Development of Multipurpose Cadastre of Udoka Housing Estate, Awka, Anambra State, Nigeria for Efficient Land Administration

by

Umenweke, D.O; Igbokwe, J.I; Ejikeme, J.O and Igbokwe, E.C

Department of Surveying and Geoinformatics, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Abstract- Multipurpose cadastre has capability to store, manipulate, analyse and retrieve parcel based land related information. In this study, a multipurpose cadastre was developed and implemented for Udoka Housing Estate, Awka in Anambra State of Nigeria. The spatial and geometric data were acquired by land surveying techniques using a second order Wild T2 theodolite and standardised steel tape, while the attribute data were obtained by groundtruthing. The layout plan was produced with AUTOCAD 2007 software using the adjusted coordinates of the beacons. This hardcopy layout plan was converted to digital layout plan through scanning, georeferencing and digitising. Arc GIS 9.2 software was used to perform GIS operations of storing, processing, manipulating, analysing and displaying of desired information. Multipurpose cadastral information layers were created for roads, parcels, beacons, residential buildings and perimeter lines. Queries were created to demonstrate the effectiveness of the developed multipurpose cadastre. These queries among others are query for roads that are not bad, query for developed and undeveloped parcels, query for parcels with duplexes ad bungalows, query for parcels that are used for residential and non-residential purposes, query for parcels whose owners are from Anambra State and query for parcels whose owners are females. The result shows that 83.78% of the total plots were developed while 16.22% were undeveloped. Out of the 83.78% developed plots, 62.37% were duplexes while 37.63% were bungalow. Also, only 2 plots or 1.8% were reserved for non-residential purposes. The results of the various queries and analyses shows that a multipurpose cadastre is a veritable tool for decision making in land related matters and should be adopted for successful implementation of the Land Reform Programme of the Federal Government of Nigeria.

Keywords: Cadastre, GIS, Land, Multipurpose

1. INTRODUCTION

Land is a basic resource for wealth creation, and on it activities of man take place. Efficient information on land is a good foundation for wealth creation and national development. Because of the vital role it plays in human affairs vis-à-vis the source of most wealth, land should be properly managed. To effectively manage land and its resources, comprehensive information about land should be recorded in an organised and robust manner to enable quick and flexible access to land related information. Land information is a prime requisite for making decisions related to land investments, development and management [1]. Multipurpose cadastre enables good land management by providing reliable and usable land information [2]. Multipurpose Cadastre is therefore a veritable tool for effective decision making in land related matters [3][4]. A functional land based Multipurpose Cadastre

provides timely, accurate and up-to-date information about parcels of land which can prevent mismanagement and wrong decision in land matters [5].

As a result of population increase, urbanisation and industrialisation in Awka Capital Territory (10 kilometre radius from Amawbia Junction through Old Onitsha/Enugu Road), there is enormous pressure on, and demand for land resources in Awka and environs. The Ministry of Lands, Survey and Town Planning, Awka charged with the responsibilities of land allocation and management in Anambra State has not fully computerised land related data, plans and records.

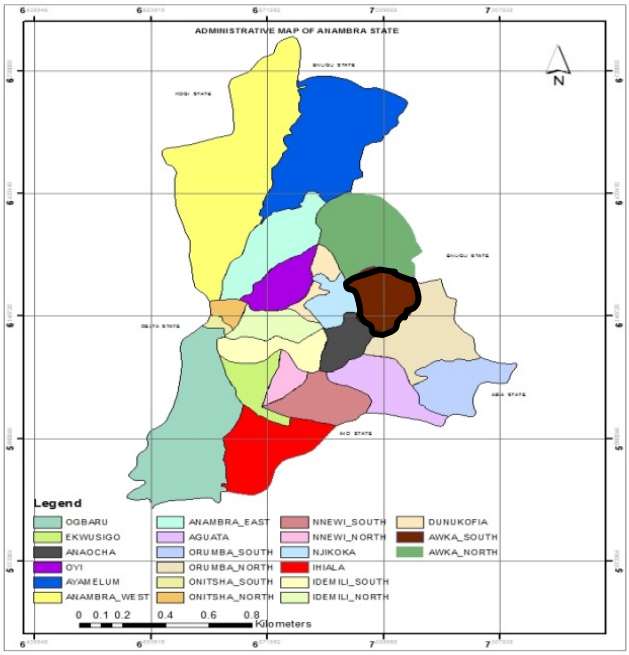
Administration and management of land and its resources by the ministry are by the use of analogue files, records and plans. Data storage, processing, manipulation, analyses, update and retrieval are very difficult tasks for the ministry. This situation has resulted into data losses and wearing out of analogue files, records and plans. The ministry is presently faced with unattended applications, multiple and fake allocations, forgeries of land documents, encroachments, court cases, and poor internally generated revenue (IGR).

Furthermore, some of the spatial data held by the Ministry do not have common reference coordinate system. Many are still referenced to local origins such as CS 316 for Awka, U21 for Onitsha, NCSIP for Nnewi, EKCSIT for Ekwulobia, UMCSIT for Umunze, etc. These problems hamper good decision making in land related matters in the State. The development and implementation of a Multipurpose Cadastre (MPC) using Udoka Housing Estate, Awka, Anambra State, as a prototype case study could be used to demonstrate how its adoption would facilitate land administration and management in Anambra State, Nigeria.

II. MATERIAL AND METHODS USED

A. *Study Area*

Udoka Housing Estate, Awka is located along Onitsha/Enugu Express Road (opposite NNPC Mega Station) Awka, Awka South Local Government Area, Anambra State, Nigeria. The site lies approximately within latitudes 6^0 12′ 19″ N and 6^0 12′ 39″ N, and longitudes 7^0 03′ 26″ E and 7^0 03′ 51″ E. It is a medium density estate or layout planned, developed and managed by Anambra State Housing Development Corporation, Awka. The case study site has an area of about 15.188 Hectares and 111 parcels. Its location along Onitsha/Enugu Express Road on Ikwodiaku Hills in Awka makes the site conspicuous and fascinating.



