FACTORS INFLUENCING COMMUNITY PARTICIPATION IN GEOTHERMAL ENERGY PROJECT IMPLEMENTATION: A CASE OF MENENGAI GEOTHERMAL POWER PROJECT IN KENYA.

BY

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A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF ARTS DEGREE IN PROJECTS PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI

2013

DECLARATION

This Research study is my own work and has not been presented for the award of diploma or degree in any other university.

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L50/70601/2011

This research study has been submitted for examination with my approval as University supervisor.

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DEDICATION

This research study is dedicated to my friend and beloved wife ColletaCheropTulel for her support and understanding throughout the course of my study.

AKNOWLEDGEMENT

The writing of this research study has been one of the most significant academic challenges I have ever came across. Without the guidance, patience and support of my supervisor Dr. John MomanyiMironga this study would not have been successful, I am genuinely indebted to him.

I would like to thank Mr. Joseph Mungai resident Lecturer Nakuru Extra Mural Centre for his material and moral support in preparation of this project report. I would also like to acknowledge the support from Nakuru Extra Mural Staff: Mr. Edward Otieno, Maureen Ndung'u and Ms Leah Mwanzia who coordinated the class activities.

I would also like to thank all my course mates for the support they offered to me during my course workand project work it is to you them that I owe my greatest gratitude. I also owe deep gratitude to my Manager, Grace Mwai for her continuous support in my entire study period; her guidance and support in assisting me getting approvals from the Company contributed a lot towards completion of this academic program. I also extent my gratitude to the entire Community Relations Department of Geothermal Development Company, for their support and cooperation during my study time, I also give special thanks to my family for the support, sacrifice and encouragement they accorded me throughout the research work.

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ABBREVIATIONSAND ACRONYMS

GDC: Geothermal Development Company

GW: Gig watt

IEA: International Energy Agency

IPP: Independent Power Producers

MW: Megawatt

SPSS: Statistical Package for Social Sciences

CSR: Corporate Social Responsibility

ABSTRACT

Through the Kenya Vision 2030 policy, economic transformation is envisioned with plans to expand the energy sector through clean renewable options such as geothermal energy in bid to meet the current and future energy demand. Geothermal prospects in the country occur mainly within the Rift Valley where wide spread volcanic activity and geothermal manifestations signify the existence of geothermal resources, with an estimated potential of between 7000MW to 10,000MW.The country is currently drilling wells for geothermal power in only two areas including Olkariaand Menengai Geothermal Power Projects. Currently, the integration of social concerns into the decision making, planning and management of any geothermal project is a requirement by international agreements/protocols, national laws, policies of bilateral agencies and international financing institutions.However, there is evidence of low community involvement in many countries including Kenya. This could partly explainthe existing distance between energy production companies and the local communities. The study was set to determine the influence of information access, income levels, gender aspects and literacy levels on community participation in implementation of Menengai Geothermal Power Project. The study adopted a survey research design. The target population included all the 10656 people from 2545 households in Wanyororo and Kirima sub-Locations in Ndungiri/Kirima Location neighboring the project. Data was collected through administration of a structured questionnaire. The collected data was then processed and analyzed quantitatively. Quantitative analysis used descriptive statistics with the aid of Statistical Package for Social Sciences version 17.0 for windows. The study provided information that will be useful in understanding the factors influencing community participation in geothermal power project implementation with focus in Menengai geothermal project. The findings revealed that majority of the respondents have knowledge about the Company and up 78.7% got the information before Company's intervention in the area through awareness meetings and those who have had chance to participate in the project activities attribute it to their knowledge about the project. The findings also indicate that majority of the residents who have participated in the project activities their average income is regarded as low. On the influence of gender 33.3% of those who have participated in project activities said that gender was a basis for their consideration. The findings further revealed that 82.0% thought that women participation in the project activities is paramount. On education the findings indicated that 93.7% of the residents who participated in the project's activities have a minimum of primary education. The study recommend the Company to put up a satellite office near the project to act as a link between the Community for the purpose of information sharing and a place community members can go to when they have concerns that they need to be addressed by the Company. Most importantly, the study recommends the influence of culture and organization factors to be studied in order to understand their influence with regard to community participation in Geothermal Power Project implementation.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Through the Kenya Vision 2030 policy, economic transformation is envisioned with plans to expand the energy sector through clean renewable options such as geothermal energy in bid to meet the current and future energy demand(Republic of Kenya, 2007). Geothermal prospects in the country occur mainly within the Rift Valley (Appendix 4) where wide spread volcanic activity and geothermal manifestations signify the existence of geothermal resources, with an estimated potential of between 7000MW to 10,000MW (Simiyu, 2010). Kenya is the first country in Sub-Sahara Africa to significantlyexploit geothermal energy; it has also the highest level of geothermal installed capacity of 121 MW (MOE, 2003a).

The country is currently drilling wells for geothermal power in only two areas including Olkaria Geothermal Power Projects (I, II, III and IV) and the new and underway Menengai Geothermal Power Project, located in the Rift Valley, the Menengai Geothermal Power Project is being developed in phases, with phase I providing 400 MW and set for completion by 2015. In total, the project has the potential to produce 1600 MW. The government has established the Geothermal Development Company Limited as a special purpose company to accelerate the development of geothermal resources. Its core activities include exploration, drilling, assessing and development of geothermal resources for power generation and other alternative uses (Simiyu, 2010: Mwangi, 2008).

These projects are capital intensive and requiring huge land surface, for example, the Olkaria geothermal field covers an area of approximately 70 km^2. As a result of their social, economic and environmental impact on the local community, the success of the projects depend on the extent to which all stakeholders, especially the local community, are involved in all the critical phases of the project (El-Gohary et al. 2006; PMI, 2008). In the current period people's participation is becoming a central issue in determining successful implementation of energy projects. For example, in Sweden wind resources are good and there is an ambitious national goal for developing renewable energy projects. But at the local level there is opposition against wind projects and thereby hindering the

development of wind power (Khan, 2004; Hammarlund, 2002).In the oilrich Niger Delta that produced the wealth, the popular reaction was resentment, leading to an explosion of anti-oil protest and resistance against the state. Since the mid-1990s, the minority ethnic communities of the oil-bearing Niger Delta region have assertively established themselves as stakeholders in the accumulation process. They have waged a formidable struggle of unrelenting violent protests, including oil theft, pipeline sabotage, and kid- napping's. Prior to this period, these ethnic communities were for the most part low-stakes clients and partisans (ECSP Report. Issue12 2007-2009).

In Kenya, the government ignored the concerns of the local community about the geothermal power development, and has responded to protests with massive violence against the community. The Kenyan government makes no requirement of the power generation Companies to dialogue with communities before beginning operations, even if the operations pose direct threats to community or individual lands (Centre for Minority Rights Development, 2008). Currently, the integration of social concerns into the decision making, planning and management of any geothermal project is a requirement by international agreements/protocols, national laws, policies of bilateral agencies and international financing institutions (Ashworth et al., 2011; Ashworth, 2010). The lack of space for effective stakeholder participation in critical phases of planning and decision making is considered one of the key obstacles facing renewable energy (Holm et al., 2008; Jobert et al, 2007; Wolsind, 2007; Hammarlund, 2002; Walker, 1995). However, there is limited theoretical knowledge and empirical evidence of the factors affecting community participation in geothermal energy projects especially in developing countries. This limited empirical and theoretical research on factors affecting community participation in energy projects motivated this study that focused onMenengai Geothermal Power Project in Kenya.

1.2 Statement of the problem

Despite the current integration of community participation into the decision making, planning and management of any geothermal project being a requirement by international agreements/protocols, national laws, policies of bilateral agencies and international financing institutions, there is evidence of low community participation in many countries including Kenya. This could partly explainthe existing distance between energy production companies and the local communities. Hence understanding factors affecting local community's participation in geothermal energy project implementation needs to be studied. Unfortunately, little theoretical and empirical research exists on factors affecting community participation in geothermal development. Thestudy examinedfactors influencing community participation in implementation of Menengai Geothermal power Project.

1.3 Purpose of the study

The study examined factors influencing community participation in implementation of Menengai Geothermal Power Project in Kenya.

1.4 Research Objectives

The above purpose of this study was guided by the following objectives:

1. To examine the influence of information access on community participationin implementation of Menengai Geothermal Power Project in Kenya;
2. To determine the influence of income levels on community participation in implementation of Menengai Geothermal Power Project in Kenya;
3. To assess the influence of literacy levels on community participation in implementation of Menengai Geothermal Power Project in Kenya;
4. To establish the influence of gender on community participation in implementation of Menengai Geothermal Power Project in Kenya.

1.5 Research questions

This study intended to answer the following research questions:

1. How does information access influence community participation in implementation of Menengai Geothermal Project in Kenya?
2. To what extent do income levels influence community participation in implementation of Menengai Geothermal Power project in Kenya?
3. What is the influence of literacy levels on community participation in implementation of Menengai Geothermal Power Project in Kenya?
4. What is the influence of gender on community participation in implementation of Menengai Geothermal Power Project in Kenya?

1.6 Significance of the study

In order to increase the level of success in the planning and implementation of geothermal energy projects, it is important to encourage community participation. There is therefore a need for detailed empirical studies on factors affecting community participation in planning and implementation of energy projects. This will assist in identifying effective ways to resolve the conflict and the opposition. In Kenya, this is especially important since majority of the potential areas with geothermal energy are in remote and rural areas and exploitation is likely to affect the sources of livelihoods of the local communities. This study is premised on the fact that the success of geothermal projects will depend on the extent to which the local community is involved. Understanding the factors affecting community involvement was viewed by this study as the key to developing strategies to enhance community participation.

