Full Length Research Paper

Urban renewal strategies in developing nations: A focus on Makoko, Lagos State, Nigeria

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One of the greatest changes that have occurred in the last century in developing countries is the urban growths which have produced more slums in our cities. The study examines the physical conditions in Makoko, an urban slum in Lagos, Nigeria. Geographical information system (GIS) and remote sensing (RS) technologies were used, in a post classification, to model possible land use changes in the area overtime. It also uses questionnaires to elicit information on infrastructural and socio-economic characteristics to determine the factors responsible for the physical conditions of Makoko. Findings revealed that the rate of infrastructural provisions are lacking behind and suffer from overstress and dilapidation The residents lack good environmental sanitation as the lagoon emits a pungent smell. It is recommended that the area is entirely restructured so as to create a habitable abode for sustainable residential living.

Key words: Slum, urban growth, physical condition, environmental sanitation, GIS/RS and Makoko.

INTRODUCTION

One of the most remarkable developments in the world especially since the 1980s is rapid urbanization. Today, according to UNDESA (2015), "fifty-four percent (54%) of the world's population lives in urban areas, a proportion that is expected to increase to 66% by 2050". Projections show that urbanization combined with the overall growth of the world's population could add another 2.5 billion people to urban populations by 2050, with close to 90% of the increase concentrated in Asia and Africa (UNDESA, 2015).

Towns and cities in developing countries have been expanding rapidly, and the total number of urban dwellers in the region is now roughly doubling every ten years (Otoo, 1982). Urbanization in Nigeria is characterized of economic growth without development. According to George (2002), "an average of 6,000 people move to Lagos everyday and the United Nation has estimated that the city of Lagos will swell to 25 million by 2016". The consequence of this is unabated gross degradation and decay of all the constituent fabrics of the city.

Makoko is an integral part of the Lagos community in terms of its population, and its importance to the economy of Lagos state, Nigeria. Makoko is one of the many water and shoreline settlements. Their economic activity includes salt making, sand dredging, sawmills, firewood, and fishing. According to Habitat (2007), Makoko is one of the 43 large blighted slums identified in Lagos, and has been classified as one of the 9 largest

slums in the city. Makoko is characterized by adverse environmental conditions otherwise known as urban slum. The total area of space covered by this settlement cannot be easily estimated as residents continue to build and encroach on the water body as population increases.

According to Kilani (2012), Makoko, "village in the city" shows a community long abandoned by government, and with inadequate basic social amenities. The residents lack sufficient sanitation – 'communal latrines are shared by about 15 households and wastewater, excreta, kitchen waste and polythene bags go straight into the water', the oily black water is no longer suitable for fishing; it emits a pungent smell, and a thick layer of white scum gathers around the shack stilts, when it rains, conditions turn particularly nasty (Udoma, 2013).

Despite the poor environmental conditions found in the settlement, Makoko continues to grow in both population size and physical boundary. More housing units can be seen sprawling into the Lagoon and road side. The aim of this study, therefore, is to examine the urban renewal activities and their effectiveness in Makoko with a view to modeling possible changes overtime, using remote sensing (RS) and Geographic Information System (GIS) techniques.

LITERATURE REVIEW

Urban renewal started as the concept of urban re-development. According to Buissink (1985), the concept has an America origin in the Housing Act of 1949, and was originally designed to clear, and restructure land use in the inner city which have developed into slums, and to develop in their place, a comprehensive programme of new residential and nonresidential development.

In America, urban renewal refers to the redevelopment and/ or rehabitation of older parts of towns and cities. In Britain, urban renewal is highly associated with the desire for housing upgrading and reform, especially in the interest of the urban poor (Onokerhoraye and Omuta, 1994). Urban renewal according to Roberts (2000) "is a normative concept and rooted in British urban policy. It leads to the resolution of urban problems and seeks to bring about a lasting improvement in the economic, physical, social and environmental conditions of an area that has been subjected to change". Although the main aim is to eliminate substandard and inadequate housing, urban renewal has become a catch-all for other strategies such as the revitalization of downtown, promotion of University or hospital centres, industrial redevelopment and the creation of new-towns-town (Zuckerman, 1991). In summary, urban renewal aims at improving the physical, social-economic and ecological aspects of urban areas through various actions including redevelopment, rehabilitation, and heritage preservation.