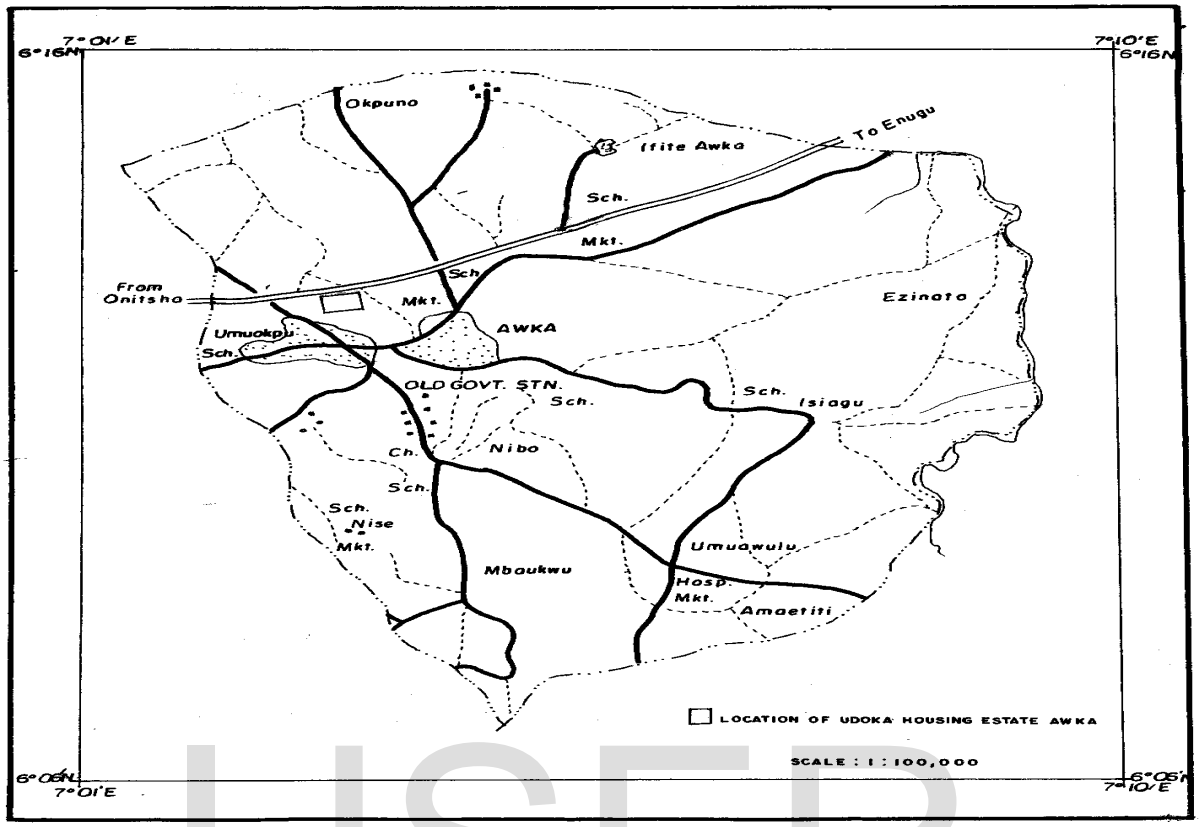


Fig.1 MAP OF AWKA SOUTH LOCAL GOVT. AREA SHOWING THE LOCATION OF UDOKA HOUSING ESTATE AWKA

B. Data Used

The data used for development of the Multipurpose Cadastre (MPC) were classified into two Primary data and Secondary data. Primary data are both spatial and attribute (non-spatial) data which were obtained through ground survey methods, enquiries and observations.

The spatial data were survey data (X, Y co-ordinates) which described the spatial locations/positions of the parcels and other entities in the real world obtained through traditional surveying technique. The non-spatial (attribute) data include ownership details, allottee details, land use, building types, as well as descriptive information about entities of interest in the study area.

The secondary data include the following:

i. Administrative map of Anambra State containing Awka South Local Government Area where the project site is located.
ii. Udoka Housing Estate Awka, Layout Plan
iii. Horizontal Coordinates (X, Y) of survey controls to be used for linking the layout survey to the national geodetic control network.

C. Data Processing and Analysis

The layout plan of the study area was scanned and imported into ArcGIS software where it was georeferenced and digitized. The spatial and attribute data were used to create the database. Attribute tables were created for the beacon numbers, roads, perimeter line, parcels etc. Information contained in the attribute tables include length, name, conditions of roads, parcel ids, owners, state of origin, parcels, beacon numbers and coordinates, etc. Figure 2 shows the Entity-Relationship diagram of the database created.