Such a study will help in providing information that could be useful to the Ministry of Energy and Petroleum, Menengai Geothermal Power Project and the local community in understanding the extent to which community involvement has been incorporated in project planning, decision making and implementation. The output of this study will help in providing input into projects and programs that seek to promote inclusion of community involvement in implementation of geothermal energy projects in the country. The study will also contribute to the existing and new knowledge in the field of community participation in project implementation in the geothermal energy sector and its impacts.

Furthermore, it will provide researchers with baseline information that could be useful in future studies.

1.7 Delimitation of the Study

The study focused on investigating factors influencingcommunity participation in project implementation in Menengai Geothermal Power Project in Kenya. Menengai Geothermal Power Project is chosen as a research site because of its surveyed potentials and the level of investment that the government and development partners have injected in. Due to the diverse stakeholders involved in the project, the study specifically targeted the local community as the primary and internal stakeholder directly involved in the implementation of the project. The local community in the immediate Wanyororo and Kirima sub-Locations in Ndungiri/Kirima Location of Bahati Division neighboring the project was used. A representative sample of the people from the local community was selected and involved in the study.

1.8 Limitations of the Study

The information secured under the survey as a method of data collection under this study depended heavily on the willingness of the respondents to participate in the study. However, this study provided respondents with a comprehensive introductory letter explaining the need of the study and how the information that they will provided will be used.

The sample size and generalization of the research findings. Adequate and more generalizable assessment of the level of community participation and involvement in project implementation require a consideration of as many projects as possible. However, findings from this study will be used specifically for Menengai Geothermal project and the immediate local community bordering the project and will be cautiously generalized to other energy projects.

The study relied on self-reported information, from the local community in assessing themselves and their involvement in the project. This may result in subjective assessment and biases but being primary stakeholders of the project their participation is crucial in the study.

1.9 Assumptions of the Study

The study was based on the following assumptions:

1. The respondents answered questions correctly and truthfully;
2. There were socio-economic factors influencing community participation in geothermal project implementation in Menengai project;
3. The sample represented the population of the study

1.10 Definition of Terms

In this section, operational definitions are presented as used within the context of this study.

Geothermal energy: The natural heat from the earth's interior stored in rocks and water within the earth's crust.

Megawatt: A unit of power equal to one million watts

Vision 2030: This is the Kenya's new development blueprint covering the period 2008 to 2030. It aims to transform Kenya into a newly industrializing middle-income country providing a high quality life to all its citizens by the year 2030.

Stakeholder: Any group or individual who can affect or is affected (positively or negatively) by the achievement of the development project objectives

Independent Power Producer: is an entity, which is not a public utility, but which owns facilities to generate electric power for sale to utilities and end users.

1.12 Organization of the study

Chapter one of this study contains the background of the study, the purpose of the study and the objectives. It also contains research questions which the study seeks to answer. The chapter also outlines the significance of the study and the basic assumptions. The chapter also contains delimitations and limitations of the study and the definitions of the significant terms used in the study. Chapter two contains literature review under themes of access to information, income levels, gender aspects and literacy levels and theories that guided the study and formulation of conceptual framework. Chapter three

contains the research methodology used in this study. It captures the research design, target population, sample selection and sample size, research instruments, validity and reliability of the instruments used. It explains the data collection and analysis procedures that were used; ethical considerations that were observed and operationalization table for variables. Chapter four contains the data analysis, interpretation and discussion. Lastly, chapter five outlines summary of research findings, conclusions and recommendations. It also contains suggestions for future studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This Chapter contains review of related literature from themes as outlined in the objectives on factors affecting community participation in implementation of geothermal project.The chapter also outlines the theoretical and conceptual frameworks used in the study. In order to understand the research problem, the study has been categorized into the following thematic areas:

2.2 The Concept of Community Participation

Participation is a rich concept that varies with its application and definition. The way participation is defined also depends on the context in which it occurs. For some, it is a matter of principle; for others, practice; for still others an end in itself (World Bank, 1995). Brager, Specht, and Torczyner (1987) defined participation as a means to educate citizens and to increase their competence. It is a vehicle for influencing decisions that affect the lives of citizens and an avenue for transferring political power. However, it can also be a method to co- opt dissent, a mechanism for ensuring the receptivity, sensitivity, and even accountability of social services to the consumers. Armitage (1988) defined citizen participation as a process by which citizens' act inresponse to public concerns, voice their opinions about decisions that affect them, and take responsibility for changes to their community.

Westergaard (1986) defined participation as "collective efforts to increase and exercise control over resources and institutions on the part of groups and movements of those hitherto excluded from control". This definition points toward a mechanism for ensuring community participation. The World Bank's Learning Group on Participatory Development (1995) defines participation as "a process through which stakeholders' influence and share control over development initiatives, and the decisions and resources which affect them.

2.2.1 Characteristics and types of Participation

Types of participation can be categorized along a spectrum with passive participation at one end and self-mobilization at the other end. Passive participation is where people are told what to do. People's control is almost non-existent while the role of the external agencies is final. On the other end is self-mobilization where the local people themselves are in total command. People have almost total control over the processes while the role of outsiders is at best minimal. So, it is concluded that participation by manipulation and passive participation can't empower community, but both interactive participation and participation by self-mobilization can be highly empowering. In between the two extreme, we have several types of participation. These types of participation are illustrated as follows:

Table 2.1: A participation typology

Type of participation	Characteristics
Passive participation	People are told what is going to happen or has already happened. Top down, information shared belongs only to external professionals.
Participation in information giving	People answer questions posed by extractive researchers using surveys etc. people not able to influence the research.
Participation by consultation	People are consulted and external agents listen to their views. Usually externally defined problems and solutions. People not really involved in decision making. Participation as consultation
Participation by materials incentives	Provision of resources, e.g. labor. Little incentive to participate after the incentives end, for example much farm research, some community forestry
Functional participation	Groups are formed to meet predetermined objectives. Usually done after major project decisions are made, therefore initially dependent on outsiders but may become self - dependent and enabling. Participation as organization.
Interactive participation	Joint analysis to joint actions. Possible use of new local institutions or strengthening existing ones. Enabling and empowering so people have a stake in maintain structures or practices.
Self-Mobilization	Already empowered, take decisions independently of external institutions. May or may not challenge existing inequitable distributions of wealth and power. Participation as empowering

Source: Pimbert and Pretty, 1994

2.3 To determine the influence of information access on community participation in project implementation

Organizations are expected to disclose information to their stakeholders as a show of trust (Pederson, 2006). Therefore, information is required to provide stakeholders and organizations with the opportunity to make decisions (Swift, 2001). In order to involve and hold stakeholders accountable there must be a degree of transparency where involved parties have access to information and can scrutinize this information as well process and outcomes of the dialogue (Pedersen, 2006; Mumford and Gray, 2010).

Kenya Electricity Generating Company believes that before any discussion of issues could commence, it had to introduce itself to the stakeholders and especially the local community. Hence as a standard procedure, the Company conducted information awareness campaign for various stakeholders consisting of the local administration, government agencies, local communities, Non-governmental organizations and private business. The information content included in the awareness program included the geothermal resource, the project description, potential environmental and social effects, measures and benefits to the host communities. The local community and stakeholders also visit Olkaria geothermal project to validate the claims of the Company on sound environmental management for the proposed project. The program has been adopted in other projects (Surface exploration studies for Menengai, Paka, Korosi and Chepchuk geothermal prospects) of the Company due to its positive effects on acceptance. The Company during its transformation for Good to Great introduced Liaison office to serve as a link between top Company Management and the various stakeholders as it was realized that communication with stakeholders must be championed and passed to high-level advocates within the organization. Participation of Company Management in public and stakeholder consultation signified accountability (Wetangula, 2008).

The concerns regarding information can be categorized in three types including other languages, technical jargon and informed decisions. Concerns can be raised about translating information from English into other languages to promote equity in public participation. Other comments encouraged the translation of technical concepts and legal jargon into understandable terms and comprehensible issues that promote honest education and public efficacy. The third concept is a combination of the first two with the additional

issue of citizen empowerment in decision making. Respondents commented that citizens need clear, detailed, unbiased information with which to reach informed decisions on community issues. One survey respondent wrote, it is my belief that too often citizens are not presented with detailed, real information upon which to make decisions. The survey participants stressed the importance of clear, unbiased information in public participation in planning.

2.4 Determine how income level influence community participation in project implementation

In a traditional society, income level of a person is considered as an important criterion for judging one's ability. Similarly to assess the extent of participation of common people in development project, income level as an indicator has been chosen in this study. Personal income may be defined as the sum of the market value of rights exercised in consumption and the change in the store of property rights between the beginning and end of period (Simons, 1938). The notion of personal income also corresponds to that put forward by John Hicks (1946), who described an individual income as maximum value he could consume during period and still be as well off at the end of the period as he was at the beginning.

The Calvert-Henderson Income Indicator focuses on trends in the standard of living as reflected in monetary measures of family income. The trends in the level and distribution of family income since 1947 are explained with a particular focus on what has been the key determinant of family income trends - changes in hourly wages. Growing income inequality since 1973 is explored, along with changes in people's wealth holdings. The Income Indicator offers a provocative and thoughtful way to assess our economy's performance in raising living standards during the economic boom of the 1990s.

