

ROLE OF FINANCIAL INSTITUTIONS ON THE GROWTH OF GEOTHERMAL DEVELOPMENT COMPANY, KENYA

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Abstract

The study primarily sought to find out the influence of financial institutions on the growth of Geothermal Development Company. This study used descriptive research design. Out of a population of 113, a sample of 76 GDC staff from different departments was taken. The study employed a questionnaire for data collection. Data were analyzed using SPSS. Both descriptive and inferential statistics were employed in the analysis. The results were presented in form of tables. The study noted that long-term loans and grant financing had a positive and significant relationship with growth of the GDC. It was further showed that, among the studied contributors of financial institutions, grant financing was the most crucial while long-term loans were the least important in enhancing the growth of the GDC. The study concluded that long-term loans were important in enhancing the growth of the energy company. Grant financing was deduced to facilitate the growth of the company. The study recommended that the GDC should seek long-term loans for capital projects. In respect to grant financing, the study advised that the GDC should have a competent team mandated with drafting proposals for grants from leading financial institutions.

Keywords: Financial institutions, Geothermal Development Company, grant financing, long term loans, organizational growth

INTRODUCTION

Geothermal energy has the potential to provide significant amounts of low-carbon, low-cost electricity in many developing countries. It is broadly cost competitive with fossil fuel alternatives across the world and is the cheapest source of available power in some developing countries with rapidly growing energy demand. It can also provide a clean, reliable and flexible power source that could directly replace coal or gas in the electricity mix and complement higher penetrations of other, intermittent, renewable sources on the grid (Micale & Oliver, 2015)

Globally, the costs and risks associated with the exploration and development phases of geothermal projects make finding early-stages financing a challenge. Costs related to exploration can reach up to 15% of the overall capital cost of the project, success rates for wells drilled in this phase are estimated at 50-59% (IFC, 2013b), and it takes 2-3 years on average to confirm that a geothermal resource is suitable for generating electricity. Public resources could be more effective when targeting support at geothermal early-stage development risks and improving developers' access to finance. (Oliver & Stadelmann, 2015)

Geothermal resources have been identified in nearly 90 countries and more than 70 countries have already had some experience utilizing geothermal energy. It has been estimated that nearly 40 countries worldwide possess geothermal potential that could, from a purely technical perspective, satisfy their entire electricity demand. Currently, electricity from geothermal energy is produced in 24 countries. The United States and the Philippines have the largest installed capacity, about 3,000 MW and 1,900MW, respectively. Iceland and El Salvador generate as much as 25 percent of their electric power from geothermal resources (World Bank, 2012)

There is a positive trend in the development of geothermal in Africa with the key drivers being, climate change and increased environmental awareness; supportive laws and regulations; high cost of fossil fuels and electricity prices; increasing demand for energy and energy security; carbon trading opportunities and opportunities for direct use of geothermal resources. Geothermal energy remains the most important indigenous energy source for many countries in Africa. One of the key elements of successful geothermal energy development is financing. Scaling up geothermal power development requires active participation of both the public and private sectors. Reliance solely on commercial capital for geothermal development is rarely viable even in developed country markets. In developing countries, where the challenges involved in attracting private capital to geothermal projects are often greater, the commitment of the public sector including the country government, international donors, and financial institutions is an essential element of success in mobilizing capital according to World Bank (2012).

Kenya and Ethiopia are the only two countries in Africa producing electricity from geothermal steam. Kenya commissioned its first geothermal power plant at Olkaria in 1981. Several other African countries, particularly in the East African Rift Valley region, have significant potential for geothermal electric generation. Some exploration has been conducted for high temperature resources in Burundi, Cape Verde, Djibouti, Eritrea, Tanzania, and Uganda (Mwangi, 2003). In a country aspiring to scale up geothermal resource development, the government needs to set up an appropriate institutional structure. The experience of countries that have been successful in developing geothermal resources highlights the importance of a national champion or a dedicated core agency in charge of geothermal exploration and development. This can be a government agency or, preferably, a state-owned company with the requisite industrial capabilities (ESMAP, 2012).

In Kenya, in the case of Olkaria III, DFIs refinancing of Ormat's initial equity investment freed additional equity resources for the subsequent development phases of the project; debt financing now totals 85% of the investment costs. Loans provided and arranged by DFIs for Olkaria III were unmatched in the local commercial market, with a 10-to-19-year tenor and estimated 6.2% interest rate. Olkaria III's project developer Ormat benefitted from Multilateral Investment Guarantee Agency's (MIGA) Political Risk Insurance (PRI). The PRI provides coverage against restrictions on money transfers, expropriation, war and civil disturbance, for both current investment amounts and standby amounts. Return requirements for the private sector in Kenya are usually in the range of 18-23% but the PRI helped lower requirements for Olkaria III to around 16%. (Micale & Oliver, 2015)

