

**ARDHI UNIVERSITY**



**VALIDATION OF THE POSTAL CODE ADDRESSING SYSTEM  
(NaPA) IN TANZANIA**

**A Case Study of Makongo Ward, Dar es Salaam**

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**BSc Geomatics**

**Dissertation**

**Ardhi University, Dar es Salaam**

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VALIDATION OF THE POSTAL CODE ADDRESSING SYSTEM (NaPA) IN  
TANZANIA

A Case Study of Makongo Ward, Dar es Salaam

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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 a research dissertation titled “**Validation of the National Postal Code Addressing System (NaPA) in Tanzania**” in partial fulfilment of the requirements for the award of degree of Bachelor of Science in Geomatics of the Ardhi University.

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Date.....

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(Second Supervisor)

Date.....

## **DECLARATION AND COPYRIGHT**

I, FUI ME BELTILA, B declare that, the contents this dissertation are the results of my own findings through my study and investigation, and to the best of my knowledge they have not been presented anywhere else as a dissertation for diploma, degree or any similar academic award in any institution of higher learning.

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*Thank you very much.*

## **DEDICATION**

*I sincerely dedicate this masterpiece to Almighty God who always has my back whenever things seem to be falling apart. He has been my inspiration throughout this project and really I've seen his blessings.*

*I also dedicate this piece of my hardworking to my beloved mother Yuster Clemens Mtega whose encouragement and support has overflowed me and made sure that I never give up and finish what I started, May God hold her in the palms of his hands now and forever "Amen".*

## **ABSTRACT**

The postal code addressing system (NaPA) plays a vital role in efficient mail delivery and logistics management. This research focuses on the validation of the postal code addressing system in Tanzania to identify its strengths, weaknesses, and areas for improvement. Through a comprehensive analysis of address data, validation processes, and stakeholder feedback, the study aims to provide insights into the accuracy, reliability, and effectiveness of the postal code system. The research utilizes a combination of qualitative and quantitative methods to assess the performance of the postal code addressing system. Data collection includes reviewing existing address databases, conducting surveys and interviews with postal service providers, and analysing historical mail delivery records. The collected data is then evaluated to identify potential issues, such as incorrect or missing postal codes, overlapping boundaries, and delivery challenges. Findings from the validation process have revealed that the postal code system demonstrates overall effectiveness in assigning postal codes to geographical areas, facilitating efficient sorting and routing of mail. However, discrepancies are identified, including inaccuracies in address data, inconsistent boundary definitions between postal code areas, and occasional delivery delays.

Based on the findings, recommendations are proposed to enhance the postal code addressing system in Tanzania. These recommendations include improving data quality through stricter validation measures, implementing advanced address validation tools, aligning geographical boundaries, conducting public awareness campaigns, establishing feedback mechanisms, and fostering collaboration among stakeholders for standardized addressing practices. The outcomes of this research provide valuable insights for policymakers, postal service providers, and other stakeholders involved in the postal code addressing system in Tanzania. By implementing the recommended improvements, the accuracy, reliability, and efficiency of the postal code system can be enhanced, leading to improved mail delivery services and customer satisfaction.

## TABLE OF CONTENTS

CERTIFICATION .....	ii
DECLARATION AND COPYRIGHT .....	iii
DEDICATION .....	v
ABSTRACT .....	vi
LIST OF FIGURES .....	ix
LIST OF TABLES .....	x
LIST OF ABBREVIATIONS .....	xi
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1 Background of the study .....	1
1.2 Statement of the problem .....	4
1.3 Objectives .....	5
1.3.1 Main objective .....	5
1.3.2 Specific objectives .....	5
1.4 Research question .....	5
1.5 Expected Output .....	6
1.6 Significance of the research .....	6
1.7 Case Study .....	6
CHAPTER TWO .....	7
LITERATURE REVIEW .....	7
2.1 Postcodes .....	7
2.2 NaPA (National Physical Addressing) .....	8
2.3 Global Positioning System (GPS) .....	11
2.4 Shortcomings of the previous addressing system .....	11
2.5 The postal sector .....	12
2.6 Challenges and measures .....	12
CHAPTER THREE .....	15
METHODOLOGY .....	15
3.1 Overview .....	15
3.2 Research Process .....	15



3.3 Research design.....	15
3.4 Sampling Technique.....	16
CHAPTER FOUR.....	19
RESULTS, ANALYSIS AND DISCUSSION .....	19
4.1 Introduction .....	19
4.2 Data Obtained from the field (Makongo ward).....	19
Easting (m) .....	19
4.3 Mapping of the coordinates.....	20
4.4 Data collected from TCRA .....	21
4.5 Comparison of data .....	22
4.6 Discussion .....	28
CHAPTER FIVE .....	30
CONCLUSION AND RECOMMENDATION.....	30
5.1 Conclusion.....	30
5.2 Recommendation.....	30
REFERENCES .....	32
APPENDIX.....	33

## LIST OF FIGURES

Figure 1-1 Case study area (Makongo Area) .....	6
Figure 2-1 Tanzania postcode system (UPU, 2020) .....	10
Figure 2-2 Address allocation in urban areas (NaPA, 2022) .....	10
Figure 2-3 Address allocation in rural areas (NaPA, 2022).....	11
Figure 2-4 Postcode addressing system standards (UPU, 2020) .....	12
Figure 3-1 Google earth image showing the display of coordinates on the ground .....	17
Figure 4-1 Display of coordinates on QGIS.....	20
Figure 4-2 Comparison between TCRA and Field data.....	28

## **LIST OF TABLES**

Table 1-1 Postcode zones in Tanzania.....	2
Table 3-1 Questionnaire research form.....	15
Table 3-2 Respondent information .....	16
Table 4-1 Sample of collected data from the field.....	19
Table 4-2 Sample of data given by TCRA.....	21
Table 4-3 Comparison of data and computed difference .....	22

## **LIST OF ABBREVIATIONS**

NaPA	National Physical Addressing
ZIP	Zoning Improvement Plan
RALG	Regional Administration and Local Government
UPU	Universal Postal Union
PAPU	Pan African Postal Union
ISO	International Standard Organization
GPS	Global Positioning System
TCRA	Tanzania Communications Regulatory Authority

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the study**

Postal addressing system; Is a way to address mail and packages so that they can be delivered to correct recipient, the system typically includes the recipient's name, street address, city, state/province and postal code. Postal code is a series of letters or digits or both included in a postal address for the purpose of sorting email. The postal addressing systems are important for efficient and accurate delivery of mail and parcels. They provide a standardized format for identifying the location of a recipient and enable postal operators to sort and route mail to its destination. Without a proper addressing system delivering mail and parcels would be difficult and time consuming.

Different countries have adopted different types of addressing systems based on their unique geographic, cultural and historical factors. For-example some countries such as the United States use a grid-based system where addresses are based on numerical street grid while other counties such as United Kingdom, use a more descriptive system where addresses are based on locality, building name and street name. Some factors that may influence a country's choice of addressing system includes population density, urbanization, historical development patterns, cultural traditions and technological advances. Countries with high population densities and complex urban landscapes may require more detailed and descriptive addressing system to ensure accurate delivery of mail and parcels. On the other hand, countries with more rural landscapes and dispersed populations may be able to use simpler addressing system. (UPU 2012)

The exact benefits of the national address network are not easy to measure, but its value increases dramatically when it brings beneficial results by connecting the services. At the personal level, everyone needs an address to be formally recognized as a member of society by having the rights that enable him/her to have access to property owned by society and more easily participate in national and international markets based on the clear identification of their home address. At the organizational level, governments need the address to have a clear understanding of the public's needs. This facilitates the planning and implementation of policies and services like water and electricity, quick response to emergencies, insuring national and international security and collection of taxes. (URT, Government Portal 2015)

Although postal codes are usually assigned to geographical areas special codes are sometimes assigned to individual addresses or institutions. The use of postal code began in early of 20<sup>th</sup> century as the more efficient process to deliver mail. The very first known code system was introduced in the United Kingdom in 1959 and it was called “Postcode”, this system used a combination of letters and digits to identify each postal area within the country, for example EK4P6QY. In the United States the first postal code system was introduced in 1963 and it was called ZIP (Zoning Improvement Plan), many other countries then followed and adopted the postal code systems these were Canada (Which uses a six-character combination of letters and digits), Australia (Which uses a four-digit system). (Accuracy of city postal code coordinates as a proxy for location residence 2004). The other type of postal code system is the one that only uses digits for example, 16783 which is very easy to use and it is the one used in our country.