Nazleen (2004) found that the participation of the poor and marginalized in rural development has not increased significantly rather some touts and intermediaries have enjoyed more access to these projects and grasped its fruits. There is a general assumption that the interest of the poor and disadvantaged cannot be safeguarded in the exploitative social structure unless it is protected by legislation.

2.5 The determine the influence of literacy levels on community participation in project implementation

Education is the pass word to enter intothe development intervention. Meaningful participation in development project largely depends on the educational status of community people. Hence, to explore the level of participation of common people in development project, literacy rate or educational status has been chosen as an indicator in this study.

Literacy concept refers to reading, writing, speaking, viewing and listening effectively in a range of contexts. In the 21st century, the definition of literacy has expanded to refer to a flexible sustainable mastery of a set of capacities in the use and production of traditional texts and new communication technologies using spoken language, print and multimedia. Learners need to be able adjust and modify their use of language to better meet contextual demands in varying situations (National Curriculum Board, 2009).

An informed energy-literate public is more likely to be engaged in the decision making process, and will be better equipped to make thoughtful, responsible energy related decisions, choices and actions. Since as early as 1970s, environmental science educators and professionals have also emphasized the applications and knowledge in attempting to set criteria for environmental literacy. Environmental literacy lacks a clear definition, but the Tibilisi Declaration 1978 was modified in 1990 to state: Environmental literacy is a basic functional education for all people, which provides them with the elementary knowledge, skills, and motives to cope with environmental needs and contribute to sustainable development.

Literature suggests that an energy literate person needs to have a basic understanding of energy concepts. A sound knowledge base is important; gains in knowledge will generally improve a person's self-confidence in that area, and as a person gains confidence in that area, and think critically about a subject, they are more likely to become active and to participate in decision making.

In Olkaria Geothermal Project has created job opportunities in the project area and beyond. Direct job opportunities are available for high caliber of professionals that includes Scientists - Environmentalists, Community Liaison, Geologists, Geochemists,

Geophysicists, Human Resource; and Engineers - Electrical, Civil, Drilling and Mechanical among others. The local communities however benefit mostly from unskilled and semi-skilled labor during the construction of the geothermal projects. Such job opportunities include construction of access roads, rehabilitation of disturbed sites, bush clearing for the power transmission lines, driving, masonry, carpentry, loading/off-loading and security work among others. Indirectly, the project will create opportunities for self-employment in the project area. This will spring spin-off activities including trade, accommodation and supply of goods and services to the skilled as well (Elizabeth Mwangi, 2011)

2.6 The influence of gender on community participation in project implementation

Gender refers to the economic, social and cultural attributes and opportunities associated with being male or female at a particular point in time (World Health Organization, 2001). In the context of gender and energy, household energy has high importance. In India, households account for 40% of direct energy use (taking commercial and non-commercial energy together) and influences 70% of the total energy use (considering the energy required for goods and services consumed by household) in India (Pachauri, 2009).

Gender inequality manifests as hierarchical gender relations, with men above women, and women being regarded as inferior and less valuable solely by virtue of their sex. Gender hierarchy is manifested in family relationships, inheritance laws and customs; valuations of women's work and the general invisibility; and the power to make decisions in society, the family, work place, religious and other cultural institutions (Mikkola, 2005). For generations, women have been denied access to resources of their own and thereby tend to be regarded as economic dependents.

Gender sensitive energy policies not only bring in equity and efficiency in daily life, but also alleviate poverty and ensure achievement of all millennium development goals. For its successful implementation, the energy sector policy, like policies in other sectors, needs to be supported by programs for gender equality and social relations and enacted through appropriate institutions at the micro and macro levels (IRADe, 2009).

Women and girls tend to have increased opportunities for good health and education when the community has access to modern forms of energy. This project will ensure an employment ratio of minimum 30% women which will be high for small town standards in Kenya. The 30% employment ratio is highlighted in the new Kenyan constitution. The employment ratio will serve to enhance women's participation in the traditionally male dominated fields, enabling them to acquire the required skill sets. The emergence of employment opportunities would translate into an increase in incomes/ revenues available to the households which women are part of and to the small and microenterprises that will be employed by and/or create by them. Provision of water to the local communities will have a direct effect in the empowerment of women and the girl child who normally collect water for domestic purposes (African Development Bank Report, 2011). As of January 2005, only 17 countries in the world had met the target set by the UN.

Economic and Social Council in 1990 of having 30 percent or more women in national legislative seats; the proportion of seats held by women in single or lower houses of parliament was only 15.9 percent globally, up from 13.5 percent in 2000 and 9 percent in 1987 (United Nations, 2005).

In Nakuru North District, women are underrepresented in most of the decision making organs. However, to ensure that there is rapid economic as well as social integration in the District, then there is need for balanced participation for all (Nakuru North District Development Plan 2008-2012).

The United Nation's new Sustainable Energy for All (SE4All) initiative clearly recognizes that increased access to energy is necessary for creating economic opportunities for women in developing countries. It also recognizes that women's engagement is essential for the successful design, marketing and adoption of new energy technologies and climate responsive innovations. The UN Secretary General has particularly emphasized the impact of energy poverty on women's employment. "Women spend hours each day on routine daily subsistence activities pounding grain, hauling water and gathering firewood, they have little or no time for earning income"(Ban Ki moon, 2011a).

It is important to note that due to gender and climate change advocacy efforts, the Green Climate Fund's governing instruments specifically calls for taking a "gender

sensitive approach" within the broader objective of pursuing environmental, social, economic, and development co benefits from climate change mitigation and adaptation actions. Reinforcing the recognition of the gender issues in the climate context, at the December 2012 Conference of the Parties to the UNFCCC governments adopted a new decision on promoting gender balance and improving the participation of women in climate change negotiations and decision making bodies (UNFCCC, 2012)

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2.7 Theoretical framework

The study was guided by Arnstein's ladder of participation theory and stakeholder theoryin explaining the factors affecting community participationin geothermal energy projects.

2.7.1 Arnstein's ladder of participation

Perhaps the seminal theoretical work on the subjectof community participation was by Arnstein (1969). The particular importance of Arnstein's work stems from the explicit recognition that there are different levels of participation, from manipulation or therapy of citizens, through to consultation, and to what we might now view as genuine participation, i.e. the levels of partnership and citizen control (See figure 3)

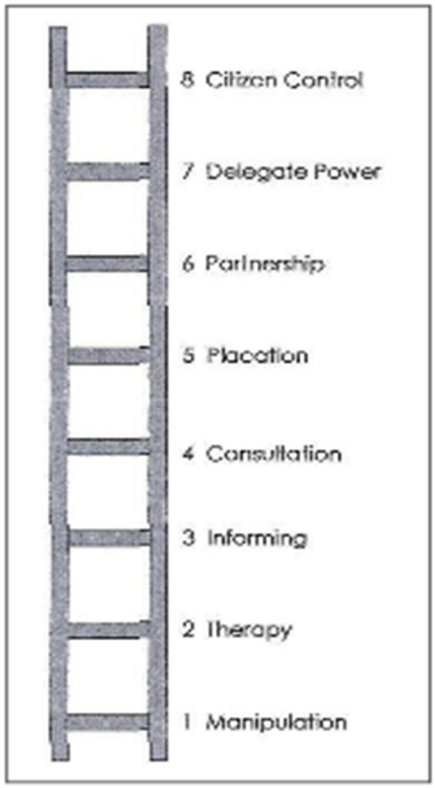

Figure 1: A ladder of participation (Anstein, 1969)

The use of a ladder also implies that more control is always better than less control. However, increased control may not always be desired by the community and increased control without the necessary support may result in failure.

2.7.2 A ladder of citizen empowerment

Since Arnstein, increasingly complex theories of participation have been advanced and new terminology added. In particular, there has been a shift towards understanding participation in terms of the empowerment of individuals and communities. This has stemmed from the growing prominence of the idea of the citizen as consumer, where choice among alternatives is seen as a means of access to power. Under this model, people are expected to be responsible for themselves and should, therefore, be active in public service decision-making. In this context,Burns et al (1994) modified Arnstein's ladder of participation and proposed a ladder of citizen power (Figure 2.3)

This is more elaborate than Arnstein's ladder, with a further, more qualitative breakdown of some of the different levels. For example, a distinction is drawn between 'cynical' and 'genuine' consultation, and between 'entrusted' and 'independent' citizen control. The phenomena of 'civic hype', increasingly recognized during the 1990s (see, for example, Harvey, 1989), are incorporated at the bottom rung of the ladder. This essentially treats community participation as a marketing exercise, in which the desired end result is 'sold' to the community.

Citizen control
12. Independent control
11. Entrusted control
Citizen Participation
10. Delegated control
9.Parnership
8. Limited decentralized decision making
7.Effective advisory boards
6. Genuine Consultation
5. High quality information
Citizen Non-participation
4.Customer care
3.Poor information
2. Cynical Consultation
1.Civic Hype

Figure 2: A ladder for citizen empowerment (Burns et al, 1994)

2.7.3 A continuum of involvement

As a development of this ladder concept of participation Wilcox identifies five interconnected levels of community participation.

Information
Consultation
Deciding together
Acting together
Supporting individual decision

Figure 3: A ladder of participation (Wilcox, 1999)

2.7.4 Stakeholder theory

The stakeholder theory posits that an organization is a social construction made of interaction of various stakeholders. The organization is envisioned as the center of a network of stakeholders, a complex system of exchanging services, information, influence and other resources (Freeman, 1984; Labia, 2000; MerslandandStrøm, 2009).

