

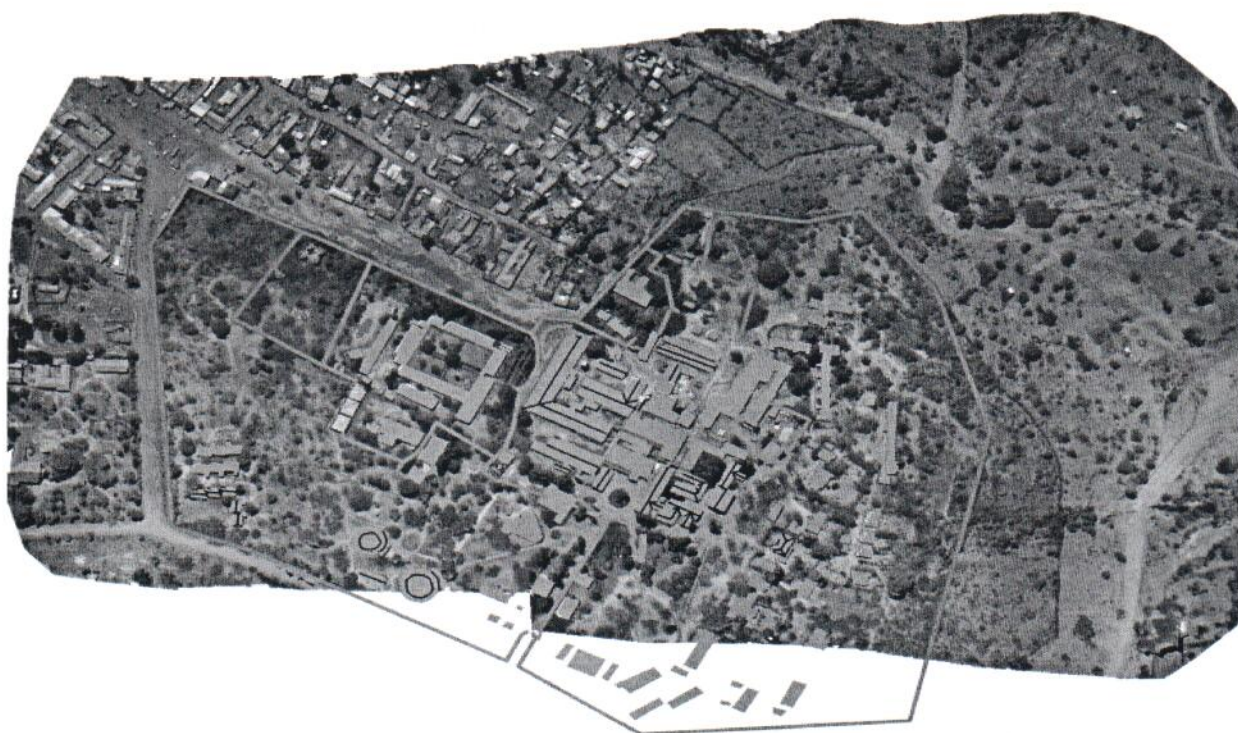
THE UNITED REPUBLIC OF TANZANIA



PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

Guideline for GIS Application in Local Government Authorities



Jiandae kuhesabiwa Siku ya Jumanne tarehe 23 Agosti, 2022

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Statement by the Permanent Secretary

This GIS Guideline responds to the Government Sector Policies, Laws and Guidelines. Rural Development Strategies, the Land Act Number 4 of 1999 and the Urban Planning Act Number 8 of 2007 Section 2(d) which requires the application of Geographical Information System in preparation of the General Planning Schemes. In all cases, the GIS Guideline shall offer wide services in the life Cycle of service provision.

The application of GIS technology have necessitated GIS users including LGAs Departments, public utility providers, thematic user communities and enterprises that use spatial data to enhance performance for better service provision. The GIS Office in LGAs, have been given capacity to properly deliver a wider portfolio of services such as data collection– management – visualization, production of static & dynamic maps, remote sensing analysis, support to connecting applications developed by other departments and development of specific application in order to delivery of a training scheme and contribution to specialized skill development in various Departments. Furthermore, it supports management in decision-making process.

The Regional Secretariats and LGAs Management Teams must ensure that, GIS Portfolio is integrated in day to day departmental duties.



