

## Access and Use of Records Through the Cadastre System at the Ministry of Mining Headquarters, Nairobi

Rachel Muthoni Nyaga\* Dr. Grace Wambui Kamau Prof. Henry Kemoni

### Abstract

The Mining Cadastre System is a tool that facilitates easy access and use of information on mining license granting process and mineral resources in Kenya. The purpose of this study was to investigate the access and use of records through Cadastre System at the Ministry of Mining headquarters in Nairobi, Kenya. The specific objectives of the study were to: examine the extent to which the features of Cadastre System capture record-keeping functionalities and facilitates access and use of records at the Ministry of Mining Headquarters, Nairobi; establish the extent to which users access and utilize the system to meet their information needs; examine the opportunities and threats associated with Cadastre System in accessing and use of records and propose measures of enhancing its use. This study was guided by the Records Continuum model by Upward (2005) and the Design and Implementation of Record-keeping System (DIRKS) model by the National Archives of Australian (2001). The research study applied descriptive survey design and used both qualitative and quantitative approaches. The target population was 152 respondents. The researcher used three sampling techniques namely; stratified sampling, simple random sampling and purposive sampling. The sample size was made up of 66 respondents. The study used interviews and questionnaires as methods of collecting data. The interview was used to collect data from the two Directors from Mines and Geology Directorate. Questionnaires were used to collect data from the staff of the Ministry who use the system. The pilot study was done in the Ministry of Mining Directorate at Community Area in Upper Hill Nairobi to test the data collection instruments. The researcher used 3 members of Registry Staff and tested the interview schedule with 2 Administrators to test the study. Quantitative data was analyzed using Statistical Package for Social Sciences (SPSS version 23) while discourse analysis was used for analyzing qualitative data. Data was presented in tables and pie-charts. Textual data presentation was presented through discourse analysis. The main results from the research were that; the Cadastre System helps in the management of the mineral resources in the Ministry of Mining; users use the system to access mineral information allowing smooth and efficient document transactions; Cadastre system maximized revenue collection from the mineral sector and enhanced investor confidence. However, there were regulatory challenges affecting Cadastre system processes because of the new Mining Act 2016. The System required skilled experts in record-keeping as a measure to improve the Cadastre System operations. The study concludes that the Cadastral System in the Ministry of Mining needs adequate funding to maintain its operations. Trained personnel with records management skills should be involved in the Cadastre System development and maintenance alongside the mining engineers and cadastral staff for better service delivery. Therefore, the study recommends for allocation of adequate funds in its budget to facilitate the system's operations and involvement of adequate skilled record's management staff to enhance Cadaster System operations alongside the mining engineers/staff possibly through departmental trainings. Cadastral system enhancement would be beneficial to policy makers, staff and investors in the ministry of Mining. Policy makers will assess the Cadastre System performance with a view of upgrading it where need be. The staff will use the system to enhance service delivery while investors will get the information they are seeking for better returns in their mining investments. There is therefore need to allocate more budget to maintenance Cadastre System and the infrastructure so as to be accessed remotely at all times.

**Keywords:** Access and use of records, Record-keeping, Cadastre System, Mining, Information needs.

**DOI:** 10.7176/IKM/10-2-03

**Publication date:** February 29<sup>th</sup> 2020

### Background of the study

A record is a document that memorizes and gives objective evidence of activities performed by a business, the occasions that the activities happened, results accomplished or received by an organization in the cause of transacting business or in pursuance of its legal commitments (Mills, D. C.2010). The Archives Archives and Records Management Association (ARMA) (2011) agrees with the above proclamation that the proof of what an institution does is expressed by records. Records capture exercises and transactions carried out by a business amongst them contract arrangements, business correspondence, personnel records, financial statement to mention but a few.

A record according to ISO (2016) is something that speaks of evidence of existence. It is a proof that an event occurred, irrespective of the medium, format or attributes. A record can be created or received by an organization in order to comply or pursue a legal obligation in the course of transacting business. Records can exist in a variety of formats; for example, they can either be tangible items such as paper documents, birth

certificates, Identity Cards, X-rays and many more, or in digital formats such as electronic document, databases, website content and e-mails. However, generation of records through manual operations is decreasing rapidly. This is because the provision of information services to users should be done at the required time, in the right format and at lower costs (Laudon, 2016).

Allee (2008) states that information in every organization's most basic and essential asset that adds value just like any other business asset. This means that in any organization, recorded information requires effective records management for its value to be appreciated. Efficient record-keeping systems are crucial for the performance of any organization. Ubiquitous accesses to records wield power over the administrative, legal, and fiscal accountability of government business activities by virtue of its contribution towards transparency (Ball, 2009).

According to Saur, (1988) of the International Council of Archives, access is the availability of records/archives for consultation as a result both of legal authorization and the existence of finding aids. The access itself has to be accompanied by principles of access for instance the first principle states that "the public has the right of access to archives of public bodies. Both public and private entities should open their archives to the greatest extent possible". The Principles of Access to Archives cover both the rights of access by the public and the responsibilities of archivists in providing access to archives and to information about them. Record access includes the terms and conditions of availability of records or information. One of the vital roles archivists has been identified as making these records available for use, and they must work together in order to ensure that archives are made accessible to everyone, while respecting the pertinent laws and the rights of individuals, creators, owners and users.

### **Statement of the problem**

At the Ministry of Mining, the uptake of digital data has been very slow due to the Ministry's cultural believe of manual records. Though the Ministry had undertaken initial digitization programmes since its inception, inadequate ICT equipment has caused delays in access and use of records. Most records were piled in a disorganized manner and accessing them would take a long time. The records' storage space was not conducive and records had deteriorated due to effects of enemies like dust. Improving access to information as an asset has been a key focus in many organizations. To achieve this, the use of technology has been on the rise thus the introduction of the Mining Cadastre System.

The Ministry of Mining implemented and is currently using the Cadastre System in provision of mineral data and information as well as other related services. Although the Ministry of Mining has been using this system, it has not been ascertained whether, it has features that capture record-keeping functionalities that facilitate access and use of records; the extent to which users are accessing and using the system to meet their information needs. Opportunities and threats associated with Cadastre System in accessing and use of records perhaps have not been established thus measures to enhance Cadastre system for access and use of records need to be unearthed. It is for the above reasons that have prompted the researcher to carry out this study.

### **Aim of the study**

The aim of this study was to investigate access and use of records through online Cadastre system, at the Ministry of Mining Headquarters, Nairobi and propose recommendations to enhance its access and use.

### **Objectives**

1. Examine the extent to which the Cadastre System features capture record-keeping functionalities that facilitates access and use of records at the Ministry of Mining Headquarters, Nairobi.
2. Establish the extent to which users are accessing and using the system to meet their information needs.
3. Examine the opportunities and threats associated with Cadastre System in accessing and use of records.
4. Propose measures to enhance Cadastre system access and use of records.

