD of 1.230 and Vandalism rating was significantly high as shown by a mean score of 3.27 and SD of 1.186.

Furthermore the findings showed that there was no defacement of property in the implemented projects as indicated by a mean score of 3.08 and SD of 1.087 and during project implementation the community was consulted adequately as shown by mean score of 3.11 and SD of 1.257. Burke (2003) emphasizes implementation has to be a multi stakeholder subject to reduce resistance. These findings strongly point to the fact that not all stakeholders are having the same position on the subject. This reveals that most of the respondents were in agreement that existing Anti- vandalism measures were insufficient, there were no reported cases of theft from the community during project

implementation and after commissioning, vandalism rating was significantly high, there were defacement of property in the implemented projects and during project implementation the community was consulted adequately.

4.6 Monitoring and Evaluation and implementation of street light projects

This section shows the statements on monitoring and evaluation plus the results of the respondents' opinion regarding monitoring and evaluation Audits.

4.6.1 Monitoring and Evaluation Audits

The researcher asked the respondents' opinion on whether monitoring and evaluation audits were done during implementation of street light projects. The responses were indicated in Table 4.10.

Table 4.10 Monitoring and Evaluation Audits

Monitoring and Evaluation Audits	Frequency	Percentage%
Yes	69	71.1
No	28	28.9
Total	**97**	**100**

The findings in Table 4.10 insinuate that 71.1% of the respondents agreed that monitoring and evaluation Audits were conducted during project implementation while 28.9% of the respondents disagreed that monitoring and evaluation Audits were conducted during project implementation. Njuki, Kaaria, Chetsike and Sanginga (2013) found that Audits strengthens learning and change at both community and institutional level. The results imply that monitoring and evaluation Audits are conducted during project implementation.

4.6.2 Influence of Internal Audits

The researcher requested the respondents' opinion regarding the extent in which internal audits influenced M&E on implementation of street light projects. The responses were indicated in Table 4.11.

Table 4.11 Effects of Internal Audits

Effects of Internal Audits	Frequency	Percentage%
Very influential	22	22.7
More influential	51	52.6
Not sure	24	24.7
Total	**97**	**100**

The findings in Table 4.11 imply that 24.7% of the respondents were not sure if the internal audits were influential towards project implementation while 22.7% and 52.6% of the respondents agreed that internal audits were very influential and more influential respectively towards project implementation.

4.6.3 Statements on monitoring and evaluation

The researcher requested the respondents to rate the degree of measurement concerning monitoring and evaluation on implementation of street light projects. The responses were as indicated in Table 4.12.

Table 4.12 Statements on monitoring and evaluation

Agreement Strength of N							Mean	Std. Deviation
Monitoring and Evaluation	**1(N)**	**2(R)**	**3(NS)**	**4(0)**	**5(A)**			
Monitoring and evaluation is conducted frequently.	0	2	30	39	26	97	3.92	0.812
Status assessment is conducted effectively	0	16	30	32	19	97	3.56	0.989
Monitoring and evaluation feedback is utilized for improvement	0	10	28	30	29	97	3.80	0.986
Am involved in monitoring and evaluation process	0	12	45	27	13	97	3.42	0.876

Most of the respondents agreed that they were involved in monitoring and evaluation process as shown by mean score of 3.42 and SD of 0.876, Status assessment was conducted effectively as shown by mean score of 3.56 and SD of 0.989, Monitoring and evaluation is conducted frequently as shown by mean score of 3.92 and SD of 0.812 and finally monitoring and evaluation feedback was utilized for improvement as shown by mean score of 3.80 and SD of 0.986. These findings are consistent with Kliem and Ludin (2006) who state that monitoring and evaluation influence implementation of projects.

The findings therefore illustrated that Monitoring and evaluation was conducted frequently, Status assessment was conducted effectively, Monitoring and evaluation feedback was utilized and respondents were fully involved in monitoring and evaluation process.

4.7 Operation and Maintenance and implementation of street light projects

This section shows the results of the respondents' opinion regarding effectiveness in operation and maintenance, how often operation and maintenance is conducted and statements on operation and maintenance.

4.7.1 Effectiveness in Operation and Maintenance.

The researcher requested the respondents' opinion regarding effectiveness of operation and maintenance towards implementation of Street lights. The responses were indicated in Table 4.13.

Table 4.13 Effectiveness in Operation and Maintenance.

Effects of Internal Audits	Frequency	Percentage%
Extremely effective	14	14.4
Effective	43	44.3
Not sure	4	4.1
Slightly effective	29	29.9
Not at all effective	7	7.2
Total	**97**	**100**

The findings in Table 4.12 indicate that 14.4% of the respondents agreed that operation and maintenance was extremely effective towards implementation of Street lights, 44.3% of the respondents agreed that operation and maintenance was effective towards implementation of Street lights, 4.1% of the respondents were not sure while 29.9% and 7.2% of the respondents agreed that operation and maintenance were slightly effective and Not at all effective respectively.

