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THE USE OF CADASTRAL MAPS IN LAND DEVELOPMENT

A Case Study of Kibaha Town Council

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BSc Geomatics

Dissertation

Ardhi University, Dar es Salaam

July, 2023

“THE USE OF CADASTRAL MAPS IN LAND DEVELOPMENT”

A case study of Kibaha Town Council

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A dissertation Submitted to the Department of Geospatial Sciences and Technology in Partially
Fulfilment of the Requirements for the Award of Science in Geomatics (BSc. GM) of Ardhi
University.

CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Ardhi University dissertation titled “**The use of cadastral maps in land development, a case study of Kibaha Town Council**”, in partial fulfilment of the requirements for the award of degree of Bachelor of Science in Geomatics at Ardhi University.

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ACKNOWLEDGMENT

I would like to take this opportunity to express my deepest gratitude and appreciation to all those who have contributed to the successful completion of this dissertation.

First, I extend my sincere thanks to my dissertation supervisor Mr Gwaleba for his invaluable guidance, expertise, and continuous support throughout this research journey. His feedback, constructive criticism, and unwavering encouragement have been instrumental in shaping this study and refining its content.

I would like to acknowledge the support and encouragement from my family and friends. Their unwavering belief in my abilities, patience, and understanding during the challenging times of this research endeavor have been a constant source of motivation. Their love, encouragement, and presence in my life have been the foundation of my success.

Lastly, The completion of this dissertation has been a collaborative effort, and I am humbled and grateful for the support and guidance I have received. Each individual mentioned above has played a significant role in this academic endeavor, and I am deeply indebted to them all.

DEDICATION

I dedicate this dissertation to my beloved family; my parents Mr & Mrs. Nyanganane.

ABSTRACT

Cadastral maps play a crucial role in land development by providing essential information about property boundaries, ownership, and land rights. This research aims to assess the awareness and understanding of the use of cadastral maps for land development in Kibaha Town Council. The specific objectives include evaluating the level of awareness, examining the benefits and limitations of cadastral maps, gathering suggestions for their improvement, and assessing the understanding of their importance.

The study employed a quantitative research methodology and utilized questionnaires as the primary data collection tool. A sample of respondents from various individuals and land officials in Kibaha Town Council was selected. The data collected through the questionnaires were analyzed using statistical techniques to derive meaningful insights.

The findings of the study provides valuable insights into the current level of awareness and understandings on cadastral maps for land development in Kibaha Town Council. The evaluation of the benefits and limitations highlights the advantages and challenges associated with the use of cadastral maps. The suggestions for improvement will offer recommendations for effectiveness and efficiency use of cadastral maps in land development processes.

Key words: Cadastral maps, land development, property boundaries, land surveying.

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ACRONYMS AND ABBREVIATIONS

SPSS	Statistical Package for Social Sciences
GIS	Geographical Information System

CHAPTER ONE

INTRODUCTION

1.1 Background information

Land is viewed in many different ways but meaning attached to it can be physical, legal or economy. In the context of land administration, land as a physical entity can be defined as “an area of the surface of the earth, together with the water, soil, rocks, minerals and hydrocarbons beneath or upon it and the air above it”. In the legal context, the term land is usually related to the legal meaning of property, including both physical land, building and other structures included in it. As an economic entity, land is necessary to build houses, schools, hospitals, shops and transport networks (Dale & McLaughlin, 1999). Land development involves a range of activities, including land acquisition, planning, design, and infrastructure development, construction, and property management. For decades, land has been used to generate income tax which contribute to the government income, so if the land is to be used effective it can be a source of income to improve the life of the people.

Cadastral maps have involved significantly over the years, moving from traditional paper-based formats to digital representations. The advent of Geographic Information Systems (GIS) and advanced mapping technologies has revolutionized the way cadastral maps are created, maintained, and utilized. These advancements have enhanced the accuracy, accessibility, and functionality of cadastral maps, enabling more efficient land development practices.

Land development is a crucial component of urban planning and real estate management, playing a vital role in promoting sustainable growth and efficient land resource utilization (Holland et al., 2010). Cadastral maps, which provide detailed information about property boundaries, ownership, and other pertinent attributes, serve as the fundamental basis for land development processes (Alesheikh & Ghorbanali, 2008).

Over the years, cadastral maps have undergone significant transformations, transitioning from traditional paper-based formats to digital representations (Mansberger et al., 2014). The advent of Geographic Information Systems (GIS) and advanced mapping technologies has revolutionized the creation, maintenance, and utilization of cadastral maps (Studler et al., 2015). These technological advancements have greatly enhanced the accuracy, accessibility, and functionality of cadastral maps, enabling more efficient land development practices.

The analysis of cadastral maps for land development involves the examination of various aspects, such as parcel boundaries, land use patterns, land ownership, zoning regulations, and infrastructure networks (Sarjakoski & D, 2010). Through such analysis, valuable insights can be gained regarding the potential for land development, identification of suitable areas for construction, and assessment of environmental impact. Moreover, integrating cadastral map analysis with other spatial data layers, such as topography, utilities, and transportation networks, further enhances the understanding of land development opportunities and challenges.

Despite the significance of cadastral map analysis in land development, several challenges and research gaps persist. These include issues related to data quality, interoperability, standardization, and the effective utilization of analytical tools and techniques (Alesheikh & Ghorbanali, 2008). Furthermore, as land development practices vary across different geographical contexts, it is crucial to consider the local regulatory frameworks, cultural factors, and socio-economic dynamics when conducting cadastral map analysis.

1.2 Statement of the research problem

In the field of land development projects, the effective utilization of cadastral maps holds significant potential for facilitating planning and decision-making processes. However, there seems to be a lack of comprehensive understanding among stakeholders on the benefits of harnessing these maps. This knowledge gap may hinder their successful integration, leading to challenges in land development initiatives. To address this issue, this research aims to assess their level of awareness and understanding on cadastral maps, evaluate their benefits and limitations, and gather suggestions for improvement. By identifying these factors, the study seeks to offer potential solutions for enhancing the effective integration of cadastral maps in land development, thereby promoting better-informed decision-making and optimized project outcomes.

1.3 Research objectives

1.3.1 Main objective

To assess the level of understanding on utilization of cadastral maps in land development processes with a focus of identifying the challenges, opportunities and potential solution for enhancing effective integration.

1.3.2 Specific objectives

- i. To assess awareness on the use of cadastral maps.
- ii. To evaluate benefits and limitations of cadastral maps use.
- iii. To gather suggestions for improvement on the use of cadastral maps.
- iv. To assess the understandings on the importance of cadastral maps for land development.

1.4 Research questions

- i. How individuals are aware on the use of cadastral maps for land development.
- ii. What are the benefits and limitations of using cadastral maps in land development?
- iii. What suggestions can be gathered to improve the utilization of cadastral maps in land development?
- iv. To what extent do individuals understands the importance of cadastral maps for effective land development?