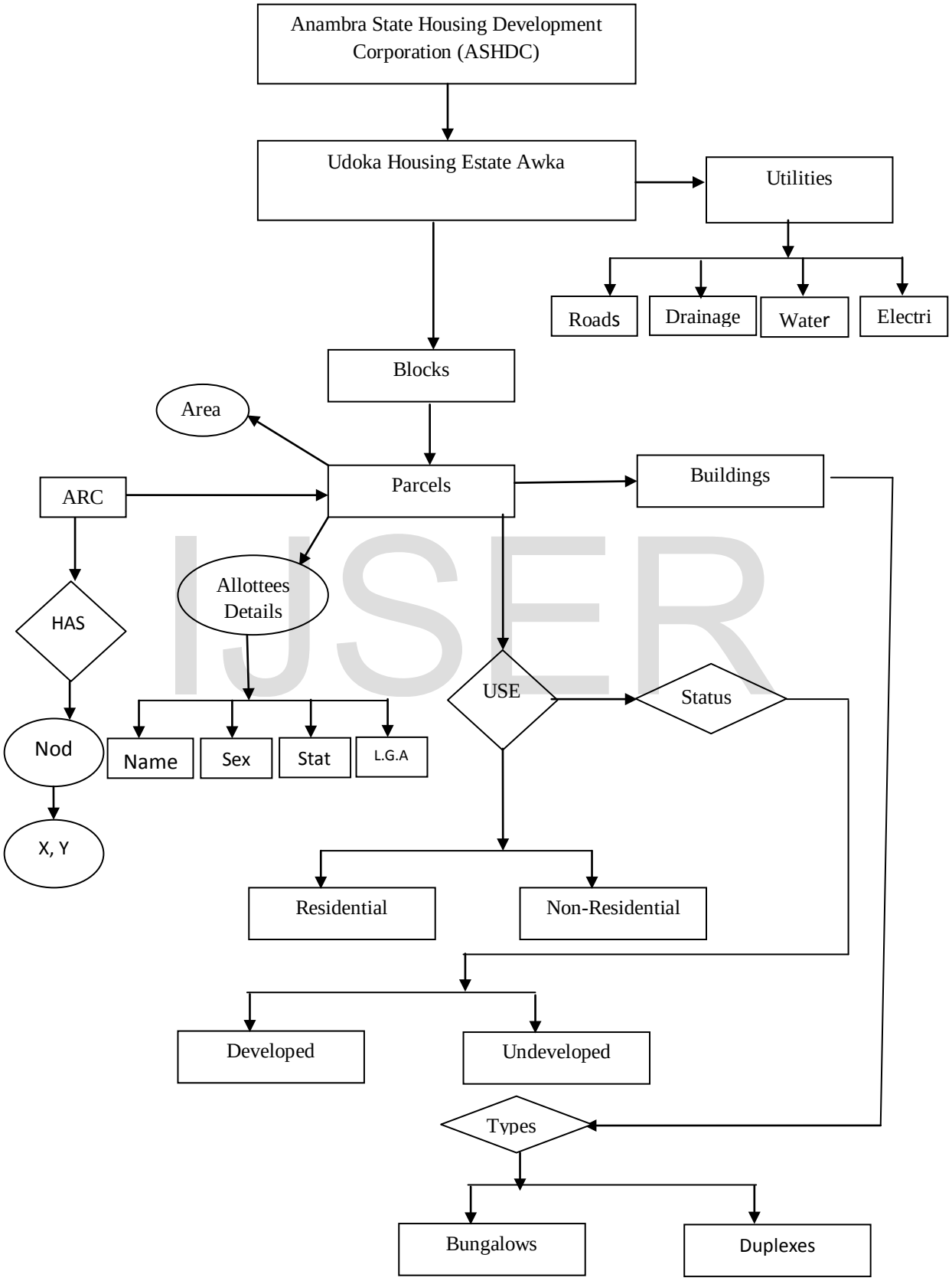

Anambra State Housing Development Corporation (ASHDC)
Udoka Housing Estate Awka
Utilities
Roads
Drainage
Water
Electri
Blocks
Area
Parcels
Buildings
ARC
HAS
Allottees Details
Nod
X, Y
Name
Sex
Stat
L.G.A
USE
Status
Residential
Non-Residential
Developed
Undeveloped
Types
Bungalows
Duplexes

Fig. 2: Entity-Relationship diagram

III. RESULTS AND DISCUSSION

Results of the database queries were presented in digital maps and attribute tables. The result of sample queries performed on the databases and their results are discussed below.

Query 1: How many parcel of land are developed and undeveloped?

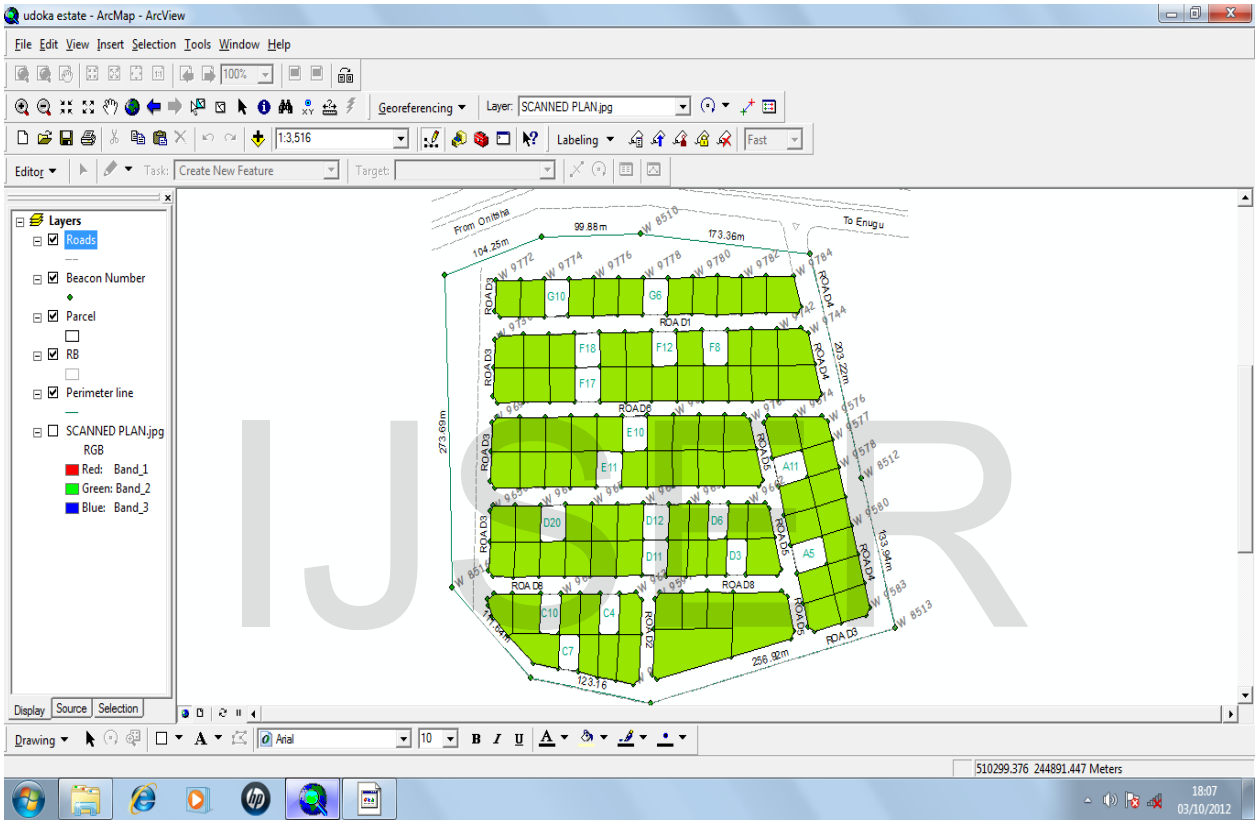


Fig 3.1: Query result showing the plots that were developed and undeveloped.

The green-colored plots were the developed plots while the undeveloped were left plain. The query result gives pictorial view of the number of developed and undeveloped parcels in the layout. The result can also aid decision making on provision of facilities, re-allocation of undeveloped parcels and enhanced revenue collection through property tax. As more parcels are developed, more occupants are attracted, and thereby increasing the population of residents of the estate. The query result can equally aid decision making on how to cater for the facility needs of the residents of the estate. Also table 1 shows the attribute table of the result of the query.

