INFORMATION ACCESS AND UTILIZATION FOR CAPACITY BUILDING IN GEOTHERMAL ENERGY DEVELOPMENT - A CASE FOR THE PROPOSED AFRICA GEOTHERMAL CENTRE OF EXCELLENCE

Bosire Paul
Geothermal Development Company
P.O Box 17700-20100, Nakuru
Kenya
pbosire@gdc.co.ke

ABSTRACT

The study was conceived with the aim of investigating the role of information access and utilization for capacity building in geothermal energy development in relation to the proposed Africa Geothermal Centre of Excellence. The study was initiated on the fact that access to and utilization of information is so fundamental for effective capacity building through teaching and learning and that specialized human resource capacity has been identified as a hindrance to exploitation of geothermal energy largely as a result of lack of available training institutions for geothermal sciences and engineering in the region. The objectives of the study were to determine the need for provision of information services, to determine the sources and channels of information, to establish the likely challenges of information access and utilization and provide recommendations and way forward for improving information access and utilization for capacity building in the proposed Africa Geothermal Centre of Excellence. The study is work in progress and underscores the importance of information access and utilization for capacity building in geothermal energy development. It describes and supports an inclusive need for information access and utilization, demonstrates how and identifies the sources of information, the information needs of different stakeholders in the geothermal energy subsector for capacity building in the proposed Africa Geothermal Centre of Excellence (AGCE). The result of the study indicates that information access and utilization is so pertinent in capacity building. The results of the findings show that the establishment of the ARGeo facility is a good platform for information access and utilization. Additionally, conference and workshops, the established geothermal database and online databases and electronic libraries are excellence sources of information that can enhance teaching and learning in the proposed African Geothermal Centre of Excellence. The study suggests that aggressive actions of information access and utilization ought to be in place to address the identified training needs in the field of geothermal energy development calling upon the inclusion of information scientists to provide an insight on the aspects of information access and utilization. The study concludes that in order to provide the skills and train actors in the geothermal industry for them to perform effectively, access to information and knowledge utilization is inevitable.

1.0 INTRODUCTION AND BACKGROUND INFORMATION

Access to and utilization of information makes individuals to be more rational, increases decision making abilities and help communities to identify sustainable opportunities and development solutions that are within their reach. The general objective of the study was to establish whether information access and utilization have any correlation with capacity building in the geothermal energy subsector in the proposed Africa Geothermal Centre of Excellence (AGCE) in Kenya. The study underscores that centres

of excellence provide a focal point for knowledge management, with the overall goal being the ability to capture new knowledge and practices from inside and outside of the business.

Policy development and planning for sustainable geothermal energy development and coherent geothermal reservoir management demands information on the best practices. Technology keeps on changing and the need for integrated information has increased demand for organizational infrastructures for the acquisition, integration, analysis and dissemination of data and information. Capacity building in the geothermal energy subsector has been growing with a very slow pace. The stakeholders in the subsector have subsequently developed mechanisms and strategies that can hasten the process of having a robust pool of human resources who can drive their agenda. To realize this, there should be continuous learning and research enabled by rapid access to and utilization of information resources.

Investment in human resource through learning and training is a promoter for a highly skilled, productive, creative, and competitive workforce in any organization. Knowledge empowers and enlightens and information resource centres are powerful entities available to the proposed Africa Geothermal Centre of Excellence for the empowerment of the African people on issues of geothermal energy development. Continuous learning and self-development can only be guaranteed through a repository of knowledge and information available in libraries and information resource centres.

In the absence of adequate access to and information utilization, the research findings cannot correlate to what other researchers have done in the same field leading to duplication of effort, loss of money and valuable time. Each player in the process of geothermal energy development should have the opportunity to acquire the necessary skills and knowledge in order to understand, participate actively in, and benefit fully from the information and the knowledge economy.

A centre of excellence is a premier organization providing an exceptional product or service in an assigned sphere of expertise and within a specific field of technology, business, or government, consistent with the unique requirements and capabilities of the centre of excellence organization (Craig *et al*., 2009). In this study, a centre of excellence has been considered as institutional environments that strive for and succeed in developing high standards of conduct in a field of research, innovation and learning.

Icelandic International Development Agency ICEIDA and Geothermal Development Company of Kenya have established cooperation for support to geothermal development in Kenya with a focus on capacity building. Geothermal Development Company of Kenya has been proposed by stakeholders to host the proposed geothermal centre of excellence to be based in Nakuru, Kenya for building human capacity by offering training programs that are geared towards the needs of geothermal energy development in Eastern Africa region. As a pilot study, three groups of students from Tanzania and Uganda have already been trained by the expertise available at geothermal development company Kenya (GDC, 2016). Though it has been a success story, the aspect of information access and utilization was wanting as the students could entirely rely on the internally generated reports available in the institution's resource centre.