These findings agree with Kenya Joint Assistance Strategy (2007), which states that each rural community has a big role to play in the technology utilized. Thus the results imply that operation and maintenance was effective towards implementation of Street lights.

4.7.2 How often operation and maintenance is conducted.

The researcher requested the respondents' opinion regarding how often operation and maintenance was conducted after commissioning of projects. The responses were as indicated in Table 4.14.

Table 4.14 How often operation and maintenance is conducted

Effects of Internal Audits	Frequency	Percentage%
Yearly	14	14.4
Quarterly	21	21.6
Monthly	19	19.6
Weekly	30	30.9
None	13	13.4
Total	**97**	**100**

The findings in Table 4.14 suggests that 30.9% of the respondents agreed that operation and maintenance was conducted weekly during the project implementation, 19.6% of the respondents agreed that operation and maintenance was conducted monthly during the project implementation while 13.4% of the respondents indicated that operation and maintenance was never conducted . In addition, 14.4% and 21.6% of the respondents agreed that operation and maintenance was conducted yearly and quarterly respectively. Through the findings it's clear that most respondent were of the opinion that operation and maintenance was conducted weekly after commissioning of projects

4.7.3 Statements on operation and maintenance.

The researcher requested the respondents to rate the degree of measurement concerning operation and maintenance on implementation of street light projects. The responses were indicated in Table 4.15.

Table 4.15 Statements on Operation and Maintenance.

Agreement	Strength		of		N		Mean	Std. Deviation
Operation and Maintenance.	**1SD**	**2D**	**3N**	**4A**	**5(SA)**			
The technology used by the maintenance team is high tech.?	9	4	32	40	12	97	3.43	1.070
The technical team is highly experienced in the field of Street lights projects?	1	18	22	44	12	97	3.49	0.970
The quality of materials used is good and there is minimal breakdown after installation.	10	23	30	23	11	97	3.02	1.164

Most of the respondents agreed that the technical team was highly experienced in the field of Street lights projects as shown by mean score of 3.49 and SD of 0.970, the technology used by the maintenance team was high tech as shown by mean score of 3.43 ;and SD of 1.070. Finally the qualities of materials used were good and there was minimal breakdown after installation as shown by mean score of 3.02 and SD of 1.164.

The findings illustrate that the quality of materials used were good and there was minimal breakdown after installation, the technology used by the maintenance team was high tech and the technical team were highly experienced in the field of Street lights projects.

4.8 Budgetary allocation and implementation of street light projects

This section shows the results of the respondents' opinion regarding budgetary allocation; continuity of the project was according to the budget allocated, rating of budgetary allocation in the implementation process and statements on budgetary allocation.

4.8.1 Budgetary allocation

The respondents were requested to indicate the extent to which they felt budget allocations influenced implementation of Street lights in Machakos County.

Table 4.16 Budgetary Allocation

Budgetary Allocation	Frequency	Percentage%
Very great extent	37	38.1
Great extent	7	7.2
Moderate extent	14	14.4
Low extent	16	16.5
Very low extent	23	23.7
Total	**97**	**100**

The analyzed data revealed that 7.2% of the respondents felt that to a great extent budget allocations influenced implementation of Street lights project and 38.1% of the respondents felt that to a very great extent budget allocations influenced implementation of Street lights project. In addition, 14.4%, 16.5% and 23.7% of the respondents felt that to a moderate extent, low extent and very low extent respectively, budget allocations influenced implementation of Street lights project. This implies that most of the respondents were in agreement that to a great extent budget allocations influenced implementation of Street lights project in Machakos County.

4.8.2 Continuity of the project according to the budget allocated

The researcher also asked the respondents whether the projects continued according to the budget allocated. Table 4.17 shows responses from the respondents.

Table 4.17 Continuity of the project

Continuity of the project	Frequency	Percentage%
Yes	13	13.4
Not Sure	25	25.8
No	59	60.8
Total	**97**	**100**

From the findings, 25.8% of the respondents were not sure if the project continued according to the budget allocated, 13.4% of the respondents felt that project continued according to the budget allocated and 60.8% of the respondents felt that project did not continued according to the budget allocated. This indicated that street lights project in Machakos did not continue according to the budget allocated**.**

4.8.3 Rating of budgetary allocation

The researcher also asked the respondents to rate budgetary allocations in the implementation process. Table 4.18 shows responses from the respondents.

Table 4.18 Rating of budgetary allocation

Rating of budgetary allocation	Frequency	Percentage%
Very good	7	7.2
Good	22	22.7
Neutral	9	9.3
Poor	57	58.8
Very Poor	2	2.1
Total	**97**	**100**

Result show that 22.7% of the respondents felt that budgetary allocations in the implementation process was good, 7.2% of the respondents felt that budgetary allocations in the implementation process was very good and 9.3% of the respondents were neutral on rating budgetary allocations in the implementation process. In addition, 58.8% and 2.1% of the respondents felt that budgetary allocations in the implementation process were poor and very poor respectively. This implied that most of the respondents were in agreement that a budgetary allocation in the implementation process was poor.