Table 1: Result of Query 1

Attributes of Parcel

FID	Shape *	Id	PARCEL_ID	OWNER_ID	SEX	STATE	LGA	B_TYPE	USE	C_OF_O	AREA	STATUS
0	Polygon	0	A1	MARK OKEKE	M	ANAMBRA	ANAOCHA	DUPLEX	RESIDENTIAL	Y	977.978	DEVELOPED
1	Polygon	0	A2	JUDE OKECHUKWU	M	ANAMBRA	EKWUSIGO	DUPLEX	RESIDENTIAL	Y	825.424	DEVELOPED
2	Polygon	0	A3	ANGELA UMEH	F	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	825.747	DEVELOPED
3	Polygon	0	A4	CLETUS ANIGBO	M	ANAMBRA	AWKA SOUTH	DUPLEX	RESIDENTIAL	Y	825.181	DEVELOPED
4	Polygon	0	A5	NNAMDI OFOMA	M	ANAMBRA	ORUMBA NORTH		RESIDENTIAL	Y	821.616	UNDEVELOPED
5	Polygon	0	A6	GRACE OJIMBA	F	ANAMBRA	AGUATA	DUPLEX	RESIDENTIAL	Y	820.469	DEVELOPED
6	Polygon	0	A7	DANIEL EZEOKE	M	ANAMBRA	NNEWI SOUTH	DUPLEX	RESIDENTIAL	N	817.486	DEVELOPED
7	Polygon	0	A8	AUGUSTINE ODIKPO	M	ANAMBRA	OYI	DUPLEX	RESIDENTIAL	Y	815.766	DEVELOPED
8	Polygon	0	A9	MARY AJALGBU	F	ANAMBRA	IDEMILI SOUTH	BUNGALOW	RESIDENTIAL	Y	813.372	DEVELOPED
9	Polygon	0	A10	GABRIEL IGBOKWE	M	ANAMBRA	IHIALA	DUPLEX	RESIDENTIAL	N	811.023	DEVELOPED
10	Polygon	0	A11	HANNAH OBILI	F	ANAMBRA	ORUMBA SOUTH		RESIDENTIAL	N	809.216	UNDEVELOPED
11	Polygon	0	A12	JAMES AGBAKOBA	M	ANAMBRA	ONITSHA NORTH	DUPLEX	RESIDENTIAL	Y	806.311	DEVELOPED
12	Polygon	0	A13	CLETUS ASEGBU	M	ANAMBRA	NJIKOKA	DUPLEX	RESIDENTIAL	Y	1015.639	DEVELOPED
13	Polygon	0	A14	EMMANUEL MUOKA	M	ANAMBRA	OGBARU	DUPLEX	RESIDENTIAL	Y	765.374	DEVELOPED
14	Polygon	0	B1	UDOKA HOUSING ESTATE PRI SCH				BUNGALOW	NIL	N	2796.206	DEVELOPED
15	Polygon	0	B2	UDOKA HOUSING ESTATE PLAYGROUND				BUNGALOW	NIL	N	2730.984	DEVELOPED
16	Polygon	0	B3	GREGORY UBAKA	M	ANAMBRA	ANAMBRA EAST	BUNGALOW	RESIDENTIAL	Y	802.317	DEVELOPED
17	Polygon	0	B4	SUNDAY EZEJI	M	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	779.270	DEVELOPED
18	Polygon	0	B5	MOSES OGUERI	M	IMO	IDEATO NORTH	BUNGALOW	RESIDENTIAL	Y	774.256	DEVELOPED
19	Polygon	0	C1	JOHN IDOKO	M	DELTA	OSHIMILI NORTH	DUPLEX	RESIDENTIAL	Y	933.284	DEVELOPED
20	Polygon	0	C2	CHIKA UMERAH	M	ANAMBRA	AWKA SOUTH	BUNGALOW	RESIDENTIAL	Y	755.987	DEVELOPED
21	Polygon	0	C3	ISAIAH OKAFOR	M	ANAMBRA	AWKA NORTH	BUNGALOW	RESIDENTIAL	N	766.084	DEVELOPED
22	Polygon	0	C4	JOSEPHINE EZE	F	ANAMBRA	NNEWI NORTH		RESIDENTIAL	N	695.234	UNDEVELOPED
23	Polygon	0	C5	THOMPSON UMEH	M	ANAMBRA	NNEWI SOUTH	DUPLEX	RESIDENTIAL	Y	691.077	DEVELOPED
24	Polygon	0	C6	ADAOBI MBONU	F	ANAMBRA	IDEMILI NORTH	DUPLEX	RESIDENTIAL	Y	692.967	DEVELOPED
25	Polygon	0	C7	ANDREW ONYEKA	M	ANAMBRA	ANAOCHA		RESIDENTIAL	N	625.792	UNDEVELOPED
26	Polygon	0	C8	JULIANA OKONKWO	F	ANAMBRA	AGUATA	DUPLEX	RESIDENTIAL	Y	689.351	DEVELOPED
27	Polygon	0	C9	GABRIEL ONUORAH	M	ANAMBRA	NNEWI NORTH	DUPLEX	RESIDENTIAL	Y	1046.182	DEVELOPED
28	Polygon	0	C10	NNAMA MBAKA	M	ANAMBRA	AYAMELU		RESIDENTIAL	N	687.438	UNDEVELOPED
29	Polygon	0	C11	AMAKA AMECHI	F	ANAMBRA	OYI	BUNGALOW	RESIDENTIAL	Y	962.500	DEVELOPED
30	Polygon	0	C12	JOSEPH UNOKA	M	ANAMBRA	IHIALA	DUPLEX	RESIDENTIAL	Y	617.308	DEVELOPED
31	Polygon	0	D1	AZUBIKE EZEH	M	ANAMBRA	ANAOCHA	DUPLEX	RESIDENTIAL	Y	1022.283	DEVELOPED
32	Polygon	0	D2	GEOFFREY OGUJI	M	ANAMBRA	EKWUSIGO	BUNGALOW	RESIDENTIAL	Y	737.405	DEVELOPED
33	Polygon	0	D3	AGATHA CHIMELU	F	ANAMBRA	IDEMILI NORTH		RESIDENTIAL	N	629.301	UNDEVELOPED
34	Polygon	0	D4	KENNETH MBACHU	M	ENUGU	OJI RIVER	BUNGALOW	RESIDENTIAL	Y	815.754	DEVELOPED
35	Polygon	0	D5	NKECHI EZEONU	F	ANAMBRA	IHIALA	BUNGALOW	RESIDENTIAL	Y	626.907	DEVELOPED
36	Polygon	0	D6	AMANDI EZEILO	M	ANAMBRA	ORUMBA NORTH		RESIDENTIAL	N	616.120	UNDEVELOPED
37	Polygon	0	D7	OLIVER NNAJI	M	ENUGU	UDI	DUPLEX	RESIDENTIAL	N	620.503	DEVELOPED
38	Polygon	0	D8	PASCAL ONYEKWERE	M	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	820.321	DEVELOPED
39	Polygon	0	D9	ODIOMA AMAEKWE	F	ANAMBRA	NJIKOKA	BUNGALOW	RESIDENTIAL	Y	618.491	DEVELOPED
40	Polygon	0	D10	PIUS UWADI	M	IMO	ISU	DUPLEX	RESIDENTIAL	Y	620.968	DEVELOPED

Record: 1 Show: All Selected Records (93 out of 112 Selected) Options

Query 2: What are the parcels of land with duplex.

