International Journal of Sustainable Development
ISSN: 2384-5341. Volume 11, Issue 2, (October, 2016) pages 27 - 49
www.africaresearchcorps.com

Toward Sustainable Development of Residential Layouts of Bori Ogoni, Rivers State, Nigeria

Baadom, Livinus E.[1], Nwiganale, Ledum Sheriff[2] and Needam, Yiinu[3]
[1]Department of Urban and Regional Planning, School of Environmental Technology, ken Saro-wiwa Polytechnic Bori, Rivers State, Nigeria. livybas@yahoo.com , 08034983226.
[2]Department of Environmental Management, Enugu State University of Business School, Enugu State, Nigeria. lysheff@yahoo.com
[3]Department of Surveying and Geo-Informatics, School of Environmental Technology, Ken Saro-Wiwa Polytechnic Bori, Rivers State, Nigeria. needamyiinu@yahoo.com

Abstract: *Functional residential layout does not only enhance beautification of the built environment but assists in qualitative social and economic sustainability of urban area. The residential area remains an allocated space of the city main for living, sleeping and the carrying out of other domestic as well as recreational activities for the wellbeing of human. The study aims to assess problems of confronting residential layout of Bori, Ogoni with the intention of proffering sustainable solutions. Multi-stage sampling techniques were adopted through the identification of streets, buildings and households. Subsequently, 332 questionnaires were administered targeting heads of households. Findings revealed that Bori residential environment lacks basic urban foundations such as pipe borne water, regular electricity, tarred roads, and workable drainage system. Physical development is found to be uncoordinated as most of the buildings within the study area are outdated and even built without consideration of town planning standards such as setbacks, building sizes and open spaces. Other socio-economic variables like increasing unemployment, insecurity and other vices are found to be predominant. A review of the 1972 Bori Master Plan should be carried out. Also, urban renewal should be conducted as action area plan to address the growing problems which tend to impede sustainable residential layout in the area.*

Key words: *Sustainable development, Urban area, Residential layout, Planning standard, Environmental quality*

Introduction

The residential environment occupies central point in the planning and functionality of any city. This is sequel to its physical, social and economic roles it plays in the determination and actualization of functional city. Thus, Duruzoechi (2001) while determining space allocation to the various land uses base on town planning standards reveals that residential land uses occupy 40% of the total land use of any standard city. The residential area is a space within the urban setting for living, relaxation and domestic activities which take up the majority of developed land and longer period of residents' life is spent within the land use.

Due to its complex functions, the designed pattern of the residential area can simply make lives a pleasure, hard, increase or reduce opportunities, determine population size in terms

of occupancy ratio, as well as provision of standards for densities. Thus, according to Biddulph (2008), the planning and design of residential areas should create physical conditions where economically, socially and environmentally sustainable lifestyles become possible. Accordingly, he maintains that economically housing should form part of a wider economy that remains popular with not only the initial residents but also subsequent residents, while commercially and community uses should be designed and integrated into any plans so that they remain viable. Also, the design of the residential layout of the city should allow residents to have equity of access to housing, the wider environment or facilities and that of the residents should be able to enjoy good quality of life while environmentally, it should create conditions where resource consumption is minimized and biodiversity within or around the residential area are enhanced and sustained.

The residential environment may be generally viewed as an aspect of the city which is generally free from industrial and major commercial activities. Thus, the Oxford Advanced Learners Dictionary defines residential as part of a town that are suitable for living in; consisting of house rather than factories or offices. Therefore, there exist differences between the residential neighborhood from the industrial and commercial land uses.

The study and assessment of residential area has generated a lot of attention especially in the fields of urban and regional planning, urban geography, sociology, demography and urban ecology as well as in recent time, environmental management. These fields have attached different names ranging from housing, shelter, and living space to the same concept (Residential Area). Okoye (2001) reveals that in its broad sense, residential area means more than a shelter and that it should be understood in the context of one's immediate living environment, comprising the shelter itself and its surroundings. This shows that the residential layout should consider the basic and ancillary facilities that will make life meaningful for living.

The living environment is also referred to as the physical territory or space that are occupied by the residents and whose major social activities are carried out within same living space. Churchman and Rosenfeld (1978) state that the term residential environment refers to the dimensions and boundaries that are significant to the conduct of accommodation, shelter of household members as well as recreation and other institutional satisfaction. Thus, the residential area deals with the physical boundaries and limit of the neighbourhood for the purpose of urban organization and the boundaries of more limited areas as subjectively perceived by the residents (Hallman, 1984).

