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Protecting Our World, Conquering New Frontiers

TOWARDS THE DEVELOPMENT OF LAND INFORMATION MANAGEMENT FOR SUSTAINABLE DEVELOPMENT IN DELTA STATE, NIGERIA

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INTRODUCTION

- Land is a key resource without which humankind cannot survive and is an essential component for the creation of wealth.
- If we are to improve the quality of life of all living species, especially human beings, then we must find more efficient and effective ways of managing this valuable resource. As such, we need to radically improve the ways in which we collect, manage and use land information.
- Information on land ownership, value and use of land is crucial to offer tenure security to all, it regulates the land market, implement land reform, preserve the environment etc.
- Land information management becomes even more urgent in post conflict disaster area, in areas under pressure of large scale acquisition as the current situation in Delta State, Nigeria.
- This study looked at some issues of land management in Delta State with the Ministries that make use of land information in focus and attempt to proffer some suggestions on how accurate and up-to-date land information can be used for planning and management in the State as most of its land information is still in the analogue form

Statement of the Problem

– The responsible Ministries involved for land management and administration in the State work independently with little coordination among them. It implies that each of the land professionals follows a "go it alone" approach. for example, Surveyors are hardly in touch with what Valuers, Planners or Quantity Surveyors are doing, whereas, they often need the same kind of data or to exchange the information they generate.

– This results in a lot of duplicated effort and data redundancy, in addition to frustrating land owners and developers who have to consult different professionals for land.

–The whole process is manual, laborious and time intensive.

– Conventional methods of land survey, preparation of land records, maintenance of all related data for each parcel of land makes land administration and management incomplete and inefficient.

– Moreover, distortion of land records at various stages hinders land development control and property tax collection.

– It is against the above background that this study was conducted in other to have accurate and up-to-date land information that can be used for planning and management in the State. This will allow effective use of the information and facilitate the decision making process.

Aim and Objectives

Aim

To have accurate and up-to-date land information that can be used for planning and management.

Objectives

– To carry out needs analysis to evaluate the geospatial need for land information management of Delta State
– To create information base of the land cadastre to improve land files through the vectorisation of existing analogue plans, using the coordinates of all existing beacons.
– To convert analogue data to digital data in the Ministry of Land, Survey and Urban Development
– Design and creation of data base by capturing all the required spatial and attribute data that will enable easy retrieval of data receive reports and statistics.
– Querying of the created database to improve data access and enhance coordination.

Scope of the Project

Delta State has
– Twenty-five (25) Local Government Areas and twenty-four (24) Ministries and Directorates.
– Thirteen (13) of the twenty-five (25) local government areas and six (6) of the 24 Ministries and Directorates were used as pilot study. These are;
  –Ministry of Lands, Surveys and Urban Development
  – Ministry of Agriculture and Natural Resources
  – Ministry of Environment
  – Ministry of Transport
  – Ministry of Housing and
  – Ministry of Water Resources.

The project is limited to showing
– Parcel ownership
– Commercial facilities (shopping mall, petrol station etc)
– Parcels with existing road, buildings (such as residential, factories, churches, mosques),
– Parcel showing area liable to flood, farmlands, undeveloped plots and
– Parcels with land title (Certificate of Occupancy (C of O)

All these entities and attributes will form the base for database creation for the development of Land Information Management (LIM) in Delta State to be driven by the Ministry of Lands and Urban Development.