Prof. Riziki S. Shemdoe

PERMANENTS SECRETARY

Abstract

The handling of spatial data usually involves processes of data acquisition, storage and maintenance, analysis and output. For many years, this has been done using analogue data sources and manual processing. The introduction of modern technologies has led to an increased use of computers and information technology in all aspects of spatial data handling. The software technology used in this domain is Geographic Information Systems (GIS). GIS is being used by various disciplines as tools for spatial data handling in a geographic environment.

This GIS Guideline is a reaction to the realized need that despite substantial investments towards establishing Geographical Information Systems (GIS) in Local Government Authorities (LGAs). All Councils have not been able to optimize/operationalise the use of GIS to the extent of linking spatial sector data with their day-to-day activities and for effectively monitoring and evaluation of Rural and Urban Development.

The Guideline has been prepared by PO-RALG to provide standardized application of GIS in all LGAs, thereby calling for strengthening of GIS Units. It starts with elaboration of GIS goals and outputs, commensurate with mainstreaming its activities in the LGAs. The stated Output and Outcome matrix shall guide implementation and assist in monitoring of results in the various Development Activities.

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Abbreviations

BRN	Building Reference Number
CAD	Computer Aided Design
CMT	Council Management Team
CVS	Comma Separated Values (file extension)
DTM	Digital Terrain Model
dxg	Data Exchange Format (file extension)
FTP	File Transfer Protocol
GPS	Global Positioning System
IRDU	Information Research and Development Unit
ISO	International Organization of Standards
IT	Information Technology
LADM	Land Administration Domain Model
LAN	Local Area Network
LCD	Liquid Crystal Display
LGA	Local Government Authority
LGRCIS	Government Revenue Collection Information System
MoU	Memorandum of Understanding
PO-RALG	President's Office -Regional Administration and Local Government
PRN	Property Reference Number
qGIS	Quantum GIS
GIS	Geographical Information System
GPS	Global Positioning System
RUD	Rural and Urban Development
UEMIS	Urban Environmental Management Information system
UPIN	Unique Parcel Identification Number
UTM	Universal Transverse Mercator
LGA	Local Government Authorities

CHAPTER ONE

1.1. Introduction

1.2. An Overview of the GIS Guideline

The Government of the United Republic of Tanzania (URT) adopted the use of GIS technology in the provision of services to its community. There have been significant changes in technology and Government initiatives in provision of Social and economic services to the public. Various technical personnel including doctors, nurses, logicians, water-and-sanitation experts, administrators, and other professionals working in Sector Ministries, Departments and Agencies are providing services in various Sectors in the Country hence necessitate the sharing of data and Information.

The common themes and directive to this Guideline are related to efficiency data saving, data sharing, changes in ways of dealing with customers and compliance with regulations this shall lead to efficient service delivery and decision making.

This GIS Guideline has been structured to primarily support all Stakeholders needs, and is made available to all Stakeholders in private and public sectors. It is made applicable and useful to all Regional Secretariat and Local Government Authorities.

1.3. The purpose of the Guideline

This GIS Guideline guides the Regional Secretariat and Local Government Authorities in making decisions regarding their day-to-day activities related to the provision of social and economic services. The Guideline seeks to make better use of spatial information held by public authorities and other sectors. Geographical information is integral to all RSs and LGAs in decision-making.

1.4. The targeted users

The Guideline is useful to all sector ministries, Regional Secretariats, Local Government Authorities, government and non-government institutions, the Investors both in public and private institutions and the community.

1.5. Expected Output/Outcome

A Geographic Information System (GIS) is a technological system that involves the creation, storage, management, evaluation, and mapping of several Spatial and Geographical data. Through this system, data is being connected to a map. This technology is gaining popularity and recognition for its economic and strategic

usefulness. It is beneficial to the Government and to enterprises of all sizes and in several sectors.

