



Environmental Issues in the Urban Fringe of Port Harcourt, Rivers State, Nigeria

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Abstract: *This paper examined the environmental issues in the urban fringe of Port Harcourt with the intention of proffering solutions to the identified problems. The fringe area continues to experience poor physical planning and management which affects patterns of road networks, unapproved housing and residential buildings on flood prone areas, poor sanitary orientation and total lack of good environmental commitments. This has created serious environmental problems within the fringe of Port Harcourt. Data were collected through the administration of structured questionnaire targeting heads of sampled households. The settlements which presently constitute urban fringe communities of Port Harcourt were identified with the use of satellite maps as well as reconnaissance survey. 5 out of the existing settlements were sampled out for detail study. The study revealed serious environmental problems ranging from air and water pollution, poor sanitary practices especially in the disposal and management of household garbage. The revealed challenges were found to result from absence of responsive government. In conclusion, the study recommends that urban renewal strategy should be conducted in the area by the governments to mitigate the widespread environmental issues in Port Harcourt urban fringe.*

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1. Introduction

The ideology of urban as relate to city activities has occupied the minds of urban and regional planners, geographers, urban sociologists, urban economists and other relevant professionals especially those within the built environment. Several literatures relating to the theoretical constructs on urban fringe, as well as the structural pattern of city growth have centered mostly on American cities.

In studying the growth of Chicago and proposing workable solutions, Burgess (1925) applied the concentric pattern of city late to both space and economic co-relations for settlement. The concentric theory suggests that the patterns of growth in the city can best be understood in terms of five concentric zones and a sixth lying beyond the

immediate confines of the urban area.

Sequel to geographical constraints, the concentric theory of urban growth was highly criticized. Thus, Hoyt in 1939 proposed the sectoral theory based on economic movement of high-rent neighbourhood (Scargil, 1979). The theory demonstrates how residential land uses tend to be arranged in sectoral fashion, radiating outwards from the city centre along transport routes.

Subsequently, the multiple nuclei theory of Harris and Ullman was suggested in 1945 on the basis of the shortcomings of the concentric and the sector theories. The multiple nuclei theory suggests that city develops on a number of areas that group around separate nuclei.

Collin Clark (1951) formulated the population density gradients: a descriptive model of city structure which reveals that urban population density decreases in a negative exponential fashion with distance from the central business district. The land value theory of Alonso (1964) assumes that the centre of the city is a highly desirable location, that land within is in short supply. He maintains that this central point attracts high cost while land value reduces with distance from the centre (Mills, 1972, Ley, 1972). The stated theories were suggested to analyze and resolve challenges which the cities faced and suggested patterns for proper city growth.

2. The Concept of Urban Fringe

The idea of urban fringe as used to describe built up area just outside the corporate limit of the city was introduced by Smith in 1937. Subsequently Wehrwen in 1942 suggested that urban fringe is a twenty-century phenomenon and defined it as the area of transition between well-organized urban land uses and the area devoted to agriculture (rural).

The term urban fringe which has attracted attentions of many researchers has been revealed to off-spring from urbanization. Thus, Balk (1945) introduced the term urbanization to address challenges and concept of urban fringe. Different terms have been applied to same concept. Thus, Needham (1977) refers it to the metropolitan fringe, Dickinson called it the intermediate zone, Wissink (1962) refers it as area of great differentiation, Pryor (1976) defined it as the zone of transition, Onokerhoraye and Omuta (1994) refer it as zone of heterogeneity, while Andres (1942) called it the rural –urban fringe. Other researchers like Firman (1996) refer it as the peri-urban region while it is referred as sub-urban area, urban-rural interface, urban edge and urban periphery by others.

The spatial location of urban in relation to urban and rural areas as well as human settlement in general is manifested in the continuous growth of settlements. Hawley (1971) observed that there is an old pattern formed of a congeries of cell-like compartments in which a great masses of the population pursues a life half-village and half-urban in character. The urban fringe becomes a continuation of urban and rural settlements and activities in relatively equal proportion. Firman (1996) while assessing the linkages between urban and rural settlements identified from levels of interaction as the peri-urban region, the agricultural regions, and the densely populated rural regions and sparsely populated rural sector.