Postal code system in Tanzania was officially implemented in February 2022 to May 2022 in preparation for the Housing Census which was conducted in August 2022, where all 31 regions of both mainland and Zanzibar were assigned with special ZIP (Zoning Improvement Plan) and NaPA (National Physical Addressing) system was introduced.

To make it easier to identify locations using postcodes, Tanzania is divided into six zones on the mainland where regions are identified by number 1 to 6 and number 7 for Zanzibar, these numbers are used as the first digit of each Postcodes. Consider the table 1-1 below;

Table 1-1 Postcode zones in Tanzania.

<b>ZONE NAME</b>	<b>FIRST POSTCODE DIGIT</b>	<b>AREA COVERED</b>
Dar es Salaam	1	Ilala CBD, Ilala, Kinondoni, Temeke, Ubungu and Kigamboni
North	2	Tanga, Arusha, Kilimanjaro and Manyara
Lake zone	3	Geita, Mara, Mwanza, Kagera, Shinyanga and Simiyu

Kati	4	Dodoma, Singida, Tabora and Kigoma
Southern highlands	5	Katavi, Iringa, Mbeya, Songwe, Rukwa, Ruvuma and Njombe
Pwani	6	Pwani, Mtwara, Lindi and Morogoro
Unguja and Pemba	7	Unguja north region, Unguja south region, Pemba north region and Pemba south region

Postal code does not reflect regions and territories, these codes represent group of destinations and delivery directions only. Now one may ask how can addresses and routes be used in data analytics, this is when Geocoding application (In Tanzania NaPA) comes to hand as it transforms the geospatial data into geocodes by assigning geospatial coordinates to a destination. While implementing the 'NaPA' system the Ministry of Information, Communication and Information Technology had the following foresights as the benefits of using the system;

- i. Facilitate the delivery and access of services and products to citizens and customers.
- ii. Facilitate online business and access to other social services such as health and security.
- iii. Easily identify the location and understand the location of the person or object thus reducing travel time and transportation costs.
- iv. Speed up the fight against crime, strengthens immigration, tourism, defence security activities.
- v. Facilitate access to data for conducting business and social development studies.
- vi. Increase productivity in rescue and disaster services. ([napa.mawasiliano.go.tz](http://napa.mawasiliano.go.tz))

NaPA can be of greater important in helping people locate their residence although it may also be limited due to severe reasons like;

- a) Spatial data incorporating postal codes can have several sales which leads to overlapping boundaries or one area being situated within another boundary
- b) Postal code areas are typically massive, which means they are often too large to be precise

Although NaPA has already been launched it still does not perform full operations as up to now it can only offer the location and residence of services offered within a nearby place for example hospitals, bank, hotels, education centres and public offices.

The most challenging aspect of locating postcode is identifying the property that needs the postcode to be assigned. For that purpose, the cadastral map has been utilized to identifying each parcel and to assign postcode. (H. A. Sadeq 2016). For Example; Ghana faced a failure of its national addressing system which was introduced in 2017 due to severe challenges, this phone-based application was designed to locate features anywhere in Ghana after every 5 squared meter in alpha-numeric format and show details such as region, metropolitan, municipal and district authority. The system consisted of only numbers (For sections of streets) and letters (For streets), it had no coordinate system and was never digitised. Cities need address systems that make it possible to provide location-based services, conducted research found that there was an indeed gap between design and reality whereas the uptake was also very low and people were frustrated with the system. (Frimpong, Digitalisation for whom the determinants of residents use of the digital property address system in Accra Ghana 2022)

## **1.2 Statement of the problem**

The development of science and technology has brought enormous impact in addressing system in our country and worldwide. This impact has been reflected in growth of cities and town, i.e., increase of inhabitants from various areas which resulted into residential population of particular area. The increase of population in town and cities has caused the complexity of routes, destination and even result in unplanned settlement. This calls the use of navigation system. Since independence, Tanzania had not adopted its own navigation system with customized needs of her inhabitants until 2022. In 2022 Tanzania had official introduced its own national address system (NaPA) with aim of promoting efficient delivery of service to its own citizen. The system aims to minimize or eliminates unfamiliar areas to remain unfamiliar



and reduce human effort for navigating to unknown locations. Therefore, this study intends to test its precision and validate its performance.

### **1.3 Objectives**

#### **1.3.1 Main objective**

The main objective of this research is to validate the postal code addressing system (NaPA) in Tanzania.

#### **1.3.2 Specific objectives**

1. Assess the precision of the postal code system (NaPA)
2. Conduct a sample mailing to see if the system coincides the ground truth.
3. To sort out important information required once a person wants to locate his/her residence using NaPA
4. To explore the current status of NaPA.

### **1.4 Research question**

How accurate are postal codes in accurately identifying the geographic location of a given address?

- i. Through the study that compares the accuracy of postal codes in locating addresses against other methods of geo-location such as GPS coordinates or street address information, the research will be able to provide answers and valuable insights into the effectiveness of postal codes as a tool for locating address and improving the efficiency of mail delivery.
- ii. This research will also be able to look upon factors that might affect the accuracy of postal codes for instance age of the code and the density population on the residence.

Which alternative could be used to develop the addressing system in Tanzania?

- i. Since the system does not fully operate to locate residence of places rather than services, the study will come out with criteria to be used to develop the system, hence improve its function.

## 1.5 Expected Output

The research is expected to give out detailed report that outlines the strength and weakness of the postal code system in Tanzania, as well as areas for improvement, such as views based on the system used to locate residence in Tanzania using postal codes, by the means of how efficiently the system is and how can it be used especially by local people in rural areas.

This output gives comprehensive evaluation of the system effectiveness along with specific recommendations for improvement where needed.

## 1.6 Significance of the research

This study will help the government and the responsible authority (TCRA) to understand the reliability and validity of the NaPA system for the public use.

## 1.7 Case Study

This study was conducted in Dar es Salaam city at Kinondoni District with Makongo ward being chosen as an area of interest. Figure 1-1 below shows the area for which the research was conducted.