Statement of the Problem

Energy is one of the infrastructural enablers of the three "pillars" of Kenya's Vision 2030. The level and intensity of commercial energy use in a country is a key indicator of the degree of economic growth and development. Geothermal energy has the potential to provide significant amounts of low-carbon, low-cost electricity in many developing countries, thereby opening up space for climate ambition. Given such advantages, the question must be asked why the use of geothermal power is not more widespread than it is. The main barriers to greater utilization of geothermal energy for power generation are related to risk and financing. Like most other renewable energy technologies, the financing profile for geothermal indicates a high up-front cost and relatively lower operating costs compared to conventional thermal power generation projects. Published data indicates that installation costs ranges between US\$2.5 million to US\$6.5 million per MW. Installation costs include resource exploration cost, appraisal costs, production drilling cost, plant and construction costs (World Bank, 2012). Resource exploration

and appraisal are most difficult development phases to be financed by other parties as the phases bear the highest risk exposure. Kenyan experience shows that multilateral, bilateral, and private entities are unwilling to invest in these phases. There is need to provide guarantees so as to attract private developers in the sector. For the growth of geothermal development there is need for participation of Financial Institutions. FIs play a critical role in terms of provision of long term loans, grants, capacity building and provision of credit enhancement mechanisms. From the problems highlighted above, there is greater need of support by financial institutions in order enhance the growth of geothermal energy in Kenya. Given that there exists scanty empirical evidence in regard to the link between financial institutions and the aforesaid growth, the present study sought to investigate the extent to which financial institutions influence growth of the GDC.

General Objective

To investigate the role of financial institutions in the growth of Geothermal Development Company in Nakuru County, Kenya.

Specific Objectives

- i. To establish the role of long term debt by financial institutions in the growth of Geothermal Development Company
- ii. To determine the role of grant financing by financial institutions in supporting the growth of Geothermal Development Company

Research Hypotheses

H₀₁: There is no significant role of long term debt by financial institutions in growth of Geothermal Development Company.

H₀₂: There is no significant role of grant financing by financial institutions in growth of Geothermal Development Company.

THEORETICAL REVIEW

This section presents a review of theories that explain financial institutions and growth of firms in geothermal energy sector. The theories reviewed and discussed include the pecking order theory, and loanable funds theory.

Pecking Order Theory

The Pecking order theory was proposed by Myers and Majluf (1984). The theory stated that financing follows a hierarchy and that companies or organizations prefer internal financing over external funding and debt over equity. The theory is premised on information asymmetry where it is asserted that managers have more information about firms than the investors. This disparity of information is referred to as asymmetric information. Other things being equal, because of asymmetric information managers will issue debt when they are positive about the firm's future prospects and will issue equity when they are unsure.

A commitment to pay to fixed amount of interest and principal to debt-holders implies that the company expects steady cash flows. On the other hand, an equity issue would indicate that the current share price is overvalued. Therefore, the manner in which managers raise capital gives signal of their belief in their firms' prospects to investors. This also implies that firms always use internal finance when available and choose debt over new issue of equity when external financing is required. Myers has called it the "pecking order theory" (Pandey, 2010).

Managers avoid signaling adverse information about their companies by using internal finance. The profitable firms have lower debt ratios not because they have lower targets but because they have internal funds to finance their activities. The Pecking Order Theory implies that managers raise finance in the following order; Managers always prefer to use internal finance, when they do not have internal finance, they prefer using debt as the last resort, managers issue shares to raise finances. The pecking order theory is able to explain the negative inverse relationship between profitability and debt ration within industry. However it does not fully explain the capital (Pandey, 2010).

Pecking order theory to date remains essential part of corporate finance. It is considered as one of the most influential theories. Pecking order theory suggests that the manner in which firms cover their financing deficits does not depend on the current levels of debt and that the firms always prefer internal funds to external funds and debt to equity Jibrán et al (2012). Bram, Charles, Frank, Cadsby, Murray, and Maksimovic, Vojislav. (1990) examine the predictive power of equilibrium dominance in experimental markets where firms with investment opportunities have an informational advantage over potential investors and are permitted to purchase a money-burning signal. Instead, equilibrium selection appears to be related to the potential earnings of a more valuable firm that can signal its type successfully by defecting from the sequential equilibrium.

The pecking order theory, which is part of capital structure theories, has been dominated by the search for optimal capital structure required for any firm Shyam-Sunder and Myers

(1999). According to Myers (1984) firms tend to utilize their retain earnings for purpose of financing when it is financially feasible and adequate. The reason is simply the adverse selection. Shyam-Sunder and Myers (1999) proposed that when any firm requires funds from external sources the equity is rarely issued. The firms simply opt for debt given that information costs associated with debt is lower than equity. They also refined these ideas into key testable predictions. When it comes to pecking order theory it has been supported by many academic such as Asquith and Mullins (1986) and Eckbo (1986) had shown evidence of adverse selection relating to equity issues. While research by Cadsby, Frank and Maksimovic (1990) provided similar evidence on experimental bases regarding firm's financing requirements. The pecking order theory can be used in the present study to show how the GDC goes about seeking financing for its capital projects such as explorations that are capital intensive. The fact that the company, besides relying on grants, seek credit from international financial organizations explain the importance of a firm relying on debt over equity in its financing as expounded by the pecking order theory.