### **Research questions**

1. To what extent do the Cadastre system features capture record- keeping functionalities that facilitate access and use of records at the Ministry of Mining Headquarters?
2. How are users accessing and using the Cadastre System to meet their information needs?
3. What are the opportunities and threats associated with Cadastre System in accessing and use of records through the system?
4. What measures can be made to enhance access and use of records in the Cadastre system?

### **Assumptions of the study**

The following were the assumptions of the study:

1. It was thought that all users in the Ministry of Mining, Headquarters understand the functionalities of the

online Cadastre System and how to interact with the system.

2. It was further assumed that staff and users are all ICT literate thus do not experience technophobia issues.

3. It was thought that the manual record-keeping system and the online record-keeping system are similar in regard to data processing and storage in the systems.

### **Justification of the study**

Mining is critical to the economic, social and cultural development of Kenya. The Ministry of Mining is supposed to facilitate those who want information on mining access it easily. At the same time there is need for the Ministry to ensure that its clients can apply their mining licenses on-line while maintaining the mining records. The Ministry of Mining installed an on-line Cadastre system which assists those who are applying for mining licenses to get them in real time. Since its installation no study has been carried out to establish its effectiveness at the same time whether the system has functionalities which can enable records to be managed and used seamlessly.

Records are the lifeblood of any organization so their access, use and maintenance become an issue of major concern. It is for the above reasons that have prompted the researcher to carry out this study so that some of the facts about Cadastre records- keeping functionalities can be established.

### **Significance of the study**

The findings of study will enable the policy makers in the Ministry of Mining to fully understand how effective and efficient the Cadastre system is in terms of its functionalities for instance whether they can use the system to manage its records and if the modules of managing records are missing and if they can purchase another system of managing its records. The policy makers will be able to address the shortcomings of the system with an aim of improving so that it can serve its clients effectively and efficiently. The findings of the study will influence the policy makers within the Ministry to make paradigm shift on access to the Cadastre system by the users and records management in general. The users of the system will also benefit since the findings will pin point the efficiency and effectiveness of accessing and using of the system to meet their information needs. Finally, the study will form the basis upon which future researchers can use with a view of conducting research on other systems like the Cadastre system that are not dedicated to digital record management but are performing the records management activities like processing data and storing information.

### **Scope of the study**

The study was confined to the Ministry of Mining Headquarters Nairobi particularly the Cadastre Section within the Ministry. The researcher dealt with those clients who had applied for mining licenses within the financial year 2017/2018 and the internal users of the Cadastre system.

### **Limitations of the study**

The study had the following limitations:

The researcher had wanted to administer the questionnaires to those using the system particularly staff at the Ministry and clients from the field who use the system to apply for licenses but getting all those respondents was not possible and that took time. That forced the researcher to book an appointment with those at the headquarters at the same time waited for those clients coming to apply for the license to come from the field and it succeeded. Some respondents were uncooperative and were not willing to fill the questionnaire. In this respect the researcher had to explain to them the purpose of the study and in any case they were told that they were likely to benefit from the findings of the study.

## **Literature Review**

### **Theoretical Framework**

Creswell (2009) has noted that a theoretical framework is an examination of the interrelationships among the variables which are thought to be crucial to the dynamics being investigated.

Sekaran (2006) characterize a theoretical framework as an accumulation of interrelated ideas that can be utilized to coordinate research with the reason for directing and clarifying the results of the study. Basically, a theoretical framework is used to indicate the rationale used in conducting research (Ravitch, & Riggan, 2016), Yoder and Ewing, 2007). In research project, theories are generalizations that the researcher advances about variables/objectives to expose relationships between or among them. This study was informed by the Records continuum model and the DIRKS Methodology.

### **The Records Continuum Model 1**

This section hints the development, origins, and growth of the records continuum as an articulated theoretical model and highlights areas related with Cadastre system at the Ministry of Mining. A literature search reveals

that all the Records Management Models originated from the records life- cycle and the records continuum approaches (Shepherd and Yeo, 2003).

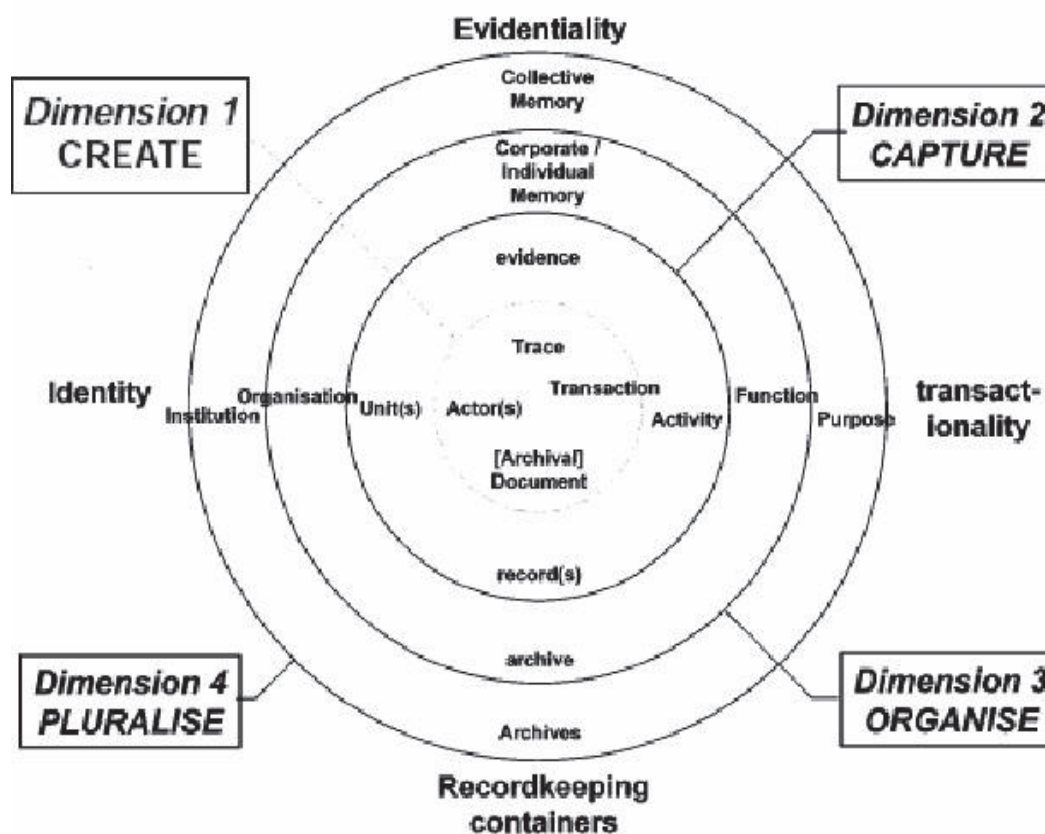
The life cycle model of records was conceived in 1956 by Theodore Schellenberg. In this model he stated that records had a life-cycle similar to a biological organism. Records are born, live through adulthood and eventually die. The life span of a record referred to the creation, maintenance, use and finally disposition.

