

**THE IMPACTS OF RAPID URBANIZATION ON THE ENVIRONMENTAL QUALITY OF PERI-URBAN SETTLEMENTS OF THE GREATER PORT HARCOURT CITY**

**\*Visigah Kpobari Peter and Arch. Anthony Dornubari Enwin**

Department of Urban and Regional Planning, Rivers State University, Port Harcourt.

Article Received on 10/01/2019

Article Revised on 30/01/2019

Article Accepted on 20/02/2019

**\*Corresponding Author**

**Visigah Kpobari Peter**

Department of Urban and Regional Planning, Rivers State University, Port Harcourt.

**ABSTRACT**

Urbanization causes urban expansion, dramatically transforming peri-urban environments and societies. In this process, peripheral lands are consumed by an expanding city, exploiting the large rent gap between agricultural and urban land. On the basis of the aforementioned reason, understanding peri-urban settlement growth is key to helping city managers develop strategies to curb undesirable development trends

around the city's periphery, especially in the area of environmental quality. To these ends, this study explored the factors responsible for the rapid urbanisation and spread of the main city into these peri-urban settlements and the challenges that accompany them. It also examines the extent of land use change between 2004 and 2016 with the view to suggesting sustainable land management practices that can be employed to improve the environmental conditions of these peri-urban settlements. The research design used was the Concurrent Triangulation Multisite Mixed Methods Design. This approach involves time series analyses of maps and images over the course of the chosen period supported by field observations as well as an assessment of the "environmental quality" from the chosen peri-urban settlements. Data analysis was based on responses from 172 questionnaires retrieved and the data were coded and analysed using SPSS 21 (Statistical Package for Social Sciences). Time series map analysis showed that built up coverage increased from 0.52km<sup>2</sup> to 8.30km<sup>2</sup> at Rumuekini and 1.19km<sup>2</sup> to 6.1km<sup>2</sup> at Ozuoba within the period under review. Secondly, rapid uncontrolled land use change was due to poor urban governance and ineffective land use controls. The study thus concludes with the following recommendations; the use of an integrated approach

to land-use management that combines public participation, proper expert systems and GIS in state policies, enactment of the state land use policy, proper implementation of the Rivers State Physical Development Law no. 6 of 2003, and the declaration of these areas as planning areas/preparation of planning schemes for emerging settlements.

**KEYWORDS:** Impact, rapid urbanization, environmental quality, peri-urban, development.

## **INTRODUCTION/BACKGROUND TO THE STUDY**

Consequent to rapid urbanization, the lands located at the edge of most cities that were predominantly used for agricultural purpose likewise alluded to as peri-urban regions have turned into the prime region for new settlements. This has led to land use conversions that have placed unmanageable pressure on the available land resources (Adam, 2014). This situation is further exacerbated by the presence of weak governmental frameworks that have been put in place to manage growth with regards to deciding the most favourable utilization of land assets in the peri-urban areas (Rockefeller Foundation, 2013). Kyessi and Johansson (2015) also pointed out that the speedy growth of informal business endeavours in most municipal centres of the developing world also attracts migrants from rural zones and this has brought about the development of numerous new informal settlements, especially in these peri-urban areas that have weak government regulation and also lack basic municipal services. According to Allen et al. (1999), land degradation is one of the major challenges of unregulated growth in peri-urban neighbourhoods and this is basically due to inappropriate waste management strategies. Urban wastes, often exceeding manageable levels have serious effects on the wellbeing of the natural environment and the populace because they are usually disposed-off illegally into delicate environments like water channels and vacant land, or are burnt. To sum it up, peri-urban areas especially in Africa have become the breeding ground for lots of environmental problems which include; proliferation of water-borne ailments, destruction of the physical environments and flooding challenges (Oyolowo and Alade, 2015).

### **Aim and Objectives**

The aim of this study is to examine the environmental quality of peri-urban settlements of Greater Port Harcourt City with a view to suggesting a framework for sustainable land management.

To achieve the aim of the study, the objectives of the study are to

1. Identify the factors responsible for the rapid urbanisation of peri-urban settlements and the challenges that accompany them.
2. Assessed the environmental quality of peri-urban settlements of the Greater Port Harcourt City region.
3. Examine the extent of land use change between 2004 and 2016 with the view to suggesting sustainable land management practices that can be employed to improve the living condition of residents in these peri-urban settlements.

## **REVIEW OF RELEVANT LITERATURE**

### **Rapid Urbanisation**

Rapid urbanization which is colossal increases in population of urban areas has outgrown the management capabilities of cities in the developing world. Consequently, the existing formal planning standards and tenure regulations have in most situations proven to be inappropriate in meeting the challenges posed by rapid urbanization. Furthermore, informal urbanization is evading formal planning regulations thereby creating parallel structures in order to tackle their existent problems (Naab, Dinye & Kasanga, 2013). Furthermore, rapid urbanization in most African countries is as a result of considerable migration to urban areas from the surrounding rural areas and also natural population increase through increased births over deaths among city dwellers (Ejaro & Abubakar, 2013). As highlighted by the UN (2006), developing countries are experiencing a more rapidly rate of urbanization than the developed world and this is evident in the fact that the annual average growth rates of most of the cities in this region were estimated to be between 4.7% and 4.6% from the period of the 1960's to 2000. Rapid urbanization, if allowed to go on in an unplanned manner as is the case of many developing countries, often leads to unsustainable development and increases in pollution, land degradation, poverty, crime and insecurity within cities and their environs (Ejaro & Abubakar, 2013). In fact, there is a negative relationship between uncontrolled and unplanned urbanization and sustainable development.

