

Locational Impact of Public Housing Schemes On Sustainable Urban Well-Being In Lagos, Nigeria

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ABSTRACT

Although, the engagement of adroit city inventiveness aided by both technological advancement and emerging innovations is targeted at enhancing well-being of citizens. Arguable advancement have been with Europe leading the resourcefulness followed by Asia Pacific, North America, Latin America, Africa and Caribbean in residential provision, innovative transportation systems, and mitigation against worsening effect of climate change. However, most residential ingenuities focused on smart living, but there is paucity of knowledge on how smart residential design-initiated solutions can enable healthy lifestyles, better quality of life and resident's physical well-being. Several government populist planning have been the main catalyst in residential provision; through implementing initiatives that are augmented by private sector partnership. This paper evaluates the location of residential neighborhoods in regions predisposed to devastation from worsening environmental conditions and its influence on resident's health and physical well-being. The methodology adopted is a combination of the appraisal of archival information from government initiatives in Lagos Metropolis from 1972 - 2016, quantitative, physical measurement and explorational technique in the 44 year period. Three (3) medium-income government residential design schemes were evaluated for locational innovation relating to healthy lifestyles beneficial to occupant's well-being. Findings proved that in the cleverness to accommodate the highest number of citizens within available budgetary limits, health and well-being problem solving design-oriented solutions were not explored. Residences were not designed to take advantage of environmental resources in tandem with better quality of life for citizens. The gap between potential and real needs are not filled. This paper recommends that stakeholders should establish responsive multi-disciplinary innovation partnerships in order to identify, understand and resolve health and well-being challenges through smart residential planning, professional best practices and design solutions. The teamwork should disseminate and share their achievements, which could then be replicated in a broader context of sustainable health and well-being support structures.

Key words: health, quality of life, smart residential design, well-being.

Aims Research Journal Reference Format:

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1. BACKGROUND TO THE STUDY

While designers of public residential milieus have always impulsively recognized that the built environment has a profound effect on its occupants, nonetheless, little research has been undertaken regarding the locational impact of residential schemes on inhabitant's well-being. Gallagher, (1993). Worldwide, government plays significant roles in providing suitable housing for citizens. Mabogunje (2002). Demographic and morphologic studies forecast that urban centers will be home to 75% of the world's population by year 2050. United Nations, (2001). This is a critical phenomenon that government initiatives and resident's participatory efforts must address in the face of worsening climate change. It implies that urban economies as a milieu will then become central to the citizen's well-being. UN (2016). Another one of the most prominent challenge of world population growth is the increasing prevalence of the developing world. Presently, 81 million persons are added annually to the world's population—95 percent of them in developing countries. According to the United Nations' long-term forecasts, the population of Africa will increase fourfold—from 700 million persons in 1995 to 2.8 billion in 2150. United Nations, (1998a), Karen & Kern, (2013).

In the context of Sub-Saharan Africa, many municipalities with high populations are coastal cities with deficient infrastructures and capacities to cope with tsunamis, flooding, housing structure collapse, acute shortage of portable water power, and disruption of poor transportation system. Going by past researches, cities are currently centers for driving the economies, health and GDP of nations. Therefore, such residential investment misplacements usually led to huge financial losses. One of the major challenges of the 21st century will be to find residential infrastructural solutions that promote resilient and sustainable physical well-being systems to serve the growing urban populations. Out of 50 countries on in Africa, 38 of them have their main urban centers as coastal cities susceptible to climate change and its associated challenges of urbanization and poor infrastructure. CIA (2008).