Records Life- cycle concentrates on manual records management other than electronic records. An ideal model would be that applicably reflects the features of electronic records. The current demand for access of accurate and timely information by the public has pushed organizations to embrace internet configured systems to enhance information dissemination.

Yusof and Chell (2000) identified the weaknesses of the records life- cycle concept in its application in electronic records management. These challenges led to the development of the Records Continuum Model.

### Etymology of Continuum thinking

As defined in Australian standards, a record continuum is a reconcilable and coherent regime of management exercise from the time of record creation and or before creation in the design of record-keeping systems through preservation and use of records as archives.



### The Records Continuum model (Upward, 2000)

An orderly procedure for electronic records management and preservation is exceptionally crucial. The record continuum model is a theoretical model that clarifies record-keeping exercises in connection to numerous contexts over space and time.

Upward Frank (2005) represented a progression of concentric rings (diminutions of Create, Capture, Organize and Pluralize) and crossed axis (transactionality, evidentially, record- keeping and character) with every axis named with a depiction of the activity that happens at that convergence. Create, Capture, Organize and Pluralize represent recordkeeping exercises that happen within space time.

At creation, the document structure and content as well as potentially their order within the immediate context of creation are captured. Records are captured into a record-keeping system evidence of accurate and correct count of events that took place. They are then organized as evidence of their function and part of the role that they play as an organizational collection. In pluralizing, records are managed so that society can use by demonstrating their ongoing value as collective memory by ensuring they are part of archival systems that carry

records beyond the life of an organization.

Atherton (1985) says a noteworthy concern of the continuum concept in general should be organization effectiveness. Records are not created to serve the interests of some future archivists or historians or even to report for descendants some huge decisions or activity. They are created and managed to serve immediate operational requirements. The continuum approach implies the end of the traditional boundary between the records managers and the archivists. The division of exercises into records management and archival stages, with the resulting division of duty between the records manager and the archivists is seen by some as fake and restrictive.

### **Dirks Methodology**

Design and Implementation of Recordkeeping Systems (DIRKS) is a methodology which is agreeable with, and expands on, the Standard for Records Management, ISO 15489 – 2002. The DIRKS methodology is an organized procedure for designing and executing recordkeeping systems. The DIRKS gives a structure to a large number of the traditional operations organizations have dependably conducted. The Model was produced by the National Archives of Australia in Conjunction with the State Records Authority of New South Wales (The State Records New South Wales, 2005).

The DIRKS technique gives an extensive way to deal with system design that helps develop systems with sufficient record-keeping functionalities that are specific to and that meet specific business needs (Australian Standard AS 4390-1996 Records Management). DIRKS involves eight steps: Preliminary investigation, Analysis of business activity, Identification of recordkeeping requirements, Assessment of existing systems, Identification of strategies for recordkeeping, Design of a recordkeeping system, Implementation of a recordkeeping system and Post implementation review.

**Preliminary investigations** refer to the initial gathering of information about legal and structured characteristics of the organization.

**Record-keeping step** refers to requirements for example, the legal guidelines; sources of evidence and information in an organization are identified. **Assessment of existing systems step** is used to perform business operations in the Ministry and identify where these systems are not meeting the Ministry's recording keeping requirements.

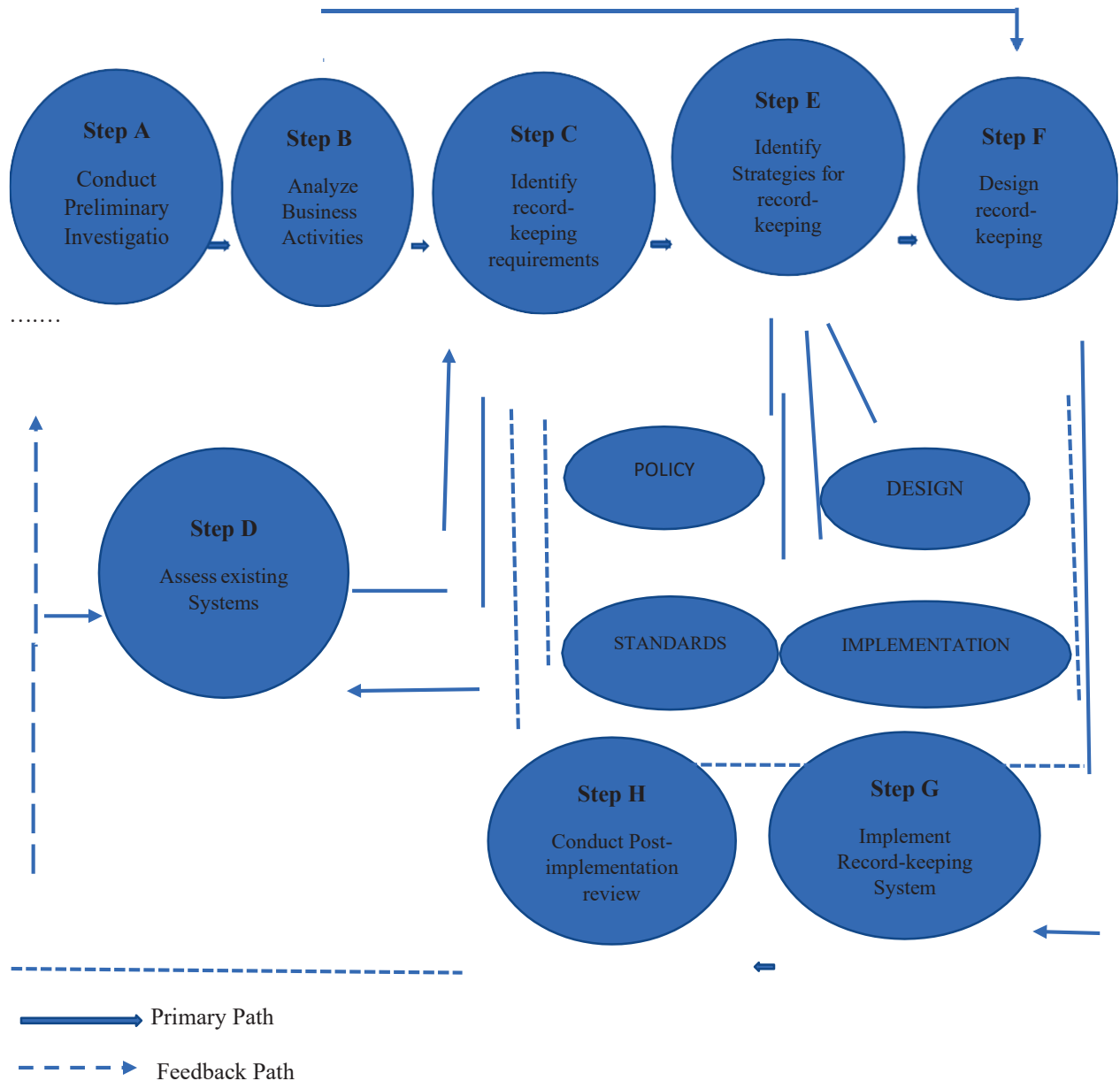
**Identification of strategies for recordkeeping** will assist the Ministry determine strategies to enable the systems meet record-keeping requirements and choose strategies that fit with the culture and environment of the Ministry.

