FACTORS AFFECTING ADOPTION OF SOLAR POWER ENERGY PROJECTS AMONG HOUSEHOLDS IN BARINGO COUNTY, KENYA

SNOWY JEPKOECH

RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE DEGREE OF MASTERS OF SCIENCE IN PROJECT PLANNING AND MANAGEMENT OF MOUNT KENYA UNIVERSITY

JULY, 2024

DECLARATION AND APPROVAL

This research project is my original work and has not been presented to any other institution oflearning.

Signature:  **Date:** 5th July 2024

SNOWY JEPKOECH

MSCPM/2022/35909

This research project has been submitted for examination with my approval as the UniversitySupervisor.

Signed  Date 5 th July 2024

Dr. Ruthwinnie Munene

School of Business and Economics

Mount Kenya University

DEDICATION

This research project is dedicated to our almighty God , my husband Mr Eric Ngetich and my loving son Enzo Berur Koech. Love you all.

ACKNOWLEDGEMENT

I wish to acknowledge those whom without them this project could not have been possible. I thank my supervisor Dr. Ruthwinnie Munene for her professional guidance, support and encouragement when I was writing my project. I am thankful to the Mount Kenya University staff in the School of Business and Economics, for their support during my study period.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

ERC : Energy Regulatory CommissionGDP: Gross Domestic Product

IEA : Institute of Economic Affairs

IPCC : Intergovernmental Panel on Climate Change

KEREA : Kenya Renewable Energy Association KNBS: Kenya National Bureau of Statistics

MW : Megawatts

NACOSTI : National Commission for Science, Technology and Innovation

PV : Photovoltaic

SEDEC : Solar Energy Development Environmental Consideration

SPSS : Statistical Package for Social Sciences

SREP : Supervisory Review and Evaluation Process

UNEP : United Nations Environment Programme

ABSTRACT

Kenya has tremendous opportunities for solar energy growth because it is located on the equator, where it receives enough sun energy of 4–6 KWh/M2. By 2030. Energy is recognized as a fundamental element and facilitator of the desired socio-economic change in the nation, helping to realize this vision. The Kenyan government can address energy challenges without the need for costly power generation projects, transmission, and distribution networks thanks to solar energy, even though only 49% of Kenyans have access to grid electricity. This is despite the country's enormous potential. The management of the solar projects by the county government of Baringo, Kenya has drawn a lot of criticism from a variety of sources. The study's goal was to identify the variables influencing how families in Kenya's Baringo County adapted solar energy installations. The following goals served as the basis for the study: to determine how household income, alternative energy sources, installation costs, and knowledge levels affect the adoption of solar energy projects in Kenya's Baringo County. The public involvement idea and the resource dependence theory served as the study's foundation. The research design used in the study was descriptive. 364 respondents, including solar project managers, community leaders, and community representatives, made up the study's population. Using a stratified random sampling procedure, 225 people were chosen as the sample size from the target population. Questionnaires that were self-administered were used to collect primary data. It was decided to administer the questionnaire using the drop-and-pick method after two weeks to allow respondents the opportunity to provide thoughtful answers. Data was collected, then examined. The results of the computation of descriptive statistics were displayed as means, standard deviation, frequencies, and percentages. Regression analysis and multiple correlation were used to demonstrate the inferential data analysis and illustrate the link between the variables. The study's conclusion was based on the data, which showed a moderately favorable and statistically significant correlation ($r = 0.451$; $p < 0.05$) between the level of knowledge and the adoption of solar power energy. The cost of installation and the uptake of solar energy had a statistically significant, somewhat favorable connection ($r = 0.488$; $p < 0.05$). The adoption of solar power energy and alternative energy sources showed a moderately positive and statistically significant link. ($r = 0.463$; $p < 0.05$). A statistically significant and somewhat positive association was observed between household income and the adoption of solar power energy ($r = 0.476$; $p < 0.05$). Based on the outcomes of the study, the researcher advocated more awareness on solar power projects and that solar power energy installation prices should be more cost effective. Alternative forms of energy that are environmentally beneficial, such as solar power energy, should be supported in Baringo County, Kenya. Future research should be conducted on the problems associated with the acceptance and sustainability of solar power energy projects in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Renewable energy can be described broadly as energy that can be generated from resources that are replenished naturally on a human scale, such as sunshine, biogas, wind, hydropower, tides, waves, and geothermal heat. Renewable energy sources have the potential to replace traditional energy sources in four distinct areas: electricity generation, hot water/space heating, motor fuels, and rural (off-grid) energy services.

Global economic growth was fueled by fossil fuels, such as coal, oil, and natural gas. However, these fuels are the primary cause of climate change and global warming since they release carbon dioxide (CO2) into the atmosphere (Stern, 2016). There will likely be a greater reliance on renewable energy sources in the future, such as wind, solar, geothermal, hydro, biogas, wave, and tidal power, as evidenced by the growing concern over the relationship between energy use and global warming.

Due to growing adoption of the necessary technology, new renewable energy has grown rapidly over the world. 2010 saw a record US$211 billion in investments in renewable energy, a 32% increase from 2009. According to UNEP (2011), the growth of wind farms in China and small-scale solar photovoltaic (PV) installations in Europe was the cause of the increase in investments. With all types of grid-connected solar PV capacity increasing by 70%, wind power rising by 29%, solar hot water gaining by 15%, and small hydro increasing by 8%, the global yearly percentage rise for 2018 shows notable accomplishments (El-Hashry, 2009).

The Renewable Energy Global Status Report (2019) also provides a list of the top five economies that invest in renewable energy, along with a ranking of the top five states based on their renewable energy investment and capacity as of 2018. It demonstrates how emerging-market nations like Brazil, China, Indonesia, India, the Philippines, and Turkey are making large investments in various renewable energy sources.

Global perspective on solar energy

Due mostly to the expansion of wind farms in China and small-scale solar PV installations in Europe, global investments in renewable energy surged by 32% in 2018 to a record US$211 billion (UNEP, 2017). When the three major economies are taken out of the equation, Africa has the highest percentage rise in investment in renewable energy among developing areas. India made up 17.7% of the world's population in 2008, but it also consumed 3.8% of the world's energy, placing it as the fifth-largest user worldwide. Coal and oil, the majority of which is imported, make up the majority of India's commercial energy supply. Renewable energy makes up over 10% of installed capacity but contributes less than 1% of total energy supply.

India's power-generating capacity is inadequate to fulfill current demand, as is the case with many nations that are going through rapid economic growth. In 2019–2020, the country saw a generation shortfall of almost 10% (84TWh) and a matching peak load deficit of 12.7%, or more than 15 GW. Approximately 6% of the GDP was lost by the Indian economy in FY2017–2018 as a result of frequent power outages. In order to achieve its present economic development targets, India will have to raise its installed generating capacity to more than 300 GW by 2017. The

federal government and commercial organizations—including those who have established captive power plants for their industrial enterprises—have gained control over generating facilities in recent years. The majority of renewable energy is produced by the private sector (Arora et al.)

Regional perspective on solar energy

The African continent possesses an abundance of both renewable and non-renewable energy sources. According to some estimations, the continent possesses a potential for 3,570TWh of hydroelectric power and 19,000 MW of geothermal energy. It receives adequate sun radiation all year round, and numerous studies have demonstrated that resources for embedded wind energy are present throughout the continent. Unfortunately, there is a dearth of use for these energy resources (Daly, 2015). For instance, the potential for hydroelectric power on the continent has only been used to roughly 5% of its capacity, whereas the comparable percentage for geothermal power is 0.6%.

In many regions of the continent, energy poverty in Africa continues to pose a significant barrier to economic and human development. Africa as a whole still faces significant obstacles in the energy sector, which are typified by low investment, poor infrastructure, low purchasing power, limited access to modern energy services, and an excessive dependence on conventional biogas to meet basic energy needs. When comparing Africa to other regions of the world, the continent exhibits the greatest degree of energy scarcity. Less than 1% of people in the majority of Sub-Saharan nations have access to the electrical grid (Daly, 2016).

According to current trends, more than 60% of people living in Sub-Saharan Africa would still lack access to electricity by 2020. The majority of the impoverished still

primarily rely on traditional biogas as their primary energy source, despite the negative effects it has on the environment, society, and health. In certain economies, biogas makes up between 70 and 90 percent of the primary energy supply and roughly 86 percent of the energy used. Furthermore, the high initial transition costs of renewable energy limit their adoption (Love, 2016). There are notable differences across the continent, too, with biogas energy making up only 5% of North Africa's energy consumption and 15% of South Africa's. Africa has an abundance of both non-renewable and renewable energy resources.

A 220 MW onshore wind farm in the Gulf of El Zeit and a 100 MW solar thermal project near Komombo were the only two agreements that caused investment in renewable energy in Egypt, Kenya's primary COMESA rival, to increase by US$9800 million to just over US$1.65 billion. The next step in the nation's renewable energy strategy is probably a call for bids for wind projects in the Gulf of Suez region, with a capacity approaching several hundred megawatts (UNEP, 2019). Kenya is home to a wealth of renewable energy resources, but its usage of them has been restricted. These include biomass, geothermal, sun, wind, and hydropower. The rising cost and need for electricity, rising oil and gas costs globally, and environmental pressure are all driving this sector's expansion.

Local perspective on solar energy

Kenya boasts a substantial solar energy potential due to its daily insolation, which ranges from 4 to 6 kWh/m2. In Kenya, photovoltaic systems, drying, and water heating are the main uses of solar energy. The three main applications for solar photovoltaic systems are water pumping, lighting, and telecommunication. The nation now has about 4 MW of installed capacity. Furthermore, there are presently about 140,000 solar water heating systems deployed across the nation. The majority

of renewable energy systems technology is currently available in Kenya, although market penetration is noticeably low and potential customers are rarely aware of these technologies' existence (Mwakubo et al., 2017).

Only over 6% of Kenya's rural population has access to grid electricity, despite the country's aspirations to achieve energy security. According to Wanjiru and Ochieng (2018), decentralized renewable energy systems offer a great deal of potential to supply isolated businesses, homes, and institutions in remote places with energy needs that need to be met immediately. The majority of people in poor nations, like Kenyans, have low incomes and prohibitively high connection charges, which exacerbate the lack of access to energy despite government efforts under the rural electrification program (Love, 2016). In contrast to the amortized life-cycle cost of US$ 1 to US$ 2 per kWh for solar and battery-operated systems, the cost of electricity in rural areas is anticipated to be between US$ 30 and US$ 40 per kWh (Kiplagat, Wang & Li, 2017).

Kenya boasts an abundance of renewable energy resources, such as solar, wind, geothermal, biofuel, biogas, and hydropower, but its use has been restricted. Environmental pressure, rising global oil and gas prices, and rising electricity demand and pricing are all driving the growth of renewable energy. In Kenya, biogas energy accounts for more than 70% of all energy use. According to Mwakubo et al. (2017), petroleum and electricity make up roughly 22% and 9% of the total. Kenya's energy industry is typified by its excessive reliance on hydroelectricity, high reliance on imported oil, frequent power outages, limited access to modern energy, and strong reliance on biogas. Adoption of renewable

energy sources is thus a crucial strategy for addressing the problems of rising demand and associated environmental pressure.

The Kenyan energy sector is currently typified by an excessive reliance on hydroelectricity, frequent power outages, a high dependency on oil imports, and a strong reliance on unsustainable biomass use. Therefore, using renewable energy is a crucial and timely way to address the associated environmental issues as well as the challenges posed by expanding demand. In order for Kenya's national electricity supply to meet demand while accounting for the 15% buffer needed to guarantee security, the country's Least Cost Power Plan (LCPP) seeks to discover new sources of generation.

Kenya had 1,412.2MW of installed electric power capacity as of December 2019, according to Kimuyu, Mutua, and Wainaina (2018). In order to fill the gap left by the installed capacity not being able to fulfill demand, the government contracted for 60MW of emergency power. In particular, during peak hours, load-shedding had to be reduced in order to satisfy the growing demand. Of all installed capacity, 51.55% comes from hydroelectric electricity, making it the most dominant source. Wind, cogeneration, geothermal, thermal (petrol), and 13.38%, 1.84%, and 0.36%, in that order, are the contributors.

Kenyan electricity generation is now primarily "green," with renewable energy accounting for about 67.1% of total energy generated. Solar energy technologies use photovoltaic cells to capture the energy of direct solar radiation and concentrate it into thermal energy to meet the demand for direct lighting. They can also be used to produce fuels for transportation and other uses, such as heating and cooling, and to produce fuel for fuel production (Hemmen, 2019).

Furthermore, relatively few research have looked into Kenya's adoption of renewable energy and its determinants. For example, Lay et al. (2018) discovered that adoption of solar home systems (SHSs) is influenced by family income and education, however the authors did not fully explore the impact of household characteristics and other economic factors on SHS adoption. Kenya possesses an abundance of renewable energy resources, including geothermal, hydropower, biomass, sun, wind, and biofuel, but its use has been restricted. Pressure from the environment, rising global oil and gas costs, and the expanding cost and need for power are all driving this sector's expansion.

In Kenya, more than 70% of all consumption is made of biomass. According to Mwakubo et al. (2017), the other sources are electricity and petroleum, which make up roughly 22% and 9% of the total. Kenya has made a wide-ranging transition to renewable energy, as shown by effective government policies and energy planning that seek to guarantee a sustainable energy mix. The amount of investment has increased from almost nothing to almost US$1.3 billion, which includes financing for the manufacture of 22 million liters of ethanol annually as well as for minor hydropower (724 MW) from geothermal, wind, and solar energy. The highlight was geothermal, as local power producer KenGen was able to secure debt financing for further units at its Olkaria project (UNEP, 2017). The company plans to add 280MW of power to the grid in the next three years under the new funding arrangement. The uptake of solar power in homes is still far too low.