The urban fringe as applied to the outer borders of the city, between the areas of

complete urban and complete rural land uses has attracted different definitions and characterized differently by various researchers. Thus, Pryor (1976) defined urban fringe as the zone of transition in land use as well as social and demographic characteristics which lies between the continuously built-up urban and sub-urban areas of the central city, on the one hand, and the rural hinter-land on the other.

The urban fringe is a product of urban expansion and characterized by activities of both urban and rural forms. It is a dynamic zone both spatially and structurally. In terms of space, it is a transition zone between fully urbanized land in cities and areas predominantly agricultural use (Rakodi, 1998).

In assessing the basic features of the urban fringe, UNICEF (1999) defined the urban fringe as areas which are conceptualized as squatter settlements, illegal areas, areas of high population growth due to rural migration, low priority areas in terms of urban planning, areas with diverse socio-cultural composition and low income, and socio-economic situation. The above analysis revealed the true situation of the area as no man land in terms of co-operate planning and administration. Golledge (1960) maintained that due to poor or complete absence of control and administration, the rural-urban fringe is geographically no man's land.

Several other parameters like absence of physical development planning, lack of urban foundation are some of the prevailing factors. Rakodi (1998) still maintains that the peri-urban interface is characterized by strong urban influences, easy access to markets, services and other inputs, ready supplies of labour, but relative shortages of land and risks from pollution and urban growth.

The rural-urban fringe results from the continuous development of both rural and urban areas which, there is no specified boundary. Hugh (1979) observed that certain communities along a graded scale between two polarities, which might be truly rural and truly urban, exist. Rural and urban areas do not exist alone in a vacuum as it were but the principal characteristics of each may be found shading into, blending or mixing with the essential characteristics of the other.

3. Environmental Conditions of the Urban Fringe

Several factors are responsible for the numerous environmental issues in the urban fringe. The total absence of government in terms of physical planning should be responsible for the gross challenges in the area. Thus, there exist uncontrolled institutions, factories, poor land subdivision for residential buildings and space for coperate urban waste. Carter (1981) revealed that in the fringe, there is an uncontrolled location, of unpleasant and noxious establishment. Onokerhoye (1994) maintains that some of the obnoxious industries, establishments and land uses inadvertently imposed on the urban fringe by institutional factors include wholesale and storage depots, junk yards, cemeteries, airports, refuse dumps, sanitary landfills, quarries and slaughter houses (abatteurs). In their operations, these activities assault the unprotected environment, causing many disamenities at the fringe, either through the generation, and / or inadequate disposal of solid waste products; through the generation of noise, smoke, dust, or odours, through the dereliction of agricultural lands, through direct disfiguration or through some combination

of the above. The urban fringe therefore becomes a haven for storing pollutants and degraders of the environment.

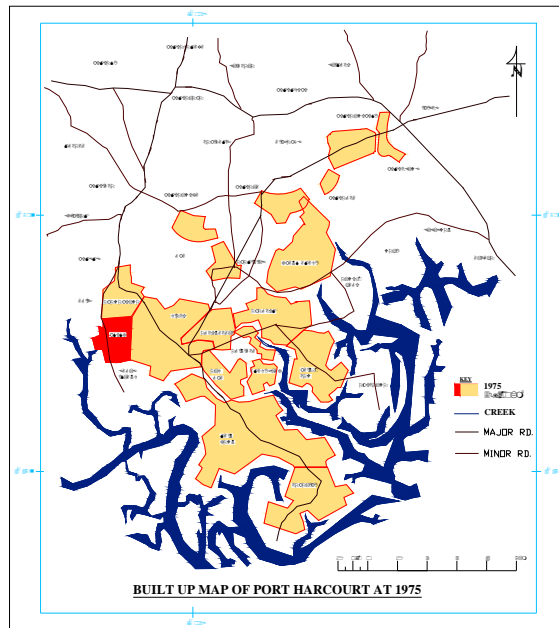
4. Population and Spatial Growth of Port Harcourt