The degree of interaction which exists between the physical setting of the environment and that of the social variables is at one point, used in the determination of the residential space within the urban area. These physical spaces as well as the nature of social activities as individual elements do not actually reveal the residential environment since the individual variable may exist within other land uses. This is in line with Rapport (1997) who states that the definition of space is partially based upon physical and social images; the variables are not only the area and its dimensions but also the degree of overlap between social and physical space

which actually defines residential area and separates it from other land uses. Though, some other researchers like Kain (1970) and Richardson (2001) view residential environment based on large quantity of buildings which are not found in other land uses. These buildings vary in size and number based on the number of households revealing density and occupancy ratio. This increasing number of houses actually determines differences between residential areas and other uses of land. Pacione (2003) ascertains that residential area is a land use in which, housing predominates, as oppose to industrial and commercial areas.

The measurement of the physical and environmental quality of residential unit is one of the challenging aspects of residential (housing) researchers. It is at one point, based on the subjective basis of the quality judgment (parameters) for residential conditions. These conditions are established in terms of policy and standards. According to Sule (1980), the establishment of the housing standard is a problem associated with the formulation of a housing policy. Consequently, no attention is paid to the manner in which standards are being established and virtually absent might be an integral element of housing policies which determine quality of residential environment.

Also, the measurement of standards depends on several factors which are instrumental in the determination of residential qualities. The standard still vary base on national relating to the residential environment. Duruzoechi (1999) confirms that the issue of standard in housing (residential environment) may be seen in relative terms but there are basic parameters that could be used to measure the standard of any dwelling unit. Assessment of residential quality is a factor of standards assumed on minimum specifications. Beyer (1965) observes that standards should define the housing or residential goals towards which a nation strives; and that little attention has been given to the manner whereby standards are being established. One of the basic instruments used in determining qualitative residential environment is functional physical planning and the implementation of planning standards. The standards of planning for the physical structure of dwelling have major effects on housing quality and environmental condition since they influence density and distribution of population within the urban space.

Emenike (1999) reveals that planning standard for the design and layout of dwellings in any urban area should aim at maintaining health and social well being of the population; expressed in terms of density, facility and structural conditions. Also, according to Sada (1978), the expression of structural conditions and facilities in individual buildings are vividly stated in Nigerian legal system. Two sets of acceptable minimum housing standards were promulgated to be practiced to maintain quality of residential environment. One is that of the Nigerian town planning act of 1959, while the other is that by the national council of housing. Sada (1978) reveals that the town planning act of 1959 states that a residential building must have a minimum of shower bath, flush toilet, electric light, pipe borne water, adequate ventilations and building material of durable nature, while the national council of housing maintains that a house should have one to three bedroom, seated rooms, flush toilet, shower and kitchen.

It is interesting to note that relationships between household population, habitable room

(occupancy ratio), the state of contemporary government policies in relation to housing quality as well as the combination of the parameters of the stated legal institutions appear silence in the operation of residential standards in Nigeria. Omuta (1983) reveals that government is silent on the association between housing quality and environmental sanitation which to a large extent determine quality of life within any urban environment.

In Nigeria, occupancy rate is also used in the determination of quality of residential environment as applied in other nations in the world. This in particular considers number of persons permissible per habitable room (Obateru, 2013). Some others rightly pointed out that an examination of existing patterns in the residential area of Nigerian cities, suggest that a habitable room shall be occupied by not more than two (2) people (Onokerhoraye, 1982; Vagale, 1971). These stated figures are observed by various researchers to be the standard of high density residential neighbourhoods in developed nations. Ozo (1987) maintains that the United Nations Organization regards occupancy of three (3) or more as overcrowding and inhabitable while health regulations provides for a maximum occupancy ratio of two (2) in tropical areas. Though, Obateru (2013) while assessing standards of residential environment in Nigerian urban areas specifically classified residential areas and recommends occupancy rates as, low density – 1.0; medium density – 1.5; high density – 1.75 and specially high density class with occupancy rate of 2.0. In determining occupancy rates, Obateru (2013) reveals that no account may be taken of a child that is less than one year old, while child of 1 – 11years may be regarded as constituting one half of an adult; while above eleven years is considered as adult (see table 1). It is significant to note that the number of persons in a household indicates the degree of facility sharing and generally the larger the number of households within a specified residential area, the greater the occupancy rate and density, the higher in the loss of privacy, convenience and increasing degradation in neighbourhood facilities, services as well as environmental quality.

