

Development of Urban Multipurpose Cadastre of Busari Olarinre Scheme Layout, Atiba, Atiba Local Government Area, Oyo, Nigeria.

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ABSTRACT- Development of urban Multi-Purpose Cadastre is very useful in Land information management in urban environment. However, such information system could be made more meaningful and useful if it can be extended for multiple usages with multi data layers, and in three-dimensions (3D). This paper discusses development and implementation of a multipurpose cadastre of Busari Olarinre Scheme Layout in Atiba. Atiba Local Government Area of Oyo State, Nigeria. This was achieved by providing systematic procedure for recording information on the allocated parcel of land, both spatial and attribute data, link both spatial and attribute database and perform some analyses, to demonstrate the capability of multipurpose cadastre and performing spatial query and analysis which serve the user's needs satisfactorily. Primary and secondary datasets of the study area were acquired, processed and analyzed using ARCGIS 9.2 software. In order to obtain the best answers from the database queries, single and multiple criteria query were performed using GIS techniques. The results of database queries were presented in form of multipurpose cadastral map and tables and subsequently discussed. It is recommended among other things that multi-purpose cadastre maps should be made available to decision makers in order to enhance efficient socio-economic administration.

Index terms: Three-dimensions (3D), GIS, Multi-Purpose Cadastre

1 Introduction

Present system of cadastral management in Nigeria is inadequate and slow, with no effective cadastral information system operating in the country.

The local Authorities, charged with the allocation and management, lands in the state, is yet to fully incorporated digital method of data management, and is currently encumbered with analogue files and records, which make data storage, update, retrieval, and processing extremely difficult tasks for the authorities, coupled with high possibility of data loss.

Existing cadastral records, consisting of paper maps and land registers are now insufficient to store, and manipulate the data of the estate.

Hence the need to solve these problems by creating a standard GIS database and multipurpose cadastre map that will serve as an information base for the government and private developers.