Theory of the Growth of the Firm

The theory of the growth of the firm was proposed by Penrose in 1959. The theory states that the growth of a firm can be examined as a dynamic process where managers interact with various resources. According to Penrose (1959), when the management strives to get the best out of the available resources, there is a truly dynamic process that is witnessed. The foregoing process encourages persistent growth; however, it limits the rate of growth of the firm. Mahoney (1995) adds that the aforesaid conversion process is catalyzed by how resourceful the management is.

In the words of Itami and Numagami (1992), resources are the cognitive drivers of strategy in a firm. In the same vein, it is noted that there exists a close nexus between the diverse kinds of resources with which a firm works and the development of ideas, knowledge and experience of the firm's managers and entrepreneurs (Penrose, 1959). In other words, a firm is viewed as a unique bundle of resources. According to Williamson (1996), it is imperative and essential to have both intimate and tacit knowledge of a firm's capabilities and resources including human capital as an asset specificity.

In tandem with the present study, the theory of the growth of the firm could be employed to show how the resourcefulness of managers can be of great essence to the growth of the GDC. Besides the fact that, the knowledge managers acquire through experience, of their employees such that they are capable of matching employee skills to project specificities (Prescott & Visscher, 1980), managers' experiential knowledge could be of other fundamental

importance. Knowledgeable managers are able to identify how a firm should be financed including the sources of funds and the best way the borrowed funds should be allocated or employed in order to realize maximum growth over a given period of time. Therefore, GDC having experiential knowledgeable managers could bolster its chances of recording immense growth, and the reverse is also true.

EMPIRICAL REVIEW

This section outlines a review of past empirical studies in respect to financial institutions and growth of firms particularly in the energy sector. Specifically the review is on studies regarding long-term debt and grant financing relative to organizational growth.

Long-term Loans and Growth of Firm

In India, Chandra (2014) conducted a study on planning, analysis, financing, implementation and review of projects. The study observed that once a project is approved, adequate funds must be made available to meet its requirements as per the plan of implementation. In addition, it was revealed that it would be highly desirable if funds are provided even before the final approval to initiate advance action. The study further noted that it is a common observation that firms which have a comfortable liquidity position are, in general, able to implement projects expeditiously and economically.

According to a study by Pandey (2010), long term loans represent long term debt with a maturity of more than one year. They are obtained from banks and specially created financial institutions. Long term loans have a number of basic features. They include maturity, direct negotiation, security restrictive covenants, convertibility and repayment schedule. The size of the company may influence its capital and availability of funds from different sources. A large company has relative flexibility in designing its capital structure. The size of the firm has an influence on the amount and the cost of funds but it does not necessarily determine the pattern of financing. In practice, the debt- equity ratios of the firm do not have a definite relationship with their size.

An empirical study by Micalé ND Oliver (2015) examined the role of public finance in deploying geothermal energy in developing countries. The study observed that once a project is approved, adequate funds must be made available to meet its requirements as per the plan of implementation. To this effect, it would be highly desirable if funds are provided even before the final approval to initiate advance action. The study also noted that it is a common observation that firms which have a comfortable liquidity position are, in general, able to implement projects expeditiously and economically. Moreover, it was argued that developing countries will need

more of development finance if they are to meet deployment targets of 23GW by 2030, particularly in countries with high costs of debt finance. In these countries, the study observed, concessional loans can reduce the power tariff by up to 25%. Moreover, favorable loan conditions can lead to a 25% reduction in the tariff, by far the most important factor in lowering costs. This was noted to be particularly critical in certain country contexts with high costs of capital to ensure the projects' financial viability.

Moreover, a study conducted in Turkey by Audinet and Fridriksson (2015) analyzed the global geothermal development plan. The study found out that governments and development financial institution will need to provide 42-55% of the total additional financing of approximately USD 133 billion in the form of low-cost, long-term loans and equity for exploration, drilling, steam field development and power plant construction. In the study, it is averred that most of this public finance is needed in countries with some experience with geothermal but challenging private investment markets such as Indonesia and Kenya. There is need to increase both concessional finance and grant support.

Locally, a study carried out by Ngugi (2012) centered on Kenya's plans for geothermal development. The study noted that, geothermal projects are capital intensive in that large sums of money are required for their implementation. These sums of money are difficult to raise from a firm's internal sources. In tandem, it was argued that debt is much cheaper than equity. Furthermore, the study revealed that firms prefer to lower their risk profile in a project by adopting project finance where other investors in particular lenders/creditors are invited to share profits and also bear some of the project risk. Thirdly, for most countries interest arising from debt is a deductible expense for income tax purposes. This provides price advantage normally known as a tax shield. There are many sources of debt which include local and international commercial banks, bilateral and multilateral funding institutions, stock markets (bonds) and pension schemes.

Grant Financing and Growth of Firm

A study carried out by Micale and Oliver (2015) analyzed lessons drawn from the role of public finance in deploying geothermal energy in developing countries. The study observed that grants or contingent grants from governments and DFIs could be used to cover the cost of preliminary surveys and surface exploration or to reduce exploration drilling risks for private developers. It was further revealed that grants that are cost free funds are very limited. While there are many institutions that provide grants, they are mainly limited to less than 2 million Euros and hardly ever greater than 5 million Euros. Grants are also limited in their application with the providing entity dictating their use. Most of the grants are aimed at capacity development, technical

assistance in studies and provision of specialized skills. The application process for grants is very intensive and generates great competition thus limiting chances of obtaining them. However, if obtained they fill gaps that help drive projects forward as supported in an earlier study by Okumu (2003).