Table 1: Residential Density Control Variable

Density Class	Number of Person Per Net		Occupancy Rates	No. of Habitable Rooms Per Net	
	Hectare	Acre		Hectare	Acre
Low	75	30	1. 0	75.0	30.0
Medium	200	80	1.5	133.3	53.3
High	375	150	1.75	214.3	85.7
Specially High	600	250	2.0	300.0	125.0

Source: Obateru, 2013 – Controlling Residential Densities, Pg 10.

The nature of the environment also occupies central point in the determination of quality of residential environment. Sada (1978) looks at environmental quality as the level of public health and medico social facilities, all of which seeks to protect man from the dangers of his health and life. This reveals that the residential environment provides a level of security for its inhabitants, and quality is proportionate to the level of natural security. It is observed that an environment is rated good or livable if those physical qualities are present with the residential environment of such urban area which will also tend to reduce in citizens a feeling of mental, physical and social well being according to the extent to which their fundamental day to day living needs are satisfied (Chapin, 1978).

Vagale (1971) maintains that to determine environmental parameters that could be used to judge good, bad or merely tolerable residential quality, the following should be used to rate qualities of a good environment. Accordingly, these are: Freedom from nuisance, healthy surrounding, availability of employment opportunities, availability of modern amenities, opportunity for educational development, access to medical care and presence of recreational facilities.

The process of assessment of quality of residential environment takes different methods.. The appraisal method is one of the outstanding means of assessing individual and general structures which collectively determined the entire environment. It involves evaluation of specific items like plumbing, electrical fittings and sewage facilities. Quality of physical components like walls, floors, stairs as well as area measurement and environmental characteristics like temperature of rooms, number of rooms are some of the parameters of measurement (Duruzoechi, 1999). In addition to the assessment of the physical structure of the dwelling unit, the quality of the residential environment in which the house is located must be evaluated (Breheny, 2001). Different elements are used in the consideration of quality of residential environment as parts of the environmental parameters. Measurement relating to incompatible land use, proportion of structure, good and poor quality traffic conditions, storm drainage systems and general cleanliness of the area are observed to still constitute important factors (Fasli, 2003; Doratli, 2004). Generally, according to Obateru (2012), the residential quality is assessed, base on the general parameters of availability of social facilities and amenities (see table 2), economic levels – income, functionality and spaciousness; and population (density) within the residential environment.

Table 2: Land Allocation in Residential Neighbourhoods

Land use	Percentage
Residential (housing plots)	50 – 60
Roads and streets	15 – 25

Commercial	3 – 5
Service industries	2 – 3
Outdoor recreation	6 – 8
Utilities, facilities and services	10 - 15

Source: Obateru, 2012 – Land Subdivision Basics, Pg 41

Other parameters like setbacks of building from the access road, width of access roads, height of building size of rooms, roofing, and total built up area within the plot as well as activity within in relation to the totality of the residential neighbourhood are considered for the approval and issuance of building permit as major factors for the assessment of quality of residential environment. Regulation and control of buildings in terms of quality and space affect the environment and quality of life of the residents which are also considered in the approval of building permit (Tricker, 2006; Ardill, 1974). Thus, building approval and permit constitute significant role in the determination of quality of residential environment.

Methodology

This research paper entails the identification of residential areas within Bori urban environment, through recognizance survey. Subsequently, the study involved detail identification of the target population which is composed of household members residing in the study area. The study adopted the stratified multistage sampling technique (Kish, 1965). The sampling stages are given below;

1. The identification of all the streets/roads within Bori residential area
2. Listing of buildings and households from the selected streets
3. Selection of households to be studied from the chosen streets and buildings
4. Selection of household respondents in the households to be studied, targeting heads of households

In detail, the study identified a total of 52 streets within Bori. Subsequently, 5 streets representing 10% of the streets were sampled for building and household counts using probability sampling techniques. Following determination of the sample size, the systematic sampling method (Kish, 1965) was used to select the households to be questioned with the structured questionnaire. This study adopted a passive – observational research design. Passive – observational research designs pertain to studies where there has been no prior treatment, intervention, rather, it entails questioning a sample of household respondents at one point in time without any experimental manipulations (Cook and Campbell, 1979).

