FACTORS AFFECTING ADOPTION OF GREEN TECHNOLOGY BY FIRMS IN KENYA

BY

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This research report is my original work and has not been submitted to any other institution or examination body for academic award.

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This research report has been submitted for examination with my approval as the University of Nairobi Supervisor.

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DEDICATION

In memory of my late mother Rispa Omamo for having brought me from far and being an inspiration to my life. I dedicate this work and give special thanks to my wife Teacher Margaret my children Allan, Dedan, Festus and other family members, for their patience and moral support during this study.

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ABBREVIATIONS AND ACRONYMS

GoK	Government of Kenya
NEMA	National Environmental Management Authority
MDG	Millennium Development Goals
SPSS	Statistical Package for Social Scientists
WHO	World Health Organization
GT	Green Technology
UNEP	United Nations Environmental Programme
NDP	National Development Plan
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNFCC	United Nations Framework Convention on Climate Change
SREP	Scaling up-Renewable Energy Programme
RPS	Renewable Portfolio Standards
KIPRRA	Kenya Institute for Public Policy, Research and Analysis.

ABSTRACT

Development of technology often has adverse effects on the environment. To mitigate the negative effects of technology countries have developed environmental –friendly technologies often referred to as Green Technology. To encourage the adoption of Green Technology countries have established policy framework to provide guidelines to companies wishing to adopt Green Technology. Kenya has such a policy framework. But despite its existence, the adoption of Green Technology has been very slow.

This study set out to investigate factors that affect the adoption of Green Technology by Kenyan firms. Specifically the study established how the regulatory framework for Green Technology has affected the adoption of Green Technology by firms in Kenya. It examined the extent to which green technology has been adopted by firms in Kenya and the factors that firms take into consideration before the adoption of Green Technology and examined the challenges faced by companies seeking to adopt Green Technology.

The research study employed a descriptive survey design that used stratified sampling methodology to sample15companies or firms, which constituted 30% of the 50 registered green energy firms in Kenya. The research study sampled target population of 68 managers and used stratified sampling to work out by proportionate stratification methodology. Random sampling was then used to get the sample. Data collection was administered using closed ended questionnaires Secondary data was gathered through literature review. Raw data was coded and analysed through Statistical Package for Social Scientists (spss) and the presentation was done in tables or tabular format.

At the time of carrying out the study, there were a total number of 50 companies registered in Kenya to investigate the green technology activities a sample of 15 companies which is 30% was used to collect the required data. Closed ended questionnaire was a tool used to collect the data which targeted only managers in the sampled firms.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Technology can be termed as the application of knowledge for practical purposes. In this context, technology allows people to become more efficient or to do things that were not possible before. To benefit from technology, it needs to be successfully linked to the country's overall development objectives and applied to solving socio-economic problems..However some of these technologies are not enviromentally safe and good example is the technology in mining industry. This is a dirty industry, i.e. industry that brings out material that is harmful to environment. Some of that dirt may not be avoided, because you are forced to tear into the earth to access useful metals and minerals necessary for use in the daily life. In other cases, it is avoidable, but only at great cost of keeping up with competitors(Beck & Martinot 2004).The phrase 'dirty technologies' is used to refer to technologies used in waste management and mining but which are detrimental to health and environment. Example of this kind of technology include waste incineration technology, aerial spraying of banned pesticides and dumping of waste.. Petroleum products pose further risk as they enhance environmental degradation through various means like motor vehicle exhaust fumes and industrial pollution.

Rare metal extraction, for example gold, involves substantial pollution in the mining, onsite processing, and refining phase gives rise to environmental degradation through topsoil loss, poorly controlled tailings ponds that leach into groundwater as well as lakes and rivers, roads slicing through habitat, and the use of large amounts of energy to extract and process the materials they uncover. Some rare earth metals require substantial processing, and that provides a number of opportunities for pollution and even death at every step of the way. Some of these technologies can be found in Kehancha in Kuria County. Kenya

In view of the challenges posed by technology to the environment, alternative solutions have been arrived at. Such alternative solutions include; recycling, water purification, sewage

treatment, remediation, flue gas treatment, solid waste management, renewable energy, solar energy. These are usually referred to as "Green Technology" (GT)

Green Technology is a broad term for environmentally friendly solutions. GT can be used as environmental healing technology that reduces environmental damages created by the products of traditional technologies. These are technologies that retain and sustain development. It is believed that the use of GT can help in environmental healing making lives comparatively better. It is also believed that GT promises to augment farm profitability while reducing environmental degradation and conserving natural resources (Werner, Rhodes and Partain, 1998). GT covers a broad group of methods and materials for generating energy to non-toxic cleaning products.

Venture capitalists are investing large amount of money into clean energy market and pursuing businesses facilitating renewable energy technologies that are energy efficient (Kenya Renewable Energy Association Report, 2002).United Nations Environmental Programme's $2.9 billion was invested in 2006 in clean technologies (mostly in wind, solar and other low-carbon energy technologies), which was 80% higher over 2005 (Sharmistha & Grabowski,2007).Climate change threat has spurred green investing,UNEP considers this trend as the "world's newest gold rush" (UNEP Report, 2008). The reason this area has been significantly important is because people expect a dramatic innovation and changes in their livelihood. The development of alternative technology should attempt to benefit the planet by protecting the environment.

Although it is difficult to precisely define the areas that are covered by Green Technology, it can safely be said that GT helps addressing the emerging issues of sustainability because of the advancement in science and technology. Thus GT can be said to be the technology that meets present needs without compromising the ability of future generations to meet their own needs.

This technology should be able to meet the needs of society in ways that can continue indefinitely into the future without damaging or depleting natural resources. It can create products manufacturing which has successfully reduced waste and pollution by changing patterns of production and consumption according to Hasna (2007).The goals of GT include: increased economic entrepreneurships, reduced indoor and outdoor pollution and, sustainability;

i.e. meeting the needs of society in ways that can continue indefinitely into the future without damaging or depleting natural resources (without compromising the ability of future generations to meet their own needs).The innovations in technology have aroused interest in developing alternative fuels as a new means of generating energy efficiently (Keller, 1991). Furthermore, GT is the application of green chemistry and green engineering, one of the most exciting fields of technology, which is supposed to transform the way that everything in the world is manufactured.

Green technology encompasses cradle to cradle design - ending the "cradle to grave" cycle of manufactured products, by creating products that can be fully reclaimed or re-used. Further, green technology encompasses source reduction which involves reducing waste and pollution by changing patterns of production and consumption (Hansen, 1998).Green technology has developed alternatives to technologies that have been demonstrated to be harmful to health and the environment and entails creating a centre of economic activity around technologies and products that benefit the environment, speeding their implementation and creating new careers that truly protect the planet.

Kenya, like other countries, is facing challenges posed by fuels. In response to these challenges, the government is try out other technologies to help turn the country's energy sector fully green. One of these technologies is the transformation of the millions of tons of solid waste generated in the country into energy. It is believed that the massive solid waste generated every day in the four major cities of Nairobi, Mombasa, Kisumu and Nakuru can be used to power and or produce a substantial amount of energy (Rotich, 2006)

Private companies are encouraged by the Kenyan government to turn to green energy production for their industrial productions. Mumias Sugar Company , the largest sugar milling company in Kenya, is perhaps the best example of industrial green energy production in the country. The company has installed an electricity plant that is fuelled with by product from its sugar milling processes. It uses a portion of the energy it generates in its industrial operations and sells the rest to the national grid. This is an indication that green energy can power economy profitably (Kenya Country Energy Information Report, 2006).

Government interest in the adoption of Green Technology is as a result of the rapidly expanding economy with an ever-increasing demand for energy. The current traditional sources which have been in use all along are proving to be extremely costly and this directly translates to the cost of living. Thus, for the economy to continue to grow, Kenya must adopt alternative sources of energy (NDP, 2005).In response to these challenges, green energy firms are emerging with a lot of encouragement from the government.

1.2 Statement of the Problem

The concept of green technology in Kenya recognizes that there is no universal definition of green economy. The concept is both feared in terms outperforming the current technologies and admired in terms of efficient production. However, Kenya has domestically contextualized the concept and is implementing programs and activities which are 'green', 'clean' and 'carbon neutral' in character. However, Kenya is yet to find a mechanism, that is, the means of implementation to assist in its development of green initiatives (UN, 2012). Kenya emphasizes that green economy must foster accelerated economic development, address poverty eradication and improvement of social welfare. The policies must favor the poor and be democratic, emphasize empowerment, social inclusion and participation in a holistic sense. To achieve these aims, a green economy approach must be pursued in line with Agenda 21 and the 'Rio Principles' especially the principle of common but differentiated responsibilities. Agenda 21, usually referred to as "The 1992 Earth Summit Meeting" was arrived at in Rio de Janeiro, Brazil where some 180 nations committed themselves to the principles of "Sustainable Development", and adopted an action plan for the 21st Century (UNCED, 1992).

The principles of sustainable development basically are; Environmental, Social and Economic are the basis on which action plans are built up and targeted at searching for a sound balance between economic efficiency, social solidarity, environmental awareness, accounting for essential needs of those who cannot express themselves (future generations, environment and all existing forms of life, excluded population,) and limiting the use of natural resources to the level of its regeneration capacity and limiting waste to the environmental capacity of its absorption. Despite the urgent need for alternative sources of energy, the adoption for green technology in Kenya has been painfully slow (Rotich 2006). The country continues to rely on the traditional

dirty technologies which have had adverse effects to the environment. The government has put in place a regulatory framework for the establishment of green technology but companies continue to shy away from adopting it. Therefore. there is need to investigate factors that affect or influence the adoption of green technology by firms in Kenya.

1.3 The Purpose of the Study

The purpose of this study was to examine the challenges faced by firms attempting to adopt the green technology in Kenya and their effort to gain market and consumption of Green Technology. The study investigated how these challenges were affecting the adoption of green technology firms in Kenya.

