Geo-spatial Compliance with Planning Law in Calabar Built-Up Area, Cross River State, Nigeria

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Abstract

This research was conducted to examine the spatial difference in the level of compliance with building Law across residential built up districts in Calabar Metropolis. The sources of data collected for this research include: direct measurement of the physical characteristics of buildings, requirements under the Cross River State Building Law of 1984 as amended in 1987 and questionnaires administered to owners of the buildings. The analysis of the result obtained from the field was done using Statistical Package for Social Science (SPSS) version 11.0. A one-way analysis of variance was adopted with compliance as dependent variable and residential districts as independent (categorical) variable, to test for the significance of the difference between the level of compliance with building Law and the residential districts in Calabar Metropolis at 5 per cent confidence level. An F ratio of 19.98 was obtained, hence retaining the alternative hypothesis and rejecting the null hypothesis. In classifying compliance in the study area, buildings that fully complied with the law were scored 100 per cent to fall into the good class, while those that fell below 100per cent belonged to the poor class further categorized into poor (the best of the poor), poorer (average poor) and poorest (the poorest of the poor). Edim Otop residential district was the lowest in terms of level of compliance (55.28) and fell within the poorest compliance classification. Esuk Utan with 92.26 mean compliance level was the overall best within the poor compliance class followed by the University of Calabar Satellite Town and Essien Town with 90.66 and 90.62 respectively. Although better than the entire study area (77.05) which was within the "poorer compliance" class, the three best still fell within the "poor compliance" classification as against the 100 per cent full compliance (good class) expected under the law. Whereas, buildings within the poorest and "poorer compliance" classification had higher factor of risk than those in the poor level of compliance, it is important to note that none of the 13 districts of the study area falls into the good class expected under the Law.The recommendation is that there should be improved compliance with building law across built up residential districts of Calabar Metropolis.

Keywords: Calabar Built-Up Area, Spatial Compliance, Compliance Classification, Building Law, Planning Law.

1. Introduction

Today,the world's greatest challenge particularly, in cities,is development.This has prompted governments of different developing countries to rise to the global challenge through Law, and under their respective Town and Country Planning laws, for ensuring a well-planned and liveable environment. Taking a hint from her long history and evolution of the problems of blatant contravention to preceding urban development control schemes, the urban and regional planning Decree of 1992 (Decree No. 88) was passed into law (Sule, 2003), by the Federal Government of Nigeria.

In order to ameliorate the problems in Cross River State,several Laws such as the building Law of 1984,as amended in 1987 was made in view of development control in the State. Other Laws put forth include the Cross River State Environmental Sanitation Enforcement (Urban Area) Law 2003, and the Land Use and Allocation Act of 1978. It should be noted that, the major rationale behind building Law is to provide for the health, safety and welfare of people in and around buildings (Oloyede, 2016). As a result, the legislative objective of Cross River State planning law under consideration was to ensure a liveable environment by providing standards for approved buildings, location of buildings, types and uses, building lines and setbacks. Others include Laws for spaces around buildings to allow convenient areas for air circulation, services and facilities, built up areas, size of rooms, dimension of ceiling height, ventilation to allow for air flow and circulation, drainage and disposal system, and other building specifications to which all occupiers, users and owners of land are expected to comply. Compliance here refers to building in line with the requirements of the selected provisions of the Cross River State building Law of 1984 as amended in 1987.

Non-compliant buildings are ubiquitous throughout the study area and they range from those buildings erected in absolute neglect to already secured approved building plans to those erected without any approved plan. A contravention of any of the provisions of the building Law is a contravention of the building plan requirements whether the plan is drawn at all or not and, where drawn, whether it is approved or not. Where a plan is approved, any other contravention means a contravention of the approved plan. However, where unapproved, it becomes a contravention of the requirements that building can only commence after a building plan had been approved

In Calabar metropolis, these contraventions vary from one residential area to another. In Edim Otop and Big Qua Town residential districts, for instance, there appear to be more cases of buildings with more than 50 per cent built up areas (as against the 50 per cent maximum prescription of the law), without approved plan, with sub-standard room sizes and ceiling heights, with attendant poor ventilation and incidents of random gas trapped in dwellings. Such buildings can lead to poor health conditions. On the contrary, in Ekorinim, Satellite Town, and other more recently developed residential areas, a rather different pattern of contravention is appearing on the scene, which is, alteration of building plan after approval and without subsequent approval.