A total of 2, 904 households were counted on the 5 sampled streets (see table 3 below).

Table 3: Sampled Streets and Households

Street	No. of Household	No. Sample Households
Kaani	603	69
TTC	647	74
Gokana	758	87
Bank Raod	512	58
Nortem Street	384	44
Total	2, 904	332

Source: Authors' Field Survey, 2016

The Yamane formula was used in the determination of actual sample size (the sample population that was interviewed by the researcher)

Yamane (1965) formula as follow:

$$\mathbf{M} = \frac{N}{1 + N(e)^2}$$

Where;

n = sample size

N = population size

e = level of precision (here set at 5%)

Similarly, observations of infrastructural facilities, such as roads, drainages, setback of buildings from access road, were also undertaken at one point in time.

Bori is the traditional headquarter of Ogoni in Rivers State and the administrative head of Khana Local Government Area. It is also the hoist to one of the fastest growing higher institutions in the Niger Delta – The Ken Saro-Wiwa Polytechnic. Sequel to its proximity to Port Harcourt the Capital of Rivers State and the administrative head of the oil rich Niger Delta of Nigeria, Bori becomes the fastest growing city in Rivers State after Port Harcourt. It is also the major commercial artery not only to the people of Ogoni but to other Riverine Communities of Andoni, Opobo, Nkoro and even Akwa Ibom.

The name Bori was derived from one of the adjoining communities – Booli (Bori) which today with other communities such as Nortem, Zaakpon, Kor, Kaani and even Nwiyaakara,

constitute the present day Bori.

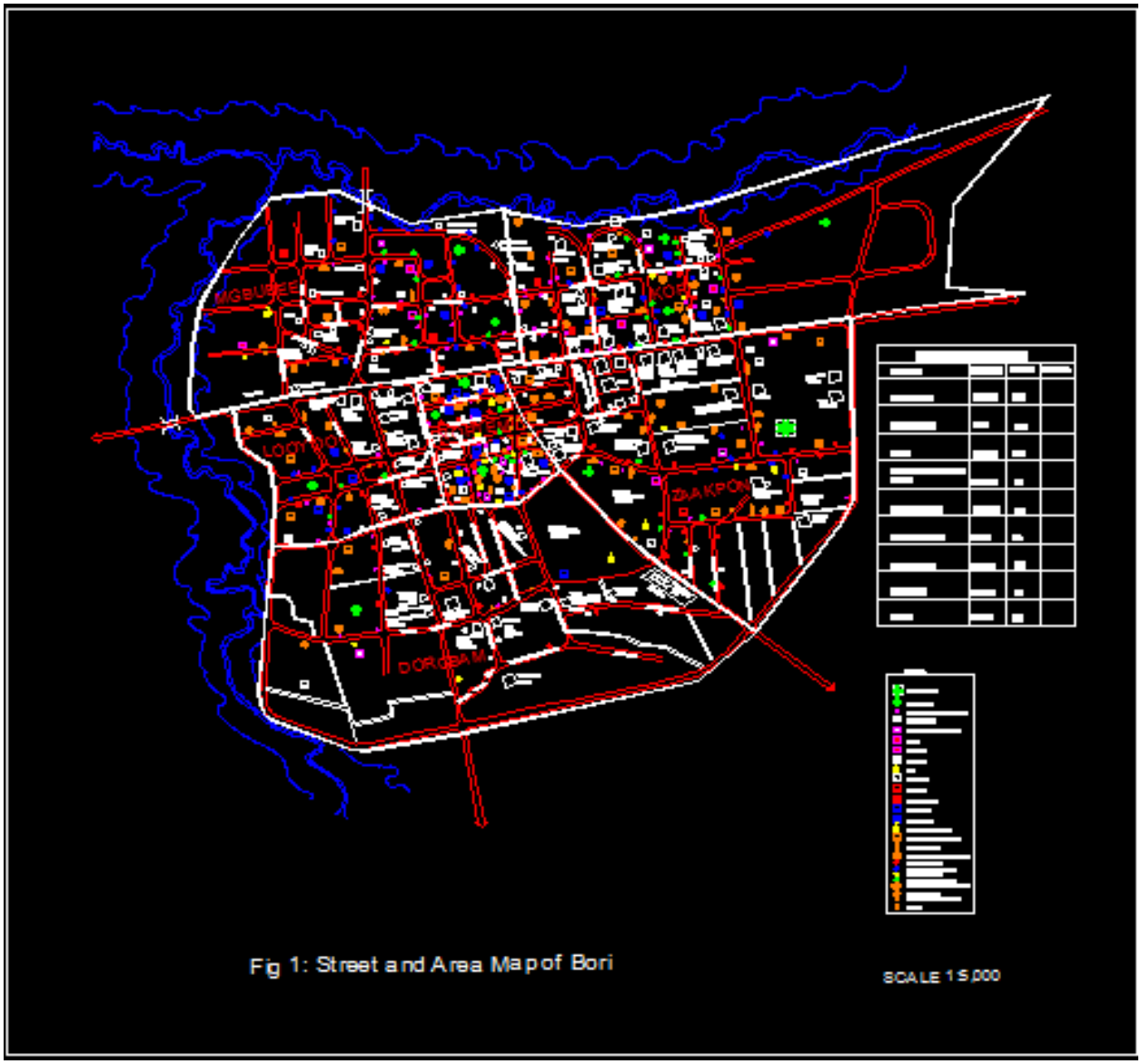
Geographically, Bori consists of a low ridge sloping to the North and South reaching a height of about 50ft above the sea level (Igbara, 2013). It is bounded to the North by the Luubara River which presently constitutes one of the physical constraints affecting its expansion toward the towns of Kor and Kaani (see fig. 1). To the east, it is bounded by Nwiyaakara and to the south and West by Zaakpon and Yeghe native communities. Bori has climatic conditions as the same with that of the Niger Delta - tropical and rainy. The average rainfall over the years is about 107.6 inches. The dry season lasts from December to March. Rainfall increases in March and April, reaching its Peak in July after which there is generally a short dry period in August (Bori Master Plan, 1972). The dry season has less cloudiness but experiences "Harmattan" - A dry desert wind from the north which carries fine sand. According to Bori Master Plan (1972), temperature in Bori ranges between minimum of 70^0F during the months of February and March, both extremes occurring in the dry season.