1.4 Objectives of the Study

The main of objective of this study was to investigate the factors that affect the adoption of Green Technology by Kenyan firms. Specifically, the study aimed at

i. Establishing how the Government Regulatory Framework for green technology has affected the adoption of Green Technology by firms in Kenya
ii. Examine the extent to which Green Technology has been adopted by firms in Kenya
iii. Examine the Factors that firms take into consideration before the adoption of Green Technology
iv. Examining the challenges encountered by companies seeking to adopt Green Technology.

1.5 Research Questions

For the purpose of investigating the problem of this study, the following research questions were generated;

i. To what extent has the Regulatory Frame work affected the adoption of green technology by firms in Kenya?

ii. To what extent has Green Technology been adopted by firms in Kenya?

iii. What are the factors that firms consider before the adoption of Green Technology?

iv. What are the challenges encountered by companies seeking to adopt Green Technology?

1.6 Significance of the Study

This study suggested intervention measures that will improve the adoption of green technology by Kenyan firms. The findings of the study will be of great importance to the Government of Kenya, the companies and the people using or intending to use green technology in their daily activities in various sectors of our economy this may include lighting, small businesses like recycling of waste etc. This will also assist in environmental conservation issues where the Government has always struggled with cleaning the environment and restricting environmental degradation.

Findings of this study can assist the Government and environmental agencies in establishing the extent to which Kenyan Companies have adopted GT.This can also help the Government to know the factors that companies take into consideration before adopting green technology. Such information can hopefully be used to develop ways of mitigating the identified challenges.

The findings of this study will enable the Government to develop policy regulatory framework that can encourage companies to invest in Green Technology. The findings can help to develop strategies for the implementation of the policy.

The findings of the study may improve the lives of many Kenyans who have no access to traditional fossil energy. Use of solar energy, is an example of such improvement, and can be used for lighting, mobile.

1.7 Limitations of the Study

Geographically, Green Technology firms are scattered in the country and this was a limitation to the researcher.The fear of respondents giving out information was a limitation in gathering the data as well as sensitivity of the issues curtailed some respondents representing the employers

from disclosing critical issues this was mainly because of business competition rivalry and the firms' policies not to participate in the kind exercise. Due to financial constraints, the research was limited to registered green technology firms only.

Documented information on green technology in the country is also not very available as this is relatively new area.

1.8 Delimitations of the Study

This study was carried out in Kenya and was confined to those companies that have adopted green technology. Though there may be many challenges facing companies which may not be directly related to the adoption of green technology, this study confined itself to those challenges directly affected by the adoption of green technology.

The study was also confined to green sources of energy and did not attempt to look at other forms of green technology. Only descriptive survey design method was used in this study to collect data related to the problem.

1.9 Basic Assumptions

The following assumptions were made by this study:

i. That the policy frame work for adoption of green technology existed in Kenya.
ii. That awareness of the advantages of green technologies would lead to their adoption
iii. That questionnaires were adequate tools to collect data required for this study;
iv. That finding of this study could be generalized to all firms using green technology.

1.10 Definition of Significant terms used in the study

Agenda 21: The 1992 Earth Summit Meeting in Rio de Janeiro, Brazil.

Dirty fuels: Tar, sands, oil shale, and liquid coal, all of which have devastating extraction impacts that cause more pollution and greenhouse gas emissions than conventional oil.

Fossil fuels: Fuels formed by natural processes such as anaerobic decomposition of buried dead organisms.

Framework: A set of principles and long-term goals that form the basis of making rules and guidelines, and to give overall direction to planning and development of the organization.

Fuels: wood, charcoal, bagasse (sugar cane waste), and animal and vegetable wastes used to generate energy

Green energy: Environmentally friendly sources of power and energy which must be renewable and non-polluting.

Green Technology: A broad term for more environmentally friendly solutions.

Sustainable use: This can be sustained indefinitely with the resources provided (Including fiscal resources).

Technology: The application of knowledge for practical purposes

Waste Management: The collection, transportation, processing or disposal, managing and monitoring of waste materials.

Dirty Technology: Application of knowledge that brings out material that is harmful to environment.

1.11 Organization of the rest of the Study.

This study was organized in five chapters. Chapter discussed background to the problem and the statement of the research problem, the purpose, objectives and research questions were included

Chapter two of the study presents review of related literature. Chapter three presents research methodology where the sampling procedures and research instruments are discussed. Chapter four presents the research findings while chapter five discusses the conclusions drawn from the study and the recommendations made.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presented a review of literature that was related to this study. The literature review included. Policy Regulatory framework by the Government, extent to which green technology has been adopted, factors that firms take into consideration before the adoption of green technology and the challenges faced by companies seeking to adopt green technology. Theoretical and conceptual framework was also being presented.

2.1 Regulatory policy framework by the Government

Technologies that could enable Kenya to grow economically while reducing or stabilizing energy use are currently of limited availability. What's more, even when such technologies are economically competitive over the long-term, they tend to require more up-front capital than Kenya can afford - unless it receives support from aid agencies or other international funding sources. Worst hit are the rural areas of Kenya. The long term goal of energy development in the country is to achieve greater self reliance through intensive energy generation. It is hoped that the use of alternative energy resources and technologies that can serve the same use and, are easily implementable from urban-to-rural community level - will help Kenyan's achieve their aspirations for a better quality of life. However, meeting the growing demand for energy now and over the coming decades will be exceedingly difficult in itself, and will be further compounded by a growing desire to provide energy services in an environmentally sound and friendly manner. Green Africa Network,(1994)

To meet the growing energy-demand, it will require that the Government of Kenya should first and foremost, constitute a policy programme that would foresee a complete overhaul and/or up-grade and modernize the existing energy utilities - leading to full maximization and efficient generation of electricity. Currently there is no proper regulatory frame work and this gives rise to amorphous pricing of green energy services and equipment on the Kenyan market. There are also major opportunities for reducing carbon dioxide emission from fossil fuels, through more efficient use of existing energy utilizing facilities including the accelerated development and

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widespread adoption of various renewable energy technologies - but more importantly - this requires a large contribution as well as investment in solar energy development, an environmentally friendly and abundant energy resource

National strategies include different policy instruments to achieve the predefine ed goals and targets. These instruments aim to remove market barriers, level the playing field for renewable energy, internalize environmental externalities, and create favorable market environment for private investments.

Renewable energy policies and instruments are being categorized in various ways. Beck and Martinot(2004) categorized them according to their effects on renewable energy market incentives while the IEA(2004) categorized policies adopted by developed countries based on the direction of their support.

Choice of specific policy instrument is influenced by various factors, such as resource endowments, economic structures, and market development objectives. In very broad terms, policies adopted by developing countries can be grouped into seven main categories i)research, development and demonstration incentives; ii) investment incentives;iii) tax measures; iv) incentive tariffs)voluntary programs; vi) mandatory programs or obligations; and vii)tradable certificates. Moreover, each country has employed a combination of these policies. Evolution of these policies since the 1970s reflects among other things, an increased market orientation of policies moving from regulation towards economic policy tools.

Presently, feed-in tariffs, obligations and tradable green certificates are emerging as the main policy instruments in many developed and developing countries. Investment incentives and various tax measures do, however, remain important mechanisms to stimulate renewable energy investment.

There are policies based on market incentives. These are some of regulatory framework policy that mandate prices to be paid for renewable, or require a fixed amount or share of generation to be renewable. Beck & Martino, (2004)

Market incentive policies also include Instruments such as pre-paid meters, electricity feed-in

laws and prepaid purchasing arrangement. An obligation is part of market incentive policy and includes renewable energy portfolio standards RPS and renewable energy certificates. This certificate is associated with attributes and benefits that can be sold separately from the underlying physical electricity associated with a renewable-based generation source. This flexibility allows organizations to support renewable energy development because of the benefits mentioned.

Coast reduction: involve reducing investment costs and the instruments in this subsidies and rebates. Tax relief is part of this policy and include tax credits and tax holiday and property tax incentives e.g. personal income tax incentive.

Public investment and market facilitation policy, involve provision of public funds instruments such as public benefit funds it also involves infrastructure policies, government procurement, grants, loans etc such that the players are able to meet their targets.

Policies based on support direction, this refers to policies addressing supply and capacity Stimulating producers with facility and/or capital costs as policy variables. (International Energy Agency, 2004).In this policy, producers are assisted to come up with facilities also assisted with capital to further the energy development.

Support direction policy also involves the following instruments investment tax credits, property tax exemptions, capital grants, Government purchases and third party finance.

Policies addressing generation and demand, this policy addresses the Government willingness to licence generation and stimulate consumers with product and/or associated price as policy variables i.e. competitively pricing the energy produced. The demand is then regulated through instruments such as net metering, green pricing, voluntary programmes, Government purchases and excise tax exemption.

Policies addressing demand and capacity in this policy, the demand issues are addressed and the capacity of end users. The use of tradable green certificates is very recent and important in this policy. Under this type of scheme, a certificate is created to represent the environmental attribute of renewable energy (such as its carbon free nature) and is traded separately from the electricity

itself. Certificates can be used to record compliance with renewable energy obligation schemes or sold in the voluntary green power markets. There is carbon trade which Kenya is already participating.

Privatisation and appropriate policy frameworks this may provide a new source of capital from debt and equity markets that can be used to finance capital intensive renewable energy projects. Privatised utilities on the other hand, may prefer to invest in conventional energy technologies due to such factors as short project time horizons, the lack of access to low interest rate loans, and higher requirements for returns on their investments. However, the privatisation processing many countries is undertaken in conjunction with power industry restructuring. In some cases, privatisation is carried out simultaneously with unbundling or the introduction of wholesale competition. Appropriate regulatory frameworks could therefore be adopted to promote renewable energy during the privatization of utilities in a given electricity market structure, such as IPP(independent power producer) frameworks under a single buyer market, or various types of obligations, feed-in tariffs and tradable green certificates in competitive electricity markets.