It should be noted that access to and utilization of information could promote the development of professionals and enhance capacity building in the proposed Africa Geothermal Centre of Excellence through surfing the internet and professional literature as apposed to learners entirely relying on the trainers notes. It should be appreciated that professional literature constitutes one of the most important methods for promoting professional development. Most of the topical issues in any professional abound in books; conference proceedings, taped slides, taped audio and videotapes and therefore information resource centres should endeavour to make them available in their collections.

2.0 PROBLEM STATEMENT AND JUSTIFICATION

The challenge in the geothermal energy has been and is the conversion of tacit knowledge into explicit knowledge and vice versa. Tacit knowledge can be passed to each other in the form socialization whereby individuals acquire knowledge from others through dialogue and observation. The proposed geothermal centre of excellence shall provide a solution to this through documentation of the students' project reports and trainers training materials.

This study notes that since the proposed geothermal centre of excellence is work in progress, the aspects of information access and utilization at the policy levels ought to be discussed. Access to geo-scientific journals and electronic databases has to be discussed and agreed on since the quality of learning in any training centre is judged by the amount of information resources that can be accessed and utilized. Capacity building and the transfer of technology is imperative in the sustainable development of renewable energy resources. Many industrialized and developed countries have significant experience in the development and operation of renewable energy installations for direct use and/or electricity production. It is important that they share that knowledge with newcomers in the field by sharing resources offered by an educational centre of excellence.

Fundamentally for all the studies that have been undertaken, the conference and workshops reports by the stakeholders reviewed, the role of information management and it provision for capacity building has not been addressed. The study therefore undertakes to unfold the critical areas of information access and utilization that can further enhance teaching and learning in the proposed Africa Geothermal Centre of Excellence.

3.0 GOALS AND OBJECTIVES

i. To establish whether provision of information services for the proposed Africa Geothermal Centre of Excellence can aid in capacity building
ii. To determine the preferred sources and channels of information for capacity building in the proposed Africa Geothermal Centre of Excellence.
iii. To determine the likely challenges of information access and utilization in capacity building in the proposed Africa Geothermal Centre of Excellence
iv. To provide recommendations and way forward for improving information access and utilization in the proposed Africa Geothermal Centre of Excellence to aid capacity building.

4.0 PREVIOUS WORKS AND RELATED LITERATURE

There is no worse form of human rights violation than to be deprived of the ability to think, create and communicate in freedom. In this era of information revolution, people are having relatively easier access to vast store array of information but it is tragic that the delivery mechanisms for knowledge are today in the hands of fewer people. The study appreciates that information is a powerful tool for economic growth and development. Therefore, there should be a forum for free information resource exchange through networking among the stakeholders as opposed to information and knowledge sharing during workshops and conferences. Institutional restrictions and barriers ought to be removed if at all the proposed geothermal centre of excellence has to be a success story.

Globalization has perpetuated in the information content being transmitted, often leaving more people out of the information loop which forms the roots of their culture and identity. They have lost the knowledge they had, and what has replaced it is not relevant. Ultimately the impact sublimely expands and erodes the traditional knowledge bases and indigenous processes best adapted to deal with local conditions. The end result is nothing short of loss of knowledge diversity. This is applicable too in the geothermal energy subsector (Vikas 2000).

Adelaja (2009) posit that ignorance is a killer of the destiny of a people. Information brings about change. According to Mingers and Willcocks (2004) the utilization of any information leads to some form of action or result which could be a reply, or an activity, or just a decision not to respond. Therefore, persons who are well informed and conscious of using the information at their disposal are those who will make the right change and not suffer any avoidable predicament.

Capacity building is a risky, messy business, with unpredictable and unquantifiable outcomes, uncertain methodologies, contested objectives, many unintended consequences, little credit to its champions and long-time lags (Morgan, 1998, p6).The goals of capacity building in the geothermal energy subsector have been and are to facilitate individual and organizational learning which builds social capital and trust, develops knowledge, skills and attitudes and when successful create an organizational culture and a set of capabilities which can enable organizations to set objectives, achieve results, solve problems, and create adaptive procedures which enable them to survive in the long run.