- a) Enhanced monitoring and evaluation of Activities and Projects
- b) Enhanced Environmental impact analysis
- c) Strengthen mapping and zoning of hazardous area, Wet land areas, social service Infrastructure, Hot spots, of Infrastructure, Soil and physical feature
- d) Enhanced productivity and Citizens Income both in Rural and Urban;
- e) Established Data base/Geographical Information System (GIS – Portal) for accessing Village and Urban data and Information;
- f) Improved communication
- g) Better decision making
- h) Enhanced Planning (Urban, transport, Agriculture, Land use, Survey, Community development, and Traffic density planning)
- i) Enhanced Environmental conservation, management of natural resources,
- j) Enhanced living Standards;
- k) Strengthen Crime prevention and security of Citizens
- l) Provision of economic and social services to the Citizens enhanced

CHAPTER TWO

2.0 Policy issues and Regulatory Framework

The enforcement of the Guideline will be supported by various Policies, Laws, and Regulations as follows: -

- a) The National Land Policy of 1995 objectives is to ensure that, Rural and Urban Land is planned, surveyed and titled in a manner that will enhance Livelihood and people's well-being. In perusing that, GIS is applicable as a tool for planning and assessing performance on land investments. Likewise, the National Human Settlements Development Policy of 2000 requires spatial mapping of the urban features and infrastructures for efficient planning and environmental assessment during settlement development.
- b) The Local Government Policy (Urban Authorities) Cap 288 (With its revised edition of 2002) directs that, Land planning, surveying and Investment should be made in a manner that will enhance the provision of social and economic services. The aim is to strengthen mapping and zoning of hazardous area, Wet land areas, social service Infrastructure, Hot-spots, Infrastructure, Soil and physical features.
- c) Rural Development Policy 2003 requires the use of technology in implementation of its Objectives. The aim is to improve planning in various Government sectors (Urban, transport, Agriculture, Land use, Survey, Community development, Traffic density planning, etc).
- d) National Addressing and Postcode Guideline. According to section 4.4 of the Guidelines, The Postcode and address information will be saved in GIS Software /GIS Database to enable users to access Information from GIS Data base.
- e) The National Postal Policy of 2003 requires the use Of GIS in implementation of the Post code and Addressing issues. For example, The National Addressing and Postcode Guideline. According to section 4.4 of the Guidelines, The Postcode and address information will be saved in GIS Software /GIS Database to enable users to access.

3.0 CHAPTER THREE

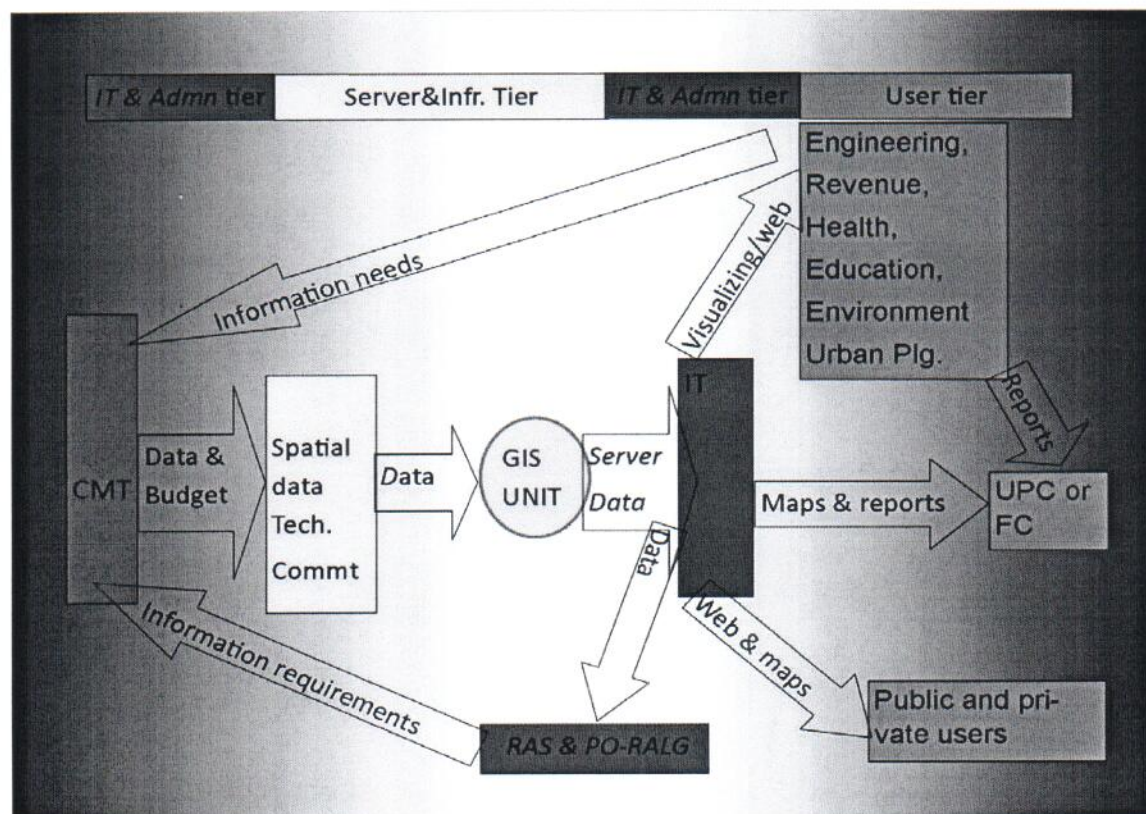
3.1 Structure and Organization of GIS Activities in LGAs