It is significant to note that most of the vegetations within the area is of secondary existence and mostly used for cultivation except marginal parts lying within floodplain of Lubara River and wetlands of Zaakpon which at the point in time, supports the growth of raffia palm, which according to Igbara (2013) is the source of palm wine – a product of major occupation of the people and other domestic vegetative utilities.

Historically, the topography of Bori necessitated the interest of the colonial officer to choose the area as the divisional headquarter. Thus Hollard (1947) ascertains that Bori is of low ridge sloping gently to both South and North which will enhance effective development as Divisional headquarter. The observed ridge has being part of the network of undulations which characterized the region.

The study area is characterized by deposits of sedimentary alluvium as applicable in many cities and settlements of the Niger Delta. The major types of soil in the study area as stated by the Bori Master Plan (1972) are shallow, poorly drained and acid sulphate soil. On physiological ground, different soil types can be identified within the area, some of them are;

- The swamp or basin soils like silky-clay-loamy or sandy – loaming soil which undated by water for most part of the year. This type is highly located along Lubara River and within swampy areas of Zaakpon.
- The soils of the high – lying leaves e.g. sandy – loaming, loaming sandy and silty – loamy
- The soils of the low-lying leaves e.g. the moderately fine texture, red silt or clay-loamy soil
- The silted river bed soils eg peat – clay water logged soils found mainly in the beds of dead creeks, streams, watershed and floodplains.



Results and Discussion

This section of the paper presents result of analyses carried out in the course of the study. Three hundred and thirty two (332) household questionnaires were carefully administered and all retrieved since enumerators were employed, trained while proper supervision was carried out on this aspect.