1.2 Statement of the Problem

Lighting is typically regarded as one of the top three energy-consuming activities in developing nations, with cooking, television, and space heating being even more

crucial (World Bank 2019). For illumination, the majority of rural residents use kerosene, and for cooking, they utilize charcoal or firewood. Because of the smoke released and the burns from the open flames, they have resulted in several health issues. Furthermore, the adoption of renewable energy sources is generally not associated with a particular fuel preference. However, a thorough understanding of the renewable adoption of fuel switching can only be achieved within this particular environment. Lighting seems to be a major use for solar home systems in Kenya (Jacobson, 2016). In Kenya, 5% of the rural population and less than 44% of the total population have access to lighting (World Bank, 2019). The obvious energy gap might be closed with the adoption of solar technology, although most developing nations find this to be insignificant. Even while the renewable energy industry is not very new, it is growing more slowly in this nation than it is in other emerging nations (SREP, 2017).

Because of the energy sector's significance, protocols have developed to help monitor and ensure that these kinds of projects are properly managed to support their success. One of the most discussed energy challenges in Kenya is solar energy projects. It has been at the forefront of the agenda for national and regional energy policy, and several state and non-state entities have taken action to address the energy deficit. Despite the fact that project failure in mainstream project management has garnered far more attention than project performance, there are a number of important studies on the variables influencing project performance. Numerous scholars have examined project success indicators and the impact of policy processes on Kenyan project performance, including Naomi (2016). As a result, they have identified several elements that are thought to influence project performance. Project performance is therefore determined by a number of factors,

which are well discussed in project management literature. These factors include sound project design, reasonable budget estimates, realistic timescales, effective communication, securing finance, institutional strengths, and cautious risk management.

Although information is available, the literature on how the four variables—economic factors, government involvement, stakeholder participation, and project management—affect project performance for solar energy projects, particularly in Kenya, is still in its early stages of development (Sansom, 2017). The major goal of this study is to identify crucial success elements that influence the performance of energy sector projects, specifically solar energy projects, using a project conducted in Remba-Homabay county. There has been no clear thorough research on the elements that determine the performance of solar energy projects in Kenya, which could explain the low performance of solar energy projects. This study intended to fill this gap by investigating the factors influencing the adoption of solar energy projects among families in Baringo County, Kenya.

1.3 Purpose of the Study

This study set out to determine what considerations households in Kenya's Baringo County were taking into consideration while adopting solar power installations.

1.4 Objectives of the Study

The study was guided by the following objectives:

i. To establish how level of awareness, affect adoption of solar power energy projects among households in Baringo county, Kenya.
ii. To determine whether cost of installation, affect adoption of solar power energy projectsamong households in Baringo county, Kenya.

iii. To evaluate how alternative sources of energy affect adoption of solar power

iv. energy projects among households in Baringo county, Kenya

v. To determine the how the level of family income affect adoption of solar power energy projects in Baringo county, Kenya.

1.5 Research Questions

The study sought to answer the following research questions:

i. How does level of awareness affect adoption of solar power projects among households in Baringo County, Kenya?

ii. To what extent does cost of installation affect adoption of solar power renewable energy projects among households in Baringo County, Kenya?

iii. How does alternative sources of energy affect adoption of solar power projectsamong households in Baringo County, Kenya?

iv. How does the level of family income affect adoption of solar power projects among households in Baringo County, Kenya?

1.6 Scope of the study

The survey was conducted among Kenyan homes in the Baringo County. Baringo County was chosen for the study because it is among the regions where the majority of rural households do not have access to Kenyan power and instead use solar energy, which has not proven to be very effective. The research was conducted from November 2023 to May 2024.

1.7 Significance of the Study

The study will offer the latest recent information on the factors influencing Kenya's adoption of solar energy. This will offer valuable perspectives on the factors that

influence the uptake and advancement of solar energy in Kenya. The study identified important areas of access to renewable energy projects, which will undoubtedly assist the project managers in the County government of Baringo, Kenya. The study will offer data that may be utilized to build policies that support the growth and accessibility of renewable energy sources, helping Kenya realize its Vision 2030. The study's findings could serve as a starting point for academics who want to investigate the use of renewable energy to better understand what factors influence the adoption of this technology. The study's conclusions will provide some groundwork for future investigations into renewable energy.

1.8 Delimitation of the Study

This study focused solely on the variables influencing the Baringo, Kenya, county government's use of solar power as a renewable energy source. The study concentrated on household income levels, community involvement, the availability of knowledge about solar power, and other energy sources. Only the project managers, local authorities, and county government representatives in charge of the project in the county were the focus of the study.

1.9 Limitations of the Study

The research team expected to run into some obstacles that made it difficult to obtain the data they were looking at. The study's target respondents were unwilling to provide information because they thought it would be used to scare them or paint a false picture of them. Nonetheless, the researcher possessed an introduction letter from the postgraduate school at Mount Kenya University. Each responder received an informed permission form as a guarantee that the data they provided would be handled with secrecy and used only for academic research. The researcher also had

difficulties because of the inaccessibility of some regions because of the layout of rural roads. This was resolved by the researcher making use of every mode of transportation available to guarantee that each respondent was reached.

1.10 Assumptions of the Study

The study assumed that there were no significant changes in the composition of the target population that would have had an impact on the study sample's effectiveness. This study also assumed that respondents were honest, cooperative, and objective in their responses to the research questions, and that they were available to do so on time. The researcher presumed that the respondents were willing to take part in this investigation. It was predicted that there would be a high response rate. Another assumption was that the location chosen for this study was a realistic reflection of that area and could be applied to other areas in Kenya with similar features.

1.11 Operational definition of key terms

Alternative sources of energy: many energy sources, both non-renewable and renewable. Biomass (wood fuel and charcoal), wind, sun, geothermal, biogas, and coal are all included in this study.

Information Availability : The agent's conduct is mechanized at the symbol level, but it is rationalized at the knowledge level.

Involvement of Community: This is how individuals participate in the process of making decisions and managing projects.

Income level of the family : refers to the availability of a productive or economic element that is necessary to complete an activity.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

An overview of the conceptual framework, theoretical review, and empirical literature is given in this chapter. The chapter provides an overview of the reviewed literature.

2.2 Empirical review

2.2.1 Performance of Solar Energy Projects

The avoidance of project failures to stay within the allocated budget, time, and space for approvals, design, and occupancy, as well as the failure to meet the necessary technical standards for quality, functionality, safety, and environmental protection, is what makes project performance the most important thing (Flanagan and Norman 2018). Project performance guarantees that businesses optimize profits, reduce the impact of uncertain and dangerous occurrences in the process of accomplishing project goals, and take advantage of opportunities for hazardous events to arise (Kululanga and Kuotcha, 2019).

2.3 Factors affecting adoption of solar power energy project

2.3.1 Level of awareness on adoption of solar energy project

Public knowledge and confidence are two of the most crucial elements in the adoption of solar energy technologies. Research indicates that community ownership and participation are becoming more and more crucial for a project to be completed successfully. According to Weisman's (2017) research, there will be a significant fluctuation in the level of support that stakeholders have for a project depending on how directly involved they are in its implementation.

The World Bank (2015) cites the availability of information and a clear declaration of requirements as the next most important factors in effective project outcomes, after stakeholder participation. Stakeholder consultation, according to Jobber (2019), is the initial step in a program to implement change. Based on the model's derivation of this element, stakeholder consultation highlights the importance of considering stakeholders' or project users' needs.

Knowing the main community will let the project manager assess whether the needs of the community are being met more precisely. Understand the voice of the customer: Urban (2015) found that this is the most critical component for new product development success. A study conducted by Ndagi (2018) indicated that initiatives that focus on services, such information technology, have greater impact from stakeholder input than projects that are not.

In order to increase the possibility of subsequent adoption, Rossman (2016) highlights the value of user interaction in the early stages of system development as an implementation method. The employment of intermediaries as a bridge between the implementation team or designer and the project's potential consumers is examined by Bean and Radnor (2019) as a means of promoting stakeholder acceptance. Naidoo (2018) discovered that user participation is the significance and individual relevance of a system to a user, and that it relates to the psychological condition of the individual. It can also mean the user's involvement in the process of implementation.

When a corporation chooses to put a system into place, there are two places where users can get involved. User participation during the system implementation phase as well as user involvement in the definition of the organization's system needs. The

system's functionality depends on the user's continued use after it is live, and it acknowledges the user as an important contributor to its development. Insufficient user training is a major reason behind the failure of many implementation efforts.

2.3.2 Cost of Installation on adoption of solar power energy

Of the non-modular expenditures of a PV system, installation costs make up the largest portion. On the other hand, in many regions of the world, the cost of PV systems has fallen below parity. This basically indicates that, throughout the course of the PV system's lifetime, power produced by the PV is typically significantly less expensive than electricity produced by the grid. Homes can become somewhat or completely independent of the electricity market by using solar power to provide at least some of the electricity they require. Furthermore, it is predicted that the falling cost of PV technology would significantly increase demand for solar energy systems. Claus and colleagues, 2014).

One of the primary variables influencing the investment in solar energy options is the cost of installing solar equipment, such as photovoltaic and hot water systems. This is because equipment for solar energy projects is frequently expensive up front, making it difficult for local technicians and contractors to complete installations successfully owing to a lack of funding. Furthermore, putting these solar energy ideas into action might need technical expertise and a particular level of specialized education, which is obviously out of reach for the majority.

Furthermore, because renewable energy equipment like solar collector panels, batteries, inverters, booster heaters, and thermostats are not produced locally, equipment importers must pay higher operating expenses. The installation of

renewable projects becomes an expensive affair due to the transmission of these expenses further down the chain.

In a 2011 study, Gebreegziabher, Z., Mekonnen, A., Kassie, M., and G. Köhlin evaluated the factors that influence the need for electric mitad cooking appliances in Northern Ethiopia for the purpose of baking bread, among other energy-related uses, as well as the implications of its adoption for urban energy transition. The five types of fuel that urban households can choose from are wood, charcoal, dung, kerosene, and electricity. The authors examine the factors that influence these choices.

Furthermore, it is discovered that family size, household expenditure, the age and education of the household head, the price of substitutes, and household expenditure all influence fuel choices more broadly. The likelihood of using modern and transitional fuels is positively correlated with the price of wood and charcoal, household expenditure, and the age and education of the household head (Gebreegziabher et al., 2017).

2.3.3 Alternative Sources of Energy on adoption of solar energy project

Kenya has a wide range of energy sources, including non-renewable ones. Wind, solar, geothermal, biogas, biomass (wood fuel and charcoal), and coal are some of the most widely used energy sources. Even if all of these energy sources are real, it's important to remember that Kenya exploits renewable energy on a massive scale. With the exception of geothermal and, to a lesser extent, cogeneration, the cost of electricity has generally stayed low because most people still prefer to use more affordable and readily available traditional energy sources.

Other energy sources that are frequently employed in Kenya, particularly in rural regions, are solar and wind energy in addition to biomass (wood fuel and charcoal).

According to Mbuthi (2017), the majority of alternatives used in rural households are directly related to their financial situation.

Since most homesteads are bordered by farms, woods, and other natural regions, most people in rural areas can readily afford biomass energy. As a result, 93% of Kenyans rely on biomass as a source of energy, while 45% of the country depends on forests for this. Globally, traditional fuels like kerosene and wood fuel are used by over 80% of the rural population in underdeveloped nations. Because of this, the majority of people choose to utilize alternative energy sources since they believe that using electricity will result in higher costs (Ministry of Energy, 2018).

Firewood, charcoal, kerosene, or electricity are used by the majority of families; the exact combination used depends on the environment (Njong,& Johannes 2017). In contrast, Kenya is mostly dependent on imported petroleum products, such as the gas that is utilized in the majority of residences (GOK, 2017).

A little over 83% of urban dwellers have access to kerosene, and over 76% of them use it for cooking and 61% for lighting, in addition to petroleum products like gas. Due to its widespread use in most houses, kerosene is one of the energy sources with the most efficient distribution networks, guaranteeing that it reaches even the most isolated locations. This has been made possible by a large number of kerosene dealers who purchase kerosene in tiny quantities for resale, which most rural homes can afford. As a result, encouraging individuals to switch to greener energy sources has become more difficult (Government of Kenya, 2017).

2.3.4 Family Income Levels on adoption of solar power energy project

The energy-ladder hypothesis is a key component of our conceptual framework. This hypothesis makes the assumption that a household's choice of fuel (or energy

source) is heavily influenced by its financial level. Households use transitional fuels like kerosene, after which they switch to contemporary fuels like grid electricity, when their income rises from traditional fuels like wood (Leach 2015). In terms of comfort, convenience of use, and efficiency, modern fuels are typically thought to be preferable to traditional or transitional fuels (Farsi et al. 2017).

Thus, the idea can be understood as a stylized extension of the consumer economic theory, which holds that when income increases, customers alter their consumption habits to select higher-quality items in addition to increasing their demand for the good (Hosier & Dowd 2017). The importance of income for fuel choice is confirmed by Heltberg (2015) in a related study conducted in Guatemala. Additionally, he stresses the significance of non-income factors, such as the price of firewood, which is a common source of cooking fuel in Guatemala.