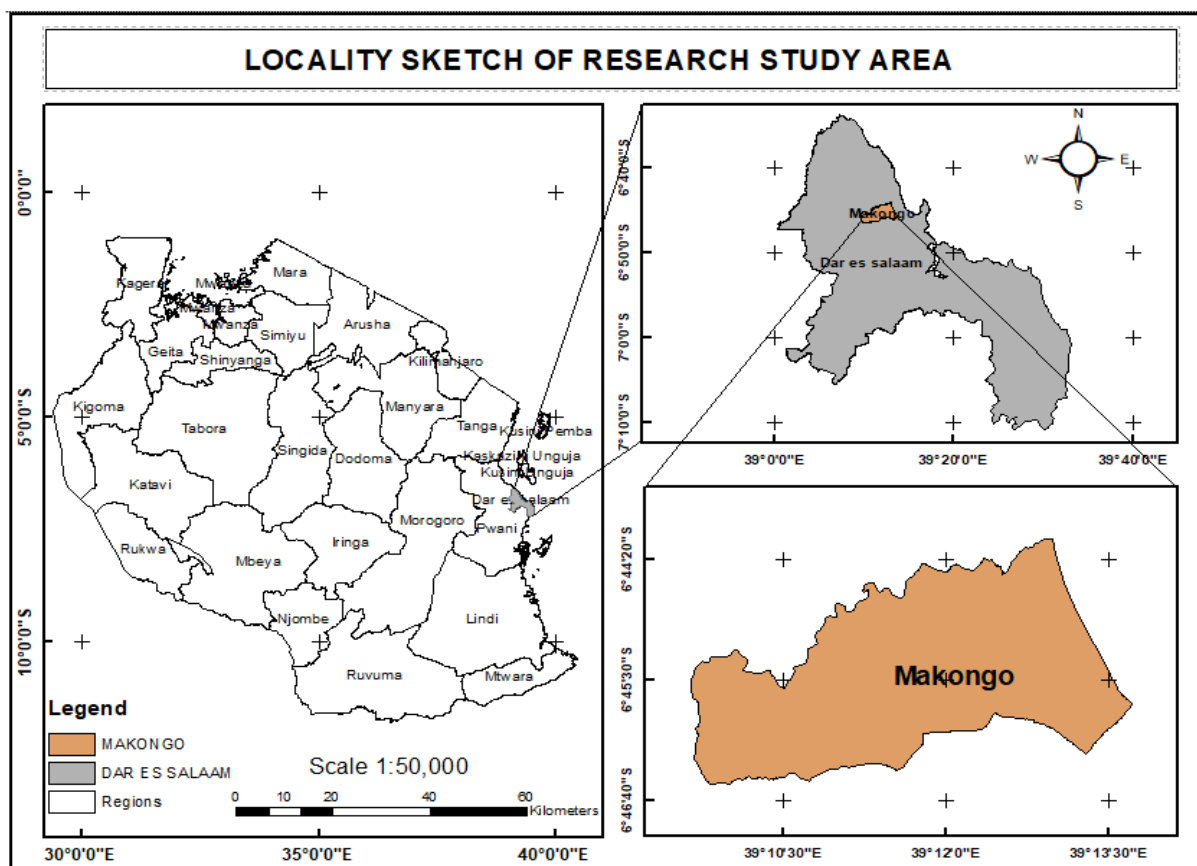


Figure 1-1 Case study area (Makongo Area)

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Postcodes**

The establishment of residential addresses and postcodes system has been described as one among the very important agenda in many countries as for now. The system aims at assisting the identification of the names of individuals within the households of a particular country, the number of households helps the government to understand its people's needs and service provision. Furthermore, this establishment facilitates means of communication which enhances the development of particular areas. (Nfaktor 2019). According to the UN (2014), 54% of world's population living in urban areas is projected to rise to 66% by 2050, while 90% of this increase is concentrated in Asia and Africa.

The growth of informal settlements in town and cities accounts for approximately a third of urban populations in developing countries (UPU 2012). These urban populations are characterized by poor housing arrangements which are excluded from basic services like sanitation and water which are subjected to weak infrastructure. The role of postcodes here is to map the areas which are often overlooked while providing a platform for vital censuses, data gathering and infrastructure planning. In Tanzania high population growth has been experienced from 1963 with 11 million people to around 63 million in 2022, if this trend continues Tanzania is expected to have around 100 million people by 2042 (MFDA 2022).

Establishment of national addressing system appears to be the key element in aiding the delivery of basic services in the presence of clear definition of street names and identification of houses and business centres in urban and rural areas. Well defined address system identifies society needs to inform government of community needs.

#### **2.2 Types of postcodes**

Postal codes are also known as ZIP codes and they are typically assigned by postal authorities to a specific geographic area so as to facilitate the sorting, delivery and the processing of mail and other packages. While the specific format and structure of postal codes can vary widely between countries and regions there are generally three main types of postal codes:

- I.    Numeric postal codes: These postal codes consist of a series of numbers and are often used in countries such as United States, Canada and China. Numeric postal codes are typically assigned to specific geographic areas such as city, town or neighbourhood.

- II. Alphanumeric postal codes: These postal codes consist of a mix of letters and numbers and are often used in countries such as United Kingdom, Australia and Japan. Alphanumeric postal codes may include both geographic and non-geographic information such as buildings and street address.
- III. Hybrid postal codes: These postal codes combine elements of both numeric and alphanumeric codes and are used in some countries such as India and Brazil. Hybrid postal codes may include both geographic and non-geographic information as well as a unique identifier for a specific postal district or region.

## **2.2 NaPA (National Physical Addressing)**

NaPA stands for National Physical Addressing, it is the system used by Tanzania government to help her people locate the residence for the purpose of services provision. This framework provides naming and numbering of streets and properties such as buildings and parcel of land to facilitate identification and location of the building dwelling on the ground. Tanzania has adopted a numeric postcode system where the country has been divided into seven postcode areas/zones, and a five-digit postcode system has been used to allocate codes at the level of individual wards which are the smallest administrative entity. Postcodes have also been allocated to post office locations, major postal customers and landmarks.

NaPA is a digital postal code program which can be accessed as smartphone application (In both android and IOS system) and as a website in search engines like google. The system specifies the exact location of a person's residence as well as the location of his/her business or office, this system operates by street name, house or building number. NaPA is digitally maintained and it identifies the area where postal services and various services including social, emergency and commercial are delivered to the intended recipient, connecting the nation from local level rural, district, regional and national.

The postal policy of 2003 has directed the creation of national addressing system which involves the names of the roads, streets and names of buildings for the purpose of delivering specific mails. Postcode is a fundamental requirement in the creation of national addresses because once used it identifies the location of supply as well as the Electronic and Postal Communications Act (EPOCA) of 2010 along with the rules of 2011 which indicates how residential addresses and postcodes has to be managed.

NaPA works under the residential address project which is implemented by the Ministry of Information, Communications and Information Technology in collaboration with the Office of the president –Regional Administration and Local Government (PMO – RALG), ministry of lands and housing development with the view to facilitate communication, services delivery and the implementation of social, economic and administrative activities. The residential address system complies with the standards set by the Universal Postal Union (UPU), the Pan-African Postal Union (PAPU) and many other internationally recognized organizations such as the International Standards Organization (ISO). Through NaPA one is able to locate his/her own residence, hence enable them to describe residence and location in case of urgent situation like fire, crime scene, and emergency medical help. However, the role of postal codes is not limited to ensuring that the post reaches its intended destination postal codes are also important social identifiers for example it can differentiate between rural and urban areas. Also, when it comes to business decisions such as where to open a new store, where to launch services postal codes play an important role. (TCRA, NaPA 2022). NaPA was officially implemented in 2022 under the order of the National Postal Policy (NPP) of 2003 that directs the establishment and use of the national communication system, also the implementation was done in line with regional and international agreements such as the African Postal Union (PAPU) and the Universal Postal Union (UPU) which asked the members of those countries to ensure that there is a national address system that will facilitate the delivery of good and services.

The exact benefits of the national address network are not easy to measure but its value increases dramatically when it brings beneficial results by connecting services, at personal level everyone needs an address to be formally recognized as a member of a society through rights which will enable him/her to have access to property owned by a society and more easily participate in national and international markets based on the clear identification of their address (UPU, Addressing an address for everyone: International Bureau of the Universal Postal Union 2012). At the organizational level government needs addresses to have clear understanding of public needs, this facilitates the planning and implementation of policies as well as services, quick response to emergency, insuring national and international security and collection of tax (URT 2022). The system further simplifies transport services which are currently provided by efficient logistics firms with track and trace systems geared to monitoring export and import shipments between countries. Figure 1-2 below shows the arrangement of the postcode digits and what they present combinely.

Tanzania Postcode System				
Postcode	Explanation			
2 3 1 1 0	5 Digits Postcode			
X - - - -	Zone	1 <sup>st</sup> Digit		
X X - - -	Region (Province)	1 <sup>st</sup> + 2 <sup>nd</sup> Digit		
X X X - -	District	1 <sup>st</sup> + 2 <sup>nd</sup> + 3 <sup>rd</sup> Digit		
X X X X X	Ward Post office Big Mailers Landmarks Activity	All 5 Digits		

Figure 2-1 Tanzania postcode system (UPU, 2020)

### 2.3 Procedures for address number allocation

The address and post code number given to each building had the following considerations.

- Be in a color that contrasts with its background, the yellow colored tablet should have black text as directed in appendix D
- The house number plate should be at least 4inches long and not more than 10 inches wide, except here the owner has requested to use larger number
- Allocation of address in urban areas was assigned in the sequence of odd numbers on the left and even numbers on the right side of the road starting from the beginning of the road in the respective street.