Urban renewal is often presented as a natural process through which the urban environment viewed as a living entity undergoes transformation. Miller and Marshall (1995) pointed out that "as the years pass, transformations take place, allowing the city to constantly rejuvenate itself in a natural and organic way". He further stated that 'the purpose of urban renewal is to deliberately change the urban environment and to inject new vitality through planned adjustment of existing areas to respond to present and future requirements for urban living and working.

Urban renewal involves the relocation of businesses, the demolition of structures, the relocation of people, and the use of eminent domain (government purchase of property for public purpose) as a legal instrument to take private property for city-initiated development projects (Chigbu,2012). Urban renewal has been seen by proponents as an economic engine and a reform mechanism and by critics as a mechanism for control. It may enhance existing communities, and in some cases result in the demolition of neighborhoods. Many cities link the revitalization of the central business district and gentrification of residential neighborhoods to earlier urban renewal programs. Over time, urban renewal evolved into a policy based less on destruction and more on renovation and investment, and today is an integral part of many local governments, often combined with small and big business incentives (Lobbia, 1999).

According to Gbadegesin and Aluko (2010), Urban renewal involves overhaul the congestion in the city centres. It comprises a number of strategies which include: filtration; social planning; the boot-strap strategy; replacement; and guiding urban growth through investment and conservation and heritage preservation.

Therefore, the main objectives of urban renewal are: re-structuring and re-planning of concerned urban areas; designing more effective and environmentally-friendly local transport and road networks within the concerned urban areas; promoting the timely maintenance and rehabilitation of buildings in need of repair; preserving buildings, sites and structures of historical, cultural or architectural value; providing purpose-built housing for groups with special needs, such as the elderly and the disabled; and providing more open space and community/welfare facilities among others (URS 2011).

Figure 1 shows the concept of urban regeneration as depicted by Couch and Fraser (2003). Couch and Fraser (2003) explained that "urban regeneration is concerned with the re-growth of economic activity where it has been lost; the restoration of social function where there has been dysfunction, or social inclusion where there has been exclusion; and the restoration of environmental quality or ecological balance where it has been lost". This approach goes well beyond efforts to put vacant land and buildings to new use.

Urban regeneration is about implementing policies in existing   urban   areas   rather than developing new
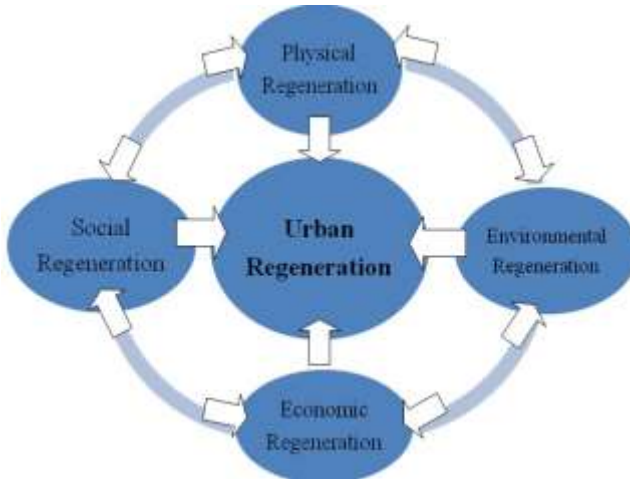
Figure 1. The concept of urban regeneration (Source: Adapted from Couch and Fraser, 2003).

urbanization. It aims to build upon the triangle of sustainability, with its commitment to economic, social and environmental problems and developments. Urban renewal is used to describe actions on a quarter-level that address neighborhoods and housing estates as a reaction on deprivation, regeneration addresses inner city areas, areas facing imbalance and decline as well as rural areas.

Roberts (2000) illustrates that "the history of urban problems and opportunities shows five continuous and enduring themes, that represent the nature of urban change plus a new one" These themes are:

(1) The relationship between physical conditions and social response
(2) The continued need for the physical replacement of many elements of the urban fabric
(3) The importance of economic success as a foundation for urban prosperity and quality of life
(4) The need to make the best possible use of urban land and to avoid unnecessary sprawl; and
(5) The importance of recognizing that urban policy mirrors the dominant social conventions and political forces of the day; plus the new theme of sustainable development.