It is observed that despite the good intentions of the law and the efforts of the existing Town Planning Department in Calabar, the rate at which contraventions persist is high, even in the face of on-going demolition exercises. This study, therefore, investigated the Geospatial Pattern of compliance to the least observed provision of the building Law among owners of building across the residential district of Calabar Metropolis.

2. Materials and Methods
2.1 Study area

The city is located in the Southern part of Cross River State. It lies between longitude 08^0 26 East of the Greenwich Meridian and latitude 04^0 58 North of the Equator and longitude 08^0 22 East. It has a total area of 159.65 kilometres (km). it is bounded by the great Kwa River and the Calabar River. Calabar was the forest city in the Eastern Nigeria. It has remained more than 300 years as an Urban centre (Offiong, 2007)

According to the 1996 population projection, the population of Calabar was 379,605. From the 2016 Nigeria population census, the population had grown to 461,796 according to Geo Names Geographical Database, making its growth rate more than 3 per cent. The city population density of 134/ sqkm in 1991 and 293 sqkm in 2006 concealed the rather acute situation in Calabar (National Population Council (NPC), 2006).

The number of buildings on separate stand/yard in Calabar metropolis stood at 15.894 going by the 2016 Nigerian's population and Housing census drawn from the thirteen (13) metropolis residential areas being studied. As rightly observed by (Ebong, 1983), housing has become the thorniest problem facing its inhabitants. In an attempt to contend with the housing problems, housing are springing up in disregard to the planning Law, with attendant consequences on land use planning. One unique characteristics of the study area is that it is contiguous to the completely built areas in the municipal capital. A greater percentage of completed houses are done without prior consideration of access to Roads. It can be easily observed that more than 50% of districts already designated as residential locations are yet to be fully built up. These include settlements and suburbs such as Ikot Ekpa, Ikot Effiom, Eyamba,Obot Okoho, Bacoco, Awkada,Adebyo Ikot Omin, Ekaobo, Ikot Nkebre, Ikot Enobong, Ikot Omin, Ine Udo, Ndito Okobo, Ine Akpan Ufana, Ine Udo, all surrounding the completely built up area but hindered by a near absence of access roads.

2.2 Types of Data and Source

The study involved data on the variation of the spatial level of compliance to the Cross River State building Laws across the 13 residential districts in the Calabar Metropolis. These set of data are needed so as to relate building structures to the level of compliance with building Law.

These data were obtained from primary and secondary sources. Primary sources of the data included questionnaires issued to the residents of the study area and the direct measurement of variables from the buildings. Whereas, the secondary source was derived from the Cross River State building Laws of 1984 as amended in 1987, the data on the existing residential district, obtained from the National Population Census of 2006.

2.3 Procedures for Data Collection

Data were collected using seven hundred and ninety four questionnaires administered on 794 respondents/owners of the five per cent of buildings on separate stand measured with the help of trained field assistants. After measurement of each variable the researcher and his field assistants recorded the data on the counterpart part of the questionnaire provided for that purpose. The data so obtained in the field were used for the analysis.

The population of study comprised of Metropolis Residential buildings/houses on separate stand and their owners in selected thirteen residential areas of Calabar Metropolis. There are about 15,894 completed buildings on separate stands in the 13 residential districts of the study area.

Measurement of buildings was done considering 5 per cent of buildings on separate stand selected using systematic random sampling technique in each of the 13 metropolis residential districts in the study area. Questionnaires were distributed to owners of the buildings measured. From the study, out of 794 questionnaires, 742 copies of the questionnaires, representing 93 per cent were successfully retrieved. This number was considered representative enough for the study. Table 1 below shows the residential districts and number of buildings measured in the Study Area.

The sampling technique adopted in this study was multi-stage sampling technique. At stage 1, purposive sampling of residential districts was done, to satisfy the researchers' desire to study only buildings within the metropolis, which are contiguous to the completely built up area in the Calabar Municipality. The districts so captured include Akim Qua Town, Ediba Qua Town, Essien Town, Ishie Town, Ikot Ansa, University Satelite Town, Ikot Efa, Esuk Utan, Ekorinin, Nyangasang and Edim Otop; secondly, to capture only buildings on separate stand/yard.