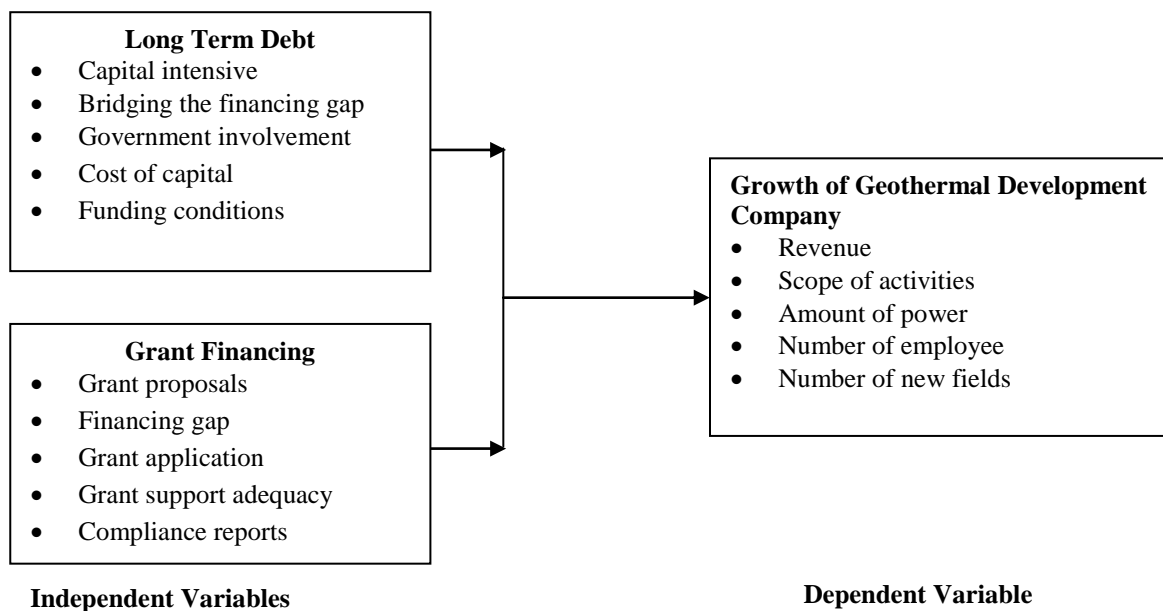
A comparative global study carried out by Sanyal, Tait, Jayawardera, Hutter and Berman (2016) analyzed mitigation approaches in relation to geothermal resource risk. The study noted that the Geothermal Risk Mitigation Funds (GRMF) is the first multi-donor scheme to specifically support geothermal risk mitigation in Africa. According to the study, the facility provides qualified public and private developers with grants for surface studies, and cost-sharing for exploration drilling. The study observed that qualified developers can receive up to 40 percent of the cost of up to 2 exploration wells, plus 20 percent of the cost of related infrastructure. In the case of a successful exploration and subsequent field development, project developers can receive an additional 30 percent of the pre-determined cost of exploration wells as a “premium.” Developers, the study noted, can apply once per year for grant funding from the GRMF and their applications are evaluated against a set of stringent, pre-determined financial and technical criteria. The study noted that some of the beneficiaries of the GRMF are four projects in Kenya and Ethiopia which received grant funding during the first Call for Proposals in December 2012 are currently in the exploration stage. The study has shown that funding can be mobilized for geothermal exploration by leveraging cost shared support from the public sector.

A study conducted by Ngugi (2012) delved into plans put in place by Kenya in respect to geothermal development. The study established that lending institutions and governments may provide grants to a project, concessional finance or at commercial rates which also differ from one institution to another. Empirical evidence further shows that Kenya is one of six pilot countries selected to benefit from the Scaling-Up Renewable Energy Program in Low Income Countries (SREP). SREP operates under the Climate Investment Funds (CIF). It is funded through contributions from bilateral development partners, the Department for International Development (FID) and the Government of Netherlands being the largest contributors. The African Development Bank (AfDB), and the World Bank Group (WBG), including the International Finance Corporation (IFC), jointly manage the SREP programmes for Kenya. The World Bank is the lead institution for the Kenya SREP. The objective of the SREP is to pilot and demonstrate the economic, social and environmental viability of low carbon development pathways in the energy sector by creating new economic opportunities and increasing energy access through the use of renewable energy (CIF, 2011).

Conceptual Framework

A conceptual framework is described as a diagrammatic representation that depicts how the variables (constructs) of a given study interact. Figure 1 shows the conceptual framework for this study. As shown, there are two sets of study variables. These are independent and dependent variables. Independent variables include capital structure and resource allocation. Financial sustainability is the dependent variable. Each of these variables is operationalized by specific indicators. The indicators of capital structure include equity, debt, retained earnings, donations, sponsorships, government funding, and tuition fees. It was hypothesized that private middle level colleges can get financing from either of the stated sources. The parameters for resource allocation include learning materials, salaries and wages, administrative costs, and research and development. Lastly, indicators of financial sustainability include strategic financial planning, income diversification, sound financial administration, own income generation, and working capital ratio.