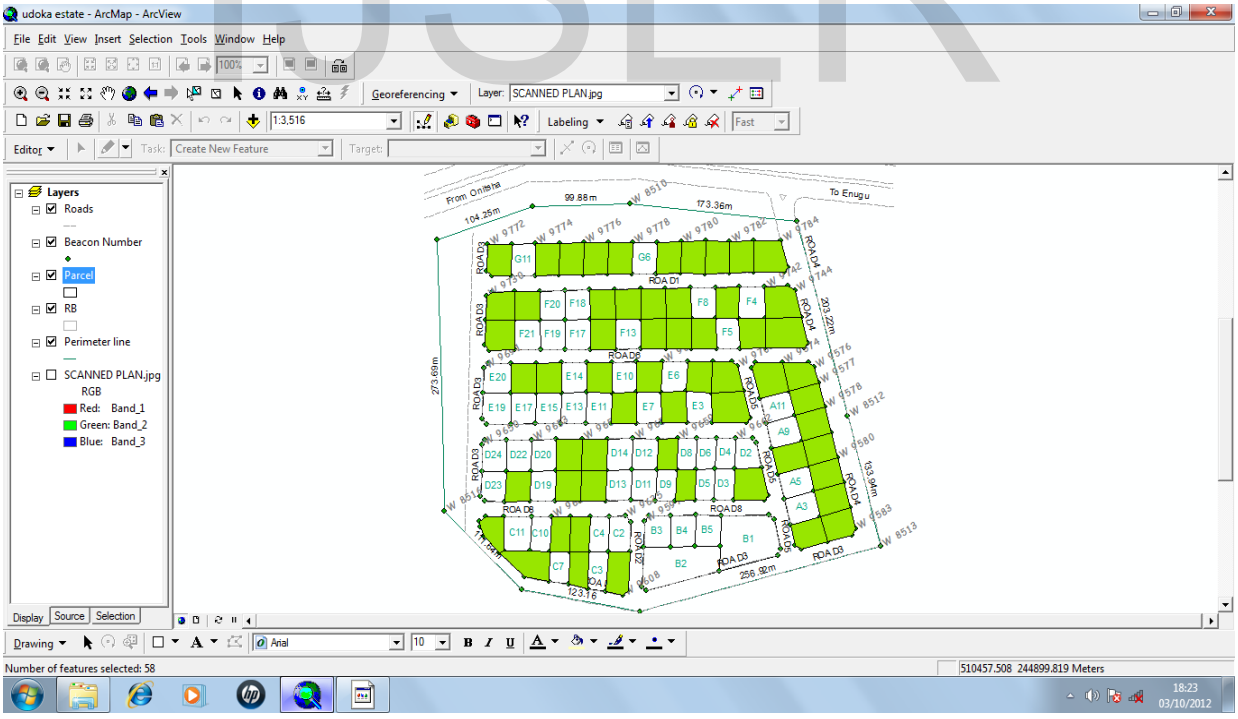


Fig 3.2: Query result showing parcel with duplex

The Udoka Housing Estate scheme permits only erection of duplexes and bungalows. The green-colored plots in Fig. 3.2 were the plots with duplex while the plain ones are those with bungalow. The query result could aid in development control in the layout. The result of the query could also aid in getting accurate revenue statistics in the layout as there is obvious disparity in the property taxes paid by duplex owners and bungalow owners. Table 2 shows the attribute table of the result of the query.