Gebreegziabher et al. (2017) observed that factors such as family size, age and education of the head of the home, household expenditure, and the cost of substitutes all influence fuel choices more broadly. According to the energy-ladder hypothesis, income or household spending is a major factor in determining the type of fuel used for cooking. The majority of writers also emphasize the significance of non-income factors, which can differ significantly from situation to situation but generally comprise socioeconomic supply-side and demand-side elements, including gasoline costs or rates of electrification. According to IEA (2018), study conducted in Kisumu households revealed that while the majority of people were open to having electricity connected, most did not have the necessary funds to pay for the installation and ongoing expenses.

2.4 Theoretical Framework

2.4.1 Dependence Resource Theory (RDT)

The authors of this idea are Pfeffer and Salancik (2015). Using this theory, the researcher examines the variables affecting the availability of renewable energy in this investigation. A more thorough analysis of the Resource Dependence theory is necessary. It's very claims of dependency are what give it its vulnerability. This theory holds that while resources are essential to an organization's existence, they are also necessary for it to attain sustainability. Resources are critical to the success of community-based organizations.

For the initiative to be sustainable, the researcher contends that these resources will not just come in the form of money but also in the form of human resources, such as volunteers and land. In order to answer study question two, which aimed to determine the impact of income level on access to solar lantern projects, this hypothesis would clarify the critical function that money plays. Jakachira (18).

2.5 Theory of Public Participation

The Great Society initiatives of President Lyndon Johnson helped to institutionalize public engagement in the middle of the 1960s (Cogan & Sharpe, 1986). The idea emphasizes that multiple players, or stakeholders, contribute to the conception and continuous functioning of every solar lantern project.

The main takeaway is that an organization's ability to effectively manage its connections with important constituencies, such the local community, and others who may have an impact on the accomplishment of project goals, determines whether a project succeeds or fails. This hypothesis provides insight into how community involvement affects project access for solar lanterns.

2.6 Conceptual Framework

The relationship between the independent and dependent variables is displayed in the conceptual framework. The degree of awareness, the cost of installation, the availability of alternative energy sources, and household income levels are independent variables. Adoption of solar power energy projects is a dependent variable. The conceptual framework in figure 1 below illustrates the parameters for each variable.

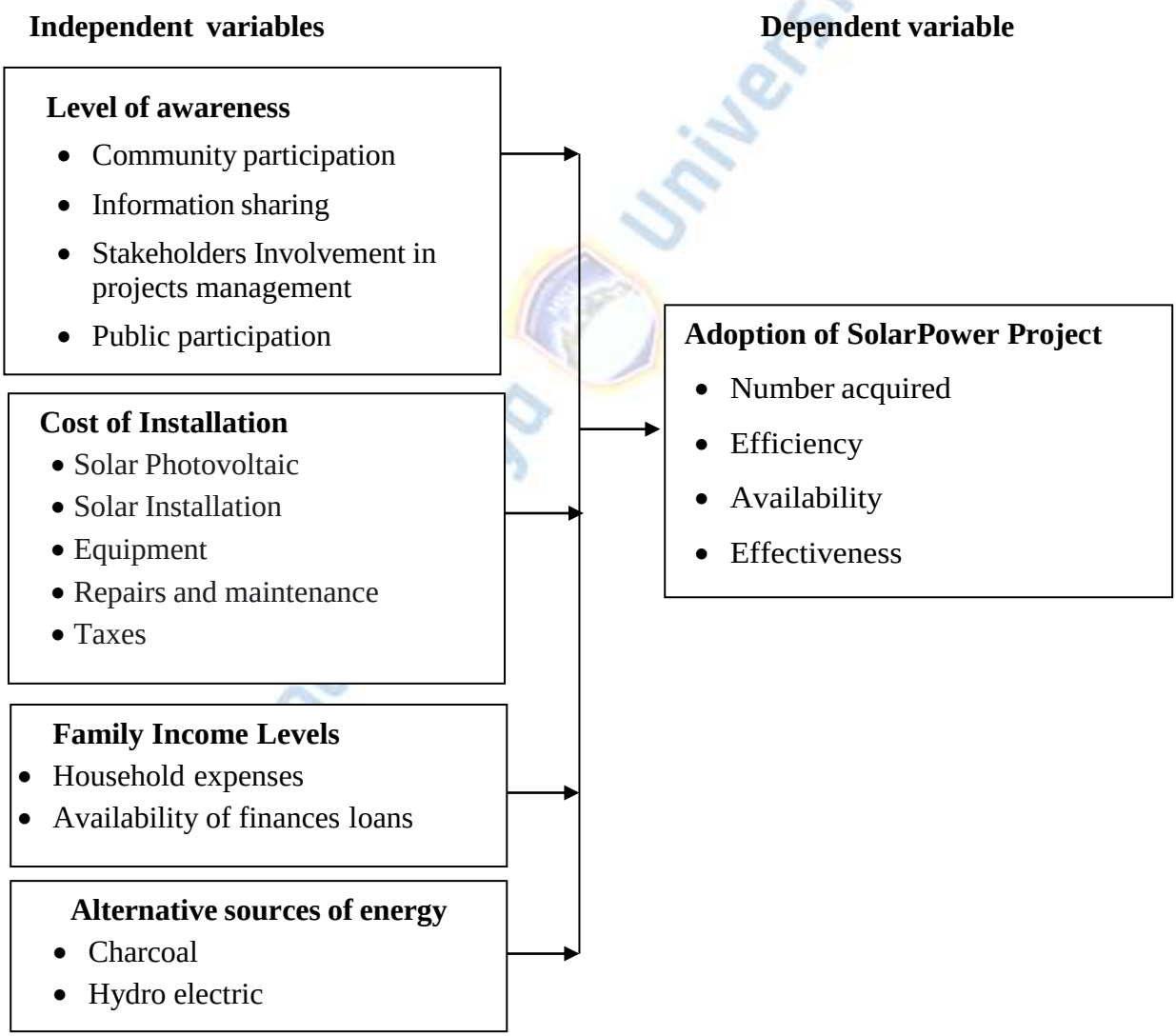


Figure 1: Conceptual Framework

Source Own Conceptualization (2023)

2.7 Recap of Literature Review

The resource dependence, stakeholder, and public engagement theories served as the foundation for this investigation. With regard to access to renewable energy, the majority of the reviewed studies in this chapter were carried out in developed nations. There is a paucity of literature on the access to solar lanterns project, and what little there is to read usually presents solar power systems in a negative light. To summarise, the factors that determine access to solar lantern project technologies are commonly studied in isolation from specific fuel choices, and they are frequently derived from non-representative samples and case studies.

The research focuses on the percentage of household energy consumption that is used for lighting since the function that lighting plays in energy use in developing nations has not been as fully studied as the influence that cooking fuel choices have had. In Kenya, Gitone (2018) conducted research on the factors influencing the uptake of renewable energy. That being said, none of the reviewed research By examining the variables impacting households in Kenya's Baringo County's adoption of solar energy projects, this study aims to close all of these gaps in the literature.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The research design, target population and sample, data collection tools, data collection processes, and data analysis are all covered in this chapter.

3.2 Research Design

The research strategy used in the study was descriptive, which made sense given that the goal of the study was to gather data through descriptions that aided in the identification of variables. In 2017, Bryman and Bell.

3.3 Target Population

As indicated in Table 1, the target group for this study included project managers, community leaders, and household representatives from Baringo County.

Table 1: Target Population

	Population	Percentage
Leaders of the Community	66	18.13
Project managers	34	9.34
Community representatives	264	72.52
Total	364	100.00

(source, Baringo county local administrators 2023)

3.4 Sample Size and Sampling Procedures

The formula from Kothari (2018) was used to calculate the target population of 364 with a 95% confidence level and an error of 0.05, resulting in a sample population of 227.

$$n = \frac{z^2.N.\partial_p^2}{(N-1)e^2 + z^2\partial_p^2}$$

Where; n = Size of the sample,

N = Size of the population and given as 364,

e = Acceptable error and given as 0.05,

∂p = *std deviation*

In cases where the population standard deviation is unknown, it is reported as 0.5. The standard variate at a 95% confidence level is 1.96.

The minimum of 30 suggested by Saunders, Lewis, and Thornhill (2016) is accommodated by the sample size. Respondents in each strata were chosen for the study using a stratified proportional method.

Table 2: Sampling Frame

	Population	**Ratio**	**Sample**
Leaders of the community	66	0.62	41
Project managers	34	0.62	21
Community representatives	264	0.62	165
Total	364		227

(source, Baringo county local administrators 2023)

3.5 Research Instruments

Primary data were gathered via self-administered questionnaires. Both closed-ended and open-ended questions were included in the questionnaire. The surveys were utilized because they were immediately useful and could be used, which helped save time and money and make analysis easier.

3.5 Pilot Testing

Pilot testing of the research instruments was conducted Samburu County, Kenya since it had a similar setting.

3.6 Validity Test

The research employed content validity, a method that extrapolates test results to a wide range of items that are comparable to those on the test. By seeking the supervisor's, lecturers', and other professionals' opinions on the suitability of the questionnaire, content validity was established. As a result, the acquired data's content validity was enhanced.

3.7 Reliability Test

Twenty-three randomly selected respondents were the pilot group to whom the questionnaire was given, and the tool's reliability was assessed using their answers. Of the sample size, this accounted for 10%. As per Rousson, Gasser, and Seifer (2017), all constructs in this investigation were deemed suitable if the construct composite reliability co-efficient (Cronbach alpha) was 0.7 or higher. To evaluate the research instrument's reliability coefficient, Cronbach's alpha (α)
was used.

3.8 Data Collection Procedures

In order to get the relevant data from the respondents, the researcher secured an introduction letter from the postgraduate school of Mount Kenya University, which was given to each respondent. The questionnaire was administered using the drop-and-pick approach, which was chosen after two weeks to provide both the researcher and respondents sufficient time to provide thoughtful answers and address any ambiguities. In order to assure time savings, the researcher scheduled a meeting with

the respondents one week in advance and provided a briefing on the study. In order to build rapport with the respondents and clarify the goal of the study as well as the meaning of items that were evident, the researcher personally gave the respondents the research instruments, as noted by Best and Khan (2018).

3.9 Data Analysis

The Statistical Package for Social Sciences (SPSS Version 25.0) was used to evaluate the data that was gathered. For every quantitative variable, descriptive statistics were calculated, and the findings were displayed in tables with frequencies, percentages, mean scores, and standard deviations. Multiple regression analysis was used to analyze inferential data. To determine the relationships between the independent and dependent variables, multiple regression analysis was employed. The following was the equation for the multiple regression model:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$$

Where: -

Y= solar power project adoption

β0=constant

β1, β2, β3 and β4 = regressioncoefficients

X1= Level of awarenessX2= Cost of installation

X3= alternative sources of energyX4= income level

ε=Error Term

3.10 Ethical Considerations

The following moral conduct about the rights of persons who would be the study's topic was noted by the researcher: First, through the issuance of an informed consent

letter, the respondents were made aware of the purpose of the study and the confidentiality of the data gathered. After consent was given, the respondent retained their rights, which included the ability to decline to participate in certain aspects of the study, to withdraw from it, to refuse to answer any questions or a specific set of questions, to refuse to provide any requested data, and even to have their data removed. Care was taken to make sure that no subject was forced to participate in the study and that the researcher utilized the least amount of time and resources possible to get the necessary data. Second, the ERC (Ethical Review Committee) and NACOSTI gave the researcher permission to gather data.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The data analysis, results presentation, and discussion of the findings are the main topics of this chapter. The study's primary goal was to identify the variables influencing families in Kenya's Baringo County's adoption of solar energy projects.

4.2 Pilot Test Results

The pilot findings, analysis, and discussion are presented in this chapter. A pilot research with twenty-three respondents was conducted in Samburu County. This accounted for 10% of the total sample size. The data was analyzed using the Statistical Package for Social Sciences (SPSS) software. Using Cronbach Alpha, the instruments' reliability was assessed. The results are displayed in Table 3.

Table 3: Reliability Test Results

Variable	N	Cronbach'sAlpha Value
Level of awareness	23	.741
Cost of installation	23	.732
Alternative sources of energy	23	.716
level of family income	23	.763
Adoption of solarpower energy	23	.736

(Source field data,2024)

A Cronbach's Alpha Test was then performed after the questionnaires had been coded. According to Table 3, every one of the five variables had Cronbach's Alpha threshold values higher than 0.7. The pilot investigation yielded Cronbach Alpha values of 0.741, 0.732, 0.716, 0.763, and 0.736, respectively. In Baringo County, Kenya, households' levels of awareness, installation costs, income levels, and use of

alternative energy sources are all correlated with their adoption of solar power. There were more than 0.7 Cronbach values for each of the variables. It follows from this that the tools worked well.

4.3 Response Rate

227 questionnaires were distributed by the study in order to collect data. Nonetheless, 198 questionnaires were correctly completed and sent back. This equated to an overall success rate of 87% for responses. Additionally, respondents received assurances on the privacy of the data they submitted. According to Trex (2012), for analysis, a response rate of 50% is sufficient, 60% is good, and 70% and higher is very good. This suggests that the response rate of 87% was ideal for the analysis of the data.

Table 4: Response Rate

Sampled No. of respondents	No. of Questionnaires Returned	Response Rate (%)
227	198	87

(Source field data,2024)

4.4 Demographic Information

4.4.1 Gender of the Respondents

The gender of the respondents who took part in the study was a goal for the researcher. The results are displayed in Table 5.

Table 5: Gender of the Respondents

Gender	Frequency	Percentage (%)
Male	94	47
Female	104	53
Total	198	100

(Source field data,2024)

The results showed that 104 (53%) of the respondents were female and 94 (47%) were male. This suggests that women made up the bulk of responders. This indicated that most of the responders, who make up the bulk of households in Kenya's Baringo County, were female.