1.5 Significance of the research

The significance of this study lies in its potential to address the existing gaps and limitations in the understanding, utilization, and perception of cadastral maps for land development. By conducting a thorough analysis and exploration of cadastral maps' effectiveness, benefits, limitations, accuracy, and reliability, this research aims to enhance familiarity, awareness, and understanding among various stakeholders involved in land development processes.

Improved Awareness, and Understanding: By assessing the understanding of cadastral maps, this study will provide valuable insights into the current level of knowledge among professionals, landowners, and other relevant parties. The research findings can contribute to educational and training initiatives aimed at increasing understanding and promoting the proper use of cadastral maps for land development purposes.

Evaluation of Benefits and Limitations: The evaluation of the benefits and limitations associated with cadastral maps will provide a comprehensive understanding of their potential advantages and drawbacks. This information can guide decision-making processes in land development projects, allowing stakeholders to leverage the benefits of cadastral maps while mitigating any limitations or challenges that may arise.

Understanding the Importance of Cadastral Maps: By assessing stakeholders' understanding of the significance of cadastral maps for land development, this research aims to highlight their role as a fundamental tool for planning, managing, and regulating land-related activities. It can help create awareness of the value and potential applications of cadastral maps, fostering their wider adoption and utilization in land development processes. These Cadastral maps play crucial roles in land development processes, since these maps provide detailed information about land boundaries, ownership, and other essential attributes related to the land. The following are key roles cadastral maps play in land development.

- i. Defining Property Boundaries, Cadastral maps accurately delineate the boundaries of individual parcels of land. These boundaries are essential for determining the exact area and shape of each property, which is crucial during land subdivision.
- ii. Land Ownership, Cadastral maps are used in the process of land registration and recording ownership details. They provide legal evidence of property ownership, helping to avoid conflicts and disputes related to land ownership.
- iii. Land Valuation and Taxation, Cadastral maps are used to assess the value of land for taxation purposes. Accurate information about the size and location of the land is essential for determining its market value and the appropriate taxes to be levied.
- iv. Infrastructure Development, Cadastral maps help in implementing infrastructure development projects. They provide insights into the location of existing utilities, roads, waterways, and other infrastructure, enabling efficient and sustainable development.
- v. Land Acquisition and Compensation, when governments or private entities need to acquire land for public projects or development, cadastral maps are used to identify affected properties and compensate landowners appropriately.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of cadastral maps

Cadastral maps are essential tools used in land administration and management to define and document land parcels, property boundaries, and ownership rights. This overview provides a brief introduction to cadastral maps, their purpose, and relevant sources.

Cadastral maps serve as graphical representations of land parcels and associated attributes, providing a visual and spatial framework for land-related information (Williamson et al., 2020). These maps are used by governments, surveyors, planners, and landowners to establish legal boundaries, support land registration systems, facilitate land transactions, and manage land use planning.

The primary purpose of cadastral mapping is to accurately delineate and document property boundaries and associated rights. Cadastral maps typically display cadastral boundaries, lot numbers, dimensions, and ownership information, creating a comprehensive record of land parcels within a jurisdiction (Bennett et al., 2017).

Cadastral maps are crucial in land administration, enabling efficient land registration and property transactions. They support the establishment of secure property rights, which are fundamental for economic development, investment, and social stability (Deininger & Feder, 2016).

Moreover, cadastral maps play a vital role in land use planning and management. They provide spatial data on land ownership, land use restrictions, and zoning regulations, helping planners make informed decisions about land allocation, infrastructure development, and urban growth (Munoz-Raskin & Steudler, 2020).

Cadastral maps have also become increasingly important in the context of sustainable land management and environmental planning. They can be used to identify ecologically sensitive areas, support natural resource management, and monitor land use changes over time (Forkuor et al., 2020).

Advancements in Geographic Information Systems (GIS) technology have greatly enhanced the capabilities of cadastral mapping. Digital cadastral maps and geospatial databases allow for efficient data storage, analysis, and integration with other spatial datasets, enabling more effective land administration and decision-making processes (Lemmen et al., 2019).

In summary, cadastral maps are critical tools for land administration, land use planning, and property rights management. They facilitate secure land tenure, support land transactions, inform land use decisions, and contribute to sustainable land management practices.

2.2 Overview of land development

Land development involves a range of activities, including land acquisition, planning, design, and infrastructure development, construction, and property management. It plays a crucial role in urbanization and economic growth, shaping the physical environment and accommodating the needs of growing populations.

One important aspect of land development is urban planning, which focuses on designing and organizing urban areas to ensure their functionality and sustainability. Urban planning considers factors such as land use zoning, transportation networks, infrastructure provision, environmental considerations, and community engagement (Batty, 2020).

The process of land development is influenced by various factors, including governmental regulations, market demand, environmental considerations, and social factors. Government policies and regulations guide land use planning, building codes, and environmental impact assessments to ensure responsible and sustainable development (Dale & McLaughlin, 2020)

Market demand and economic factors also influence land development. Developers assess market conditions, demand for specific types of properties, and financial feasibility when deciding on the scale and type of development to pursue (Geltner et al., 2020).

Furthermore, social factors, including community needs and public participation, are essential in land development. Engaging with the community and stakeholders can help ensure that development projects align with the needs and values of the local population (Lynch & Marques, 2019).

Overall, land development is a complex and multifaceted process that requires careful planning, consideration of various factors, and collaboration between stakeholders. Balancing economic, social, and environmental aspects is crucial for creating sustainable and vibrant urban areas.

2.3 Cadastral mapping and land administration

2.3.1 Importance of cadastral maps in land development and their roles

Cadastral maps play a crucial role in land development by providing detailed information about land parcels, their boundaries, ownership, and other relevant attributes. These maps are essential for facilitating efficiency and promoting sustainable land use practices. Here is an overview of the importance of cadastral maps and their roles in land development:

Accurate identification of land parcels: Cadastral maps accurately define the boundaries of land parcels, enabling precise identification of individual properties. This information is crucial for land developers to understand the exact location and size of the land they are working with, which is essential for planning and executing development projects (UN-Habitat, 2018).

Land ownership and tenure information: Cadastral maps provide information about land ownership and tenure, including details about property boundaries and the rights associated with the land. This information helps developers navigate legal requirements, obtain necessary permits, and establish land use agreements with landowners (UN-Habitat, 2018).

Land administration and management: Cadastral maps serve as the foundation for effective land administration and management systems. By maintaining an up-to-date cadastral database, authorities can ensure accurate land registration, monitor land transactions, and facilitate land taxation processes. This promotes transparent and accountable land governance, reducing land-related conflicts and supporting sustainable land use practices (UN-Habitat, 2018).