Table 2: Result of Query 2

Attributes of Parcel

FID	Shape *	Id	PARCEL_ID	OWNER_ID	SEX	STATE	LGA	B_TYPE	USE	C_OF_O	AREA	STATUS
0	Polygon	0	A1	MARK OKEKE	M	ANAMBRA	ANAOCHA	DUPLEX	RESIDENTIAL	Y	877.978	DEVELOPED
1	Polygon	0	A2	JUDE OKECHUKWU	M	ANAMBRA	EKWUSIGO	DUPLEX	RESIDENTIAL	Y	825.424	DEVELOPED
2	Polygon	0	A3	ANGELA UMEH	F	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	825.747	DEVELOPED
3	Polygon	0	A4	CLETUS ANIGBO	M	ANAMBRA	AWKA SOUTH	DUPLEX	RESIDENTIAL	Y	825.181	DEVELOPED
4	Polygon	0	A5	NNAMDI OFOMA	M	ANAMBRA	ORUMBA NORTH		RESIDENTIAL	Y	821.616	UNDEVELOPED
5	Polygon	0	A6	GRACE OJIMBA	F	ANAMBRA	AGUATA	DUPLEX	RESIDENTIAL	Y	820.469	DEVELOPED
6	Polygon	0	A7	DANIEL EZEOKE	M	ANAMBRA	NNEWI SOUTH	DUPLEX	RESIDENTIAL	N	817.486	DEVELOPED
7	Polygon	0	A8	AUGUSTINE ODIKPO	M	ANAMBRA	OYI	DUPLEX	RESIDENTIAL	Y	815.766	DEVELOPED
8	Polygon	0	A9	MARY AJAEGBU	F	ANAMBRA	IDEMILI SOUTH	BUNGALOW	RESIDENTIAL	Y	813.372	DEVELOPED
9	Polygon	0	A10	GABRIEL IGBOKWE	M	ANAMBRA	IHIALA	DUPLEX	RESIDENTIAL	N	811.023	DEVELOPED
10	Polygon	0	A11	HANNAH OBIELI	F	ANAMBRA	ORUMBA SOUTH		RESIDENTIAL	N	809.216	UNDEVELOPED
11	Polygon	0	A12	JAMES AGBAKOBA	M	ANAMBRA	ONITSHA NORTH	DUPLEX	RESIDENTIAL	Y	806.311	DEVELOPED
12	Polygon	0	A13	CLETUS ASIEGBU	M	ANAMBRA	NJIKOKA	DUPLEX	RESIDENTIAL	Y	1015.639	DEVELOPED
13	Polygon	0	A14	EMMANUEL MUOKA	M	ANAMBRA	OGBARU	DUPLEX	RESIDENTIAL	Y	765.374	DEVELOPED
14	Polygon	0	B1	UDOKA HOUSING ESTATE PRI SCH				BUNGALOW	NIL	N	2796.286	DEVELOPED
15	Polygon	0	B2	UDOKA HOUSING ESTATE PLAYGROUND				BUNGALOW	NIL	N	2730.964	DEVELOPED
16	Polygon	0	B3	GREGORY UBAKA	M	ANAMBRA	ANAMBRA EAST	BUNGALOW	RESIDENTIAL	Y	802.317	DEVELOPED
17	Polygon	0	B4	SUNDAY EZEJI	M	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	779.270	DEVELOPED
18	Polygon	0	B5	MOSES OGUERI	M	IMO	IDEATO NORTH	BUNGALOW	RESIDENTIAL	Y	774.256	DEVELOPED
19	Polygon	0	C1	JOHN IDOKO	M	DELTA	OSHIMILI NORTH	DUPLEX	RESIDENTIAL	Y	933.284	DEVELOPED
20	Polygon	0	C2	CHIKA UMERAH	M	ANAMBRA	AWKA SOUTH	BUNGALOW	RESIDENTIAL	Y	755.987	DEVELOPED
21	Polygon	0	C3	ISAIAH OKAFOR	M	ANAMBRA	AWKA NORTH	BUNGALOW	RESIDENTIAL	N	766.064	DEVELOPED
22	Polygon	0	C4	JOSEPHINE EZE	F	ANAMBRA	NNEWI NORTH		RESIDENTIAL	N	695.234	UNDEVELOPED
23	Polygon	0	C5	THOMPSON UMEH	M	ANAMBRA	NNEWI SOUTH	DUPLEX	RESIDENTIAL	Y	691.077	DEVELOPED
24	Polygon	0	C6	ADAOBI MBONU	F	ANAMBRA	IDEMILI NORTH	DUPLEX	RESIDENTIAL	Y	692.967	DEVELOPED
25	Polygon	0	C7	ANDREW ONYEKA	M	ANAMBRA	ANAOCHA		RESIDENTIAL	N	625.792	UNDEVELOPED
26	Polygon	0	C8	JULIANA OKONKWO	F	ANAMBRA	AGUATA	DUPLEX	RESIDENTIAL	Y	689.351	DEVELOPED
27	Polygon	0	C9	GABRIEL ONUORAH	M	ANAMBRA	NNEWI NORTH	DUPLEX	RESIDENTIAL	Y	1046.182	DEVELOPED
28	Polygon	0	C10	NNAMA MBAKA	M	ANAMBRA	AYAMELU		RESIDENTIAL	N	687.438	UNDEVELOPED
29	Polygon	0	C11	AMAKA AMECHI	F	ANAMBRA	OYI	BUNGALOW	RESIDENTIAL	Y	962.500	DEVELOPED
30	Polygon	0	C12	JOSEPH UNOKA	M	ANAMBRA	IHIALA	DUPLEX	RESIDENTIAL	Y	617.308	DEVELOPED
31	Polygon	0	D1	AZUBIKE EZEH	M	ANAMBRA	ANAOCHA	DUPLEX	RESIDENTIAL	Y	1022.283	DEVELOPED
32	Polygon	0	D2	GEOFFREY OGUJI	M	ANAMBRA	EKWUSIGO	BUNGALOW	RESIDENTIAL	Y	737.405	DEVELOPED
33	Polygon	0	D3	AGATHA CHIMELU	F	ANAMBRA	IDEMILI NORTH		RESIDENTIAL	N	629.301	UNDEVELOPED
34	Polygon	0	D4	KENNETH MBACHU	M	ENUGU	OJI RIVER	BUNGALOW	RESIDENTIAL	Y	615.754	DEVELOPED
35	Polygon	0	D5	NKECHI EZEONU	F	ANAMBRA	IHIALA	BUNGALOW	RESIDENTIAL	Y	626.987	DEVELOPED
36	Polygon	0	D6	AMANDI EZEILO	M	ANAMBRA	ORUMBA NORTH		RESIDENTIAL	N	616.120	UNDEVELOPED
37	Polygon	0	D7	OLIVER NNAJI	M	ENUGU	UDI	DUPLEX	RESIDENTIAL	N	620.503	DEVELOPED
38	Polygon	0	D8	PASCAL ONYEKWERE	M	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	620.321	DEVELOPED
39	Polygon	0	D9	OBIOMA AMAEKWE	F	ANAMBRA	NJIKOKA	BUNGALOW	RESIDENTIAL	Y	618.491	DEVELOPED
40	Polygon	0	D10	PIUS UWADI	M	IMO	ISU	DUPLEX	RESIDENTIAL	Y	620.968	DEVELOPED

Record: 1 Show: All Selected Records (58 out of 112 Selected) Options

Query 3: What are the parcels that are used for residential and non residential purposes**.**