4.8.4 Statements on Budgetary allocation

The researcher requested the respondents to rate the degree of measurement concerning budgetary allocation on implementation of Street lights projects .The responses were indicated in Table 4.18.

Table 4.19: Statements on Budgetary allocation

Agreement	**Strength**		**of**		**N**		**Mean**	**Std. Deviation**
Vandalism	**1SD**	**2D**	**3N**	**4A**	**5(SA)**			
Procurement process is done as per the law	11.3	35.1	27.8	20.6	5.2	97	2.73	1.075
Procurement process starts on time	4.1	17.5	32	41.2	5.2	97	3.26	0.950
Power bill payment is done on time	1	63.9	19.6	9.3	6.2	97	2.56	0.913
Payment of suppliers is done without delays	0	40.2	29.9	23.7	6.2	97	2.96	0.946

Table 4.18 revealed that most of the respondents disagreed with the statement that power bill payment is done on time as shown by a mean score of 2.56 and a SD of 0.913, payment of suppliers was done without delays as shown by a mean score of 2.96 and SD of 0.946, and the procurement process starts on time as shown by a mean score of 3.26 and SD of 0.950. Finally the procurement process was done as per the law as shown by a mean score of 2.73 and SD of 1.075.

The findings therefore revealed that budget allocation influenced implementation of Street lights projects as the respondents disagreed that; procurement process was done as per the law, power bill payment was done on time and payment of suppliers was done without delays.

4.9 Implementation of street light projects

This section shows the results of the respondents' opinion regarding implementation of street lighting projects in Machakos County. The responses were indicated in Table 4.19.

Table 4.20 Implementation of street light projects

	Strength of Agreement					N	Mean	Std. Deviation
Implementation of street light projects	**1SD**	**2D**	**3N**	**4A**	**5(SA)**			
Users are fully satisfied with the Street lights project.	2.1	18.6	28.9	49.5	1	97	3.29	0.853
Street lights projects are implemented successfully?	4.1	6.2	18.6	49.5	21.6	97	3.78	0.992
Completed project works is sustainable?	8.2	0	33	43.3	15.5	97	3.58	1.029

As per the study results, a large number of participants were in agreement that users are fully satisfied with the Street lights project as shown by a mean score of 3.29 and SD of 0.853. Street lights projects were implemented successfully as shown by a mean score of 3.78and SD of 0.992 and finally Completed project works were sustainable as shown by a mean score of 3.58 and SD of 1.029. This suggests that most of the respondents were in agreement that completed project works was sustainable, Street lights projects were implemented successfully and users were fully satisfied with the Street lights project.

4.10 Inferential statistics

The inferential statics in this study used correlation analysis of four objectives and ANOVA on budgetary allocation and the effectiveness of implementation of Street lights project.

4.10.1 Correlation Analysis

The aim of the exploration was to investigate factors influencing implementation of Street lights in Kenya: A case of Machakos County. Pearson's correlation analysis was used to test this relationship as illustrated in the table below.

Table 4.21 Correlation Analysis

		Vandalism	Monitoring and evaluation	Operation and maintenance	Budgetary Allocation	Implementation of street light
Vandalism	Pearson Correlation	1	.042	-.120	.160	-.003
	Sig. (2-tailed)		.683	.240	.116	.978
	N	97	97	97	97	97
Monitoring and evaluation	Pearson Correlation	.042	1	-.159	.053	.070
	Sig. (2-tailed)	.683		.119	.604	.497
	N	97	97	97	97	97
Operation and maintenance	Pearson Correlation	-.120	-.159	1	.119	-.045
	Sig. (2-tailed)	.240	.119		.244	.659
	N	97	97	97	97	97
Budgetary Allocation	Pearson Correlation	.160	.053	.119	1	.350**
	Sig. (2-tailed)	.116	.604	.244		.000
	N	97	97	97	97	97
Implementation of street light	Pearson Correlation	-.003	.070	-.045	.350**	1
	Sig. (2-tailed)	.978	.497	.659	.000	
	N	97	97	97	97	97

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

The analysis in Table 4.20 revealed a medium and positive connection between monitoring & evaluation and implementation of Street lights projects as depicted by a correlation coefficient of 0.497. This means that monitoring and evaluation feedback

when utilized well has a great influence on implementation of Street lights projects; since it gives the M&E team adequate resources to ensure its efficacy.