2.3.2 Meaning of cadastral mapping and its significance in land administration and management

Cadastral mapping refers to the process of creating and maintaining maps that depict the boundaries, dimensions, and other relevant attributes of land parcels within a specific jurisdiction. It plays a significant role in land administration and management by providing accurate and up-to-date spatial information about land ownership, land use, and associated rights. Here is an explanation of the meaning of cadastral mapping and its significance in land administration and management.

Cadastral mapping involves the creation of cadastral maps, which are graphical representations of the cadastral survey data. These maps show the boundaries, dimensions, and other characteristics of land parcels, along with information about land ownership, land use, and related legal rights. Cadastral mapping is an integral part of land administration systems, providing the foundation for effective land management and governance.

The significance of cadastral mapping in land administration and management can be understood through the following:

Land registration and tenure security: Cadastral mapping enables accurate and transparent land registration processes. By creating cadastral maps that clearly define the boundaries of land parcels and record ownership information, governments can establish secure and formal land tenure systems. This enhances tenure security, reduces land disputes, and promotes investment in land (UN-Habitat, 2018).

Land value assessment and taxation: Cadastral maps support land valuation and taxation processes. Accurate spatial information about land parcels, including their size, location, and characteristics, facilitates fair and efficient property assessment for taxation purposes. Cadastral maps provide the basis for determining property values and assessing appropriate taxes (UN-Habitat, 2018).

Land administration and governance: Cadastral mapping supports effective land administration and governance systems. By maintaining accurate cadastral databases, governments can monitor and manage land transactions, enforce land regulations, and ensure compliance with land-use policies. Cadastral maps provide the spatial foundation for transparent and accountable land administration, contributing to good governance practices (UN-Habitat, 2018).

2.3.3 Purpose of cadastral maps in establishing property boundaries and recording ownership rights

Cadastral maps serve several purposes in establishing property boundaries, recording ownership rights, and supporting land transactions. The following are the purposes of cadastral maps in these context:

Establishing property boundaries: Cadastral maps play a crucial role in defining and establishing property boundaries. These maps provide graphical representations that clearly depict the spatial extent and boundaries of individual land parcels. By consulting cadastral maps, land surveyors and land administrators can accurately determine property boundaries, resolving disputes and ensuring clear demarcation of land (UN-GGIM, 2017).

Recording ownership rights: Cadastral maps are essential in recording ownership rights associated with land parcels. These maps are used to link cadastral spatial data with information about property owners and their rights. By integrating ownership information into cadastral maps, governments can establish reliable records of land ownership, which is crucial for tenure security and property transactions (UN-GGIM, 2017).

Ensuring legal certainty: Cadastral maps contribute to legal certainty in land administration and transactions. By accurately representing property boundaries and ownership rights, cadastral maps provide a reliable basis for determining property rights and resolving legal disputes. Cadastral maps support the establishment of clear and well-defined property rights, promoting investment and economic development (World-Bank, 2018).

Preventing and resolving boundary disputes: Cadastral maps help prevent and resolve boundary disputes by providing visual representations of property boundaries. By consulting cadastral maps, landowners, surveyors, and land administrators can identify and clarify boundary discrepancies, reducing conflicts and promoting peaceful resolution of disputes (UN-GGIM, 2017).

2.3.4 Roles of cadastral mapping in promoting spatial framework for land related information and facilitating land use planning resources

Cadastral mapping plays a vital role in providing a spatial framework for land-related information and facilitating land use planning. Here are roles of cadastral mapping in these aspects:

Spatial framework for land-related information: Cadastral mapping establishes a spatial framework that serves as the foundation for organizing and managing land-related information. Cadastral maps provide a geospatial reference that integrates various data layers, including property boundaries, land ownership, land use and infrastructure. This spatial framework allows for the efficient storage, retrieval, and analysis of land-related information, supporting effective land administration and management (Van der Molen et al., 2021).

Land use planning: Cadastral mapping plays a crucial role in land use planning processes. Cadastral maps provide essential spatial information about land parcels, their boundaries, and ownership, which is essential for identifying suitable areas for different land uses. By analyzing cadastral maps, land use planners can allocate land resources efficiently, designate specific zones for residential, commercial, industrial, or agricultural purposes, and ensure compatibility between land uses (Van der Molen et al., 2021).

Infrastructure development: Cadastral mapping contributes to efficient infrastructure development by providing the spatial information necessary for planning, designing, and implementing infrastructure projects. Cadastral maps help identify suitable locations for roads, utilities, transportation networks, and other infrastructure facilities. Integrating cadastral data with infrastructure planning allows for optimal resource allocation and minimizes conflicts with existing land uses (UN-Habitat, 2018).

Land valuation and taxation: Cadastral mapping supports land valuation and taxation processes by providing accurate and up-to-date information on property boundaries, land area, and ownership.

Cadastral maps serve as the basis for determining property values, assessing appropriate taxes, and ensuring fairness in the taxation system. Reliable cadastral maps contribute to transparent and efficient land valuation and taxation (UN-Habitat, 2018).

2.4 Integration of cadastral maps in land development processes

2.4.1 Contribution of cadastral maps in land development processes

Cadastral maps play a significant role in various land development processes, including land acquisition and disposal. Here is an explanation of how cadastral maps contribute to these land processes:

Land acquisition: Cadastral maps provide essential information for land acquisition processes. These maps accurately depict property boundaries, ownership information, and other relevant attributes. Prospective buyers or developers can refer to cadastral maps to identify land parcels of interest, assess their location and size, and verify their legal status. Cadastral maps support informed decision-making and due diligence in land acquisition (UN-Habitat, 2018).

Land disposal: Cadastral maps are equally crucial in land disposal processes. When government agencies or landowners decide to sell or lease land, cadastral maps serve as a reference for marketing and showcasing available parcels. These maps help interested parties understand the spatial context of the land, including its location, boundaries, and nearby infrastructure. Cadastral maps facilitate efficient land disposal by providing accurate and comprehensive information to potential buyers or lessees (UN-Habitat, 2018).

Subdivision and parceling: Cadastral maps support subdivision and parceling processes, particularly when dividing large parcels into smaller ones for development purposes. Cadastral maps provide the necessary spatial information to determine the appropriate subdivision boundaries, ensuring compliance with regulations and zoning requirements. These maps assist in accurately delineating new property boundaries and recording the resulting parcels (Van der Molen et al., 2021).

2.4.2 Roles of cadastral maps in supporting property registration system and secure land tenure for developed parcels

Cadastral maps play important roles in supporting property registration systems and ensuring secure land tenure for developed parcels. Here are the key roles of cadastral maps in this context:

Spatially defining property boundaries: Cadastral maps provide a graphical representation of property boundaries, accurately delineating the spatial extent of individual land parcels. These maps serve as a reference for registering and recording property rights, ensuring clarity and certainty in land tenure (UN-GGIM, 2017).