Figure 2-2:Address allocation in urban areas (NaPA, 2022)

Address numbers in rural areas was allocated in a random order like scheduled areas, buildings were given address numbers in a sequence of numbers starting from 1, 2, 3 ...

- a. Consider the following figure which presents the numbering of houses in the streets within rural areas.



Figure 2-3 Address allocation in rural areas (NaPA, 2022)

### 2.3 Global Positioning System (GPS)

GPS has revolutionized efforts to pinpoint locations by assigning precise physical coordinates to geographical positions, the data derived from GPS is a string of numbers interpreted by specialized devices which are not intuitive to user. With the help of identifiable and standardized addresses, GPS can be made more user friendly and can be used in array of devices (ISO, 2010).

A Geographic Information system (GIS) similarly stress data that can be used to analyse and manage geographical information and present that information into maps, GIS combines data on land use, population and property to form an integrated model that aids in decision making and can be adapted to other data models. GIS can make use of address infrastructure by adding another layer to existing data models to expand applications and observe relationships contributing to a base of information.

### 2.4 Shortcomings of the previous addressing system

The designated postal operator, Tanzanian Posts Corporation TPC, has installed a total of 173,000 post office boxes country wide. However, this number is insufficient to meet the current demand for addresses, taking into account the size of the country, its population and number of households. The absence of proper addressing system had been an obstacle to the postal sector's efforts to make a significant contribution to the socio-economic development of the country.

The current system has a number of shortcomings, For-example lack of standardized addresses and attempts to apply street addresses often involve lengthy descriptions of locations that leads to confusion. As a result, mail is miss sorted and misrouted, consequently be the system is unsuitable for the demands of e-commerce.

## 2.5 The postal sector

An address for every household and location in the country will help to achieve the objective of worldwide initiative “Addressing the world - An address for everyone”. Mail sorting will easier and more efficient where missorted, misrouted and undeliverable mail will be minimized. The system includes preparation for the possible automation of the postal sorting, and new postal products related to the new addressing system will be introduced. The sector could also benefit from a rise in revenue as a result of increasing advertising mail volumes and the delivery of e-commerce items through the postal network.

National addressing standard			
For the purpose of establishing the national addressing standard, addresses were categorized into four main types (urban, rural, postal delivery and international), as described in the following examples:			
<b>Urban address</b>		<b>Postal delivery</b>	
Regional manager	<i>Name of addressee</i>	Mr Peter Mhina	<i>Name of addressee</i>
Arusha Head Post Office	<i>Building name</i>	P.O. Box 25	<i>Post office box number</i>
1 Boma Street	<i>House number + street name</i>	20267 Muheza	<i>Postcode + post office</i>
23100 Arusha	<i>Postcode + locality</i>		
<b>Rural address</b>		<b>International address</b>	
Aloyce Lwambano	<i>Name of addressee</i>	Jackson Massawe	<i>Name of addressee</i>
12 Mazengo	<i>House number + hamlet</i>	45 Kipanga Street	<i>House number + street name</i>
Matonya Village	<i>Village name</i>	23115 Kaloleni	<i>Postcode + locality</i>
41521 Galigali	<i>Postcode + locality</i>	Arusha	<i>District</i>
Mpwapwa	<i>District</i>	Tanzania	<i>Country</i>

Figure 2-4 Postcode addressing system standards (UPU, 2020)

## 2.6 Challenges and measures

There are several challenges that has been faced during the implementation of NaPA:

- i. Many urban areas lack street names, signage and house numbers. Where they do exist, they are not presented in a logical and/or consistent manner
- ii. Cities and suburban areas are characterized by poor urban planning, which increases the difficulties associated with the implementation of address.



- iii. There has been an increase in unplanned settlements in urban and suburban areas on the account of urban migration, and the lack of strict regulation for property development
- iv. There are resource and data sharing problems among stakeholders. Many institutions, including local governments, the Revenue Authority, the Permanent National Voters register, the National Identification Authority among others, maintain their own databases which are tailored to their particular needs. There is a need to integrate incompatible databases to allow for data sharing and the maintenance of accurate and consistent data.
- v. The lack of village settlement planning creates particular challenges for adoption of special numbering and the assigning of rural addresses.

## **2.7 Validation methods**

Different countries adopted different methods to validate and standardize the postal code system depending on the adopted type of postal code system. The common methods which have been used to validate postal addressing system are as the followings:

- a. Validation rules: Postal authorities often have rules in place to ensure that postal codes are valid and accurate. These rules may specify the format and length of postal codes, as well as any restrictions on the character or numbers that can be used.
- b. Geocoding: Geocoding technologies can be used to validate postal codes by comparing them to known geographic locations. For example, if a postal code is entered for a particular address the geocoding system can compare it to latitude and longitude of that address to see if it matches a known postal code for that area.
- c. Machine learning algorithms: These can be trained on large datasets of addresses and postal codes to identify patterns and predict the correct postal code for a given address. These algorithms can be particularly useful in cases where there are errors or inconsistencies in the address data.
- d. Address verification services: Many postal authorities and shipping companies offer address verification services that can validate and standardize postal codes as well as other address components such as street names and building numbers. These services can help to ensure that packages and mail are delivered to the correct address.

- e. Human verification: In some cases, postal authorities may rely on manual verification by postal workers or other staff to ensure the accuracy of postal codes. This may involve checking addresses against physical maps or other records to confirm that the correct postal code is used.

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Overview

This part describes the techniques, methods and how data were obtained for the purpose of carrying out the purpose of this research. It is devoted to the understanding of how the postcodes coordinates were collected, the tools used as well as the general assessment of the addressing system (NaPA).

#### 3.2 Research Process

The processes enacted during the research included data collection, here data were first collected from the Kinondoni Municipal Council these were the address name and number, house postcode as well as the postcode coordinates for the Makongo area. Since the research was based on validating the addressing system, the next procedure was site work where the research wanted to evaluate the difference between the collected and the obtained data to see if the system coincides with the ground truth.

#### 3.3 Research design

Here both qualitative and quantitative approach were adopted to produce a descriptive analysis of the physical addressing system NaPA, first data were collected on the accuracy of the current system through surveying which was conducted in Makongo ward. While collecting data from the field a sample of individuals who have used the system (NaPA) were asked sample questions about their experience with the system to see whether they have encountered any issues with their address being incorrectly recorded or delivered. Additionally, the survey asked the respondents to suggest any improvements that could be made to the system hence improve the accuracy and effectiveness of the postal addressing system. Consider table 3-1 showing the sample of the questionnaire form used during the research study.

Table 3-1 Questionnaire research form

SAMPLE QUESTIONS	YES	NO
Are you aware of the system (NaPA)?		
Do you have knowledge on how NaPA operates?		

Have you ever used NaPA application?		
Would you like to try it?		

Table 3-2 includes the information acquired from the questionnaire during the research study, those information are based on respondents knowledge about the system (NaPA)

Table 3-2 Respondent information

S/N	Respondent	Number of Sample space	Percent based on awareness of NaPA	
			YES	NO
1	University students	50	20%	80%
2	Lectures	10	50%	50%
3	Private Sector	25	0%	100%
4	Government employees	30	25%	75%
5	Normal citizens	100	35%	65%

### 3.4 Sampling Technique

A sample mailing was conducted within the case study area where 4 streets of Makongo ward were surveyed these were Changanyikeni, Mbuyuni, Mlalakuwa and Makongo Juu streets, with a total of 50 houses from each. While reaching out those addresses the NaPA application was put out to use to see if each address could be reached out. During the survey the coordinates were staked out using a handheld GPS while integrating address database and the geographic information system.

### 3.5 Field work procedures

First a letter seeking support for research study was handled to Kinondoni municipality, the request was approved and data for Makongo area were provided. After wards another letter from Kinondoni municipal was provided for seeking support from the local government at Makongo ward.

Feld reconnaissance was then carried out so as to understand the pattern of streets and plan for the actual execution of the field work. During field reconnaissance the arrangement of buildings, street road pattern, house number postcode was put into consideration.

After field reconnaissance followed the execution of the field work where 50 houses from each street were surveyed and their position was recorded using handheld GPS, the survey form constituted the following information, postcode address, house number, name of the owner and the coordinates staked out.