**Design of a recordkeeping system step** will involve designing record-keeping systems that incorporate the Ministry's chosen strategies. In the **Implementation of a recordkeeping system** the Ministry will ensure that all components of the new designed systems function according to requirements, educate staff about the new system, roll out the technology, upload data and manage change paramount to this stage.

In the final step which is the **Post implementation review**, record-keeping system progress will be reviewed and gathering of information on the effectiveness of the record-keeping system either by interviewing or surveying will take place so as to know the progress of the system. In case of problems, the identification will take place.

DIRKS methodology can be utilized to guarantee creation and capture of records and managing records access and security. It can likewise be utilized to develop new systems with sufficient recordkeeping functionalities and in this way ensuring records are stored appropriately. From various perspectives, DIRKS is a reinvention of a wheel that is continually turning in an institution. Numerous businesses experience functional analysis the test is to integrate the DIRKS procedure in with other institutional or process analysis initiatives. Indeed, even without integration there is chance to share information between various projects bringing about less duplication of efforts and less variation in results.





**DIRKS Methodology (National achieves of Australia, 2001)**

Record-keeping is about the management of records from creation to either destruction or preservation.

Reliability - routinely capture all records, organize records appropriately, and provide ready access to records.

Integrity - Prevent unauthorized access, destruction, alteration or removal of records.

Compliance - The system ensures records are managed in compliance with all requirements that apply to the Ministry functions under which the records were created.

Comprehensiveness - Manage all records resulting from the business activities that are documented or managed by the system.

Fixity - store records in a way that mean they cannot be tampered with, deleted inappropriately or altered.

Accessibility - Allow records to be shared as information resources across A work space, business unit or organization.

**Relevance of the record continuum model and dirks methodology to the study**

The Continuum Model shows methods for graphical representation of the complexity of any records environment as opinioned by Upward (2000). Cadastre information ordinarily comprises of two sections, one is spatially referenced spatial data (Cadastre data) and the other is land attribute data (Cadastre register). They can likewise be named as parcel based Geographic Information Systems (GIS). The advanced Cadastre system is comprised of the Cadastre map the related registers. The two elements represent to the graphical and the textual

part of the Cadastre system.

In Kenya, the Mining Cadastre Portal enables the ministry to control and acquire incentives from mining operations. The online mining Cadastre assists the ministry to formally record all applications for different kinds of licenses and issue mineral rights i.e. licenses, permits and agreements. These licenses enlist all changes to the mineral rights; check overlapping with existing cases or different obstacles. The system additionally starts the methodology for altering or cancelling a permit if need be guided by the Mining Act, keeping up a register and a map of the licenses as a technical reference if there should be an occurrence of dispute and encourage submission of statutory charges for licenses and permits.

In the Continuum model, the first 'create' dimension of the records continuum model represents the locus of all action. It is around there that the matter of action (all action) occurs, incorporating representations of actions in documents. Things with the first dimension are presently being developed, may exist in versions or as incomplete expressions. The document can possibly move past the locus of creation, however yet this potential is incipient – each element required for robustness are available yet not explicit and until the connections are explicit, the document cannot be overseen as a record.

The beginnings of that process to robustness happen with progress into the second 'capture' dimension when the document is communicated or connected through associations with different documents, with sequences of actions. With attributes from the second dimension, records, now verify proof of action and can be distributed, accessed and comprehended by others associated with undertaking business exercises. The change to the second dimension might be formal or casual, may include a purposeful act of registration in organization systems, or might be an intention represented by placement or gathering. Here metadata components expected to make the setting of the document known are included and the record can be referenced or drawn upon by others.

The third dimension, the 'organize' dimension represent an aggregation above individual cases of successions of actions, investing the record with explicit components expected to ensure that the record is accessible over time surpassing the immediate environment of action. Here, a record joins various different records getting from numerous successions of actions embraced for numerous reasons. This is the dimension of the 'archive' or the 'fonds', the whole, extant or potential, of the majority of the records of an institution cumulating to form organizational or individual memory. At an implementation level, this is the dimension of policy or rule foundation which will influence the 'create' and 'capture' dimensions.

The fourth or 'pluralize' dimension is the more extensive social environment in which records operate – the legitimate and regulatory condition which deciphers social requirements, diverse for every society and at every period, for recordkeeping. Recordkeeping does not happen in a social, cultural or political void. The environment of recordkeeping external to a specific locus of records actions critically decides the nature of the record. The fourth dimension likewise represents the capacity of a record to exist past the limits of a solitary creating entity. This is the environment expected to ensure records can fulfill requests of those not included with the activities encouraging records creation, capture and organization. The fourth dimension includes ensuring that records can be reviewed, accessed and analyzed beyond the organization, for the different external accountability, historical, cross organizational purposes that are required, for whatever length of time that they are required. As indicated by Hernandez (2013) the above mentioned steps i.e. create, capture, organize and pluralize of the continuum model are of relevance in this study in that if applied and utilized in the Cadastre system which is an Online Transactional Mining Cadastre Portal (OTMCP), nationals in the Kenyan Mining Industry might have the capacity to communicate with the Ministry to see licenses or permit details and application status instantly, submit and oversee electronically the application for granting renewals and different business processes, submit digital records to meet reporting necessities and furthermore to submit fee payments by means of VISA or mobile money hence getting to the correct information and settling on right decisions. The utilization of records in institutions and who utilizes them tends to address specific needs in the improvement of information systems (Orlikowski and Yates, 2002).

The DIRKS model gives a structure to a large number of the traditional operations organizations have dependably conducted. The DIRKS technique gives an extensive way to deal with system design that helps develop systems with sufficient record-keeping functionalities that are specific to and that meet specific business needs (Australian Standard AS 4390-1996 Records Management).

The main purpose of this study was to establish if the Cadastre system had recordkeeping functionalities and this model becomes relevant given the reasons why it was developed.