Other types of housing unit include; informal improvised dwelling (0.6percent), semi-detached (7.3percent), flat in block of flats (10.4percent), Traditional Hut structure (9.5percent), others (0.4percent). At Stage 2, systematic sampling was done. A sample frame was defined for each street at the interval of 20 buildings according to the number of buildings on separate stand/yard with a target of not less than 5percent in mind. Stage 3 involved repeated systematic sampling in districts where the minimum 5percent was not met at first time after repeated absence or outright refusal to allow measurement or supply needed information by owners of buildings within the frame.

2.4   Data Analysis

The ten provisions considered for the study was provided by the Cross River building Law 1984 as amended in 1987. This include: Building line, Ceiling height, Building Plan, Set Back, Building size restrictions, Size of living room, Height of ground floor, Ventilation, Space around building and Corridor dimension. The compliance classification is shown in the Table 2.

3.   Results and Discussion

To examine the spatial pattern of compliance with building Law in Calabar Metropolis one-way analysis of variance was adopted with compliance as dependent variable and residential districts as independent (categorical) variable. From the analysis, Edim Otop residential district was the lowest in terms of level of compliance (55.28) and fell within the poorest compliance classification. Esuk Utan with 92.26 mean compliance level was the overall best within the poor compliance class followed by University Satellite Town and Essien Town with 90.66 and 90.62 respectively. Although better than the entire study area (77.05) which was within the "poorer compliance" class, the three best still fell within the "poor compliance" classification as against the 100percent full compliance (good class) expected under the law.

Whereas, buildings within the poorest and "poorer compliance" classification had higher factor of risk than those in the poor level of compliance, it is important to note that none of the 13 districts of the study area falls into the good class expected under the Law. The Table 3 shows the mean compliance in each of the 13 residential districts of the study area.

Table 4 shows the spatial distribution of compliance classification of all the respondents in the residential districts of the study area. This is also depicted in Figure 1. University Satellite Town, and Esuk Utan are the only residential districts that do not have buildings within the lowest and poorer compliance classification. The implication is that, these two are the only districts with lower factor of risk. The rest stand higher risk of collapsed buildings, domestic accidents, automobile casualties, incidents of flooding, road traffic problems associated with lack of parking space, respiratory disorder associated with insufficient ventilation, etc.

Out of a total of 794 respondents' buildings measured as shown on Table 4, only 67 buildings representing 8 per cent were in the "good compliance" category expected under the law. This is considered poor compliance. Figure 1 shows that only 8percent of buildings measured fell into good class, 49 per cent fell into poor class, 32 per cent poorer, while 11percent belonged to poorest class in Calabar Metropolis.

Tables 6.0 - 6.12 Show the level of compliance as well as the compliance class for respective residential districts of the study area. The level of compliance in Akim Qua town residential district at 83.91 fell within the "Poor compliance" class better than that of the entire study area which is "poorer".

As indicated on table 4.5, the level of compliance in Ediba Qua Town residential district at 67.46 belonged to "Poorer compliance" class which tallied at same class as that of the entire study area poorer (77.05), except that it was worse than would be expected under the law (100 per cent).

Big Qua with 76.9 mean compliance level as well as the entire study area fall into the "poorer compliance" classification (Table 6.2). Table 6.3 shows that Essien Town was within the "poor compliance" classification with mean compliance of 90.62. Ishie Town recorded 68.09 mean compliance level to fall into "lower compliance" classification. The 77.52 mean compliance observed in Ikot Ansa was within the same compliance classification of "lower compliance" as the entire study area.

As shown in Table 6.6, it is important to state here that the University Satellite Town which is a government Site and Service scheme with 90.66 mean compliance (poor classification) did not still measure up to 100 per cent compliance standard expected under the law. 70.24 mean compliance recorded by Ikot Efa, makes the residential district the same with the study area. Esuk Utan with 92.26 mean compliance is the best of the poor compliance classification and this may not be farfetched from the fact that it is the closest to the Calabar Sea Port and necessarily would have attracted government's attention in terms of planning and enforcement over time.80.14 recorded in Ekorinim is higher than the entire study area in terms of level of compliance and classification. Esuk Atu, being one of the most recent layout in the Calabar Metropolis, with a mean compliance of 75.50 (i.e. poorer compliance) is not impressive. This can be explained in terms of the skeletal building Law enforcement activities in that district coupled with pressure on land directly linked to its strategic location and proximity to the University of Calabar and the University Teaching Hospital. Nyangasang falls within the "poor compliance" classification with 79.89 mean compliance, better than its two immediate neighbouring districts, Edim Otop (poorest) with 55.28 mean compliance, and Ediba (67.46-poorer). Edim Otop is a typical unplanned area. Information from reconnaissance survey collaborate data in Table 56 where the contraventions are more notable in some unplanned areas than in others. The poorest of the poor with lowest (55.28) mean compliance recorded in Edim Otop is proportional to the high density witnessed over time with increasing demand for land and rental accommodation in the area.