### 3.3 Geocoding

Geocoding is widely known as a process of converting a physical address into geographic coordinates such as latitude and longitude. It can be useful for mapping and spatial analysis. With validating the postal code addressing system geocoding can be used for spatial verification through verifying latitude and longitude associated with the address to see if it is within the expected geographic range for that postal code. ‘Google earth software’ was used to geocode the obtained data from the field as well as those given from TCRA so as to observe how they appear on the ground. The specific addresses were entered on the software and the software detected the latitude and longitude of each while displaying how they appeared onto the ground.



Figure 3-1 Google earth image showing the display of coordinates on the ground

### **3.6 Data collection tools**

- i. Handheld GPS: This was used for the collection of coordinates (Northings and Eastings) with the accuracy of 3 metres.
- ii. Data collection form: This form included street name, house number, name of the resident as well as the postcode coordinates for the specific building.
- iii. Pencil and rubber
- iv. Clipboard

## CHAPTER FOUR

### RESULTS, ANALYSIS AND DISCUSSION

#### 4.1 Introduction

This chapter presents all the results which were obtained from methodology of this research and provides analysis of the obtained results.

#### 4.2 Data Obtained from the field (Makongo ward)

To provide a baseline for validating the postal addressing system, a survey was conducted through which data were obtained. The table below contains the coordinates obtained from the field which are in WGS84

Table 4-1 Sample of collected data from the field

Street Name	Postcode	House Number	Resident Name	Easting (m)	Northing (m)
Serikali ya mtaa	14129	15	Ofisi ya mtaa	524856.034	9251901.734
		28	Malt Tailoring	524843.132	9251883.623
		30	Paul Shija	524846.321	9251875.096
		42	Happiness Boutique	524815.568	9251799.314
Tingisha	14129	1	Winfrida P Assey	524938.674	9251940.021
		2	Antipas R Shirima	524959.329	9251944.741
		8	Sarah Salon	524961.431	9251938.075
		20	Mama P Salon	524927.472	9251944.608
		22	Christer S Robby	524919.312	9251946.634
		3	Hussein H Kahigi	524915.879	9251943.452
		24	Zainabu R Chambo	524912.204	9251948.863
		26	Steven Y Kasamia	524883.014	9251959.064
		30	Gasper Isaya	524858.743	9251975.753
		13	Aziki S Mtulia	524830.134	9251983.724
		56	Size N Saboye	524812.764	9251993.051
		72	Lina W Minja	524789.098	9251993.945
		21	Modesta R Mukaina	524750.962	9251980.331
		92	Kisuja L Kibiriti	524658.342	9251979.021
		29	Agness Geofrey	524608.254	9251971.903

		94	Christina S Nderumaki	524590.872	9251982.365
		96	Clara S Malya	524541.052	9251952.561
		98	Meenda G Malya	524495.132	9251938.064
		100	Kasimu H Kibwana	524481.789	9251934.009
		41	Peter A Kapoka	524446.752	9251915.807
		43	Best Saloon	524432.813	9251913.909
		104	Gedion L Meenda	524412.617	9251912.76
Msekwa	14129	2	Nora Shosho	524412.073	9251961.054
		4	Meenda M Malya	524425.347	9251972.408
		15	Priscilla M Nanyaro	524438.453	9252088.921
		23	Martin K Mwandete	524516.342	9252171.713
		20	Sebastian N Maiko	524532.362	9252179.845
		21	Katani C Mwandete	524530.035	9252188.003
		22	Hilder M Ngahyoma	524547.734	9252212.149
		29	Edina M Laurian	524551.052	9252241.081

### 4.3 Mapping of the coordinates

The collected data were then mapped to see how they align with the ground truth using QGIS software, the software was able to visualize and analyse the spatial information which were entered

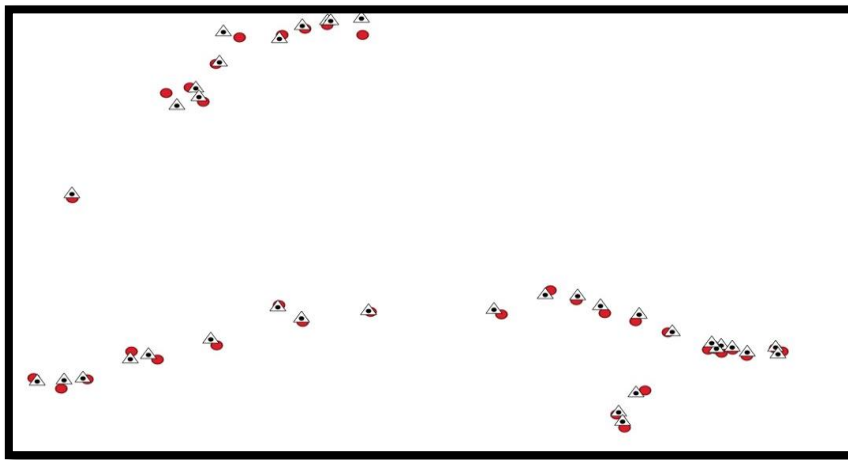


Figure 4- 1: Display of coordinates on QGIS



#### 4.4 Data collected from TCRA

In order to assess the system (NaPA) the data from the field were to be compared with the data given from TCRA office which are the baseline of the system. Table 4-2 below consists of sample data obtained from the TCRA which are used within the system (NaPA), the coordinates are in WGS84 system

Table 4-2 Sample of data given by TCRA

Street Name	Postcode	House Number	Resident Name	Easting (m)	Northing (m)
Serikali ya mtaa	14129	15	Ofisi ya mtaa	524863	9251904
		28	Malt Tailoring	524842	9251882
		30	Paul Shija	524848	9251869
		42	Happiness Boutique	524816	9251809
Tingisha	14129	1	Winfrida P Assey	524938	9251937
		2	Antipas R Shirima	524959	9251945
		8	Sarah Salon	524964	9251942
		20	Mama P Salon	524928	9251943
		22	Christer S Robby	524919	9251940
		3	Hussein H Kahigi	524915	9251943
		24	Zainabu R Chambo	524909	9251944
		26	Steven Y Kasamia	524880	9251960
		30	Gasper Isaya	524857	9251971
		13	Aziki S Mtulia	524833	9251978
		56	Size N Saboye	524812	9251989
		72	Lina W Minja	524793	9251999
		21	Modesta R Mukaina	524757	9251976
		92	Kisuja L Kibiriti	524660	9251979
		29	Agness Geofrey	524609	9251969
		94	Christina S Nderumaki	524592	9251984
		96	Clara S Malya	524546	9251948
		98	Meenda G Malya	524502	9251933
		100	Kasimu H Kibwana	524482	9251942
		41	Peter A Kapoka	524450	9251915
		43	Best Saloon	524431	9251907
		104	Gedion L Meenda	524410	9251917

		4	Meenda M Malya	524502	9251933
Msekwa		2	Nora Shosho	524412	9251962
		15	Priscilla M Nanyaro	524439	9252086
		23	Martin K Mwandete	524508	9252184
		20	Sebastian N Maiko	524536	9252177
	14129	21	Katani C Mwandete	524526	9252189
		22	Hilder M Ngahyoma	524545	9252212
		29	Edina M Laurian	524563	9252237

#### 4.5 Comparison of data

The table below shows the comparison of data collected from the field and those given from TCRA as well as the computed distance between them, the coordinates are in WGS84.