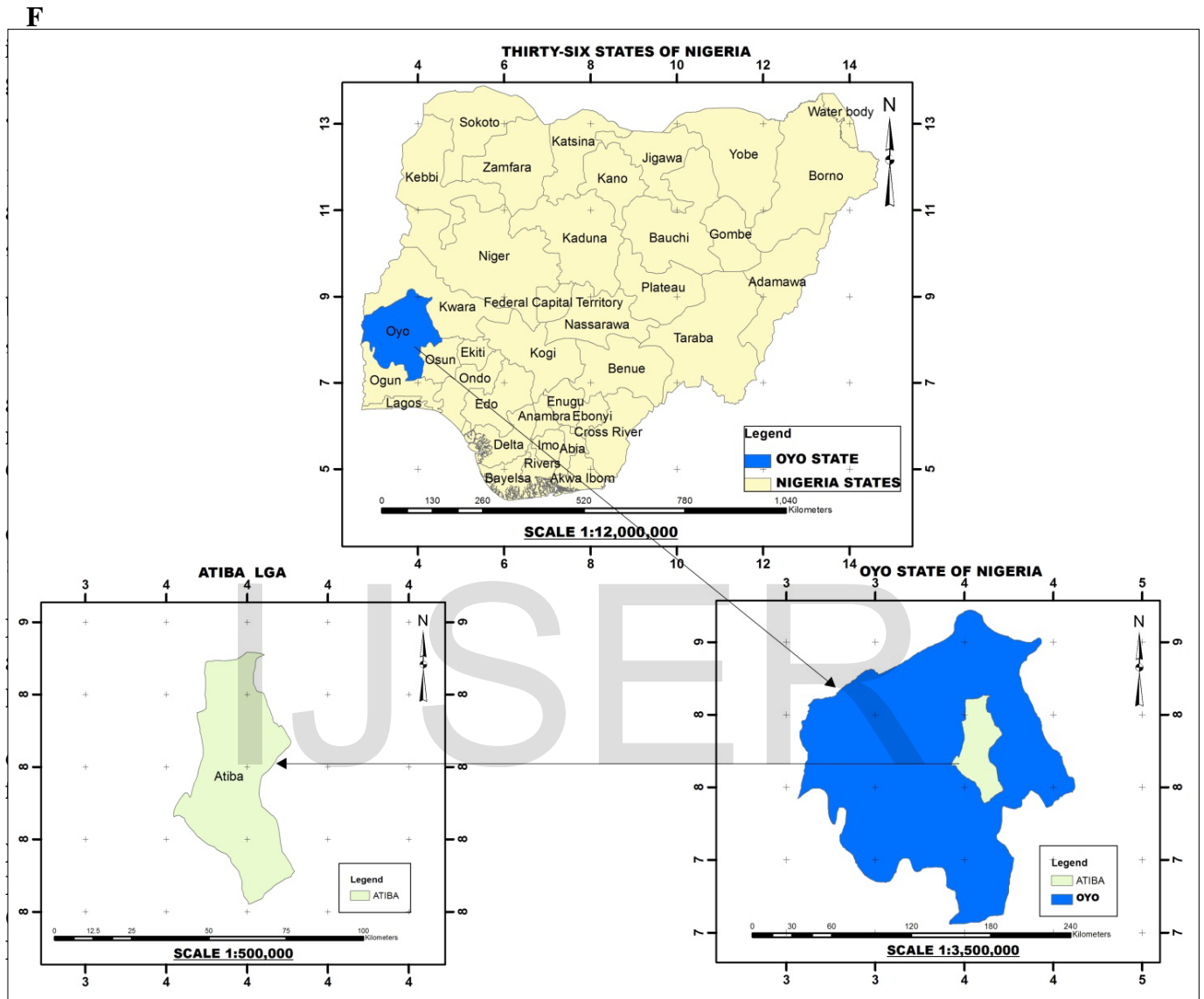
1.1 THE STUDY AREA

The study area is Busari Olarinre Scheme Layout Oyo. The Layout is in Atiba, Atiba Local Government Area.

Atiba is a Local Government Area in Oyo State, Nigeria. The headquarters is in the town of Ofa Mefa. It has an area of 1,757 km² and a population of 168,246 at the 2006 census. The Local Government is one of the three local councils carved out of Old Oyo Local Government Area of Oyo State. It is located between latitudes 07° 40'N and 07° 51'N and between Longitudes 03° 50'E and 03° 57'E, it is bounded in the South by Iyaji Local Government Area, in the west by Iseyin and Ifedapo Local Government Area, in the east by Oyo East Local Government Area and in South by Akinyele Local Government Area.

Therefore, the inhabitants of the area are mainly Yorubas. The area is an offspring of the defunct famous Oyo Empire of the 18th century headed by Alaafin of Oyo. The Alaafin had traditional chiefs around him known as the Oyomesi. The former location of the Empire was called 'Oyo Ile' where the Alaafin and his subjects moved down to the present location known as Oyo town. While the area is fairly with a side sloping gently towards a small stream that flows across the area. Oyo town is situated between the rain forest and the savannah region. It has moderate rain which starts around April and ends by October or November each year. The temperature is about 28° c during the rainy season while it rises to about 34°c during

the dry season. The soil type is mainly sand and mixed with gravels.



ig 1. Map of Nigeria showing the study area
Source: Survey Department of Atiba Local Government Area

2. METHODOLOGY

The methodology adopted in execution of the research work is subdivided into various steps such as: Data needs data source, data processing and analysis.



Fig. 2: Methodology Workflow and Procedures

2.1 DATA NEEDS

The following data were used for the execution of the research project.

- The plan of the study area, showing all the plots and their area (size)
- The co-ordinates of all the plots in the study area.
- The use for each parcel (plot).
- The list of all plots that has C of 0 with their owners
- The name of all the roads in the estate
- The list of all the allottees in the estate

Planning Stage

This stage is very significant for a proper and effective optimization process. In this phase of the project, selection of hardware and software was done.