To test for the significance of the spatial difference in the level of compliance with building planning Law across residential districts in Calabar Metropolis, an analysis of variance was used. Table 7 shows the analysis of variance derived from data collected. From Table 3, it is observed that the mean compliance levels of all the residential districts vary, with 3 (three) residential districts viz:- Edim Otop, Ediba Qua town, and Ikot Efa having mean compliance levels lower than the study area average (77.05), while the other 10 (ten) residential districts have compliance levels greater than or equal to the study area average, with Essien Town, University Satellite town and Esuk Utan at the leading edge of compliance with building Law; a poor class. To test for the significance of this difference, we obtained the following from Table 7

$F_{cal} = 19.98$

$p < 0.05$

$\alpha = 5percent.$

Hence, the level of compliance with building planning Law varies significantly across residential districts in Calabar metropolis.

4. Conclusion and Recommendation

From the foregoing, based on the spatial dimension of compliance, there is a significant variation in the pattern and level of compliance in the study area, which makes it imperative to adopt different levels of measures in tackling the problem in Calabar Metropolis. Consequently, compliance problem in the study area would therefore, in line with the institutional/organizational theory adopted for the study, require multi-dimensional and comprehensive approach.

It is recommended, therefore, that residents should by themselves, seek enlightenment not only as to the specified minimum building standards, under the law, but also as to the importance of especially those ones that they do not understand or do not seem to agree with. Often it is ignorance, not only of the existence of the law, but also of the relevance of the law that constitutes the major challenge. This aspect is very interesting especially because when a building is found to be non-compliant with standards the architects and supervisors are not usually blamed. The blame goes to the owner of the building whether or not he has the ability to determine when the service rendered meets the required legal standards. The wise thing for developers to do, therefore, is to hire the services of qualified personnel. At least, if not for any other reason, an ignorant person ought to consult an expert or seek the advice of one more knowledgeable in the field as an indication that he is indeed willing to do what is right and lawful. Perhaps it is on this ground that ignorance indeed ought not to be an excuse.

Going by the 100 per cent full compliance expected under the law, none of the 13 residential districts has satisfied the absolute requirements of the law. The present level of compliance observed for Calabar can be improved if the present level of awareness is improved through the involvement of professionals who have the requisite knowledge of the provisions of the law especially, in the areas with poorer compliance such as Ediba, Big Qua, Ishie Town, Ikot Ansa, Ikot Efa, Esuk Atu. Greater attention needs to be given to Edim Otop, which falls into the worst category of the poor compliance recorded in the study area.

The Town Planning Authority in carrying out its law enforcement responsibility must bear in mind the fact that the present level of compliance in the study area can be improved by increasing developers' present middle level awareness. This can be done by deliberately organizing periodic stakeholders interactive conferences with a view to sensitizing developers about the importance of the minimum standards for buildings. The information should go beyond mere information as to the requirements of the law; it should also sensitize the people on the importance of the minimum standards to the health, safety and welfare of people in and around buildings. These stakeholders' meetings are a way of getting feedback for proper appraisal of enforcement activities. In addition, building regulations can be included in school curriculum at secondary school level as part of the environmental education presently being propagated in Cross River State.

On the part of the registered builder, responsibility for compliance should be placed on them. So that apart from demolition of buildings, when there is gross violation, the builder supervisor can be penalized also. Depending on the level of violation, the penalty can range from fine, suspension from practice for a certain period to outright withdrawal of license. By these stringent measures, the supervisor will not be able to transfer blame to the owner of the building for not making available enough funds, or for not supplying standard materials. By this measure also, the supervisors, would have been co-opted into quasi-enforcement, by being expected to report erring owners of buildings to the town planning Authority.