Mariita N. O. (2015) observes that in an increasingly competitive global operating environment we must educate and train the very best people, then make sure that they are employed effectively in the interests of industry and of society as a whole. The geothermal industry relies on a spectrum of professionals with varying technical backgrounds and experience. He recommends that the creation of a Geothermal Training Institute in Kenya was therefore envisaged to be an important contribution to address the technical capacity and confidence barriers through shared experience and technical assistance in geothermal exploration, exploitation and utilization in the region.

This study appreciates that although the literature conducted was largely on access and utilization of information and knowledge in general, they are largely applicable to players working in the geothermal energy subsector as well. Therefore, the success of the proposed Africa Geothermal Centre of Excellence in fulfilling its objective of capacity building in geothermal energy development will largely depend on the quality and relevance of information consulted. The players and stakeholders in the proposed Africa Geothermal Centre of Excellence ought to appreciate that increased access to information and knowledge, underpinned by universal literacy, is an essential pillar of sustainable development in the matters of geothermal energy development.

5.0 METHODOLOGY

The study adopted purposive sampling technique among 40 respondents from diverse disciplines from Geothermal Development Company in trying to establish the role information access and utilization could play in the proposed Africa Geothermal Centre of Excellence in capacity building in geothermal energy development. Respondents were sampled from Geothermal Development Company Kenya since the stakeholders have suggested that the Africa Geothermal Centre of Excellence will be hosted by Geothermal Development Company Kenya. Questionnaires and document analysis were used as data collections instruments. The respondents were all in the working age of between 18-60 years. All the respondents received and completed the data collection instrument. The response rate was 100%

6.0 DISCUSSION OF THE FINDINGS

6.1 Need for information access and utilization for capacity building in proposed Africa Geothermal Centre of Excellence

The study sought to answer the question of whether there is any need for enhancing information access and utilization for capacity building in the proposed Africa Geothermal Centre of Excellence. It was noted that information access and utilization is so pertinent in capacity building in the geothermal energy subsector and more especially to the proposed Africa Geothermal Centre of Excellence. It is indicative that for effective learning and training to take place in the proposed Africa Geothermal Centre of Excellence there should be an information resource centre providing adequate access to information to enhance maximum utilization of information. Furthermore, ensuring effective access to information in the institution information repositories will greatly help in finding full texts of articles that they might be having only bits and pieces of, seeing who is writing about a particular subject. It is noted that the extent to which young scientists, engineers and other stakeholders of today will be creative, informed and knowledgeable will be shaped by the boundaries of the contents of the information resources available within their environment or organizations in the geothermal energy subsector. A wide variety and plentiful supply of information resources are required to encourage independent study so that young engineers and scientists from early age can learn how to think so that their convictions and views are formed as a result of active mental efforts. All these efforts can serve as solid foundation for successful concept of capacity building in the proposed Africa Geothermal Centre of Excellence. Figure 1 below shows a summary of the views of the respondents on the need for information access and utilization for capacity building in the proposed Africa Geothermal Centre of Excellence.

Figure 1: Need for information access and utilization for capacity building

6.2 Sources of information for capacity building in the geothermal energy subsector

6.2.1 ARGeo facility

The study sought to answer the question of whether the establishment of the ARGeo facility as a source of information will enhance capacity building in the proposed Africa Geothermal Centre of Excellence. It was observed that the ARGeo facility has greatly enhanced the sharing of information and knowledge in the geothermal energy subsector in the region by providing an enabling environment for tapping tacit knowledge which then can be documented and made available in the proposed Africa Geothermal Centre of Excellence for future references for young scientists, engineers and other stakeholders. It was observed that indeed that establishment of the ARGeo facility has provided a firm foundation of information

exchange that goes way forward in enhancing capacity building in the region. Figure 3 below shows a summary of the views of the respondents on the ARGeo Facility