Figure 1: Conceptual Framework



METHODOLOGY

This section outlines the methodology that was used in gathering data, analyzing and reporting the results. It comprises of research design, population, sampling technique, research tools, pilot testing, data collection method, and data analysis. Lastly, it states how the results of the analyses were presented.

Research Design

Research design is the blue print of the research used in data collection, analysis, interpretation and presentation. This study used descriptive research design. Descriptive studies are those that are used to describe phenomena associated with a subject population or to estimate proportions of the population that have certain characteristics Cooper and Schindler (2003). According to Coopers and Schindler (2004), descriptive studies are more formalized and typically structured with clearly stated hypotheses or investigative questions. It was used to obtain information concerning the current status of the group and to survey what exists with respect to the conditions in a situation. The methods involved will consist of secondary data and primary data collected from a certain grade of employees in the Geothermal Development Company.

Target Population

Cooper and Schindler (2003) define population as the total collection of elements whereby inference has to be made. The large set is the population while the smaller set is the sample. The target population comprised of all staff working with the GDC in Kenya. The study population, on the other hand is a subset of the target population are refers to the subjects that a researcher is able to access. In this regard, therefore, the study population constituted all the 113staff working with the GDC in Nakuru County.

Sampling Frame

Sampling frame refers to an exhaustive list of subjects from which the sample is derived. In this respect, therefore, the 113 employees working with the GDC in Nakuru County constituted the sampling frame as shown in Table 1.

Table 1: Sampling Frame

Department	Number of Employees
Corporate Planning & Strategy	17
Project Management	15
Finance	52
Audit Risk & Compliance	14
Corporate Performance Management	15
Total	113

Sample Size

The sample size was determined through calculation using a formula by Nassiuma (2009). The formula considered a coefficient of variation (V.C) of 30% and a margin of error of 2% as shown below

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

Where;

n represented sample size;

N represented population size;

C represented coefficient of variation

e represented error margin.

Sample size (n) was thus determined as illustrated below.

$$n = \frac{113 \times 0.3^2}{0.3^2 + (113-1)0.02^2}$$

$$n = 75.44$$

$$n = 76 \text{ respondents}$$

Sampling Technique

Stratified random sampling method was used to obtain the 76 sampled respondents from the study population of 113 employees. Stratification is the process of dividing members of the population into homogeneous subgroups before sampling (Mugenda & Mugenda, 1999). This method was chosen because it ensured that there was fair and equitable distribution of respondents across the 5 departments of the GDC as shown in Table 2.

Table 2: Sample Distribution

Department	N	Proportion (%)	n
Corporate Planning & Strategy	17	15.0	11
Project Management	15	13.3	10
Finance	52	46.0	35
Audit Risk & Compliance	14	12.4	10
Corporate Performance Management	15	13.3	10
Total	113	100	76

Research Instrument

The study employed a structured questionnaire as its research instrument in the collection of primary data. To measure the variables under study, the questionnaire was designed with a Likert scale of 5 points.

Pilot Testing

A pilot study is an activity that is done before the actual data collection is done. The researcher randomly issued 10 questionnaires to employees of Geothermal Development Company. This helped to check whether the instrument measured what was intended to measure if it was appropriate for the study. The participant in this study were excluded from taking part in the main study. The bottom line of carrying the pilot study was in order to investigate both the validity and reliability of the data collection tool.

Validity Testing

According to Kimberlin and Winterstein (2008), validity test is a measure of the extent to which a given data collection instrument measures what it purports to. In the context of the present study, the researcher determined the content validity of the instrument by seeking the expert opinion of the university supervisor. There were no alterations or adjustments made on the research instrument after seeking the expert opinion. The supervisor's views were deemed sufficient in determining the instrument's validity.

Reliability Testing

Reliability test is a measure of internal consistency which is within the control of the researcher. Granted that the research instrument contained items on a Likert scale, the Cronbach alpha coefficient was employed to test the reliability. Moreover, Kimberlin and Winterstein (2008) aver that this is the most widely employed and recommended test for reliability. The results of the reliability test are as shown in Table 3.

Table 3: Results for Reliability Test

Study Variable	Items Tested	Test Results (α) (%)
Long-term loans	6	0.78
Grant financing	7	0.80
Capacity building	6	0.78
Credit enhancement mechanisms	6	0.81
Growth of GDC	5	0.79

As shown in Table 3, the data collection instrument was found to be reliable in that all the five study variables namely long-term loans, grant financing, capacity building, credit enhancement mechanisms, and growth of GDC returned alpha values greater than the threshold of 0.7.

Data Collection Procedure

The researcher used both the primary and secondary data collection methods. The primary data was collected through a semi structured close and open ended questionnaires; the secondary data of the study was collected from GDC documents. Each instrument was employed based on the objectives that the researcher wanted to achieve, therefore the researcher used appropriate data collection instrument so as to achieve identified research objective and therefore get answers to the questions asked.