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Tables

Table 1 Residential districts and number of buildings measured in the Study Area

S/N	Residential Districts	No. of Buildings	No. of buildings measured/ questionnaire administered.	Questionnaires Retrieved.	Percentage retrieved (%)
1.	Akim Qua Town	2020	101	99	98
2.	Ediba Qua Town	1837	92	82	90
3.	Big Qua Town	2361	118	117	99
4.	Essien Town	1942	97	97	100
5.	Ishie Town	2627	131	112	85
6.	Ikot Ansa	1722	86	73	84
7.	University Satellite Town	750	38	38	100
8.	Ikot Efa	414	21	18	85
9.	Esuk Utan	204	10	10	100
10.	Ekorinim	441	22	22	100
11.	Esuk Atu	240	12	12	100
12.	Nyangasang	720	36	36	100
13	Edim Otop	616	30	25	83
	Total	**15, 894**	**794**	**742**	**93**

Source: 2016 Population and Housing Population Data Bank, Nigerian's National Population Commission
Sample size: Researcher's Field Work 2016.

Table 2 `Compliance classification
Compliance

Mean grouping	Ranking	Classification
1 – 59.4	1	Poorest
59.5 – 79.4	2	Poorer
79.5 – 95.4	3	Poor
95.5 – 100	4	Good (Full compliance)

Source: Researcher's Field Work 2016

Table 3 Descriptive and Compliance Levels for all Residential Districts in the Study Area

Residential District	Buildings	Mean Compliance	Compliance Ranking	Classification
Akim Qua Town	101	83.91	3	Poor
Ediba Qua Town	92	67.46	2	Poorer
Big Qua Town	118	76.91	2	Poorer
Essien Town	97	90.62	3	Poor
Ishie Town	131	68.09	2	Poorer
Ikot Ansa	86	77.52	2	Poorer
University Satellite Town	38	90.66	3	Poor
Ikot Efa	21	70.24	2	Poorer
Esuk Utan	10	92.26	3	Poor
Ekorinim	22	80.14	3	Poor
Esuk Atu	12	75.50	2	Poorer
Nyangasang	36	79.89	3	Poor
Edim Otop	30	55.28	1	Lowest(Poor)
Total	794	77.05	2	Poorer

Source: Researcher's field work, 2016

Table 4 Spatial Distribution of Compliance classification for all respondents in Residential districts of the Study Area

Residential Districts	Compliance classification				
	Poorest	Poorer	Poor	Good	Total
Akim Qua Town	4	20	68	9	101
Ediba Qua Town	19	34	35	4	92
Big Qua Town	9	54	48	7	118
Essien Town		8	52	37	97
Ishie Town	25	52	54		131
Ikot Ansa	5	37	44		86
University Satellite Town			32	6	38
Ikot Efa	3	14	4		21
Esuk Utan			8	2	10
Ekorinim		8	14		22
Esuk Atu	1	7	3	1	12
Nyangasang		18	17	1	36
Edim Otop	22	5	3		30
Total	88	257	382	67	794

Source: Researcher's field work, 2016

Table 5 Spatial Distribution of Compliance Classifications across Residential Districts in the Study Area.

Compliance Classification	No of districts
Poorest	1
Poorer	6
Poor	6
Good`	0
Total	13

Source: Researcher's fieldwork, 2016

Table 6.0 Compliance Level in Akim Qua Town

Compliance Class	Mean	N	Std. Deviation
Poorest	46.01	4	21.31
Poorer	73.29	20	4.42
Poor	87.55	68	4.01
Good	96.79	9	1.47
Total	83.91	101	11.50

Source: Researcher's field work, 2016

Table 6.1 Compliance Level in Ediba Qua Town

Compliance Class	Mean	N	Std. Deviation
Poorest	15.81	19	16.62
Poorer	73.09	34	4.96
Poor	86.46	35	4.31
Good	98.85	4	2.31
Total	67.46	92	28.67

Source: Researcher's field work, 2016

Table 6.2 Compliance Level in Big Qua Town

Compliance Class	Mean	N	Std. Deviation
Poorest	48.09	9	16.03
Poorer	71.70	54	5.79
Poor	85.29	48	3.58
Good	96.57	7	1.13
Total	76.91	118	12.90

Source: Researcher's field work, 2016

Table 6.3 Compliance Level in Essien Town

Compliance Class	Mean	N	Std. Deviation
Poorer	73.25	8	5.72
Poor	88.69	52	4.06
Good	97.08	37	1.88
Total	90.62	97	7.47

Source: Researcher's field work, 2016

Table 6.4 Compliance Level in Ishie Town

Compliance Class	Mean	N	Std. Deviation
Poorest	23.59	25	19.82
Poorer	71.23	52	5.36
Poor	85.66	54	4.00
Total	68.09	131	24.56