4.4.2 Highest level of education

The researcher sought to find out the highest level of education involved in the study. The findings are as indicated in table 6.

Table 6: Highest level of education

Highest level of education	Frequency	Percentage (%)
Certificate	84	43
Diploma	52	26
Bachelor Degree	46	23
Masters	14	7
PhD	2	1
Total	198	100.0

(Source field data,2024)

According to the results, n=84 (47%) of the respondents held certificates, making up the majority. Those with diploma qualifications came next, with n=52(26%). Bachelor's degree holders made up n = 46 (23%) of the population, master's degree holders made up n = 14 (7%), and Ph.D. holders made up n = 2 (1%). This suggests that the majority of study participants were certificate holders, suggesting that all participants were literate and comprehended the surveys, allowing them to complete the questions on their own.

4.4.3 Respondents age

The age range of the responders was a goal for the investigator. As seen in Table 7, the results.

Table 7: Age of the respondents

Age in years	Frequency	Percentage (%)
Between 20-30 years old	57	29
Between 31-40 years old	54	27
Between 41-50 Years old	56	28
5 Between 1-60 Years old	31	16
Total	198	100.0

(Source field data,2024)

The majority of respondents (n =57; 29%), according to the age distribution of the sample, are in the 20–30 age range. 54 (27%) of the participants were between the ages of 31 and 40, while 56 (28%) were between the ages of 41 and 50.n=31 (16%) of the minority were between the ages of 51 and 60. According to these findings, the bulk of responders were in the 20–50 age range. These demonstrated that people of this age are engaged in solar-powered initiatives.

4.5. Descriptive Statistics for the study variables

The purpose of the study was to identify the variables influencing the uptake of solar energy projects by Kenyan households in Baringo County. The four variables that were the focus of the study were family income, alternative energy sources, installation costs, and knowledge level.

4.5.1 Adoption of the degree of knowledge that Kenyan households in Baringo County have for solar energy projects.

The primary goal of the study was to determine how families in Kenya's Baringo County adopted solar power energy projects in relation to their level of awareness. The following ratings were given to the statement: 1 for "no extent," 2 for "less extent," 3 for "moderately extent," 4 for "great extent," and 5 for "very great extent." The results are displayed in Table 8.

Table 8 : Level of awareness on adoption of solar power energy projects among households in Baringo county, Kenya

	5 (%)	4 (%)	3 (%)	2 (%)	1 (%)	Mean	Std. Dev
Community leaders create awareness on solar power energy projects Baringo county , Kenya	40.0	51.5	2.9	2.5	2.7	4.26	.83
Homes in Baringo County have a high degree of awareness regarding solar PV and solar hot water technologies.	26.4	48.3	10	12.8	.5	3.96	.82
Involvement in decision making	28.3	38.1	12.8	14.2	6.7	2.61	1.51
Baringo County residents can reach the suppliers of solar technologies.	55.6	23.6	10	5.6	5.3	2.44	1.47
Knowledge on solar energy	20.5	55.6	14.2	5.8	3.9	3.94	.80
There is information sharing on solar power energy	33.6	43.9	16.7	4.4	1.6	4.24	.78
There is stakeholder engagement mechanism on solar power energy installation	39.3	49.6	5.6	3.2	2.4	4.11	.73
The sustainability and social benefit of the project are guaranteed by project management.	31.1	36.7	18.1	12.6	11.5	2.61	1.27
Households are instructed on solar energy installation and its advantages to society by a skilled labor force.	29.4	35.6	20.6	16.8	7.7	2.13	1.24
Trained solar energy technicians are readily available in Baringo county	36.9	28.1	29.7	9.1	6.2	2.37	1.31
There is a clear channel to communicate challenges on solarpower energy usage	34.2	38.1	14.2	11.7	11.9	2.17	1.18

(Source, field data 2024)

According to the results of a survey conducted in Baringo County, Kenya, on community leaders raising awareness about solar power energy projects, the

majority of respondents (51.5%) agreed to a very great extent, while 40% agreed to a great level. A minority of 2.76 percent agreed to no extent, compared to 2.5% who agreed to a lesser extent and 2.9% who agreed to a substantial amount.With a standard deviation of 0.83, the mean was 4.26. These findings showed that in Baringo County, Kenya, community leaders raise awareness about solar power energy initiatives.

The results of the survey demonstrated that households in Baringo County, Kenya, have a high degree of awareness regarding solar power and solar hot water technology. The majority of respondents, or 48.3%, agreed to a considerable extent, while 26.4% agreed to a very great amount. 10% of respondents agreed to a moderate degree, 12.8% agreed to a lesser extent, and 5% of respondents agreed to no extent at all.3.96 was the mean, and 0.82 was the standard deviation. These findings showed that families in Kenya's Baringo County have a high degree of understanding regarding solar power and solar hot water technology. 55.6 percent of respondents agreed to a very great extent, while 23.6% agreed to a considerable extent, according to the results on the suppliers of solar technology available in Baringo County. The minority agreed at no extent at 5.3%, while those who agreed at a moderate degree at 10.0% and 5.6% agreed to a lesser degree agreed.A standard deviation of 1.47 and a mean of 2.44 were found. According to these findings, Baringo County has access to solar technology providers.

According to the results of the study, the majority of respondents in Baringo County agreed with solar energy to a large extent (55.6%), while 21.5% agreed with it to a very great extent. A moderate percentage of respondents—14.2 percent—agreed, compared to 5.8% who agreed less—and 3.9% of respondents who agreed not at

all.A 0.80 standard deviation accompanied the 3.94 mean. The adoption of solar power projects by families in Baringo County, Kenya, is influenced by household awareness of solar energy, as these results demonstrate.

The results of the survey demonstrated that information on solar energy is shared in Baringo County, with the majority of respondents agreeing to a very great extent (43.9%) and those who agreed to a great extent (33.6%). A minority of 1.6% agreed to no extent, compared to 16.7% who agreed to a considerable degree and 4.4% who agreed to a lesser level.4.24 was the mean and 0.78 was the standard deviation. According to these findings, families in Kenya's Baringo County adopt solar power projects at a different rate when information on solar energy is shared.

The results of the study demonstrated that Baringo County has a stakeholder engagement mechanism for solar power energy installation. Of those who agreed, the majority (49.6%) agreed to a great extent, while 39.3% agreed to a very great level. The percentage of respondents who agreed to a moderate degree was 5.6%, 3.2% agreed to a lesser extent, and 2.4% disagreed completely. 4.11 was the mean, and 0.73 was the standard deviation. These findings demonstrated that the process of stakeholder participation in solar power energy installation influences household adoption of solar power projects in Kenya's Baringo County.

According to the survey, project managers in Baringo County made sure the project was sustainable and useful to the community, as evidenced by the majority of respondents (36.7%) who agreed to a very great extent and 31.1% who agreed to a great extent. 18.1% of respondents agreed to a moderate degree, 12.6% agreed to a lesser extent, and 11.5% of respondents agreed to no extent. 2.61 was the mean, and 1.27 was the standard deviation. These findings showed that project managers make

sure their work is sustainable and good for society, which influences the uptake of solar power projects among Kenyan families in Baringo County.

The study's conclusions demonstrated that households in Baringo County are trained to install solar energy and learn about its advantages for the community; 35.6% of respondents agreed to a very great extent, while 29.4% agreed to a large level. 20.6 percent agreed to a moderate degree, 16.8 percent to a lesser extent, and 7.7 percent of the minority agreed to no extent at all. The standard deviation was 1.24 and the mean was 2.13. These findings showed that the adoption of solar power projects among households in Baringo County, Kenya, is influenced by a skilled staff that instructs households on solar energy installation and its advantages to society.

The study's conclusions demonstrated that Baringo County has a large pool of trained solar energy specialists; 369.9% of respondents agreed to a very great extent, while 28.1% agreed to a great level. The minority agreed at no degree at 6.2%, while those who agreed at a moderate extent at 29.7% and 9.1% agreed at a lesser extent agreed. The standard deviation was 1.31 and the mean was 2.37. These findings showed that Baringo County, Kenya has a large supply of qualified solar energy technicians, which has an impact on the adoption of solar power projects by local households.

The results of the survey demonstrated that there is a good channel for discussing issues related to solar energy usage in Baringo County, with the majority of respondents agreeing to a great extent (38.1%) and the remaining respondents agreeing to a very great extent (34.2%). 14.1 percent agreed to a moderate degree, 11.7 percent to a lesser extent, and 11.9 percent of the minority agreed to no extent at all. With a standard deviation of 1.18, the mean was 2.17. These findings showed

that families in Kenya's Baringo County adopt solar power projects more readily when there is a clear channel of communication for discussing issues related to solar power energy usage. The overall findings showed that families in Kenya's Baringo County adopted solar power energy projects differently depending on their level of understanding.

4.5.2 Installation cost of on adoption of solar power energy project among households in Baringo County , Kenya .

The study sought to establish whether cost of installation has an affect on adoption of solar power among households in Baringo county, Kenya. The findings are as indicated in Table 9.

Table 9: Cost of installation on adoption of solar power

Cost of installation	Frequency	Percentage (%)
Yes	179	90
No	19	10
Total	198	100

(Source field data,2024)

The research findings revealed that majority of the respondents at n= 179(90%) reported that cost of installation had an effect on solar power adoption. Minority of the respondents at n= 19 (10%) reported that cost of installation dis not have an effect on solar adoption . This implied that majority of respondents cost of installation had an effect of solar installation in Baringo county, Kenya. Kenya.

4.5.3 Installation Cost of on adoption of solar power energy projects among households in Baringo county, Kenya.

The initial goal of the study was to determine how installation costs affected households in Kenya's Baringo County's adoption of solar power projects. The

following ratings were given to the statement: 1 for "no extent," 2 for "less extent," 3 for "moderately extent," 4 for "great extent," and 5 for "very great extent." The results are displayed in Table 10.

Table 10 : Cost of installation on adoption of solar power energy projects among households in Baringo county, Kenya

Cost on Installation	5 (%)	4 (%)	3 (%)	2 (%)	1 (%)	Mean	Std. Dev
Solar Photovoltaic	45.3	40.5	7	4.2	3	4.32	.61
Solar heating system	37.5	38.6	16.9	4.6	2.4	4.15	.83
Installation costs	43.1	41.4	11.4	2.6	1.6	4.32	.74
Technicians cost	31.7	41.7	19.7	4.9	2.0	4.18	.78
Repair and maintenance cost	34.4	42.1	17.9	4.1	1.5	4.25	.80
Tax levied on solar equipment	35.8	33.1	26.8	2.9	1.4	4.29	.89
The majority of solar energy technology is an expensive energy source.	44.2	31.1	18.9	3.8	1.0	4.42	.74

(Source field data,2024)

The results of the survey demonstrated that solar photovoltaic costs had an impact on solar adoption in Baringo County, with 45.5% of respondents agreeing to a considerable extent and the majority (45.3%) agreeing to a very great level. The minority agreed at no degree at 3%, while those who agreed at a considerable extent at 7% and 4.2% agreed to a lesser extent agreed. With a standard deviation of 0.61, the mean was 4.32. These findings showed that solar photovoltaic costs have an impact on households' adoption of solar power projects in Kenya's Baringo County.

According to the study's findings, the cost of solar heating systems had an impact on the adoption of solar power in Baringo County. A majority of respondents—38.6%—agreed to a considerable extent, while 37.5% agreed to a very great level. 16.9% of respondents agreed to a moderate degree, 4.6% agreed to a lesser extent,

and 2.4% of respondents agreed to no extent at all. With a standard deviation of 0.83, the mean was 4.15. These findings showed that solar heating systems had an impact on households in Kenya's Baringo County's adoption of solar power projects.

The results of the survey indicated that solar adoption in Baringo County was impacted by the cost of solar installation, with 43.1% of respondents agreeing to a very great extent and 41.4% agreeing to a considerable amount. 11.4% of respondents agreed to a moderate degree, 2.6% agreed to a lesser level, and 1.6% of respondents agreed not at all. 4.32 was the mean, and 0.74 was the standard deviation. These findings showed that solar installation costs have an impact on households' adoption of solar power projects in Kenya's Baringo County.

According to the study's findings, the cost of technicians had an impact on the adoption of solar power in Baringo County, with the majority of respondents agreeing to a significant extent (41.7%) and the highest percentage (31.7%). 19.7% of respondents agreed to a moderate degree, 4.9% agreed to a lesser extent, and 2.0% of respondents agreed to no extent at all. With a standard deviation of 0.78, the mean was 4.18. These findings showed that the cost of technicians had an impact on households' acceptance of solar power projects in Kenya's Baringo County.

The results of the survey indicated that the cost of repairs and maintenance had an impact on the adoption of solar power in Baringo County, with the majority of respondents agreeing to a large extent (42.1%) and the majority agreeing to a very great extent (34.4%). 17.9% of respondents agreed to a moderate degree, 4.1% to a lesser level, and 1.5% of respondents agreed to no extent at all. With a standard deviation of 0.80, the mean was 4.25. These findings showed that families in

Kenya's Baringo County adopt solar power projects differently depending on the cost of upkeep and repairs.

The results of the study demonstrated that a tax imposed on the cost of solar equipment had an impact on the adoption of solar power in Baringo County, with the majority of respondents agreeing to a very great extent (358.8%) and those who agreed to a great extent (33.1%). A considerable percentage of respondents (26.8%) agreed, 2.9% agreed less, and 1.4% of respondents agreed not at all. With a standard deviation of 0.89, the mean was 4.29. These findings showed that taxes imposed on solar equipment have an impact on households in Kenya's Baringo County's decision to implement solar power projects.

