

MULTIPURPOSE CADASTRE: AN UNDER-UTILIZED NGDI DATASET

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The Meaning of Cadastre

Cadastre is a public register of land boundaries that defines the separate holdings of land. The outlines of the land parcels are normally shown on large scale maps.

Development into Multipurpose Cadastre

It was soon realized that it would be more beneficial to the society if multiple uses of cadastre were made.

The Concepts of Planning and Management

Furthermore, with a map of the land available it was convenient to add features on the land that facilitated planning and management such as:

- Nature of the soil
- Vegetation cover
- Land use
- Buildings and personal data of occupants
- Drainage
- Details of water, telephone and electricity services

Problems militating against Multipurpose Cadastre

- Maps became over crowded with details, or
- There were too many map themes of the same parcel of land, and there was therefore
- Need to overlay several map themes of the same parcel of land to achieve a desired purpose.

GIS to the Rescue

What is GIS?

- Can be defined as an integrated computer information system designed for collecting, managing, displaying and analyzing large volumes of spatially referenced and associated attribute data (NASRDA 2003).
- As its driving force, GIS is one of the most important components of Geospatial Data Infrastructure. GIS makes it possible to:
 - Hold the various map themes on different layers
 - Attached attribute data to the map layers
 - Combine or disaggregate various map layers to satisfy a desired purpose

What is Geospatial Data Infrastructure (GDI)?

- Geospatial Data Infrastructure consists of the technology, policies, standards and institutional arrangements necessary to acquire, process, store, distribute and improve the utilization of geospatial data from many different sources and for a wide group of potential users (Groot 1998).
- Since there are different national and transnational initiatives on GDI, its components are also seen differently but they invariably contain interconnected geospatial databases consisting of thematic data sets and fundamental datasets.

Thematic and Fundamental Datasets Explained

- **Thematic Datasets are application specific**
- **Fundamental Datasets have national coverage and are needed consistently by more than one government agency in order to achieve their objectives (NASRDA 2003).**

Multipurpose Cadastre as Fundamental Dataset

- Cadastre contains every available data (spatial and attribute) pertaining to a land parcel.
- When cadastre is extended over the whole country in a national multipurpose cadastre it should constitute one of the most widely and frequently used datasets in a National Geospatial Data Infrastructure (NGDI).

Benefits of Multipurpose Cadastre

- Property Inventory
- Project Implementation and Monitoring
- Crime Prevention and Detection
- Utility Management
- School Management
- National Identity Cards
- Census Mapping
- Population Estimates
- Electoral Processes
- Agricultural Yield Prediction

Imperatives for a National Multipurpose Cadastre

- **Spatial Reference Framework, also called Geodetic Reference Framework**
This gives spatial meaning to the other datasets.
It consists of monumented survey control points established in accordance with such adopted standards as a reference ellipsoid, a map projection, a meridian of reference, a coordinate system and its origin, a scale factor and a geoid of reference.
- **Current large scale map of the country**
This is tied to the geodetic reference framework and provides identifiable ground features to relate spatial datasets to the ground.
- **Cadastral Overlay delineating all Cadastral Parcels**
Cadastral parcels being the basic units in a national multipurpose cadastre are assigned unique parcel identification numbers for purposes of information retrieval and for linking information in other files.

— A series of Attribute Data Files

Attribute data are not normally entered on the spatial database for two main reasons. The first is that the spatial database would get overcrowded with the numerous attribute data usually involved. The second is that such a block entry does not allow for the manipulation of the various classes of attribute data, as may be desired. For these reasons a separate attribute data file is created for each parcel.

— File linkage facilities

File linkage entails assigning common identifiers, called link paths, to the set of records that are required to be linked. Using a query language, the link paths are used to manipulate the files and display any desired records.

Current Cadastral Practice in Nigeria: Problems and Solutions

Lack of Awareness

There is lack of awareness on the part of policy makers of the numerous possibilities offered by the scheme. Therefore the starting point for initiating and implementing a national multipurpose cadastre is to mount an awareness campaign targeted at both policy makers and potential users.

Existence of Cadastral Records in Analogue Form

Most cadastral data still exist only in the form of conventional hard copy maps. There is the need to digitize these maps to facilitate their use in a national multipurpose cadastre.

National Integration

In Nigeria, although the various state cadastral survey standards are common in many respects, they are tied to various local origins. This is a drawback because surveys tied to the various local reference systems must be transformed to the national reference system before they can be used in a national multipurpose cadastre. Three sequential steps, namely translation of origin, rotation of axis and a scale change are required to achieve the transformation.

Presenting New Cadastral Records in Computer compatible forms

In many parts of Nigeria existing regulations still allow cadastral records to be submitted only in hard copy formats. Therefore, while steps are being taken to digitize existing records, there should be a new regulation requiring that all newly prepared cadastral plans should be presented in computer compatible forms. This will facilitate their use in updating the multipurpose cadastral database.

Shortage of Relevant Qualified Manpower

Concept of multipurpose cadastre is still new in Nigeria and there is yet insufficient number of qualified local personnel to man the various nodal points required for the implementation of the scheme. Efforts should be made to attract home Nigerians in the diaspora who have the requisite training and experience. Furthermore, every project in this scheme should include a training component for local personnel to strengthen local capacity.

Funding and Sustainability

It is expected that a huge financial outlay will be required at the initial stage of the implementation of a national multipurpose cadastre. It is suggested that the federal government, as the biggest stakeholder, should provide the seed money for the take-off of scheme. It should also make available some annual grants for the first few years of the scheme. Thereafter, after the society has imbibed the idea of a national multipurpose cadastre, the scheme can be sustained by the fees regularly paid by the numerous bodies that would seek information from the multipurpose cadastral database.

Conclusion

By implementing the above suggestions and integrating the resulting national multipurpose cadastre into the NGDI, multipurpose cadastre can be turned into one of the most widely and frequently used geospatial datasets with numerous benefits to the society. This will be in line with the recommendations of FIG-Commission 7 Working Group 1 "Vision Cadastre" looking at trends and developing visions for cadastral systems in 2004.

THANK YOU.