Data Processing Techniques

The data collected were analyzed using Statistical Package for Social Sciences (SPSS) version 24 tool. The analysis took the form of both descriptive statistics and inferential statistics. Descriptive statistics were in form of frequencies, percentages, means, and standard deviation while correlation and multiple regression analyses were the inferential statistics. The results of the analyses were presented in form of tables. The following regression model was adopted

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

Where Y represented growth of GDC

X_1 represented long term loans

X_2 represented grant financing

β_1, β_2 represented parameter estimates for independent variables

β_0 represented constant

ϵ represented error term for the regression model

EMPIRICAL FINDINGS

Response Rate

It is stated that the percentage of people who respond to a given survey is referred to as the response rate. The response rate facilitates to determine the representativeness of the target population. The optimum or acceptable response rate vary depending on mode of administration of the research instrument. According to Hamilton (2003), the acceptable response rate for online survey is an average of 30% while in face-to-face surveys, 75% to 85% is considered good (Punch, 2003). In the present study, a total of 76 questionnaires were issued

and the ones returned having successfully been filled totaled 56. This translated to 73.68%. According to Punch, the foregoing response rate was good and as such, acceptable.

Descriptive Findings

The study evaluated the opinions of the employees working with the Geothermal Development Company in Nakuru County on issues of long-term loans, capacity building, and grant financing, credit enhancement mechanisms.

Descriptive Findings and Discussions for Long Term Loans

The study has put into perspective the views of the GDC employees regarding long-term loans. The afore stated views are summarized in Table 4.

Table 4: Descriptive Statistics for Long Term Loans

	n	Min	Max	Mean	Std. Dev
Geothermal development is capital intensive project	56	1	5	4.59	.890
Long term debt is necessary for GDC growth	56	1	5	4.46	.852
The government of Kenya is involved when borrowing money	56	1	5	4.43	.931
Financial institutions helps in bridging the financing gap leading to the growth of GDC	56	1	5	4.34	.920
GDC adheres to the funding conditions	56	1	5	4.07	.951
Cost of capital is considered when borrowing money	56	1	5	4.02	1.152

The study noted that the GDC employees were in strong agreement (mean = 4.59; std dev = 0.890) that geothermal development was a capital intensive project. It was further agreed that long-term debt was necessary for GDC growth (mean = 4.46; std dev = 0.852); the Government of Kenya was involved when borrowing money (mean = 4.43; std dev = 0.931); and that financial institutions helped in bridging the financing gap thus leading to the growth of GDC (mean = 4.34; std dev 0.920). In the same vein, it was revealed that the respondents held the view that the GDC adhered to the funding conditions (mean = 4.07; std dev = 0.951); and that cost of capital was considered when borrowing money.

Descriptive Findings and Discussions for Grant Financing

The study analyzed the views of the GDC employees in respect to grant financing in their firm. The descriptive results outlining these views are presented in Table 5.

Table 5: Descriptive Statistics for Grant Financing

	n	Min	Max	Mean	Std. Dev
GDC has benefited from grants from FIs	56	1	5	4.37	.799
GDC prepares and submits proposals for grants	56	1	5	4.36	.862
Grant financing helps to fill in the financial gap in GDC	56	2	5	4.32	.765
Grants support high risk exploration activities	56	2	5	4.09	.859
GDC prepares compliance reports on the use of grants	56	1	5	4.07	.828
Grant application is a competitive process	56	1	5	3.96	.914
Grant support is very limited	56	1	5	3.64	1.086

It was agreed that the Geothermal Development Company had benefited from grants from financial institutions (mean = 4.37; std dev 0.799); the firm prepared and submitted proposals for grants (mean = 4.36; std dev = 0.862); and also that grant financing helped to fill in the financial gap in the firm (mean = 4.32; std dev = 0.765). The study further revealed that grants supported high risk exploration activities (mean = 4.09; std dev = 0.859), GDC prepared compliance reports on the use of grants (mean = 3.96; std dev = 0.914), and also that grant support was very limited (mean = 3.64; std dev = 1.086).

Descriptive Findings and Discussions for Organizational Growth

The study further sought the views of the employees working with the GDC in respect to the growth of their organization. The results to this effect are as presented in Table 6.

Table 6: Descriptive Statistics for Organizational Growth

	n	Min	Max	Mean	Std. Dev
Revenue of GDC has been rising over the years.	56	4	5	4.71	.456
The scope of activities and mandate of GDC has increased over time	56	4	5	4.66	.478
The amount of geothermal power generated by the firm has increased significantly	56	4	5	4.50	.505
The number of employees working with GDC is on the rise	56	4	5	4.34	.478
GDC has opened new power generation sites in the recent past	56	2	5	4.00	.572

The study established that, it was strongly agreed that revenue of GDC had been rising over the years (mean = 4.71; std dev = 0.456); the scope of activities and mandate of the firm had increased over time (mean = 4.66; std dev = 0.478); and also that the amount of geothermal

power generated by the firm had increased significantly (mean = 4.50; std dev = 0.505). Additional findings as shown in Table 6, revealed that the sampled employees held the view that the number of employees working with GDC was on the rise (mean = 4.34; std dev = 0.478); and also that the firm had opened new power generation sites in the recent past (mean = 4.00; std dev = 0.572). In general, it was noted that GDC had recorded growth in various spheres.