This paper evaluates available empirical data of residential infrastructural capacity of Lagos, a coastal, former capital city and Nigeria's economic/commercial nerve center vis-a vis, the location of public residential schemes/ settlement in areas prone or vulnerable to effects of climate change and uncontrolled abuse of natural resource on occupants well-being. Lagos is one of the fastest growing mega-cities of Africa with an estimated population of around 20-22million. Lagos State Population Commission, (2016). It is annually beleaguered with problems like air and water pollution, poor air quality, ocean surge, loss of arable wetlands from intense land reclamation and climate change. Simmonds, (1983), Obiefuna, Idris & Uduma-Olugu(2015). These challenges are common to many cities located in coastal areas like Houston, Florida, USA, third world or poorer cities like Karachi, Bangladesh in Asia and cities of Central America devastated by hurricanes that displaces millions of urbanites with yearly fatalities WHO. World Report (2017)



Fig. 1: Coastal countries in Africa
 Source-CIA -the World Factbook. (2008).

In Nigeria, Lagos as the most populous city also rank first as the fastest growing mega-city within a geographical space 1,425 9000km², the built-up land area of Lagos metropolis is about 18,533 hectares. Residential coverage is about 9,609 hectares representing 52.1% of the built-up land area. Ninety-four percent of the city's population were classified as urban dwellers. It is also one of the fastest growing large urban agglomerations in Africa. One of Africa's largest sea ports is located in Lagos. The road network in Lagos covers about 650 km, with a traffic density of 222 motor vehicles per road kilometre, far above Nigeria's average of 11 motor vehicles. In the fifty-seven year period between 1950 and 2007, the population of Lagos grew from 300,000 to an estimated 17.0 million (Oyeleye, 2001; George, 2008).

This substantial population growth has extreme consequences, particularly in terms of adequate housing provision for vulnerable rural-urban migrants in search of better opportunities. Mabogunje (2002), reports that the population density of Lagos is about 20,000 persons per square kilometre. High population density as a factor is significant in addressing the problems of urban settlements, housing needs, housing demand, housing supply and well-being. Iweka (2012), Karen & Kern, (2013).

1.1 Medium-Income Housing

Out of over 50 housing schemes, three medium income residential neighborhoods- Ebute-Meta, Ketu-Alapere, Kosofe and Abraham Adesanya, Lekki of the Lagos State Property Development Corporation's (LSDPC) were selected for the study because they have been built and occupied for 25-30 years. Built with prefabricated components, this medium-income estate is located at the heart of Ebute-Metta, in Lagos Mainland. It is a gated community with boundary fence walls and only one access with a security post. The buildings are made up of three-storey blocks, with two apartments of four-bedrooms on every floor. There are altogether sixty-six blocks of eight apartments, totalling 528. The floor plans are prototypical units.

Ketu-Alapere medium housing scheme is located in the densely populated area of Ikeja on the Mainland. It is a neighbourhood with 105 medium income families with an estimated population of 800. 26% of occupants have lived here from 1 year to 30 years. Surrounded by the wetlands, this residential scheme is at risk of inundation or ocean rise or sea encroachment. The third urban site is the Abraham Adesanya housing scheme is located on the former peri-urban Lekki Peninsular. This was mainly reclaimed wetlands formerly a popular or informal favela otherwise known as 'Maroko'. It was later taken over by policy fiat with a view to upgrade the well-being of the resident. Lagos State government initiative developed over 10 large residential estates on this region to an estimated cost of \$20-\$30 billion in housing provision investment. (LSDPC 2016). As an inundation zone, Lekki Peninsular may also bear the brunt of climate-related changes over the next 25 years, according to a report by the Centre for Global Development. Mabogunje (2002) and Obiefuna (2016), UN (2016).

The assessment of vulnerability is based on the city's topographical vulnerability as well as its population. Obiefuna (2016) suggesting gross disparity and huge economic loss in the amplified impact of future disasters.

1.2. Statement of Problem

Amongst over 50 African Countries, 38 of them are shoreline nations with major urban areas along these vulnerable precincts. Lagos is considered at-risk of storm water drainage systems that are outdated or inadequate, principally in slum zones, according to a breakdown of the worse-impacted cities by region. Mabogunje (2002). Recent substantiation reveals that sea-level rise could reach 1000mm or more within the next 50 years, Dasgupta, *et al.* (2009); Rahmstorf (2007) U.N., Intergovernmental Panel on Climate Change (2017) and OCHA, (2009). The locational impact of these multifamily housing on the well-being of residents are causes for concern for both private and public sectors.