Source: Researcher's field work, 2016

Table 6.5 Compliance Level in Ikot Ansa

Compliance Class	Mean	N	Std. Deviation
Poorest	45.62	5	24.42
Poorer	73.05	37	4.72
Poor	84.91	44	3.13
Total	77.52	86	11.80

Source: Researcher's field work, 2016

Table 6.6 Compliance Level in University Satellite Town

Compliance Class	Mean	N	Std. Deviation
Poor	89.08	32	3.80
Good	99.08	6	2.25
Total	90.66	38	5.14

Source: Researcher's field work, 2016

Table 6.7 Compliance Level in Ikot Efa

Compliance Class	Mean	N	Std. Deviation
Poorest	37.60	3	8.62
Poorer	72.81	14	3.50
Poor	85.73	4	1.51
Total	70.24	21	15.10

Source: Researcher's field work, 2016

Table 6.8 Compliance Level in Esuk Utan

Compliance Class	Mean	N	Std. Deviation
Poor	91.09	8	3.19
Good	96.96	2	0.65
Total	92.26	10	3.75

Source: Researcher's field work, 2016

Table 6.9 Compliance Level in Ekorinim

Compliance Class	Mean	N	Std. Deviation
Poorer	74.18	8	5.20
Poor	83.54	14	2.49
Total	80.14	22	5.84

Source: Researcher's field work, 2016

Table 6.10 Compliance Level in Esuk Atu

Compliance Class	Mean	N	Std. Deviation
Poorest	55.00	1	.
Poorer	71.71	7	2.29
Poor	84.67	3	7.23
Good	95.00	1	.
Total	75.50	12	10.83

Source: Researcher's field work, 2016

Table 6.11 Compliance Level in Nyangasang

Compliance Class	Mean	N	Std. Deviation
Poorer	73.67	18	4.27
Poor	85.41	17	4.27
Good	98.00	1	.
Total	79.89	36	7.83

Source: Researcher's field work, 2016

Table 6.12 Compliance Level in Edim Otop

| Compliance Class	Mean	N	Std. Deviation
Poorest	49.45	22	5.11
Poorer	63.30	5	4.83
Poor	84.60	3	4.35
Total	55.28	30	12.22

Source: Researcher's field work, 2016

Table 7 ANOVA result for testing the significance of the mean difference in Compliance Level

|	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	66682.24	12	5556.85	19.98	0.00
Within Groups	217222.2	781	278.13		
Total	283904.5	793			

Source: Researcher's field work, 2016

Figures

Figure 1: Spatial distribution of compliance classification for all respondents in residential districts of the study area
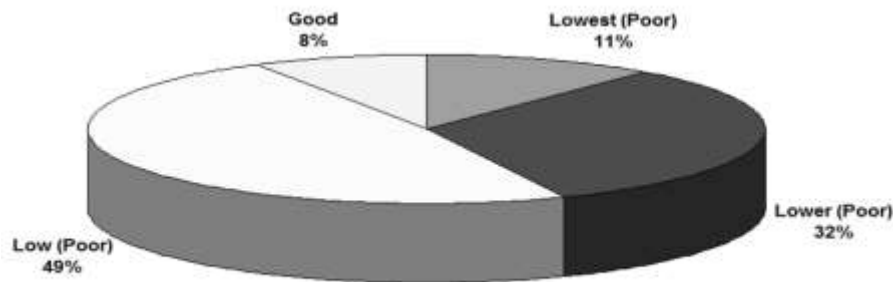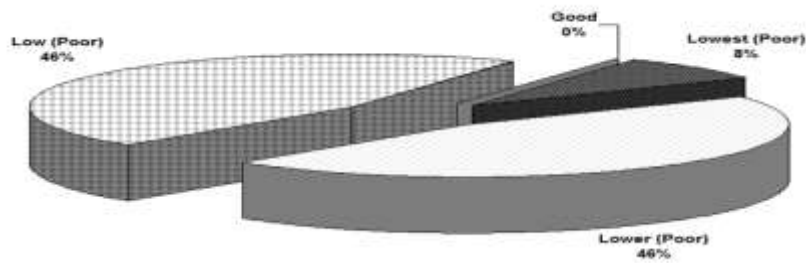