Inferential Findings

The study further examined various inferential statistics in reference to aspects of financial institutions and organizational growth of the Geothermal Development Company (GDC). These statistics facilitated the determination of the relationship between the said aspects of financial institutions and organizational growth. Moreover, they aided in assessing the influence of the aforementioned aspects on growth of the GDC.

Correlation Analysis

Correlation analysis enabled the researcher to determine the relationship between each of the aspects (long-term loans, grant financing, capacity building, and credit enhancement mechanisms) of financial institutions and organizational growth. Pearson's correlation coefficient was employed to conduct the analysis. The pertinent results of the correlation analysis are presented in Tables 7 and 8.

Table 7: Long-Term Loans and Organizational Growth

		Organizational Growth
Long Term Loans	Pearson Correlation	.440**
	Sig. (2-tailed)	.001
	n	56

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

As shown in Table 7, the correlation between long-term loans by financial institutions and organizational growth was found to be positive, moderately strong and significant ($r = 0.440$; $p < 0.05$). This was interpreted to mean that as the Geothermal Development Company employed more long-term loans, the more it was likely to record organizational growth. The significance of this relationship underlined the importance of long-term loans in respect to the growth of the GDC.

Table 8: Grant Financing and Organizational Growth

		Organizational Growth
Grant Financing	Pearson Correlation	.545**
	Sig. (2-tailed)	.000
	n	56

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

The study, as indicated in Table 8, revealed that there existed a positive, moderately strong, and significant relationship between grant financing and organizational growth ($r = 0.545$; $p < 0.05$). The result implied that as grant financing continued to be more embraced, the GDC was inclined to record greater growth, and the reverse of this assertion was true. The significance of the afore stated relationship indicated the importance of grant financing in propelling the organizational growth of GDC.

Regression Analysis

This section outlines the results of combined correlation (R) between all factors studied under financial institutions, and organizational growth of the GDC. It also shows the results of the coefficient of determination (R^2) which illustrates the extent to which the studied elements of financial institutions contributed towards the growth of the GDC. In this section the influence of financial institutions on organizational growth is also examined. Moreover, the results of the t-test statistics that enable addressing the null hypotheses are presented in this section.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.636 ^a	.405	.358	.33828

a. Predictors: (Constant), Long Term Loans, Grant Financing

The study as shown in Table 9 observed that the relationship between the four studied elements of financial institutions (long-term loans and grant financing) combined and organizational growth was positive and strong ($R = 0.636$). The results meant the more the GDC encouraged and embraced the facilitation rendered by financial institutions, the more it was likely to record growth. According to the results of the coefficient of determination ($R^2 = 0.405$), shown in Table 9, the mentioned factors (long-term loans and grant financing) could explain 40.5% of growth of

the GDC. The results indicated in Table 10, show the significance of the combined financial institution factors and organizational growth.

Table 10: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3.969	4	.992	8.671	.000 ^a
Residual	5.836	51	.114		
Total	9.805	55			

a. Predictors: (Constant), Long Term Loans, Grant Financing

b. Dependent Variable: Organizational Growth

As shown in Table 10, the relationship between long term loans and grant financing combined, and organizational growth was statistically significant ($F = 8.671$; $p < 0.05$). When interpreted the results emphasized the significant role played by financial institutions towards the growth of the Geothermal Development Company. Table 11 shows the results of the regression coefficients and t-test.

Table 11: Regression Coefficients and T-test Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.095	.393		5.336	.000
Long Term Loans	.009	.089	.015	.096	.924
Grant Financings	.231	.103	.305	2.242	.029

a. Dependent Variable: Organizational Growth

The regression results shown in Table 11, were interpreted using the following regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

$$Y = 2.095 + 0.09X_1 + 0.231X_2$$

The findings implied that a change of growth of the GDC by a single unit was subject to 0.09 unit change in long-term loans, and 0.231 unit change in grant financings. At the same time, other factors represented by 2.095 were supposed to be held constant in order for the foregoing model to hold. These findings further showed that among the studied contributions of financial

institutions, grant financing was the most crucial. At the same time, long-term loans were the least important in enhancing the growth of the GDC. On this premise, therefore, it was imperative for the management of the GDC to source for greater financing through grants while paying less attention to long-term loans. Unlike long-term loans which attract interest, financial grants are interest free and are more often than not large in monetary amounts.

The results of the t-test statistics shown in Table 11 were employed to test the null hypotheses. The first null hypothesis (H_{01}) stated that there was no significant role of long-term loans by financial institutions in growth of Geothermal Development Company. To this effect, the results of the t-test statistics ($t = 0.096$; $p > 0.05$) led to failure to reject the stated null hypothesis. The second null hypothesis (H_{02}) stated that there was no significant role of grant financing by financial institutions on growth of GDC. However, the results of the t-test statistics ($t = 2.242$; $p < 0.05$) led to the rejection of the stated null hypothesis.