Study Area

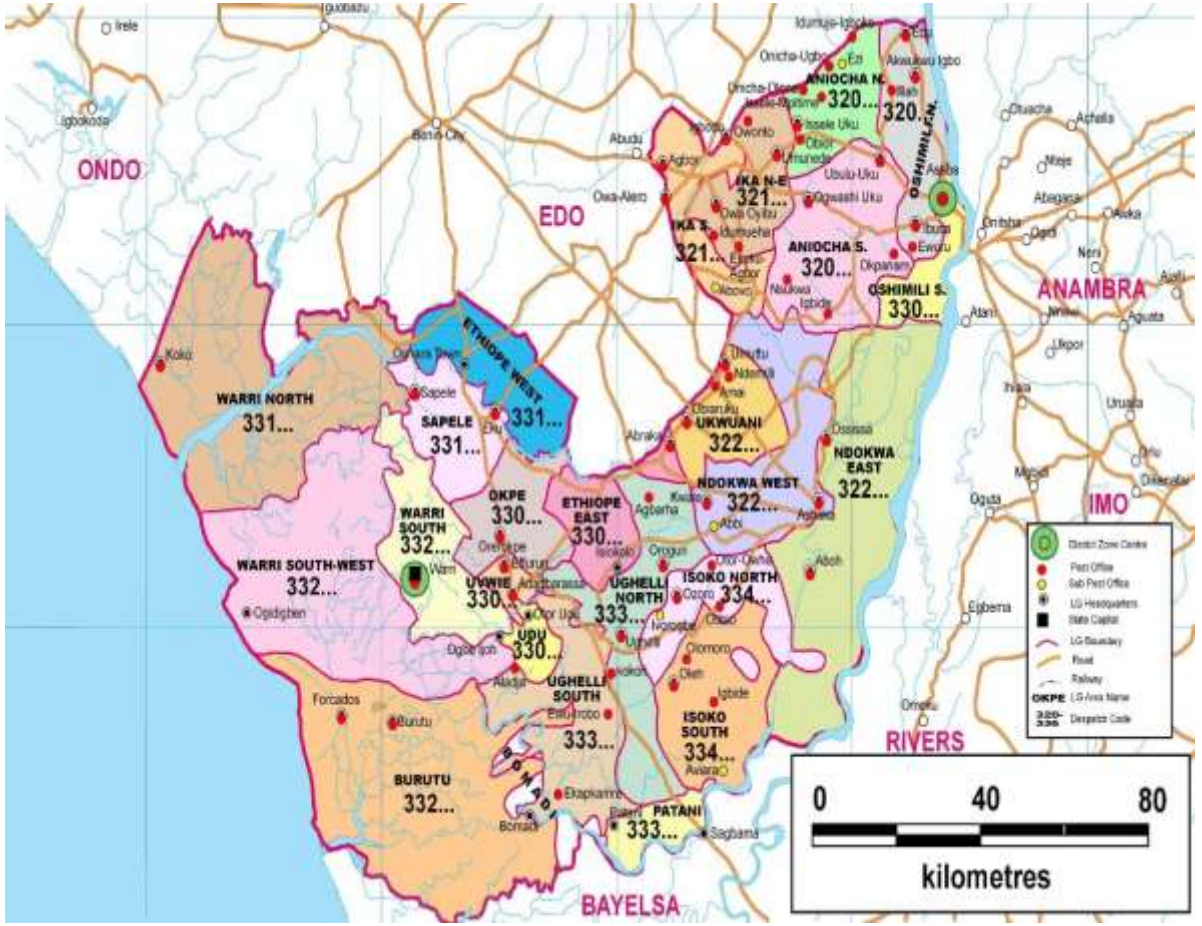
– Delta State is an oil and agricultural producing State of Nigeria, situated in the region known as the South-South geo-political zone with a population of 4,098,291.

– Its capital city is Asaba, located at the Northern end of the state, with an estimated area of 762 square kilometers, and a total land area of 16,842 square kilometers.

– It consists of 25 Local Government Areas, and shares common boundaries with Edo and Ondo States to the North West, Imo and Anambra to the North East, Rivers and Bayelsa States to the South East.

– In the South West and South it has approximately 122 kilometers of coastline bounded by the Bight of Benin on the Atlantic Ocean.

– The major ethnic groups are Urhobo, Igbo, Ezon, Isoko and Itsekiri.



METHODOLOGY

The study was carried out in two Phases.
– First, a Needs Analysis was conducted in the six Ministries that make use of land information, and
– Secondly, a geometric data was captured and creation of digital data base.

Needs Analysis

Prior to the development of the Needs Analysis, a meeting with stakeholders was held. Such as the Surveyor General of Delta State, the Director of Urban Planning Board, The Chairman, Land Use and Allocation Committee, The Directors of the Ministry of Agriculture, Environment, Transport and Housing.

The Needs analysis was intended to achieve the following primary objectives:
– Extract detailed information about various ministries existing work flows, data, procedures, and hardware/software platforms
– Determine how to most effectively implement the State's Land Information Management(LIM)
– Prepare a Comprehensive Needs Assessment report detailing the findings of the Needs Analysis

These objectives were achieved through the performance of the following sub-tasks:
– Develop, Distribute, and Analyze User Questionnaires.
– Conduct User Interviews

METHODOLOGY CONT.

Develop, Distribute, and Analyze User Questionnaires

Prior to development of the data base design, questionnaires for the purpose of soliciting pertinent information from each of the Ministry's selected for their Needs Assessment were distributed.

Conduct User Interviews

A series of personal interviews was conducted with the selected Ministry employees, over a three week period. A total of twenty four (24) Ministry employees, representing a variety of departments, were interviewed. There is no correlation between the number of employees who completed the questionnaires, and those whom were interviewed.
Several employees who completed the questionnaire were not interviewed, and vice versa.

Accordingly, the sample size of the study was 72 (seventy-two) comprising of 12 employees from each selected organizations (6). The Stratified Random Sampling technique was employed to determine the sample size, which were 60. The major reason for using this technique is to ensure adequate or proportional representation of the different categories or types of elements that make up the population in the selected sample.

METHODOLOGY CONT.

Data Capture

Two sets of primary data are required to accomplish this type of study. They include geometric and attribute data.