Table 4-3 Comparison of data and computed differences

RESIDENTS	TCRA DATA		FIELD DATA		DIFFERENCES		DIST (m)
	Northings (m)	Eastings (m)	Northings (m)	Eastings (m)	ΔN	ΔE	
Abednego B Biloti	9253091.440	522401.240	9253096.560	522402.210	-4.119	-1.028	4.245
Agency Baa	9251806.920	521728.600	9251813.360	521737.810	-7.438	-9.255	11.873
Agness Geofrey	9251969.190	524609.380	9251972.900	524608.250	-2.713	1.046	2.908
Agness Mlingwa	9252269.470	521485.230	9252272.920	521485.450	-2.450	-0.263	2.464
Agriculture Inputs Shop	9251732.400	521770.390	9251738.930	521777.920	-5.534	-7.653	9.444
Alexander Mkubwa	9253456.160	522940.840	9253453.010	522944.840	3.155	-4.082	5.159
Amor H Said	9251869.460	524375.680	9251875.660	524373.360	-5.204	2.199	5.650
Anamringi A Kalalu	9253075.800	522499.160	9253073.580	522494.310	2.220	4.815	5.302
Angela Mtafulu	9252284.700	521515.710	9252285.760	521514.610	-1.061	1.088	1.520

Antipas R Shirim	9251944.6 80	524959.5 20	9251945.7 40	524959.3 30	-1.061	0.121	1.068
Antony F Sononga	9252046.4 30	524114.2 30	9252050.4 60	524113.1 90	-4.026	1.017	4.152
Asifiwe Mwakapuja	9253537.0 70	522648.5 30	9253540.2 60	522646.3 00	-3.194	2.227	3.894
Aziki S Mtulia	9251977.0 70	524832.8 60	9251984.7 20	524830.1 30	-6.654	2.706	7.183
Beatrice D Hinjo	9251991.6 40	521655.7 30	9251992.4 20	521653.6 80	-1.781	1.985	2.667
Beatrice D Hinjo	9252070.0 10	521640.4 80	9252074.5 40	521639.8 50	-3.532	0.565	3.577
Benard J Makwerere	9251939.3 80	521684.4 60	9251948.2 10	521679.6 50	-8.828	4.746	10.02 3
Bertha O Koda	9252042.0 00	521642.8 30	9252041.8 50	521641.6 50	1.146	1.165	1.634
Best Saloon	9251906.4 20	524430.5 00	9251914.9 10	524432.8 10	-7.609	-2.313	7.953
Betha O Konda	9252074.3 00	521633.4 10	9252075.3 10	521635.6 50	-1.719	-2.275	2.851
Brown S Arafati	9253308.5 90	522825.0 60	9253304.6 20	522845.0 50	4.177	- 20.08 4	20.51 4
Bugirwa Mulozi	9252028.8 00	521641.1 90	9252031.1 00	521648.3 50	-2.776	-7.235	7.749
Casmil M Mtobangi	9253491.3 20	522753.7 80	9253491.0 80	522759.5 80	0.312	-5.905	5.913
Christer S Robby	9251940.3 90	524919.3 50	9251947.5 70	524919.3 10	-7.084	0.008	7.084
Christina S Nderumaki	9251984.7 10	524591.6 90	9251982.6 30	524590.8 70	1.995	0.698	2.114
Clara S Malya	9251947.5 50	524545.6 10	9251953.3 70	524541.0 50	-5.791	4.548	7.363
Cleopance D Makwaya	9253383.3 60	522556.4 00	9253384.5 60	522548.2 40	-1.567	7.804	7.960
Constructi on Technician	9251821.7 70	524253.7 50	9251818.2 40	524249.7 90	2.148	3.905	4.457
Damian D Damian	9252017.6 70	521643.9 90	9252017.4 60	521644.2 30	-0.172	-0.324	0.367
Daniel N Yona	9253158.6 10	522957.4 80	9253161.2 90	522939.2 70	-3.037	18.10 7	18.36 0

Deoscorous B Ndolo	9253393.120	522596.340	9253397.460	522595.840	-4.058	0.431	4.081
Dp Lodge	9252051.420	524100.730	9252052.880	524100.280	-0.820	0.395	0.910
Edina M Laurian	9252236.820	524562.600	9252241.030	524551.050	-5.241	11.578	12.709
Exaud D Macha	9252238.210	524654.230	9252254.080	524652.740	-15.211	1.408	15.276
Gasper Isaya	9251970.840	524856.100	9251976.630	524858.740	-6.123	-2.693	6.689
Gedion L Meenda	9251916.420	524410.890	9251913.750	524412.620	3.240	-2.617	4.165
Gibson Kawago	9253391.630	522899.900	9253395.760	522898.670	-3.816	1.234	4.011
Habibu S Ngalala	9253156.160	522431.140	9253162.060	522420.240	-6.658	10.902	12.774
Haji M Haji	9252347.240	521522.770	9252359.480	521529.030	-12.095	-6.332	13.652
Hamadi J Abadallah	9251869.820	521719.330	9251882.080	521708.300	-13.255	11.007	17.229
Happiness Boutique	9251808.980	524816.260	9251799.480	524815.570	8.266	0.592	8.287
Healing Faith Centre	9251912.220	521688.720	9251923.310	521685.040	-10.898	3.677	11.502
Hilder M Ngahyoma	9252211.580	524545.300	9252212.360	524547.730	-1.459	-2.444	2.846
Hussein H Kahigi	9251943.460	524914.920	9251943.140	524915.880	-0.312	-0.999	1.047
Judica Ulomi	9253367.690	522524.940	9253372.450	522525.860	-4.638	-0.926	4.730
Julieth Sanga	9253445.140	522397.000	9253441.040	522400.230	3.432	-3.274	4.743
Karimje J Mazengo	9253214.400	522824.830	9253210.300	522813.340	3.544	11.498	12.032
Kasimu H Kibwana	9251941.730	524482.550	9251934.350	524481.790	6.871	0.681	6.905
Katani C Mwandete	9252189.930	524525.890	9252188.010	524530.040	0.967	-4.245	4.354
Kennedy Pondamal	9253148.890	522731.250	9253138.000	522746.640	9.816	-15.483	18.332
Kikwasi Juniour	9253540.880	522631.270	9253543.760	522632.750	-2.810	-1.596	3.232

Kisuja L Kibiriti	9251978.9 70	524659.6 40	9251979.6 50	524658.3 40	-1.021	1.208	1.582
Laura J Ngole	9252247.1 80	524627.3 00	9252251.0 20	524627.8 90	-3.813	-0.563	3.854
Lina W Minja	9251999.5 40	524792.7 20	9251994.9 90	524789.1 00	4.595	3.642	5.863
Lucia M Sanguya	9253366.0 80	522391.0 50	9253365.9 60	522397.0 30	0.625	-6.002	6.034
Madafu A Madafu	9251959.0 00	521653.8 30	9251969.4 60	521655.0 70	-9.578	-1.263	9.661
Malt Tailoring	9251882.5 10	524842.9 00	9251884.8 70	524843.1 30	-1.873	-1.162	2.204
Mama P Salon	9251942.3 00	524927.9 20	9251945.6 30	524927.4 70	-2.128	0.378	2.161
Mariam L Mgeta	9253383.5 70	522885.3 40	9253384.6 10	522890.9 10	-0.578	-5.612	5.642
Martin K Mwandete	9252184.5 40	524508.3 70	9252172.0 60	524516.3 40	12.127	-8.062	14.56 2
Martina Upele	9251997.8 60	521644.0 70	9252003.7 10	521648.6 80	-6.067	-4.678	7.661
Matilda B Ally	9253375.4 20	522547.1 50	9253382.0 70	522552.7 60	-7.129	-5.644	9.093
Maulid K Maina	9252155.0 20	521616.3 00	9252141.1 60	521631.9 10	13.816	- 15.61 8	20.85 2
Meenda G Malya	9251933.2 70	524501.7 80	9251938.2 10	524495.1 30	-4.574	6.598	8.028
Miraji Mohamed	9253100.4 40	522396.5 40	9253098.0 70	522399.4 90	2.143	-3.035	3.715
Mjungu H Muuh	9252178.2 30	521625.3 30	9252181.9 60	521626.4 60	-3.180	-1.186	3.394
Modesta R Mukaina	9251976.4 50	524756.5 20	9251980.7 20	524750.9 60	-4.291	5.538	7.006
Moses G Koda	9252111.0 00	521631.9 80	9252112.3 30	521628.5 70	-0.743	2.433	2.544
Msomi M Musiba	9253340.5 10	522862.1 80	9253345.4 40	522859.3 20	-5.048	2.809	5.777
Mtega C Mtega	9252478.2 00	521522.3 60	9252473.9 70	521500.3 90	4.258	21.85 8	22.26 9
Mussa Abdul	9253439.4 70	522936.0 00	9253443.5 90	522935.6 50	-4.391	0.352	4.405
Mwajuma Kasimu	9253411.8 00	522897.2 60	9253406.3 30	522898.0 30	4.422	-0.804	4.494