MATERIALS AND METHODS

Research locale

Lagos State lies between longitude 3°21'24"E and latitude 6°35'8"N. It is located at the South-Western of Nigeria (Figure 2). Lagos State consists of twenty local governments. Ikeja currently serves as an administrative seat of the State and of a local government (Figure 3).

The study area is Makoko, located in Lagos Mainland Local Government Area of Lagos State. Makoko is one of the many

water and shoreline settlements in Lagos State. Is geographically located within Longitude 3°23'31.085"E, Latitude 6°30'9.154"N; and Longitude 3°22'57.467"E, Latitude 6°29'28.887"N. Figure 4 shows the location of Makoko within the Lagos Mainland Local Government.

Makoko is a shanty settlement located in the centre of Lagos city, along the banks of the Lagos lagoon. It was established in the 18th century as a fishing village (Udoma, 2013). Makoko lies within the south-eastern part of Lagos metropolis. It is bounded on the North by Iwaya and University of Lagos; at the West, by Ebute-Meta; South, by the Third Mainland Bridge; and East by the Lagos lagoon (Udoma, 2013). The vegetation is majorly wild swamp trees. The community is dominated by the Ilajes and Eguns; there are also Yorubas with few Igbos and other ethnic groups (Oduwaye and Lawanson, 2010).

The population of Makoko according to the Baale (chief of the village) is estimated to be 400,000 people. The area was not officially counted as part of the 2006 census, because the settlement is considered non- existent and illegal. The World Bank estimates that the population on land is just over 85,840 with each dwelling unit usually housing between six to ten people and a high percentage are rental properties (Udoma, 2013).

The houses on water are built from hardwood, supported by wood stilts driven deep into the waterbed. Each house usually houses between six to ten people. The water is five feet deep. Water meanders through the water settlement like streets in between houses, which act as a road system, with canoes as means of transportation. Canoes are used for fishing and act as points of sale; where women sell food, water and household goods.

The main economic activities are salt making, sand dredging, sawmills, firewood, and fishing. Plate 1 and Figure 5 show the aerial photograph and digitized building map of Makoko respectively.

Data base

Data was collected through structured questionnaire which was administered on household heads in Makoko community. The questionnaire contained close-ended questions with pre-coded alternatives meant to ascertain: the socio-economic characteristics of respondents; building and environmental condition in the community; as well as sustainable residential living. The authors administered the questionnaires through face-to-face contact with residents of the community in March 2016.

A total of 205 respondents were randomly selected for interview representing 5% of the total number of people due to homogeneity characterizing the population. Other relevant data were gathered from texts, seminars, reports, internet and observation made at the study site in terms of nature of the environment, transportation and general living condition in the study area. Aerial photograph and Google-Earth imagery of the study site was acquired and digitized to produce the composite map of Makoko which was used for further analysis using the Geographic Information System (GIS) technology. Photographs of scenic sites were captured and presented. Data from questionnaire administration was processed by computer using Statistical Package for Social Sciences (SPSS). Univariate analysis of data was utilized for easy description of the phenomenon investigated.