Stakeholder theory pertaining to managing organizations has become one of the major paradigm shifts of the last century (Amaeshiand Crane, 2006, p. 247) and is concerned with the nature of the relationship between the firm and its stakeholders (Ayuso, Rodrıguez, andRicart, 2006). The theory is traced back to Freeman's (1984) now classic definition of stakeholders, arguably the most popular definition cited in literature (KolkandPinkse, 2006) which proposed that stakeholders are "any group and individuals who can affect, or is affected by the achievement of an organization ′ s objectives" (Freeman, 1984, p. 46). This definition was particularly important to this analysis in that it highlighted a two way relationship between the organization and its stakeholders. In recent times the theory has become the frame of reference when CSR and sustainability issues are discussed (Pedersen, 2006).

According to stakeholder models, an organization must be aware of and respond to the various demands of its constituents, including employees, customers, investors and suppliers as well as the local community (Post, Preston, and Sachs, 2002). Greenwood (2007) argued that instead of focusing on the attributes of organizations and stakeholders,

organizations should rather be focusing on the “relationships between organization and stakeholders” (Greenwood, 2007). In other words organizations have an obligation to pay attention to the relationship that must be fostered between the organization and its stakeholders.

The theory further argues that an organization’s value is created when it meets the needs of the important stakeholders in a win-win fashion (Bosse et al., 2007). In efforts to improve the theory, some studies proposed three stakeholder theory types: normative, instrumental and descriptive/empirical. Stakeholder theory postulates that organizations must engage with stakeholders for normative and instrumental reasons (Ayuso, Rodrıguez, andRicart, 2006; Donaldson and Preston, 1995). These types have been proposed in order to add coherence to the theory (Donaldson, 1995; Jones and Wicks, 1999), to make it more precise (Freeman, 1999) and guide discussions of the stakeholder literature (JawaharandMClaughlin, 2001). These types are briefly discussed below.

In the normativeexplanation relationships between the organization and stakeholders takes place on an ethical basis suggesting that managers must consider the interests of those stakeholders who have a legitimate stake in the organization (Ayuso, Rodrıguez, andRicart, 2006; Preble, 2005). Normative stakeholder theory prescribes how organizations ought to treat their stakeholders (Freeman, 1999). One of the central points in this realm is that organizations should attend to the interests of all their stakeholders - not just their shareholders. A common theme among the scholars of this theory is that firms should treat stakeholders as "ends" (JawaharandMClaughlin, 2001). Normative theory is discussed with strong pillars of moral principles and ethics and thus organizations should view their stakeholders as having intrinsic value (Jones and Wicks, 1999). In normativetheory there is a moral obligation for the organization to engage with stakeholders (Greenwood, 2007; Preble, 2005) and people have a democratic right to participate in the decision making process (Reed, 2008).

By contrast instrumentaltheory sees stakeholders as being valuable in helping the organizations achieve objectives since participation is seen as a means to an end (Donaldson and Preston, 1995; Preble, 2005). Instrumental stakeholder theory posits that certain outcomes will be obtained by the organization if certain behaviors are adopted (Jones and Wicks, 1999). According to this theory, if the behavior of the managers is in-

line and accepted by the stakeholders then the organization will have certain outcomes. Freeman (1999) puts this as “if managers want to maximize shareholders’ wealth, they should pay attention to their key stakeholders”. In this theory, stakeholders are treated as both means and ends. The general proposition for this theory is that managers of organizations are employed based on mutual trust and cooperation between them and the stakeholders. Accordingly, the organization achieves its objectives by managing this relationship with stakeholders (Ayuso, Rodrıguez, andRicart, 2006; Donaldson and Preston, 1995; Preble, 2005; Reed, 2008). Via this approach, organizations address the interests of those that have influence recognizing that managing these interests will ultimately lead to superior performance and superior decisions (Ayuso, Rodrıguez, andRicart, 2006; Reed, 2008).

Descriptive stakeholder theory explains how organizations manage and or interact with stakeholders (Freeman, 1999). This theory purports to describe the actual behavior. According to (JawaharandMClaughlin, 2001), the descriptive stakeholder theory of an organization posits that the nature of its stakeholders, their values, their relative influence on decisions and the nature of the situation are all relevant information for predicting the organizational behavior and performance.

However, all these three approaches to stakeholder theory are nested within each other with descriptive being supported by instrumental and normative being the central core of the rest (Donaldson 1995; Kale, 2003). They are all important and furthermore this distinction is rooted from the old philosophy of science in which descriptive theory explain what the world really is (reality), normative prescribes how the world should be and instrumental links means and ends (Freeman, 1999).

Donaldson and Preston (1995) defined stakeholders as any persons or groups that claim interests in an organization which implies that all stakeholders are of value and deserve equal treatment. Greenwood (2007) on the other hand argues that the issue of stakeholder identification has become the primary focus in the debate on the nature of the relationship between stakeholders and the organization. An organization needs to develop filters to separate important stakeholders from less critical ones otherwise the dialogue would have to include everyone and everything (Pedersen, 2006). The challenge that remains is to identify important stakeholders (Ayuso, Rodrıguez, andRicart, 2006; Preble,

2005) and the selection criteria that must be used to distinguish these important stakeholders (Pedersen, 2006).

2.8 Conceptual framework

This study conceptualizes that there are several factors that affect community participation in geothermal project implementation. These factors (Independent Variables) affect the project implementation (Dependent Variables). Figure 5illustrates the relationship between the independent and dependent variables with the interplay of the intervening variables.

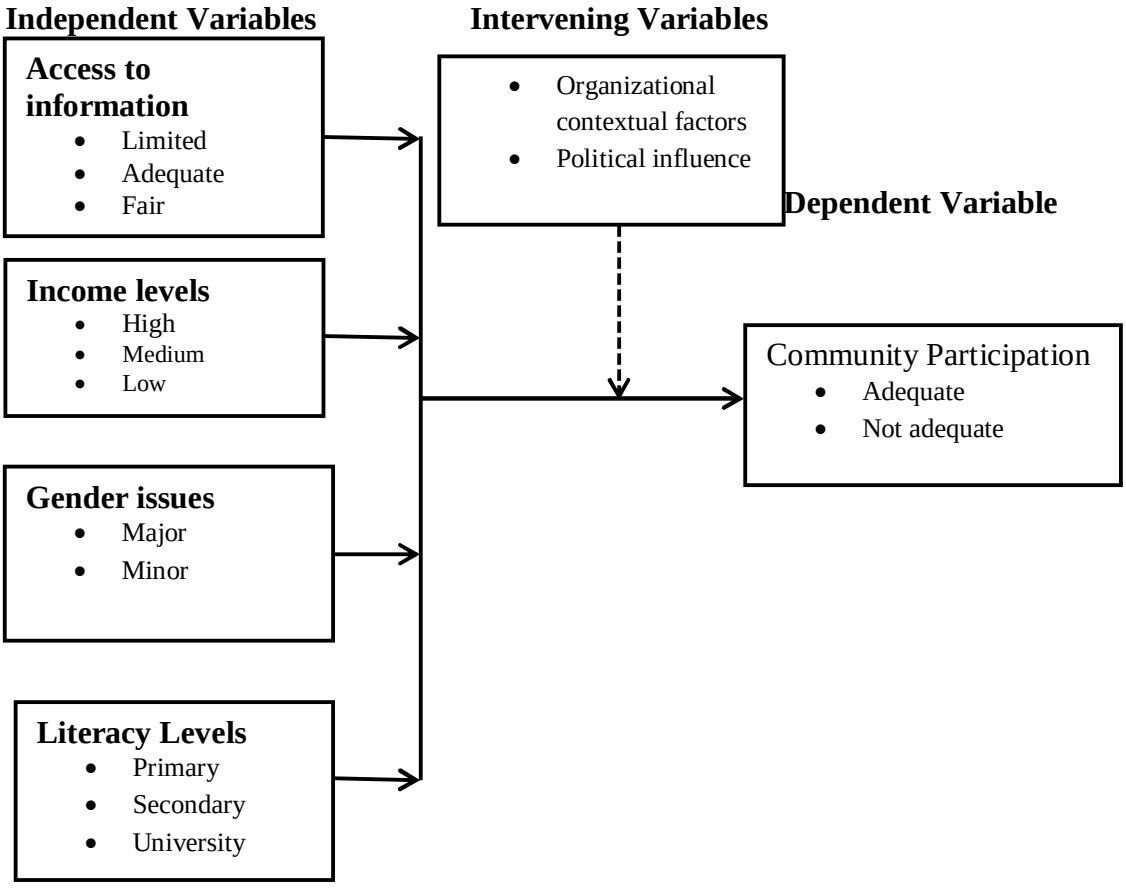

Figure 4: Conceptual Framework

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives the methodological procedures that were used in data collection and analysis. The discussion include the research design; location of the study; population of the study; sampling procedure and sample size; instrumentation; data collection; and data analysis.

3.2 Research Design

The study adopted a survey research design. A survey research design involves the selection of a sample of respondents and administering questionnaires or conducting interviews to gather information on variables of interest (McMillan and Schumacher, 1993). Data is collected from respondents about their experiences and opinions in order to generalize the findings to the population that the sample is intended to represent (Gall, Borg and Gall, 1996).

This design is the most appropriate for obtaining factual and attitudinal information or for research questions about self-reported beliefs, opinion, characteristics and present or past behaviors (David and Sutton, 2004; Gray, 2004; Neumann, 2000). Since the study obtained descriptive and self-reported information from the local community, the survey design was the most appropriate. The survey design allowed the researcher to expose the respondents to a set of questions to allow comparison. It was assumed that all the respondents had information or experience that bears on the problem that was investigated.