The researcher used the two models to complement each other in the sense that in the continuum model records remain relevant throughout their life. The records processed by the Cadastre system are created by the system, used and at the same time archived within the system seamlessly. This indicates that the three stages of a record are managed as one stage from creation to disposal (archiving) in the system. In the DIRKS model, the researcher was 41

interested to establish whether the Cadastre system could capture the record-keeping functionalities. This could be possible by looking at its design and architecture. It's during the design stage that the functionalities of

a system are determined. It therefore follows that during its design and implementation, DIRKS model was put into consideration. It was also of interest to the researcher to establish whether the Cadastre system can work seamlessly by performing the work of issuing permits to the miners at the same time performing record-keeping functionalities. The two models were pertinent to this study after citing the above reasons.

### Research gaps

Empirical studies have covered the expanding scope of the Cadastre system in areas such as tax collection, land registration, land improvement, urban planning and design of infrastructure. The view is that these land enlistment frameworks secure all privileges of proprietorship and different rights ashore and structures. For instance, the Cadastre system has allowed for well-organized designation of decisions pertaining mining thus overcoming lapses in mining titles. Studies have also highlighted the extent to which the Cadastre system allows the users to access information at the push of the button on a computer screen. This information is stored in form of cadastral documents, maps and reports and that it can be accessed instantly by large numbers of users anywhere in the world thus providing users with services for beyond what could be imagined for the manual system. However, this is but a narrow perspective of the Cadastre system as the studies do not give insight to the extent to which the Cadastre features capture record-keeping functionalities that facilitates access and use of records. The extent of user access to information to meet their information needs has not been put to focus. Also, the opportunities and threats associated with the access and use of records in the Cadastre system has not been discussed. These, together with recommendations to enhance the Cadastre system access and use of records are what form the basis of this research in order to add to the knowledge base regarding this fast growing record-keeping sector. The study with regard to the objectives will give a greater insight of the Cadastre system and therefore add to the knowledge base of the existing empirical studies.

## METHODOLOGY

### Area of study

This study was carried out at the Ministry of Mining at Madini House in Nairobi. The Ministry Headquarters is located at Upper Hill area of Nairobi also popularly known as Community Area while the Department of Mines and Geology is at Madini House on Machakos Road in Industrial Area in Nairobi.

### Target population

The target population was a total of 152 people. The target population was made up of 4 Mining Registry Staff, 4 Head of Directorates at Madini House and Section Heads, 12 Mining Engineers, 5 Mining ICT Staff, 2 Administrators and the 127 dealers who applied for licenses online (within 2017/2018 Financial Year) as shown in the Table below.

The dealers were identified by the researcher by the assistance of the Ministry's official as they came to apply for the licences.

### Population of the study

S/No	Section/designation	Total
1.	Mining registry staff	4
2.	Head of Directorates Madini House and Section Heads	2
3.	Mining engineers	12
4.	Mining ICT staff	5
5.	Administrators	2
6.	Dealers who applied for licenses online (2017/2018)	127
<b>Total</b>		<b>152</b>

### Sampling techniques

The researcher used three sampling techniques to collect data from the respondents. To achieve this, stratified sampling was applied in order to determine the various groups to be involved in the study. Three categories of strata were identified. These were two key informants where survey method was applied to collect data. The two informants in the senior administration were interviewed individually. This approach was deemed to collect accurate and detailed data. The two respondents were from senior management staff who were directly involved in the implementation of the Cadastre system. It was believed that since they were involved in the implementation of the system they could provide the needed information. The other stratum consisted of registry staff, mining ICT staff, administrators and mining engineers where purposive sampling was applied to collect data. Biggam (2008) argues that purposive sampling is viewed as more suitable when the universe happens to be



little and a known normal for it is to be contemplated seriously. Purposive sampling was applied since these are the people working with the system and are believed to be conversant with the system in the Ministry of Mining. The other stratum was the clients who apply for mining licenses through the system from field stations where simple random sampling was since the researcher did not have the control over the people applying for the licences in the Ministry. It is important to note that the two informants were interviewed while the other two strata were subjected to questionnaires for data collection.

### Sampling frame

Ardilly (2006) defines sample frame as the source material or device from which a sample is drawn. It is a list of all those within a population who can be sampled. The sample frame was made up of the Mining registry staff, Head of Directorates Madini House and Section Heads, Mining engineers, Mining ICT staff, Administrators and the dealers who applied for licenses online (for a period of at least 1 year).

### Sample size

As indicated by Saunders et. al., (2012) the decision of test measure is administered by the certainty required in the information, the room for give and take that can be endured and kind of investigations to be embraced and the extent of the populace from which the example is to be drawn.

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

Where n = Sample size, N = Population size, C = Coefficient of variation and e = Standard margin of error. A margin error ranging between 2%-5% and coefficient of variation ranging between 20%-30% is considered acceptable. The selection of the sample was preferred to represent the whole population as follows;

$$n = \frac{152 \times 0.21^2}{0.21^2 + (152 - 1)0.02^2}$$

n = 64 respondents

The sample size was 64 respondents as presented in Table .

**Table Distribution of the Sample Size**

S/No	Section/designation	Target population	Sample Size
1.	Mining registry staff	4	2
2.	Head of Directorates Madini House and Section Heads	2	2
3.	Mining engineers	12	5
4.	Mining ICT staff	5	3
5.	Administrators	2	1
6.	Dealers who applied for licenses online (1 year)	127	51
<b>Total</b>		<b>152</b>	<b>64</b>

From the sample size it can be noted that a large number of the respondents are dealers who apply for licenses and these are the primary users of the system. The reason for their substantial number was because the system was developed to assist those who are applying for licenses and mining permits. The officials at the Ministry of mining are only implementers of the system. The Ministry of mining officials were easily identified since they are all within the Cadastre section of the Ministry and the dealers were identified since there was one Ministry official who assisted the researcher to identify them as they came to the Ministry.

### Data collection instruments

The researcher used both a questionnaire and an interview guide to collect data. Quantitative data was gathered from the respondents utilizing semi-structured questionnaire and while qualitative data was gathered by interviewing the respondents. The two tools complimented each other in the sense that, two Heads of Directorates Madini House were interviewed while questionnaires were administered to Mining registry staff, the Section Heads, Mining engineers, Mining ICT staff and administrators at the Ministry of Mining. The questionnaires were also administered to the dealers who apply for mining licenses and permits at the Ministry of Mining.

### Data collection procedures

The researcher sought permission from all relevant authorities before collecting data. The researcher first sought approval from the Department of Information and Knowledge Management as well as that of the School of

Graduate and Advanced Studies at the Technical University of Kenya. The researcher then proceeded to seek a research permit from National Commission for Science, Technology and Innovation (NACOSTI) allowing the researcher to conduct the study. Also sought was permission from the Principal Secretary Ministry of Mining to conduct the study in the Ministry. With the granted permissions the researcher then proceeded to the Heads of Directorates and Heads of Sections to conduct the study.