Recording property ownership information: Cadastral maps are integrated with property ownership information, linking cadastral spatial data with details about property owners. By associating ownership information with cadastral maps, governments and land administration authorities establish reliable records of property ownership, facilitating property registration and secure land tenure (UN-GGIM, 2017).

Supporting property registration processes: Cadastral maps play a crucial role in property registration processes. These maps provide the necessary spatial information for accurately identifying and describing properties. Cadastral maps enable land administrators to verify property boundaries, assess land use, and record ownership rights, streamlining the property registration process and ensuring legal recognition of land ownership (UN-Habitat, 2018).

Establishing evidence of ownership: Cadastral maps serve as tangible evidence of land ownership. These maps, combined with other cadastral documents and records, provide visual proof of property boundaries and ownership rights. The existence of cadastral maps strengthens the evidentiary value of property rights, enhancing the security and transferability of land tenure (UN-Habitat, 2018).

Facilitating land title issuance: Cadastral maps support the issuance of land titles, which provide legal recognition and protection of property rights. These maps are referenced during the process of issuing land titles, ensuring that the title accurately reflects the boundaries and characteristics of the developed parcel. Cadastral maps contribute to the establishment of a secure and formalized land tenure system (UN-Habitat, 2018).

By providing spatially accurate and legally recognized information about property boundaries and ownership, cadastral maps support property registration systems and contribute to secure land tenure for developed parcels.

CHAPTER THREE

METHODOLOGY

3.1 Overview

This chapter focuses on availability of data, data quality and methods followed to achieve the research objectives. It mostly explains about data source, data collection, data cleaning and data analysis.

3.2 Description of study area

The study area for this research is Kibaha Town Council, a local administrative unit located in the coast region of Tanzania. Kibaha Town Council was selected as the study area due its accessibility and dynamic nature as fast-growing urban center where there is presence of diverse land development projects provided relevant context to perform the study.

3.2.1 Geographical location

The case study area is Kibaha Town Council in Kibaha region. Kibaha Town Council is one among the seven Councils of Coast Region; it also headquarters of the Region. The council is 40 km away from Dar es Salaam City. It is bordered by Kinondoni District to the East, Bagamoyo to the North, Kisarawe South and the Small Town of Mlandizi at North. The Council has an estimated area of 750 square Kilometers and lies between latitude 6.8° South and longitude 38.2° and 38.5° East. The location of the study area is shown in the following figure 3.1.

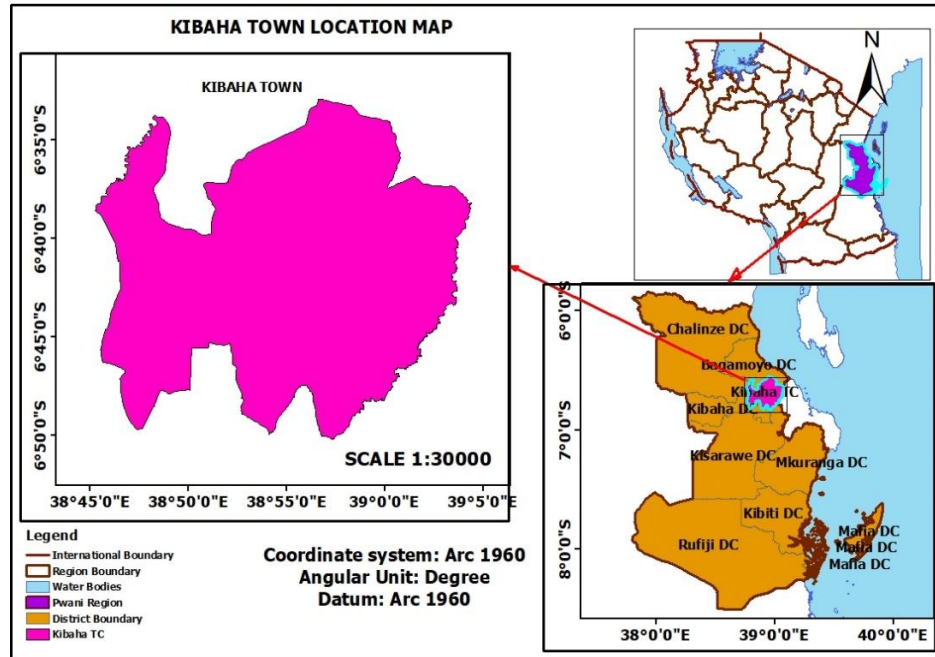


Figure 3.1: Location map of Kibaha Town Council

3.3 Sampling and sample size

3.3.1 Sampling design

Sampling design is a crucial process in the field of statistics and research methodology, used to select a subset, or sample, from a larger population for the purpose of making inferences about the entire population. Proper sampling design is essential to ensure that the sample is representative of the population and that the conclusions drawn from the sample can be generalized to the entire population (Lohr, 2019). In sampling there are two general aspects namely population and sample. Population refers to the entire group of individuals or items that researchers are interested in studying and it could be a group of people, animals, plants, or any other objects relevant to the research question while Sample is a subset of the population selected for the study (Lohr, 2019). The goal of sampling design is to obtain a representative sample that accurately reflects the characteristics and diversity of the entire population.

3.3.2 Sample size

Sample size refers to the number of individuals, elements, or observations that are included in a study or research sample. It is a crucial aspect of any empirical investigation as it directly impacts the reliability and validity of the findings. In simple terms, a larger sample size generally leads to more accurate and representative results, while a smaller sample size may introduce more uncertainty and potential biases. When conducting research, the goal is to draw conclusions about a larger population based on the observations made in the sample. The sample size is essential because it influences the precision of estimates and the ability to detect meaningful differences or relationships between variables. A larger sample size increases the chances of capturing the true characteristics of the population, reducing the impact of random variations that can occur in smaller samples (Bougie et al, 2016).

In this study, a convenience sampling approach was employed to select the participants who were available and willing to respond the questions. Convenience sampling was chosen due to practical constraints and the accessibility of potential respondents within the target area. The study aimed to assess the awareness and knowledge of residents, given the limited timeframe, budget and resources available, convenience sampling provided a feasible and efficient means of data collection. Participants were approached in homes and public places, such as, shopping centers, and community centers, during weekends and evenings, which allowed for a diverse representation of residents. The number of people who lives at Kibaha Town Council according to 2022 census is 265,360 and sample size taken for the study was 215 which selected due to the availability of residents who provided a responses to questions, also there were other reasons of not including the whole population of Kibaha Town Council to the study because other residents have been temporarily located outside Kibaha during collection of data making impossible to include them into the sample, others have been engaged in their activities making them unavailable for participating on the study.