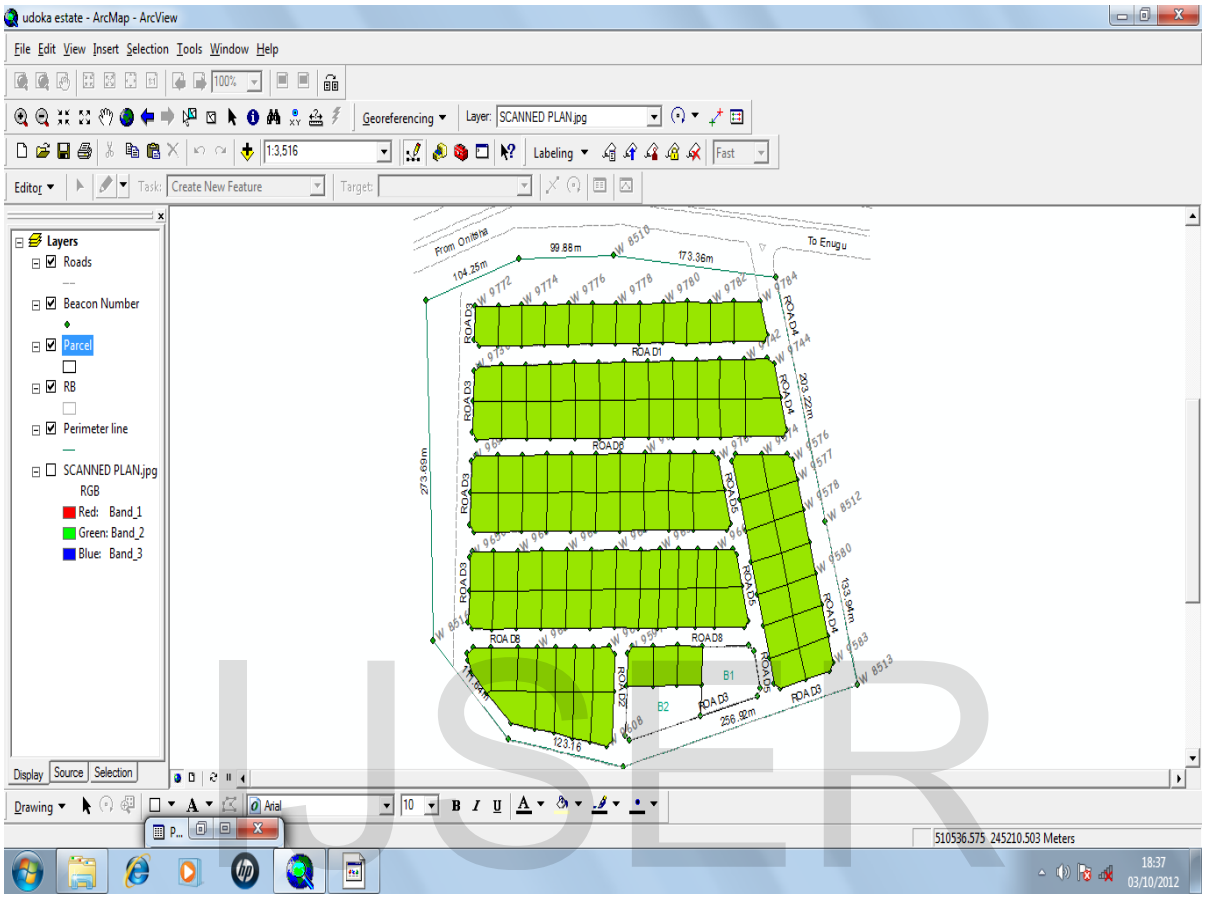


Fig.3.3: Query result showing residential and non-residential plots.

The query result reveals that only two parcels (B_1 and B_2) are used for non-residential purposes. The management of the estate could be aided in making decisions on the sufficiency or otherwise of the two parcels used for social/recreational purposes. The attribute table of the plots is presented in table 3.