2.2 DATA ACQUISITION

Data acquisition for the work were acquired through Primary and Secondary source. **Primary data** are both spatial and non-spatial (Attribute) data. The X, Y coordinates of the study area acquired by land surveying method using digital instrument such as the Global Positioning System and Total Station were obtained from the local government authority.

While Secondary data (layout plan of the study area showing each plot) were obtained from the survey department of the Local Government Area.

Appropriate hypothetical values were used for the attributes of the parcels such as owner name, allottee

name, parcel value, etc as a result of high level bureaucracy in the ministries.

2.3 MULTIPURPOSE CADASTRAL DATABASE DESIGN

Database is a collection of structured, integrated data on a (related defined field). It prohibits redundancy. This process of designing such database is called database design.

Data base design was carried out during this study taking into consideration all the objects and their interrelationship within any spatial unit (Busari Olarinre Scheme Layout) being considered. The design was carried out in such a way that maximum benefit could be derived from the result database.

3. PRESENTATION AND DISCUSSION OF RESULT

All the results of database queries were presented inform of digital maps or graphic displays, report and tables. Data storage, editing, updating and analysis, manipulation, retrievals were done in a logical and well defined manner.

Spatial queries and analysis is a common analysis in GIS. It is a way of processing or manipulating data in order to generate useful scenarios for decision making. GIS software (ArcGis 9.2 version) was used for database management.

Results is an essential aspect of this study and this was done thoroughly in such a way that the objectives of the study were met. The Results of database queries were presented inform of digital maps, graphic displays or

animated graphics, photographs, reports and attribute tables. Samples of the results obtained include demonstrating, through various analyses, the potential of GIS in development and implementation of multipurpose cadastre in Atiba, Atiba Local Government Area.

Figure 3 shows layout map of the study area with street names and roads within are shown clearly. Different colours are used to distinguish between plots.

While, figures 4 shows a query command ("shape_Area">=1000) which precisely determines the property area greater than 1000. The result of the query shows all (32) as being selected. The properties are shown in the layout map and 5 shows shows a query command ("OWNER_STATE"='OYO' AND SHAPE_AREA>=1000 AND PURPOSE =RESIDENTIAL) which precisely shows three condition query. The result of the query shows all (6)

as being selected. The plots are shown in the layout map. Figures 6 and 7 The figure (6 and 7) shows a query command ("CONDITION"='TARRED') and ("CONDITION"='UNTARRED') which precisely shows condition of the road within the study area. The result of the query shows all (2) as being selected as tarred, while the selected street roads are untarred . The roads are shown in the layout map. The figure 8 shows the owners' states of each plot within the study. They are depicted using different colours. The figure 9 shows a query command ("C OF O"='NO' AND STATUS=DEVELOPED) which precisely shows two condition query. The result of the query shows all as being selected. The plots are shown in the layout map.