The results of the survey demonstrated that solar energy technology, which is a rather expensive energy choice, had an impact on the adoption of solar in Baringo County, where the majority of respondents (44.2%) agreed to a very great extent and 31.1% agreed to a great extent. 18.9% of respondents agreed to a moderate degree, 4.8% agreed to a lesser extent, and 1.0% of respondents agreed to no extent at all. With a standard deviation of 0.74, the mean was 4.42. These findings demonstrated that solar energy technology is a relatively costly energy choice that influences household adoption of solar power projects in Kenya's Baringo County.

The overall findings showed that household adoption of solar power energy projects in Kenya's Baringo County is influenced by the cost of solar installation.

4.5.4 The adoption of solar power in Baringo County, Kenya, and the extent of alternative energy sources.

The goal of the study was to determine how much the adoption of solar power projects in Kenya's Baringo County is impacted by alternative energy sources. The outcomes are displayed in Table 11.

extremely large degree

a great deal

To a moderate degree

Lower degree

Not to that extent

Table 11: Extent alternative sources of energy affect adoption of solar power energy

Extent	Frequency	Percentage (%)
Extremely great degree	36	18
Great degree	59	30
Moderate degree	39	20
Lower degree	38	19
No degree of extent	26	13
Total	198	100.0

(Source field data,2024)

The research findings on the extent alternative sources of energy affect adoption of solar power energy project in Baringo County, Kenya. The results revealed that majority of the respondents agreed a great extent n=59(30%). This was followed by those who agreed at moderate extent with n=39(20%). Those who agreed at a less extent were n =38 (19%). Those who agreed at a very great extent were n= 36(18%) while the minority comprising of n=26(13%) agreed at no extent. These results implied that alternative sources of energy affect adoption of solar power

energy project in Baringo County, Kenya.

4.5.5 Alternative sources regarding the uptake of solar energy projects in Kenyan households in Baringo County.

The goal of the study was to determine how families in Kenya's Baringo County adopted solar power projects in relation to alternative energy sources. The following ratings were given to the statement: 1 for "no extent," 2 for "less extent," 3 for "moderately extent," 4 for "great extent," and 5 for "very great extent." The results are displayed in Table 12.

Table 12 : Alternative sources regarding the uptake of solar energy projects in Kenyan households in Baringo County.

Alternative sources of energy	5 (%)	4 (%)	3 (%)	2 (%)	1 (%)	Mean	Std. Dev
Proximity Grid electricity	40.1	41.4	13.4	2.4	1.8	4.23	.70
Wind power	40.7	31.7	19.7	14.4	2.5	4.18	.87
Kerosene	34.4	45.1	18.9	4.1	1.5	4.51	.88
Charcoal	43.8	32.1	14.8	5.9	1.4	4.60	.81
Candles	40.3	25.6	24.2	13.0	1.2	4.23	.67
Biomass	27.5	28.6	26.6	15.6	1.7	4.51	.83
Animal dung	33.2	41.4	31.4	12.8	1.3	4.32	.74
Biogas	21.7	23.0	26.7	20.7	6.9	4.08	.86
Crop residues	34.4	33.1	11.9	14.2	6.4	4.38	.81
Branches	35.8	33.6	26.6	12.6	1.4	4.26	.72

(Source, field data 2024)

The results of the survey demonstrated that solar adoption in Baringo County was impacted by nearby grid energy, with 41.4% of respondents agreeing to a very great

extent and 40.1% agreeing to a considerable amount. The minority agreed at no extent at 1.8%, while those who agreed at a considerable extent at 13.4% and 2.4% agreed at a lesser extent agreed. The standard deviation was 0.70 and the mean was 4.23. These findings showed that household adoption of solar power projects in Kenya's Baringo County is influenced by closeness to the grid for electricity.

According to survey results, wind power had an impact on the adoption of solar power in Baringo County. A majority of respondents—41.7%—agreed to a considerable extent, while 31.7% agreed to a very great level. A minority of 2.5% agreed to no extent, compared to 19.7% who agreed to a considerable extent and 14.4% who agreed to a lesser level. 4.18 was the mean, and 0.87 was the standard deviation. These findings showed that families in Kenya's Baringo County adopted solar power projects differently as a result of wind power.

The results of the study indicated that kerosene had an impact on the adoption of solar power in Baringo County, with the majority of respondents agreeing to a large extent (45.1%) and the majority agreeing to a very great extent (34.4%). Of those who agreed, 18.9% agreed to a considerable degree, 4.1% agreed to a lesser level, and 1.5% of the minority agreed not at all. 4.51 was the mean, and 0.88 was the standard deviation. These findings showed that kerosene has an impact on households in Kenya's Baringo County's decision to acquire solar power projects.

According to the study's findings, the adoption of solar power in Baringo County was impacted by charcoal. A majority of respondents—43.8%—agreed to a very great extent, while 32.1% agreed to a considerable amount. 14.8 percent agreed to a moderate degree, 5.9 percent to a lesser extent, and 1.4% of the minority agreed to no extent at all. With a standard deviation of 0.81, the mean was 4.60. These

findings showed that the adoption of solar power projects by families in Kenya's Baringo County is influenced by charcoal.

The results of the survey indicated that candles had an impact on the adoption of solar power in Baringo County, with the majority of respondents agreeing to a very great extent (40.3%) and the remaining respondents agreeing to a great extent (25.6%). There were those who agreed to a moderate degree (24.2%), those who agreed to a lesser extent (14.0%), and those who disagreed completely (1.2%). The standard deviation was 0.67 and the mean was 4.23. These findings demonstrated that household adoption of solar power projects in Kenya's Baringo County is influenced by candles.

The results of the study indicated that biomass had an impact on the adoption of solar power in Baringo County, with the majority of respondents agreeing to a significant extent (27.5%) and those who disagreed to a great extent (28.5%). A minority of 1.7% agreed to no extent, compared to 26.6% who agreed to a considerable extent and 15.6% who agreed to a lesser level. With a standard deviation of 0.83, the mean was 4.51. These findings showed that household adoption of solar power projects in Kenya's Baringo County is influenced by biomass.

According to the study's findings, there was a significant difference in the adoption of solar power in Baringo County between those who agreed to a large extent (41.4%) and those who agreed to a very great extent (33.2%). A minority of 1.3% agreed to no extent, but 31.4 percent agreed to a considerable extent and 12.8% agreed to a lesser extent. With a standard deviation of 0.74, the mean was 4.32. These findings showed that adoption of solar power projects by families in Kenya's Baringo County is impacted by animal dung.

Results of the survey indicated that biogas had an impact on solar adoption in Baringo County, with a majority agreeing to a moderate degree (26.7%) and a significant extent (23.1%). The percentages of those who agreed very much (21.7%), somewhat (20.7%), and not at all (4.08%) were the different groups. A standard deviation of 0.86 and a mean of 4.08 were achieved. The adoption of solar power projects by households in Baringo County, Kenya, is influenced by biogas, according to these findings.

The results of the study indicated that crop residues had an impact on the adoption of solar power in Baringo County, with the majority of respondents agreeing to a very great extent (34.4%) and those who agreed to a considerable extent (33.1%). 11.9% of respondents agreed to a moderate degree, 14.2% to a lesser level, and 6.4% of respondents agreed to no extent at all. With a standard deviation of 0.81, the mean was 4.38. These findings showed that household adoption of solar power projects in Kenya's Baringo County is influenced by crop wastes.

The majority of respondents agreed to a very great extent (34.4%), while those who agreed to a substantial level (33.1%) said that crop residues had an impact on Baringo County's adoption of solar power. These findings support the study's findings. Regarding the degree of agreement, 11.9% of participants expressed moderate agreement, 14.2% expressed lesser agreement, and 6.4% expressed no agreement at all. The mean was 4.38, and the standard deviation came to 0.81. According to these results, crop wastes in Kenya's Baringo County have an impact on household adoption of solar power installations.

According to the study, branches had an impact on the adoption of solar power in Baringo County. A majority of respondents—35.8%—agreed to a very great extent,

while 33.6% agreed to a considerable level. A minority of 1.4% agreed to no extent, whilst 27.6% agreed to a moderate degree and 12.6% agreed to a lesser level. 4.26 was the mean, and 0.72 was the standard deviation. These findings showed that branches have an impact on households in Kenya's Baringo County's adoption of solar power projects. The adoption of solar power projects in Kenya's Baringo County is impacted by alternative energy sources, according to these findings.

4.5.6 Income level of households on adoption of solar power energy project among households in Baringo County , Kenya .

The study sought to establish whether income level of households had an affect on adoption of solar power among households in Baringo county, Kenya. The findings are as indicated in table 13.

Table 13: Income level of households on adoption of solar power

Income level of households	Frequency	Percentage (%)
Yes	181	92
No	17	8
Total	198	100

(Source field data,2024)

The research findings revealed that majority of the respondents at n= 181(92%) reported that income level of households had an effect on solar power adoption. Minority of the respondents. at n= 17 (8%) reported that income of households did not have an effect on solar adoption . This implied that majority of respondents income level of households had an effect of solar installation in Baringo county, Kenya. Kenya.

4.5.7 . Extent of income levels of households on adoption of solar power project in Baringo, County, Kenya.

The study sought to establish the extent income levels of households affect adoption of solar power energy project in Baringo County, Kenya. The results are as indicated in Table 14.

Table 14: Extent income of households affect adoption of solar power energy

Extent	Frequency	Percentage (%)
Very great extent	56	28
Great extent	49	25
Moderately extent	38	19
Less extent	35	18
No extent	20	10
Total	198	100.0

(Source field data,2024)

The research findings on the extent income levels of households affect adoption of solar power energy project in Baringo County, Kenya. The results revealed that majority of the respondents agreed a very great extent n=56(28%). This was followed by those who agreed at great extent with n=49(25%). Those who agreed at moderate extent were n =38 (19%). Those who agreed at a less extent were n= 35(18%) while the minority comprising of n=20(10%) agreed at no extent. These results implied that income levels of households affect adoption of solar power energy project in Baringo County, Kenya.

4.5.8 Income of households on adoption of solar power energy projects among households in Baringo County, Kenya

The primary goal of the study was to determine how much household adoption of solar energy projects in Kenya's Baringo County is influenced by income levels. The

following ratings were given to the statement: 1 for "no extent," 2 for "less extent," 3 for "moderately extent," 4 for "great extent," and 5 for "very great extent." The results are displayed in Table 15.

Table 15: Income levels on adoption of solar energy

Income levels	N	5 %	4 %	3 %	2 %	1 %	Mean	Std
Household expenses	198	45	30	13	7	5	4.17	.75
Availability of the finances	198	40	36	16	10	3	4.68	.92
The adoption of solar energy projects has been impacted by the low level of legislative support for these projects, as evidenced by the minimum budget allocated to renewables.	198	35	38	14	9	4	4.45	.67
Since the majority of Baringo residents do not have a source of income, solar energy projects are not within their financial means.	198	43	29	20	5	3	4.56	.89
The number of people installing solar systems who make a regular income is rising.	198	37	40	16	4	3	3.70	1.12
Bank loans to solar contractors are one of the more advantageous financial facilities.	198	28	34	12	9	7	4.94	1.13
Bank loans and other forms of financial assistance are available to customers who install solar systems.	198	35	38	15	5	2	4.52	.66

(Source field data,2024)

The results of the study demonstrated that household expenses had an impact on the adoption of solar power in Baringo County, with the majority of respondents

agreeing to a very great extent (45%) and the remaining respondents agreeing to a great extent (35%). Only 5% of respondents agreed at all, while 13% agreed to a moderate degree and 7% agreed to a lesser level. A 0.75 standard deviation accompanied the mean of 4.17. The adoption of solar power projects by households in Baringo county, Kenya, is influenced by household expenses, as these statistics indicate.

The results of the survey demonstrated that the adoption of solar power in Baringo County was influenced by the availability of funds, with 40% of respondents agreeing to a very great extent and 36% agreeing to a large amount. A minority of 3% agreed to no extent, while 10% agreed to a lesser extent and 16% agreed to a moderate extent. The standard deviation was 0.92 and the mean was 4.68. These findings showed that financial accessibility had an impact on families' adoption of solar power projects in Kenya's Baringo County.

The results of the study indicated that there is little legislative support for solar energy projects, as seen by the minimum budget allocated to renewable energy, which had an impact on the uptake of solar energy projects in Baringo County. A majority of 35% agreed to a considerable extent, and 35% agreed to a very great extent. The percentage of respondents who agreed to a moderate degree was 14%, 9% agreed to a lesser extent, and 4% disagreed completely. 4.45 was the mean, and 0.67 was the standard deviation. These findings demonstrated that households in Baringo County, Kenya, are less likely to accept solar power projects due to insufficient policy support for these projects, as evidenced by the minimum budget allotment to renewable energy.

The results of the research indicated that the majority of Baringo residents cannot finance solar energy projects because they lack a source of income, which has an impact on the county's adoption of solar energy. 33% agreed to a large extent, and 29% agreed to a very great extent. The majority was in agreement. A minority of 3% agreed to no extent, 5% agreed to a lesser extent, and 20% agreed to a significant degree. Standard deviation was 0.89 and the mean was 4.56. The majority of Baringo residents do not have a source of income, which has an impact on the adoption of solar power projects among families in Baringo County, Kenya. These results indicate that solar energy projects are an expensive alternative for most of the population.