Distributed renewable energy generation policy, embedding smaller generators within a grid network, referred to as 'distributed generation', can provide a number of benefits, including reduced greenhouse gas emissions (for generation based on renewable energy and low carbon fuels); increased energy security and diversity of supply; and reduced costs(as electricity is generated by more efficient systems and closer to the point of consumption). Additional benefits can include deferred transmission upgrades, reduced distribution losses, and increased network support. The current regulatory frameworks, however, often fail to recognize, allocate and evaluate most of these benefits. The current regulations in Kenya play hard on small holders who want to generate their own energy in the countryside and this leads to unnecessary a waste of otherwise available resources IEA (2004).Production of power by Mumias sugar company did find a lot of resistance and restrictions from the KPLC and this is an example of embedding smaller generators to adopt the green energy.

2.3 Extent to which green technology has been adopted in Kenya

Scaling-Up Renewable Energy, Kenya is one of six pilot countries selected to benefit from the Scaling-Up Renewable Energy Program in Low Income Countries (SREP). The objective of the

SREP is to pilot and demonstrate the economic, social and environmental viability of low carbon development pathways in the energy sector by creating new economic opportunities and increasing energy access through the use of renewable energy SREP (2011).

Broadening renewable green energy, the Government has formed a Climate Change Coordination Unit in the Office of the Prime Minister that ensures that policy development and implementation on green energy is effective and consistent across ministries/ departments/firms. Also there is a plan of the Government to establish Green Energy Fund, which will address the issues of high upfront cost and human resource constraints in renewable energy development by providing concessional lending as well as capacity development support. It has been explained that given its resource constraints, the Green Energy Fund could benefit from SREP financing. From this statement there is actual redness for green energy adoption

Mini Hydro and Biomass, opportunities to develop mini hydro and biomass (biogas and bagasse) resources exist. The private sector has shown interest in developing these resources if current barriers are addressed and risk mitigation structures established. The possibility of using srep to provide a first-loss guarantee as an incentive to scale-up the use of these resources has been by discussed various stake holders.

Regulatory Option, Feed-in-Tariff the Prime Minister's Climate Change Policy Advisor discussed the obstacles to cogeneration through renewable energy sources with the Mission. SREP could scale up smaller scale renewable energy by selectively subsidizing feed-in-tariffs. This format of regulatory policy is mentioned above. A feed-in tariff (FIT) is a policy instrument that makes it mandatory for energy companies or "utilities" responsible for operating the national grid to purchase electricity from renewable energy sources at a pre-determined price that is sufficiently attractive to stimulate new investment in the renewable sector. This, in turn, ensures that those who produce electricity from identified renewable energy sources such as solar, wind and other renewable sources have a guaranteed market and an attractive return on investment for the electricity they produce. Aspects of an FIT include access to the grid, long-term power purchase agreements and a set price per kilowatt hour (UNEP Green economy report, 2011)

Civil society, barriers to scaling up renewable energy deployment in Kenya are insufficient public awareness, regulatory constraints and incentive regimes, high initial cost, limited pool of trained technicians to undertake operations and maintenance of equipment, as well as. Research on energy consumption pattern shows that household consumers are generally more satisfied with renewable energy, such as solar, wind, and biogas, than fossil fuels and biomass KIPPRA (2011).The Government therefore is making effort to remove these barriers in order to adopt the green energy fully

Wind Power, Lake Turkana Wind Project, is being constructed in the arid North Eastern province, and is projected to add 300 MW of wind power to the national grid

Northern Kenya and along the coast are ideal sites for setting up wind farms, the Christian Aid study notes. Wind energy can be located where agricultural production is impractical like in the North Eastern province (African Energy Policy Research Network, 2004)

Recently, the government's Rural Electrification Authority (REA), in partnership with Japan International Cooperation Agency (JICA), has embarked on a pilot project to promote wind turbines among communities, institutions and individuals. The project is installing wind turbines for domestic electricity supply, with the surplus being sold to the Kenya electricity generating company Kengen Davis and Shirtliff, (2011)

2.4 Factors that firms take into consideration before the adoption of green technology

Technological factors, technological characteristics of an innovation can affect its adoption, including complexity, compatibility, relative advantage, triability, observability, ease of use, perceived usefulness, information intensity, uncertainty and so on (Tornatzky and Klein, 1982).The perceived technological characteristics of an innovation are considered as cognitive beliefs reflected in an attitude towards the innovation. Green innovations incorporate both tacit and explicit knowledge. The tacit knowledge may be inherent in identifying sources of pollution, reacting quickly to accidental spills, and proposing preventive solutions (Boiral, 2002).A technology will be more complex while it reveals a higher level of ambiguity (Simonin, 1999). An organization is apt to advance technical innovation when knowledge is shared easily within the organization. Efficient knowledge sharing can lead to better innovative capabilities in terms

of higher order learning, and consequently can improve organizational performance including environmental management effectiveness (Etzion, 2007). Potential organizational benefits of green innovations include reduced energy and natural resource consumption, reduced waste and pollutant emission, improved environmental and financial performance and greater responsiveness to social environmental expectation (Etzion, 2007; Hart, 1995). In a study of the Spanish pulp and paper industry, Del Rio Gonzalez (2005) suggests that economic and financial advantages are important technological characteristics that influence the adoption of clean technologies. The perceived net benefits that the green innovation offers will serve as motivations for companies to adopt the technology. Therefore, the adoption of green innovations for firm in Kenya is expected to be positively associated with the perceived relative advantage of the innovations.

Organizational factors, this in context implies the processes and attributes that constrain or facilitate technical innovation. Several studies have discussed the influences of a variety of organizational characteristic variables such as quality of human resources, top management's leadership skills, organizational support, organizational culture and organizational size on technical innovation (Kimberly and Evanisko, 1981; Tornatzky and Fleischer, 1990) and environmental strategy (Etzion, 2007; Gonzalez-Benito and Gonzalez-Benito, 2006). In general, sufficient organizational resources and qualified organizational capabilities are two relevant organizational characteristics advancing technical innovation The availability of resources, management support, organizational learning capabilities and human resources will influence the adoption of green innovations (Lee, 2008; Lin and Ho, 2011; Zhu et al., 2008). To overcome knowledge barriers to adopting green innovations, employees need extensive specialized training to learn the principles underlying the innovation. Employees with competent learning capabilities will be apt to increase their absorptive capacity through training programs that can advance green innovation adoption. Therefore, companies that have qualified human resources will benefit adopting green innovations agood example in this case is cleaner production mentioned elsewhere in this draft. A positive association between the adoption of green innovations and the quality of human resources will expected.

Environmental factors, in this study refer to the standard conceptualization of external environment in the organizational behaviour literature. The external environment in which a

company conducts its business is another important factor affecting innovative and green behaviour. Certain environmental variables such as environmental uncertainty, environmental munificence, governmental support, industry type, competition and network relations are often discussed in the literature of technical innovation (Jeyaraj et al., 2006; Tornatzky and Fleischer, 1990) and environmental management (Etzion, 2007; Gonzalez-Benito and Gonzalez-Benito, 2006). Environmental uncertainty and external resource availability are consistently regarded as two primary environmental factors influencing technical innovation and environmental strategy (Aragon-Correa and Sharma, 2003; Jeyaraj et al., 2006; Rothenberg and Zyglidopoulos, 2007; Tornatsky and Fleischer, 1990). The government plays an important role in supporting resources for innovation adoption (Lee, 2008; Li and Atuahene-Gima, 2002; Scupola, 2003). Based on Lin and Ho's (2011) model, this study focuses mainly on the influences of environmental uncertainty, governmental support, and stakeholder pressures. Environmental uncertainty refers to frequent and unpredictable changes in customer preferences, technological development and competitive behavior perceived by the managers. It has been viewed as the most relevant environmental characteristic that affects a firm's decision making (Li and Atuahene-Gima, 2002). Managers facing uncertain business environments tend to be more proactive and use more innovative strategies than managers in less turbulent environments. Under high environmental uncertainty, companies will attempt to gather and process information frequently and rapidly to address environmental changes (Gupta and Govindrajan, 1991), and also tend to pay more efforts on innovation and increase the rate of technical innovation to maintain a competitive advantage (Damanpour, 1991; Kimberly and Evanisko, 1981; Zhu and Weyant, 2003), because adopting green innovations can be regarded as a technical innovation process that can improve a company's environmental performance, the adoption of green innovations is expected to be positively associated with the perceived environmental uncertainty. Companies are more likely to invest in resources and adopt environmental innovations to generate the capacity to improve environmental performance in uncertain environments (Aragon-Correa and Sharma, 2003; Rothenberg and Zyglidopoulos, 2007).

Governmental support is a relevant environmental factor influencing technical innovation. The governments can advance technical innovation through several encouraging policies such as providing financial incentive, technical resources, pilot projects and tax breaks (Tornatzky and

Fleischer, 1990; Scupola, 2003).Adopting green innovations relies to some extent on the availability of external resources. Munificence of resources in the business environment increases the degree to which a company engages in environmental management (Aragon-Correa and Sharma, 2003; Rothenberg and Zyglidopoulos, 2007). The government can raise the munificence by providing governmental subsidies or tax incentives for alternative energy technologies, bank financing at lower rates for environmentally friendly technologies, and lower insurance premiums for lower environmental risks (Aragon-Correa and Sharma, 2003).The governmental should support green initiatives which have a positive influence on the company's willingness to participate in the green supply chain. Therefore, a positive association between the adoption of green innovations and governmental support will be expected.

2.5 Challenges faced by companies seeking to adopt green technology

Regulating the market:-Major issue in considering the "green economy" is the need for regulating markets and corporations. Although the private sector has an important role to play in the shift to sustainable development and to a green economy, they should operate within the framework of government regulation and policies. Markets and companies left to themselves have been unable to take a sustainable development pathway Hallstrom, N. (2011).

Regulatory mechanisms such as limits to pollution and emissions, pesticides in food, water contamination, and use of environmental taxes and fines, are thus seen as crucial policy instruments that should be major or central components to promoting the "green economy". Therefore if this concept is missed out by the firms seeking to adopt the green energy, they will face a huge challenge.

Using environment for trade protection: - The environment, and by implication the "green economy", can be inappropriately made use of by firms for trade protectionist purposes, such that the firms adapting green technology will be viewed as if they want to practice which is against WTO discrimination principle which states that a member shall not discriminate between "like products" from different trading partners.