A strong and positive connection amongst the operation and maintenance and implementation of Street lights projects was found as shown by a correlation factor of 0.659. This suggests that if operation and maintenance is conducted effectively during project implementation process and after commissioning it can be an assurance of sustainability in Street lights projects. In addition, the study revealed a very strong positive connection amongst vandalism and implementation of street lights projects as indicated by a correlation factor of 0.978. This is a suggestion that in every project design strong anti- vandalism measures should be put in place to curb vandalism in Street lights infrastructure. Lastly, the study found a weak connection on budgetary allocation and implementation of Street lights projects as shown by a factor of 0.00. This suggests that if budgetary allocation was effective then great improvement in implementation of Street lights project would have been noted.

4.10.2 Further analyses

Further to the descriptive statistics done where the influence of each independent variable on the dependent variable was sought, the study pursued to establish the collective influence of the independent variables on the dependent variable by carrying out a regression analysis in order to determine the extent to which the four variables under study influenced implementation of Street lights project in Machakos County and the results were as follows:-

A multiple regression model was developed to establish the relationship between the dependent and independent variables which are the implementation of street light project and the factors influencing implementation of Street projects in Machakos County. The relationship equation was represented by the linear equation below:

$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \mu$ where;

Y=Implementation of Street projects, X1= Vandalism, X2=Monitoring and evaluation, X3=Operation and Maintenance, X4=Budgetary allocations

4.10.3 Model Summary

Table 4. 22 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.370[a]	.137	.100	1.482	.137	3.658	4	92	.008

a Predictors: (Constant) vandalism, Monitoring and evaluation, Operation and maintenance and Budgetary Allocation.

Dependent: implementation of street light project

From the Table 4.21 above, R represented the multiple correlation coefficients and was contemplated as a measure of the quality of the prediction of the dependent variable. A value of .370a was a proof that the level of prediction was good.

R-Squared is the proportion of the variance in the dependent variable influence of implementation of street light project that was explained by variations in the independent variable vandalism, Monitoring and evaluation, Operation and maintenance and Budgetary Allocation.

This implied that the independent variables explained 13.7% of the variance or correlation of the dependent variable.

Adjusted R2 is called the coefficient of determination which indicates implementation of street light project varies with variation in factors influencing implementation of street light projects which includes vandalism, Monitoring and evaluation, Operation and maintenance and Budgetary Allocation.

From the table above, the value of adjusted R2 is 0.100. This implied 10% of variance in dependent variable (implementation of street light project) is explained in the independent variables .Other factors not studied contribute to 90% variations in

implementation of street light projects and further research should be conducted to establish the same.

4.10.4 ANOVA

Table 4.23 ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	32.118	4	8.029	3.658	.008[b]
	Residual	201.965	92	2.195		
	Total	234.082	96			

a Predictors: (Constant)), Budgetary Allocation, Monitoring and evaluation, vandalism, Operation and Maintenance

Dependent: Implementation of street light

This table gives an F-test to determine whether the model had a good fit for the data. The F-Test (F(4,92)=3.658, P=0.008< 0.05) indicated that the regression model formed between Implementation of street light and factors that influence implementation of street light projects was a good fit for the data.

4.10.5 Coefficients

Table 4.24 Coefficients

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	T	Sig.
(Constant)	7.872	2.084		3.777	.000
Vandalism	-.035	.046	-.075	-.759	.450
Monitoring and evaluation	.026	.067	.038	.390	.697
Operation and Maintenance	-.042	.045	-.093	-.928	.356
Budgetary Allocation	.190	.051	.371	3.738	.000

a Predictors: (Constant) vandalism, Monitoring and evaluation, Operation and Maintenance and Budgetary Allocation.

Dependent: Implementation of street light

From the findings in the table the established regression equation was;

Y = 7.872+ .395+ .526X2 + .342X3 + .490X4 + 0.52106

These coefficients indicated how the dependent variable varied with an independent variable when all other independent variables were held constant. In interpreting the coefficients table 4.23 above all predictors were checked individually as shown below.

Table 4.25 Significance Summary

Each predictor was tested at alpha= 0.05

Vandalism	Not statistically Significant	(p= 0.45)
Monitoring and evaluation	Not statistically Significant	(p=0.697)
Operation and Maintenance	Not statistically Significant	(p=0.356)
Budgetary Allocation	Statistically significant	(p=0.000)

This demonstrated that from all the predictors only budgetary allocation had a statistical significant amount of unique variance explained in implementation of street lights and all interpretations were based only on the predictor (Budgetary allocations). From the unstandardized coefficients it was disclosed that for every increase in one unit of the predictor (budgetary allocations) there was a change in the dependent variable of 0.190.

When interpreting the result from the standardized coefficients the researcher used standard deviation and concluded that for every increase in predictor budgetary allocation of one standard deviation unit, there was an increase in the dependent variable of 0.371 standard deviations.