For this study, geometric data was obtained by ground survey method using Total Station equipment and reflectors with all accessories. This was earlier carried out and the information was used for the attribute data. While for the secondary information, the map of Delta State was acquired from the Office of the Surveyor General of Delta State. This was used as a base map for the execution of this study. The control coordinates of some points was also collected.

Creation of Digital Data Base

The creation of database is the heart of GIS for it is the process of imputing data into the computer. According to Nuhu (2009), GIS is one of the modern methods that could be used in the computerization of land records as well as enhancing the process of land registration in Nigeria. Having completed the stages of design phases both spatial and attribute data were used to create the database. The basic database sets were put in place and the created tables were then populated with necessary data.

DATA BASE QUERIES, RESULT AND ANALYSIS

For this study, the manipulation and queries were performed with Arc GIS 10.0 software, in order to achieve the objectives of this study. The queries are as shown below:

– Query 1: Parcel Ownership
– Query 2: Buildings (such as residential, factories, churches, mosques) Status (Under-Construction)
– Query 3: Parcels Liable to Flood
– Query 4: Parcels with Certificate of Occupancy
– Query 5: Parcels with Existing Roads
– Query 6: Undeveloped Plots.
– Query 7: Commercial Facilities e.g. shopping mall, petrol station etc.
– Query 8: Parcels with Farmland