Table 4: Type of Building

	Sampled Streets					
Building Type	Kaani Rd	TTC Rd	Gokana St.	Bank Rd	Nortem	Total

	No	%	No	%	No	%	No	%	No	%	No	%
Temporary	8	11.6	12	16.2	16	18.4	2	3.4	11	25.0	49	14.8
Rooming	32	46.4	31	41.9	38	43.7	36	62.1	23	52.3	160	48.2
Flat/Bungalow	17	24.6	23	31.1	21	24.1	15	25.9	18	18.2	84	25.3
Storey Building	12	17.4	8	10.8	12	13.8	5	8.6	2	4.5	39	11.7
Total	69	100	74	100	87	100	58	100	44	100	332	100

Source: Authors' Field Survey, 2016

Table 4 above reveals the type of building as perceived by the respondents on the sampled streets of the study area. The table ascertains that 160 respondents representing 48.2% confirmed that most of the buildings were rooming in nature. This is followed by 84 symbolizing 25.3% who maintained that flats/bungalows were found within the area. It is significant to note that temporary buildings occupied about 14.8% as 49 out of the 332 respondents confirmed this assertion. This shows the presence of very low quality residential character which also affects the quality of life of the people. Though only 39 out of the 332 representing 11.7% unveiled that storey buildings were also found within the sampled streets of the study area.

Table 5: Condition of Street Surface

Condition	No	%
Tarred	46	13.9
Not tarred	204	61.4
Tarred with Potholes	82	24.7
Total	332	100

Source: Authors' Field Survey, 2016

The table above manifests the conditions of streets within the sampled area. The table shows that 204 out of the 332 respondents representing 61.4% confirmed that the streets were not tarred. Though 24.7% of the total respondents revealed that their roads were tarred but with a lot of portholes which reduced traffic flow. Table 5 above also reveals that 46 symbolizing 13.9% of the total respondents revealed that the roads were tarred.

Table 6: Sources of Water Supply

Source of water supply	No	%
Pipe borne water (public)	2	0.6
Pipe borne water from borehole (private)	69	20.8
Well	8	2.4
stream	11	3.3
Buy from neighbour's borehole	242	72.9
Total	332	100

Source: Authors' Field Survey, 2016

Table 7: Means of Transportation

Transportation	No	%
Public Transport (buses)	24	7.2
Taxi	16	4.8
Private Cars	13	3.9
Motorcycle	279	84.1
Total	332	100

Source: Authors' Field Survey, 2016

Table 6 above unveils the respondent's perception pertaining to their sources of water supply. The table shows that majority of the respondents (242) got their water for sustenance from purchase of neighbour's boreholes. Though, 69 out of 332 representing 20.8% had their private boreholes as their sources of water supply while 8 symbolizing 2.4% and 11 representing 3.3% respectively got their water supply from well and stream.

Also, the above table 7 shows the various means of transportation of respondents and their household members to their different places of work, school and business. The table shows that 279 representing 84.1% used commercial motorcycle as their major means of transportation. It maintains that 24 symbolizing 7.2% used public transportation more especially buses while 16 used taxi. The table maintains that 13 out of the 332 respondents representing just 3.9% had private cars which they used as their prime means of transportation.

Table 8: Availability of Building Facilities

Building Facilities	Availability					
	Yes		No		Total	
	No	%	No	%	No	%
Flush Toilet	153	46.1	179	53.9	332	100
Shower Bath	96	28.9	236	71.1	332	100
Electric Light	259	78.0	73	22.0	332	100
Adequate Ventilation	102	30.7	230	69.3	332	100
Pipe Borne Water	2	0.6	330	99.4	332	100

Source: Authors' Field Survey, 2016

Basic building facilities and services which are used in determining quality of building as well as residential environment are portrayed on table 8 above. The table reveals that 300 out of the 332 respondents symbolizing 99.4% revealed that they never had pipe borne water in their residential buildings while only 2 representing 0.6% revealed to the researcher through the structured questionnaire that they had pipe borne water in buildings. The table maintains that 230 representing 69.3% and 236 out of the 332 representing 71.1% respectively unveiled that their residential buildings did not possess adequate ventilation and shower bath, which are predominate in the assessment of quality of residential areas and layouts.

The above table 8 discloses that only 153 representing 46.1% had flush toilet while over average of about 78.0% revealed that they had electric light despite its high rate of irregularity.

Table 9: Environmental Parameters

Environmental Parameters	Yes		No		Total	
	No	%	No	%	No	%
Freedom from nuisance	41	12.3	291	87.7	332	100
Healthy surrounding	36	10.8	296	89.2	332	100
Availability of Employment Opportunity	51	15.4	281	84.6	332	100
	48	14.5	284	85.5	332	100

Availability of Modern Amenities	63	19.0	269	81	332	100
Access to Medicare	146	44.0	186	56.0	332	100
Opportunity for Educational Development						

Source: Authors' Filed Survey, 2016

Generally, the Bori residential environment had various types of buildings in which, most inhabitants occupied rooming buildings. The type of building reveals a significant degree of social and economic classes of the dwellers which is an element of quality of education, man power training and economic strength. Thus, it has been found that strong relationship exists between socio-economic classes of people and the quality of residential area where they live. These buildings as mostly found in the study area do not possess proper facilities that should enhance sustainable residential layout as well as quality of life of the residents.