The study's conclusions demonstrated that the number of persons installing solar systems who have a regular income is rising, which has an impact on Baringo County's adoption of solar energy. A majority of 40% agreed to a great extent, while 37% agreed to a very great extent. 15% of respondents agreed to a moderate degree, 4% agreed to a lesser extent, and 3% of respondents agreed to no extent at all. 3.70 was the mean, and 1.12 was the standard deviation. These findings showed that the number of persons installing solar systems who make a regular income is rising, which is having an impact on the uptake of solar power projects among Kenyan homes in Baringo County.

The results of the study demonstrated that bank loans to solar contractors, among other beneficial financial facilities, had an impact on the adoption of solar power in Baringo County. 34% of respondents agreed to a great extent, while 28% agreed to a very great amount. A minority of 7% agreed to no extent, 9% agreed to a lesser extent, and 12% agreed to a moderate extent. With a standard deviation of 1.13, the mean was 4.94. These findings showed that families in Kenya's Baringo County

adopted solar power projects more frequently when they had access to favorable financial facilities, such as bank loans to solar contractors.

The study's conclusions demonstrated the significant financial assistance, such as bank loans, provided to customers who install solar systems, which has an impact on Baringo County's adoption of solar energy. 38% of respondents agreed to a very great extent, while 35% agreed to a great amount. 15% of respondents agreed to a moderate degree, 5% agreed to a lesser extent, and 2% of respondents agreed not at all. With a standard deviation of 0.66, the mean was 4.52. These findings demonstrated that a significant amount of financial assistance, such as bank loans to customers who install solar systems, influences the uptake of solar power projects among Kenyan households in Baringo County.

4.5.9 Adoption of solar power energy projects among households in Baringo County, Kenya

The goal of the study was to determine how households in Kenya's Baringo County had been able to utilize solar power projects over the previous five years. The following rating was given to the remark regarding 5 = significantly better, 4 = better, 3 = constant, 2 = declined, and 1 = significantly worse. The results are displayed in Table 16.

Table 16: Kenyan households in Baringo County utilizing solar energy

Access to solar power	N	5 %	4 %	3 %	2 %	1 %	Mean	Std
Number acquired	198	40	35	21	8	6	4.47	.85
Efficiency and effectiveness	198	34	30	25	11	5	4.68	.92
Availability	198	31	28	19	13	9	4.45	.67

(Source field data,2024)

The study findings showed that the number acquired in solar adoption in Baringo county had greatly improved at 40 % and those who agreed that it had improved at 35 %. Those who agreed that the number was constant was at 21 %, 8 % agreed that the number acquired had decreased while the minority agreed that the number had greatly decreased at 6 %. With a standard deviation of 0.85, the mean was 4.47. These findings demonstrated that families in Kenya's Baringo County were adopting solar power projects at a higher rate.

The study findings showed that efficiency and effectiveness in solar adoption in Baringo county had greatly improved at 34 % and those who agreed that it had improved was at 30 %. Those who agreed that efficiency and effectiveness was constant at 25 %, 11 % agreed that efficiency and effectiveness had decreased while the minority agreed efficiency and effectiveness had greatly decreased at 5 %. The standard deviation was 0.92 and the mean was 4.68. These findings demonstrated that solar power projects had improved in terms of efficiency and effectiveness among Kenyan households in Baringo County.

The study findings showed that availability of solar power in Baringo county had greatly improved at 31 % and those who agreed that it had improved at 28 %. Those who agreed that the availability of solar power was constant at 19 %, 13 % agreed that availability of solar power had decreased while the minority agreed that availability of solar power had greatly decreased at 9 %. 4.45 was the mean, and 0.67 was the standard deviation. These results revealed that availability of solar power projects had improved among households in Baringo county, Kenya. These results implied there is accessibility and adoption of solar power energy project in Baringo County, Kenya.

4.6 Diagnostic Test

4.6.1 Autocorrelation Assumption Test

Autocorrelation refers to the correlation of a variable with itself over time. The results of the test of autocorrelation assumption are presented in Table 17.

Table17 : Autocorrelation Assumption Test Results

Variable	Durbin-Watson
Level of awareness	2.262
Cost of installation	2.351
Alternative sources of energy	2.418
level of family income	2.309
Adoption of solarpower energy	2.681

(*Source, field 2024)*

The results, as shown in Table 17, showed that the level of awareness's Durbin-Watson statistic value was 2.262. Furthermore, the cost of installation (2.351) equaled the Durbin-Watson statistic value. Additionally, the findings showed that in Baringo County, Kenya, the adoption of solar power energy was 2.681, while the Durbin-Watson statistic value for alternative sources of energy was 2.418 and the family income level was 2.309. This suggests that the research variables were independent of mistakes, as it satisfies the Durbin-Watson criterion of 0–4. A test statistic ranging from 0 to 4 is reported by the Durbin-Watson test, where a score of 0-2.5 indicates no autocorrelation. In conclusion, it was determined that the data gathering tools were legitimate and trustworthy, meaning they could be utilized for data.

4.6.2 Normality Assumptions Test

A normality test was performed as part of the study to ascertain whether the data is normally distributed. In Table 18, the normalcy test result is displayed.

Table 18: Normality Assumption Test Results

Variable	Kolmogorov- Smirnov	Sig
Level of awareness	.369	.573
Cost of installation	.388	.641
Alternative sources of energy	.294	.554
level of family income	.321	.760
Adoption of solarpower energy	.374	.701

(*Source, field 2024)*

Given that the significance values for Kolmogorov-Smirnov were more than 0.05, Table 18's results for the normality assumption test demonstrated that the data was normally distributed. The study's results showed that awareness had a p=.573>0.05 Kolmogorov-Smirnov significant value. The installation cost exhibited a significant Kolmogorov-Smirnov value of p=.641>0.05. The significance value of Kolmogorov-Smirnov for alternative energy sources was p=.554>0.05. The family income level showed a significant Kolmogorov-Smirnov value of p=.760>0.05. The Kolmogorov-Smirnov significance value for solar energy adoption was p=.701 >0.05. It can be inferred that the data were normally distributed since the p-values were higher than the significance level of 0.05.

4.6.3 Multicollinearity Test

When there is a strong correlation between two or more independent variables, this phenomenon is known as multicollinearity. When a regression model exhibits multicollinearity, it might be challenging to pinpoint the distinct role that every independent variable plays in the results. The study's findings are shown in Table 19.

Table 19: Multicollinearity Assumption Test Results

Variables	Tolerance	VIF
Level of awareness	.434	1.362
Cost of installation	.591	1.290
Alternative sources of energy	.508	1.295
level of family income	.617	1.202
Adoption of solarpower energy	.647	1.237

(Source, field 2024)

Tolerance and variance inflation factor values were found for the following: alternative energy sources; tolerance = 0.617 and VIF = 1.2020 for family income level; tolerance = 0.434 and VIF = 1.362 for level of awareness; tolerance = 0.591 and VIF = 1.290 for cost of installation; tolerance = 0.508 and VIF = 1.295 for alternative energy sources; and tolerance = 0.647 and VIF = 1.237 for adoption of solar power energy. It is implied from the study results that there was no multicollinearity in the data utilized, as all tolerance values for the five variables under investigation were all above 0.10 and VIF values were all below 10.

4.6.4 Homoscedasticity Test Results

When the disturbance between the independent and dependent variables is homogeneous throughout the independent variable values, it is referred to as homoscedasticity.

It expresses constant residual terms across observations. Conversely, unequal errors lead to heteroscedasticy problem. Heteroscedasticity contribute to inefficient parameter estimates and incorrect confidence intervals. When the value of the dependent variable changes, the error term ought not to vary much. For homoscedastic data, p-value is greater than 0.05. Homoscedasticity test results are shown in Table 20.

Table 20: Homoscedasticity Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.057	.254		.161	.739
	Level of awareness	.031	.053	.083	-.124	.752
	Cost of installation	.073	.066	.235	1.041	.619
	Alternative sources of energy	.077	.090	.046	.268	.713
	level of family income	.089	.041	.061	-.345	.745

a. Dependent Variable: Adoption of solarpower energy

The results in Table 20 shows that level of awareness, cost of installation , alternative sources of energy and level of family income had p-values 0.751 0.619, 0.713 and 0.745 respectively. All these values are greater than 0.05, implying that the data was homoscedastic and there was no heteroscedasticity problem. The results helped the researcher to validate the appropriateness of the linear regression analysis.

4.6.5 Linearity Test Results

Linearity tests were undertaken to establish the linear that level of awareness, cost of installation , alternative sources of energy and level of family income. Results are presented in Tables 21, 22, 23 and 24.

Table 21: Relationship between solar power energy adoption and awareness level

			Sum of Squares	df	Mean Square	F	Sig.
Adoption of solar power energy * level of awareness	Between Groups	(Combined)	3.638	118	.348	3.241	.014
		Linearity	2.121	12	2.016	19.312	.001
		Deviation from Linearity	1. 624	107	.161	1.713	.123
	Within Groups		1.556	118	.103		
	Total		6.330	198			

(*Source, field 2024)*

Results show that the p-value for the deviation from linearity was 0.123. In order for a linear relationship to be present, there must be a divergence from linearity of greater than 0.05. The link between the amount of awareness and the adoption of solar power energy is implied to be linear at 0.123>0.05. This linear association will help inferential statistical analysis, especially when figuring out the cause-and-effect relationship between solar energy uptake and awareness in Kenya's Baringo County.

Table 22: Relationship between solar energy uptake and installation costs that is linear

			Sum of Squares	df	Mean Square	F	Sig.
Adoption of solar power energy * cost of installation	Between Groups	(Combined)	2.639	118	.378	3.211	.017
		Linearity	2.132	12	2.018	19.512	.001
		Deviation from Linearity	1.623	107	.121	1.752	.156
	Within Groups		1.556	118	.106		
	Total		5.441	198			

(*Source, field 2024)*

Results show that the p-value for the deviation from linearity was 0.156. For linear relationship to exist, the deviation from linearity should be greater than 0.05. 0.156>0.05 implies that between cost of installation and adoption of solar power energy are linearly related. In particular, this linear relationship will help establish the causal relationship between solar energy uptake and installation costs in Kenya's Baringo County. It will also facilitate inferential statistical research.

Table 23: Linearity between the use of solar energy and other energy sources

			Sum of Squares	df	Mean Square	F	Sig.
Adoption of solar power energy * Alternative sources of energy	Between Groups	(Combined)	2.539	118	.478	3.201	.019
		Linearity	1.132	12	2.118	19.712	.001
		Deviation from Linearity	1.623	107	.151	1.612	.165
	Within Groups		1.547	118	.105		
	Total		4.332	198			

(*Source, field 2024)*

Based on the data, the departure from linearity's p-value was found to be 0.165. A departure from linearity of more than 0.05 is required for a linear relationship to exist. The relation between the adoption of solar power and alternative energy sources is linear, as indicated by the value of 0.156>0.05. Particularly in establishing the causal relationship between the adoption of solar power energy in Kenya's Baringo County and other energy sources, this linear relationship will facilitate inferential statistical analysis.

Table 24: Income level of the family and the utilization of solar energy are linear

			Sum of Squares	df	Mean Square	F	Sig.
Adoption of solar power energy * Income of households	Between Groups	(Combined)	2.539	118	.438	3.501	.016
		Linearity	2.102	12	2.318	19.512	.001
		Deviation from Linearity	2.625	107	.194	1.714	.191
	Within Groups		1.547	118	.102		
	Total		6.305	198			

(*Source, field 2024)*

Results show that the p-value for the deviation from linearity was 0.191. For linear relationship to exist, the deviation from linearity should be greater than 0.05. 0.191>0.05 implies that between income of households and adoption of solar power energy are linearly related. This linear relationship will support inferential statistical analysis particularly in determining the causal relationship between income of households and adoption of solar power energy in Baringo county Kenya.

4.7 Inferential Statistics

4.7.1 Correlation Analysis

4.7.1.1 Level of awareness and adoption of solar power energy

The purpose of the study was to determine whether awareness and solar energy adoption were correlated in Kenya's Baringo County. Table 25 presents the results of the investigation.

Table 25: Level of awareness and adoption of solar power energy

		Adoption of solar power energy
Level of awareness	Pearson Correlation	.451**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

In Baringo County, Kenya, there was a moderately favorable and statistically significant link between the level of awareness and the adoption of solar power energy, as shown in Table 28 of the study. With $p < 0.05$, $r = 0.451$. This suggests that awareness raises the rate at which solar energy is adopted in Kenya's Baringo County.

4.7.1.2 The price of installing and utilizing solar energy

The objective of this study was to determine whether solar energy uptake in Kenya's Baringo County was correlated with installation costs. Table 26 presents the results of the investigation.

Table 26: Level of awareness and adoption of solar power energy

		Adoption of solar power energy
Cost of installation	Pearson Correlation	.488**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

The study finds that, in Baringo County, Kenya, there was a moderately favorable and statistically significant link between the cost of installation and the adoption of solar power energy, as shown in Table 26. With $p < 0.05$, $r = 0.488$. This suggests that in Kenya's Baringo County, the cost of installation increases the use of solar energy.

4.7.1.3 Alternative sources of energy and adoption of solar power energy

The goal of the study was to determine whether the use of solar energy in Kenya's Baringo County was correlated with the use of other energy sources. The study's conclusions are displayed in Table 27.

Table 27: Alternative sources of energy and adoption of solar power energy

		Adoption of solar power energy
Alternative sources of energy	Pearson Correlation	.463**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

Table 27 of the study shows that there was a statistically significant and somewhat positive link between the adoption of solar power energy in Baringo County, Kenya, and other energy sources. With $p < 0.05$, $r = 0.463$. This suggests that the use of alternative energy sources increases the uptake of solar energy in Kenya's Baringo County.