### **Environmental Quality**

Rabinowitz (2016) defined environmental quality as “the measure of the health of the environment itself and the effects it has on the health, comfort and psychological state of people that inhabit it”. It also has to do with the built environment and how it affects our health, comfort and the health of the natural environment and resources we depend on to

sustain the built environment. Science for Environment Policy (2015), pointed out that to create a sustainable urban environment, it is fundamental to measure and consider existing policies, infrastructure, socio-economic factors, resource use, emissions and any other processes that contribute to the city's prosperity and quality of life. This makes it clear that there is a need for setting parameters for assessing the sustainability performance of urban settings and this will involve focusing on environmental problems caused by rapid urban expansion and transformation. Furthermore, an arrangement of such magnitude will allow city planners and governments in general, to identify areas of opportunity as well as concern, and to be in a position that will enable them to develop realistic sustainability goals to enhance environmental quality.

### **The Concept of Peri-urbanism**

Afrane and Amoako (2010) defined peri-urbanism as “a non-contiguous and mostly unplanned expansion of urban areas which is characterised by low density physical development and, mostly, the non-existence of basic municipal infrastructure usually beyond urban fringes”. Sharma (2015) conceived it as “the area of transition between well recognized urban land uses and the area devoted to agriculture”. This is a region of blended urban and rural land uses where complete municipal services are discontinued and the area where farming activities take the upper hand.

Ravetz et al. (2013) further pointed out that: “*Peri-urbanization in older industrial or post-industrial countries is different from what obtains in newer industrialising countries and most of the developing world because in the former, it is characterized by ‘socio-economic change and spatial restructuring’ while in the later, it is often ‘a zone of chaotic urbanization leading to sprawl’*”.

In other words, these groups of scholars linked peri-urban growth in the developing countries with urban sprawl and this is understandable due to the fact that peri-urbanization in the developing world is occurring amidst poor regulation and controls.

### **Peri-Urban Land use Changes and Problems in the Developed World**

The surfacing of urban development beyond the limits of assigned urban delineation has been a worldwide occurrence; however the challenge is that this growth occurs at a much higher scale in developing countries, leading to rapid change that is usually unmanageable given the economic status of most of these nations (Allen, 2003). A research undertaken in the late 80's

considered peri-urban growth as characterised by poverty and informal economies in developing countries, particularly Africa (Browder & Bohland, 1995). East Asian peri-urbanisation is rather different in the sense that it is portrayed by formal land improvement, frequently on an expansive scale. To some degree, this improvement has been a consequence of a developing system of worldwide private enterprise (Goldblum and Wong, 2000).

## **METHODOLOGY**

This section describes the major procedures that were used in carrying out the research. This study is a multi-site mixed method case study that employed a Concurrent Triangulation Mixed-Method design. This study involved time series analyses of maps and images over the course of the chosen period supported by field observations as well as an assessment of the “environmental quality” using questionnaires and interviews. Using a multisite mixed methods approach, the study appraised two selected peri-urban settlements of the Greater Port Harcourt City (See attached Map).

According to Bishop (2010), “a multi-site case study is a study that examines a distinct, present-day occurrence that is common to two or more naturalistic settings”. A mixed methods study “enables a researcher to mix or combine qualitative and quantitative research philosophies/paradigms, as well as methodologies, methods, techniques, approaches, concepts, and or language into a single study with a view to achieving breadth and depth of understanding, and corroboration of findings” (Johnson, 2014).

### **Population and Sampling**

Due to the fact that the study focused more on time series analyses of maps and images over the course of the chosen period supported by field observations, questionnaires played a secondary role to support the observations. For this research, the target population includes residents from the two peri-urban settlements of the study area Rumuekini and Ozuoba settlements. These peri-urban settlements were purposefully selected for the research due to their rapid urbanization status which was identified using a time series of Google imagery of several peri-urban settlements. Furthermore, purposive sampling was the best technique for this selection because the conventional idea of random sampling on average is not appropriate for a multi-site study in terms of site selection (Yin, 2009). The sample size was determined using Cochran Sample size determination formula. A total of 183 respondents were sampled for the study; Rumuekini 91 and Ozuoba 92.

### **Sampling Procedure**

Systematic random sampling was used to identify the respondents. First of all, the streets in each of the settlements under study were listed and selected using simple random sampling. After all the streets were listed, five (5) streets were identified and selected from each of the two peri-urban settlements using the stated technique. After the streets to be surveyed were selected, the buildings in each street were listed. Listing entails obtaining the following attributes for each building; numbering the buildings, using a small sample of the buildings, the average number of households per building was determined, using a small sample of dwelling units, determine the number of persons per household, selection of buildings to be studied, using the Systematic random sampling technique.

### **Data Source and Instrumentation**

Two sources of data; Primary and Secondary were used in the study. Primary sources include; Key informants' interviews, questionnaires (structured and unstructured), Qualitative survey/structured direct observation and Photographs for assessing environmental quality and rate of urbanization. While secondary sources include: secondary examination of past research data/Official documents and maps (from Google Earth Imagery) for time series analysis on rate of urbanisation.

### **Techniques used for GIS Mapping**

Spatial data for the territorial expansion of the peri-urban settlements were generated using Google Earth Pro, Snipping Tool and AutoCAD 2016 software. The territorial expansion of built up areas for the study sites covering various time scales/periods (2004-2008, 2008-2012 and 2012-2016) were captured using Google Earth Pro and copied using the snipping tool. The Copied data were later transferred to AutoCAD where they were traced and layered to produce the finished maps. The territorial expansion of the built up regions for the various time periods were calculated using the polygon tool in Google earth Pro while distance of study sites from the city centre were computed using the distance measurement tool; also present in Google Earth Pro.