The GIS guideline shall work under a framework of a three-tier system of operations, administrative rights, and reporting as shown in figure 1 below.

- a) **USER-LEVEL TIER** (data users)—dealing with viewing, downloading, or printing data measurement, searching data, overlay, and other analytic functions. The area shall encompass the use of GIS output including printing and visualization. The main software that this tier use includes LGRCIS, map server, and Arc GIS online. Users in this tier may use various gadgets such as desktop computers, laptops, specialized point of service remote gadgets, and mobile phones. All departments and sector agencies that commonly make reference to the spatial need to be connected and access GIS data as users. These user departments and sections include engineering, internal revenue, health, education environment, urban planning, RAS office, and utility agencies or service providers.

- b) **INFORMATION TECHNOLOGY AND NETWORKING TIER** (data administrators). The functions of this tier concentrate on interoperability within the agreed standards. Functions related to interoperability are sharing, maintaining web-based connections, managing links, and overlay functions with external web-based data. They also deal with inter and intra-organizational web security of the networks. The data exchange should be the priority approach to sharing data especially if outside agencies are involved. They can use a map server, FTP, or other specialized software. They are also involved with protocols for linking GIS with other computerized systems in the Council. Those involved in this tier allocate administrative/access rights for users. The Department of information technology shall be the leading in this tier.

Figure 1: Proposed organization Structure of GIS activities in the Councils



- c) **SERVER AND INFRASTRUCTURE TIER** (data publishers)—this tier is basically about GIS officers who have the capacity to input data rather than use the system, meaning those in rural and urban development. Their roles include capturing, creating, and editing data. They manage data, they manage servers, they are responsible for GIS data security, maintain metadata catalog, they maintain image and documents (system catalog, they have leg database . They manage links with zoning plans and other national spatial data.

3.1.1 Other Proposed Organs and Reporting Structure

There shall be a Standing Committee in each LGAs with the responsibility of directly receiving and deliberate reports relating to the performance and progress of GIS in relation to the development needs of a particular Council and population at large. The Council Management Team (CMT) shall be the internal policy body and approving entity for GIS activities and budget.

There shall be a spatial data/GIS technical committee. Its composition shall be selected from CMT members. Its size shall be between 5 and 7 members and shall be able to meet every two weeks to discuss GIS issues. The Council director shall appoint the Committee members formerly.

There shall be a spatial data/GIS technical committee in each Regional Secretariat responsible for discussing and recommending GIS reports from LGAs in their respective Regions. The Committee shall submit the reports to the Region Management Team quarterly. The overall region report shall be the agenda for the RCC Meetings.

3.1.2 Technical Guiding principles in GIS development in LGAs

- a) Improve openness and transparency in data;
- b) Single point of collection for efficient resource use and omission of redundancies;
- c) Quality data and standardization including improving reliability;
- d) Focus on core responsibilities and mandates of LGAs (LGAs' business processes);
- e) Compatibility with legal systems including the Statistics Act of 2015; and
- f) Data and information that has a direct user department should be promoted and operated

3.1.3 Data standards

The data standard to be used should be ISO 19152. The organization of data should conform broadly to Land Administration Domain Model (LADM). In this model data are to be organized in a sequence of details from broad ownership or location of the area to the basic administrative or type units; followed by the use and development conditions as defined by rights, responsibilities, and restrictions concluded by parcel units which include legal space, the status of survey; and finally the spatial representation meaning typology and geometry.

4.0 CHAPTER FOUR

4.1 CONCLUSION

In order to ensure sustainable GIS application in the Regional Secretariat, Local Government Authorities a number of steps are required (see figure 1), of most importance is the creation of relevant registries which involves basically the development of base-map/map sets and linking tables and spatial data with locations in various data sets.