Data Presentation

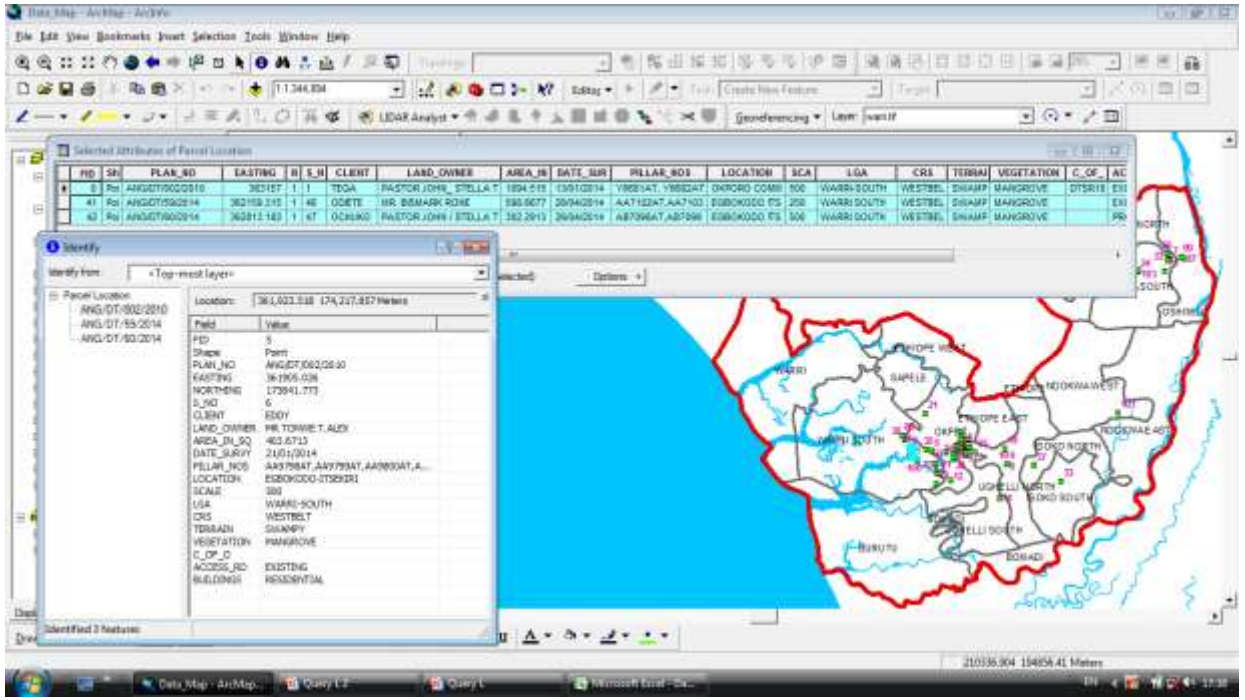


Figure 4.1 Query 1: Parcel Ownership Parcel

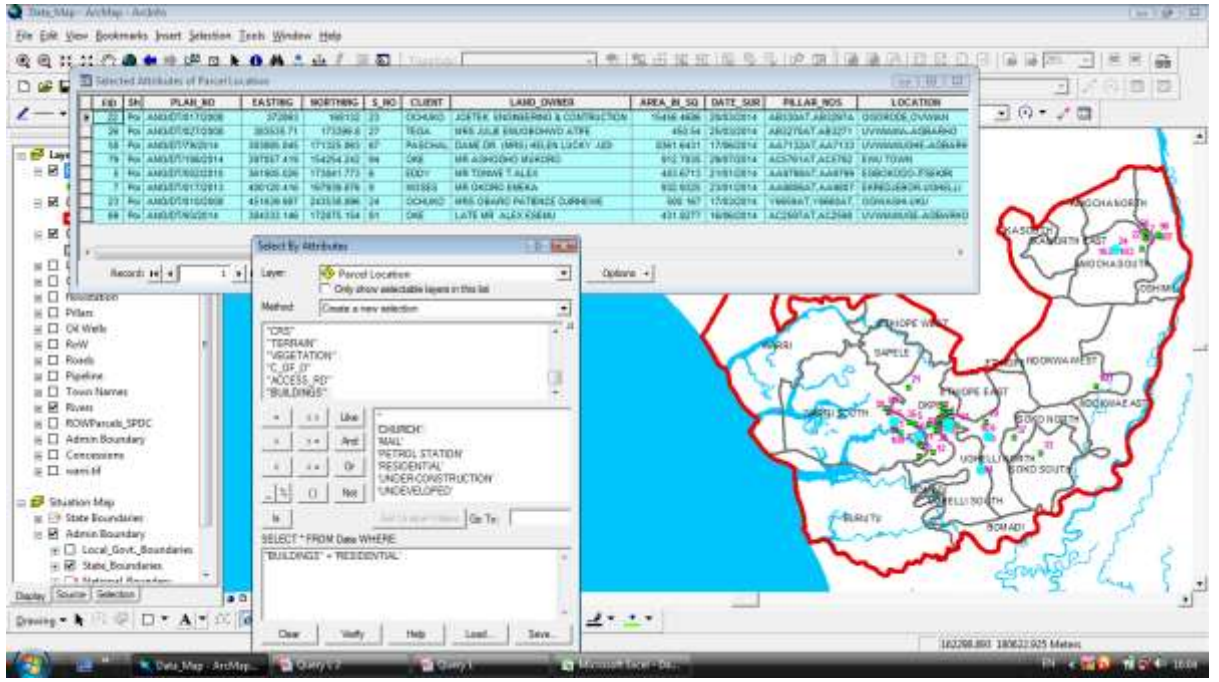


Figure 4.2: Query 2: Buildings (Parcels with Residential Buildings)

Data Presentation Cont.