**Table 1: Key Informants interview list for the study.**

S/N	Key Informant Type	Organisation represent	Total Number
1	Directors in the Development Control Unit	(i) Ministry of Urban Development and Physical Planning	1
		(ii) Greater Port Harcourt City Development Authority	1
2	Registered Town Planners in the Plan Approval unit	(i) Ministry of Urban Development and Physical Planning	1
		(ii) Greater Port Harcourt City Development Authority	1
3	Local land agents	(i) Rumuekini	3
		(ii) Ozuoba	3
		<b>Total</b>	<b>10</b>

Source: Field Survey, September 2016

## RESULTS AND DISCUSSIONS

This section of the analysis will attempt to answer the questions posed by the study.

### Factors Responsible for rapid migration into Peri-urban settlements in Greater Port Harcourt

In response to the question: What are the major factors responsible for land use changes and problems in the peri-urban areas of Port Harcourt Metropolis?.

According to Haroldo (2011), peri-urban expansion is influenced by different factors which can be classified as; Demographic factors, socio-economic factors, and institutional factors economic factors.

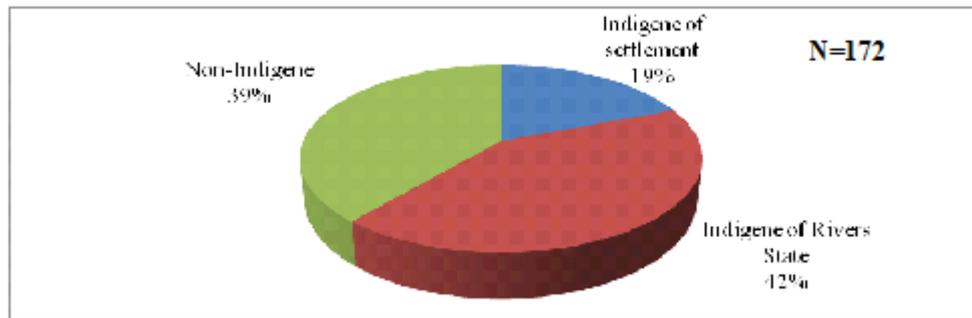
This approach is adopted in the study and the findings are as follows:

#### Demographic Factors

The demographic characteristics of Rumuekini and Ozuoba indicate that there has been a high level of migration into these peri-urban settlements with 81% of respondents being non-natives. This is illustrated in Table 2 and Figure 1.

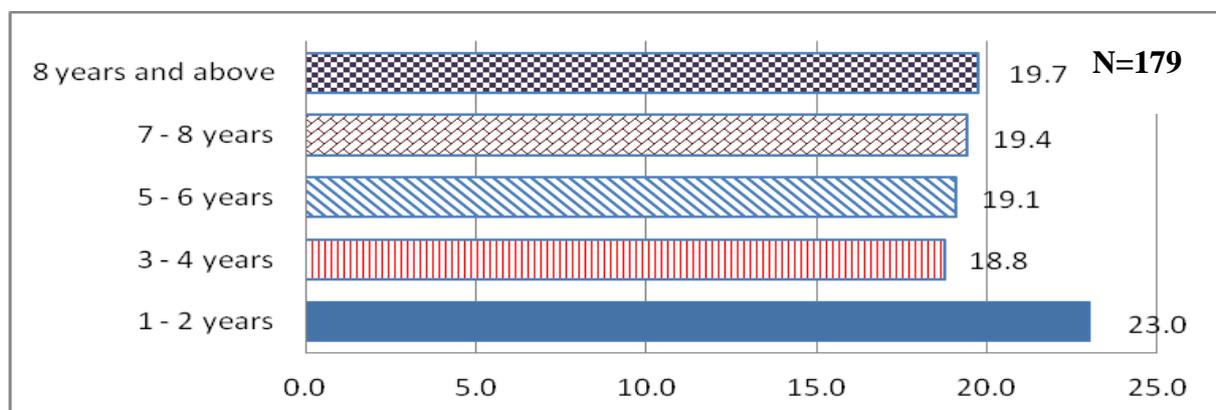
**Table 2: Population of settlements.**

S./N.	Settlement	Population in 2002	Projected population in 2016
1.	Rumuekini	6943	10502
2	Ozuoba	10134	15329



**Fig. 1: Ethnic Origin of Respondents** Source: Field Survey, September 2016.

Another factor that throws more light on the migrant nature of the settlements is the length of stay in neighbourhood. From the survey, that majority of the respondents were new to the settlements. The findings showed that there has been an influx of people into these settlements, hence an increase in conversion to land for building developments and territorial expansion of settlements. It is also obvious from the results of the study that length of stay in these peri-urban settlements is a function of whether the resident is a native of the settlement or a non-native (*fig. 2*).



**Fig. 2: Length of Stay in Settlements** Field Survey, September 2016

### Socio-economic factors

The majority of respondents also gave reasons for their migration to these peri-urban settlements as follows; Land availability for residential development, availability of houses for rent, family ties and related reasons while community families and services was the least reason why residents chose to reside in these peri-urban settlements. This finding shows how the perceived attractiveness of these peri-urban settlements have influenced their growth and transformation and changes in land use and show that perhaps people will want to dwell were

their basic needs can be met. It also indicates that people will be attracted to areas because they are more affordable when compared to other parts of the city.