A close analysis of table 9 manifests that most determinant variables tailored toward the assessment of sustainable residential layout are traced from the physical, social, and economic aspects of the environment. These are freedom from nuisance, health surrounding, availability of employment and modern amenities as well as opportunity for educational development (see table 9). Though, attributes to some of the stated variables which also deal with sustainable residential environment, are well- planned area with necessary and adequate infrastructural facilities such as good roads and proper sewer system.

Table 9 above shows that the residential environment of Bori has not been free from nuisance. Such manifests high and increasing level of social vices such as robbery, prostitution, kidnapping, assignations and general gangsters. The table maintains that accessibility to affordable and qualitative medical care is completely absent in the area as more than 80% of the respondents ascertained this assertion. Another determinant of sustainable residential layout is availability of employment opportunities. About 84.6% of the total respondents simply complained of lack of employment which presently affects significant population of Nigerian youths especially the urban dwellers Though, Bori urban area still experience low opportunity for educational development 44.0% despite that it is a hoist community to the one of the state's polytechnic (Ken Saro-Wiwa P0lytechnic) which is one of the fastest growing higher institutions in the Niger Delta.

Observations from enumerators through the questionnaires disclosed that majority of the buildings (83%) were located almost on the pedestrian lines, drainages and even right of ways (see fig. 2).

Fig. 2: Buildings without Setbacks

A strong sign that the buildings were not properly planned and do not respect any town planning standards in terms of setbacks, percentage of built up area, height of buildings, sizes of rooms, and occupancy ratio etc. Thus, most of the buildings (93%) do not possess appropriate planning permits from the town planning authority of the local government council and even the zonal town planning office. Most of the buildings were unpainted and even the painted ones were observed to be over twenty years (see fig. 3a and 3b).

Fig. 3 a: Unpainted Building of the Study Area

Fig. 3b: An Aged Painted Wall of Residential Building in the Study Area

The roofs of the buildings were mostly corrugated iron sheets (78%) which are strongly affected by lead and subjecting them to rust more especially as the study area is located within the coastal zone were the South West Winds easily blow the Atlantic particles and deposit in the area. Deposition of these particles on the roofs of these buildings results in rusting (see fig. 4 a and 4b).

Fig. 4 a: Rusted Building Roof in the Study Area

Fig. 4b: Blighted Residential Building on the Sampled Street

Also, the respondents revealed that the area experienced periodic flooding (76%) especially after heavy rainfall as most of the streets do not possess functional drainage system (see fig 5 a and 5b).

Fig. 5a: Ineffective Drainage on Gokana Street of the Study Area

Fig. 5 b: Unpaved Sampled Street Subject to Periodic Flooding

Street lighting is completely out of the reach of the area as over 95% of the respondents revealed that they had never seen street light in Bori.

Conclusion

This paper has critically investigated into present problems of residential areas of Bori Ogoni. The study reveals that the residential settlements within the study area fall below the acceptable physical planning and environmental standards which are responsible for ineffective sustainability of residential qualities. It is also found that the residential buildings within the area lack basic housing amenities and are mostly rooming.

The information from the various tables remains tools for the re-organization of the residential settlement to achieve sustainable and functional residential area.

Recommendation

Sequels to the findings the following specific recommendations are made which are tailored toward the provision of lasting solution to the growing urban area which will enhance sustainable residential layout in Bori. The Rivers State and Khana Local Government should review the 1972 Bori Master Plan. The Local Planning Authorities should be empowered to monitor

building activities in the area and to ensure compliance to environmental standards. Urban renewal should be carried out on structures and some areas with the urban environment. Also, basic facilities, utilities and services should be provided in the area.

References

Ardill, J. (1974). The New Citizen's Guide to Town and Country Planning. Charles Knight and Co. Ltd London.

Beyer, C.H. (1965). Housing and Society. Macmillan Company, New York.

Bidduphy, M. (2008). Introduction to Residential Jordan Hill, Oxford, UK.