SUMMARY

The study noted that it was strongly agreed that geothermal development was a capital intensive project. This was in tandem with past observations in a study conducted by in Kenya by Ngugi (2014). Ngugi had noted that geothermal projects are capital intensive in that large sums of money are required for their implementation. It was further agreed that long-term debt was necessary for GDC growth, the Government of Kenya was often involved when borrowing money, and that financial institutions helped in bridging the financing gap thus leading to the growth of GDC. The foregoing findings concurred with the observations made in a study by Audinet and Fridrikson (2015) that long-term loans were low-cost and as such were suitable for exploration, drilling, steam field development and power plant construction.

The study further established that the GDC adhered to the funding conditions instituted by financial institutions, and that cost of capital was considered when borrowing money. From the findings, financial institutions greatly influence the growth of GDC through provision of long term loans. The study underlined the importance of long-term loans in respect to the growth of the GDC.

The study revealed that the Geothermal Development Company had benefited from grants from financial institutions. It was also observed that the firm prepared and submitted proposals for grants, and also that grant financing helped to fill in the financial gap in the company. The study further revealed that grants supported high risk exploration activities, GDC prepared compliance reports on the use of grants, and also that grant support was very limited. From the research findings, GDC employees agreed the grant financing influences the growth of the company. The study indicated the importance of grant financing in propelling the

organizational growth of the GDC. The findings in this study concurred with earlier observations made in a study carried out by Sanyal et al (2016) that some of the beneficiaries of the Geothermal Risk Mitigation Funds are four projects in Kenya and Ethiopia which received grant funding during the first Call for Proposals in December 2012.

The study established that revenue of the GDC had been rising over the years, the scope of activities and mandate of the firm had increased over time, and also that the amount of geothermal power generated by the firm had increased significantly. More so, it was revealed that the number of employees working with GDC was on the rise, and also that the firm had opened new power generation sites in the recent past. The study generally noted that the GDC had recorded growth in various spheres. It was also revealed that the more the GDC encouraged and embraced the facilitation rendered by financial institutions, the more it was likely to record growth. The study further underscored the significant role played by financial institutions towards the growth of the Geothermal Development Company. These findings, in addition, showed that among the studied contributions of financial institutions, grant financing was the most crucial while long-term loans were the least important in enhancing the growth of the GDC.

CONCLUSIONS

The study made several deductions pertinent to objectives of the study. The conclusions were drawn from the findings of the study. It was concluded that geothermal development was a capital intensive project. It was inferred that that long-term debt was necessary for GDC growth. This was based on the assertion that the company was involved in capital projects which required long-term financing as opposed to short-term funds. The study also concluded that the government was involved in procurement of loans by the GDC, largely due to the fact that the company is a State corporation largely funded and managed by the government through the ministry of energy. The study further concluded that long-term loans were important in enhancing the growth of the energy company.

The study concluded that the GDC had benefited from grants from financial institutions. In order for the company to get financial grants from financial institutions, it was required to compile and submit the requisite proposals. The study also deduced that grant financing helped in bridging the financial gap in the firm. Grant financing was further concluded to have helped the GDC in carrying out high risk exploration activities. Moreover, it was concluded that the GDC filed compliant report on how the funds granted were employed. Grant financing was deduced to facilitate the growth of the company.

RECOMMENDATIONS

The study recommended that the Geothermal Development Company (GDC) should seek long-term loans for capital projects while both short-term and medium-term debts should be limited to recurrent expenditure of the firm. The loans, regardless of their amount and repayment period, should be evaluated in respect to the accruing interest. The credit facilities thus taken by the firm should make positive sense in the net present value of the projects whose financing is being sought. When procuring loans, it was also advisable for the firm to ensure that all concerned stakeholders were full involved.

In respect to grant financing, the study advised that the GDC should have a competent team mandated with drafting proposals for grants from leading financial institutions particularly those with global presence. The foregoing is based on the assertion that the soundness of the grant proposal significantly determines the accessibility of the grant financing or not, and also the amount of the grant. The management of the GDC is advised to ensure that all the funds sourced from financial institutions are accounted for and reports to this effect duly compiled and submitted to those institutions in order to facilitated future funding.

LIMITATIONS OF THE STUDY

The researcher faced challenges when collecting data since some of the respondents were not willing to participate in the study. In order to address this limitation, the respondents were assured that the study was for academic purposes and that their identity would not to be disclosed to third parties. Another limitation was the fact that the data collecting instrument had close-ended questions that facilitated collection of quantitative, categorical data. In respect to these, the respondents were limited in respect to how they were to answer the questions. In addressing the foregoing challenge, the researcher strived to ensure that the questions captured in the instrument were as objective as possible and compressively addressed all the study constructs.

SUGGESTIONS FOR FURTHER STUDIES

It is recommended that studies be carried out on other financial factors influencing the growth of the Geothermal Development Company in Kenya. It is also recommendable to conduct studies on the implication of other forms of loans (short-term and medium-term loans) on the growth of the GDC. The study also recommends a comparative empirical study to be conducted on the influence of both local and international financing on the growth of the GDC. A similar study should also be conducted on the role of loans and grants on the growth of the GDC.

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