The researcher together with the research assistant administered the questionnaires and collected them the following day after completion. They therefore, assisted the respondents to interpret the questions and give clarifications when required. The researcher and the research assistant were also ready to explain in depth to the respondents on what was expected of them so as to be able to get accurate results. The researcher also conducted a face-to-face individual interview with the Heads of Directorates and Heads of Sections. For better results she gave each officer at least 45 minutes to answer her interview questions. She requested them to take an audio recording so that she could capture everything they had to say.

## Results and Discussion

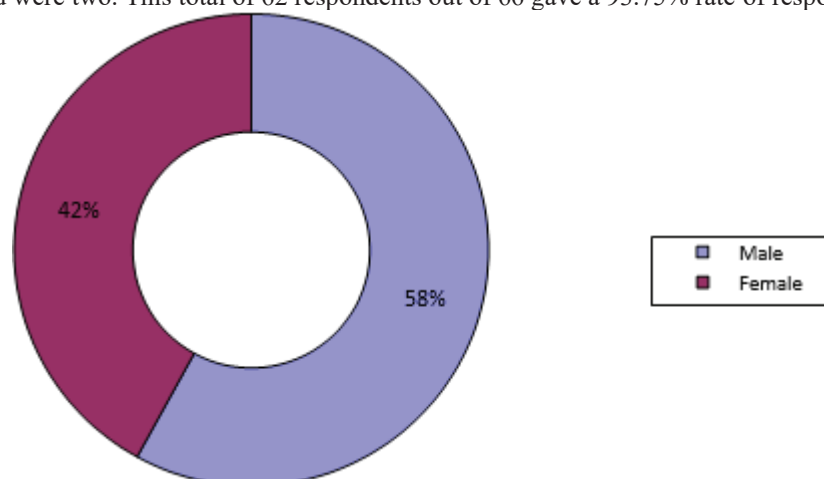
### Response rate from respondents

The researcher issued questionnaires to 64 respondents that included the mining registry staff, head of directorates at Madini House and section heads, mining engineers, mining ICT staff, administrators and the dealers who applied for licenses online (1 year). Table below presents the response rate.

#### Response Rate

Section/designation	Sample	Responded
Mining registry staff	2	2
Head of Directorates Madini House and Section Heads	2	2
Mining engineers	5	5
Mining ICT staff	3	3
Administrators	1	1
Dealers who applied for licenses online (1 year)	51	47
<b>Total</b>	<b>64</b>	<b>60</b>

The questionnaire was administered to 64 respondents while two respondents were interviewed making it a total of 66 respondents. The number of respondents who responded to the questionnaires was 60 and those who were interviewed were two. This total of 62 respondents out of 66 gave a 93.75% rate of response.

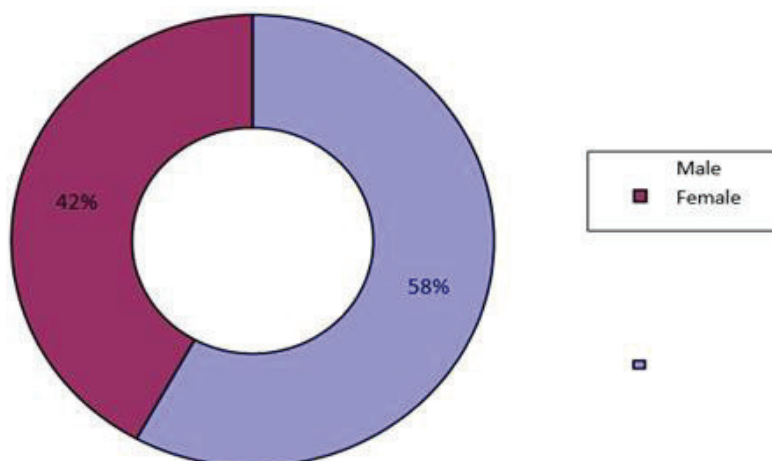


### Gender of the respondents.

#### Characteristics of respondents

#### Gender of the Respondents

The study collected gender characteristics of respondents in the study. This was necessary because the mining sector was male dominated, UN Women and Equal Opportunities Commission (2018). This information was necessary to the researcher in order to describe the information concerning the participants for conclusions in the study.



This study ensured that the sample included both male and female respondents. 35 (58%) were male while 25 (42%) were female respondents. Traditionally, mining activities were believed to be a prerogative for men. With time women have ventured into the mining Sector and that was the reason for consideration of gender in the study. The findings on the access and use of records through online Cadastre system at the Ministry of Mining are a representation from both genders. This was investigated in order to make sure both gender has been involved in the study.

#### Age bracket of the Respondents

The age bracket of the respondents is presented in the table below.

##### Age bracket of the respondents

Age bracket	Frequency	Percentage
25-29	3	5
30-35	8	13
36-40	32	53
41 – 45	12	20
Above 45	5	8
<b>Total</b>	<b>60</b>	<b>100</b>

The distribution of respondents' age indicated that the leading age groups of between 36–40 years were 32 (53%). They were followed by 41-45 years age group at 12 (20%), third category was between 30-35 years at 8 (13%). Fourth category was above 45 years were 5 (8%) while those between 25-29 years were 3 (5%). This means that the study involved a variety of respondents of various age groups. This helped to involve all the groups of employees in the organization

#### Highest Level of education of the Respondents

The highest level of education of the respondents is shown in table below

##### Highest Level of education of the respondents

Highest Level of education	Frequency	Percentage
Diploma	6	11
Degree	41	68
Masters	10	16
PHD	3	5
<b>Total</b>	<b>60</b>	<b>100</b>

41 (68%) of the respondents had degree as their highest level of education while 10 (16%) had masters. Another 6 (11%) of the respondents had diploma. This means that the respondents were capable to understand the access and use of records through online Cadastre system at the Ministry of Mining. This was examined to make sure the information was from an educated source of respondents.

#### Working Experience of the Respondents

The working experience of the respondents is shown in table below.

A total of 43 (72%) of the respondents had an experience of above 5 years of having worked at the Ministry of Mining while 14 (23%) had worked for between 4-5 years. A few 2 (3%) had an experience of between 1-3

years while another 1 (2%) had an experience of below 1 year. This shows that the respondents were experienced in understanding the access and use of records through online Cadastre system at the Ministry of Mining. This helped to understand the kind of information collected in terms of accuracy.