3.3 Target Population

A population or universe is defined as aggregate of all elements, Shao (1999). The population must be defined in terms of elements. The study was conducted in the community neighboringMenengai Geothermal Power Project. The project is located within the Menengai Caldera in Wanyororo and Kirima Sub-Locations in Ndungiri/Kirima Location of Bahati Division in Nakuru North District, Nakuru County. The project is located 160 km north west of Nairobi. It is situated at an altitude of 1859m above sea level

and is within the region of the Great Rift Valley whose formation gave rise to a unique natural structure.

The target population for the study included all members of the local community in Wanyororo and Kirima sub-Locations in Ndungiri/Kirima Location neighboring the project. According to the 2009 Population Census Report, the total population in the two sub-Locations is 10656 people from 2545 households distributed as follows in Table 1.

Table 3.1: Population Distribution in the Study Area

Sub-Location	Male	Female	Total	Households
Kirima	2103	2071	4174	1022
Wanyororo	3229	3253	6482	1523
Total	5332	5324	10656	2545

Source: Kenya Population and Housing Census, 2009

3.4 Sample Size and Sampling Procedure

Ideally, it would have been preferable to collect data from all the 10656 people from the 2545 households in Kirima and Wanyororo Sub-Locations in the study area. However, only household heads were purposively involved and assumed to provide information on the concerns affecting their household members and therefore the entire population. A representative sample size of the household heads drawn from the 2545, the study adopted a formula by Kathuri and Pals (1993) for estimating a sample size, n, from a known population size, N

$$n = \frac{\chi^2 NP\ (1-P)}{\sigma^2\ (N - 1) + \chi^2\ P\ (1 - P)}$$

Where:

n = required sample size

N = the given population size of households, 2545 in this case

P = Population proportion, assumed to be 0.50

σ^2 = the degree of accuracy whose value is 0.05

χ^2 = Table value of chi-square for one degree of freedom, which is 3.841

Substituting these values in the equation, estimated sample size (n) was:

$$n = \frac{3.841 \times 2545 \times 0.50\ (1 - 0.5)}{}$$

$$(0.05)^2 (2545 - 1) + 3.841 \times 0.5 \times (1 - 0.5)$$

$$n = 335$$

After a representative sample of 335 household heads was determined, multi-stage sampling using stratified and simple random sampling procedures was used in distributing and selecting the sample. First, proportionate stratified sampling was used in distributing the sample of 335 households in the 2 administrative sub-Locations. This ensured that the sample is proportionately and adequately distributed among the 2 sub-Locations according to the population of each sub-Location. A sampling frame of all households in the two selected sub-Locations was determined from the Population and Housing Census 2009. Each sub-Location (stratum) was allocated a portion of the sample by dividing the total number of households in that sub-Location by the total number of all households in the 2 selected sub-Locations and then multiplied by the sample size (335). 200 households were sampled in Wanyororo sub-Location and 135 households were sampled in Kirima Sub-Location.

In the second stage, a list of all the households in each sub-Location was obtained from the National Sampling Frame by Central Bureau of Statistics. The list contained names, numbers of all the households and villages in all sub-location in the study area. Simple random sampling using random numbers table was used to select the specific number of households allocated to each selected sub-Location. The household corresponding to the number picked was included in the sample.

3.5 Methods of Data Collection

Data was collected using a semi-structured questionnaire with the local community. A semi-structured questionnaire was preferred for collecting data from the local community because in such a questionnaire, the questions, their wordings and sequence are fixed and identical to all respondents. This had an advantage of obtaining standard responses to items in the questionnaire, making it possible to compare between sets of data. The community questionnaire elicited information on the factors affecting community participation in implementation of Menengai Geothermal Power Project.

3.5.1 Validity of the Research Instrument

The content validity of the research instruments was established in order to make sure that they reflect the content of the concepts (factors affecting community participation in project implementation) in question. First, the researcher went through the instruments and compared them with the set objectives and ensured that they contain all the information that answers the set questions and addressed the objectives. Second, expert (supervisor) was consulted to scrutinize the relevance of the questionnaire items against the set objectives of the study. The instruments were then taken for piloting on a population that is similar to the target population; a local community surrounding Olkaria IV project in Naivasha. The piloting included 20 household heads from Olkaria. The objective of piloting was to eliminate any ambiguous items, establish if there are problems in administering the instruments, test data collection instructions, establish the feasibility of the study, anticipate and amend any logistical and procedural difficulties regarding the study, and allow preliminary (dummy) data analysis.

3.5.2 Reliability of Research Instrument

Reliability is a measure of the degree to which a research instrument yields consistent results or data after trials (Mugenda&Mugenda, 2003). Reliability of instrument in research is influenced by random error. Random error is the deviation from a true measurement due to factors that have not effectively addressed by researcher. To ensure reliability of the field data, data was coded accurately, avoiding ambiguous instructions to the subjects and gave ample break intervals to self and research assistants to minimize fatigue.

3.5.2.1 Internal consistency

Cronbach's alpha reliability coefficient was employed to test the internal consistency. A threshold of reliability coefficient of 0.7 and above was sought. This is in line with recommendation by Borge and Gall (2003). A high Coefficient implies that items correlate highly among themselves that is there is consistency among the items in measuring the concept of interest. An adjustment on the instruments was done, if a lower reliability coefficient was released.

3.8 Ethical Considerations

The researcher began data collection by briefing the respondents on the objectives of the study, the research instruments to be used, and how the findings of the study will be utilized. This was done to avoid any misunderstandings that could crop up during the interview about the purpose of the research**.** The researcheralso sought consent of the informed target respondent before any interviewbegan. Those who were unwilling were replaced by their immediate neighbors'. The researcher also assured the respondents of utmost confidentiality of the information given. The researcher also sought approval from the Management of Menengai Geothermal Power Project.

3.9 Operational definition of variables

Table 3.2 gives the variables, measurable indicators, data collection and analysis instruments. An operational definition is a demonstration of a process such as a variable, term, or object in terms of the specific process or set of validation tests used to determine presence and quantity. The dependent variables operationalized as shown in the table 3.2

Table 3.2: operational definitions of variables

Research objectives	Independent Variable	Indicators	Measurement	Measuring Scale	Tools for data collection
To examine the influence of information access on community participation in implementation of Menengai geothermal project in Kenya;	Information access	• Awareness meetings attended	How /many meetings	Nominal	Questionnaire
To determine how of income levels influence community participation in implementation of Menengai geothermal project in Kenya;	Income levels	• High • Medium • Low	What is your income level	ordinal	Questionnaire
To assess the role of literacy levels on community participation in implementation of Menengai geothermal project in Kenya;	Literacy levels	• Level of education	Primary/High School/College/ University/Not schooled	Nominal	Questionnaire
To establish the role of gender on community participation in implementation of Menengai geothermal project in Kenya.	Gender aspects	• Women participating in implementation process	How many women participate in implementation process	Nominal	Questionnaire

3.7 Methods of Data Analysis

Data was analyzed by checking the entire questionnaire to ensure that it's properly filled, consistent and clear. The four objectives of the study were analyzed for the purpose of understanding factors influencing Community participation in geothermal project implementation. The data was analyzed using Statistical Package for Social Sciences version 17.0 Windows and cleaned for analysis. This was done using mainly descriptive statistics. Descriptive statistics including frequencies, percentages presented in tables. Chi-Square test was also utilized in testing how variables in the study influence each other.

CHAPTER FOUR

DATA PRESENTATION ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter presents a summary result of the analysis from the data collected using the questionnaire designed by the researcher. The results include response rate, respondents' profile and analysis as per the four objectives. Data collected was analyzed and presented in table format. The questionnaire employed in this study is presented in (Appendix 2).

4.2 Response Rate

A total of 335 Households of Kirima and Wanyororo Sub-Locations were sampled. However the researcher managed to access a total of 278 respondents representing 82.96%.The distribution of the respondents within the sub-Locations under consideration was 66.55% came from Wanyororo and 33.45% from Kirima sub-Location. The average age of the respondents was 39 years.

Table 4.1: Questionnaire response rate

Response	Frequency	Percentage
Returned	278	82.96
Not returned	57	17.04
Total	335	100.00

This was a moderately high rate of response that was achieved, according to (Kothari, 2008) the data is analyzable. This response rate was achieved because the researcher briefed the research assistants on the contents of the questionnaire and made sure that they have understood. The researcher was also present at the field throughout the data collection exercise.

4.3 Back ground information of the respondents

In this section the researcher sought to know information on the spread of the respondents by sub-Location, Education Level and Gender.

4.3.1 Spread of respondents by sub-Location

The study was undertaken in two sub-Locations of Ndungiri/Kirima Location in Bahati Division. The tables below show the spread of respondents in the two sub-Locations.

Table 4.2 Spread of respondents by sub-Location

Sub-Location	Frequency	Percentage
Wanyororo	185	66.55
Kirima	93	33.45
Total	278	100.00

Table 4.2 on the distribution of respondents by sub-Location revealed that 185 respondents came from Wanyororo sub-Location and 93 came from kirima sub-Locations, this is 66.55% and 33.45% respectively. The study also revealed that the Household Heads who participated in the study had an average age of 39 Years old. 51.1% were male and 48.9% were female.