### **Institutional factors - Ease of relative access to land**

Furthermore, the survey also reveals that the demographic change, and changes in land use experienced in these settlements were also a product of the ease of access to land for residential development. This is because 69% of the respondents that owned property in these settlements reported that it was easy for them to obtain land to build upon in these areas because there were few restrictions and because the communities were willing to sell parcels of land to them. The ease of access to land also explains the reasons why there are more non-natives in these peri-urban settlements. In addition, findings from interview of land agent in the four settlements indicate that most of properties developed by the new residents of the peri-urban settlements were purchased between 2008 and 2012. This is because there were no restrictions to the sale and acquisition of land in these settlements. During this period land prices escalated due to increased demand of plot for residential development. In 2012, the land price in Rumuekini was estimated between N600, 000.00 to N1, 000 000.00 per plot, while in 2016 the estimate was between N1.5 million to 3.5 million depending on the remoteness of the plot. Ozuoba, was also similar to Rumuekini in land price between the period; 2008-2012, but there were variations in 2016 because at Ozuoba it was around N3 million and above depending on location. This indicates that the attractiveness of these communities for residential developments has led to escalation of land prices.

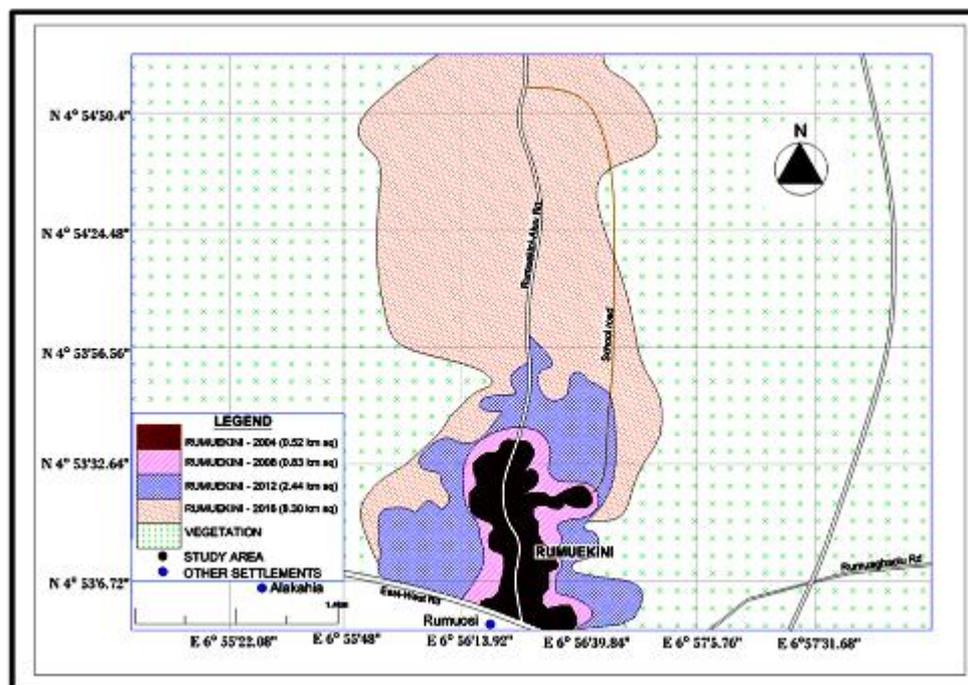
### **Land use Changes in Peri-urban Settlements**

The Map analysis of territorial expansion of peri-urban settlements around the periphery of Port Harcourt city, based on (2004 - 2016) Google satellite imagery, indicates rapid encroachment on peri-urban agricultural land due to increasing housing development. A High level of housing development was noticed in Ozuoba and Rumuekini Figure 3 and figure 4 These areas were predominantly used for agriculture activities in 2004, the base year for the analysis.

### **Trend in Rumuekini Spatial Expansion of built-up area**

Figure 3 shows the spatial expansion of Rumuekini from “undeveloped” to “developed”. It was captured from Google Earth and it shows the land use changed enormously between the periods (2004 – 2016). In 2004 the settlement covered an area of about 0.52 km<sup>2</sup> but the built area of the community later expanded from 0.52 km<sup>2</sup> to 8.30 km<sup>2</sup> in 2016. This growth was

phenomenal considering the fact that it was approximately sixteen times the size of the built up area in the base year 2004. As we can see, this has very strong planning implications and goes on to support other findings of this study such as the proposition that there is a significant rate of migration into these settlements.



**Figure 3: Map of Rumuekini showing spatial expansion of built-up area. Source: Researcher, September 2016.**

### Spatial Expansion of Ozuoba Built-up Area

Apart from Rumuekini, Ozuoba is another peri-urban settlement that experienced tremendous spatial growth and loss of agricultural land. It grew from a size of 1.19 km<sup>2</sup> in the base year 2004 to approximately 6.1 km<sup>2</sup> in 2016. This was over five times the size of the settlement in the base year. Corroborated with other results from the findings of this study, it can be deduced that the growth was motivated by the availability of land for housing development at affordable rates and considerably cheaper rental values as compared to the core of the Port Harcourt city. The spatial expansion of Ozuoba settlement is illustrated in Figure 4. Ozuoba settlement built-up area grew from a size of 1.19 km<sup>2</sup> in the base year 2004 to approximately 6.1 km<sup>2</sup> in 2016. On the basis of these map analysis of peri-urban settlement covering the period between 2004 and 2016, it is clear that there is a general increase in built up areas in the peri-urban settlements of the Port Harcourt leading to increased agricultural land conversions. Furthermore, between 2012 and 2016, the highest change in land use was

noticed. With a percentage increase of 88.9% (12.69 km<sup>2</sup>) within a period of 12 years, there is need for adequate urban planning to be able to address rising challenges. Table 3 further illustrates this change. It could be seen from the survey that most of these new developments were undertaken by developers that were not indigenes of these settlements indicating a growing influence of Greater Port Harcourt city on surrounding peri-urban settlements.