4.7.1.4 Income of households and adoption of solar power energy

The goal of the study was to determine whether household income in Kenya's Baringo County and the use of solar energy were related. Table 28 displays the study's conclusions.

Table 28: Alternative sources of energy and adoption of solar power energy

		Adoption of solar power energy
Income of households	Pearson Correlation	.476**
	Sig. (2-tailed)	.000
	N	198

**. Correlation is significant at the 0.05 level (2-tailed).

The study shows that, in Baringo County, Kenya, there was a somewhat favorable and statistically significant link between household income and the use of solar power energy, as shown in Table 28. With $p < 0.05$, $r = 0.476$. This suggests that household income in Baringo County, Kenya, influences the use of solar power energy.

4.8 Regression Analysis

Regression analysis was performed as part of the study to assess the combined impact of household income, alternative energy sources, installation costs, and awareness level on the adoption of solar power in Baringo County, Kenya. Table 29 presented the model summary.

Table 29 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.891[a]	.793	.795	.3051	.000

The percentage of variance in the dependent variable that can be accounted for by the independent variables is known as the R-Squared. The study's R-squared value was 0.793, indicating that the four independent variables of household income, alternative energy sources, installation costs, and awareness level can account for 79.3% of the adoption of solar power in Baringo County, Kenya, while other factors can account for 20.7%.

Table 30 : ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.31	4	7.113	100.326	.000[b]
	Residual	8.041	194	.1004		
	Total	35.072	198			

a. Dependent Variable: adoption of solar power energy in Baringo county, Kenya
b. Predictors: (Constant), level of awareness, cost of installation, alternative sources of energy, income of households

In this study, the analysis of variance was employed to assess the model's suitability for the data. According to the results, the p-value was 0.000, which is less than 0.05, meaning that the model does an excellent job of forecasting how the four independent variables—adoption of solar power energy in Kenya's Baringo County, level of awareness, cost of installation, and income of households—affect this adoption. Additionally, the F-value of 100.326 indicates that the model fit the data in terms of predicting how the independent factors will affect the dependent variable.

Table 31: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.072	.157		.206	.747
	Level of awareness	.259	.149	.543	5.360	.017
	Cost of installation	.281	.047	.233	2.617	.003
	Alternative sources of energy	.225	.195	.176	2.326	.073
	level of family income	.398	.144	.215	3.304	.006
	Adoption of solarpower energy					

The overall significant test findings for the proposed study model are displayed in Table 31. The following regression model is used to interpret the reported findings.

$Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \beta_4X_4$

Therefore,

$Y= 0.072+ 0.259X_1 + 0.281\ X_2 +0.225X_3 + 0.398\ X_4$

The intercept (β0) indicates that the adoption of solar power energy in Baringo County, Kenya, was 0.072 when the four independent variables are held constant. Additionally, a unit increase in knowledge would result in a 0.259 improvement in the adoption of solar power energy in Baringo County, Kenya, leaving all other independent factors constant. Furthermore, a unit rise in installation costs will result in a 0.281 improvement in the adoption of solar power energy in Baringo County, Kenya, assuming all other independent variables remain constant.

Moreover, a unit increase in alternative energy sources would result in a 0.225 improvement in the adoption of solar power energy in Baringo County, Kenya, leaving all other variables constant. In conclusion, if every other variable remains unchanged, a 0.398 improvement in the adoption of solar power energy in Baringo County, Kenya, would result from a unit rise in household income. From these results, it can be concluded that household income in Baringo County, Kenya, had the greatest impact on the uptake of solar power energy, followed by installation costs, awareness levels, and alternative energy sources, in that order.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a thorough overview of the study's main discoveries, follows by conclusions and a discussion of the implications that arise from them. Lastly, it offers some advice and ideas for topics that could be researched further. The goal was to identify the variables influencing the uptake of solar energy projects by Kenyan households in Baringo County.

5.2 Summary of Major Findings

The goal of the study was to compile a summary of its most important discoveries. The synopsis was divided into distinct goal categories.

5.2.1 Baringo County, Kenyan households' level of understanding and usage of Solar Power

The results of the study showed that in Baringo County, Kenya, community leaders raise awareness about solar power energy projects. Households in Kenya's Baringo County have a high degree of understanding regarding solar power and solar hot water technology. The outcomes also showed that Baringo County has access to solar technology providers. Households in Kenya's Baringo County were aware of solar energy and the deployment of solar power projects. The findings showed that adoption of solar power projects among Kenyan households in Baringo County is influenced by information sharing regarding solar energy.

Households in Kenya's Baringo County adopted solar power projects differently as a result of the stakeholder engagement method on solar power energy installation. When solar power projects were adopted by homes in Kenya's Baringo County,

project administrators made sure the initiative was sustainable and advantageous to society as a whole. The findings showed that the adoption of solar power projects among households in Baringo County, Kenya, was influenced by a skilled workforce that instructs people on solar energy installation and its advantages to society.

In Baringo County, Kenya, households were able to easily embrace solar power projects due to the availability of trained solar energy technicians. The findings showed that families in Kenya's Baringo County adopt solar power projects more readily when there is a clear channel of communication for discussing issues related to solar power energy usage. The overall findings showed that household adoption of solar power energy projects in Kenya's Baringo County is influenced by the amount of awareness.

5.2.2 Cost of Solar Energy Installation and Adoption in Kenya's Baringo County Households

These research findings revealed that solar photovoltaic cost affect adoption of solar power projects among households in Baringo county, Kenya. The study findings also showed that solar heating system cost had affect on solar adoption in Baringo county in Baringo county . Solar installation costs affect on solar adoption in Baringo county. The study findings showed that technicians cost effect on solar adoption in Baringo county. The results revealed that repair and maintenance cost affect adoption of solar power projects among households in Baringo county, Kenya. Tax levied on solar equipment affects adoption of solar power projects among households in Baringo county, Kenya. Solar energy technology is a largely expensive energy option affect adoption of solar power projects among households in Baringo County, Kenya. The overall results revealed that cost of solar installation

affect adoption of solar power energy projects among households in Baringo County, Kenya.

5.2.3 In Baringo County, Kenya, households are adopting solar electricity and other Alternative Energy Sources

These results revealed that proximity Grid electricity affect adoption of solar power projects among households in Baringo county, Kenya. The results revealed that wind power affect adoption of solar power projects among households in Baringo county, Kenya. Kerosene and charcoal affect adoption of solar power projects among households in Baringo county, Kenya.

The results revealed that candles and biomass affect adoption of solar power projects among households in Baringo county, Kenya. The results revealed that animal dung and biogas affect adoption of solar power projects among households in Baringo county, Kenya. These results also revealed that crop residues and branches affect adoption of solar power projects among households in Baringo county, Kenya. The overall results implied that alternative sources of energy affect adoption of solar power energy project in Baringo County, Kenya.

5.2.4 Income of households and adoption of solar power energy among households in Baringo County, Kenya

The results of the study indicated that household spending in Kenya's Baringo County had an impact on solar adoption. The results of the study also demonstrated that solar adoption in Kenya's Baringo County was influenced by financial availability. The results of the study showed that families in Baringo County, Kenya, accept solar power projects at a lower rate when policies supporting solar energy projects are limited, as seen by the minimum budget allocated to renewable energy.

These findings showed that the majority of Baringo residents cannot afford solar energy projects since the majority do not have a source of income, which has an impact on the uptake of solar power projects among Kenyan families in Baringo County. The study's conclusions demonstrated that the adoption of solar power projects among Kenyan households in Baringo County is being impacted by the rising number of persons with regular incomes installing solar systems.

The study's conclusions showed that families in Kenya's Baringo County adopted solar power projects more frequently when they had access to advantageous financial facilities, such as bank loans to solar contractors. The results of the study demonstrated that a significant amount of financial assistance, such as bank loans to customers who install solar systems, had an impact on the uptake of solar power projects among Kenyan households in Baringo County.

5.2.5 Solar power energy adoption of among households in Baringo county, Kenya

As a result of enhanced household adoption of solar power projects, the number of solar power adoption projects in Kenya's Baringo County was found to have improved. The results of the study demonstrated that households in Kenya's Baringo County were experiencing an improvement in the efficiency and efficacy of solar power plants.

The results of the study showed that residents in Kenya's Baringo County now have better access to solar power installations. The findings demonstrated that solar energy projects are accessible and widely adopted in Kenya's Baringo County.

5.3 Conclusions

Based on the data, the study came to the conclusion that in Baringo County, Kenya, there was a moderately favorable and statistically significant association between the level of awareness and the adoption of solar power energy. ($p < 0.05$; $r = 0.451$). This suggests that in Baringo County, Kenya, a higher awareness level encourages the use of solar energy. In Kenya's Baringo County, there was a statistically significant and somewhat favorable association found between the cost of solar energy adoption and installation. ($p < 0.05$; $r = 0.488$). This suggests that installation costs increase the use of solar energy in Kenya's Baringo County.

According to the study, there was a statistically significant and moderately positive association between the use of solar power energy in Kenya's Baringo County and other energy sources. ($p < 0.05$; $r = 0.463$). This suggests that the use of solar energy is increased in Kenya's Baringo County via alternative energy sources. In Kenya's Baringo County, there was a statistically significant and somewhat positive link between household income and the usage of solar energy. ($p < 0.05$; $r = 0.476$). This suggests that household income increases the utilization of solar energy in Kenya's Baringo County.

5.4 Recommendations

The study's results led the researcher to suggest that community leaders in Baringo County, Kenya should raise awareness of solar power installations. (2014). The study also recommended that providers of solar technologies should be more accessible. The study also recommends that solar power energy installation costs should be more cost effectiveness to encourage more households to adopt the solar energy acquisition in Baringo county , Kenya. The study also recommends that

alternative sources of energy that are ecofriendly should be encouraged in this case solar power energy and finally this study recommends that solar energy should be made available and reliable to minimize alternative sources of energy. Training workforce should be set up to t trainshouseholds on solar energy installation and its benefits to the society to encourage those with low income among house holdings in Baringo county , Kenya.

5.5 Suggestion for further Studies

Future studies should be done on the challenges facing adoption and sustainability of solar power energy projects in Kenya.

REFERENCES

Acker, R. H. & Kammen, D. M. (2016). The quiet (energy) revolution: analyzing the dissemination of photovoltaic power systems in Kenya. *Energy Policy*, *24*(1), 81-111.

Armstrong, D. M. (2016). *What is a Law of Nature?* Cambridge University Press Arora,

A., Simone, G., Salieb-Beugelaar, G. B., Kim, J. T. & Manz, A. (2019). Latest developments in micro total analysis systems. *Analytical chemistry*, *82*(12), 4830-4847.

Best, J. W. & Kahn, J. V. (2018). *Research in Education*. Boston: Library of congress cataloguing in publication data.

Bryman, A. & Bell, E. (2019). *Business Research Methods*. Oxford university press.

Cogan, A., Sharpe, S., & Hertzberg, J. (2016). Citizen participation. *International City Managers' Association/American Planning Association, Chicago*, 283-305.

Cronbach, L.J.(2015). Coefficient alpha and the internal structure oftests. *psychometrika*, *16*(3), 297-334.

Freeman, R. E. (2016). *Strategic Management: A Stakeholder Approach.* Pitman Publishing Company, 36(4),276-287.

Gareth, C. (2017). *Real World Research.* Oxford: Blackwell.

Gebreegziabher, Z., Stage, J., Mekonnen, A. & Alemu, A. (2017). Climate changeand theEthiopian economy: A computable general equilibrium analysis.

Gillham, B. (2011). *Developing a questionnaire*. A&C Black.

Global fund. (2018). Monitoring and evaluation toolkit HIV/AIDS, Tuberclosis and Malaria.

Goerss, P. G., & Jardine, J. F. (2019). *Simplicial homotopy theory*. Springer Science & Business Media.

GoK. (2017). *Vision 2030*. Nairobi: Government Printer

Government of Kenya (2018). African Centre for Economic Growth [ACEG] and KREP Holdings, *National micro and small enterprises baseline survey*. Nairobi: CBS.

Hosier, R. H., & Dowd, J. (2017). Household fuel choice in Zimbabwe: an empirical test of the energy ladder hypothesis. *Resources and energy*, *9*(4), 347-361.

Jabareen, Y. (2019). Building a conceptual framework: philosophy, definitions, and procedure. *International Journal of qualitative methods*, *8*(4), 49-62.

Jakachira, G. (2018). *An exploratory study of the interface of child-headed households and academic performance*: A case of primary school students in Beatrice resettlement area, Zimbabwe.

Jobber, M. 2019). *Business Research Methods*. Pearson Education India.

Karanja, T. W., Ithinji, G. K., & Nyaboga, A. B. (2018). The contribution of personalitytrait in Entrepreneurial intentions among University students in Kenya.

Keriri, H. (2018). Prevalence and risk factors of low back pain among nurses in operatingrooms, Taif, Saudi Arabia. *Am J Res Commun*, *1*(11), 25.

Kimuyu, P., Mutua, J. & Wainaina, J. (2015). Role of renewable energy in promoting inclusive and sustainable development in Kenya. *Background Paper [Internet]*. *European Report on Development*.

Kothari, C. R. (2018). *Research Methodology*: Methods and Techniques. New Delhi: New Age Publications.

Kumar, R. (2018). *Research methodology: A step by step for beginners*. London: SagePublication.

Leach, G. (2016). The energy transition. *Energy policy*, *20*(2), 116-123.

Looijen, M. & Hemmen, L. J. G. T. (2017). *Beheer van informatiesystemen: voor onderwijs en praktijk*. Academic Service.