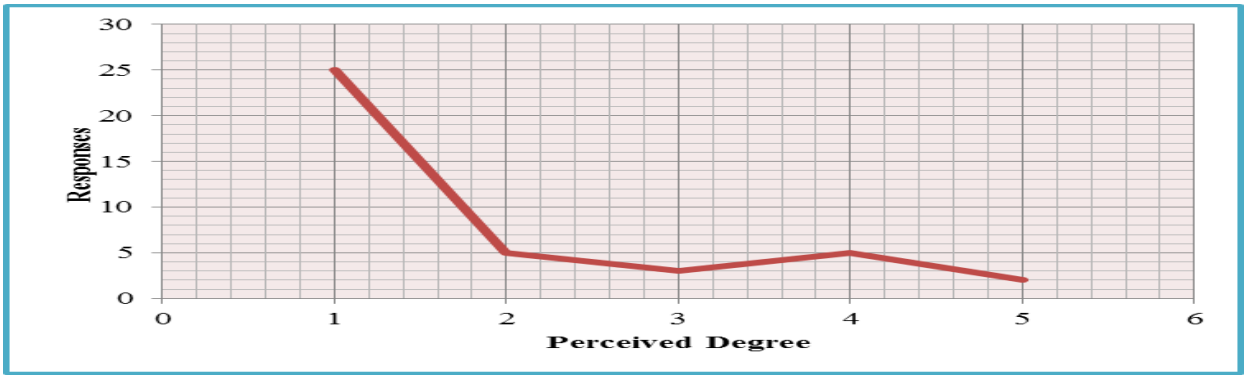

Figure 2: ARGeo facility as a source of information for capacity building

6.2.2 Conference and workshops

The study sought to answer the question of whether continued workshops and conference could fast-track capacity building in the proposed Africa Geothermal Centre of Excellence. It was noted that conferences and symposiums provide an excellent platform for tapping both tacit and explicit knowledge among the participants from diverse countries in the world related to geothermal research, development, use and direct use applications.

In addition, it provides a forum with which members can learn from current lessons and years of valuable experience in development and applications of geothermal energy and technology and network and explore possible cooperation, partnerships, and business relationships among participants in the field of geothermal energy development. All the knowledge in the geothermal energy subsector ought to be tapped and documented in the institutional repository through such conference and workshop forums. Figure 2 below indicates the perception and views of the respondents on conferences and workshops as a source of information for capacity building in the proposed Africa geothermal centre of excellence.

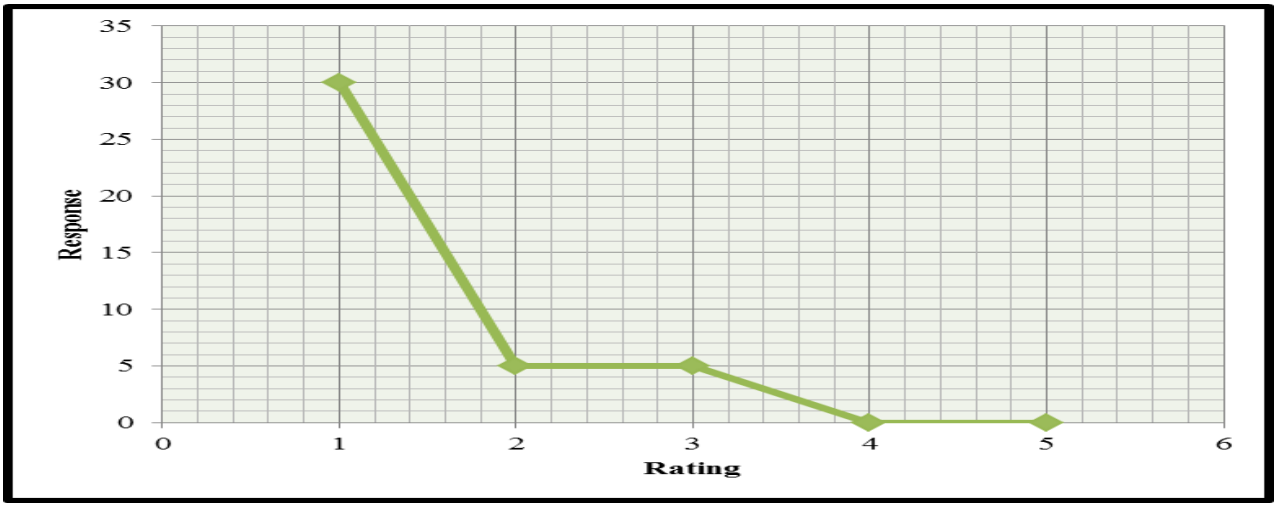

Figure 3: Conference and workshops as a source of information for capacity building

6.2.3 Geothermal Database

The study sought to answer the question of the impact of the so created geothermal database in capacity building for the proposed Africa Geothermal Centre of Excellence. It was noted that the development of an Internet-accessible database on success stories and best practices to allow better sharing of information and ideas on matters of geothermal energy development in the various countries within the region is so instrumental for capacity building in the AGCE as a source of information for referencing purposes.