(UNCTAD, 2010).Kenya has been facing this challenge in the very recent past where her flowers were having many issues some of them stemming from pollution and transportation.

Were it that there was no intense discussion by world trade organization, the economy of Kenya and the loss of jobs in that sector would have been extremely bad. There was a major debate inside and outside the WTO on the possible role of trade-related environment measures and in particular about the possible use of the concept of "processes and production methods (PPMs)." The PPM concept had been introduced as a means of distinguishing between products by the manner in which the products are made and the environmental effects (for example, the volume of pollution) arising from the production. Therefore this challenge should be addressed using appropriate lobbing measures by the firms.

Technology transfer:-The central role of technology transfer was recognized in the 1992 Rio Summit and its related conventions It states the principle of the need for favorable access to and transfer of environmentally sound technologies to developing countries through technology cooperation enabling transfer of technological know-how and building up of economic, technical and managerial capabilities for the efficient use and further development of transferred technology. In Kenya, there is no transfer of technologies beyond the firms which are trying to adopt the green technology while at the same time transfer of technology from the developed nations to firms in Kenya trying to adopt the green technology is almost a pipe dream as they have to think of patents and how to buy the same from the developed world making the technology transfer issue a big challenge

The UNFCCC also recognizes technology development and transfer in several provisions. Despite this, there has been in fact little transfer of climate-friendly technology under the UNFCCC. A central aspect of technology development and transfer is the building of local capacity to design and make technologies which can easily be adopted by our local companies (UNCTAD, 2007).

Countries like Kenya should be given the chance to climb the technological ladder from the initiation stage, where technology as capital goods are imported; to the internalization stage, where local firms learn through imitation and flexible intellectual property rights regime so that there is realization in the effort of various firms that seek to adopt the green technology.

Information challenge, there is lack of information and awareness on the benefits of renewable

energy. Investment allowances and capital allowances were made available for RE(Renewable Energy) implementation since 2008. However, not many companies are aware of the special incentives. There is a clear need for government agencies to help and advice applicants and potential recipients on how to go about applying for RE incentives and the need for more. some non-governmental agencies are now taking up the duty of informing the population through different media houses on the benefits of green technology how the environment can be safe with green technology adoption. However the Government has not clearly come out to encourage people on the same and this is appointer to earlier mentioned policy issues. This research will seek to bring out the informational challenge so that the companies adopting green technology can do indulge in their activities and at the same time disseminate the information through procedures which are recognized one of these will be to launch a forum that will be part of the government agency like the energy regulation commission and which will have specific duty of informing Kenyans on monthly or quarterly basis on development of green technology and gains made overall.

2.6 The Conceptual framework

Reichel and Ramey (1978) cited in Kombo and Tromp, (2006) explain conceptual framework as a set of ideas and principles taken from relevant field of inquiry and used to structure subsequent presentations. Conceptual framework involves forming ideas about relationships between variables in the study and showing these relationships graphically or diagrammatically (Mugenda and Mugenda,2003). It is a useful framework for prioritizing green technology interventions the players, and for formulating or assessing the strategy for firms wishing to adopt the technology from the independent variable side of the figure to the dependent side is, in a sense, a central major goal of green energy adoption. However, the objective of the exercise is to identify where, along the path the adoption of green technology is not effective. The effective adoption of green technology by companies in Kenya process is indicated in figure 1.

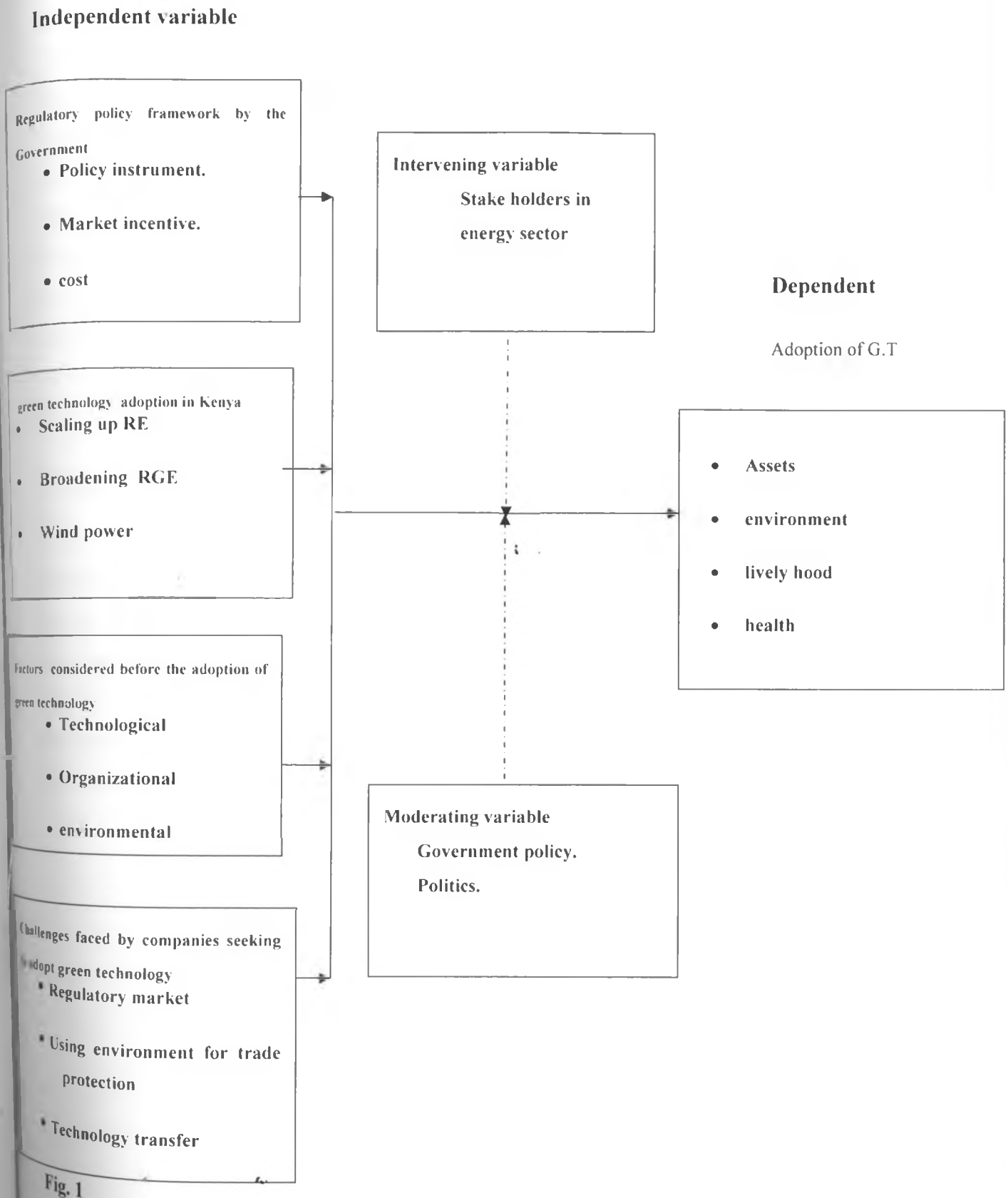
Independent variable
Regulatory policy framework by the Government
• Policy instrument.
• Market incentive.
• cost
green technology adoption in Kenya
• Scaling up RE
• Broadening RGE
• Wind power
Factors considered before the adoption of green technology
• Technological
• Organizational
• environmental
Challenges faced by companies seeking to adopt green technology
• Regulatory market
• Using environment for trade protection
• Technology transfer
Intervening variable
Stake holders in energy sector
Moderating variable
Government policy.
Politics.
Dependent
Adoption of G.T
• Assets
• environment
• lively hood
• health

Fig. 1

The conceptual framework shows the independent factors that influence the dependent factor in this study. The Regulatory policy framework by the Government variable was divided into three indicators policy instruments, market incentive and the cost as elaborated in the review. Extend to which the green technology has been adopted variable contains Scaling up Renewable Energy, Broadening Renewable Green Energy and Wind power energy use and how these indicators influenced dependent variable. The Factors those firms take into consideration before adoption of green technology was divided into three indicators, technological, organizational and environmental and how these indicators influence dependent variable. The fourth independent variable is the challenges faced by companies seeking to adopt green technology. The variable has three main indicators these are regulatory market, using environment for trade protection and technology transfer as explained and how these indicators influence dependent variable.

2.7 Summary of literature review

In this chapter, review of literature related to the study was discussed and relevant references acknowledged. The challenges facing green technology firms in the Kenya was discussed and part of this included regulatory policy frame work, the extent to which green technology has been actualised is discussed. Factors that firms consider before starting green technology activities, and challenges faced by companies seeking to start green technologies are also elaborated as part of this summary. The conceptual framework communicates or indicates how these issues above are interlinked and their effect.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research design, description of the study area, target population, sample size and the sampling technique, data collection instruments, validity and reliability of research instruments and data.

3.2 Research Design

This study employed descriptive survey. Descriptive survey study describes systematically problem, phenomena or provides information about a condition (Kumar, 2009).It is also a method of collecting information by interviewing or administering a questionnaire to a sample of individuals (Orodho, 2003). It can also be used when collecting information about people's attitudes, opinion, habits or any of the variety of education or social issues (Orodho and Kombo, 2002). This method was preferred because there was need to describe study respondents in regard to their attitude or behaviour and opinion about the factors affecting adoption of green technology in Kenya

Descriptive survey data was collected through questionnaire method. In using the questionnaire method, the respondents remained anonymous, expected to be more truthful and were given enough time to think about the question before responding. Thus it was expected that the respondents were more reliable and responsive.

