

CURRENT STATUS OF NGDI STANDARDIZATION IN KENYA

By

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ABSTRACT

A National Geospatial Data Infrastructure (NGDI) is the combination of technology, data, institutional arrangements and people that enables the discovery, evaluation and application of geospatial data from all sectors of the economy, plus the general citizenry. For any GDI to work, standards are required for the data, information technology, standardization process, human capacity building and evaluation of NGDI performance. This paper looks at the current status of NGDI standardization in Kenya, focusing on data standardization. Based on the results of a GIS installation survey carried out in 2002/3, it reports that no systematic standardization exists of now, although elements of de facto standardization exist in respect of some data characteristics. Considering that Kenya is in the initial stages of setting up a NGDI, a way forward is proposed.

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1. INTRODUCTION

A National Geospatial Data Infrastructure is the combination of technology, data, institutional arrangements and people that enables the discovery, evaluation and application of geospatial data from all sectors of the economy, plus the general citizenry (Mulaku, 2002 a).

A standard is a documented agreement containing technical specifications or other precise criteria to be used consistently as rules, guidelines or definitions of characteristics to ensure that materials, products and services are fit for their intended purpose. One of the major objectives of a GDI is to make available to users geospatial data sets of consistent quality, even if the datasets are collected and maintained by different agencies. This therefore cannot be done without standards; indeed, it is often stated that standards are the gist of GDI.

2. GDI STANDARDIZATION

A GDI typically consists of data and metadata, standards, technology, policies, institutional cooperation and people (GDI end users and also those who facilitate and run the system) (Groot and McLaughlin, 2000); each of these components is subject to standardization.

Therefore for GDI, there ought to be:

- **Data standards:-** to which data and metadata should conform.
- **Information technology standards:** - to which GDI hardware, software and communication components should conform.
- **Organizational standards:-** which define how the standardization process should be organized and implemented (e.g., reference model, conformance and testing procedures, etc).
- **Education standards:-** to which GDI professional and other personnel should conform.

- **Performance standards:-** which may be used to evaluate the performance of the GDI once in place.

However, when people talk about GDI standards, they are mostly referring to data standards.

3. DATA STANDARDS

These are the bulk of standards that geoinformation players in GDI have to deal with. They are the standards to which data and metadata should conform in order to ensure consistent quality and enable efficient data interchange between different systems and users in the infrastructure. Data items that need standardization include *feature definitions, database schemas, feature codes, interchange formats, co-ordinate systems, quality (e.g., accuracy, resolution etc), symbology and metadata specifications*. Many developed countries and even dominant industries have developed standards on some of these aspects e.g., the United States of America's SDTS or AutoCAD's DXF. The ISO's TC/211 has, drawing from such national, industry and other efforts (e.g., those of the Open Geospatial Consortium) developed many international standards on the same aspects. There is therefore much to draw and learn from for developing countries that are faced with the prospect of GDI data standardization

4. STATUS OF DATA STANDARDIZATION IN KENYA

Kenya does not have a NGDI yet, being only in the initial stages of setting up one. However, it has two functioning international clearing house nodes at UNEP and ILRI. A survey carried out in 2002/2003 (Mulaku, 2002 b; Siriba, 2004; Mulaku et al., 2005) found that there were at the time about 60 GIS installations with datasets covering most thematic aspects. Of the installations, 50% were in the public sector, 22% in the private sector, 17% in international organizations and 11% in the academic institutions. Figure 1 illustrates this.