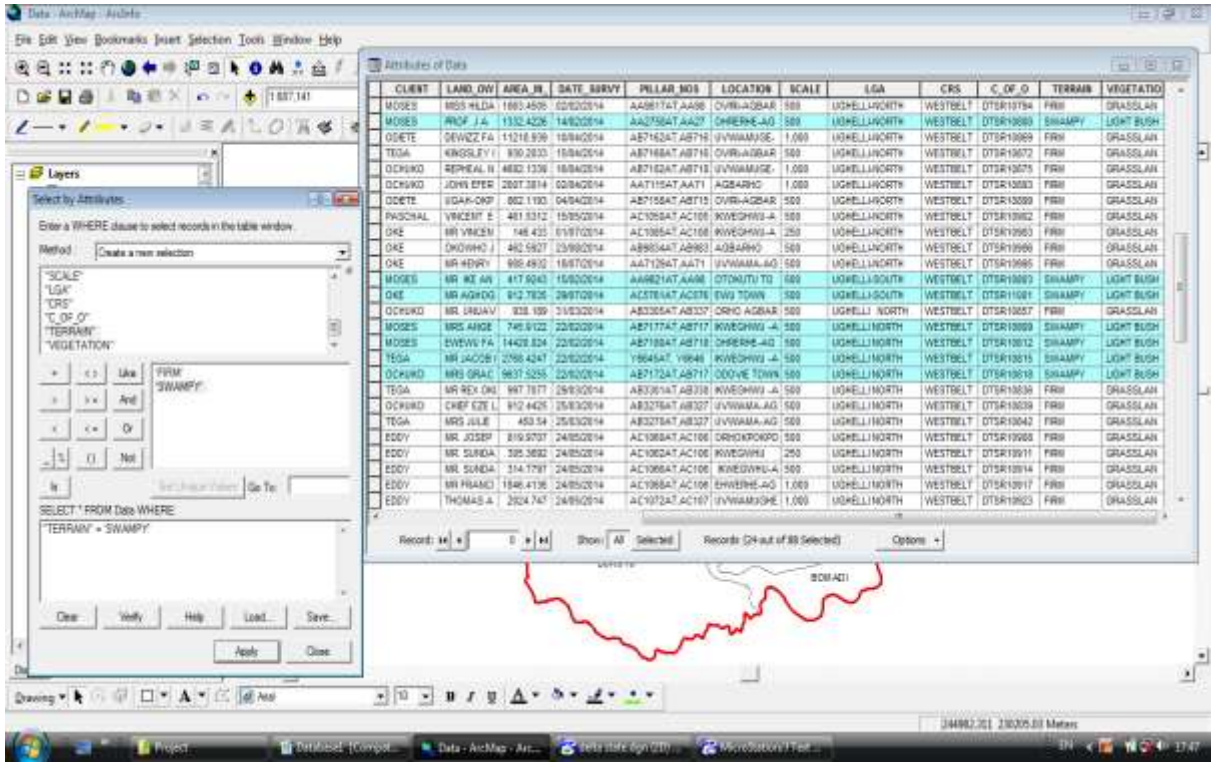


Figure 4.3: Query 3: Parcels Liable to Flood

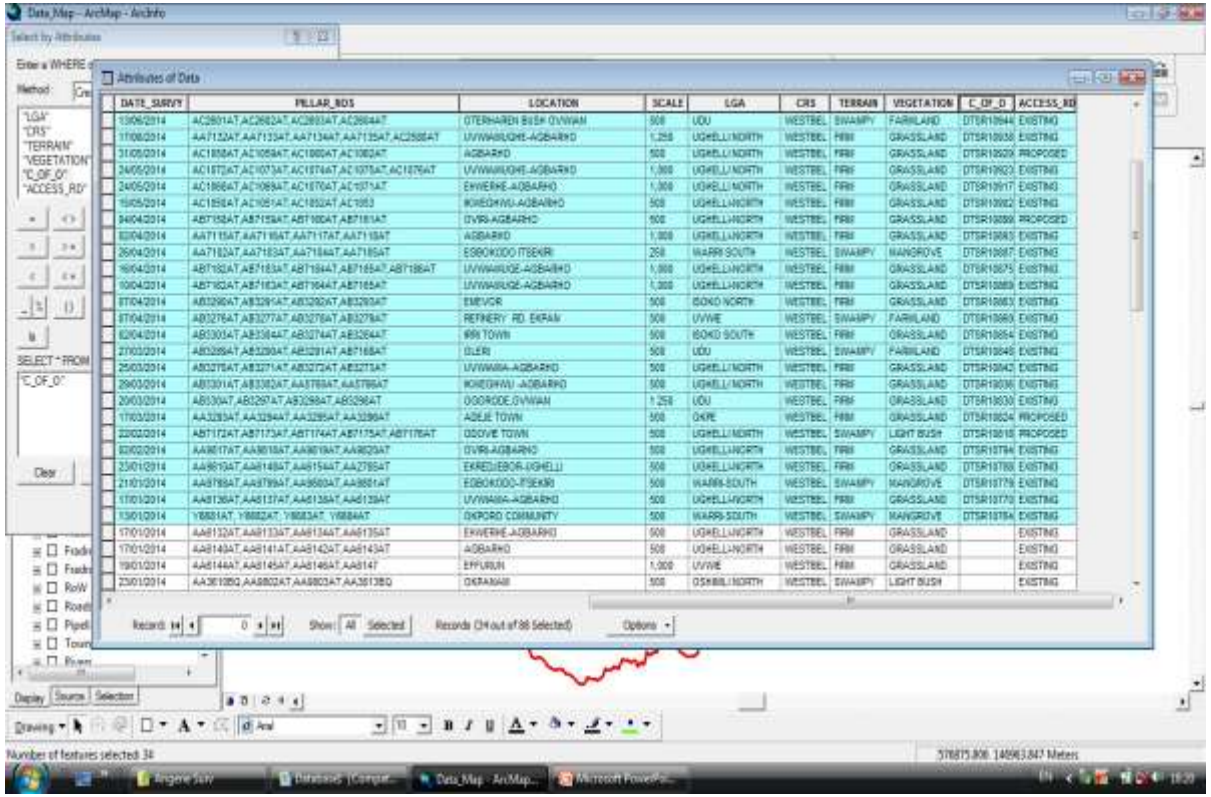


Figure 4.4: – Query 4: Parcels with Certificate of Occupancy

Data Presentation Cont.