4.3.2 Spread of respondents by Education Level

Table 4.3 Spread of respondents by Education Level

	Frequency	Percentage
Primary	99	36.4
Secondary	117	43.0
College	32	11.8
University	10	3.7
No Schooling completed	14	5.1
Total	272	100.0

The table 4.3 shows that out of the 278 respondents 272 responded to the question on the education level while 6 chose not to respond. 43% of this number had attained a secondary level of education while at the same time the table informs us that more than 94.9 % of 272 respondents have gone and completed schooling.

4.3.3 Duration the respondent has lived in the study area

Table 4.4 Duration respondent has lived in a sub-Location

	Frequency	Percentage
1-5 years	21	7.6
6-10 years	14	5.0
11-15 years	43	15.5
16 - 20 years	55	19.8
More than 21years	145	52.2
Total	278	100.0

Table 4.4 results reveal that 92.4% of the Kirima and Wanyororo residents have lived in the respective sub-Locations for more than five years.

4.4The influence of information accesson Community Participation in implementation of Energy Project Activities

Table 4.5 Respondent Awareness of any energy project in Menengai Caldera

		Respondent Awareness of any energy project in Menengai Caldera		
		Yes	No	Total
Total	Count of the respondents	239	39	278
	% of the respondents in the sub-Locations	86.0%	14.0%	100.0%

Table 4.5 has shown that out of the 278 respondents 239 are aware of the energy project implemented in the Menengai Caldera, which is 86.0% of the total respondents.

Table 4.6 Source of information of Energy Project in Menengai Caldera

	Frequency	Percentage
Awareness Meetings	136	56.9
Radio	79	33.1
Newspaper	14	5.9
Other	10	4.2
Total	239	100.0

The table 4.6shows that 56.9% of the respondent who are aware of the energy project in the Menengai Caldera knew from awareness meetings, 33.1% from radio, 5.9% from the newspaper, and 4.2% from other sources other than awareness meeting, radio or newspaper.

The results also indicated that 78.7% of the respondents who were aware about the project while they were at the initiation stage while 21.3 percent learnt about the project at its implementation stage.

Table 4.7 Best way project information can be disseminated to the Community

The study also sought to understand the opinion of the participants on the best way project information can be disseminated to the Community and they responded as follows:

	Frequency	Percentage
Public Barazas	50	18.0
Radio	149	53.6
Posters	35	12.6
Churches	4	1.4
Schools	2	.7
Social Media	7	2.5
Village Elders	3	1.1
No Response	28	10.1
	278	100.0

Table 4.7 indicates that when the respondents were asked the best way GDC can disseminate information to the local community, out to the 278 respondents, 250 which is representing 89.9% gave an answer to this question. Out of these 250 respondents 59.6% preferred radio, 20% public barazas and 14.0% posters.

Table 4.8 Reaction about the information received on the construction and purpose of the project

	Frequency	**Percent**
Happy/Positive	266	95.7
Not Happy/Negative	12	4.3
Total	278	100.0

Table 4.8 shows that 95.7% of the respondents were either happy or had a positive reaction when they heard about the construction and purpose of the Menengai Caldera project. 59.2% of the these respondents has a positive reaction towards the project because they believed that it will create employment, 32.5% percentage felt that the project will provide alternative cheap energy to the residence while 1.5% felt that the project will facilitate development of infrastructure in the area.

15.5% of the total respondent highlight challenges those residents of Wanyororo and Kirima face in accessing information on the energy project in Menengai Caldera. 60.5% of this group of the respondents identified inaccessibility of the GDC premise presents a major challenge in accessing the energy project information.

Table 4.9 Awareness Level about the Energy Project Cross tabulated with participation in the Energy Project Activities

			Participated in of the project activities		
			Yes	No	Total
Respondent Awareness of any energy project in Menengai Caldera	Yes	Count	12	222	234
		% within Participated in of the project activities	80.0%	86.4%	86.0%
	No	Count	3	35	38
		% within Participated in of the project activities	20.0%	13.6%	14.0%
Total		Count	15	257	272
		% within Participated in of the project activities	100.0%	100.0%	100.0%

Results in Table 4.9 shows 234 respondents were aware of the energy project in the Menengai Caldera, and only 12 respondents participated in the project activities. It also shows that 15 respondents participated in the project activities and 80.0% of these respondents were aware about the project.

4.3 The influence of income-level on the community participation in implementation of Energy Project Activities

Table 4.10Income Level in relation to the sub-Location

			Sub location of the respondent		
			Wanyororo	Kirima	Total
Level of income	High	Count	14	0	14
		% within Sub location of the respondent	17.7%	.0%	5.2%
	Middle	Count	66	32	98
		% within Sub location of the respondent	40.5%	34.7%	36.4%
	Low	Count	124	33	157
		% within Sub location of the respondent	41.8%	65.3%	58.4%
Total		Count	190	79	269
		% within Sub location of the respondent	100.0%	100.0%	100.0%

The table 4.10 shows that in Kirima sub-location there were no respondents with high income level while in Wanyororo there were 14 respondents who 5.2% of the 269 respondents. 124respondents from Wanyororoand 33respondents from Kirima had a low-income which they represented about 58.4% of the respondents. This is an indication that a majority of the residents in the two sub-locations have a low income. The Pearson Chi-square value of 39.456 shown in table 4.2 is significant since $p < \alpha$ at 95% confidence interval. This means that the level of income is influenced by the sub-location one is coming from.

Table 4.11 Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.456[a]	2	.000
Likelihood Ratio	40.439	2	.000
Linear-by-Linear Association	26.741	1	.000
N of Valid Cases	269		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.11.

The results also reveals that 235 respondents said that they are not employed which represents 84.5% of the respondents.

Table 4.12 Relationship of Employment Status and Level of income

			Level of income			
			High	Middle	Low	Total
Employment Status	Employed	Count	12	19	11	42
		% within Employment Status	28.6%	45.2%	26.2%	100.0%
		% within Level of income	85.7%	19.4%	7.0%	15.6%
	Unemployed	Count	2	79	146	227
		% within Employment Status	.9%	34.8%	64.3%	100.0%
		% within Level of income	14.3%	80.6%	93.0%	84.4%
Total		Count	14	98	157	269
		% within Employment Status	5.2%	36.4%	58.4%	100.0%
		% within Level of income	100.0%	100.0%	100.0%	100.0%

The Table 4.9 further reveals that 146 of the unemployed respondents have a low income. The Chi-square test in Table4.12 shows that Pearson Chi-square value of 62.103 is significant (p-value < α) at 95% confidence interval. Hence there employment influences the income level of the residents in Kirima and Wanyororo.

Table 4.12 Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	62.103[a]	2	.000
Likelihood Ratio	45.493	2	.000
Linear-by-Linear Association	43.321	1	.000
No. of Valid Cases	269		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.19.

Table 4.13 Income level of respondents cross tabulated with participation in the project activities

			Participated in of the project activities		
			Yes	No	Total
Level of income	High	Count	1	13	14
		% within Participated in of the project activities	7.1%	5.2%	5.3%
	Middle	Count	6	89	95
		% within Participated in of the project activities	42.9%	35.6%	36.0%
	Low	Count	7	148	155
		% within Participated in of the project activities	50.0%	59.2%	58.7%
Total		Count	14	250	264
		% within Participated in of the project activities	100.0%	100.0%	100.0%

The Table 4.13 shows the distribution of the respondents who participated in the project in relation to their level of income. The results show that majority of the respondents have never had a chance to participate in the project activities, 59.2% of this count represents respondents with low income. 50.0% of respondents who participated in the project activities, their average income are regarded as low, 42.9% had middle income and 7.1% the average income was high.

4.4 The influence gender in relation to participation in project activities

Table 4.14 Participation in the project activities

			Participated in any of the project activities		
			Yes	No	Total
Gender of the respondent	Male	Count	11	128	139
		% within Gender of the respondent	7.9%	92.1%	100.0%
		% within Participated in any of the project activities	73.3%	50.2%	51.5%
	Female	Count	4	127	131
		% within Gender of the respondent	3.1%	96.9%	100.0%
		% within Participated in any of the project activities	26.7%	49.8%	48.5%
Total		Count	15	255	270
		% within Gender of the respondent	5.6%	94.4%	100.0%
		% within Participated in any of the project activities	100.0%	100.0%	100.0%

Table 4.14 shows reveal that out of 139 Male respondents who participated in the study 11 of them have participated in the Company's activities; this represents 7.9% of the total Male respondents. The study also shows that out of 131 House Holds that responded to this question 4 of them have had the chance to participate in the Energy Project activities which is 3.1% of the total Female respondents.

The 15 respondents both Male and Female who were involved in the energy project activities, 33.3% of this group said that gender was the basis for consideration in the project activities, 40% thought otherwise while the 26.7% chose not to respond to this question. The results further revealed that 82.0% of the 278 respondents thought that women participation in the project is important.