Table 3: Attribute result of Query 3

Attributes of Parcel

FID	Shape *	Id	PARCEL_ID	OWNER_ID	SEX	STATE	LGA	B_TYPE	USE	C_OF_O	AREA	STATUS
0	Polygon	0	A1	MARK OKEKE	M	ANAMBRA	ANAOCHA	DUPLEX	RESIDENTIAL	Y	877.978	DEVELOPED
1	Polygon	0	A2	JUDE OKECHUKWU	M	ANAMBRA	EKWUSIGO	DUPLEX	RESIDENTIAL	Y	825.424	DEVELOPED
2	Polygon	0	A3	ANGELA UMEH	F	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	825.747	DEVELOPED
3	Polygon	0	A4	CLETUS ANIGBO	M	ANAMBRA	AWKA SOUTH	DUPLEX	RESIDENTIAL	Y	825.181	DEVELOPED
4	Polygon	0	A5	NNAMDI OFOMA	M	ANAMBRA	ORUMBA NORTH		RESIDENTIAL	Y	821.616	UNDEVELOPED
5	Polygon	0	A6	GRACE OJIMBA	F	ANAMBRA	AGUATA	DUPLEX	RESIDENTIAL	Y	820.469	DEVELOPED
6	Polygon	0	A7	DANIEL EZEOKE	M	ANAMBRA	NNEWI SOUTH	DUPLEX	RESIDENTIAL	N	817.486	DEVELOPED
7	Polygon	0	A8	AUGUSTINE ODIKPO	M	ANAMBRA	OYI	DUPLEX	RESIDENTIAL	Y	815.766	DEVELOPED
8	Polygon	0	A9	MARY AJAEGBU	F	ANAMBRA	IDEMILI SOUTH	BUNGALOW	RESIDENTIAL	Y	813.372	DEVELOPED
9	Polygon	0	A10	GABRIEL IGBOKWE	M	ANAMBRA	IHIALA	DUPLEX	RESIDENTIAL	N	811.023	DEVELOPED
10	Polygon	0	A11	HANNAH OBIELI	F	ANAMBRA	ORUMBA SOUTH		RESIDENTIAL	N	809.216	UNDEVELOPED
11	Polygon	0	A12	JAMES AGBAKOBA	M	ANAMBRA	ONITSHA NORTH	DUPLEX	RESIDENTIAL	Y	806.311	DEVELOPED
12	Polygon	0	A13	CLETUS ASIEGBU	M	ANAMBRA	NJIKOKA	DUPLEX	RESIDENTIAL	Y	1015.639	DEVELOPED
13	Polygon	0	A14	EMMANUEL MUOKA	M	ANAMBRA	OGBARU	DUPLEX	RESIDENTIAL	Y	765.374	DEVELOPED
14	Polygon	0	B1	UDOKA HOUSING ESTATE PRI SCH				BUNGALOW	NIL	N	2796.286	DEVELOPED
15	Polygon	0	B2	UDOKA HOUSING ESTATE PLAYGROUND				BUNGALOW	NIL	N	2730.964	DEVELOPED
16	Polygon	0	B3	GREGORY UBAKA	M	ANAMBRA	ANAMBRA EAST	BUNGALOW	RESIDENTIAL	Y	802.317	DEVELOPED
17	Polygon	0	B4	SUNDAY EZEJI	M	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	779.270	DEVELOPED
18	Polygon	0	B5	MOSES OGUERI	M	IMO	IDEATO NORTH	BUNGALOW	RESIDENTIAL	Y	774.256	DEVELOPED
19	Polygon	0	C1	JOHN IDOKO	M	DELTA	OSHIMILI NORTH	DUPLEX	RESIDENTIAL	Y	933.284	DEVELOPED
20	Polygon	0	C2	CHIKA UMERAH	M	ANAMBRA	AWKA SOUTH	BUNGALOW	RESIDENTIAL	Y	755.987	DEVELOPED
21	Polygon	0	C3	ISAIAH OKAFOR	M	ANAMBRA	AWKA NORTH	BUNGALOW	RESIDENTIAL	N	766.064	DEVELOPED
22	Polygon	0	C4	JOSEPHINE EZE	F	ANAMBRA	NNEWI NORTH		RESIDENTIAL	N	695.234	UNDEVELOPED
23	Polygon	0	C5	THOMPSON UMEH	M	ANAMBRA	NNEWI SOUTH	DUPLEX	RESIDENTIAL	Y	691.077	DEVELOPED
24	Polygon	0	C6	ADAOBI MBONU	F	ANAMBRA	IDEMILI NORTH	DUPLEX	RESIDENTIAL	Y	692.967	DEVELOPED
25	Polygon	0	C7	ANDREW ONYEKA	M	ANAMBRA	ANAOCHA		RESIDENTIAL	N	625.792	UNDEVELOPED
26	Polygon	0	C8	JULIANA OKONKWO	F	ANAMBRA	AGUATA	DUPLEX	RESIDENTIAL	Y	689.351	DEVELOPED
27	Polygon	0	C9	GABRIEL ONUORAH	M	ANAMBRA	NNEWI NORTH	DUPLEX	RESIDENTIAL	Y	1046.182	DEVELOPED
28	Polygon	0	C10	NNAMA MBAKA	M	ANAMBRA	AYAMELU		RESIDENTIAL	N	687.438	UNDEVELOPED
29	Polygon	0	C11	AMAKA AMECHI	F	ANAMBRA	OYI	BUNGALOW	RESIDENTIAL	Y	962.500	DEVELOPED
30	Polygon	0	C12	JOSEPH UNOKA	M	ANAMBRA	IHIALA	DUPLEX	RESIDENTIAL	Y	617.308	DEVELOPED
31	Polygon	0	D1	AZUBIKE EZEH	M	ANAMBRA	ANAOCHA	DUPLEX	RESIDENTIAL	Y	1022.283	DEVELOPED
32	Polygon	0	D2	GEOFFREY OGUJI	M	ANAMBRA	EKWUSIGO	BUNGALOW	RESIDENTIAL	Y	737.405	DEVELOPED
33	Polygon	0	D3	AGATHA CHIMELU	F	ANAMBRA	IDEMILI NORTH		RESIDENTIAL	N	629.301	UNDEVELOPED
34	Polygon	0	D4	KENNETH MBACHU	M	ENUGU	OJI RIVER	BUNGALOW	RESIDENTIAL	Y	615.754	DEVELOPED
35	Polygon	0	D5	NKECHI EZEONU	F	ANAMBRA	IHIALA	BUNGALOW	RESIDENTIAL	Y	626.987	DEVELOPED
36	Polygon	0	D6	AMANDI EZEILO	M	ANAMBRA	ORUMBA NORTH		RESIDENTIAL	N	616.120	UNDEVELOPED
37	Polygon	0	D7	OLIVER NNAJI	M	ENUGU	UDI	DUPLEX	RESIDENTIAL	N	620.503	DEVELOPED
38	Polygon	0	D8	PASCAL ONYEKWERE	M	ANAMBRA	AGUATA	BUNGALOW	RESIDENTIAL	Y	620.321	DEVELOPED
39	Polygon	0	D9	OBIOMA AMAEKWE	F	ANAMBRA	NJIKOKA	BUNGALOW	RESIDENTIAL	Y	618.491	DEVELOPED
40	Polygon	0	D10	PIUS UWADI	M	IMO	ISU	DUPLEX	RESIDENTIAL	Y	620.968	DEVELOPED

Record: 1 Show: All Selected Records (109 out of 112 Selected) Options

4.0 Conclusion and Recommendations

4.1 Conclusion

The project was able to achieve its primary goal which was the design and implementation of a prototype multipurpose cadastre for Udoka Housing Estate, Awka to demonstrate its usefulness in efficient administration and management of land resources.The procedures adopted in the development of the prototype multipurpose cadastre included map data collection, scanning, georeferencing, digitisation, spatial and attribute data creation and queries. The Arc GIS 9.2 software was used in the study. The thematic layers created in the

study included roads, parcels, beacon numbers, residential buildings (RB) and perimeter lines.

It is strongly believed that the adoption and implementation of a statewide multipurpose cadastre based on the results of this prototype case study will greatly enhance the activities of various ministries and agencies in Anambra State that deal with land resources and other environmental matters.

4.2 Recommendations

1. For successful implementation of the Land Reform Programme of the Federal Government, implementation of a nationwide multipurpose cadastre is strongly recommended.

2. There is a great need for the conversion of local coordinate systems used in all states of the Federation to the National Grid.

3. There is urgent need for training and updating of surveyors in the operations, use and management of digital systems, spatial analyses, remote sensing and image processing techniques.

4. Public enlightment programmes should be organised to educate members of the public and governmental agencies on the potentials of multipurpose cadastre as a veritable tool for making decisions on matters related to land.

5. The Survey Laws should be amended to give legal backing to the use of digital equipments for data acquisition, processing, analyses and presentation.

References

[1] Kaufman J. & Steudler D. (1988). Cadastre 2014: A Vision for a Future Cadastral System. A paper presented to the Working Group 1 of FIG Commission 7. Committee on Geodesy, Mathematics and Physical Sciences, National Research Council, Academy Press, Washington.

[2] Nnam,V.C., Okeke, F.I. And Anejionu, O.C.D (2011) Implementation of a Multipurpose Cadastre in Nigeria: A case study of Achara Layout, Enugu State. Proceedings of 46th Annual General Conference of the Nigeria Institute of Surveyors at Calabar. NIS Publications, Lagos.

[3] Chiemelu, N.E. & Eze, C.O (2011): Land Administration and Management using Geographic Information System: A case study of Bethel Estate, Enugu, Nigerian. Proceedings of 46th Annual General Conference of Nigerian Institution of Surveyors at Calabar. NIS Publications, Lagos.

[4] Pal Nikolli, Bashrim Idrizi, Ismail Kabashi, Sonila Papathimiun (2010) Multipurpose Land Information Systems – An Albanian Perspective. Paper presented at International Conference SDI 2010 Skopje, 15-17 September 2010.