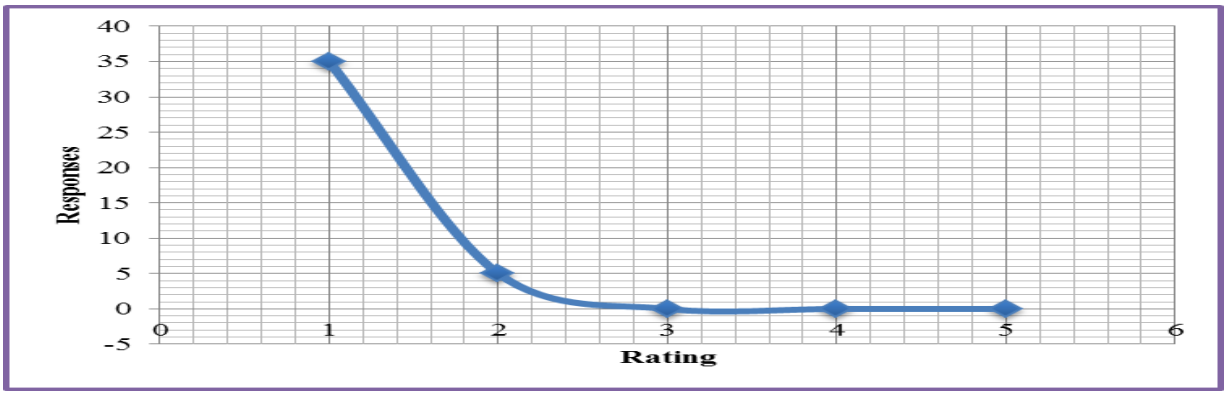

Figure 4: Geothermal database as a source of information for capacity building

6.2.4 Online databases and electronic libraries

The study sought to answer the question of whether the respondents were aware of the availability of online database and electronic libraries and if so whether they can add any value to the proposed Africa Geothermal Centre of Excellence. It was observed that library databases that provide access to resources across a wide spectrum of topics and subject areas forms the backbone of any training and learning and that access to subscribed databases will enhance capacity building in the AGCE. The AGCE should provide ready access to online databases and libraries to enhance teaching and learning. It is noted that online databases such as Online Access to Research in the Environment (OARE) funded by UNEP can further enhance teaching and learning in the proposed Africa Geothermal Centre of Excellence if access can be granted. Figure 6 below indicates a summary of the responses on Online Databases and electronic libraries as a source of information for capacity building in the proposed Africa Geothermal Centre of Excellence.

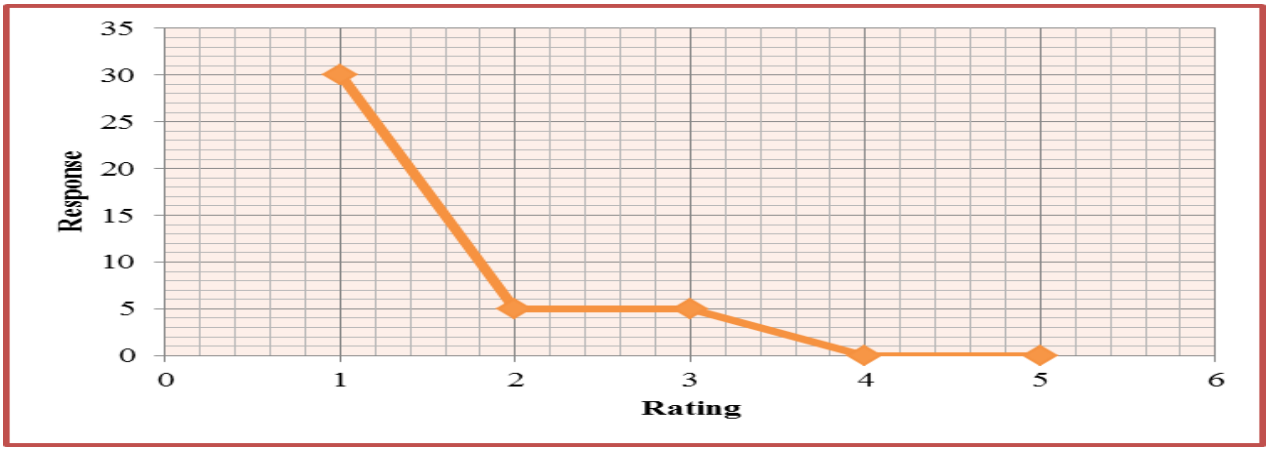

Figure 6: Online Databases and libraries as a source of information for capacity building

6.3 Challenges of information access and utilization in capacity building in the proposed Africa Geothermal Centre of Excellence

The study sought to answer the question of the likely challenges of information access and utilization for capacity building in the proposed Africa Geothermal Centre of Excellence. Items rated over 50% of the responses were appreciated as problem areas affecting access to and utilization of information for capacity building in the geothermal energy subsector in Kenya.