The column of coefficient shows the predictor variables are constant, vandalism, Monitoring and evaluation, Operation and Maintenance and Budgetary Allocation. The first variable constant of 7.872 represented the constant which predicted value implementation of street light when all other variables of factors influence implementation of street light projects were constant at zero (0). From the above regression model, it was found that implementation would be at 7.872 holding vandalism, Monitoring and evaluation, Operation and Maintenance and Budgetary Allocation constant at Zero.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section concludes the study by summarizing the results, discussing them and recommending the way forward for further researches.

5.2 Summary of Findings

The objective of the research was to investigate factors influencing implementation of Street lights in Kenya: A case of Machakos County assessed how vandalism, Monitoring and evaluation, Operation and Maintenance and budgetary allocation influenced implementation of Street lights in Machakos County.

5.2:1 Vandalism and implementation of Street lights projects

The findings outlined also show that there is a no positive correlation between vandalism and implementation of Street lights as shown by a coefficient of 0.395 and a p-value of 0.003 at 95% confidence interval which is greater than 0.05 and a t-value of 1.987 which is less than 2. This infers that there is a negative significant relationship between user vandalism and implementation of Street lights.

5.2:2 Monitoring and Evaluation and implementation of street light projects

In addition, the findings show that there is a positive significant relationship between Monitoring and evaluation and implementation of Street lights as shown by a coefficient of 0.526 and a p-value of 0.000 at 95% confidence interval which is less than 0.05 and a t-value of 4.390 which is greater than 2. This can be used to conclude that there is a positive significant relationship between Monitoring and evaluation and implementation of Street lights.

5.2:3 Operation and Maintenance and implementation of street light projects

Further, the findings show that there is a significant positive relationship between operation and maintenance and implementation of Street lights projects as shown by a coefficient of 0.342 and a p-value of 0.006 at 95% confidence interval which is less than 0.05 and a t-value of 2.929, which is greater than 2. This shows that there is a positive significant relationship between top management support and performance of road projects.

5.2:4 Budgetary allocation and implementation of street light projects

Further, the findings show that there is a significant positive relationship between budget allocation and implementation of Street lights projects as shown by a coefficient of 0.490 and a p-value of 0.002 at 95% confidence interval which is less than 0.05 and a t-value of 3.738 which is greater than 2. This shows that there is a positive significant relationship between budget allocation and implementation of Street lights projects.

5.3 Discussions of the Findings

The research found there was very strong positive connection amongst vandalism and implementation of street lights projects. It was found out that anti- vandalism measures w put in place were inadequate, there was defacement of property in the implemented projects and during project implementation the community was consulted adequately. This concurs with (Hualiang et al., 2012) who states that most studies on vandalism focus on its association with other problems such as different crimes, and involve the use of similar measurement methods to investigate the effect of the design variables on these problems. Furthermore, this was also in agreement with Hillier and Shu (2000) who posited that vandalism was considered as a distinct type of social problem differing from other social problems such as crime in terms of the type and age of perpetrators, targets of the acts, and motives for the acts.

Additionally, a medium and positive connection between monitoring & evaluation and implementation of Street lights projects was found. The study further showed that well utilized monitoring and evaluation feedback gave an adequate basis for improvement in

implementation of Street lights projects. This was in agreement with Stem et al (2005) who stated that effectiveness of project monitoring and evaluation is also dependent on the approach of M&E. Some of the monitoring and evaluation approaches that may be applied by project managers and monitoring teams include: basic research; accounting and certification; status assessment; and effectiveness measurement.

Furthermore, strong and positive connection amongst operation and maintenance and implementation of Street lights projects was found. The study found that effective operation and maintenance lead to sustainable street light projects.

This is in agreement with Kumar (2013) who illustrates that the performance of repair and maintenance in projects is critical for the long-term value creation and economic viability of many industries. It is important that the performance of the maintenance process be measured, so that it can be controlled and monitored for taking appropriate and corrective actions to minimize and mitigate risks in the area of safety, meet societal responsibilities and enhance the effectiveness and efficiency of the asset maintained.

Finally, a weak connection on budgetary allocation and implementation of Street lights projects was witnessed. The study found out that ample budgetary allocation were a powerful tool towards resource mobilization in implementation of Street lights projects. This was in agreement with Naidoo (2011) who states that project budgets are an impression of venture work and the planning of that work. An extensive spending plan furnishes administration with a comprehension of how support was used and exhausted after some time for activities or operations. This then supports the cause for government /donors' keen interest with the budgetary allocation.

5.4 Conclusions

The study findings established that vandalism negatively and significantly influence implementation of Street lights projects in Kenya. The study based on this finding concludes that vandalism has a significant influence on the implementation of street lights projects by county governments.

Moreover the findings also established that monitoring & evaluation positively and significantly influenced implementation of street lights projects by county governments. Therefore the study concludes that the monitoring & evaluation feedbacks should function as basis for improvement in implementation of all projects.