3.4 Data collection

3.4.1 Data

Data refers to a collection of factual information, statistics or observations that are typically presented in a structured format. It can be raw or processed and it serves as a foundation for analysis, decision-making and understanding of various phenomena in different field, including sciences, business and social sciences (Alferes, Pereira, & Judice, 2016). Properly analyzed and interpreted data can lead to valuable insights, patterns, and trends, facilitating informed decision-making and problem-solving. Data can be categorized into qualitative and quantitative. Qualitative data, is type of data deals with descriptions, characteristics, or attributes that cannot be measured numerically and often observed and recorded in a subjective manner, examples of qualitative data include texts, interviews, observations, opinions, and open-ended survey responses while quantitative data, consists of numerical measurements or quantities that can be analyzed using mathematical and statistical techniques (Mertler & Vannata, 2018).

3.4.2 Data collection methods

Data collection methods are the techniques or procedures used to gather information and data for research, analysis or study purposes. The choice of method depends on the type of data needed, the research objectives, available resources, and ethical considerations. Some common data collection methods include, surveys (questionnaires or interviews), observations, experiments and focus groups (Babbie, 2016). Data collection can be categorized into primary data collection and secondary data Collection. Primary Data Collection, involves gathering data directly from the original source for a specific research purpose (Yin, 2017). Secondary data collection, involves collection of data from existing sources, such as government reports, publications, databases, or other research studies (Bryman, 2016).

This study adopted primary data collection method which involved the use of questionnaires. Questionnaires refers to an instrument for the collection of data, usually in written form, consisting open and closed ended questions and other enquires requiring responses from subject. The questionnaires were designed to provide specifically to the research objectives, ensuring the collection of relevant and targeted information.

The questionnaire format involved a combination of open-ended and closed-ended questions. Open-ended questions allowed participants to provide detailed and unstructured responses, enabling them to express their thoughts, opinions, and experiences freely. On the other hand, closed-ended questions offered a set of predetermined response options, facilitating quantitative analysis of the collected data. To maintain the ethical integrity of the data collection process, strict adherence to ethical guidelines was observed. Participants were provided with clear information about the research objectives, the use of their data, and the assurance of confidentiality. Informed consent was obtained from each participant before their participation in the study. Sample of the questionnaires distributed to the respondents are attached to the appendices. The data collection process was facilitated by the permission granted by the Town Director of Kibaha Town Council and the following figure 3.2 depicts the offices of Kibaha Town Council where necessary authorization was obtained.



Figure 3.2: A picture of Kibaha Town Council offices.

Source, Field picture.

CHAPTER FOUR

RESULTS, ANALYSIS AND DISCUSSION

4.1 Overview

This section presents and discusses the key findings of the study, thereby offering a comprehensive understanding of the collected data and its implications in relation to the research objectives. The results are carefully examined in the context of existing theories and their significance is discussed, contributing to the broader understanding of the research. The results obtained through this study were carefully presented and discussed to communicate the research objectives as follows.

4.2 Demographic information

This provided the characteristics of the specific group within a population. The characteristics taken into account include age, gender, and education level. This involved two types of respondents: citizens and land officials. In the case of land officials, their official designation within the offices was an additional factor considered. Consequently, the collected information was presented in a table format, outlining the demographic details of both citizens and land officials as shown in the following tables 4.1, 4.2, 4.3, and 4.4.

Table 4.1: Age for individuals.

Age		Frequency	Percent
	15 - 25	26	12.1
	26 - 36	54	25.1
	37 - 47	60	29.9
	48 - 58	55	25.6
	59+	20	9.3
	Total	215	100.0

Source, Field work.

The findings shows that age of citizens who responded to the questions were in the following percentages (15 – 25) years old were 12.1%, (26 – 36) years old were 25.1%, (37 – 47) years old were 29.9%, (48 – 58) years old were 25.6%, and 59+ were 9.3%. This shows that the responses were mostly for age groups (26 – 36), 37 – 47) and (48 - 58) years old.

Table 4.2: Age for land officials.

Age	Frequency	Percent
15 - 25	1	25.0
37 - 47	2	50.0
48 - 58	1	25.0
Total	4	100.0

Source, Field work.

The findings shows that age ranged (15 – 25) there was one land official, (37 – 47) there were two land officials, and (48 – 58) there was one land official.

Table 4.2: Gender for individuals.

Gender	Frequency	Percent
Male	107	49.8
Female	108	50.2
Total	215	100.0

Source, Field work.

This revealed that the sample comprised 49.8% males and 50.2% females. It is noteworthy that the selection of the sample was designed to ensure a balanced representation of both genders. The gender distribution was carefully accounted for, ensuring equal opportunities for male and female participants.

The findings also shows that there were only male land officials who responded to the questions.

Table 4.3: Education level for citizens

Education level	Frequency	Percent
Primary	74	34.4
Secondary	108	50.2
Higher education	33	15.3
Total	215	100.0

Source, Field work.

The results provided valuable insights into the education level in Kibaha, indicating that 34.4% of citizens have only primary education, 50.2% have attained secondary education, and 15.3% possess higher education level.

Table 4.4: Land officials' designation.

<i>Designation</i>	<i>Frequency</i>
Land surveyor	2
Town planner	1
Land valuer	1
Total	4

Source, Field work.

This shows that there were two land surveyors, one town planner and one land valuer who responded to the questions that aimed at understanding of cadastral maps use for land development.

4.3 Awareness and understandings on cadastral maps

This focused on determining the extent of awareness on cadastral maps among respondents. Additionally, aimed to understand individuals' awareness on the use of cadastral maps in land development. This was achieved through individuals' responses on questions that aimed to understand their awareness and understandings on cadastral maps.

4.3.1 Citizens awareness on cadastral maps

This was achieved when individuals responded to the question asked that, do they know cadastral maps? The question needed them to answer “Yes” for individuals who know cadastral maps and “No” for those who do not know cadastral maps. The responses on this question presented as follows in table 4.5.

Table 4.5: Shows individuals awareness on cadastral maps.

Responses	Frequency	Percent
Yes	74	34.4
No	141	65.6
Total	215	100.0

Source, Field work.

The survey results reveal that 34.4% of the respondents answered “Yes”, stating that they know cadastral maps and its purpose in land development. In contrast, the majority of respondents, accounting for 65.6%, “No”, indicating that they are not familiar with cadastral maps and their role in land development.

The findings highlights a significant gap in knowledge and awareness among the respondents regarding cadastral maps and their significance in land development. The majority of participants expressed a lack of understandings with these maps, suggesting a potential need for education or increased awareness initiatives at Kibaha Town Council.

4.3.2 Citizens’ awareness on cadastral maps in land development

This was achieved when individuals responded to the question asked that, have they ever heard about cadastral maps being used in land development? The question needed them to answer “Yes” for individuals who heard that cadastral maps being used in land development and “No” for those who never heard about cadastral maps being used in land development. The responses are shown in the following table 4.6.

Table 4.6: Citizens who heard cadastral maps being used in land development.

Responses	Frequency	Percent
Yes	124	57.7
No	91	42.3
Total	215	100.0

Source, Field work.