RESULTS AND DISCUSSION

Socio-economic characteristics of residents

The socio-economic characteristics of the people show

Figure 2. Map of Nigeria showing Lagos State (Source: Google Satellite Imagery, digitized by Authors using ArcGIS (2016).
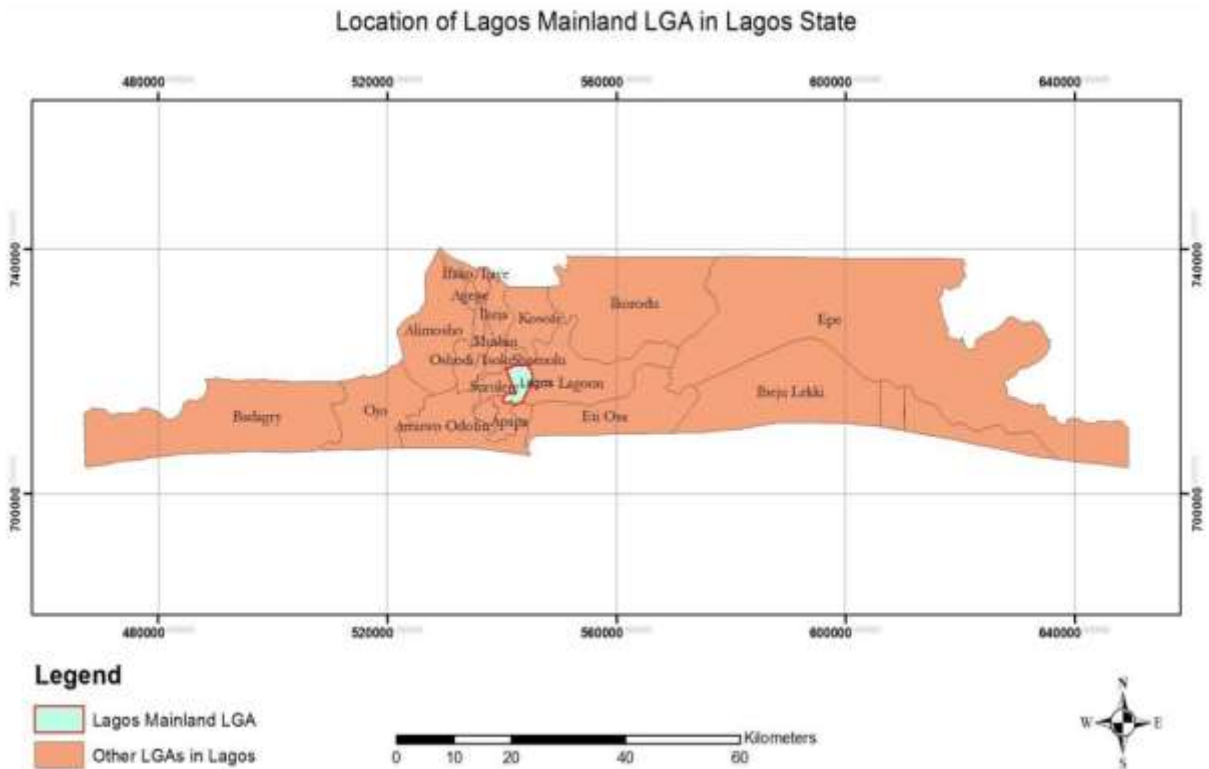

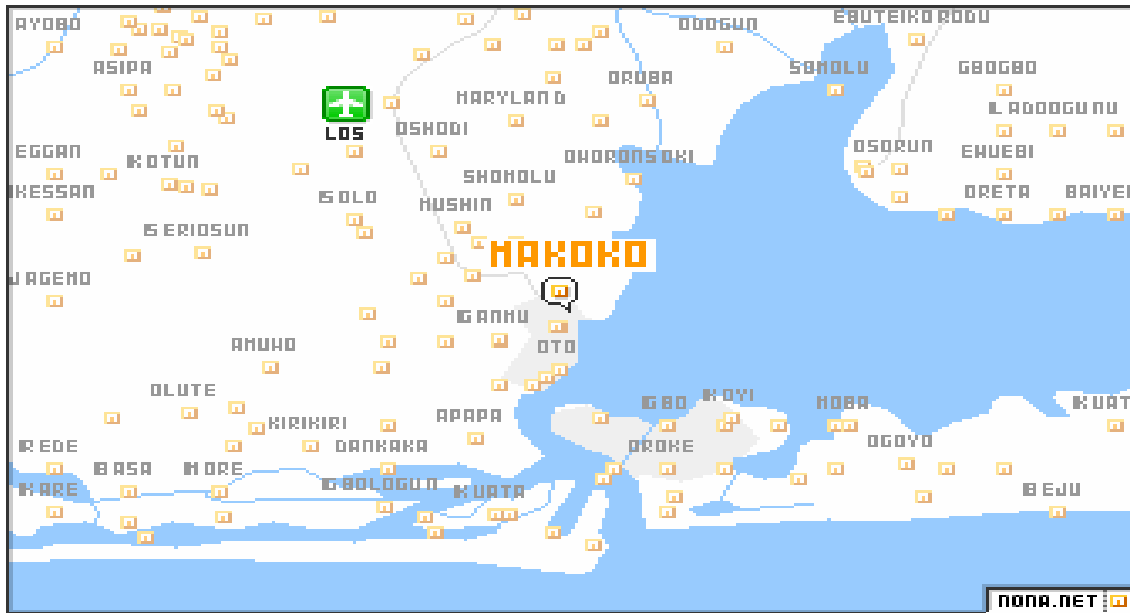**Figure 3.** Location of Lagos Mainland LGA within Lagos State (Source: Adapted from: Kelani, 2012).

