

Green Walls and Public Healthcare Facilities in Port Harcourt Metropolis, Nigeria

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Abstract: Generally, the architectural design and physical development of green walls in urban hemisphere has gone beyond aesthetics and traditional values. However, the multifunctional approach and quality healthcare contributions of green infrastructure are perhaps the contemporary trend urban dwellers value most. The economic, social, environmental and healthcare understanding of urban green spaces is on increase, as many environmental advocates affirmed that urban green spaces enhance sustainable city development. Conversely, this article concentrated more on public healthcare services or provision of green spaces in Nigeria urban environment, using Port Harcourt as a situation study. The healthcare benefit, environmental protection and sustainable city ideology of greens are imperative, but many have hardly been given any significant attention for smart city growth or development. Distribution of questionnaire for field survey constitute the study instrument while Statistical Package for Social Scientist (SPSS) served as the data analytical method and 5% of The sample was also derived from onscreen digitization of the neighbourhoods under investigation and the findings showed that green space sustain biodiversity, densification, environmental degradation, human health/wellbeing and mitigation against climate change are the healthcare services green spaces provide to the urban environment. However, population increase, urbanisation, poor physical planning/ zoning and government policy are the major determinants for the damages urban green spaces recorded as a healthcare facility. The analysis maintained that absences of green spaces in urban environment are responsible for poor urban morphology, loss of resilience/smart city, quality air, depreciation of property and neighbourhood value etc. As usage understanding, budget constraint and inappropriate cost benefit analysis are the challenges of urban green spaces in developing cities. The recommendations made by the research include the adoption of green space creation exercise. The minimum of two green spaces should be created and maintained per urban street schemes, participation of urban residents, corporate and non-government organisations in urban green spaces planning, development and the inspiration of mini green space for individual building plans among others. This will enhance sustainable urban healthcare facilities and development in Nigeria.

Keywords: Green Wall, Public Healthcare, Facilities, Port Harcourt, Metropolis and Nigeria

I. Introduction

Globally, the architectural design and physical development of urban green walls in form of public parks, urban gardens and related activities delivers sustenance, aesthetics, and quality air, subtraction of noise and air pollution, calming of environmental heats, subversion of storm water, groundwater regeneration and allied services to the urban environment (research work 2022). The strategic opportunities and overall framework that prescribes how green walls should be handled globally have undergone series of evolutionary stages. Today, many policy frameworks exist to attest to the fact that government have made concerted efforts to reduce the challenges and injustice of green walls melted on neighbourhoods. In some of the emerging countries of world, urban green areas has recorded many challenges in terms of number, scale and trend especially in the last three decades. But in reaction to these problems, the global community developed a number of policies and framework for challenges reduction to encourage green space management and its trend that benefits resident's wellbeing. Being a member of the global community and a signatory to these frameworks, Nigeria developed series of mechanisms for urban green space injustice including the review of national urban development policy periodically to incorporate and domesticated whatever fresh methodology and tools that are introduced at the global level (survey 2012). This is to place the nation on the same podium with the rest of the global community and ensure smart and resilience urban development. According to Matthias, Braubach, Egorov, Mudu Wolf, Thompson, and Marco (2019), the recent urban life expectancy is connected with protracted pressure, unsatisfactory physical actions and contact to anthropogenic ecological dangers. The usage of urban green spaces such as parks, playgrounds, and residential greenery may enhance mental and physical health as well decrease illness and death in urban environment the provision of psycho- logical easing and stress mitigation, social consistency inspiration, substance of physical activity, and diminishing contact to air contaminants, noise and extreme temperature etc,

Statement of Problem

In Nigeria, more than 50% of the population dwell in urban land uses and neighbourhoods with the expectation of quality greens for mental and health benefits. But these urban neighbourhoods experience injustice and stresses on the available greens. The injustice or deprivation of green spaces occur as a result of non-provision, conversion, encroachment with physical, social, and environ- health implications. With the current challenges of climate change and chronic disease, many cities are experiencing poor mitigation, aesthetics and health benefit obtainable from green infrastructure, and this has given reasons for urban green justice and resilience. It is therefore compulsory for Nigeria urban areas to be resilient and to develop sustainably to accommodate the forthcoming population growth and green infrastructure. Many research works showed the importance of land use planning as tool for urban green space justice and resilience enhancement (Marianne, 2019; Pilar and Tomas, 2016). Some studies were done on African cities (Abdullah, Celestina and Kerry 2016) and they delivered awareness on just how urban planning can lead to urban green space justice. This article therefore, highlights the role of urban planning and architecture in the Neighbourhoods justice of green spaces in Nigeria. It discovers the influential framework in physical planning for urban green injustice, challenges and planning measures that have been undertaken to reduce the injustice and possible ways to enhance the application of physical planning in urban green space management and fairness.