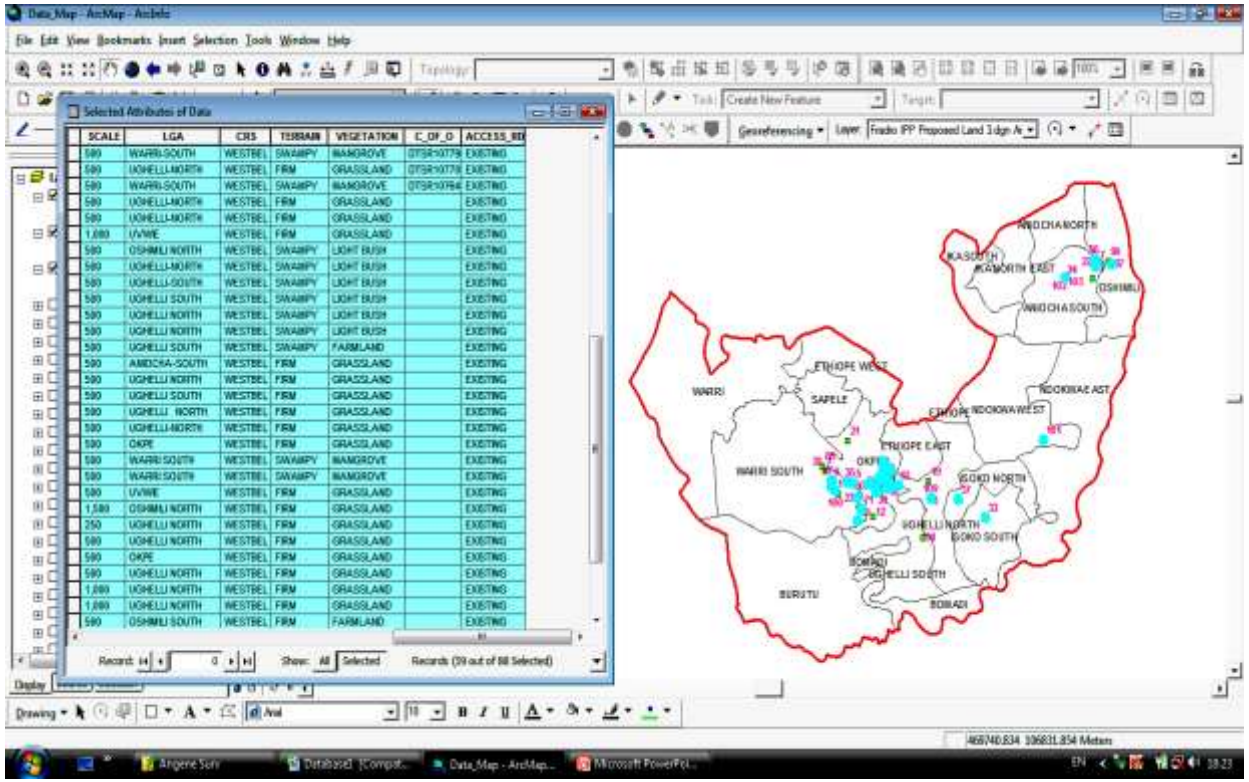


Figure 4.5: – Query 5: Parcels with Existing Roads

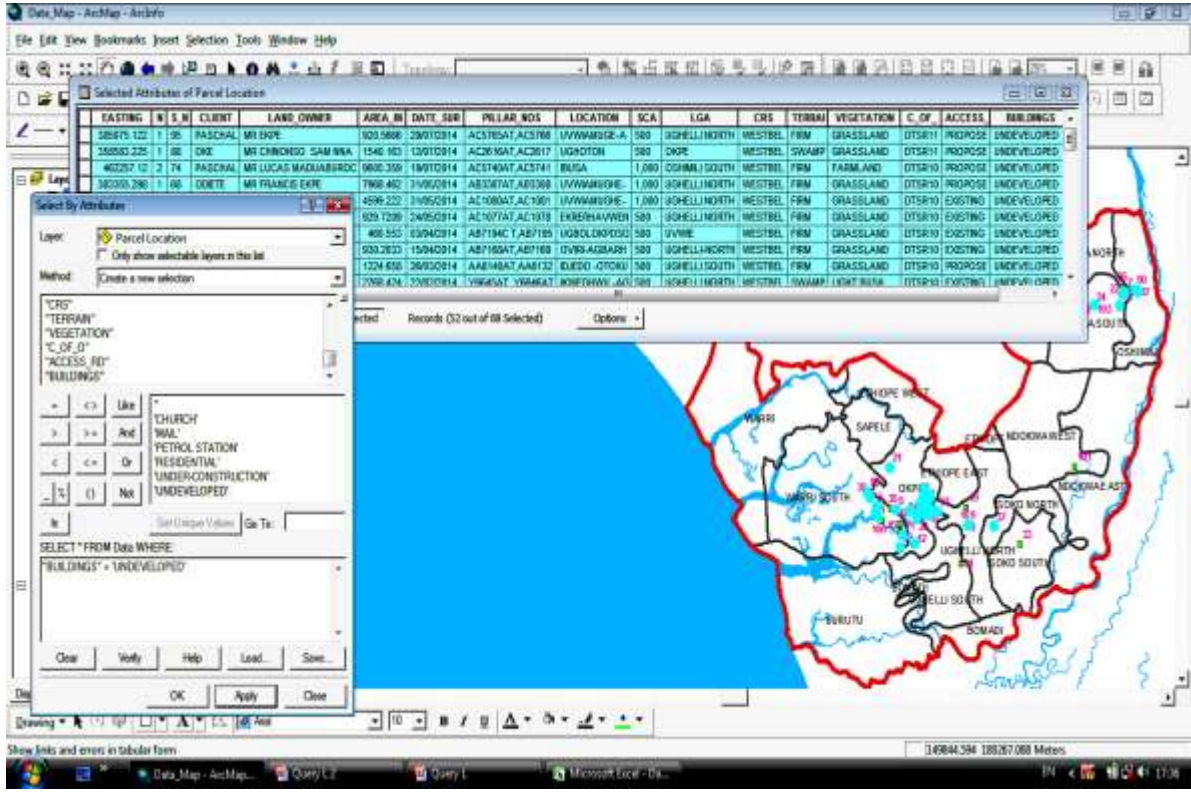