Mateen, S., Zafar, A., Moin, S., Khan, A. Q. & Zubair, S. (2016). Understanding theroleof cytokines in the pathogenesis of rheumatoid arthritis. *Clinica Chimica Acta*, *455*, 161- 171.

Mathbor, G. M. (2018). Leading Social Workinto the 21st Century1. *Pobreza y desigualdad social: Retos para la reconfiguración de la política socia*.

Mbuthi, P., Odongo, F., Machera, M. & Imitira, J. K. (2007). Gender Audit of Energy Policy and Programmes in Kenya: Final Report.

Moolenaar, N. M. & Daly, A. J. (2018). Social networks in education: Exploring the socialside of the reform equation. *American Journal of Education*, *119*(1), 1-6.

Naidoo, K. (2019). *Millenium fundermentals of research methods introduction.* Nairobi: Destiny Logistics Ltd.

Ndagi, M. U. (2018). Remembering late president Yar‟ Adua. *Retrieved on*, *19*.

Pfeffer, J. & Salancik, G. R. (2018). *The external control of organizations: A resourcedependence perspective*. Stanford University Press.

Rogers, R. A. (2015). Introduction: Strategy for New Products with Positive and Negative Word- of-Mouth. *Management Science*, 30(12), 1389-1404.

Rossman, G. (2016). *Climbing the charts: What radio airplay tells us about the diffusion of innovation*. Princeton University Press.

Saunders, M. (2017). Choosing Research Participants. *Qualitative organizational research: Core methods and current challenges*, 35-52.

Sekaran, U. & Bougie, R. (2019). *Research methods for business*: A skill building approach. Wiley.

Sloth-Nielsen, J. (2017). *Realising The Rights of Children Growing up in Child-Headed Households: A Guide To Laws, Policies and Social Advocacy*. Cape Town: Creda Communications.

UNEP (2018). *Project Formulation, Approval, Monitoring and Evaluation manual.* Nairobi: programme Coordination and Management Unit.

Urban, J. P. G., Hall, A. C. & Gehl, K. A. (2018). Regulation of matrix synthesis rates bythe ionic and osmotic environment of articular chondrocytes. *Journal of cellular physiology*, 154(2), 262-270.

Weisman, M. L. (2017). When parents are not in the best interests of the child. *Atlantic Monthly*, 274(1), 43-63.

World Bank (2016). *Participatory Management and Local Culture: proverb and paradigms.*

APPENDICES

Appendix I: Informed Consent Form

Dear Sir/Madam,

RE: REQUEST FOR YOUR CONSENT TO PARTICIPATE IN A RESEARCH
I kindly write to request for you to participation in a research project. The study title is: FACTORS AFFECTING ADOPTION OF SOLAR POWERE ENERGY PROJECTS AMONG GHOUSELODS IN BARINGO COUNTY, KENYA

The potential risks and discomforts of the study are minimal. This is because you will only be expectedto participate in the questionnaire. Before filling the questionnaire, all respondents will be reminded and requested to keep what is discussed to be confidential. There are no potential benefits for you as a person for participating in this study. I am requesting you to volunteer and share your opinions. No payments will be made for the information that you give or for the time that you will spend with us. Confidentiality of any information that you provide will be maintained. Data collected will only be used for the purpose of this study and will be destroyed when the findings are published.

PARTICIPATION IN THIS STUDY IS ENTIRELY VOLUNTARY.YOU MAY REFUSE TO FILL THE QUESTIONNAIRE AND YOU MAY WITHDRAW AT ANY STAGE IF YOU SO WISH.

I f you accept to participate in this study, please append your signature below:

Signature ofparticipant: …… Date: ……
If you have any query, please contact the following:

Mobile phone: +254726008705 Or by email: jepkoechwhite @gmail.com
Sincerely,

Snowy Jepkoech
Researcher

CONSENT

I have carefully reviewed the provided details, comprehended the information, and had the chance to seek clarification. I acknowledge that my involvement in this study is entirely voluntary, and I retain the freedom to withdraw at any point, without the need to provide a justification and without incurring any expenses. I am aware that I will receive a copy of this consent form. With full understanding, I willingly consent to participate in this study.

Participant's signature_____Date_____

Investigator's signature_____Date_____

Appendix II: Research Questionnaire

This questionnaire is to collect data for purely academic purposes. The study seeks to investigate the ***FACTORS AFFECTING ADOPTION OF SOLAR POWER RENEWABLE ENERGY PROJECTS IN AMONG HOUSEHOLDSBARINGO, KENYA***

There will be full confidentiality about all information. Please fill out this questionnaire without providing any personal information. Provide your response to each question by either checking the appropriate box or filling in the blank.

Section A: Demographic Data

(Please check the suitable response (√))

1. Kindly specify your gender: Male [] Female []
2. Identify your greatest educational achievement.

   Certificate [ ] Diploma [ ] Degree [ ] Masters [ ] PhD [ ]

3. Please select the appropriate age range.

   20-30 years [ ] 31-40 years. [ ]

   41-50 years [ ] 51 – 60years [ ]

Adoption of solar power energy projects: awareness level

4. 4. How, in your opinion, does information accessibility impact households in Kenya's Baringo County's ability to participate in solar energy projects?

   Yes [ ] No [ ]

5. . How much do you agree with each of the following claims? (Check the corresponding box) Please rate the level of awareness on the deployment of solar power energy projects in Baringo County, Kenya, on a scale of 1 to 4 (1 being disagree, 2 being agree to a little amount, 3 being highly agree, and 4 being extremely agree).

Statements	Very great extent	Great extent	Moderate extent	Low extent	Not at all
Community leaders create awareness on solar power energy projects Baringocounty , Kenya?					
Homes in Baringo County have a high degree of awareness regarding solar PV and solar hot water technologies.					
Involvement in decision making					
Baringo County residents can reach the suppliers of solar technologies.					
Knowledge on solar energy					
There is information sharing on solarpower energy					
There is stakeholder engagement mechanism on solar power energy installation					
The sustainability and social benefit of the project are guaranteed by project management					
A skilled labor force instructs homeowners on the installation of solar energy and its advantages for the community					
Trained solar energy technicians are readily available in Baringo county					
There is a clear channel to communicate challenges on solar power energy usage					

Cost of Installation

6. In your view does cost affect adoption of solar power energy project amonghouseholds in Baringo County , Kenya?

Yes[ ] No [ ]

7. How much does the cost of the following impact the use of solar power?

Statements	Very great extent	Great extent	Moderate extent	Low extent	Not at all
Solar Photovoltaic					
Solar heating system					
Installation costs					
Technicians cost					
Repair and maintenance cost					
Tax levied on solar equipment					
The majority of solar energy technology is an expensive energy source.					

Sources Of Alternative Energy

8. To what degree does the deployment of solar power projects in Kenya's Baringo County depend on alternative energy sources?

Not degree at all [ ] Minimum [ ] Degree [ ]

Moderate degree [ ] Great degree [ ] Very great degree [ ]

9. To what degree do the following sources of alternative energy affect Baringo County, Kenya's adoption of solar power projects?

Statements	Very great extent	Great extent	Moderate extent	Low extent	Not at all
Proximity Grid electricity					
Wind power					
Kerosene					
Charcoal					
Rural electrification					
Candles					
Biomass					
Animal dung					
Biogas					
Crop residues					
Branches					

Income Level Of Households

9. Does the income affect adoption of for solar energy projects?

   Yes ( )

   No ( )

10. To what extent does income level affect adoption of solar power energy projectsi n Baringo County, Kenya?

    Not degree at all [ ] Minimum Degree [ ] Moderate Degree [ ]

    Very Great Degree [ ] Great Degree [ ]

11. What impact do the following factors have on the adoption of solar projects in Kenya's Baringo County?

Statements	Verygreat extent	Great extent	Moderate extent	Low extent	Not at all
Household expenses					
Availability of the finances					
The minimum budget allocated to renewables indicates that there is little legislative support for solar energy projects, which has impacted the uptake of solar energy projects.					
Because most Baringo people don't have a source of income, most solar energy projects are out of reach for them.					
The percentage of people who install solar systems on their regular incomes is rising.					
Bank loans to solar contractors are one of the more advantageous financial facilities.					
Bank loans and other forms of financial assistance are available to customers who install solar systems.					

Adoption to Solar Power Energy Project

12. For the past five years, what has been the trend in the following areas of access to solar energy power projects? In this case, 1 = considerably decreased, 2 = decreased, 3 = constant, 4 = improved, and 5 = greatly improved.

	1	2	3	4	5
Number obtained					
Efficiency and efficacy.					
Accessible					

I appreciate you taking part.

Appendix III: ERC Clearance

Mount Kenya University

REF: MKU/ISERC/3553
TO: SNOWY JEPKOECH

Date: 28 March 2024

REG: MSCPM/2022/35909

Dear Sir/Madam,

RE: FACTORS AFFECTING ADOPTION OF SOLAR POWER ON PERFORMANCE OF RENEWABLE ENERGY PROJECTS IN COUNTY GOVERNEMENT OF BARINGO, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2597.** The approval period is **28/03/2024 - 27/03/2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P.O. Box 342 - 01000, Thika

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 | +254 709 153 200
Email: info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution.
Unlocking Infinite Possibilities

Appendix IV: Introductory Letter

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MSCPM/2022/35909

2nd April, 2024

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: SNOWY JEPKOECH– REGISTRATION NO. MSCPM/2022/35909

The purpose of this letter is to introduce the above named student who is pursuing **Master of Science in Project Management** in the **Department of Management** in the school of **Business and Economics.**

The title of the research is **"Factors Affecting Adoption of Solar Power on Performance of Renewable Energy Projects in County Government of Baringo, Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached; and now has to proceed to the field to collect data between **April, 2024 and June, 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

For

Dr. Samuel M. Karenga, PhD
Director, Graduate Studies
Enc.

Mount Kenya University
P.O. Box 342-01000, THIKA
Office of the Director
Graduate Studies

Appendix V: NACOSTI Clearance

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **305579**

Date of Issue: **06/May/2024**

RESEARCH LICENSE

This is to Certify that Miss.. Snowy Jepkoech of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Baringo on the topic: FACTORS AFFECTING ADOPTION OF SOLAR POWER ENERGY PROJECTS AMONG HOUSEHOLDS IN BARINGO COUNTY, KENYA for the period ending : 06/May/2025.

License No: **NACOSTI/P/24/34721**

305579

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

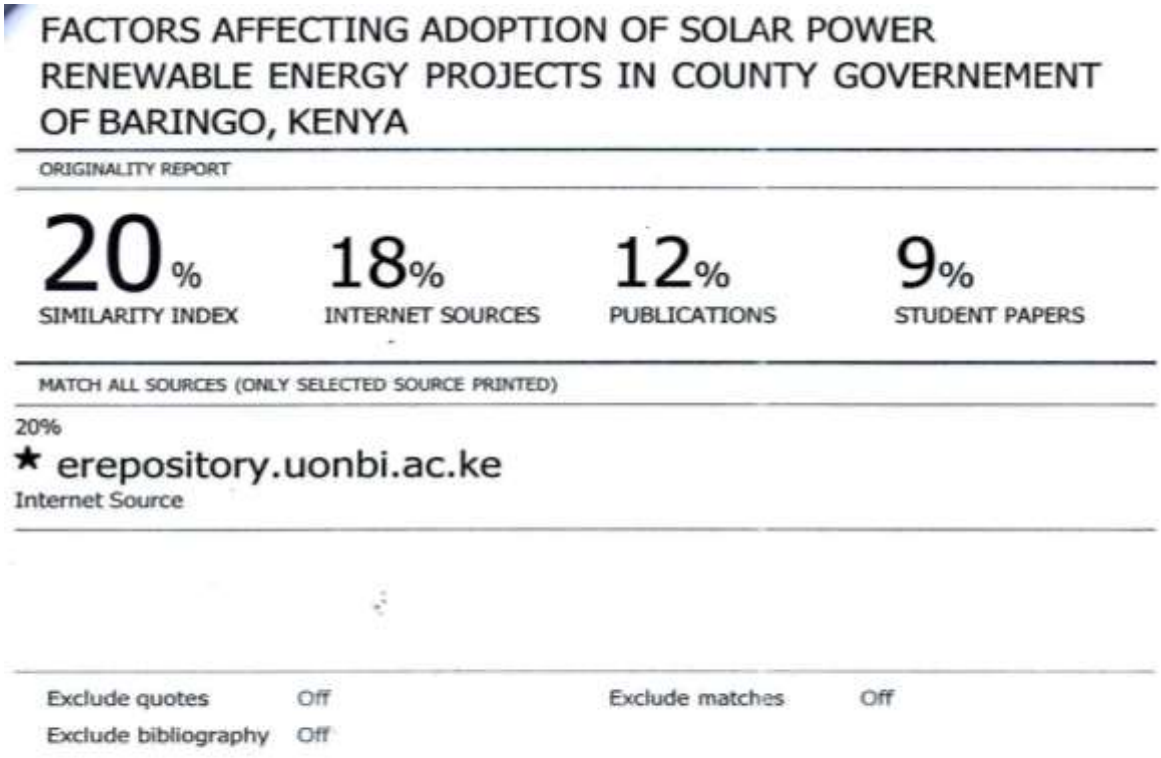
The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix VI: Similarity Index



FACTORS AFFECTING ADOPTION OF SOLAR POWER RENEWABLE ENERGY PROJECTS IN COUNTY GOVERNEMENT OF BARINGO, KENYA

ORIGINALITY REPORT

20%	18%	12%	9%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

20%

★ erepository.uonbi.ac.ke

Internet Source

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	Off		