3.3 Target population

This study targeted the companies involved in green technology. There were 50 firms actively doing Green Technology in Kenya. Information from management of these firms indicated that there were a total of 1650 employees who were inclusive of 68 managers at different levels managing different operations from production to Human resources. Because of the nature of information required, this study targeted the mangers within the green technology firms

Table 3.1 distribution of mangers in the sampled Green Technology firm

Firm	Target population	Stratum
Associated Battery Manufacturers	10	**28(A1)**
Renewable Energy Enterprises	2	
Chloride Exide Kenya Limited	9	
Energy Alternatives Africa	3	
Kenital Solar Limited	4	
		26(A2)
Clean energy foundation	3	
Solar World (E.A.) Ltd	4	
Alpa Nguvu Solar Systems	4	
Davis & Shirtliff Limited	4	
Eveready Batteries Kenya	6	
American Solar Technology	3	**14(A3)**
Kenya cleaner production	4	
Kenya Green energy foundation	3	
Clean energy foundation	2	
Green Network Africa	2	
Total	68	

Sources: Kenya cleaner production, Associated Battery Manufacturers, Eveready Batteries Kenya.

In table 3.1 above, the researcher ensured that there was no overlap and this was done proportionately. It is therefore important to note that the strata must be non-overlapping otherwise this may grant some individuals higher chances of being selected and in the process negates the idea of stratified sampling. Different criteria may be used which may be statistical or non-statistical in this case, consideration of the following was used to arrive at strata historical,geograpical and cost e.g. ABM has been in Kenya for quite a long time, it was within Nairobi and it was less costly to talk to managers there. In the last strata, a number of the companies mentioned are far from Nairobi and were visited last. It is generally acceptable that

the size of the sample in each stratum should be taken in proportion to the size of the stratum and allocated proportionally as in this case such that A1 had 28 members, A2 had 26 members and A3 had 14 members in that order.

3.4 Sampling

This research used stratified sampling method to arrive at the sample size. There are many situations in which researchers would choose stratified random sampling over other types of sampling. First, it is used when the researcher wants to highlight a specific subgroup within the population. Stratified sampling is good for this because it ensures the presence of key subgroups within the sample. Researchers also use stratified random sampling when they want to observe relationships between two or more sub groups. With this type of sampling, the researcher is guaranteed subjects from each subgroup are included in the final sample, whereas simple random sampling does not ensure that subgroups are represented equally or proportionately within the sample. The most important advantage of this method is that researchers who are interested in rare extremes of a population can use it because they can representatively sample even the smallest and most inaccessible subgroups of the population. Simple random sampling does not allow this.

Stratified random samples generally require smaller sample sizes as in this specific research, the method in this instance saved a lot of time, money, and effort for the researchers and also ensured high statistical precision as compared to simple random sampling due to the fact that the variability within the subgroups is lower compare to the variations of dealing with an entire population. So this probability research sampling technique ensured representativeness of the sample and also guaranteed better coverage of the population. Further, research sampling technique in this study was used in terms of Clarity and relevance purpose, and researchbility of the problem. Justification of suitability of this methodology is the use of tools that are non-human i.e questionnaires etc which are first pretested to enhance reliability and validity.

So then the sample under consideration being small, called for relevant method which was appropriate. Stratified sampling then saved time, money and effort of the researchers especially considering the time lines within which this study was to be concluded.ie one year.

3.4.1 Sample

Cohen & Manion. (2007) noted that a sample size of about 30% is conventionally acceptable as the minimum percentage to use in research if any or some statistical analysis on the data was intended. The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample. In practice, the sample size used in a study is determined based on the expense of data collection, and the need to have sufficient statistical power. Determination of sample size may also rely on published tables which provide the sample size for a given set of criteria (Isreal, 2009). The stratified working is indicated in the table below and how the stratified sample is arrived at is also explained.

Table 3.2 how stratified sample is arrived at.

Stratum	**A1**	**A2**	**A3**
Sample Size	.03x28	.03X26	.03X14
Rounding the numbers	9	8	5

Stratified sample=Sample A1+A2+A3=22

3.4.2 Sampling procedure

In table 3.3 below,the sample size of each stratum i.e. strata A1, A2, A3 respectively in this stratified sampling technique is proportionate to the population size of the stratum when viewed against the entire population. This means that the each stratum has the same sampling fraction.

Table 3.3 Stratum Population of Each Stratum

Firm	Target population	Stratum
Associated Battery Manufacturers	10	**28(A1)**
Renewable Energy Enterprises	2	
Chloride Exide Kenya Limited	9	
Energy Alternatives Africa	3	
Kenital Solar Limited	4	
		26(A2)
Clean energy foundation	3	
Solar World (E.A.) Ltd	4	
Alpa Nguvu Solar Systems	4	
Davis & Shirtliff Limited	4	
Eveready Batteries Kenya	6	
American Solar Technology	3	**14(A3)**
Kenya cleaner production	4	
Kenya Green energy foundation	3	
Clean energy foundation	2	
Green Network Africa	2	
Total	68	

In table 3.3 above the population of each stratum is indicated The researcher chose a sampling fraction of 30% and this was randomly sampled from each of the stratum.

The researcher had 3 strata with 28, 26 and 14 population sizes respectively.

Table 3.4 below indicates the computation of sample size for each of the stratum indicated above

Table 3.4 computation of the sample.

Stratum	A1	A2	A3
Population Size	28	26	14
Sampling Fraction	30%	30%	30%
Sample size	(.03X28)	(.03x26)	(.03x26)
Final sample(rounding off)	9	8	5

Table 3.4 above indicates that stratum A1 had asample size of 9 respondents,8 respondents were in A2 and 5 respondents in from A3.The total sample size in this study was 22 respondents

3.5 Data Collection Instrument

The researcher designed and used a questionnaire with both closed and open ended questionnaire as the instrument for data collection. The questionnaire was chosen because it provides a high degree of data standardization and adoption of generalized information amongst any population. (Chandra. 2003),The questionnaire gave the respondeds adequate time to think through the questions before responding or writing the answer down.The method was also cost effective compared to other instruments as face- to- face interviews

Questionnaires are a good survey technique, because the cost (printing, distribution, collection, analysis) is low relative to that of other methods such as personal interviews, because participants can respond at their own convenience, because no interviewer bias is introduced, and because responses can be kept completely confidential.

The questionnaire was divided into three sections. (See appendix 3). Part A was used to collect demographic data i.e. age, education background and position held by the respondent. In a given firm. Part B of the questionnaire sought for information on Green Technology firms, and factors that influence their operations. Part C of the questionnaire sought for information on policy frame work for Green Technology in Kenya. Part D sought for information of factors that firms consider before adopting Green Technology. The last part of the questionnaire sought to find out

the challenges that firms were facing in the adoption of Green Technology.

3.5.2 Validity of the Instrument

Validity referred to the accuracy and meaningfulness of inferences, which are based on the research results (Mugenda &Mugenda,2003).It is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. Prior to using the research instrument, the content validity of the instruments was be determined by the researcher discussing the items in the instrument with the supervisor and and putting the same under peer consideration (Robson, 2002). In establishing the content validity, the study based on literature review which revealed the essential aspect of the variables that were to be included in the content. The researcher used a number of techniques to ensure that the information was correct and these included gross examination, recording personal thought while asking the questions and revisiting the firms at least more than once this also involved triangulation i.e. a method of cross-checking data from multiple sources to search for irregularities in the research data (O'Donoghue & Punch, 2003)..

3.5.3 Reliability of Research Instruments

Reliability, which has two aspects, stability and equivalency, is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda& Mugenda, 2003). To ascertain the reliability of the questionnaires, a pilot study was be conducted in 10% of the sampled populations which was then excluded in the actual data collection. The respondents were requested to leave unanswered the items they found ambiguous. The information that was gathered was used to clarify ambiguities in the instruments. Only the items that were considered relevant for the study were included in the research instruments.

3.5.4 Data Collection Procedures

Data for this study was obtained using questionnaires. The researcher and a research assistant personally visited the sampled firms for the administration of the questionnaire. A research permit was obtained before the actual collection of data.

Before visiting a firm, the researcher set appointments with the management of the firms through

the telephone. The researcher and the assistant visited the firms on the appointment dates where they administered the questionnaires to the respondeds who were randomly sampled. Before responding to the questionnaires, the instructions were explained to the respondents. They were given about three hours to fill the questionnaires after which these were collected. This approach ensured a high response rate as compared to leaving the questionnaires with the respondents and going for them later.

3.5.5 Data analysis

The data obtained through the questionnaires was analysed using Statistical Package for Social Scientists (SPSS) Version 17 and MS-Excel using percentages and frequency distribution. SPSS is a modern technique for data analysis, which is reliable, and affordable.(Onyango, 2001 and Mugenda, 2008). SPSS is known for its ability to process large amounts of data with its wide spectrum of statistical procedures purposely for social Scientists. The data obtained was subjected to quantitative analysis in order to determine whether there was a problem in adoption of green energy. The findings were presented in form of tables.