Port Harcourt today, is the capital of Rivers State, the administrative headquarters of the oil rich Niger Delta of Nigeria, and the hoist to two local Government Areas-Port Harcourt City and ObioAkor. Port Harcourt also owns one of the major sea Ports in the Country. It was established in 1913 because its site met the location requirement set by colonial surveyors for a port – terminus deep water near ground which shall be connected to the mainland (Anyanwu, 1979).

In 1914, a total of 7,403 labourers were engaged in railway construction work at Port Harcourt and along the line. Though, most of the workers left and by 1915, the population was estimated to about 500 persons. By 1944, the population grew to about 30,200 persons and according to Anyanwu (1979), it was estimated to 34,000 in 1946. The 1952 – 53 population census of Nigeria revealed the population figure of Port Harcourt to be 179,563 and was estimated to 213, 443 in 1970. The figure rose to 231,532 persons in 1973. According to the national population census of 1991, the Port Harcourt municipality had a population figure of 440,399. The 2006 national census show that the population has risen to 1,005,904 persons. Base on the growth rate as provided by the 2006 national census, by 2014, the population is estimated to 1,467,586 persons.

Spatially, Port Harcourt actually started following certain policies and decisions in 1912 (Port Harcourt master plan, 1975; Anyanwu, 1979; Dar al – handasah, 2008Ogionwo, 1979). A piece of land of about 25sq miles in extent was acquired in 1911 from the traditional Ikwerre and okirika people, sequel to the signing of the Hargrove Agreement between the British government and the representatives of the traditional landlords. The land so acquired was referred to as “Crown Land ”in deference to the British Monarchy.

The town was divided into two distinct residential areas – European and African based on construction procedures which stated in 1913. A green belt of a quarter mile in breadth was basically met for recreationseparated the two different residential densities. Between 1925 and 1934 the city expanded to the present AzikiweRoad then beach Road. Nwala (1979) revealed that in 1928, the then Port Harcourt main market was located close to the railway station. In 1952, Port Harcourt has extended to Diobu and by 1960s; it has covered up TransAmadi industrial Estate, Rainbow town, Diobu creek layout, Ogbunabali, Obio and the Oroworukwu Commercial Layout. By 1975, Port Harcourt has covered up an estimated built up area of 39.60km squared (see Fig.1).



According to Dar – al Handasah (2008), the city expanded by the mid 1990s in which as at then, it had spatial coverage of about 94km squared. Following the satellite image map of Port Harcourt, by 2008, the metropolitan city has covered about 106.77 km squared of land space (see Fig.2).

urban fringe of Port Harcourt. 5 representing 20% of the 24 existing settlements were sampled out for detail studies. Household counts were conducted on the 5 sampled communities while 2,155 representing 10% of the existing households within the sample communities were studied. Finally structured questionnaires were administered targeting heads of households or adult members of the households to sort out relevant information on environmental and environmental related issues within the urban fringe. The structured questionnaire also assessed the socio – economic characteristics of the respondents as major components of the study.

6. Environmental Profile of the Area

The urban fringe of Port Harcourt experiences various environmental problems as revealed by the respondents in various sampled communities within the study (See table 1) majority of the respondents revealed that traffic congestion constituted serious environmental problems within the fringe (91%). This is followed by noise pollution which recorded relatively as high as 88% in the area. The study maintains that 64% of the respondents complained that the area was prone to flooding and they experienced periodic flooding especially during rainy season. The urban fringe or peri-urban of Port Harcourt also experienced other environmental problems like air pollution (79%), water pollution (75%) and erosion which is 57%. Majority of the respondents (83%) who were mostly indigenes or tenants who have lived for a long time in the area (83%) complained that conversion of farm land (agricultural land use) to other land uses mostly residential has been predominant and constituted environmental challenge within the various communities of the fringe of Port Harcourt.