4.5 The influence of literacy level on community participation in the energy project in the Menengai project

Table 4.15 Level of Education cross tabulated with participation in Energy Project Activities

			Participated in of the project activities		
			Yes	No	Total
Education Level of the respondents.	Primary	Count	3	94	97
		% within Participated in of the project activities	20.0%	37.2%	36.2%
	Secondary	Count	7	108	115
		% within Participated in of the project activities	46.7%	42.7%	42.9%
	College	Count	4	28	32
		% within Participated in of the project activities	26.7%	11.1%	11.9%
	University	Count	0	10	10
		% within Participated in of the project activities	.0%	4.0%	3.7%
	No Schooling completed	Count	1	13	14
		% within Participated in of the project activities	6.7%	5.1%	5.2%
Total		Count	15	253	268
		% within Participated in of the project activities	100.0%	100.0%	100.0%

Table 4.15 shows that none of the respondents who have graduated from the university were involved in the project activities. Out of those who are involved in the project activities, they were seven respondents who had a secondary certificate which represents 46.7%. Cumulatively, 93.7% of the respondents involved in the project activities have a minimum of primary education

Table 4.16 Category that the organization should involve more in implementation of its activities

	Frequency	Percent
Primary	10	3.6
Secondary	43	15.5
College	7	2.5
University	33	11.9
No Schooling completed	1	.4
All	172	61.9
No response	12	4.3
	278	100.0

In table 4.16, show that 53.6% of the respondents noted that the Company engaged individuals with secondary level education. At least more than 90% of those engaged in the company activities have completed a minimum of basic education.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONSAND RECOMMENDATIONS

5.1 Introduction

This section gives the summary of the research findings, discussion, conclusions, recommendations and suggestions for future studies. The chapter also summarizes and concludes the research findings based on the thematic areas of the research study. From the results analyzed the section goes ahead and proposes recommendations that are helpful to the project under study in order to enhance participation of the local community in implementation of its activities which is central in determining success of the Company.

5.2 Summary of the findings

The research study is organized and informed around various thematic areas. These areas are important as they give the reach its scholarly issues that need to be addressed. The study found out that out of the 278 respondents 239 are aware of the energy project in the Menengai Caldera, which is 86.0% of the total respondents. The spread of respondents who participated in the survey by count was 185 and 93 with respect to Wanyororo and Kirima sub-Locations respectively which is 66.55% and 33.45% by percentages. The average age of the participants was 39 years old. By gender out of the total house hold heads who participated in the study 51.1% were male and 48.9% were female.

The residents of Wanyororo and Kirima Sub-locations who participated in the research study gave a positive indication that there is little community involvement in the implementation of Energy project activities. The results from the SPSS software generally indicate that of the people who participated, 92.4 % had lived in the place for more than five years. This gives the authenticity of the research as the residents must have given their honest personal experiences with regard to implementation of GDC activities in Menengai Geothermal Project. It is worth noting that the Company has barely operated in the region for less than five years, though there is a heavy investment project in the area. From the research findings it is clear that the Company did a lot of sensitization about

MenengaiGeothermal Project through awareness meetings that was done across the two sub-Locations. The study revealed that 56.9% of those surveyed got information about the Company from awareness meetings, 33.1% through radio, 5.9% through Newspaper and 4.2% from other sources. According to the research study, it also came out very clearly that majority of the aboriginals of the Wanyororo and Kirima Sub-Locations get most information through the radio stations. This is evident as a mega percentage; up to 59.6% prefer listening to the radio stations and 14.0% preferring local posters and billboards. This was got from 250 out of 278 respondents that represents up to 89.9% of the respondents. The same respondents also disclosed that only 20.0% attend and prefer public barazas as reliable sources of information.Notably, majority of the people, representing up to 95.7% would like to be actively included and fully participate in GDC activities in the area as opposed to the 4.3% who were May-be not happy or responded as non-affected by the inclusion. Agnes C. de Jesus, 2005 emphasized on the need to consult communities on geothermal projects with potential impacts to their lives was a premier concern; this was in relation to Philippines Geothermal projects. Meaningful consultation is not possible unless the community is fully aware about the project activity which is the case in Menengai Geothermal project.

It is important to note that information is essential to any project development. According to Trish Melton, expert personnel at the Federal State Renewable energy regulations, (Melton, 2012), the success of a project is greatly determined by the level of information that the people who implement it receives about the project itself beforehand. As a result, there is an urgent need for the Company to carefully analyze the influence of the community; particularly the members of the Wanyororo and the Kirima sub-Locations and actively engage them in the execution of the project.

Moreover, the community has also cited heavy barrier to physical access of GDC as a company. They cite heavy security accorded to the project area with up to 15.5% of the total respondents highlighting challenges in accessing information on the energy project in Menengai Caldera. Of these groups a significant number of up to 60.5% of the

respondents identified inaccessibility of the GDC premise presents a major challenge in accessing the energy project information.

After cross tabulating data between the 234 respondents who were aware of the energy project in the Menengai Caldera, the study revealed that only 12 respondents participated in the project activities. It also shows that 15 respondents who have participated in the project activities which represented 80.0% of these respondents were aware about the project.

Income is defined as the average revenues that a person gets on periodical basis based on the work that the person does. It is the level of compensation that one gets out of their efforts in the business that the person undertakes. Income has many effects on the social order and the social status of a group of people. It holds the people's capacity to advance and get civilized faster. The higher the level of income of a people, the faster the process of fast tracking the development agenda of the people and the higher the standards of living. People who have higher standards of living are always considered civilized and can make rational decisions. As a result, they can easily be included in the development projects of the countries to which they belong. The research findings shows that in Kirima sub-location there were no respondents with high income level while in Wanyororo there were 14 respondents who were 5.2% of the 269 respondents. 124respondents from Wanyororo and 33respondents from Kirima had a low-income which they represented about 58.4% of the respondents. This is an indication that a majority of the residents in the two sub-locations have a low income. The Pearson Chi-square value of 39.456 shown in table 4.2 is significant since $p < \alpha$ at 95% confidence interval. This means that the level of income is influenced by the sub-location one is coming from.

Further analysis indicated that majority of the respondents have never had a chance to participate in the project activities, 59.2% of this count represents respondents with low income. 50.0% of respondents who participated in the project activities, their average income are regarded as low, 42.9% had middle income and 7.1% the average income was high.The research findings revealed that there is no any meaningful correlation between

the income levels and the community participation in GDC projects in the locality. The research thus returned a negative outcome based on the research hypothesis.

The research study also presents a case where the level of education is a possibility of being actively or passively involved in the development projects of their area as far as GDC is concerned. From the research study, it was revealed that the people have varied levels of education, with the majority having attained the high schooleducation. A few people have the primary education level. On the same note, the number of the person with the post-secondary education is equally few. This is the category that includes the college, university and other graduates from various institutions.

The number of respondents who have attained a degree education in the two sub locations is significantly higher and stands second after those from the high schools, with 3.6% adrift. The higher number of the university and high school graduates among the participants in the region signifies the fact that the people are informed enough to be involved in major decisions making processes about those factors that could directly and indirect impact in their natural habitats and homes. From the 278 respondents, 272 responded to the question on the education level while 6 chose not to respond. 43% of this number had attained a secondary level of education while at the same time the table informs us that more than 94.9 % of 272 respondents have gone and completed schooling. The high number of educated people among the Wanyororo and the Kirima Sub Locations is a sure reason for the Company to fully consider including them in its operations in the locality. A large number of community members, particularly the Wanyororo and the Kirima Sub –Locations would really like to be included as the Company stakeholders following their strong academic backgrounds. The findings from cross tabulation of education level and participation in project activities revealed that that none of the respondents who have graduated from the university were involved in the project activities. Out of those who are involved in the project activities, they were seven respondents who had a secondary certificate which represents 46.7%. Cumulatively, 93.7% of the respondents involved in the project activities have a minimum of primary education. This scenario can be explained by (International Council of Science, 2007) that developing a

competitive energy sector requires large number of highly skilled people in many specialized areas.

Gender is the social roles that the society puts on an individual. As a result, the only type of gender that exists includes the male and the female gender. For a long time, some jobs have been greatly associated with a given type of gender and the other. Among the Wanyororo and the Kirima communities, various activities like the mining and the energy explorations would initially be left to the male gender. However, with the increased level of civilization and education, there exist only imaginary lines between the two genders as far as the duties that are to be performed in the community are concerned.Today, many of the residents are equally learned in either case of the gender

The findings revealed that 94.4% of the 270 respondents did not participate in the energy project activities based on gender biasness in the few cases the company involved the community. This figure cuts across both males and femaleswho were not engaged in the energy project in the Menengai Caldera.

From the study, it was possible to make out that there were fifteen respondents who were involved in the energy project activities. Out of this numbers, 33.3% said that gender was the basis for consideration in the project activities, and 40% thought otherwise. This is a factor that follows from the community values that states that gender roles should be observed in the allocation of duties and responsibilities in the society.

It is equally important to point out that up to 82.0% of the 278 respondents thought that women participation in the project is as important as the men's participation. This shows the high level of integrity and assertiveness that the community has embraced in the recent past. As a result, it is high time the Company realized the importance of including the society members, particularly the aboriginals in the bid to improve on its products and services in the community.

5.3 Conclusions

The level of success that a business or a company may realize in its projects implementations is the level of involvement that it gives to all the stakeholders in the project. As a result, it can be concluded that there is need to provide community members with sufficient information that involves the Company's activities in the area. The research has revealed that the Company relied mostly on public barazas that the community members are supposed to attend and get the information. However, this has not been as effective as most of the aboriginals prefer the use of radios and posters as sources of information. This can also be attributed to the fact that they are learned people, and most of them, may be are pre occupied with other field activities. They need the information to continue supporting the Company's activities.

The level of education that the Wanyororo and the Kirima village members have received is one that can be considered to be at the height of formal education. The research study reveals that majority of the community members are learned and holds either a degree or a form four certificate. That is simply to state that they can read, write and actively reason out on matters pertaining to their community development. However, GDC has taken little effort to actively incorporate this important aspect of its projects success.