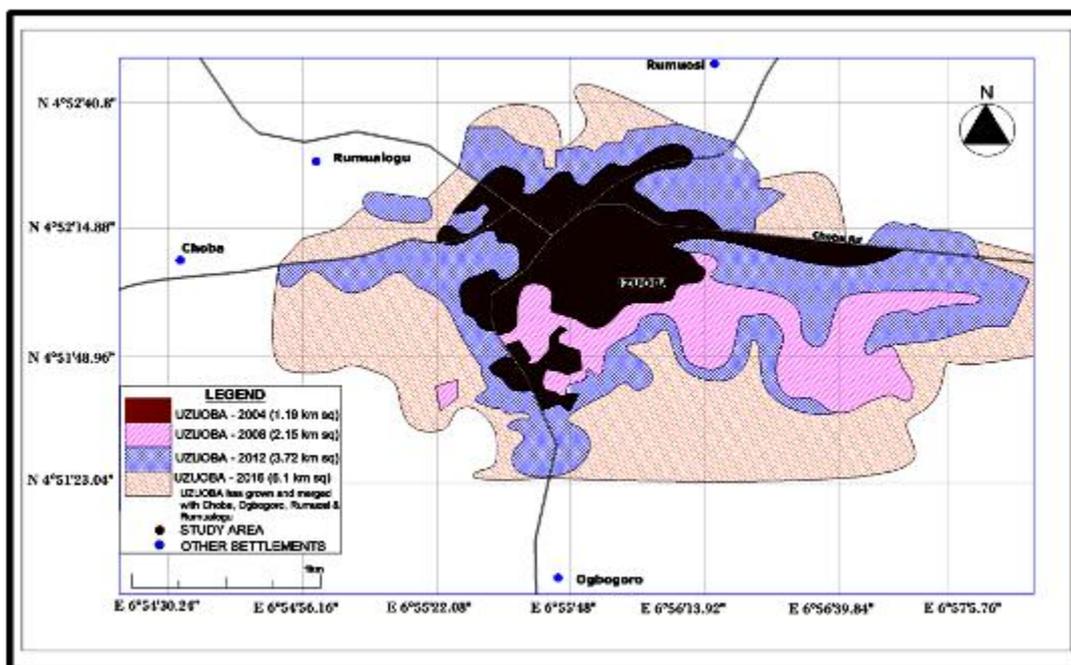


Figure 4: Map of the Ozuoba showing spatial expansion of built-up area. Source: Researcher, September 2016.

Table 3: Cumulative Territorial Expansion Area of the Study Settlements.

Settlement	Built-up Coverage in 2004 (km <sup>2</sup> )	Built up Coverage in 2016 (km <sup>2</sup> )	Trend Change (Spatial expansion) (Km <sup>2</sup> )	Overall Trend Change in %	Distance from City Centre (km)
1. Rumuekini	0.52	8.30	7.78	94.1	16
2. Ozuoba	1.19	6.1	4.91	83.7	15
<b>Total</b>	<b>1.71</b>	<b>14.4</b>	<b>12.69</b>	<b>88.9</b>	

Source: Researcher’s Computation, December 2016

Table 4: Trend in Spatial Expansion of Selected Peri-urban Settlements

Settlement	Trend in Spatial Expansion of selected Peri-urban settlements		
	2004-2008	2008-2012	2012-2016
Rumuekini	31.1 Ha.	161 Ha.	586 Ha.
Ozuoba	98 Ha.	157 Ha.	238 Ha.

Source: Researcher’s Computation, September 2016

### Nature/Problems of Peri-urban Settlements – Environmental Quality

In answering the question: **What are the predominant characteristics of these settlements in terms of environmental quality?**

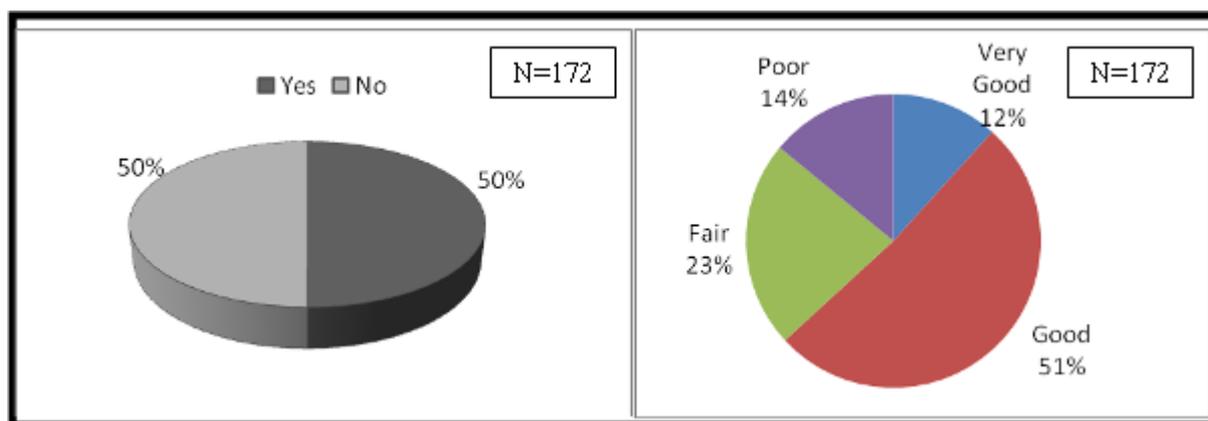
The graphs and tables presented in section were discussed to address the question. In this analysis, housing, neighbourhood and settlements characteristics are appraised.