3.5.6. Table 3.2 Operationalization of variables

Objectives	Type of variables	Indicators	Measures	Level of scale	Methods of data collection	Analysis
To establish how the regulatory framework for green technology has affected the adoption of green technology by firms in Kenya	IV Policy Instruments	Energy distribution	Convenience of distribution	Ordinal	Descriptive survey	Qualitative and quantitative
		Market environment	Response of market	Ordinal	Descriptive survey	Qualitative and quantitative
		Green firms coverage	Number of green firms coming up	Interval	Descriptive survey	Qualitative and quantitative
	DV Green technology firms	Environment	Change of the enviroment	Ordinal	Descriptive survey	Qualitative and quantitative
		Livelihood	Change in living	Ordinal	Descriptive survey	Qualitative and quantitative
		Health due to good environment	Health status difference	Ordinal	Descriptive survey	Qualitative and quantitative
To Find out extent to which green technology has been adopted by firms in Kenya	IV Scaling up Renewable Energy(RE)	Economic viability	Economic improvement	Ratio scale	Descriptive survey	Qualitative and quantitative
		Social viability	Social integration of groups in these areas.	Ordinal	Descriptive survey	Qualitative and quantitative
		Environmental viability	Improvement in environment	Ordinal	Descriptive survey	Qualitative
	DV	Environment	Change of the	Ordinal	Descriptive	Qualitative

	Green technology firms		environment		survey	and quantitative
		Livelihood	Change in living	Ordinal	Descriptive survey	Qualitative and quantitative
		Health due to good environment	Health status difference	Ordinal	Descriptive survey	Qualitative and quantitative
To find out the main factors that firms take into consideration before the adoption of green technology	IV Technological factors	Technology improvement	Compatibility and relative advantage	Ordinal	Descriptive survey	Qualitative and quantitative
		Improved working	Identifying sources of pollution	Ordinal	Descriptive survey	Qualitative and quantitative
		Efficiency	Benefits of green innovations	Ordinal	Descriptive survey	Qualitative and quantitative
	DV Green technology firms	Environment	Change of the environment	Ordinal	Descriptive survey	Qualitative and quantitative
		Livelihood	Change in living	Ordinal	Descriptive survey	Qualitative and quantitative
		Health due to good environment	Health status difference	Ordinal	Descriptive survey	Qualitative and quantitative
To Examine the challenges faced by companies seeking to adopt green	IV Regulating the market	No of firms that operate within the framework of government regulation and policies	No of firms licensed to operate	Ratio scale	Descriptive survey	Qualitative and quantitative

technology		limits to pollution and emissions	No of regulations and Policies	Ratio scale	Descriptive survey	Qualitative and quantitative
		environmental taxes and fines	Fines and punishment by authority	Ratio scale	Descriptive survey	Qualitative and quantitative
	DV Green technology firms	Environment	Change of the environment	Ordinal	Descriptive survey	Qualitative and quantitative
		Livelihood	Change in living	Ordinal	Descriptive survey	Qualitative and quantitative
		Health due to good environment	Health status difference	Ordinal	Descriptive survey	Qualitative and quantitative

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.0 Introduction

The purpose of this study was to investigate the factors that affect the adoption of green technology by Kenyan firms with a special focus on firms in the energy sector. This chapter presents analysis of data and the research findings of the study. The results are presented on the factors that affect the adoption of green technology by Kenyan firms in the energy sector. The specific areas discussed in this section include questionnaire return rate, gender distribution of the respondents, age of the respondents, working experience, level of education, job cadre, regulatory framework, adoption of green technology by firms in Kenya, factors that firms take into consideration before the adoption of green technology and the challenges faced by companies seeking to adopt Green Technology. The study findings were presented according to response from the research questions raised in chapter one of this study.Demograhpic data on respondents is also presented.

4.1 Questionnaire Return Rate

The study sampled 22 respondents from the target population in collecting data presented that was required in this study. Table 4.1 below indicates the response.

Table 4.1: questionnaire Response Rate

Response	Frequency	Percentage
Responded	19	86.4
Not responded	3	13.6
Total	22	100

Table 4.1 above indicates that there was a high response rate. From the study, 19 out of 22 target respondents filled in and returned the questionnaire return rate of 86% was realised. Only 3(13.6 %) respondents did not return the questionnaire. This response was commendable and helped the researcher to have true representative data for drawing conclusions.

4.2 Demographic Characteristics of the Respondents

This study sought to establish the demographic characteristics of the respondents in terms of gender, academic qualification, age length of employment and designation. The study findings are given below.

4.3.1 Distribution of the Respondents by Gender

The study sought to find out the gender of the respondents.

. Table 4.2 below shows the distribution of the respondents by gender.

Gender	Frequency	Percentage
Male	12	54.5
Female	7	31.8
No response	3	13.6
Total	22	100

Table 4.2 above indicates that, 12 (54.5%) of the respondents were male while 7 (31.8%) of them were female and 3(13.6%) did not respond. It can be concluded that the majority of the employees in the energy sector firms are male staff. The findings show that the institutions studied had both male and female members.

4.3.2 Highest Academic Qualifications

The energy sector requires staffs in different cadre. This study sort to find out academic qualifications of the respondents. This was thought to be necessary in order to establish whether academic qualification of the respondents could be related to their awareness on issues of Green Technology. Table 4.3 below indicates the educational level of the respondents of this study

Table 4.3: Level of Education

Gender	**Frequency**	**Percentage**
college	10	45.4
University	9	40.9
No response	3	13.6
Total	22	100

Table 4.3 above indicates that, 10 (45.4%) of the respondents had college education, while 9 (40.9%) of the respondents indicated that they had university education and 3(14%) did not respond. This implied that all respondents were in apposition to understand and respond to questionnaires adequately and were aware of policy issues concerning Green Technology.

4.3.3 Distribution of Respondents by Age

Green technology is about a technological advancement concept which is likely to be easily up taken by different age groups differently. This Study tried to establish the age of the respondents in order to find the general age bracket of those in green technology industry. It is generally believed that younger people are more receptive to change than older people. The study finding is shown in table .4 below.

Table 4.4: Age Brackets of the Respondents

Age Bracket	Frequency	Percentage
18-23	4	18.2
24-29	6	27.3
30-35	3	13.6
36-40	6	27.3
No response	3	13.6
Total	**22**	**100**

From table 4.4 above indicates that, 6 respondents (27.3%) were aged between 24-29 years while those between 36-40 were 6 (27.3%).The finding indicate the distribution of employees from different age brackets in the Green Technology industry. There was no response form 13.6% of the respondents.

4.3.4 Working Experience in the Firms

The length of service/working in an organization determines the extent to which one is aware of the issues affecting the organisation. This study sought to find out the work experience of the respondents are given in able 4.5 below.

Table 4.5: Length of Employment.

Length of Service in Years	Frequency	Percentage
1-5	5	22.7
6-10	12	54.5
11-15	2	9.1
No response	3	13.6
Total	**22**	**100**

Table 4.5 above, indicate that 12 respondents showing (54.5%) had work experience of 6-10 years, 5 (22.7%) had experience of 1-5years, only 2 (9.1%) they had work experience of 11-15 years while 3(13.6%) did not respond. This study finding may inform the fact that Green Technology industry is relatively new area and employees lack long work experience.

4.3.6 Distribution of the Respondents by Job Cadres

The study sought to establish the job designation in order to find out the representation of management at various levels the study findings are indicated in table 4.6 below

Table 4.6: Job Category of the Respondents.

Job Category	Frequency	Percentage
Top Management	7	31.8
Middle level Management	12	54.5
No response	3	13.6
Total	**22**	**100.0**

Table 4.6 above indicate that, 12 (31.8%) held top management positions, while 12(54.5%) held middle level management positions. There was no response for 3(13.6%).

4.4 Regulatory Policy Framework

The main task of this study was to establish the level of awareness of the policy frame work affecting Green Technology. This could lead to establish how the regulatory framework has

affected the adoption of Green Technology by firms in.Table 4.7 below indicate the rating on level of awareness.

Table 4.7: Rating the Policy Framework.

Aspects of Policy Framework	Poor	fair	good	excellent
Policy Instruments	68.4	0	31.6	0
choice of a specific policy instrument	52.6	21.1	26.3	0
Policies based on market incentives	0	63.2	26.3	10.5
Cost reduction policies	5.3	57.9	10.5	26.5
Public investment and market facilitation policies	0	47.4	26.3	26.3
Policies based on support direction	5.3	63.2	26.3	26.3
Policies addressing generation and demand	5.3	52.6	15.8	26.3

Table 4.7 above indicate that the respondents rated the policy instruments in the firms as poor as shown by score of 68.4 percent , they indicated that the choice of a specific policy instrument is also poor as shown by 52.6 percent , policies based on support direction is fair as shown by 63.2 percent, public investment and market facilitation policies are fair as shown by 47.4 percent, the policies addressing generation and demand are also fair as shown by 52.6 percent, cost reduction policies are fair as shown by 57.9percent, while they rated the policies based on market incentives to be fair as shown by a mean score of 63.2 percent

The study further sought to establish the extent to which Government regulatory framework affects Green Technology in firms. The responses are as depicted in Table 4.8 below

Table 4.8: Effects of Government Regulatory Framework on Green Technology in Firms

Extent	Frequency	Percent
Moderate extent	9	40.9
High extent	10	45.5
No response	3	13.6
Total	**22**	**100.0**

Table 4.8 above indicate that 45.5% of the respondents consider the government regulatory framework to influence green technology in firms to a high extent, while 40.9% of them

indicated that government regulatory framework affects green technology in firms to a moderate extent. There was no response from 3(13.6%)

4.4.1 Influence of Green Technology on Environment

This study sought to find out whether the regulatory frame work has had any impact on environment. This would imply that adoption of Green. Technology has a bearing on environment. Table 4.9 below indicate the observation made by respondents on changes on the environment.

Table 4.9: Changes Noticed in the Environment and Vegetation for the Last 10 Years

Changes in the Environment and Vegetation	Frequency	Percent
Increased grassland	10	45.5
Increased tree cover	2	9.1
Diminishing grassland	4	18.2
Diminishing tree cover	3	13.6
No response	3	13.6
Total	**22**	**100**

Table 4.9 above indicates that 45.5% of the respondents believe there has been increased grassland cover, while 9.1% of the respondents indicated that there has been increased tree cover. However it is important to note that 18.2% indicated that grassland has actually diminished in the last 10years.This may indicate that Green Technology is having little impact on environment which is likely to be a result of its low inception levels in the country.

4.4.2 Distributed Renewable Energy Generation Policy Instrument

The study set to find out the rating of distributed Renewable Energy Generation Policy Instrument from the respondents and their comment on the same

The results are depicted in table 4.10.below

Table 4.10: Distributed Renewable Energy Generation Policy Instrument

Rating	Frequency	Percent
Poor	3	13.6
Fair	3	13.6
Good	10	45.5
Very good	3	13.6
No response	3	13.6
Total	22	100.0

Table 4.10 above indicate that, 45.5% of the respondents commented that the distributed renewable energy generation policy instrument was good, while 13.6% of them indicated that distributed renewable energy generation policy instrument was poor, while13.6% commented it to be fair and 13.6 % very good. There was no response of 13.6%

4.5 Adoption of Green Technology by Firms in Kenya

The study sought to establish the extent to which green technology had been adopted by firms in Kenya. Table 4.11 below shows the response on the extent of adoption of Green Technology in Kenya

Table 4.11: Extent to which Green Technology has been adopted by Firms in Kenya

Extend	Frequency	Percentage
Good	13	59.1
Average	3	27.5
Poor	3	59.2
Very poor	3	6.6
Total	22	100

Table 4.11 above indicate the study, majority of the respondents (shown by 59.1%) unanimously reiterated that green technology had been moderately adopted by firms in Kenya, while 13.6% of them indicated that green technology had been adopted by firms in Kenya to a high extent and very high extent in each case.