The survey results indicate that 57.7% of the respondents answered “Yes”, stating that they have heard of cadastral maps being used in land development. On the other hand, 42.3% of the respondents responded “No”, indicating that they have not heard of the use of cadastral maps in land development.

The findings suggest a mixed level of awareness among the respondents regarding the utilization of cadastral maps in land development. While a significant portion of the participants indicated some awareness with the role of cadastral maps, a notable percentage remained unaware of the cadastral maps use in this context.

The respondents who have heard of cadastral maps being used in land development may have some understanding of their significance in areas such as boundary determination, land ownership verification, and land administration. They likely recognize the value of cadastral maps as essential tools in facilitating various aspects of land development processes.

However, the considerable percentage of respondents who have not heard of the use of cadastral maps in land development indicates a need for increased awareness and education in this area. Efforts to promote the understanding and recognition of the benefits and applications of cadastral maps in land development can help bridge the knowledge gap and effectiveness use of cadastral maps in land development.

4.3.3 The use of cadastral maps by land officials in their daily works office

This was achieved when land officials responded to the question asked that, how frequently do they utilize cadastral maps in their works as land official? The question needed them to answer “Frequently” if daily uses cadastral maps for office works and “Occasional” if land official uses cadastral maps for certain occasion. The responses are shown in the following table 4.7.

Table 4.7: Frequency use of cadastral maps by land officials in daily works.

Responses	Frequency	Percent
Frequently	2	50.0
Occasionally	2	50.0
Total	4	100.0

Source, Field work.

The survey results indicate that two land officials, who are specifically land surveyors, responded that they frequently use cadastral maps in their work. On the other hand, two other land officials, namely a town planner and a land valuer, stated that they use cadastral maps occasionally.

The different responses from these land officials suggest varying levels of reliance on cadastral maps in their respective roles and responsibilities. The land surveyors, who directly deal with land boundaries and measurements, likely have a higher frequency of utilizing cadastral maps as an integral part of their work. Cadastral maps provide them with essential information for conducting surveys and accurately determining land boundaries.

In contrast, the town planner and land valuer, while still recognizing the value of cadastral maps, may not rely on them as frequently in their day-to-day tasks. Their roles may involve a broader scope of activities, where cadastral maps are used on an occasional basis for specific purposes such as land-use planning or property valuation.

4.4 Benefits and limitations of using cadastral maps for land development

This focused on determining the perception of respondents on benefits of utilizing cadastral maps in land development. These perception on limitations or challenges utilizing cadastral maps for land development purposes were identified through their understanding on how cadastral maps can benefits towards land development as well as the limitations occurs when utilizing cadastral maps in land development.

4.4.1 Benefits of cadastral maps towards land development

This was achieved when individuals responded to the question asked that, what is the main benefit of using cadastral maps in land development? The question needed them to answer according to their understanding on what is the main benefit of using cadastral maps in facilitation of successful land development, through different options being written in questionnaires. Also this needed them to respond to the option “Not aware” to indicate that they do not know benefit of utilizing cadastral maps in land development. The responses of residents are shown in the table 4.8 below.

Table 4.8: Individuals’ perception on cadastral maps benefits in land development.

Responses	Frequency	Percent
Accuracy boundary determination	124	57.7
Facilitation of land ownership verification	58	27.0
Not aware	33	15.3
Total	215	100.0

Source, Field work.

The survey results, 57.7% of the individuals who participated acknowledged that cadastral maps are beneficial for accurately determining boundaries. This suggests that a majority of respondents recognize the usefulness of cadastral maps in establishing precise land boundaries.

Furthermore, 27% of the participants indicated that cadastral maps are helpful for verifying ownership. This finding highlights the role of cadastral maps in facilitating the process of confirming land ownership, which is crucial for various purposes such as legal transactions and property rights.

However, it is concerning that 15.3% of the respondents admitted to being unaware of or unfamiliar with cadastral maps. This lack of awareness or understanding implies that a significant portion of the surveyed individuals may not fully comprehend the potential applications of cadastral maps in land development decision-making and land development processes.

The survey findings also indicates that all land officials responded that main benefits of using cadastral maps for land development incudes accuracy boundary determination, facilitating land ownership verification and important for efficient planning. This response indicates that cadastral maps provides information that are helpful for land development processes.

4.4.2 Benefits of cadastral maps towards land development

This was achieved when individuals responded to the question asked that, what limitations or challenges faces when utilizing cadastral maps for land development purposes? The question needed them to answer according to their understanding on what limitations or challenges occurs when utilizing cadastral maps for land development purposes, through different options being written in questionnaires. The responses of residents are shown in the table 4.8 below.

Table 4.9: Individual's perception on challenges faces when using cadastral maps for land development.

Responses	Frequency	Percent
Inaccurate boundary information	40	18.6
Difficulties in interpreting maps	84	39.1
Limited access to cadastral maps	91	42.3
Total	215	100.0

Source, field work.

The survey results reveal that respondents identified several limitations associated with using cadastral maps for land development. Among the respondents, 18.6% highlighted inaccurate boundary information as a significant limitation. This suggests that there may be concerns regarding the reliability or precision of the boundary data depicted on cadastral maps, which could lead to potential disputes or inaccuracies in land development processes.

Furthermore, 39.1% of the respondents expressed difficulty in map interpretation as a limitation of using cadastral maps. This indicates that some individuals may face challenges in understanding and effectively utilizing the information presented on these maps. Difficulties in map interpretation can hinder the ability to extract relevant data or make informed decisions in land development activities.

Additionally, 42.3% of the respondents cited limited access to cadastral maps. This suggests that there may be obstacles or restrictions in accessing these maps, potentially impeding individuals or organizations from utilizing them effectively in land development projects.

The survey results also indicates that all land officials responded with answers, inaccurate boundary information and limited integration with other geospatial data systems when asked about challenges and limitations faces when using cadastral maps for land development. These challenges highlight potential difficulties in ensuring the accuracy of boundary information on cadastral maps and the limited ability to integrate and synchronize them with other geospatial data systems for comprehensive analysis and decision-making.

4.5 Gathering suggestions for improvement on the use of cadastral maps

The objective of this phase was to gather suggestions and recommendations from citizens to improve cadastral maps use in land development projects. The study aimed to identify specific improvements or advancements desired by these stakeholders to enhance the effectiveness of cadastral maps utilization in land development.

4.5.1 The responses of the citizens toward suggestions for cadastral maps improvements

This was achieved when individuals responded to the question asked that, do they have any suggestions for effectiveness use of cadastral maps in land development projects? The question needed them to answer “Yes” for individuals who have suggestions and “No” for those who do not have any suggestion. The responses on this question presented as follows in table 4.10.

Table 4.10: Shows citizens responses toward suggestions for cadastral maps improvements.

Responses	Frequency	Percent
Yes	50	23.3
No	165	76.7
Total	215	100.0

Source, Field work.