Source: Researcher's fieldwork, 2016

Figure 2: Chart depicting the level of compliance and non-compliance with building Law in the study area
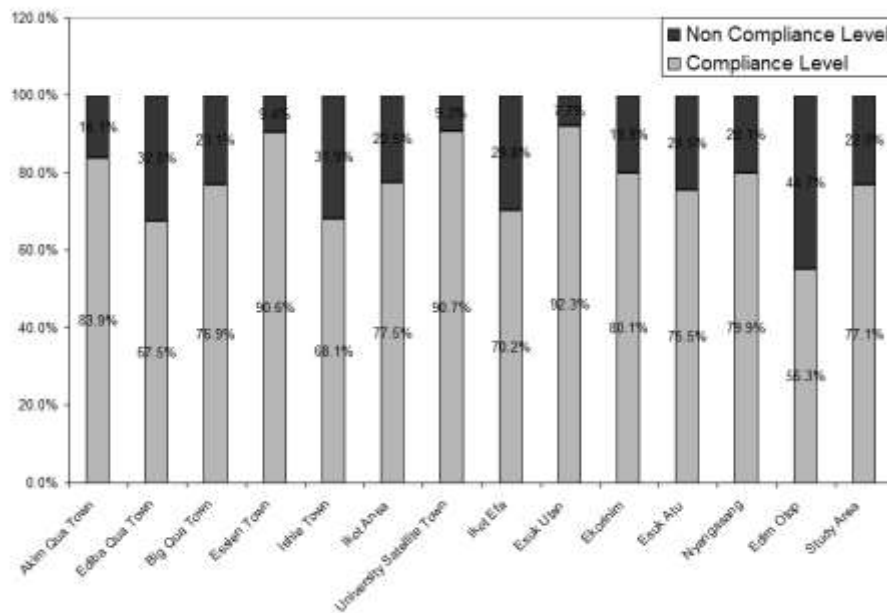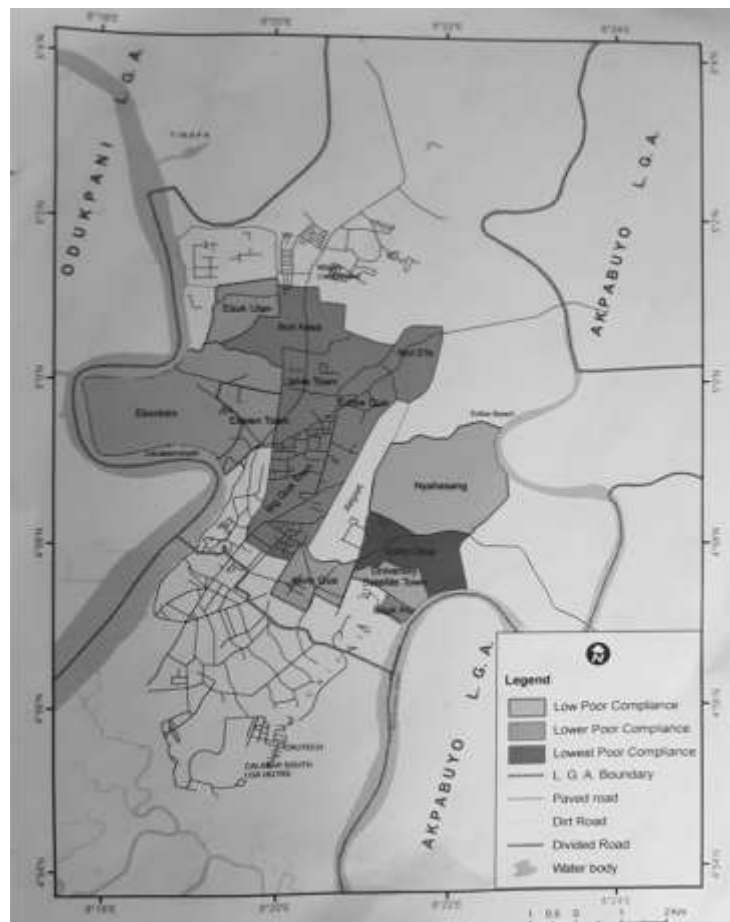

Source: Researcher's fieldwork, 2016

Figure 3: The spatial state of the compliance class of residential districts with building Law in Calabar metropolis

Source: Researcher's fieldwork, 2016

Figure 4: Map Showing Compliance With Law Across the 13 District

Source: Researcher's fieldwork, 2016