Figure 4. Map of Lagos showing Makoko and the Lagos Lagoon (Source: Daily mail, 2016).

Plate 1. An aerial photograph of Makoko (Source: Authors' Apolola, 2016).

that about 73.7% of Makoko residents were females while 26.3% were males. The modal age of respondents falls between 46 and 55 years, which constitutes about 49.0% of the population. The median age is between 25 and 35 years, representing approximately 25.0% of the respondents.

The age grade comprises mostly the educated but employed people who have lived in the area for more than 10 years, and were able to give required information on the subject matter based on experience. There is high proportion of married people as over 77% of respondents are married as against 21% that are not
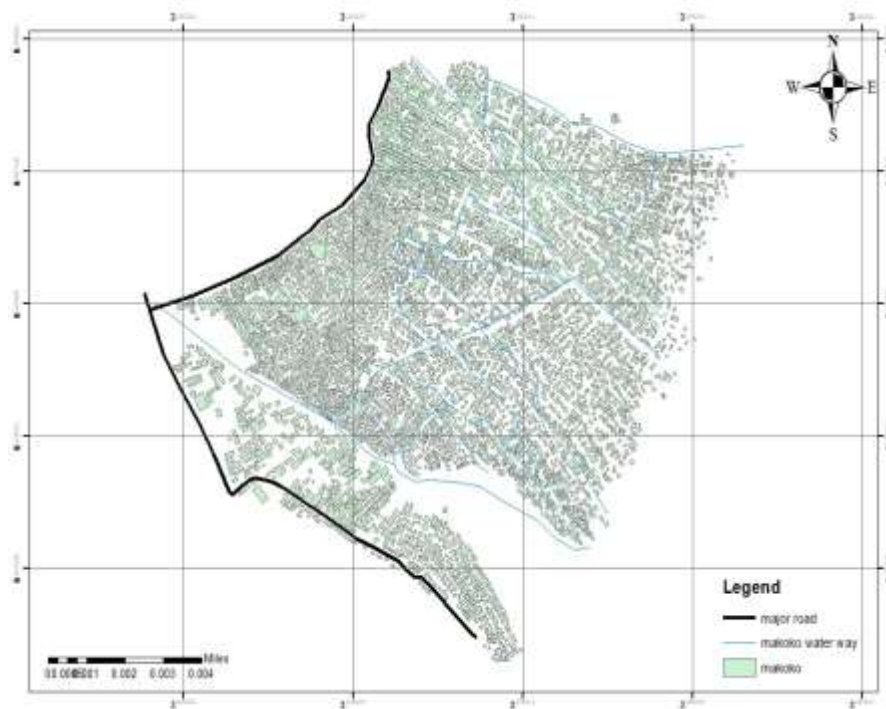
Figure 5. Digitized building map of Makoko (Source: Authors' Apolola, 2016).
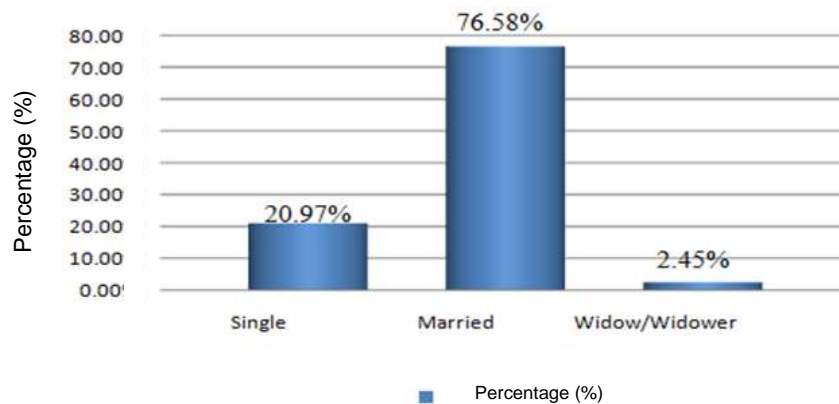