#### Drainage



**Plate 1: Ozuoba – Road without drainage.**

The study revealed that that only 50% of the streets sampled have drainages, the other 50% do not. This has serious implication especially as it relates to flooding. It will also have a negative impact on the durability of any road being constructed in these areas, in that this will reduce the life span of the roads because they will be prone to erosion. While amongst the streets that have drainages, 12% were in very good state while 51% were considered to be in good state. Of the remaining 37%, those that were fairly good make up 23% and those in poor state, 14%. Results from interviews also provided more insight into this as some of those interviewed reported slight flooding (flood risk) due to poorly maintained roads with no drainages or lack of proper drainage systems to deal with excess run off when it rains. Also, in some of these neighbourhoods, respondents reported that it was difficult to access their homes or the main road when it rains heavily.



**Fig. 5: Presence of Drainage/Drainage Quality** Source: Field Survey, September 2016

### Accessibility

The study revealed that most of the streets had access roads (99.3%). However, the challenge was that a greater portion of these roads were not in good working condition (See plate 1). Also, on the basis on the survey, it was discovered that a majority of the roads (34.9%) had a width that was between 5-7m, those more than 7m in width comprise 31.3% while 30.9% had widths that were between 2-5m. The remaining 3% were either less than 2m or without roads. From observation, Rumuekini had wider accesses roads than Ozuoba peri-urban settlement, especially in the newly developed neighbourhoods.

### Nuisance created by human activities

Respondents when asked if there were activities or land uses constituting nuisance in their neighbourhood gave the following responses. A higher proportion 58% reported (No) while the remaining 42% reported (Yes). Furthermore, those that reported 'yes' when asked what the major issues were, made the following comments: stench from waste dumpsite located close to their homes when wastes are burnt; Noise pollution – the reason being that most of the residents in their neighbourhood use generators to power their buildings and this created lots of noise. The generators also created air pollution because of the thick fumes they release. Another source of noise identified were the numerous churches using high sounding loud speakers outside their buildings. Others identified slight flooding (flood risk) due to the lack of proper drainage systems.

### Waste Management

Responses to the question about how respondents rated waste management in their settlement reveal that most rated waste management low. About 54% rated waste management below average (fair – 29.6% and poor - 24.3%). One major reason for this is because these

settlements did not really benefit from waste collection services provided by government contractors and even in areas where these services are provided, they were not regular. From the survey, you can see that most of the respondents depend on private waste collections for their waste management. The services provided by government contractors serve mainly as a substitute. The results of interviews also provided some insight into the challenges facing waste management at these settlements. Respondents when asked to state other comments they have on waste management, identified a lack of structured collection as a problem in areas that were serviced by government contractors. This was because the wastes were not cleared or collected regularly at the open dump sites leading to land and air pollution. Most were also of the view that the Rivers State Waste Management Agency (RIWAMA) needs to increase its area of coverage and also increase manpower in its system so that the challenge of collecting waste once a month will be greatly reduced and the agency will not perform below expectation. Some also expressed their fears that these open dumpsites if not cleared regularly posed a challenge to health and environmental safety, therefore a receptacle should be provided at different places within neighbourhoods to reduce waste mountains.



**Plate 2: Heap of uncollected Waste in study area.**

## Crime

Responses to question about crime in the peri-urban settlements revealed that not all areas experience crime which is also as a result of security arrangements in some neighbourhood as was indicated by some respondents during interview. Results show that 34% of the respondents have experienced crime in their neighbourhoods while 66% have not. Those that did not experience crime gave reasons for their neighbourhood being crime free as the existence of a neighbourhood watch system, while those that have experienced crime, advocated for constant security patrols and raiding of criminal hideouts and community policing as a means of curbing crime.

## Spatial distribution of settlements

The survey reveals that most parts of the settlements studied were developed in a clustered manner (54%), 32% linear while the remaining 14% dispersed. This is an indication of unplanned and unregulated housing developments and most of these settlements based on interview with land agents also lacked layout plans which should have directed the pattern of spread (growth). This result can also be observed using Google imagery of these settlements in 2016.