Length of time	Frequency	Percentage
Below 1 years	1	2
1 – 3 years	2	3
4 –5 years	14	23
Above 5 years	43	72
<b>Total</b>	<b>60</b>	<b>100</b>

A total of 43 (72%) of the respondents had an experience of above 5 years of having worked at the Ministry of Mining while 14 (23%) had worked for between 4-5 years. A few 2 (3%) had an experience of between 1-3 years while another 1 (2%) had an experience of below 1 year. This shows that the respondents were experienced in understanding the access and use of records through online Cadastre system at the Ministry of Mining. This helped to understand the kind of information collected in terms of accuracy.

### Discussion and Analysis

What types of information do clients seek to access and use through the Cadastre System?

The researcher sought to establish the types of information they normally seek and in what formats the information was presented.

#### Cadastre system is about information on mineral licensing/permits

Response	Frequency	Percentage
Strongly agree	60	100
Agree	0	0
Strongly disagree	0	0
Disagree	0	0
<b>Total</b>	<b>60</b>	<b>100</b>

All 60 (100%) of the respondents strongly agreed that Cadastre system is about information on mineral licensing/permits. This means that the system is about storing information that includes mineral licensing and permits. The Head of Directorate had the following to say; *“Users upload their documents and we process them in order to issue them with licences. The investors can view the process online.”*

The issues on the renewal of licenses, errors in mining operations and transparency in Cadastre systems were investigated and the findings are shown in Table 4.7 below.

#### Cadastre system on stabilizing and regulating errors in mining operations

Response	Frequency	Percentage
Strongly agree	38	64
Agree	9	15
Strongly disagree	5	8
Disagree	8	13
<b>Total</b>	<b>60</b>	<b>100</b>

Majority 38 (64%) of the respondents strongly agreed that Cadastre system stabilizes and regulates the errors in mining operations while 9 (15%) agreed. This means that the system is helps in stabilizing and regulating the errors in their operations in the ministry. It can then be deduced that the types of information sought ranged from application mineral licensing and permits and renewal of licences. From the foregoing it can be concluded that these constitute their information needs.

Wakeham... etal (1992) defined information need as “what is perceived to be required for the competent performance of professional task”. An understanding of information needs therefore focuses on why information is required and the source from which it is obtained. Wakeham in his definition of information needs attests to this. It is for this reason that the clientele and other stakeholders would seek for the type of information that would facilitate their work in the mining industry.

#### What are the factors prompting clients to seek and use information through the Cadastre system?

The participants were asked to indicate what prompted them to seek information on records in the Cadastres system. Maslow (1943) in his hierarchy of needs theory proposed that motivation is the result of a person’s attempt at fulfilling five basic needs: physiological, safety, social, esteem and self-actualization. According to Maslow, these needs can create internal pressures that can influence a person’s behaviour. The needs theories attempt to identify internal factors that motivate an individual’s behaviour and are based on the premise that people are motivated by unfulfilled needs. If one looks at the needs we do have esteemed needs that refer to the need for self-esteem and respect, with respect and admiration from others. When the respondents were asked this question they responded as in the table below.

### Users search and get all the information they require on mining

Response	Frequency	Percentage
Strongly agree	29	49
Agree	14	23
Strongly disagree	9	15
Disagree	8	13
<b>Total</b>	<b>60</b>	<b>100</b>

Majority of the respondents, that is, 29 (49%) strongly agreed that Users search and get all the information they require on mining while 9 (15%) strongly disagreed. This means that the Cadastre system is somehow resource in terms of providing the required information. The Head of Directorate had this to say;

*“The system is very resourceful in terms of providing information in registration of the clients and also offers information on the status of the process of registration.”*

### Users get comprehensive feedback through the Cadastre system

Response	Frequency	Percentage
Strongly agree	31	53
Agree	11	18
Strongly disagree	8	13
Disagree	10	16
<b>Total</b>	<b>60</b>	<b>100</b>

Majority; 31 (53%) of the respondents strongly agreed that users get comprehensive feedback through the Cadastre system while 10 (16%) disagreed. This means that the Cadastre system gives comprehensive feedback to the users of the system.

### How do clients access and use information through the Cadastre system?

The participants were asked how they sought information and responded as in the table below.

#### Users are given access to information over the internet

Response	Frequency	Percentage
Strongly agree	58	97
Agree	2	3
Strongly disagree	0	0
Disagree	0	0
<b>Total</b>	<b>60</b>	<b>100</b>

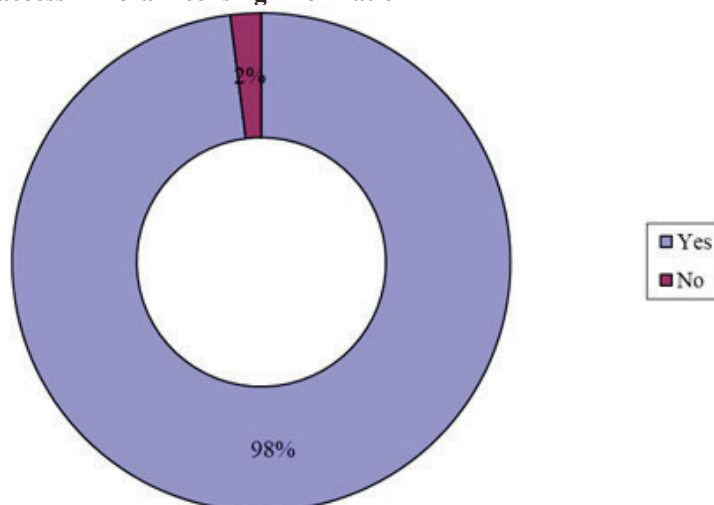
Majority, that is, 58 (97%) of the respondents strongly agreed that users are given access to information over the internet while 2 (3%) agreed. This means that the system uses the internet in accessing information as one of them remarked by head of the directorate *“The directorate has enhanced the internet capability by ensuring we have ICT staff on stand-by to monitor any shortcomings with internet infrastructure.”*

### What extent does users access and use the Cadastre system to meet their information Needs?

The study examined the extent to which users are accessing and using the system to meet their information needs. This was done by probing if the users use the system to access mineral licensing information and the extent to which users use the system to access mineral licensing information. The study sought to find out if the users access the system at all times (24/7) and if the users search and get all the information they require on mining. The study probed if the users get comprehensive feedback through the Cadastre system. It also examined the reliability, integrity and the flexibility of using the Cadastre system.



### Use of the system to access mineral licensing information



Majority comprising of 59 (98%) of the respondents agreed that users use the system to access mineral licensing information while 1 (2%) disagreed. However, The Head of Directorate commented by saying that;  
*“The system is used in accessing information on various types of licenses like the Reconnaissance License, Prospecting License, Retention License, Mining License, Reconnaissance Permit (RP), Prospecting Permit (PP), Mining Permit (MP) and the records required when applying for a licenses and permits.”*

### Extent to which users use the system to access mineral licensing information

Response	Frequency	Percentage
Very large extent	43	72
Large extent	9	15
Small extent	2	3
Very small extent	6	10
<b>Total</b>	<b>60</b>	<b>100</b>

Majority 43 (72%) of the respondents indicated that they use the system to access mineral licensing information to a very large extent while 9 (15%) revealed to a large extent. This means that the system is often used to access mineral licensing information.