Most of the converted lands from agricultural land use to others may have been through purchase from the traditional landlords in which the design and construction of such residential buildings never passed through the appropriate government agency – The Town Planning Authority. The locations of such residential buildings within the urban fringe are confirmed to be far away from certain residential amenities. The study reveals that 72% of the respondents maintained that their residential buildings were located over 1,000 meters away from the police post. It is interesting to note that about 90% affirmed that their locations were more than 1,000 meters from fire service station. Table 2 revealed that 85%, 77% and 75% respectively reported that their locations were over 1,000 meters away from recreation ground, secondary school and super market or grocery shop. The study still show that about 69% of the total respondents confirmed that their residential locations were more than 1,000 meters away from the location of primary school. Though, in the design of residential neighbourhood, which is the unit of physical planning, the primary school determines the neighbourhood, and is centralized to enable pupils not to walk more than $\frac{1}{2}$ mile about 0.8045 km to the primary school.

Sequel to the unavailability of the residential amenities and the basic facilities, utilities and services which constitute urban foundations about 971 out of the 2,155 respondents representing 45.1% poorly rated the fringe of Port Harcourt residential neighbourhoods. This is followed by 41.6% who maintained that the neighbourhoods were very bad. Significantly only 1.1% symbolizing 24 out of the 2,155 total respondents rated their residential neighbourhoods to be very good.

In the study area, household wastes were mostly mixed related wastes such as cartons, papers, animal waste, foodstuff and other household related wastes. Disposals of house hold garbage were mostly by roadside (77.9%). Though, 16.4% ascertained that garbage were disposed at government designated site while 5.7% dumped their garbage at the family dump site. A large percentage (62.8%) complained of the irregularity of sanitary agency on garbage collection. An assessment of the frequency of sanitary agency on garbage collection in the area shows 16% confirmed its regularity while 10% ascertained this activity to be very irregular.

The government designated garbage dump sites in the study area were located over 1,000 meters from the residential buildings (61.3%). This is followed by 500-1,000m (21.9%) while 16.8% confirmed that garbage dump sites are located at less than 500 meters distance from the buildings. The study shows that the dwellers of the urban fringe of Port Harcourt obtained their main source of water for domestic and other activities through private boreholes (78.6%). Open well 8.6%, organize tanker 7.6% while pipe borne water accounted for 3.6%. This major source of water supply (private boreholes) is found to be sold to the consumers. In the study area, 20 litres is sold at N20.00 about 0.125 dollars.

The study observed that accessibility to the main road is absolutely difficult. This is due to the poor physical planning within the urban fringe. The study maintains that 68.2% never had direct access to the main road; while only 31.8% of the studied buildings were found to have direct access to the main road. Sequel to the inaccessibility of the buildings to access roads, the study reveals that majority of the dwellers of the Port Harcourt urban fringe parked their vehicles along the road (72.3%) while only 27.7% engaged in curtilage nature of vehicle parking.

7. Discussion

This study has effectively examined the environmental issues in the urban fringe of Port Harcourt with the objective of determining the characteristics of the fringe and the identification of the communities which presently constitute the fringe as well as its physical extent. The study reveals that sequel to the rapid growth in terms of space and human population, this drastic urbanization has created gross reflection on the environment. The urban fringe becomes easy home for migrant from the rural areas who are seeking for white collar jobs and harbor for core urban dwellers who could no longer afford the stress and challenges of the central city.

Thus, most buildings within the fringe do not pass through appropriate processes of approval by the planning authority (72.4%). The area remains unplanned with the presence of certain environmental disasters like flooding; since most buildings are built in areas prone to flooding. These challenges reflect almost total absence of the face of government in the fringe, a confirmation of the concept of the fringe as no man's land. The fringe becomes the midpoint between the urban center and the rural settlements.