2. CRITERIA FOR SUSTAINABILITY

Land capital or resource is central to human life. (Alonzo 1964) Chiarazzo *et al.*, (2014). The availability of land, water, and sun at the disposal of populations determine their prospective affluence, while tangible wealth depends on the ability to proficiently manage these resources. Mishandled, these resources may be irretrievably lost while national wealth and well-being are proportionately and consequently depleted. Obiefuna, (2016); Pemberton & Humphris, (2016). The prime goal is to balance human activities with natural laws in order to take advantage of environmental assets for sustainable urban well-being. Sustainability is not just about being green. It is about dependent and independent variables working together to simulate positive well-being change. It involves delivering long term value, providing the best dwelling places and neighborhood environments whilst minimizing negative environmental impact. Altman, (1993), Wilson & Wileman, (2005). Strategic planning and design practices that significantly lessen or eradicate the adverse impact of locations on the well-being of occupants in five wide-ranging areas – setting, water, energy, resources and comfort are key criteria for consideration. (US Department of Energy, (USDoE) 2009)

2.1 Smart Design Approach

Strategic architectural design and good planning forms the worth of the residential environments should be tied or tailored to improving the health, happiness, and enhance well-being of urbanites. Karl Johnson in 2012 at the Clinton Global Initiative and American Institute of Architects (AIA) proposed a 10-year develop design and technology solutions for cities addressing public health, sustainability, and resiliency challenges.

Placing human and environmental health and well-being centrally at the core of architecture discipline by specifically employing an architectural design-enabled and integrated well-being enhancing systems with the overall aim of designing for effective control. In order to demonstrate the link between location, residential design and the health of people who live or play there. Architectural best practices should bring the dynamism of design to bear on the public well-being domain. AIA CEO Robert Ivy, (Karen & Kern, 2013). It was further stated that good design is cheaper than high technology – pay attention to design before anything else, (USDoE .2009); Nordin *et.al*, (2016). Smart neighborhoods are in a better position to solve local problems and supply more cost effective and innovative solutions for the well-being of residents. Attending to the connections between location and sustainable residential well-being should be the over-arching goal of design or planning pursuit, finding ways to strengthen and illuminate these links demands people-oriented design solutions. Architectural education and practice should eradicate barriers to interdisciplinary collaboration, often ignored, overlooked, or poorly quantified. Three key issues at the core of residential provision revealed are; residential design must be wide-ranging and inclusive, it must accept change and transformation, and must incorporate the user as part of the design decision-making process. Habraken (1972), Iweka (2012), Johnson, Adebamowo, Adejumo (2017).

2.2 Well-being concepts in residential environments

The term well-being largely suggests or denotes that something is good quality. Veenhoven (2004). At the public and individual's level, good quality refers to the physical condition of the built-environment as criteria or variable to measuring objective well-being. Well-being includes an individual's feeling about themselves in relation to the world or environment around them. Residential settings have significant impact on the level of well-being, consequently, for residents to experience healthy environment, the neighborhood must be in a healthy state and in a good location. A healthy neighborhood is one that engenders surroundings that not only minimizes direct and indirect impacts on health, but also improves the well-being of residents by helping them perform optimally. Pemberton & Humphris, (2016).