The researcher further found out that operation and maintenance positively and significantly influenced implementation of street lights projects by county governments. With reference on this outcomes, the study concludes that sustainability of projects executed by county governments was significantly influenced by operation and maintenance of the projects.

Finally the study outcomes confirmed that budgetary allocation majorly and positively propels the implementation of street lights projects done by county governments. The research based on these findings concludes that budgetary allocation is key in resource mobilization during implementation of street lights projects by county governments.

5.5 Recommendations of the study

The study recommends that management team of Machakos County Government should consider operation competency when initiating a project of Street light. This aspect of operation competence would enable the management team to assess experience of project teams brought on board. The management team of the Machakos County should also consider introducing strong anti -vandalism measures since these had a significant influence on the implementation. Furthermore, the management should establish a strong monitoring team with responsibility of monitoring the performance of the street light in order to establish and identify those which failed or about to fail and make replacement before they failed completely, as shown by influence of operation and maintenance.

The study further recommended that that the County Government of Machakos should form a competent project steering committee tasked to determine the project requirements. The committee should develop a plan on how the project would be introduced, implemented and properly managed. The committee should also come up

with a budget or cost of the project as well as labour requirements. Capacity building should also be done to enhance efficiency of the project. This would enhance implementation of street light project.

5.6 Suggestion for Further Study

Another study should also be done to explore those other factors affecting implementation of Street light projects in Machakos County. From the findings, conclusions and recommendations, the study suggested that an in-depth study should be carried to determine the challenges faced by County Governments in implementing the street light projects. A further study should also be carried out to establish the effects of public street light development projects on performance of County government of Machakos.

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APPENDICES

Appendix I: Transmittal Letter

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MACHAKOS.
0711 474 530

Dear Respondents,

RE: PARTICIPATION IN RESEARCH

I am a postgraduate student at the University of Nairobi pursuing Masters of Arts in Project Planning and Management. I am carrying out a research on factors influencing implementation of Street lights in Kenya as part of requirements for the Award of this Degree. Your organization has been selected and consequently, you have been sampled as part of the respondents.

I therefore humbly request you to respond the questions as asked in the questionnaires.

I assure you that the information provided was solely used for the academic purpose of this study.

Thank you in advance
Yours faithfully,

Edmond Luusa (P.Eng.Tech)

Appendix II: Research Questionnaire

This questionnaire is to collect data for purely academic purposes. The study seeks to investigate factors influencing implementation of Street lights in Kenya: A case of Machakos County. All information will be treated with strict confidence. Do not put any name or identification on this questionnaire.

Answer all questions as indicated by either filling in the blank or ticking the option that applies.

Section A: Demographic Characteristics of Respondents

1. Gender:

   Male ☐ Female ☐

2. Educational background

   Certificate ☐

   Diploma ☐

   Bachelor's degree ☐

   Post-graduate degree ☐

   Other (specify)……

3. What is your age group?

   18-23 ☐

   24-29 ☐

   30-35 ☐

   36-40 ☐

   41 and above ☐

4. What is your occupation in this project?

   Management Level ☐

   M&E Staff ☐

   Technician ☐

   Market Chairmen ☐

   Other (specify)……

Section B: Vandalism on implementation of Street lights projects

5. To what extent does vandalism affects implementation of Street lights in Machakos County?

   Very low extent [ ] Low extent [ ]

   Moderate extent [ ] Great extent [ ]

   Very great extent [ ]

6. Kindly indicate your level of agreement with each of the following statements by ticking against the correct choice.

   Using likert scale 5-1 where;

   Strongly agree 5

   Agree 4

   Neutral 3

   Disagree 2

   Strongly disagree 1

SN	Statements	5	4	3	2	1
1	Vandalism rating is significantly high					
2	Anti- vandalism measures are put in place					
3	There is no defacement of property in the implemented projects					
4	During project implementation, the community is consulted adequately					
5	There are no reported cases of theft from the community during project implementation					

7. How would you rate the anti- vandalism measures put in place?

   Excellent ☐

   Good ☐

   Neutral ☐

   Fair ☐

   Poor ☐

Section C: Monitoring & Evaluation on implementation of Street lights projects

8. Monitoring and evaluation Audits is conducted during project implementation?

Yes ☐ No ☐

9. To what extent did the internal audits influence monitoring and evaluation towards project implementation?

Very influential ☐

More influential ☐

Not sure if it's influential ☐

Influential ☐

Not at all ☐

10. In your opinion, kindly rate the following monitoring and evaluation statements on implementation Street lights? Using the Likert scale 5-1, where

Always 5

Often 4

Not sure 3

Rarely 2

Never 1

SN	Statements	5	4	3	2	1
1	Monitoring and evaluation is conducted frequently.					
2	Status assessment is conducted effectively					
3	Monitoring and evaluation feedback is utilized for improvement					
4	Am involved in monitoring and evaluation process					

Section D: Operation and Maintenance on implementation of Street lights projects

11. How effective is operation and maintenance towards implementation of Street lights?

    Extremely effective ☐
    Effective ☐
    Not sure ☐
    Slightly effective ☐
    Not at all effective ☐

12. In your opinion, kindly rate the following statements using likert scale 5-1, where;

    Strongly disagree 5
    Disagree 4
    Neutral 3
    Agree 2
    Strongly Agree 1

SN	Statements	5	4	3	2	1
1	The technology used by the maintenance team is high tech.?					
2	The technical team is highly experienced in the field of Street lights projects?					
3	The quality of materials used is good and there is minimal breakdown after installation.					