The gender of the community members have been proven beyond any reasonable doubt that cannot be an impediment in the involvement of the community member's in the Company's activities. In the community, both the males and the females are equally learned and can take on any professional activity or decision to be made. As a result, the community seeks to find the attention that it deserves from the Company during the process of making and implementing its objectives. It is thus important that they get actively involved in the projects without any kind of gender biasness. This is paramount for the business to realize the high amounts of cooperation that it needs in the community.

5.4 Recommendations

The following recommendations were made in order to enhance community participation in the project implementation:

1. Set up a satellite office in Menengai geothermal project that will promote information flow between the Company and the local community;
2. The Company should consider use of local radio stations in passing project information to the community;
3. In order to improve sustainability the Company should create and implement an outreach plan to address and manage community concerns;
4. The Company should develop a mechanism to respond to community concerns and questions should be put in place and maintained throughout the project life.

5.5 Contribution to the body of knowledge

Table 5.1 indicates the contribution made by this study to the body of knowledge.

Table 5.1 Contributions to the body of knowledge

Objectives	Contribution to the body of knowledge
To influence of information access on community participation in geothermal project implementation	Majority of the responds indicated that they received information about the energy project at the initiation stage. The results also indicated that residents preferred radio as a means of communicating project information as opposed to public barazas.
To determine how income levels influence community participation in geothermal project implementation	The research findings revealed that there is no any meaningful correlation between the income levels and the community participation in GDC projects in the locality.

To assess the influence of literacy levels on community participation in geothermal project implementation	The results indicated that majority of the community members are learned and holds either a degree or a form four certificate. That is simply to state that they can read, write and actively reason out on matters pertaining to their community development. However, GDC has taken little effort to actively incorporate this important aspect of its projects success.
To establish the influence of gender on community participation in geothermal project implementation	The gender of the community members have been proven beyond any reasonable doubt that cannot be an impediment in the involvement of the community member's in the company's activities.

5.6 Suggestions for further studies

The following areas are suggested for future study:

1. To establish the role of organizational factors in influencing participation of local communitythe in geothermal project implementation in Kenya;
2. To examine cultural factors affecting participation of local community participation in geothermal in geothermal project implementation in Kenya;

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APPENDICES

APPENDIX 1: LETTER OF TRANSMITTAL

Peter T. Mading
Masters Student,
University Of Nairobi,
P.O. Box 30197
Nairobi.

2nd April, 2013

To The Area Manager
Geothermal Development Company Limited
Central Rift Region
P.O. Box 17700-20100
Nakuru

REF: REQUEST FOR ACADEMIC SURVEY RESEARCH

I am a post graduate at the University of University undertaking Masters of Arts degree in Project Planning and Management and currently conducting project research proposal as part of the fulfillment of the course.

I am kindly, requesting to conduct academic survey research at Menengai geothermal project entitle: **Factors influencing community participation in geothermal project implementation: A case of Menengai Geothermal project.**

I assure you that the data collected will be solely be used for academic only and not any other purpose.

Any assistance you offer is highly appreciated.

Thank you

Yours' faithfully

Peter TirokwoMading

APPENDIX 2: COMMUNITY QUESTIONNAIRE

S/No……

Kindly take few minutes to complete this questionnaire. The information you provide will remain confidential and the result will be analyzed and reported collectively. Your views in combination of others are extremely important in understanding factors influencing community participation in Geothermal Power Project implementation in Menengai. Thank you for participation in the survey.

Please tick and respond to the questions appropriately.

Section A: Profile of the respondent

1. Age (in complete years) _____
2. Gender Male □ Female □
3. Marital status Single □ Married □
   Divorced/separated □ Widowed □
4. Sub-Location
   Wanyororo □ Kirima □
5. How many children do you have?
   Male_____ Female_____

Section B: The influence of access to information on Community Participation

1) For how long have you lived in this Sub-Location?
   □ 1-5 Years□ 11-15 Years
   □ 6-10 Years□ 16 -20 Years
   □ More than 21 Years
2) In the last four years are you aware of any energy project in Menengai Caldera?
   Yes □ No □

3) If yes, how did the information reach you?

□Awareness meetings

□Radio

□Newspaper

□Other_____

4) At what stage of the project did this information reach you?

□At initiation

□At implementation

5) What was your reaction about the information received on the construction and purpose of the project?

Happy/Positive

□ Source of Employment

□ Source of Employment

□ Cheap source of Energy

□ Cheap source of Energy

Development of infrastructure

Not Happy/Negative

□ Environmental pollution

□ Displacement of people

□ Other_____

6) Are there any challenges you face in accessing information about the project?

□ Limited Number of awareness barazas

□ Hard to access GDC premises

□ Delay of information

□ Other_____

7) How best do you think project information can be disseminated to the community?

□ Public meetings

□ Radio

□ Posters

□ Churches

□ Schools

□Social media

□ Village elders

Section C: The influence of income level on community participation

1) What is your employment status?

□Employed □ Unemployed

2) If employed, specify the nature of your employment

□ Public Sector □ Farming

□ Private Sector □Business

□ House Wife

3) What is your income level in the Sub-Location?

□High

□Middle

□Low

4) In your opinion do you think income level affect your participation in implementation of the Project?

Yes □ No □

Section D: The influence of Gender in Community Participation

1) Have you ever participated in any of the project's activities?

Yes □ No □

2) If No explain

□Limited opportunities

□Committed Elsewhere

□Lack of information

□Any Other_____

3) If yes, in 2 above were you considered on the basis of your gender?

Yes □ No □

4) In your opinion, is women's participation crucial in implementation of the project?

Yes □ No □

5) If Yes, kindly tick appropriately

□ Constitutional right

□Women are part of the community

□To improve their livelihood

□For sustainability of the energy project

□Have same skills as their male counterparts

□Other_____

6) If Yes, in 6 above suggest ways of strengthening women's participation in the implementation of the project

□Providing Employment opportunities

□Capacity building initiatives

□Other_____

Section E: The influence of literacy level on community participation

1) What is your highest level of school completed?

Primary □ Secondary □

College □University □

No Schooling Completed □

2) From your experience is there a specific group that the Company engages more in the implementation of its activities?

Primary □ Secondary □

College □University □

No Schooling Completed □ No, idea □

3) If your response in 2 above is specific to any group kindly, explain the nature of engagement

□Casual jobs

□Permanent jobs

□Other_____

4) In your opinion which category of individuals should the Company involve more in implementation of its activities?

Primary □ Secondary □

College □University □

No Schooling Completed □ All □

5) Are you aware of any environmental and social consequences associated with the project?

Yes □ No □

If yes, what are these consequences?

□Environmental pollution

□Displacement of people

□Other_____

Thank You

APPENDIX 3:RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550
Mobile: 0713 788 787 , 0735 404 245
Fax: 254-020-2213215
When replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: **NCST/RCD/14/013/935**

Date: **5th June 2013**

Peter Tirokwo Mading
University of Nairobi
P.O Box 1120
Nakuru.

RE: RESEARCH AUTHORIZATION

Following your application dated **28th May, 2013** for authority to carry out research on "***Factors affecting community participation in geothermal energy project implementation: A case of Menengai Geothermal power project in Kenya.***" I am pleased to inform you that you have been authorized to undertake research in **Nakuru North District** for a period ending **31st July, 2013.**

You are advised to report to **the District Commissioner and District Education Officer, Nakuru North District** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:
The District Commissioner
The District Education Officer
Nakuru North District.

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development".

APPENDIX 4: DETERMINATION OF SAMPLE SIZE FOR RESEARCH

Table for determining needed size (s) of a randomly chosen sample from a given finite population *n*cases such that the sample proportion *p* will be within ± .05 of the proportion *p*with a 95 percent level of confidence.

Population	**Sample size**	**Population**	**Sample size**	**Population**	**Sample size**
10	*10*	220	*140*	1300	*297*
15	*14*	230	*144*	1400	*302*
20	*19*	240	*148*	1500	*306*
25	*24*	250	*152*	1600	*310*
30	*28*	260	*155*	1700	*313*
35	*32*	270	*159*	1800	*317*
40	*36*	280	*162*	1900	*320*
45	*40*	290	*165*	2000	*322*
50	*44*	300	*169*	2200	*327*
55	*48*	320	*175*	2400	*331*
60	*52*	340	*181*	2600	*335*
65	*56*	360	*186*	2800	*338*
70	*59*	380	*191*	3000	*341*
75	*63*	400	*196*	3500	*345*
80	*66*	420	*201*	4000	*351*
85	*70*	440	*205*	4500	*354*
90	*73*	460	*210*	5000	*357*
95	*76*	480	*214*	6000	*361*
100	*80*	500	*217*	7000	*364*
110	*86*	550	*226*	8000	*367*
120	*92*	600	*234*	9000	*368*
130	*97*	650	*242*	10000	*370*
140	*103*	700	*248*	15000	*375*
150	*108*	750	*254*	20000	*377*
160	*113*	800	*260*	30000	*379*
170	*118*	850	*265*	40000	*380*
180	*123*	900	*269*	50000	*381*
190	*127*	1000	*274*	75000	*382*
200	*132*	1100	*278*	100000	*384*
210	*136*	1200	*285*		

Adapted from R.V. Krejecie and D.W. Morgan, Determining Sample Size for Research Activities," *Educational and Psychological Measurement*, 30(3), p, copyright 1970 by Sage Publication, Inc. Reprinted by Permission of Sage publicans, Inc.

APPENDIX 4: GEOTHERMAL PROSPECTS IN KENYA