Fundamentally, non-availability of currents sources of information, high cost of acquiring materials, internet information overload, inadequate library opening hours, inadequate time to read or browse, inadequate reading time and poor internet connective will hamper capacity building in the proposed Africa Geothermal Centre of Excellence. Figure 7 below indicates the perceived challenges of information access and utilization for capacity building in the proposed Africa Geothermal Centre of Excellence.

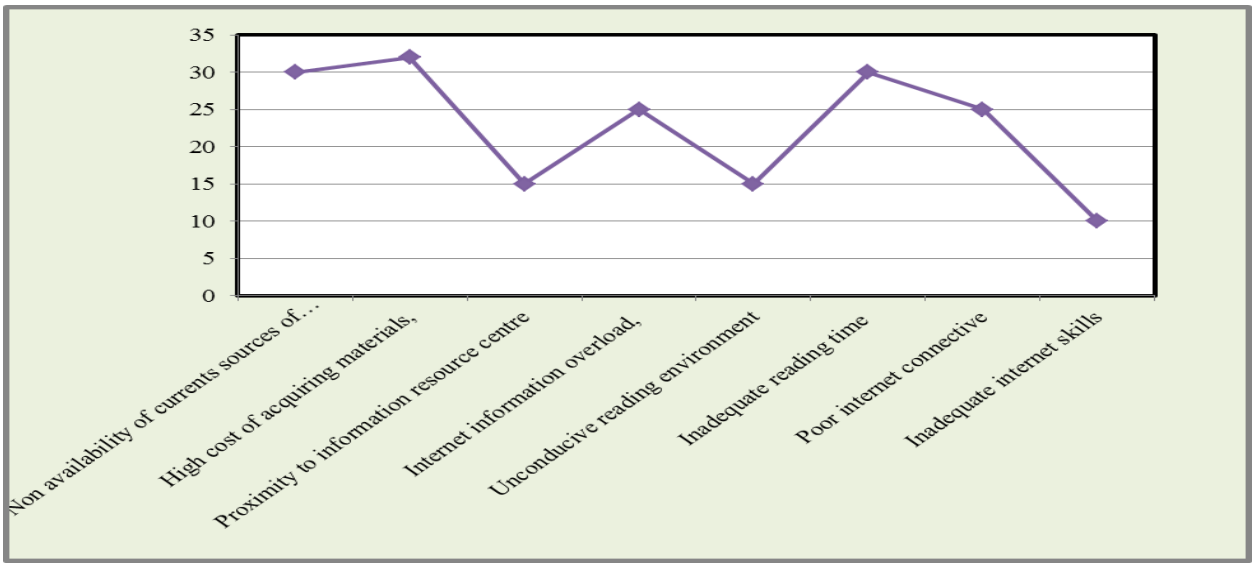

Figure 7: Challenges of Information access and utilization for capacity building

7.0 CONCLUSIONS

Although, the study dwells on the proposed establishment of the centre of excellence, it provides the stakeholders with vital information in the implementation process. The study points out the likely challenges for the future and provides a number of recommendations for the way forward, which will be helpful both to the relevant communities in the field of geothermal energy development.

In order to provide the skills and train actors in the geothermal industry for them to perform effectively, access to information and knowledge utilization is inevitable. Fundamentally a lot has been done in regards to establishment of the Africa Geothermal Centre of Excellence but limited attention has been accorded in relation to information access and its utilization as a tangible product. Much attention has not been taken into consideration in the holistic approach of a modern library providing access to vast amount of electronic information resources. The library is seen as only a repository of reports.

8.0 RECOMMENDATIONS

On the basis of the study findings, the following recommendations are made as suggestions for enhancing increased access to geo-scientific information and knowledge for purposes of capacity building in the proposed Africa Geothermal Centre of Excellence.

i. Capacity building being one of the UNEP ARGeo project component, UNEP should consider providing free access to its online libraries to the proposed Africa Geothermal Centre of Excellence more especially Online Access to Research in the Environment (OARE).

ii. More attention should be accorded in relation to information access and its utilization as a tangible product

iii. Enhance access to information and knowledge utilization

iv. More studies on information access and utilization to be undertaken in relation to capacity building in the proposed AGCE

9.0 ACKNOWLEDGEMENT

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