Figure 4.6: – Query 6: Undeveloped Plots

Data Presentation Cont.

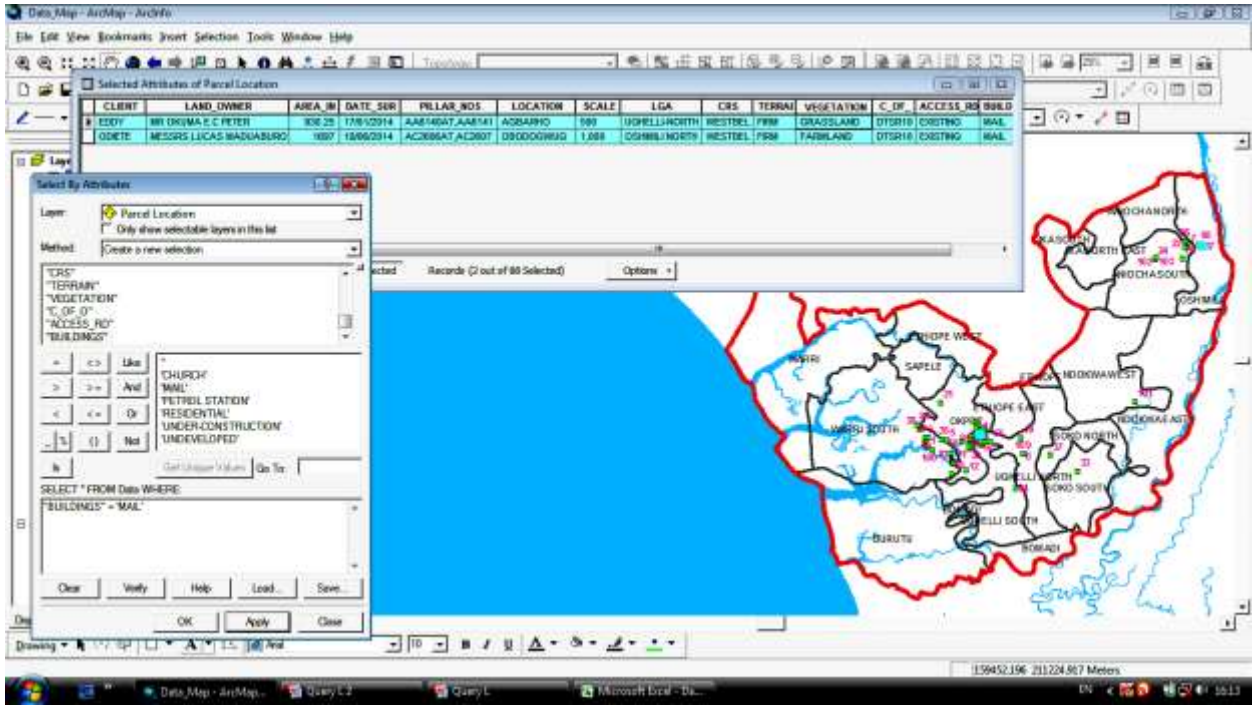


Figure 4.7: – Query 7: Commercial Facilities (shopping mall)