According to combined theories on urban economy, the give-and-take between accessibility, residential locations, availability of public amenities, workplaces, open parks, neighborhood recreational facilities and other opportunities usually have higher landed property values per unit area. Other attributes that can affect the real estate values in an urban organizations, include the natural landscape, the built environmental and the air quality. Alonso, (1966). Chiarazzo *et al*. (2014); Nordin *et.al*, (2016). The definition of healthy residential building cannot be overtly isolated from what is universally known as green buildings. Green building is defined by the Office of the Federal Environmental Executive, United Kingdom (2003) as the “practice of increasing the efficiency with which buildings and their sites use energy, water and materials as well as reducing building impacts on human health and the environment, through better siting, design, construction, operation, maintenance and removal throughout the complete life cycle of the building.” The issues of citizen's well-being in the urban conundrum in relation to climate change are conflictive leading to divergent challenges. Responding to these problems effectively and sustainably is a key objective for governments, authorities, institutions, and stakeholders involved in urban development processes. As suggested by Simmonds, (1983), each human settlement is best conceived as an integral part of the natural environment. (Karen & Kern, 2013). Well-being is defined as the state of good health, happiness, fulfilment and living in perceptually healthy conditions physically, socially and mentally. The World Health Organization (WHO, 1948) and research scholars agreed that in improving the quality of life, three main aspects impact, namely; housing quality, the quality of the close neighborhood environment and the quality of the urban site UN-HABITAT, (2007); Mohit, Ibrahim & Rashid, (2010). Wells *et al*, (2010).

The concept of well-being is widely used in social and economic research, but not constantly with a distinct explanation or understanding of what constitutes well-being. An extensive body of literature developed aimed at expounding the conception of well-being and identifying its constituents. Fundamental to this are two contrasting insights: one in which well-being is concomitant to satisfaction of desires or predilections (hedonic), and the other in which it is associated with the life activities in which people participate (eudaimonic). Conceição & Bandura (2008). Well-being in housing is directly impacted by the natural balance, environment and physical safety amongst other variables. The framework recognizes well-being of residents as dynamically built by factors through connections between their circumstances, locality, and activities for residents. Knight & McNaught (2011). Other research studies on well-being has been hypothesized largely and correlated very pragmatically to an individual's locality and functioning in society, with significant attention being paid to their operational, communal and recreational relationships. Rapoport (1975); Katyal (2002); Kellert, Judith, & Mador (2008).

2.3 Study area.



Fig. 2: A Map of the Study Area
 Source-CIA The World Factbook.(2008).

2.4 Objective

This paper evaluates the location of residential neighborhoods in areas predisposed to devastation from worsening environmental conditions and its influence on resident's health and physical well-being.

3. RESEARCH METHODOLOGY

This paper approached investigates smart design for well-being using a triangular approach. This is a combination of archival information from government initiatives in Lagos Metropolis over a period of 44 years from 1972 – 2016. Quantitative, physical measurement and observational research methods. A survey was designed to evaluate the innovation in 3 medium income government residential schemes (Abraham Adesanya, Lekki, Ebute-Meta and Ketu – Alapere) to evaluate design innovation for healthy lifestyles beneficial to user's well-being. The quantitative survey method was adopted to collect data in order to confirm whether there are design responsiveness to take advantage of resources present in the natural environment with the view to reducing dependence on artificial resource and enhance resident's well-being.

The relationship between the objective and subjective aspect of occupants' well-being was carried out through user self-measurement technique. See (table 1).Observatory technique evaluates the physical characteristics or variables like roads, accessible open spaces, car-parking, parks, wide-enough sidewalks, bike trails spatial adequacy and other well-being indicators in the selected typologies of LSDPC .

Methods adapted to address the aim and objectives include the review of the relevant literature by other researchers in order to provide a suggestion for improvement. Hoornweg, Freire, Lee J, Bhada-Tata & Yuen, (2011).