The study further sought establish the extent to which scaling-up renewable energy has contributed to economic, social, environmental, new economic opportunities and increasing energy. Table 4.12 below indicates the response.

Table 4.12: Opportunities Resulting from Activity-Scaling Up Renewable Energ

Activity-scaling up renewable energy	Low	moderate	high	very high
Economic opportunities	5.3	0	47.4	47.4
Social opportunities	0	36.8	52.6	10.5
Environmental opportunities	0	36.8	47.4	15.8
New economic opportunities	10.5	36.8	47.4	5.3
Increasing energy opportunities	26.3	0	73.7	0

table 4.12 above shows that, majority of the respondents indicated that scaling-up renewable energy has highly contributed to economic opportunities as shown by score of 47.4%, as well as environmental opportunities shown as high by 47.4% and social opportunities shown by a score of 52.6, while it has moderated to contributed to new economic opportunities shown by score of 47.4% and increasing energy opportunities shown by a score of 73.7%.

4.5.1Extent of the Distribution of Wind Power in the Country

The study sought to establish the extent of the distribution of wind power in the Country. Table

4.13 below shows the results.

Table 4.13: Extent of the Distribution of Wind Power in the Country.

Extent	Frequency	Percentage
Very low	11	50
Low	8	36.4
No response	3	13.6
	22	100

Majority of the respondents as shown by 50% indicated that the distribution of wind power in the Country was very low, while 36.4% of the respondents indicated that the distribution of wind power in the Country was low. There was no response from13.6%

4.5.2 Effectiveness Regulatory Option Feed in Tariff on Cogeneration of Green

The study sought to establish how effective the regulatory option has been in feed-in-tariff, specifically on cogeneration of green energy in Kenya. The response is indicated in Table 4.14 below

Table 4.14: Effectiveness Regulatory Option Feed in Tariff on Cogeneration of Green Energy.

Effectiveness	Frequency	Percentage
Very effective	3	13.6
Effective	8	36.4
Neither effective nor ineffective	5	22.7
Ineffective	3	13.6
No response	3	13.6
Total	22	100

Table 4.14 above indicates that 36.4% of the respondents rated the regulatory option feed in tariff on cogeneration of green energy to be effective, 22.7% of them rated it to be neither effective nor ineffective, while 13.6% of the respondents rated that the regulatory option feed in tariff on cogeneration of green energy was very effective and 13.6% rated it ineffective.13.6% did not respond..

The respondents were further required to comment on broadening renewable green energy in the

country.

Table 4.15: Rating the Broadening Renewable Green Energy in the Country.

Effectiveness	Frequency	Percentage
Very good idea	9	40.9
Good idea	10	45.5
No response	3	13.6
Total	22	100

Table 4.15 above indicate, majority of the respondents (40.9%) commented that broadening renewable green energy in the country is a good idea, while 45.5% of them indicated that it was a very good idea.13.6% failed to respond

4.5 Factors considered by firms before the Adoption of Green Technology

The study examined the extent to which firms considers factors as technological, organisational and environmental factors before adopting Green Technology. Such factors influence adoption of either negatively or positively. Table 4.16 below shows the results on the level to which firms in Kenya consider certain factors before adopting green technology.

Table 4.16: Extend to which Firms Consider Certain Factors before Adopting Green Technology.

Level of consideration	Frequency	Percent
High extend	10	45.5
Low extend	9	40.9
No response	3	13.6
Total	22	100

Table 4.16 above indicate that, 45.5% considered certain factors to high extend, while 40.9% consider same factors to low extend and 13.6% did not respond.

4.5.1 Effectiveness of the Technological Factors in Green Technology Adoption

The study sought to find out the effectiveness of technological factors i.e. environmental management effectiveness, technology transfer effectiveness etc. in facilitating the adoption of Green Technology. The results are indicated in table 4.17 below.

Table 4.17: Effectiveness of the Technological Factors in Green Technology Adoption

Effectiveness	Frequency	Percentage
Very effective	4	18.2
Effective	12	54.5
Neither effective nor ineffective	3	13.6
No response	3	13.6
	22	100

Table 4.17 above indicate that, 54.5% of the respondents thought that technological factors in green energy adoption by firms in Kenya as effective, 18.2% of them rated technological factors in green energy adoption by firms in Kenya as being very effective, while 13.6% of the respondents indicated that the technological factors in green energy adoption by firms in Kenya are neither effective nor ineffective. There was no response from 13.6%

4.5.2 Extent of Considering Organizational Factors in the adoption of Green.

The study sought to find out the extent to which the firms consider organizational factors such as

processes, organizational culture, politics and leadership. Table 4.18 below shows the results. Of this finding.

Table 4.18: Extent of Considering Organizational Factors in the adoption of Green Technology.

Extent	Frequency	Percentage
Very high	1	4.5
High	2	9.1
Moderate	12	54.5
Low	4	18.1
No response	3	13.6
Total	22	100

Table 4.18 above indicate that 54.5% of the respondents thought that organizational factors are moderately considered before firms adopt green technology in Kenya. 18.1% of them indicated organizational factors are lowly considered before firms adopt green technology in Kenya. 9.1% of the respondents rated the consideration as being high, while 4.5% of the respondents thought that organizational factors are very high considered before firms adopt green technology in Kenya. There was no response from 13.6%.

4.5.3 Stage at which Firms Consider Environmental Factors in Adopting of Green Technology

The study sought to establish the stage at which firms consider environmental factors in adopting of green technology. Such factors as environmental uncertainty, network relations, external resource availability. Table 4.19 below indicates the findings and response form the respondents.

Table 4.19: Stage at which Firms Consider Environmental Factors in Adopting of Green Technology.

Stages of Considering Environmental Factors	Frequency	Percentage
At construction stage	13	59.1
At operation stage	6	27.3
No responded	3	13.6
Total	22	100

Table 4.19 above indicates that the respondents 59.1% showed that environmental factors in adopting of green technology are considered at the construction stage, as compared to 27.3% of the respondents who indicated that environmental factors in adopting of green technology are considered at the operation stage and 13.6 did not respond

4.6 Challenges faced by Companies seeking to adopt Green Technology

Study sought to establish challenges faced by companies seeking to adopt green technology. Such challenges included use of environment for trade protection, Regulating the market, informational challenge etc. As such the respondents were required to rate the level of challenges faced by companies seeking to adopt green technology. Table 4.20 indicates these findings

Table 4.20: Rating the Level of Challenges faced by Companies Seeking to Adopt Green Technology.

Rating the Level of Challenges	Frequency	Percentage
Very high	13	59.1
high	4	27.3
Moderate	2	9.1
No response	3	18.1
Total	22	100

Table 4.20 above indicate the findings from the respondents, 59.1% rated the challenges very

high,18.2% rated the same as high while 9.1 percent rated the same as moderate. There was no response form 13.6percent.This may be an indicator that challenges faced by firms trying to adopt Green technology are actually very high since this is an emerging technology in Kenya

The study sought to establish how Technology Transfer is Challenge to Firms that seek to adopt Green Technology such challenges include, intellectual property rights, unfavourable access to patents, and lack of efficient use of transferred technologies etc. Table 4.21 below indicate the information.

Table 4.21: Technology Transfer as Challenge to Firms that Seek to adopt Green Technology.

Challenge	Frequency	Percentage
Very big challenge	14	63.6
Big challenge	4	18.2
Not a challenge	1	4.5
No response	3	13.6
Total	22	100

Table 4.25 above indicates that 63.6% of the respondents agree that technology transfer is a very big challenge to firms that seek to adopt green technology in Kenya, 18.2% of them indicated that it is a big challenge, while 4.5% of the respondents indicated that technology transfer is not a challenge to firms that seek to adopt green technology in Kenya. There was no response on 13% of the respondents. From this indication, there is likelihood that technology transfer is one of the challenges encountered by the firms that need to adopt Green Technology in Kenya

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The study investigated, through descriptive survey, the factors affecting adoption of green technology by firms in Kenya. It further sought to establish the extent to which Green Technology has been adopted in Kenya and the challenges encountered by companies engaged in Green Technologies. This chapter therefore presents the summary of findings, draws conclusion and makes recommendations on the findings of the study.

5.1 Summary of Findings

This study had four objectives and consequently made four major findings. Below is a presentation of the summary of the findings of this study.

The study investigated how the regulatory framework for green technology has affected the adoption of green technology by firms in Kenya. The study found out that Majority of the respondents rated the policy instruments in the firms as being poor as shown by 68.4% they indicated that the choice of a specific policy instrument is good as shown by 26.3%.policies based on support direction is fair as shown by 63.2% , public investment and market facilitation policies are fair as shown by 47.4%, the policies addressing generation and demand are also fair as shown by 52.6 %, cost reduction policies is fair as shown by 57.8% of the respondents , while they rated the policies based on market incentives to be fair as fair at 63.2%.The respondents' comments on various government policy frame work and their effect on adoption of green technology by firms in Kenya were all different at various levels as indicated earlier

The study investigated the extent, to which green technology has been adopted by firms in Kenya, From the study, majority of the respondents (shown by 59.1. %) unanimously reiterated that green technology had been moderately adopted by firms in Kenya, while 13.6% of them indicated that green technology had been adopted by firms in Kenya to a high extent and very high extent in each case. This indication may be a bad pointer to the growth problem in this subsector of Kenya's economy.

The study sought to find out the main factors that firms take into consideration before the

adoption of green technology. It was clear from the study, that 45.5% of the respondents reiterated that firms in Kenya consider certain factors before adopting green technology at a high level, while 40.9% of the firms in Kenya consider certain factors before adopting green technology at a moderate level. Many factors like environmental challenges should be closely considered otherwise many problems may emerge on the way and delay any anticipated gains.