According to the survey results, 23.3% of the respondents expressed a positive response, indicating that they do have suggestions for enhancing the accuracy and effectiveness of cadastral maps for land development projects. On the other hand, a significant majority, comprising 76.7% of the participants, responded negatively, stating that they do not have any suggestions in this regard. These findings highlight that while a portion of the respondents provided suggestions, a majority of the participants did not feel equipped to contribute specific ideas for improving the accuracy and effectiveness of cadastral maps use in land development projects, and this may be due to their unfamiliarity with cadastral maps.

4.5.2 The suggestions for cadastral maps improvements

This was achieved when individuals responded to the question asked that, what specific improvements or advancement would you like to see in the use of cadastral maps for land development? The question needed them to answer according to their understanding on how the use of cadastral maps can be improved, through different options being written in questionnaires. The responses of residents are shown in the table 4.11 below.

Table 4.11: Shows individuals' perception on specific improvements for cadastral maps use.

Responses	Frequency	Percent
Enhancing map accessibilities and user-friendliness	141	65.6
Integration with other technologies such as GIS and remote sensing	74	34.4
Total	215	100.0

Source, field work.

The survey results revealed that a significant majority of the individuals, accounting for 65.6% of the respondents, expressed a strong inclination towards the option of "enhancing map accessibility and user friendliness" as a crucial aspect of improving cadastral maps. In contrast, 34.4% of the respondents favored the option of "integrating modern technology such as GIS" to enhance the analysis of cadastral maps. These results highlight the individuals' desire for improved accessibility and usability of cadastral maps, while also recognizing the potential benefits of incorporating advanced technologies like GIS for more comprehensive analysis.

4.6 Understandings on the importance of cadastral maps analysis and its roles toward successful land development

The objective of this exploration was to determine the perceptions of citizens on the importance of cadastral maps use in ensuring successful land development projects. The study sought to capture the views of both groups regarding the significance of cadastral maps use. The obtained information are summarized in the table below.

4.6.1 Citizens' trust on cadastral maps in ensuring land development projects

This was achieved when individuals responded to the question asked that, Do you believe that cadastral map utilization to be important or not for ensuring successful land development projects? The question needed them to answer "Important" for citizens who believed that cadastral maps use can ensure successful land development projects, and "Not important" for those who do not believe that cadastral maps use cannot ensure successful land development projects and "Not familiar" for those who were not familiar with cadastral maps specifically in land development. The responses are shown in the following table 4.12.

Table 4.12: Shows individuals' trust on cadastral maps use in land development.

Responses	Frequency	Percent
Important	130	60.5
Not important	5	2.3
Not familiar	80	37.2
Total	215	100.0

Source, field work.

According to the survey results, a majority of the citizens, specifically 60.5%, expressed their belief that cadastral maps use to be important in ensuring land development projects. A small percentage, 2.3%, indicated that they consider these maps to be not important. A significant portion, 37.3%, stated that they are unfamiliar with the potential cadastral maps use in land development.

This findings indicates that majority of the respondents (60.5%) expresses their views that cadastral maps to be important in ensuring successful land development projects. Since that cadastral maps helps in accurate determination of land, ownership verification, land title and land suitability such land size for certain land development project.

4.6.2 Roles of cadastral maps in land development

This was achieved when the land officials provided their responses to the question asked to them that, how cadastral maps ensures successful land development projects. Their collective response to the question probing the significance of cadastral maps in ensuring successful land development highlights the pivotal role these maps play in the process. Their responses were as follows.

Cadastral helps land identification, enabling developers to accurately locate and identify specific land parcels. Additionally, cadastral maps aid in boundary determination by providing precise information about property boundaries, helping developers avoid conflicts with neighboring properties.

Cadastral maps contribute significantly to infrastructure development. They offer insights into existing infrastructure networks, such as roads, utilities, and drainage systems, which helps developers plan their projects efficiently.

Cadastral maps provides essential information for determining the market value of land parcels, which is crucial for securing financing and attracting investors. Accurate property valuation enhances investor confidence and supports the financial aspects of the development project

Cadastral maps facilitate land registration and titling processes. They serve as evidence of land ownership and ensuring secure property rights. This aspect boosts investor confidence, provides clarity regarding ownership, and fosters long-term investment in land development projects.

These responses given from land officials on how cadastral maps ensures successful land developments indicates that, information provided by cadastral maps, can make land developers to be informed, comply with regulations, optimize design, attract investment, and navigate legal processes, thereby ensuring the success of their land development projects.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study aimed to assess the extent level of awareness and understandings among residents of Kibaha Town Council on how cadastral maps is used in facilitating land development projects in aspects such as residential development, commercial development and infrastructure development.

The assessment on extent level of awareness on cadastral maps use revealed varying levels of awareness among respondents. According to the sample for this study shows that 65.6% do not understand or not aware on the use of cadastral maps. This indicates that mostly of residents at Kibaha Town Council are not aware on the use of cadastral maps.

The evaluation of the benefits and limitations of cadastral maps use shed light on their advantages and challenges. Participants acknowledged that cadastral maps provide essential information for planning and managing land development projects. However, limitations such as the potential for inaccuracies, outdated data, and challenges in accessing and interpreting the maps were also identified.

The study also gathered valuable suggestions for improving the use of cadastral maps. These suggestions included enhance accessibility and user-friendly of cadastral maps as well as an integration with other technologies such as geographic information system and remote sensing.

The assessment of understandings on the importance of cadastral maps use highlighted their significance in land development. Participants recognized that cadastral maps facilitate land tenure security, support effective land administration, assist in resolving property disputes, and contribute to sustainable development.

Based on these findings, it is evident that while some stakeholders possess a good understanding of cadastral maps and their importance, there is a need for further awareness and education among others. Moreover, addressing the limitations identified and implementing the suggested improvements would enhance the effectiveness and usability of cadastral maps in land development processes.

5.2 Recommendations

Based on the findings of this study, which highlight the significant knowledge among individuals regarding understandings and awareness on the use of cadastral maps in land development project, it is crucial to address this issue. Toward the use of cadastral maps in land development should recommended that, an exploration to the integration of other geospatial data or technologies such as remote sensing and geographical information systems to overcome limitations of cadastral maps usability in aspects such as land identification, site selection for development projects basing on factors such as land size and location and infrastructures through provision of existing infrastructures such as roads to support development projects.

Furthermore, due to large percentage of individuals who are not aware of cadastral maps, it is crucial to conduct further research to understand the reason behind this lack of awareness.

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APPENDICES

A. APPENDIX 1

Permission letter from Kibaha Town Council

B. APPENDIX 2

Letters from Ardhi University

C. APPENDIX 3

Questionnaires

APPENDIX 1

Permission letter from Kibaha Town Council



JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA RAIS
TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA MJI KIBAHA



Unapojibu tafadhali taja:

Kumb. Na. KTC/E.60/9 VOL.XIV/55

25/07/2023


Mkuu wa Chuo,
Chuo cha Ardhi,
S.L.P 35176,
DAR ES SALAAM.