Figure 6. Marital status of respondents (Source: Authors' fieldwork, 2016).

married, while the remaining 2.0% are widowed (Figure 6).

This explains the high population of children in Makoko with average household size of 8 which is higher than the estimated National average number of household (7) as reported by Fasakin (2000) and Olajuyigbe (2008) in similar studies. The settlement is however dominated by tenants who constitute about 58.0% of respondents while the remaining 42.0% are landlords. The implication of this is that most residents in Makoko are poor, illegal migrants (seeking greener pastures)

who could not afford the high cost of accommodation in Lagos mainland, hence sought alternative and cheaper accommodation in Makoko.

Table 1 shows the occupation of respondents in Makoko. From the table, it is evident that majority of respondents are fishermen, traders and artisans. Only about 10.7 and 6.3% are civil servants, and in allied professions respectively. This implies that Makoko residents are majorly peasant farmers and traders with low income. Plate 2 shows traders displaying their wares in canoes on water.

Table 1. Occupation of respondents.

Occupation	Frequency	Percentage (%)
Fisherman	47	23.0
Trader	69	33.7
Civil servant	22	10.7
Artisans	54	26.3
Others	13	6.3
Total	205	100.00

Source: Authors' fieldwork (2016).

Plate 2. Trading activities on water at Makoko (Source: Authors' fieldwork, 2016).

Of the type of materials used in building construction coupled with the age of the buildings, over 75.0% of building walls are in poor condition, while a paltry 12.20% and 11.71% were adjudges good and fair respectively (Plate 4). However, most buildings in Makoko enjoyed good roofing materials such as aluminum (65.37%); corrugated iron sheet (22.93%); and asbestos (11.70%). No building with thatched roof.

Housing condition in Makoko

From Table 2, analysis on age of buildings shows that over 75.0% of respondents affirmed that buildings in Makoko have existed for more than 20 years. A meager 9.76% of them were between 1 to 10 years old. This shows that slum condition had persisted for over two decades in the area. The building types were mostly Wings and the Brazilian (face-to-face) category. Bungalows and duplexes constituted about 1.0 and 5.0%, respectively. The materials of construction were chiefly wood (64.88%), sandcrete block (32.68%), and corrugated iron sheet (2.44%) (Plate 3).

Environmental condition in Makoko

Apart from the application of GIS to analyze the environmental situation in Makoko, other variables such as the toilet system, refuse disposal method, location of kitchen and the drainage system were examined. First, over 70.0% of respondents defecate directly into open Lagoon, while the others made use of pit latrines. This trend was responsible for dirty and stinking environment in the area. Plate 5 shows the location and condition of a typical toilet system in Makoko.

The refuse disposal method is another environmental concern in Makoko. Over 80.0% of respondents affirmed the use of refuse dump to dispose solid waste (Plate 6). Observation shows that the residents dump their waste directly into the Lagoon as they use this to reclaim land portions from it. The implication of this is flooding hazard during raining season.

Social amenities in Makoko

The social and public amenities in the study area is in a

Table 2. Housing condition in Makoko (N=205).

Variable	Frequency	Percentage (%)
Age (in years)		
1-10	20	9.76
11-20	31	15.12
21-30	45	21.95
31-40	84	40.97
41 years and above	25	12.20
Types of building		
Bungalow	2	0.98
Duplex	11	5.37
Wing	89	43.41
Brazilian type	48	23.41
others	55	26.83
Materials of building construction		
Wood	133	64.88
Block	67	32.68
Corrugated sheet	5	2.44
Walling condition		
Good	25	12.20
Fair	24	11.71
Poor	68	33.17
Very poor	88	42.92
Roofing materials		
Aluminum sheet	134	65.37
Corrugated iron sheet	47	22.93
Asbestos	24	11.70
Thatched	0	0.00

Source: Authors' fieldwork (2016).