13. Indicate how often operation and maintenance is conducted after commissioning?

    Yearly ☐
    Quarterly ☐
    Monthly ☐
    Weekly ☐
    None ☐

Section E: Budgetary allocation on implementation of Street lights projects

14. To what extent does budgetary allocations affects implementation of Street lights in Machakos County?

Very low extent [ ] Low extent [ ]

Moderate extent [ ] Great extent [ ]

Very great extent [ ]

15. In your opinion, kindly rate the following statements. Using likert scale 5-1, where;

Strongly Agree 5

Agree 4

Neutral 3

Disagree 2

Strongly disagree 1

SN	Statements	5	4	3	2	1
1	Procurement process is done as per the law					
2	Procurement process starts on time					
3	Power bill payment is done on time					
4	Payment of suppliers is done without delays					

16. Did the project continue according to the budget allocated?

Yes ☐ Not Sure ☐ No ☐

17. How would you rate budgetary allocations in the implementation process?

Very good ☐

Good ☐

Neutral ☐

Poor ☐

Very poor ☐

Section F: Implementation of Street lights projects

18. In your opinion, kindly rate the following statement. Using scale 5-1, where;

Strongly Agree 5
Agree 4
Neutral 3
Disagree and 2
Strongly disagree 1

SN	Statements	5	4	3	2	1
1	Users are fully satisfied with the Street lights project.					
2	Street light project are functional					
3	Street lights projects are implemented successfully?					
4	Completed project works is sustainable?					

THANK YOU FOR YOUR COOPERATION

Appendix III: Introduction Letter from University of Nairobi

UNIVERSITY OF NAIROBI
OPEN, DISTANCE & e-LEARNING CAMPUS
SCHOOL OF OPEN & DISTANCE LEARNING
DEPARTMENT OF OPEN LEARNING
MACHAKOS LEARNING CENTRE

Telegram: ''VARSITY'' NAIROBI
Telephone: 245-020-318262
Telex: 28520Varsity KE

P.O Box 30197 NAIROBI
NAIROBI, KENYA
e-mail: acadreg@uonbi.ac.ke

RE: MUNYAE EDMOND LUUSA L50/10664/2018

The above named is a student at University of Nairobi, Open, Distance and e-Learning Campus, School of Open and Distance Learning, Department of Open Learning. He is undertaking His Degree Master of Arts in Project Planning and Management. We authorize him to carry out his research on **Factors influencing implementation of street lights in Kenya: A case of Machakos County.**

Any assistance accorded to him will be highly appreciated by this Department to enable him compile final document.

Thanks.

UNIVERSITY OF NAIROBI MACHAKOS EMC P. O. Box 30197, MACHAKOS LEARNING CENTRE

for Date: 13/2/2020

DR.JOYCE OTIENO
REGIONAL COORDINATOR
LOWER EASTERN REGION

Appendix IV: Authorization letter from Machakos County

REPUBLIC OF KENYA
GOVERNMENT OF MACHAKOS COUNTY
MINISTRY OF ENERGY, LANDS, HOUSING & URBAN DEVELOPMENT

Telephone: 0202004086
Email:info@machakosgovernment.com
Opp. County Commissioner's office

P.O Box 1996 – 90100
Mwatu Wa Ngoma Road
MACHAKOS

20th December, 2019

TO WHOM IT MAY CONCERN.

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION- MUNYAE EDMOND LUUSA

The above named student from the University of Nairobi has been awarded approval to carry out research on **"Factors Influencing Implementation of Streetlights in Kenya: A case of Machakos County"** for the period ending 18th December, 2020.

Please grant him the necessary support to facilitate the success of his research.

Attached herewith are copies of approval from the university and the license from the National Commission for Science, Technology and Innovation.