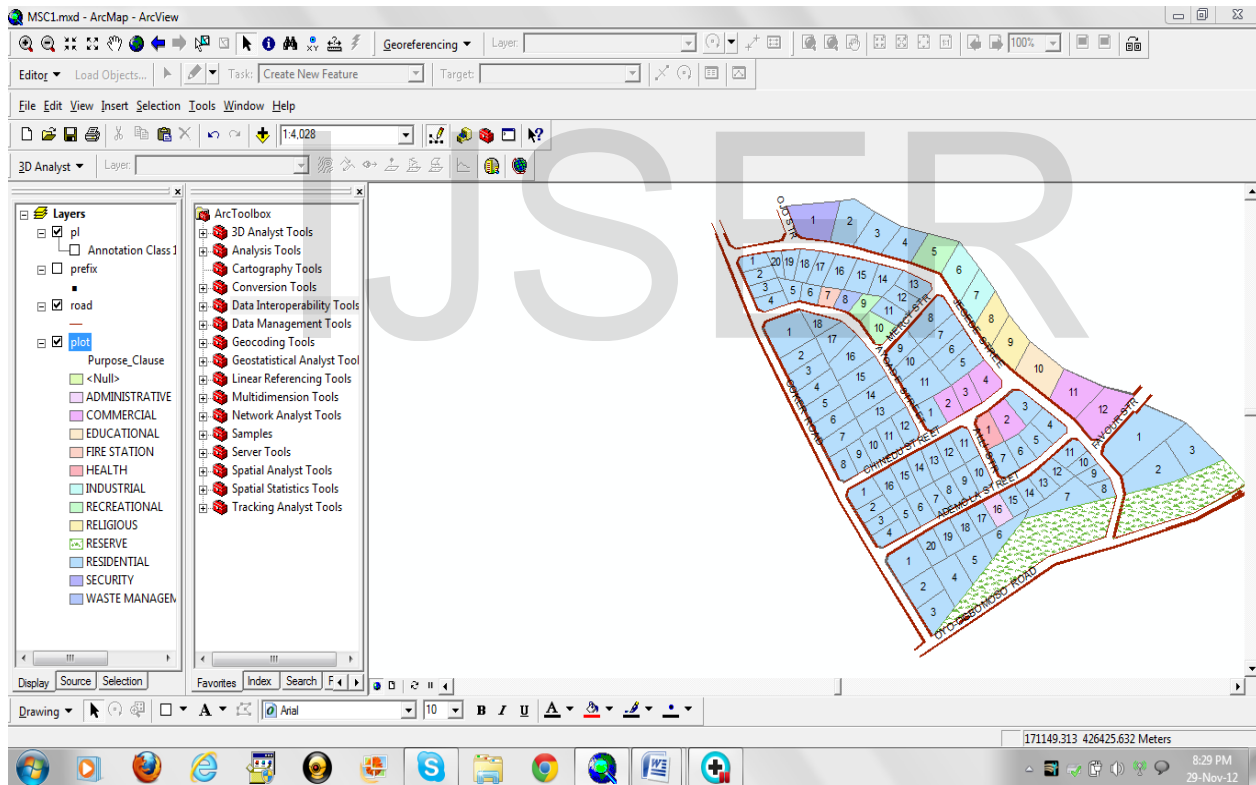


Fig 3: Land use map of the study area

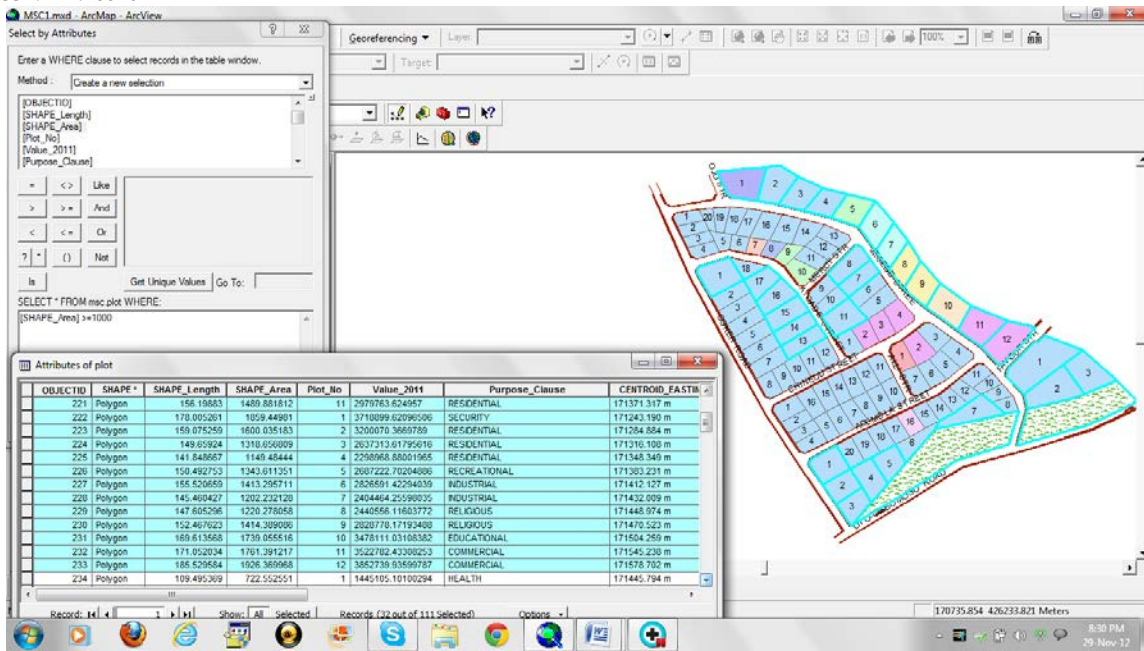


Fig. 4: Demonstration of single criteria query.