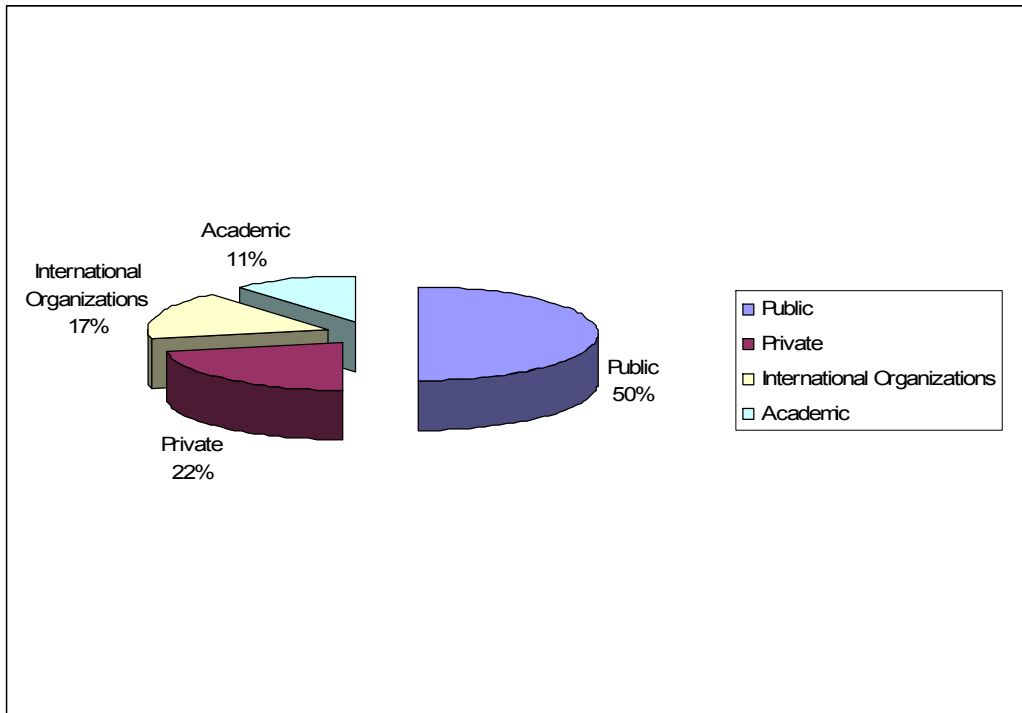


Figure 1: GIS installations by sector (After Mulaku et al, 2005)

In all 115 datasets were identified, broken down as foundation (38%), framework (21%) and application (41%). The key datasets of geodetic control, administrative boundaries, electoral boundaries, topographic mapping (1:50,000 and 1:250,000), national gazetteer, transportation network, cadastre, land use/ land cover, soil mapping, population mapping and large scale topographic mapping were all found to be present and mostly in public sector organizations, especially the Survey of Kenya; Table 1 gives a summary of this availability. All the 115 datasets identified were evaluated for suitability for inclusion in the proposed Kenya NGDI; Table 2 gives a summary of the results of this evaluation.

Dataset	Availability	Remarks
Geodetic control	Yes	Analogue. 80% of monuments destroyed
DEM	Yes	Limited Coverage
Orthoimagery	No	RCMRD can take lead in development
Administrative and electoral boundaries	Yes	In digital form
Topographic mapping 1:50,000	Yes	About 67% coverage of which about 20% is digitized
Topographic mapping 1:250,000	Yes	Full national coverage; nearly all digitized
National Gazetteer	Yes	Analogue
Transportation	Yes	Analogue, mainly on roads
Cadastre	Yes	Covers mainly high potential agricultural areas; digitization going on
Land use/cover	Yes	Digital at medium scale
Hydrography	No	Survey of Kenya could do with a hydrographic section
Soil mapping	Yes	In digital form
Population	Yes	Digitization going on
Topographic mapping at large scales	Yes	In digital form for most of major towns

Note: RCMRD – Regional Centre for Mapping of Resources for Development

Table 1: Summary of Key GDI dataset availability (After Mulaku et. al., 2005)

Suitability Index	Foundation		Framework		Application	
	Number	%	Number	%	Number	%
Very suitable	2	5	0	0	2	4
Suitable	23	52	11	46	17	36
Unsuitable	19	43	13	54	28	60
Very unsuitable	0	0	0	0	0	0

Table 2: Summary of GDI suitability for available datasets (After Mulaku et al., 2005)

Very Suitable: Available, accessible, digital, catalogued, complete or near complete coverage, UTM.

Suitable: Available, digital, accessible.

Unsuitable: Available, not digital or not accessible.

Very unsuitable: Not available.

One quickly notes that of the suitability criteria used, standardization was not one of them. Indeed in respect at the common data items for standardization that are listed in section 3 above, no evidence of any formal and systematic standardization was found. However, a significant amount of de-facto standardization was found to exist in respect of some items such as co-ordinate system (UTM), exchange formats (DXF and TIFF) and symbology (Survey of Kenya standard symbology). Elements of this de-facto standardization were also found in respect of technology (e.g. the Windows operating system, IBM compatible hardware products, ESRI GIS software, etc.). No kind of standardization exists in terms of standards organization, education or NGDI performance. The national standards body, Kenya Bureau of Standards, was found to be an observer member of the ISO/TC211 but with little impact on the issue of geoinformation standardization locally.

5. THE WAY FORWARD

Initial steps have been taken to set up the Kenyan NGDI, including the drafting of the relevant policy, setting up of a secretariat and formation of several working groups; one of the working groups is charged with developing the GDI standards. At the last KNSDI workshop (Government of Kenya, 2006), this standards group reported that it had split into five sub-groups to work on standards relating to the spatial reference frame, metadata, feature coding, interchange formats and a definition of the list of fundamental datasets. Like all the other working groups of KNSDI, this group needs to be enabled to work so that it can carry out these, and many other standardization tasks. It is also proposed that wherever possible, the group should avoid the long and expensive process of developing standards from scratch; instead, it should be encouraged to access existing standards (such as those of ISO/TC211 through Kenya Bureau of Standards) and customize them to the needs of the Kenyan NGDI.

6. CONCLUSION

In this paper, the current status of NGDI standardization in Kenya has been outlined, focusing on data standardization. It has been found that no systematic standardization exists although elements of de-facto standardization are there for some data characteristics. A way forward has been proposed.

7. REFERENCES

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