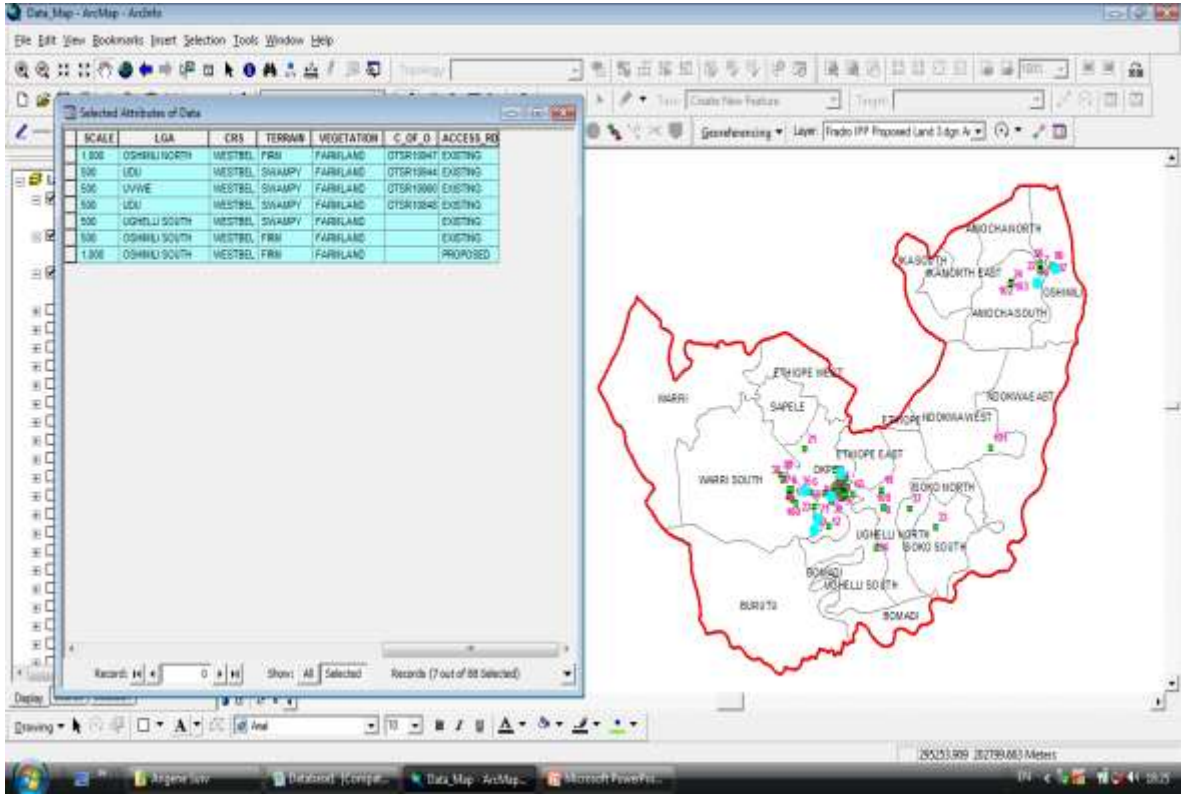


Figure 4.8 Query 8: Parcels with Farmland

Summary of Results

The total number of plans used for the study was eighty seven (87). In order to show how land information can be used as a tool for effective planning and sustainable development, some selected database queries and analysis were performed as shown below, and the results of the database queries and analysis helped in achieving the aim of the project.

– Parcel Ownership: With just a click, details of parcel owner could easily be seen. Fig. 4.1 shows the parcel owner as Mr. Tonwe T. Alex, showing other attributes.
– Identify parcels with buildings (Fig. 4.2) Residential buildings were eight (8) in number.
– Identify parcels liable to flood (Fig. 4.3). Ten (10) were identified within the study area.
– Identify all parcels with Certificate of Occupancy (C of O). They were Thirty four (34) (Fig. 4.4).
– All parcels with existing roads were queried and identified. They were thirty (30) in number (Fig. 4.5).
– Parcels not developed were identified to be fifty two (52) Fig. 4.6.
– Parcels used for commercial purposes were identified. Shopping mall was two (2), Fig.4.7.
– Parcels used as farmland were identified as seven (7) Fig. 4.8

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Major Research Findings

Having analyzed the various responses of the respondents, and testing the correctness of the hypotheses, the following were the findings of the study.

– Most of the Ministries that make use of land information use paper copies of existing data or maps in keeping land records.
– In the ministry of land, it is almost impossible for data on a computer in one office to be accessed on a computer in another office or even in the same office.
– The ministry of land seem not to have any problem with data interoperability when a department or agency receives data from another agency / ministry.
– The use of internet for land records management has not been popular in all the ministries used for the study.

But there exist one consistent significant reason in all. A systematic bias in favour of the development of land information management at the expense of more acquisition of analogue data.

CONCLUSION

A great deal of information was compiled during the Needs Assessment phase of this project. Though there were a number of underlying challenges for the introduction of Land Information Management (LIM) for land administration and management system in Delta State, decisions can be made with more confidence and conviction based on more and better information that will enhance the decision-making processes through reduction of uncertainty.

It was of importance that greater cooperation amongst the different land professionals with the long-term objective of creating a stronger integrated surveying profession should be established. A good start could be an integrated approach to the training of surveyors, so that the new surveying graduate will be sufficiently broad based as to be able to perform most of the functions of the present day surveying with modern technology, as most comprehensive system would be useless if its users would not have the technical knowhow on how to benefit from it. So there is need for training and re-training of professionals.

Finally, harnessing the power of Land Information Management (LIM) is not always easy. It can be complex and challenging. However, the ultimate benefits associated with the introduction of Land Information Management (LIM) in terms of the effective and efficient utilisation of human and physical resources means that they are well worth striving for.