Plate 3. Building wall materials in Makoko (Source: Authors' fieldwork, 2016).

Plate 4. A typical building wall condition in Makoko (Source: Authors' fieldwork, 2016).

Plate 5. A typical toilet system in Makoko.

Plate 6. A typical refuse dump in Appolo Street, Makoko (Source: Authors' fieldwork, 2016; Date of plate: 2/7/2016).

Plate 7. Women and children in search of drinking water (Source: Authors' fieldwork, 2016).

state of pity as the available drainage have been blocked by refuse; public electricity distribution is in a condemnable state as residents prefer other means of generating electricity for themselves. Generator sets are mostly used and this adds to the smell exuding from the water body due to large deposit of waste. The source of water coupled with its distance for the residents living on water is strenuous as residents who don't have water for consumption during the night would wait till its morning to get water.

Plates 7 and 8 show the search for water and state of water facility in Makoko. There is no public health facility in this settlement as majority of the facilities are privately owned and not well equipped. There is a missionary public primary school, other primary schools are privately owned. There is no secondary or tertiary institution in the study area. The settlement is generally susceptible to flooding during heavy downpour of rain causing the ground to be soggy and waterlogged. Also, during the raining season, there is always an occurrence of sea level rise causing water to rise above its normal level thereby affecting commuters who walk on the wood bridges made to connect houses.

GIS analysis

The acquired Google-earth imagery of Makoko was processed in the GIS environment using the ArcView software. The overlay operation was performed on two map data sets, namely: buildings and pollution maps. The pollution map is as shown in Figure 7, while the overlay of the pollution map and the building map is as depicted in Figure 8. From Figure 7, the GIS analysis shows that about 16.7% of Makoko was fairly polluted; 33.3% highly polluted; while about 50.0% was very

polluted. Generally, all the buildings are located in polluted areas (Figure 8) but the majority is located in highly polluted areas. The highly polluted area is characterized by offensive and pungent smell due to poor waste disposal practices (Figure 7 and 8). Observation shows that the rate of pollution reduces as one goes farther into the Lagoon. This shows that pollution of the Lagoon water was from the land. This can also be explained on the premise that the Lagoon cleanses itself by pushing the pollutants to the shore.

CONCLUSION AND RECOMMENDATION

Urban Renewal Strategies in developing nations spans through rehabilitation, redevelopment and total clearance. The situation in Makoko calls for partly rehabilitation and partly total clearance depending on the level of decadence from street to street as depicted in this paper.

However, this study has been able to establish that majority of the residents in Makoko are immigrants who are seeking for greener pastures. Many of them live in make-shift building on water. They dump wastes in nearby bushes, lagoon and drainages which make the environment repugnant. They are poor with majority of them being peasant traders, fishermen and artisans with low level of education and income. The housing condition is poor, built mainly with wood and without toilet facilities.

GIS analysis shows that every household in Makoko suffers pollution of both land and water due to indiscriminate dumping of refuse and open defecation. A meager 16.7% of Makoko area is fairly polluted; 33.3%, highly polluted; while about 50.0% was much polluted. The highly polluted area is characterized by offensive

Plate 8. A dilapidated borehole tank (Source: Authors' fieldwork, 2016).