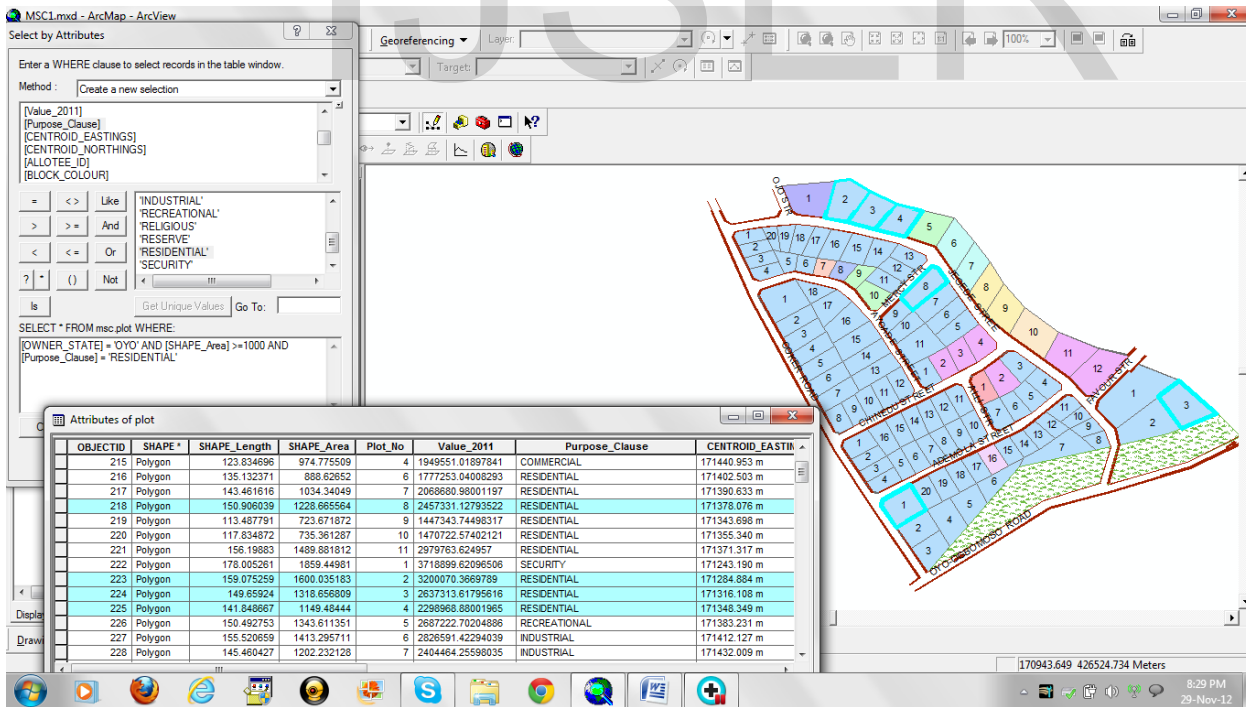


Fig.5: Demonstration of multi criteria query

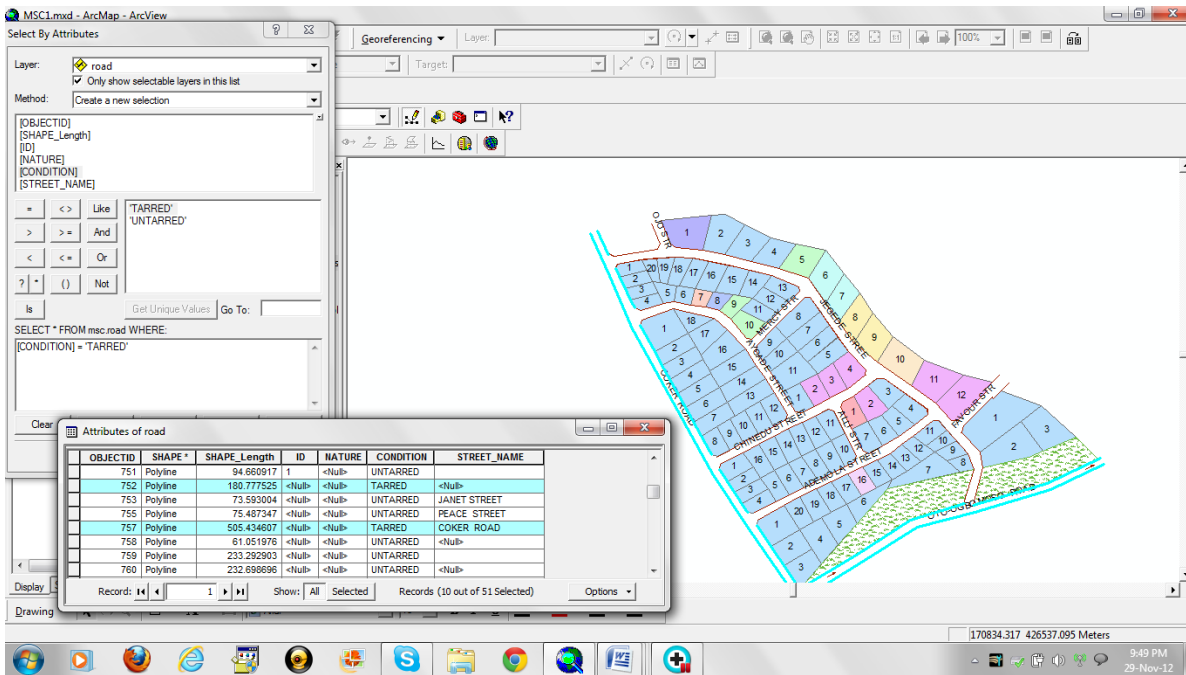


Fig.6: Demonstration of road condition.