Chapin, F.S. (1978). Urban Land Use Planning University of Illinois Press, USA

Churchman, A. and Rosenfeld, N. (1978). Guideline for the Design of Residential Environments: The Precinct Level, Haifa; Technion, Faculty of Architecture and Town Planning (Hebrew).

Cook, T.D; and Campbell, D.T. (1979). Quasion Issues for Field Settings. Rand Mc Nally Chicago, USA

Dar al-handasah Consultants (1972). Bori Master Plan. Rivers State of Nigeria, Ministry of Lands and Housing.

Doratli, T. (2004). An Analytical Methodology for Revitalization Strategies in historic Urban Quarters: A Case Study of the Walled City of Nicosia, North Cyprus. Cities Vol. 21 No. 4

Duruzoechi, N.F. (1999). Housing Development and Public Policy. Alphabet Nigeria Publishers, Owerri, Nigeria

Duruzoechi, N.F. (1999). Urban and Regional Planning Law and Building Regulations in Nigeria. Alphabet Nigeria Publisher, Owerri, Nigeria.

Duruzoechi, N.F. (2001). Town Planning Practice in Nigeria. Krisdon Graphic Limited Owerri, Nigeria.

Emenike, G.C. (1999). "Housing" in Oyegun and Adeyemo (eds). Port Harcourt Regional; Paraphics, Port Harcourt.

Fasli, M. (2003). A Model for Sustaining City Identify. Case Study Lefkosa (Nicosai) in North Cyprus. Unpublished PhD Thesis Eastern Mediterranean University, Famagusta.

Hallman, H.W. (1984). Neghbourhoods, their Place in urban Life. Beverly Hills, Sage.

Holland, S.W.C. (1947). "Report of the Acting Divisional Officer. Calabar Province on Bori". File No. 09/1395/128.

Hornby, A.S. (2000). Oxford Advanced Learner's Dictionary. The 6th Edition. Oxford University press, New York.

Igbara, P.I. (2013). The Emergence of Bori Town: the Ogoni Heartland. Onyoma Research Publications, Orogbum Crescent GRA Port Harcourt, Nigeria.

Kain, T.F and Quiley, J. (1970). Measuring the Value of Housing Quality. Journal of the American Statistical Association. Vol. 65.

Kish, L. (1965). Survey Sampling John Willey and Sons Inc. New York.

Obateru, O.I. (2012). Land Subdivision Basics Penthouse Publications (Nig). Old Bodija, Ibadan Nigeria.

Obateru, O.I. (2013). Controlling Residential Densities. Penthouse Publication (Nig). Old Bodija, Ibadan, Nigeria.

Okoye, T.O. (2001). "Urban Housing Problems" in Ofomata and Phil Eze: Environmental Problems and Management in Nigeria Jamoe Enterprises, Enugu

Omuta, G.E.D. (1983). Housing and Environmental Sanitation in Auchi, Edo State. Journal of Environmental Management, Vol. 16.

Onokerhoraye, A.G. (1982). "Perspectives on Urban Environmental Quality and Public Policy in Nigeria. "Seminar Paper: Department of Geography, University of Benin.

Ozo, A.O. (1987). "Housing Conditions of the Urban Poor in Benin City, Nigeria in Makinwa and Ozo (eds). The Urban Poor in Nigeria University of Benin Press.

Pacione, M. (2003). "Urban Environmental Quality and Human Well – beings: A Social Geographical Perspectives" Landscape and Urban Planning 65 (2003).

Rapoport, A. (1997). The Nature and the Role of Neighbourhoods. Urban Design Studies.

Richardson, H.R. and Gordon, P. (2001). Compactness of Sprawl in Echenique, M. and Andrew, S. (eds). Cities in the New Millenium Spon Press, London.

Sada, P.O. (1978). Housing in Benin in Sada, P.O. and Nwankwo, C.N: Censer Seminar Papers. The University of Benin Press Benin, Nigeria.

Sule, R.A. (1980). Urban Planning and Housing in Nigeria: Principles and Practice. Vantage press, New York.

Tricker, R.S. and Algar, R. (2006). Building Regulations in Brief. Elsevier Ltd London UK.

Vagale, L.R. (1971). Manual of Space Standards for Urban Development. Ministry of Lands and Survey, Ibadan, Nigeria.

Yamane, T. (1967). Statistics. An Introductory Analysis. 2nd ed. Harper and Row New York.