4. DATA PRESENTATION

The data collected for analysis is presented as follows.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.891	.906	6

Table 2: Spatial Adequacy in Typical LSDPC 3-Bedroom Apartment.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Adequacy of Living room/parlour	15.83	33.275	.657	.504	.882
Adequacy of Dining Room	15.00	28.846	.717	.524	.872
Adequacy of Bedroom	15.40	31.626	.805	.678	.863
Adequacy of Kitchen	15.28	32.588	.749	.598	.871
Adequacy of Store	14.40	27.000	.651	.472	.896
Adequacy of Toilet & Bath	15.02	28.615	.840	.725	.851

5. FINDINGS

This explorational review underscores research findings by Mabogunje and Obiefuna that water levels in the selected residential neighborhoods had risen by 450mm in the past 20years. Ketu Alapere on the Odo Iya Alaro-Agboyi creek axis is prone to the adverse effects of indiscriminate land reclamation, Abraham Adesanya on the Lekki Peninsular is susceptible to ocean surge as evident in flooding in heavy rainfall of 2017.No effective drainage scheme, and the prevailing land reclamation is also a major challenge for the future. The resultant variations in coastal morphology will heighten the effects in some areas, while largely over-spilling to others. Obiefuna (2016). Well-being as the goal of both government and citizens is at low-level, the study confirmed that in the fast developing Lekki-Epe free trade corridor, accessible physical amenities like open space, natural parks, pedestrian sidewalks, bike-trails, people friendly recreational spaces are not available. These are criteria for determining sustainable well-being according to Evans *et al* (2000); Evans, *et al* (2003), Wells *et al* (2008, 2010) and Nordin *et.al*, (2016).

All the residential neighborhoods examined are vulnerable to flooding by ocean surge if the water level should rise by 1000mm from the existing level. Our results suggest gross inadequacy in the heightened impact of future disasters, with the most severe effects likely to affect major residential areas of Lagos Metropolis, thus further compounding the urban problem of residential inadequacy. 86% of respondents expressed concern about environmental safety and security of housing investment in view of the incessant annual flooding in Abraham Adesanya scheme. There is no policy standard and building control measures to enforce that foundation datum levels are above an established neighborhood safety mark to alleviate vulnerability to flooding or ocean rise during the raining seasons especially.

76% of residents are planning to move out of these residential schemes to the Lagos Mainland in view of affective factors like flooding, non-existent well-being enhancing physical infrastructures like open spaces, adequate parking, wide-enough walkways, easily accessible recreational parks and other people-responsive smart design initiatives for sustainable urban well-being. UN-HABITAT, (2007). In Ketu-Alapere housing scheme is a gated community, comfort, happiness rated 39.0 % and 30.1% by respondents respectively. (See table 3).

Table 3: resident's self-measurement for safety, security and quietness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Excellent	26	37.7	37.7	37.7
	Very Good	21	30.4	30.4	68.1
	Good	22	31.9	31.9	100.0
	Total	69	100.0	100.0	

6. CONCLUSIONS AND RECOMMENDATIONS

Government as a key player in residential provision should embark on strategic phase-by-phase upgrading of prone residential neighborhoods by design best practices for coastal protection, prevention and gradual relocation of vulnerable populations. Provision of alternative residential areas that are not disposed to locational risks, safer from damaging natural occurrences to minimize future loss or damage to available residential capacity and enhance resident's well-being resilience. Similarly, uncontrolled and indiscriminate reclamation of natural wetlands, encroachment of river banks, lagoons, and poor spatial planning should stop to minimize flooding and ocean surge effects on resident's well-being.

Provision of alternative residential areas that are not prone to or safer from damaging natural occurrences to minimize future loss or damage to available residential capacity and enhance resident's well-being resilience. Similarly, uncontrolled and indiscriminate reclamation of natural wetlands, encroachment of river banks, lagoons, and poor spatial planning should stop to minimize flooding and ocean surge effects on resident's well-being. Smart architectural design innovations and practices should be engaged to mitigate against damages and maximize environmental potentials for future well-being needs.

7. CONTRIBUTION TO KNOWLEDGE

This study emphasises the engagement of smart-design resourcefulness as a tool for urban planners and private residential investors in building sustainable housing for of resident's well-being. It verified that well-being is a measurable entity through the evaluation of neighborhood's physical characteristics. It further confirms the association between location, neighborhood attributes and their impact on sustainable well-being.

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