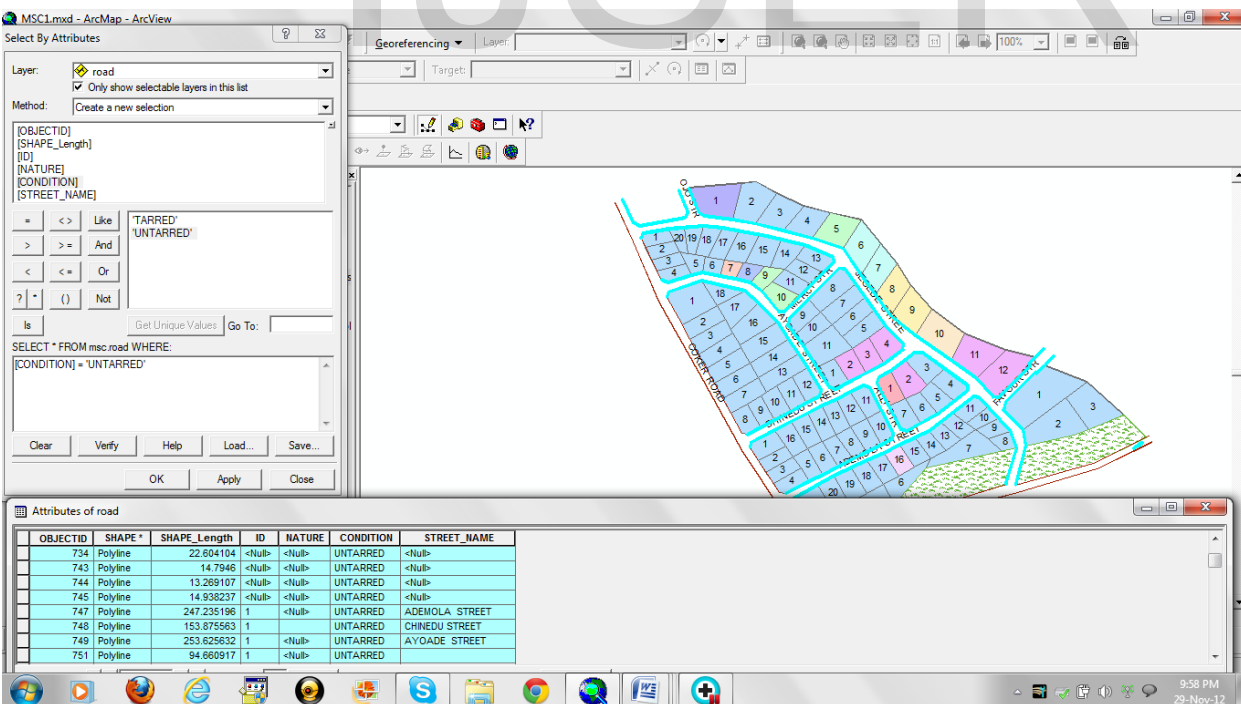


Fig. 7: Demonstration of road condition.