Nasibu Kilonzo	9253379.4 20	522894.9 30	9253383.3 60	522892.0 60	-3.545	2.789	4.511
Nasra J Kulusu	9252259.7 50	521578.4 30	9252263.4 50	521575.4 40	-3.572	2.935	4.623
Neema Kavishe	9253066.8 00	522281.1 40	9253084.4 40	522271.0 70	-18.088	10.06 5	20.70 0
Nursery School	9252260.1 20	521561.8 50	9252264.9 80	521557.7 80	-4.012	4.016	5.677
ofisi ya kijiji	9251904.6 40	524862.7 80	9251902.0 00	524856.0 30	2.496	6.646	7.099
paul shija	9251869.6 90	524847.6 70	9251875.7 70	524846.3 20	-5.646	1.319	5.798
Pendo H Mchome	9251812.8 20	524244.2 30	9251815.1 20	524246.0 50	-2.302	-1.895	2.982
Peter A Kapoka	9251915.8 80	524449.7 40	9251916.0 90	524446.7 50	-0.927	2.978	3.119
Priscilla M Nanyaro	9252085.1 90	524438.7 80	9252089.3 40	524438.4 50	-3.731	0.217	3.737
Pulita J Omar	9252158.4 70	521631.9 40	9252161.5 20	521629.0 50	-2.775	2.805	3.946
Richard Kalokola	9251871.3 00	524347.2 50	9251868.7 6.42	524353.1 20	3.517	-5.904	6.872
Safronia H Urrio	9252270.6 90	524624.1 00	9252251.8 50	524630.2 10	18.756	-6.084	19.71 8
Sarah Salon	9251941.0 80	524964.3 90	9251938.0 90	524961.4 30	2.525	2.859	3.814
Sebastian N Maiko	9252176.3 40	524535.9 10	9252180.6 90	524532.3 60	-4.315	3.538	5.580
Serikali ya mtaa	9253195.7 60	522412.1 10	9253197.6 50	522416.7 70	-1.514	-4.695	4.933
Silvesta W Mchungu	9251855.9 80	524353.1 20	9251854.3 10	524352.0 60	1.406	1.077	1.771
Sitta Mwakabel ela	9253063.3 00	522616.9 30	9253067.1 40	522629.1 20	-4.076	-12.18 3	12.84 7
Size N Saboye	9251989.5 40	524811.9 50	9251993.5 40	524812.7 60	-3.661	-0.884	3.766
Steven Rugaimuka mu	9251813.6 50	521717.2 20	9251826.7 00	521720.5 40	-13.028	-3.342	13.45 0
Steven Y Kasamia	9251959.0 00	524879.9 10	9251959.9 00	524883.0 10	-0.034	-3.134	3.134
Suma H Mwampulo	9252238.9 90	524594.2 40	9252235.5 00	524592.2 70	3.630	1.901	4.098

Valentine M Bukozo	9251938.7 60	521669.5 10	9251948.4 50	521670.7 90	-9.977	-1.316	10.06 3
Vincent J Gwabbo	9252281.2 70	521504.8 00	9252281.2 30	521505.7 30	-0.374	-0.902	0.976
William G Kimwaga	9251841.5 30	521736.6 90	9251830.1 00	521730.7 30	11.504	5.849	12.90 6
Wilson P Bogota	9253277.2 50	522839.8 80	9253288.6 70	522833.4 20	- 10.958	6.327	12.65 3
Wilson S Mwalisa	9253120.4 30	522624.5 70	9253103.5 40	522625.3 60	16.955	-0.820	16.97 5
Winfride P Assey	9251937.2 10	524938.5 30	9251940.0 40	524938.6 70	-3.221	-0.194	3.227
Yakobo Malisa	9253497.2 20	522896.6 30	9253501.9 60	522894.0 70	-3.419	2.503	4.237
Zainabu R Chambo	9251943.5 10	524909.4 70	9251949.8 60	524912.2 00	-6.353	-2.834	6.956
Zilpa T Zilpa	9252244.2 20	524611.4 40	9252247.7 60	524609.2 70	-2.536	2.173	3.340

The following image shows the distribution and layout of postcode coordinates given by TCRA and those obtained from the field at Makongo ward and how they deviate from one another.

[illegible]

Figure 4-2 Comparison between TCRA and Field data



#### **4.6 Discussion**

After the comparison between the data to determine visually how close the postal code represented the address in the system (NaPA) the distance between them was obtained. It has been observed that the distance between the address and the postal code location vary across pairs in a certain range for-example from this research the range of location differences in Makongo ward has been varying from 3 to 20 meters. The range may be smaller or larger in other areas depending on the length, size and shape of the postal code area.

## **CHAPTER FIVE**

### **CONCLUSION AND RECOMMENDATION**

#### **5.1 Conclusion**

After conducting a thorough validation of the postal code addressing system, several key findings have emerged. The analysis revealed that the system generally functions well and accurately assigns postal codes to specific geographical areas. However, some discrepancies and issues were identified during the validation process.

One significant finding is that a small percentage of addresses had incorrect or missing postal codes, leading to delivery delays and potential misrouting of mail. These errors could be attributed to various factors such as human error during data entry, outdated databases, or inadequate address validation processes. It is crucial to address these issues to ensure the overall efficiency and effectiveness of the postal code addressing system.

Additionally, the validation process uncovered inconsistencies in the postal code assignment for certain regions. These discrepancies were found to be caused by overlapping or ambiguous boundaries between adjacent postal code areas. These inaccuracies can lead to confusion and difficulties in delivering mail to the correct locations. Resolving these boundary issues is essential to enhance the precision and reliability of the postal code addressing system.

#### **5.2 Recommendation**

Based on the findings from the validation of the postal code addressing system, several recommendations are proposed to improve its accuracy and effectiveness:

1. **Data Quality Improvement:** Measures are to be implemented to enhance the accuracy and completeness of address data. This can include stricter validation rules during data entry, regular data cleansing and verification processes, and updating the postal code database with the latest information.
2. **Address Validation Tools:** Investment in advanced address validation software or tools that can automatically verify and correct address information in real-time. These tools can help minimize human errors and improve the quality of postal code assignment.
3. **Geographical Boundary Alignment:** Collaborate with relevant authorities to review and align geographical boundaries between adjacent postal code areas. Clear and unambiguous boundaries will facilitate accurate address assignment and eliminate confusion during mail delivery.

4. **User Education and Awareness:** Conduct public awareness campaigns to educate residents and businesses about the importance of using correct and complete addresses, including postal codes. Encourage individuals to double-check their addresses before sending mail to minimize errors.
5. **Continuous Monitoring and Feedback:** Establishing a feedback mechanism to collect information on misrouted or undelivered mail. Regularly monitor and analyze this data to identify recurring issues and implement necessary improvements to the postal code addressing system.
6. **Collaboration and Standardization:** Foster collaboration between postal service providers, government agencies, and other relevant stakeholders to establish standardized addressing guidelines and best practices. This collaboration will help streamline processes, reduce errors, and ensure consistency across different regions.

By implementing these recommendations, the postal code addressing system can be strengthened, leading to improved mail delivery efficiency, reduced errors, and enhanced customer satisfaction.