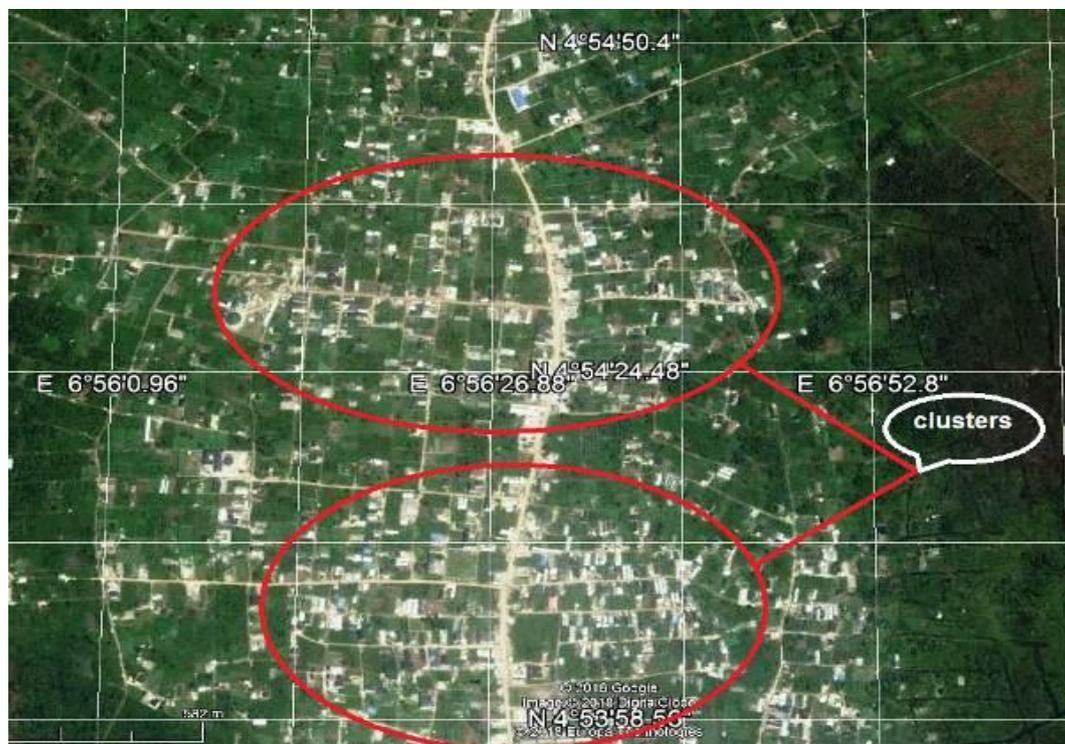
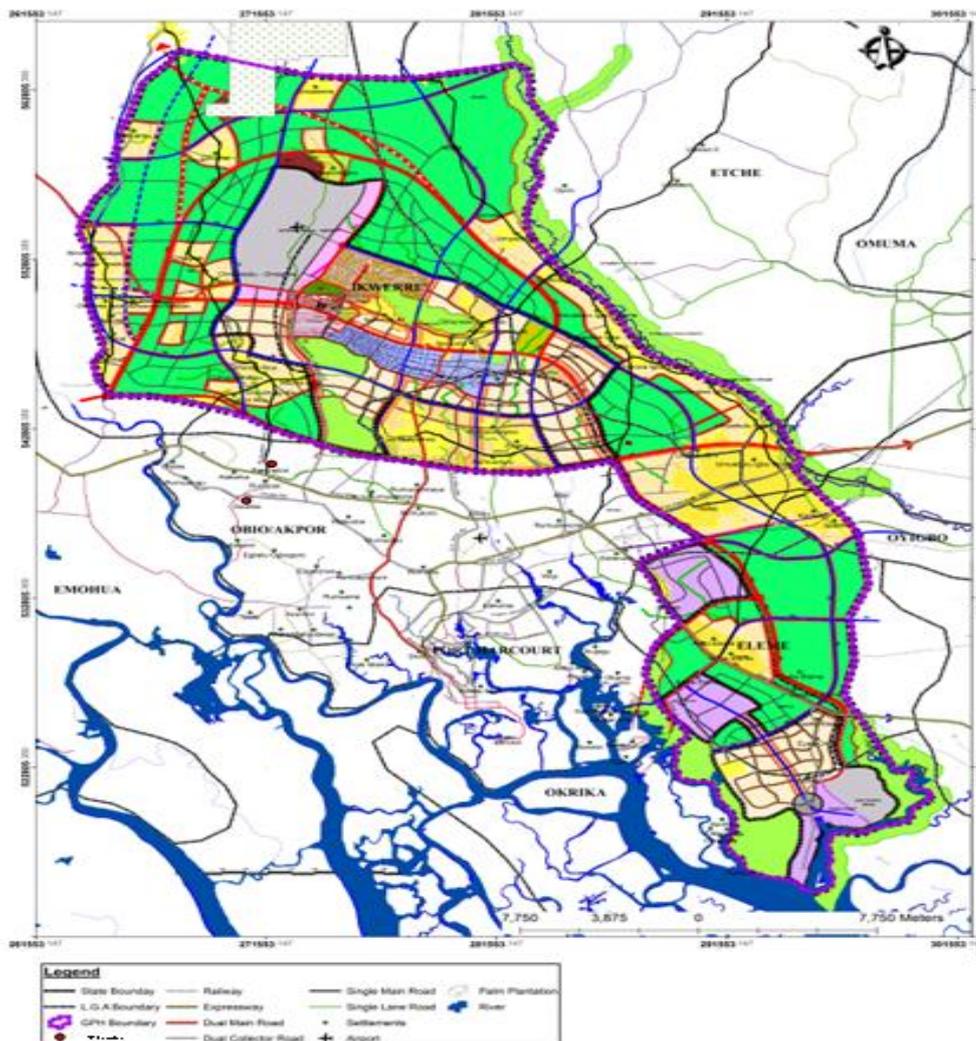


Figure 6: Part Of Rumuekini Settlement showing clusters of development.



Source: Greater Port Harcourt Development Authority, 2016

### Map of Greater Port Harcourt showing its boundaries and the study sites

#### Perception of settlement quality

Respondents when asked what their perceptions were of the settlements in which they resided gave the following responses. Most reported that they were fairly good (47.4%) while those who reported that they were good constituted 37.5% of those sampled. Very few were of the impression that the settlements were very good (9.2%) or poor (5.9%) in terms of neighbourhood quality. On the basis of these results, it is clear that most of the respondents perceive of their surrounding as being conducive for them, irrespective of the non-availability of some of the basic-necessary facilities which supports the idea put forward by Sharma (2015) which states that:

*“developers (house owners) in peri-urban settlements ignore the probable harmful socio-environmental consequences such as flooding, spread of water related diseases and*

*extinction of the natural habitats provided houses are fairly durable and have reasonable infrastructure and services; and if rents are relatively cheap and flexible”.*

### **Conclusion and Recommendation**

On the basis of the research findings, conclusion and recommendations were made in addition to suggestions for future studies.