Due to the uncoordinated growth of the fringe, the unplanned settlements within the study area continue to experience other environmental challenges like air and water pollution. Significant numbers of industries, commercial and residential buildings are fused with express permission of the industries to emit gases into the atmosphere and discharge

of waste into the existing natural drains. The area becomes easy point for mining of large quantity of laterite in which, proper environmental impact assessment is never conducted on such activity.

The aftermath creates burrow pits which retain contaminated water that become breeding ground for mosquitoes and dangerous reptiles. Studies conducted on the extent of laterite mining on the fringe of Port Harcourt revealed that the miners only stopped when they have gotten to the ground water table, an activity which constitute great hazard to the land and ground water. The ground water is abstracted by private individuals who at times sell to the public for consumption without any treatment measures.

Sequel to lack of physical planning and maintenance of the planning process, the fringe area suffers serious traffic congestion. This particular problem also results from lack of the construction and maintenance of road. Thus, large quantity of lead iv oxide and other elements of carbon are emitted from the congested vehicles into the environment. Despite the drastic increase in population, the attentions of sanitation agency especially in relation to the collection of household garbage remain very poor. This situation has continued to worsen over a long period of time.

The study reveals that population growth and density is inversely proportional to distance from the city center. The fringe settlements with close proximity to the city even lack appropriate open spaces. The study shows that the existing open spaces have been built up due to the influx of people from both the city center and the rural communities to the fringe. Inadequate open spaces results in environmental degradation as there is no balance in the eco-system.

In terms of land use, the study shows that there is no organize system of land use pattern as approved by the physical planning authority. The study maintains that there is mixture of residential, commercial, industrial, institutional and recreational land uses in the area. Thus, there is absolute absence of zoning in the urban fringe of Port Harcourt.

Table 1: Environmental Problems in the Neighbourhood

PROBLEMS	YES	NO
Air pollution	79%	21%
Flooding	64%	36%
Water pollution	75%	25%
Laterite mining	62%	38%
Noise pollution	88%	12%
Erosion	57%	43%
Traffic congestion	91%	9%
Conversion of farm land	83%	17%

Source: Field Survey, 2014.

Table 2: Distance to Residential Amenity

AMENITY	DISTANCE (M)		
	LESS THAN 500	500-1,000	MORE THAN 1,5000
Police post	13%	15%	72%
Traditional market	19%	24%	57%
Super market/grocery shop	14%	11%	75%
Secondary school	6%	17%	77%
Fire service	2%	8%	90%
Recreation center	3%	12%	85%

Source: Field Survey, 2014.

Table 3: Rating Of Neighbourhood

RATING	NUMBER	PERCENTAGE
Very good	24	1.10
Good	69	3.20
Average	103	4.80
Bad	971	45.10
Very bad	897	41.60
Uncertain	91	4.10
Total	2,155	100.00

Source: Field Survey, 2014.

8. Conclusion

The study has critically examined the environmental issues in the urban fringe of Port Harcourt. Several parameters were used to represent elements which constitute serious environmental challenge and problems in the area. These elements were assessed to enhance effective governance and sustainable environmental management of the urban fringe. In consideration of the diverse physical and environmental problems which are

attached to the fringe, there is need for redesign of government policies toward the development of the fringe.

Physical planning remains the best option in re-structuring the fringe. This can be implemented through the conduct of urban renewal strategies in the study area. Such planning should be participatory in nature to ensure that the residents partake in decision and implementation of policies and programmes that will affect them.

Sequel to the fact that the urban fringe remains no man's land, both the state and the local governments should be involved in the provision of infrastructure for the enhancement of the quality of life of residents. There should be proper division of responsibility between the state and local governments in the disposal of solid waste and general environmental sanitation. Every household should possess garbage bin while waste disposal agency should be regular in the discharge of this duty. Other environmental pollution like air and water should be monitored through zoning and to ensure proper conformity of land uses.

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