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## APPENDIX

SN	NAME	TCRA DATA COORDINATES		FIELD DATA COORDINATES	
		NORTHING	EASTING	NORTHING	EASTING
1	Abednego B Biloti	9253091.44	522401.18	9253095.559	522402.208
2	Agency Baa	9251805.92	521728.55	9251813.358	521737.805
3	Agness Geofrey	9251969.19	524609.3	9251971.903	524608.254
4	Agness Mlingwa	9252269.47	521485.19	9252271.92	521485.453
5	Agriculture Inputs Shop	9251732.4	521770.27	9251737.934	521777.923
6	Alexander Mkubwa	9253456.16	522940.76	9253453.005	522944.842
7	Amor H Said	9251869.46	524375.56	9251874.664	524373.361
8	Anamringi A Kalalu	9253074.8	522499.12	9253072.58	522494.305
9	Angela Mtafulu	9252283.7	521515.7	9252284.761	521514.612
10	Antipas R Shirim	9251943.68	524959.45	9251944.741	524959.329
11	Antony F Sononga	9252046.43	524114.21	9252050.456	524113.193
12	Asifiwe Mwakapuja	9253537.07	522648.53	9253540.264	522646.303
13	Aziki S Mtulia	9251977.07	524832.84	9251983.724	524830.134
14	Beatrice D Hinjo	9251990.64	521655.66	9251992.421	521653.675
15	Beatrice D Hinjo	9252070.01	521640.41	9252073.542	521639.845
16	Benard J Makwerere	9251939.38	521684.4	9251948.208	521679.654
17	Bertha O Koda	9252042	521642.81	9252040.854	521641.645
18	Best Saloon	9251906.3	524430.5	9251913.909	524432.813
19	Betha O Konda	9252073.59	521633.37	9252075.309	521635.645
20	Brown S Arafati	9253307.8	522824.97	9253303.623	522845.054
21	Bugirwa Mulozi	9252028.32	521641.11	9252031.096	521648.345
22	Casmil M Mtobangi	9253491.39	522753.67	9253491.078	522759.575
23	CCM	9251773.71	521768.96	9251769.566	521758.462
24	Christer S Robby	9251939.55	524919.32	9251946.634	524919.312
25	Christina S Nderumaki	9251984.36	524591.57	9251982.365	524590.872
26	Clara S Malya	9251946.77	524545.6	9251952.561	524541.052
27	Cleopance D Makwaya	9253382.67	522556.04	9253384.237	522548.236
28	Construction Technician	9251820.61	524253.69	9251818.462	524249.785
29	Damian D Damian	9252017.12	521643.91	9252017.292	521644.234
30	Daniel N Yona	9253158.42	522957.38	9253161.457	522939.273
31	Deoscorous B Ndolo	9253392.82	522596.27	9253396.878	522595.839
32	Dp Lodge	9252051.21	524100.67	9252052.03	524100.275
33	Edina M Laurian	9252235.84	524562.63	9252241.081	524551.052
34	Exaud D Macha	9252238.42	524654.15	9252253.631	524652.742
35	Gaspar Isaya	9251969.63	524856.05	9251975.753	524858.743
36	Gedion L Meenda	9251916	524410	9251912.76	524412.617
37	Gibson Kawago	9253391.24	522899.9	9253395.056	522898.666

38	Habibu S Ngalala	9253155.82	522431.14	9253162.478	522420.238
39	Haji M Haji	9252346.98	521522.7	9252359.075	521529.032
40	Hamadi J Abadallah	9251869.22	521719.31	9251882.475	521708.303
41	Happiness Boutique	9251807.58	524816.16	9251799.314	524815.568
42	Healing Faith Centre	9251912.46	521688.72	9251923.358	521685.043
43	Hilder M Ngahyoma	9252210.69	524545.29	9252212.149	524547.734
44	Hussein H Kahigi	9251943.14	524914.88	9251943.452	524915.879
45	Judica Ulomi	9253367.4	522524.93	9253372.038	522525.856
46	Julieth Sanga	9253444.73	522396.96	9253441.298	522400.234
47	Karimje J Mazengo	9253213.89	522824.84	9253210.346	522813.342
48	Kasimu H Kibwana	9251940.88	524482.47	9251934.009	524481.789
49	Katani C Mwandete	9252188.97	524525.79	9252188.003	524530.035
50	Kennedy Pondamal	9253147.58	522731.16	9253137.764	522746.643
51	Kikwasi Juniour	9253539.84	522631.15	9253542.65	522632.746
52	Kisuja L Kibiriti	9251978	524659.55	9251979.021	524658.342
53	Laura J Ngole	9252247.18	524627.33	9252250.993	524627.893
54	Lina W Minja	9251998.54	524792.74	9251993.945	524789.098
55	Lucia M Sanguya	9253366.08	522391.03	9253365.455	522397.032
56	Madafu A Madafu	9251959.29	521653.81	9251968.868	521655.073
57	Malt Tailoring	9251881.75	524841.97	9251883.623	524843.132
58	Mama P Salon	9251942.48	524927.85	9251944.608	524927.472
59	Mariam L Mgeta	9253383.48	522885.3	9253384.058	522890.912
60	Martin K Mwandete	9252183.84	524508.28	9252171.713	524516.342
61	Martina Upele	9251997	521644	9252003.067	521648.678
62	Matilda B Ally	9253375.08	522547.12	9253382.209	522552.764
63	Maulid K Maina	9252154.98	521616.29	9252141.164	521631.908
64	Meenda G Malya	9251933.49	524501.73	9251938.064	524495.132
65	Miraji Mohamed	9253099.93	522396.45	9253097.787	522399.485
66	Mjungu H Muuh	9252177.54	521625.27	9252180.72	521626.456
67	Modesta R Mukaina	9251976.04	524756.5	9251980.331	524750.962
68	Moses G Koda	9252111	521631	9252111.743	521628.567
69	Msikiti	9253404.51	522390.44	9253403.769	522390.754
70	Msomi M Musiba	9253340.3	522862.13	9253345.348	522859.321
71	Mtega C Mtega	9252477.57	521522.25	9252473.312	521500.392
72	Mussa Abdul	9253438.54	522936	9253442.931	522935.648
73	Mwajuma Kasimu	9253410.86	522897.23	9253406.438	522898.034
74	Nasibu Kilonzo	9253379.42	522894.85	9253382.965	522892.061
75	Nasra J Kulusu	9252259.02	521578.37	9252262.592	521575.435
76	Neema Kavishe	9253066.27	522281.13	9253084.358	522271.065
77	Nursery School	9252260.44	521561.8	9252264.452	521557.784
78	ofisi ya kijiji	9251904.23	524862.68	9251901.734	524856.034
79	paul shija	9251869.45	524847.64	9251875.096	524846.321
80	Pendo H Mchome	9251812.27	524244.15	9251814.572	524246.045

81	Peter A Kapoka	9251914.88	524449.73	9251915.807	524446.752
82	Priscilla M Nanyaro	9252085.19	524438.67	9252088.921	524438.453
83	Pulita J Omar	9252158.3	521631.85	9252161.075	521629.045
84	Richard Kalokola	9251871.36	524347.22	9251867.843	524353.124
85	Safronia H Urrio	9252269.83	524624.13	9252251.074	524630.214
86	Sarah Salon	9251940.6	524964.29	9251938.075	524961.431
87	Sebastian N Maiko	9252175.53	524535.9	9252179.845	524532.362
88	Serikali ya mtaa	9253195.04	522412.07	9253196.554	522416.765
89	Silvesta W Mchungu	9251854.98	524353.14	9251853.574	524352.063
90	Sitta Mwakabelela	9253063.4	522616.94	9253067.476	522629.123
91	Size N Saboye	9251989.39	524811.88	9251993.051	524812.764
92	Steven Rugaimukamu	9251812.65	521717.2	9251825.678	521720.542
93	Steven Y Kasamia	9251959.03	524879.88	9251959.064	524883.014
94	Suma H Mwampulo	9252238.21	524594.17	9252234.58	524592.269
95	Valentine M Bukozo	9251938.32	521669.47	9251948.297	521670.786
96	Vincent J Gwabbo	9252280.75	521504.83	9252281.124	521505.732
97	William G Kimwaga	9251841.27	521736.58	9251829.766	521730.731
98	Wilson P Bogota	9253276.75	522839.75	9253287.708	522833.423
99	Wilson S Mwalisa	9253119.6	522624.54	9253102.645	522625.36
100	Winfrida P Assey	9251936.8	524938.48	9251940.021	524938.674
101	Yakobo Malisa	9253497.27	522896.57	9253500.689	522894.067
102	Zainabu R Chambo	9251942.51	524909.37	9251948.863	524912.204
103	Zilpa T Zilpa	9252244.22	524611.44	9252246.756	524609.267