### **CONCLUSIONS**

Suffice to say that this study has helped to proffer solutions to the key questions that motivated this research, thus it has shown that rapid urbanization motivated by increasing population and the lack of affordable accommodation in the main city has created ample room for the proliferation of many informal settlements in the peri-urban areas of Greater Port Harcourt city. This has impacted greatly and negatively on the peri-urban environment in that it has led to the mismanagement of land resources and environmental degradation. This is evident in the proneness of some areas to pollution, and flood risks as a result of poor access roads lacking proper drainages. It has also created waste management challenges beyond the capacity of the Rivers State Waste Management Agency (RIWAMA). Other challenges created by these unregulated and unplanned housing development is the overbearing development control challenges it poses to planning agencies that are poorly staffed, equipped and lack basic policy framework in which to operate. The study identified a range of issues associated with poor land management and development control systems motivated by weak regulations and institutions. It also discovered that, developers need to be made aware of the impacts of their activities which will in turn promote sustainable land use and create a conducive, living, working, playing and business environment that is aesthetically pleasing. Other reasons that were identified are the belief by most respondents that the plan approval process is too cumbersome and expensive.

### **Recommendations**

#### **Strategies for Promoting Sustainable Land Management Practices in Peri-Urban Settlements**

It is hereby recommended that

- First, the government policy and decision making regarding land development should be based on sound land information system because the current system that is characterised by poor cadastral system will not be effective in regulating physical development.

- Second, the issuance of Certificate of Occupancy on landed property and the issuance of development permit should be seen as a major source of revenue generation for the State government. The procedures for the processing of C of O should also be streamlined so that developers will be eager to obtain it since it is a major requirement for plan approval in the state.
- Third, an integrated approach to land-use management that combines public participation, proper expert systems and GIS in state policies as passed by the house of Assembly of the state, zoning regulations, area layout plans, urban containment/densitification strategies (three areas of focus: land policies, land information management, and land-use management) should be adopted.
- Fourth, the enactment of the state land use policy and implementation of the requirements of the Rivers State Physical Development Law no. 6 of 2003 by setting up the Urban and Regional Planning Board, local planning authorities, Urban and Regional Planning Fund, the Urban and Regional Planning Tribunal and the formulation of the Urban and Regional Planning Policy.
- Fifth, The Development Control Unit of planning agencies in the state should be properly funded, equipped and strengthened with adequate legal backing to cope with the professional challenges of sound development management/control within the city and its periphery. Implementation of proactive measures for new neighbourhoods such as the engagement of community scouts (whistle blowers) and an excellent monitoring mechanism for already built up neighbourhoods.

## REFERENCES

1. Adam, A. G. Institutions Governing Informal Settlements in the Peri-urban Areas of Bahir Dar, Ethiopia. *FIG Congress 2014, Engaging the Challenges – Enhancing the Relevance* (p. 17). Kuala Lumpur, Malaysia: Institute of Land Administration, Bahir Dar University, 2014.
2. Afrane A. & Amoako, S. *Peri-Urban Development in Kumasi*. Kumasi: Future of the Tree: Towards growth and development of Kumasi, 2010.
3. Allen. A, Nilvo L. A. Da Silva and E. Corubolo Environmental Problems and Opportunities of the Peri-Urban Interface and Their Impact upon the Poor; *Strategic Environmental Planning and Management for the Peri-urban Interface Research Project*. Retrieved from *PUI website*: <http://www.ucl.ac.uk/dpu/pui>, 1999.

4. Bishop, P. Multi-Site Case Study. In: A. J. Mills, G. Durepos & E. Wiebe, eds. *Encyclopaedia of Case Study Research*. Thousand Oaks, CA: SAGE Publications, Inc, 2010; 588-591.
5. Ejaro, S. P & Abubakar, A. The challenges of rapid urbanization on sustainable development of Nyanya, Federal Capital Territory, Abuja, Nigeria. *Journal of Applied Science and Environmental Management*, 2013; 17(2): 299-313.
6. Johnson, R. B. *Mixed methods research design and analysis with validity: A primer*. Department of Professional Studies, University of South Alabama, USA, 2014.
7. Kyessi A. G, & R. Johansson Governance of Land and Municipal Services in Urban Centres in Tanzania, *Institute of Human Settlements Studies, Ardhi University*, 2015.
8. Naab, F. Z., Dinye, R. D., & Kasanga, R. K. Urbanisation And Its Impact On Agricultural Lands In Growing Cities In Developing Countries: A Case Study Of Tamale In Ghana. *Modern Social Science Journal*, 2013; 2(2): 256-287.
9. Oyalowo B, A & Alade, W A frame work for Sustainable Land Management in Peri-Urban Areas of South-West Nigeria. *The International Journal of Sustainability in Economic, Social and Cultural Context*, 2015; 8(3): 15-30.
10. Rabinowitz, P. *Protecting Environmental Quality*. Internet article: Retrieved from [www.ctb.ku.edu](http://www.ctb.ku.edu) and [www.community-earth.ku.edu](http://www.community-earth.ku.edu), 2016.
11. Ravetz, J., Fertner, C., & Nielsen, T. S. The Dynamics of Peri-Urbanization. *Springer-Verlag Berlin Heidelberg*, 2013; 13-15-22.
12. Rockefeller Foundation. Degradation and Loss of Peri-Urban Ecosystems. *Decision Intelligence Document, Cycle*, 2013; 2: 1-12.
13. Science for Environment Policy. (2015). Indicators for sustainable cities. In-depth Report 12. UWE, Bristol.: *Produced for the European Commission DG Environment by the Science Communication Unit*., Retrieved March 12th, 2016. from <http://ec.europa.eu/science-environment-policy>.
14. Sharma, M. S. Peri-Urban Area: A Review of Problems and Resolutions. *International Journal of Engineering Research and Technology (IJERT)*, 2015; 4(09).
15. Yin, R.K. *Case Study Research: Design and Methods* (4th ed.). Thousand Oaks, CA: SAGE Publications, 2009; 29-31-34.