CHIEF OFFICER
DEPARTMENT OF ENERGY & ELECTRIFICATION
GOVERNMENT OF MACHAKOS COUNTY
P. O. Box 1364 - 90100,
MACHAKOS

Newton Mulinde(Eng.)
CHIEF OFFICER- DEPARTMENT OF ENERGY AND ELECTRIFICATION
Copy to:
- CECM, Ministry of Energy, Lands, Housing & Urban Development

Appendix V: Nacosti Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **384846**

Date of Issue: **18/December/2019**

RESEARCH LICENSE

This is to Certify that Mr.. edmond munyae of University of Nairobi, has been licensed to conduct research in Machakos on the topic: FACTORS INFLUENCING IMPLIMENTATION OF STREET LIGHTS IN KENYA: A CASE OF MACHAKOS COUNTY. FACTORS INFLUENCING IMPLIMENTATION OF STREET LIGHTS IN KENYA: A CASE OF MACHAKOS COUNTY. FACTORS INFLUENCING IMPLEMENTATION OF STREET LIGHTS IN KENYA: A CASE OF MACHAKOS COUNTY. for the period ending : 18/December/2020.

License No: **NACOSTI/P/19/3108**

384846

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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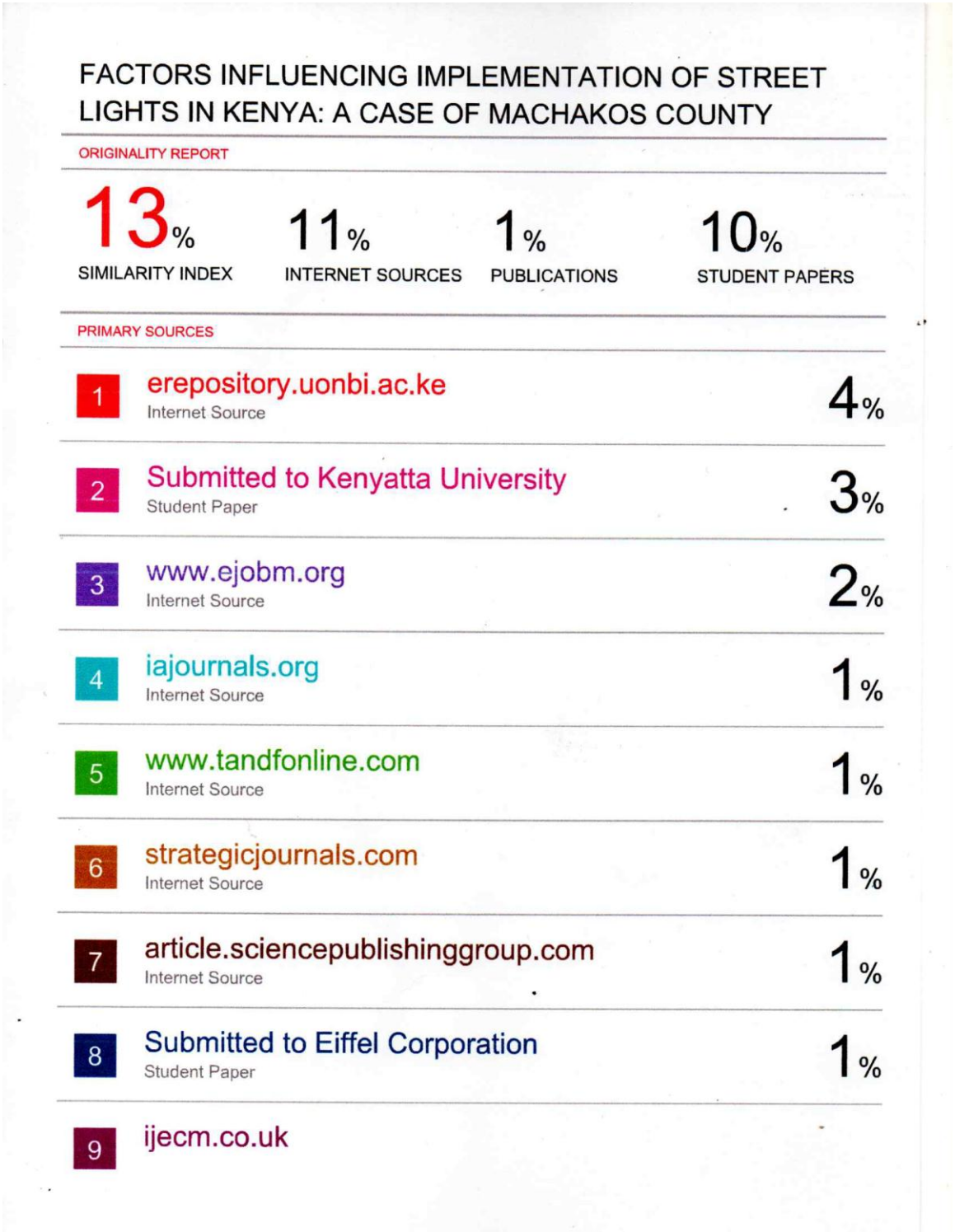
Appendix VI: Originality Report



FACTORS INFLUENCING IMPLEMENTATION OF STREET LIGHTS IN KENYA: A CASE OF MACHAKOS COUNTY

ORIGINALITY REPORT

13%	11%	1%	10%
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