**YAH: MAOMBI YA KUFANYA UTAFAUTU WA MATUMIZI YA RAMANI YA
ARDHI [RESEARCH]**

Tafadhali rejea barua ya tarehe 02/06/2023 yenye na Kumb. Na ARU/AB.522/562/01 uliyomuomba Mwanachuo wako kufanya mafunzo ya vitendo..

2. Napenda kukufahamisha kuwa mwanachuo wako amekubaliwa kufanya mafunzo ya Utafiti katika Masuala ya *Matumizi ya ramani za Ardhi katika maendeleo ya ardhi* kuanzia tarehe 24/07/2023 hadi 01/09/2023.

4. Nashukuru kwa ushirikiano.


Nyamizi Yassin
K.N.Y Mkurugenzi Wa Mji
KIBAHA.

Nakala:
Mkuu wa Idara - Tafadhali mpokee na mpangie kazi
KIBAHA.

Prosper A. Nyanganane,
Chuo cha Ardhi – Dar Es Salaam.

APPENDIX 2

Permission letter 1 from Ardhi University

ARDHI UNIVERSITY

Direct line: + 255 738 357 323
Telegrams: ARDHICHUO



P. O. Box 35176
Dar Es Salaam
e-mail: aru@aru.ac.tz
website: <http://www.aru.ac.tz>

Ref. ARU/AB.522/562/01

2nd June, 2023

TOWN DIRECTOR,
KIBAHA TOWN COUNCIL
P. O. Box 30112,
KIBAHA.

Dear Sir/Madam,

RE: REQUEST FOR RESEARCH DATA AT KIBAHA TOWN COUNCIL

Refer to the above heading.

Mr. NYANGANANE PROSPER A with registration number 22814/T.2019, (*Mobile number and Email: 0717779875, prosperashery98@gmail.com*), is a 4th year (Final year) student in the Department of Geospatial Sciences and Technology taking B.Sc. in Geomatics programme at Ardhi University. He is conducting his dissertation entitled "ANALYSIS OF CADASTRAL MAPS FOR LAND DEVELOPMENT AT KIBAHA." which is relevant to his specialization and important to the society as a necessary requirement for the award of B.Sc. in Geomatics of Ardhi University. The aim of this research is to examine and analyze the use of cadastral maps in the development of land at Kibaha town council.

Hence, the student requests for cadastral maps, infrastructure data and demographic data to conduct his research at KIBAHA TOWN COUNCIL so as to accomplish his dissertation which has already started.

We kindly request your organization to assist him for the completion of the degree.

Sincerely yours,

Dr. Dorothea Deus



For Deputy Vice Chancellor Academic Research and Consultancy

Permission letter 2 from Ardhi University

ARDHI UNIVERSITY



Direct line: + 255 738 357 323
Telegrams: ARDHICHUO

P. O. Box 35176
Dar Es Salaam
e-mail: aru@aru.ac.tz
website: <http://www.aru.ac.tz>

Ref. ARU/AB.522/562/01

2nd June, 2023

TOWN DIRECTOR,
KIBAHA TOWN COUNCIL
P. O. Box 30112,
KIBAHA.

Dear Sir/Madam,

RE: REQUEST FOR RESEARCH DATA AT KIBAHA TOWN COUNCIL

Refer to the above heading.

Mr. NYANGANANE PROSPER A with registration number 22814/T.2019, (*Mobile number and Email: 0717779875, prosperashery98@gmail.com*), is a 4th year (Final year) student in the Department of Geospatial Sciences and Technology taking B.Sc. in Geomatics programme at Ardhi University. He is conducting his dissertation entitled "ANALYSIS OF CADASTRAL MAPS FOR LAND DEVELOPMENT AT KIBAHA." which is relevant to his specialization and important to the society as a necessary requirement for the award of B.Sc. in Geomatics of Ardhi University. The aim of this research is to examine and analyze the use of cadastral maps in the development of land at Kibaha town council.

Hence, the student requests for cadastral maps, infrastructure data and demographic data to conduct his research at KIBAHA TOWN COUNCIL so as to accomplish his dissertation which has already started.

We kindly request your organization to assist him for the completion of the degree.

Sincerely yours,


Dr. Dorothea Deus



For Deputy Vice Chancellor Academic Research and Consultancy

CC. DVC ARC

CC. DEAN SERBI

APPENDIX 3

QUESTIONNAIRE

i. Questionnaire for citizens

A. Individuals details

1. Age.....
 - a. 15 – 25
 - b. 26 – 36
 - c. 37 -47
 - d. 48 – 58
 - e. 59 +
2. Gender.....
 - a. Male
 - b. Female
3. Level of education.....
 - a. Primary
 - b. Secondary
 - c. Higher education

B. Individuals perceptions and usage of cadastral maps

1. Do you know cadastral maps?
 - a. Yes
 - b. No
2. Have you ever heard of cadastral maps being used in land development projects?
 - c. Yes
 - d. No
3. What is the main benefits of using cadastral maps in land development projects?
 - a. Accurate boundary determination
 - b. Facilitation of land ownership verification
 - c. Not aware

4. What limitations or challenges faces when utilizing cadastral maps for land development purposes?
 - a. Inaccurate boundary information
 - b. Difficulty in map interpretation
 - c. Limited access to cadastral maps
5. Do you have any suggestions for effectiveness use of cadastral maps for land development projects?
 - a. Yes
 - b. No
6. What specific improvements or advancements would you like to see in the analysis methods of cadastral maps for land development purposes?
 - a. Enhanced map accessibility and user-friendliness
 - b. Integration with modern technology such as GIS
7. Do you believe that cadastral map utilization to be important or not for ensuring successful land development projects?
 - a. Important
 - b. Not important
 - c. Not familiar

ii. Questionnaire for land officials

A. Land officials details

1 What is your age?

- a. 15 -25
- b. 26 – 36
- c. 37 – 47
- d. 48 – 58
- e. 59 +

2 Gender.....

- a. Male
- b. Female

3 Official designation.....

- a. Land surveyor
- b. Town planner
- c. Land valuer
- d. Land officer

B. Land officials perspective and usage of cadastral maps

1. How frequently do you utilize cadastral maps in your work as a land official?

- a. Frequently
- b. Occasionally

2. What are the main benefits of using cadastral maps in land development projects?

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3. What are the limitations or challenges you face when utilizing cadastral maps for land development purposes?

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4. Do you have any suggestions for specific improvement on the use of cadastral maps in land development projects?

- a. Yes
- b. No

5. What specific improvements or advancements would you like to see in the use of cadastral maps for land development purposes?

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6. Does cadastral map important for ensuring successful land development projects?

- a. Yes
- b. No

7. How cadastral maps does ensures successful land development projects?

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