Plate 9. Children on queue for water (Source: Authors' fieldwork, 2016).
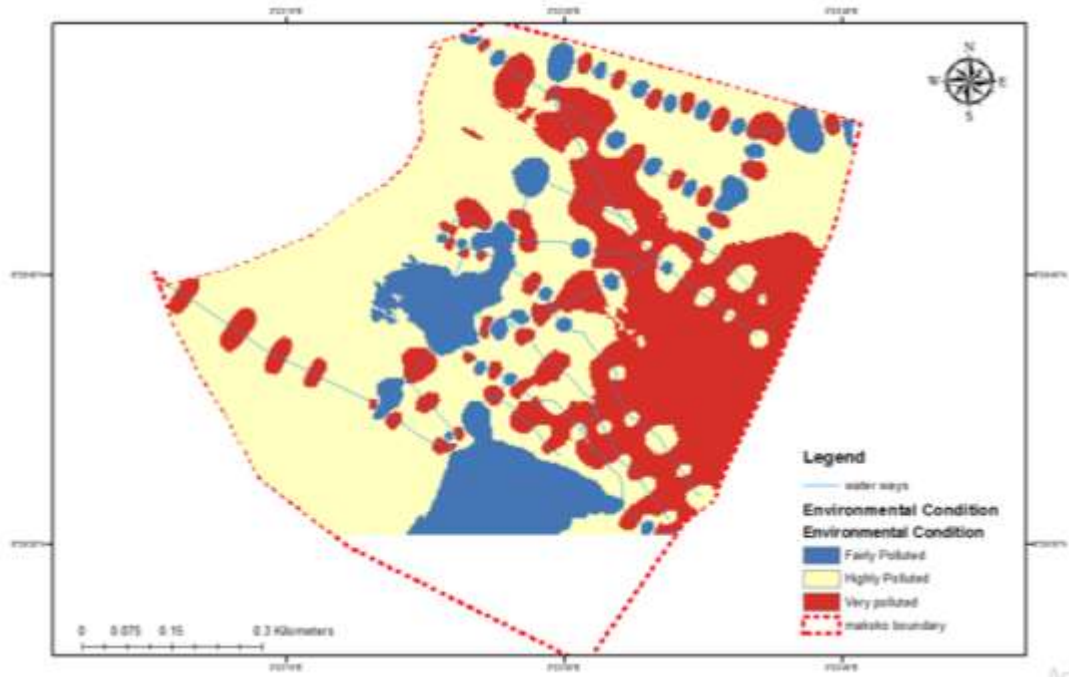
Figure 7. Pollution Map of Makoko (Source: Authors' fieldwork, 2016).
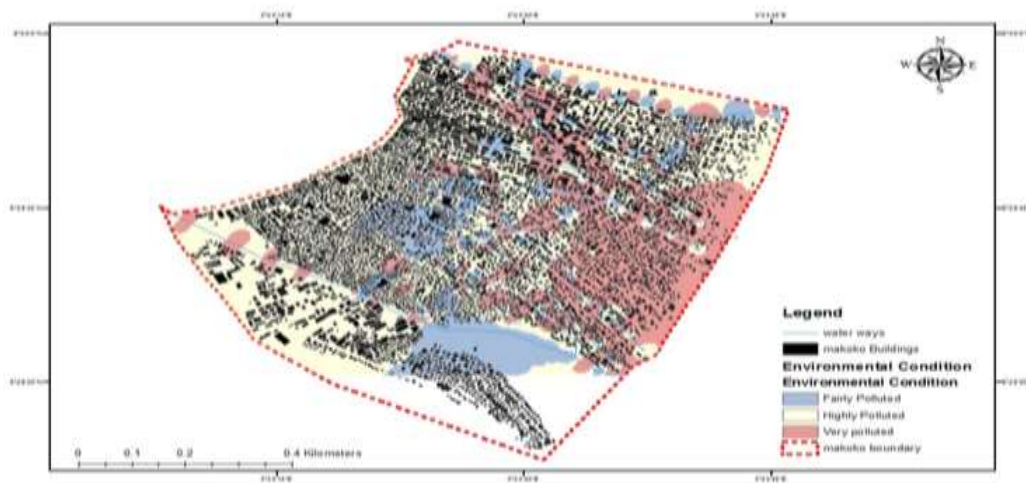

Figure 8. Overlay pollution map of Makoko (Source: Authors' fieldwork, 2016).

and pungent smell due to poor waste disposal practices.

In order to eliminate substandard condition in Makoko and get rid of dilapidated and derelict buildings, the redevelopment and rehabilitation option of urban renewal strategy is canvassed. This would help to create new housing opportunities; redevelop vacant, deteriorated and underutilized properties; improve public safety/community facilities and enhance the general aesthetics and image of Makoko.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

Department, Federal University of Technology, Akure, whose final project provided significant data and information for this paper.

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