### What are the challenges faced by clients in accessing and using Information in meeting their information needs through the cadastre system?

#### Threats of Cadastre systems

Statements	SA	A	NS	D	SD
Users get comprehensive reliable information	27(45%)	18(30%)	2(4%)	2(5%)	11(16%)
Easier access of information	3(50%)	18(30%)	7(9%)	2(5%)	3(6%)
There is no political goodwill due to vested interest in non-transparent processes in the mining industry	29(48%)	24(38%)	3(6%)	3(6%)	1(2%)
There are regulatory challenges affecting Cadastre system processes because of the new Mining Act 2016	21(36%)	16(27%)	9(14%)	7(11%)	7(12%)
Historic data quality linkage is affected	26(44%)	20(33%)	1(2%)	7(11%)	6(10%)
Indexing the records and establishing the metadata to fit into the Cadastre system is easy	29(48%)	14(24%)	6(10%)	5(8%)	6(10%)
Managing interests of large scale and artisanal sectors is an issue since the investors are used to traditional methods of processing their mineral rights.	35(58%)	14(24%)	3(6%)	2(3%)	6(9%)
The Cadastre system requires investors to log online and in certain cases, most of the investors are not computer literate.	38(63%)	10(15%)	6(10%)	2(4%)	4(8%)

Statements	SA	A	NS	D	SD
Cadastre system is inadequate whereby many government departments are involved in the process of granting Mining Permits/Licenses.	35(58%)	8(13%)	4(8%)	9(13%)	4(8%)
Use of Cadastre system enhances policy decisions	34(56%)	9(21%)	2(5%)	6(10%)	4(8%)
There are insufficient funds for Cadastre system operations	34(55%)	7(13%)	6(10%)	7(12%)	6(10%)
Personnel manning the Cadastre system are inadequate /not familiar with records management skills	38(62%)	7(12%)	3(6%)	5(8%)	7(12%)

Majority 27 (45%) of the respondents agreed that users got comprehensive reliable information. A large number 30 (50%) agreed that accessing information was easier. Majority 29 (48%) agreed that there is no political goodwill due to vested interest in non-transparent processes in the mining industry. A large number 21 (36%) agreed that there were regulatory challenges affecting Cadastre system processes because of the new Mining Act 2016. Majority 26 (44%) agreed that historic data quality linkage is affected. Majority 29 (48%) agreed that indexing the records and establishing the metadata to fit into the Cadastre system was easy.

A large number 35 (58%) agreed that managing interests of large scale and artisanal sectors was an issue since the investors are used to traditional methods of processing their mineral rights. Majority 38 (63%) agreed that the Cadastre system requires investors to log online and in certain cases, most of the investors are not computer literate. A large number 35 (58%) agreed that the Cadastre system was inadequate whereby many government departments are involved in the process of granting Mining Permits/Licenses. Majority 34 (56%) agreed that use of Cadastre system enhances policy decisions. A large number 34 (55%) agreed that there was insufficient funds for Cadastre system operations. Majority 38 (62%) agreed that personnel manning the Cadastre system are inadequate /not familiar with records management skills. The head of directorate was quoted saying; *“The system requires experts in record keeping for them to properly transfer all the few manual records into softcopy and manage the system professionally. The system can perform optimally since there is stable internet which needs to be checked on. There is need for proper distinction and integration between the record management sections and the licensing record.”*

### Recommendations

From the findings of the study, the researcher makes the following recommendations:

#### Sensitizing Clients applying for Mining licenses on the Mining Act 2016

From the findings, it was established that majority 37 (63%) of the respondents agreed that there were regulatory challenges affecting Cadastre System processes because of the new Mining Act 2016. Those applying for licenses were being faced with challenges arising out of this Act. The Ministry officials should organise for sensitization programme to ease on-line licence application understanding by the clients.

#### Upgrading the system so that it can be accessed 24/7

The findings indicated that sizeable figure of the respondents 32 (53%) disagreed that clients’ access the system at all times. This means that the Cadastre System is not accessed at all times (24/7). The Ministry should ensure that the system is upgraded so that it can be accessed at all times so as not to inconvenience those applying for mining licenses.

#### Lack of Funds

The researcher, established that a 41 (68%) of the respondents agreed that there was insufficient funds for Cadastre System operations. To correct this analogy, the Ministry should ensure that it allocates enough funds in its budget to fund the system’s operations.

#### Lack of Adequate Personnel/ Training

The study established that 45 (74%) of the respondents agreed that personnel manning the Cadastre System are inadequate /not familiar with records management skills. It is therefore recommended that the Ministry ensures it has adequate staff to man the system and at the same time build the staff capacity.

### REFERENCES

- Atherton, J. (1985). From life cycle to continuum: some thoughts on the records management– archives relationship. *Archivaria*, 21, 43-42.
- Commonwealth of Australia (2001). *DIRKS: A Strategic approach to managing business Information*. Australia:

- National Archives.
- Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2012). Management research. Sage.
- ISO 15489-1:2016 Information and documentation — Records management — Part 1: Concepts and principles
- Lester, K.J. (2006). The cadastral information system in the Republic of South Africa. Mowbray, Cape Town. A paper presented in the United Nations Economic Commission for Africa.
- Munkhbaatar, B., & Lee, J. (2015). A study on the improvement of cadastral system in Mongolia—focused on national land information system. *The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, 40, 83.
- Ortega Girones, E., Pugachevsky, A., & Walser, G. (2009). Mineral Rights Cadastre: Promoting Transparent Access to Mineral Resources.
- UN Women, & Equal Opportunities Commission. (2018). Sustainable Development Goals (SDGs); Financial resource. *Gender and Equity Compact for the Energy and Mineral Development Sector*. <https://africa.unwomen.org/en/digital-library/publications/2018/02/gender-and-mining>. Accessed on 30/5/2019
- Upward, F. (2005). Continuum mechanics and memory banks [Series of two parts] Part 2: The making of culture. *Archives and manuscripts*, 33(2), 18.
- Wills, B. A., & Napier-Munn, T. (2006). *Mineral Processing-Technology An Introduction to the Practical Aspects of Ore Treatment and Mineral Recovery* (7th ed.). Elsevier Science & Technology Books.
- Yasuhiko, N. (2006). Theories and Practices of record-keeping: The records continuum and the DIRKS methodology (Records Management and Accountability) Osaka .Japan: Records Management Society.
- Yusof, Z. M., & Chell, R. W. (2000). The records life cycle: an inadequate concept for technology-generated records. *Information Development*, 16(3), 135-141.