The study also sought to investigate the challenges faced by companies trying to adopt Green Technology. There was an indication that 53.6% of the respondents concurred that technology transfer is a very big challenge to firms that seek to adopt green technology in Kenya, 18.1% of them indicated that it is a big challenge, while 4.5% of the respondents indicated that technology transfer is not a challenge to firms that seek to adopt green technology in Kenya. There was no response from 13.6% of the respondents. These challenges bring with them stagnation in growth and they need to be addressed by relevant authorities.

5.3 Conclusion

From the research finding of this study, the following conclusions were arrived at. First, the policy regulatory framework does not seem to be influencing the adoption of Green Technology in Kenya.

Secondly, the level of awareness of the advantages and use of Green Technology is still low in Kenya.

Thirdly, there were many factors affecting the adoption of Green Technology and this ranged from technological, to environmental factors. All these factors may be negatively influencing the number of firms wishing to adopt Green Technology.

Lastly it was concluded that there are many challenges in Green Technology such as, informational, technological, environmental, policy framework etc. These challenges have acted as constraint in the development of green technology in the country

5.4 Recommendations

The study made the following recommendations strongly that the Government need to look across the spectrum and deep in all the factors affecting the adoption of green technology by firms s in Kenya ranging from effects of regulatory frame work to challenges faced by same firms.

The Government need to renew or revamp green technology policy in order to ensure that it encourages and promotes the adoption of green technology by firms and individuals.

There is also need to investigate further the other factors that are part of green technology policy that may be causing low levels of Green Technology adoption in Kenya

5.5 Suggestion for further study.

There is need to investigate further the reason why Green technology is not in tandem with the industrial growth in the country.

This being relatively new area of research in Kenya, there is need for more studies in order to to fully understand the intricacies between the various variables that are at work in Green Technology.

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Appendices1: Introductory Letter

JACKSON OMAMO,

MAPPM CLASS

UNIVERSITY OF NAIROBI.

MANAGING DIRECTOR,

Dear Sir,

RE: PERMISSION TO COLLECT DATA FOR ACADEMIC RESEARCH PROJECT.

The subject above underlined refers.Im a masters student in project management and planning. Part of the requirement for this course is to come up with a research proposal or project in partial fulfilment of the programme.Im therefore required, towards this fulfilment, to carry out a research with and intention of solving a problem in any area of interest. I chose the topic "Factors affecting the adoption of green energy technology by firms in Kenya".

In my wide reading and search I found out that your firm is involved in green technology activities. I, therefore wish to request for your permission to carry out the said study in your area of operation. The information you will provide will solely be used to accomplish this academic requirement and not for any other purpose.

Yours Faithfully,

Jackson O. Omamo.

Appendix II: Letter of transmittal

RE: INTRODUCTION

Dear Respondent.

This questionnaire is aimed at providing information on factors affecting the adoption of green technology by firms in Kenya. You are kindly requested to assist in provision of information by providing the details of information required. The information you provide will be treated with confidentiality and used for the sake of accomplishing academic requirement. Note that all answers are neither wrong nor right. The respondents are only from the management cadre so as to get optimum information.

Respondent Name (manager): _____

Number of Respondents: _____

APPENDIX 111 QUESTIONNAIRE

Factors affecting adoption of green technology by firms in Kenya.

PART A: Background information

BACKGROUND SECTION

1. What is your gender?

   Male [ ] Female [ ]

2. Level of completed education?

   Primary [ ] Secondary [ ] College [ ] University [ ]

3. What is your age in years?

   Below 18 yrs [ ] 18-23yrs [ ] 24-29yrs [ ] 30-35yrs [ ] 35-40yrs [ ]

   40-50yrs [ ] 50-60yrs [ ] 60 and above indicate.

4. For how long have you worked with this firm?

   1-5yrs [ ] 6-10yrs [ ] 11-15yrs [ ] 16-20yrs [ ] 20yrs and above [ ]

5. Which cadre do you belong?

   Top management [ ] middle level management (technician) [ ] operation staff [ ]

PART B.

Regulatory policy framework.

QI) Please rate and comment on the following government policy frame work and their effect on adoption of green technology by firms in Kenya.

	Policy	Poor	fair	good	Excellent	Comment
	Policy Instruments	4	3	2	1	
	choice of a specific policy instrument					
	Policies based on market incentives					
	Cost reduction policies					
	Public investment and market facilitation policies					
	Policies based on support direction					
	Policies addressing generation and demand					

Please answer the following items. Tick (√) in the appropriate space

2) i) To what extent do you think Government regulatory framework has affected your green technology firms in Kenya.

a) Very high extent [ ]

b) High extent [ ]

c) Moderate extent [ ]

d) No extent [ ]

e) Others specify_____

ii) What has been the effect of government regulatory frame work on your firms operations?

a) Very high effect [ ]

b) High effect [ ]

c) Moderate effect [ ]

d) No effect at all [ ]

e) Others specify_____

iii) What changes have you noticed in the environment or natural vegetation cover at either community or national level over the last 10 years where the green energy firms are working?

Diminishing tree cover [ ]

Diminishing grasslands [ ]

Increased tree cover [ ]

Increased grasslands [ ]

iv) What is your comment on distributed renewable energy generation policy Instrument?

a) Very good policy [ ]

b) Good policy [ ]

c) Fair policy [ ]

d) Poor policy [ ]

e) No comment [ ]

Part c: The extent to which green technology has been adopted by firms in Kenya. Please Tick (√) in the appropriate space.

Q1) (i) what is the Extent of green technology adoption by firms in Kenya?

a))very high extend [ ]

b) High extend [ ]

c) Moderate extend [ ]

d) low extend [ ]

e) Others specify_____

ii) Please indicate the extent to which Scaling-Up Renewable Energy has contributed to economic, social, environmental, new economic opportunities and increasing energy.

1-very high 2-high 3-moderate 4 low.

	Activity-scaling up renewable energy	low	moderate	high	Very high	Comment
	Economic	4	3	2	1	
	social					
	Environmental					
	new economic opportunities					
	increasing energy					

iii) To what extend is the distribution of wind power in the country?

a) Very high

b) High

c) Very low

d) Low

e)Non existent

iv) How effective has been Regulatory Option – Feed-in-Tariff, specifically on cogeneration of green energy in Kenya.

a)Very Effective

b)Effective

c) Neither effective nor Ineffective

d) Ineffective

e) Others please specify----------

iv) What is your comment on Broadening renewable green energy in the country?

a)Very good idea [ ]

b) Good idea [ ]

c) Very bad idea [ ]

d) Bad idea [ ]

e) Others please specify----------

v) How do you rate the support of civil society in Kenyan firms adopting green energy technology?

Very good [ ]

Good [ ]

Fair [ ]

Poor [ ]

Not supportive at all [ ]

Part D Factors that firms take into consideration before the adoption of green technology.i.eTechnological, Informational, Environmental, Organizational factors

Tick (√) in the appropriate space

(ii) To what level do firms in Kenya consider certain factors before adopting green technology?

a)very high level [ ]

b) High level [ ]

c) Moderate level [ ]

d) Low level [ ]

e) Others specify_____

iii} How can you rate these factors in this specific area?

Very good [ ]

Good [ ]

Fair [ ]

Poor [ ]

Others specify ----------

iv}How effective are the technological factors in green energy adoption by firms in Kenya?

Very Effective [ ]

Effective [ ]

Neither effective nor Ineffective [ ]

Ineffective [ ]

v) What extent do you think Organizational factors are considered before firms adopt green technology in Kenya?

a)Very high extent [ ]

b) High extend [ ]

c) Moderate extend [ ]

d) Low extend [ ]

e) Others specify_____

vi) At what stage or when do firms consider environmental factors in adopting of green technology?

a) At all stages [ ]

b) At construction [ ]

c) At operation [ ]

d) At no stage [ ]

e) Others specify_____

Neither effective nor Ineffective [ ]

Ineffective [ ]

v) What extent do you think Organizational factors are considered before firms adopt green technology in Kenya?

a)Very high extent [ ]

b) High extend [ ]

c) Moderate extend [ ]

d) Low extend [ ]

e) Others specify_____

vi) At what stage or when do firms consider environmental factors in adopting of green technology?

a) At all stages [ ]

b) At construction [ ]

c) At operation [ ]

d) At no stage [ ]

e) Others specify_____

Neither effective nor Ineffective [ ]

Ineffective [ ]

v) What extent do you think Organizational factors are considered before firms adopt green technology in Kenya?

a)Very high extent [ ]

b) High extend [ ]

c) Moderate extend [ ]

d) Low extend [ ]

e) Others specify_____

vi) At what stage or when do firms consider environmental factors in adopting of green technology?

a) At all stages [ ]

b) At construction [ ]

c) At operation [ ]

d) At no stage [ ]

e) Others specify_____

Part E: Challenges faced by companies seeking to adopt green technology. Tick (√) in the appropriate space

1) i) How do you rate the level of challenges faced by companies seeking to adopt green technology?

a)very high level [ ]

b) High level [ ]

c) Moderate level [ ]

d) Low level [ ]

e) Others specify_____

ii) Are you aware and informed of Market regulatory challenge by these firms seeking gren energy adoption in Kenya?

a. well informed [ ]
b. informed [ ]
c. fairly informed [ ]
d. Poorly informed [ ]

iii) How is Using environment for trade protection an effective a challenge to firms which seek to adopt green energy technology in Kenya?

Very Effective [ ]

Effective [ ]

Neither effective nor Ineffective [ ]

Ineffective [ ]

v) What is your view on Technology transfer as challenge to firms that seek to adopt green technology in Kenya?

a)very big challenge [ ]

b) Big challenge [ ]

c) Challenge [ ]

d) not a challenge [ ]

e) Others specify_____

vii). what is you view on informational challenge as a factor to be considered by green technology firms before adoption of the same.

a)very big challenge [ ]

b) Big challenge [ ]

c) Challenge [ ]

d) Not a challenge [ ]

e) Others specify_____

Thank you for your cooperation.