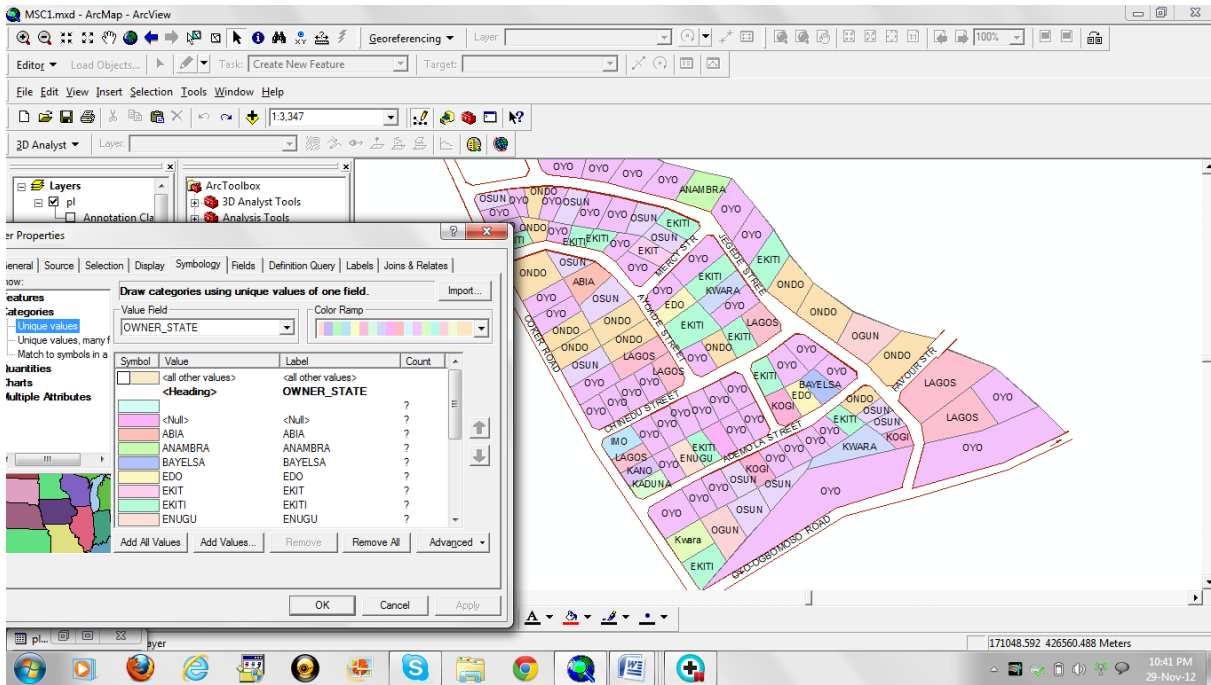


Fig 8.:Query by Symbology

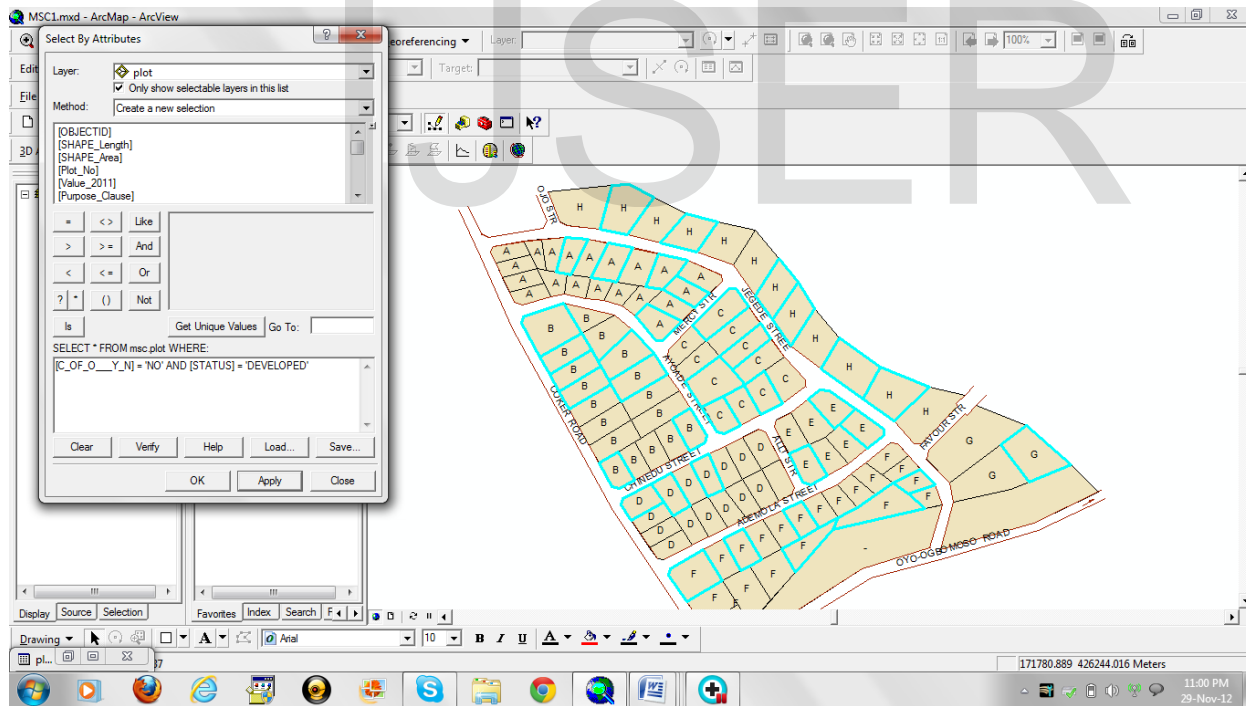


Fig. 9: Demonstration of multi criteria query

4. CONCLUSIONS

From the objectives and the methodology adopted in the course of the study and the results presented, one could easily know the importance of Multipurpose cadastre in urban development and with digital Layout Multipurpose cadastre Map of the area under study produced for appropriate analysis.

On completion of this study and based on experience gathered, it has been demonstrated and proved beyond reasonable doubt that development of multipurpose cadastre will aid concerned authorities in land use planning, land management and environmental management. Therefore, the following recommendations are made;

- Local Government or Urban Development Board should create public awareness on importance of Multipurpose cadastre in urban development by organizing, meetings, workshops and seminars . propounded
- Develop a GIS unit in each Local Government or Urban Development Board to be manned by a GIS expert.
- A current Multipurpose cadastre map of the study area should be made available to decision makers in order to enhance efficient socio-economic administration.
- Government, Estate developers and private businesses should start using Multipurpose cadastre map as a tool to plan and improve their services.
- Extensive training of existing staff on modern trend in spatial data acquisition and Management matter related to land.

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