Relevant Literature Reviewed on Global Basis

A good number of studies have been carried out in the urban and suburb areas in Nigeria and they connected the green spaces problems to include poor or inadequate physical planning. The empirical work of Matthias, Egorov, Mudu, Wolf, Ward and Marco (2017) gave distinct consideration to advantages of urban green space for deprived population and the effect on health fairness. They extended the investigation to Probable health dangers connected with urban green spaces and strategies for declining the dangers through appropriate scheme and upkeep of green spaces. The work connect green spaces to health and well- being, confirmed the superior advantageous impacts of green spaces like better mental health, abridged risks of cardiac sickness, obesity, diabetes, death and improved pregnancy outcomes. Matthias, Andrey, Pierpaolo, Tanja, Catharine, and Marco (2017) noted that Current system of life in urban centre gave birth to chronic stress, insufficient physical actions and contact to anthropogenic environmental dangers. But explained that town green space which could be parks, playgrounds and residential greenery which enhance mental and physical health and lessen sickness and death in the urban hemisphere by producing emotional slackening and stress mitigation, motivating social unity, sustains physical activity, and dropped contact to air pollutants, noise and extreme heat. Their work concluded about the ways that connects green spaces to health and comfort, and deliberates about the obtainable indication of exact beneficial properties which might be improved mental health, abridged danger of circulatory disease, obesity, diabetes and death, and improved pregnancy result. The study recommended that particular consideration should be given to advantages of urban green space for deprived population and similar effect on health fairness. While Probable health dangers related with urban green spaces should be debated together with methods of decreasing or eradicating the dangers through appropriate strategy and preservation of green areas. With the application of qualitative descriptive in determination of urban and regional planning situation that linked to knowledge viewpoint, literature and model. Filsafat, Terkait, Perencanaan, and Dan (2017) evaluated green urban open space across numerous urban centres of Indonesia such as Surabaya and Bandung and settles that green urban open space and living standard remains experiential exploration, sense which could be determined. Accordingly, the analysis pinpointed that theories are portions of inferential investigation and likeness that physical planning means rational information and a skill portion. As many urban areas of Indonesia bagged honour as a result of their positivity in developing green urban open space, the development of green urban open space were seem as a direction for enlightening urban population and their life quality that linked to urban and regional planning as complete component of planning whereas skill viewpoint shows the basis to comprehend investigation spot. Mensah, Andres, Perera and Roji, (2016) pursued a knowledge crack by outlining the connection among urban green spaces and value of life, and ways such acquaintances may update strategy expansion in manners that contributes to governments affirmative attainment result for quality of life. Hereupon, the article applied a theoretic method which employed methodical appraisal direction including 452 global publications and severe contented examination integrated to retrieve relevant data. Green spaces were found to provide various social, economic, and environmental benefits, which in turn improve physical, psychological, emotional, social, and material wellbeing of individuals and thus enhance quality of life. Therefore, strongly recommendations that conservation of green spaces should be integrated into national health, environmental and socio-economic policies in order to promote effective utilisation of green spaces to enhance population overall life quality, as improved citizens' quality of existence is a stated priority of many governments in both the global north and south.

In the city of Nezami Ganjavi, Akbari, Seyedan, and Radfa,(2016) conducted assessment with a list that contained park survey, interview and green space professionals to research urban green spaces approach to health, safety and environment. The findings revealed that utility of health indicators were the highest followed by environment and safety. Their SWOT examination confirmed that many Parks exist with vital materials which include fire extinguishers, first aid box, annual testing of drinking water and the ability of children and parents to spend free times. They maintained that green parks dipping stress, decreases air pollution and

production of oxygen, gives individuals the chances to contribute in physical activities, ideal environment for children and decline of noise pollution as a display of urban development. However, they pointed that the most imperative danger is inappropriate park facilities for disabled. Therefore, the proposal and upkeep of urban green spaces necessitates combined administrative scheme built on global ideals of health, safety and the environment. Also led to credence is the work of Jinguang, Zhaowu, Bing, Ranhao and Henrik (2020), who Acquired 18961 green health investigation journals within the environment of core Web in pure science gathering as of 1901 to 2019 for global investigation position, direction and potential predictions in the areas of green spaces and health research in the previous proposed agenda for the causal instruments and ways that connect green space all over the communal health. Their analysis focused on features of journal productions, prominent methodical chastisements, and alterations in presentation among nations and institutes. As well, gratified examinations were held conducted for the major issues together with other incidence studies and main term bunching scrutiny. The study found (a) constant measurable growth in the journals, vigorous publications and inclusive nations and institutes as far 1990s; (b) important growth and dynamics in green health connected put in the ground corrective classes and atmosphere connected tweaks flattering of the normal. (c) exploration concerned and tendencies well-known constructed from the breakdown of greater occurrence other happening and major issue (d) the prominent area such as green spaces and physical health, mental health, and bionetwork health discovered and envisaged built on major bunching studies (e) the structure of original devices and alleyways connecting green space to environmental health planned on conception of the three prominent acquaintance areas. They summarised that the key problem of green health inquiry should additional illuminate painstaking the original devices and conduits from numerous standpoints together with manifold countries, corrections besides the investigation schemes. Oradini-Alacreu, Rebecchi, Mezzoiuso, Croci, Buffoli, Odone, and Signorelli, and Capolongo (2020) examined 2015 PRISMA declaration, Medline and Embrace for measurable health outcomes deemed suitable for analysis. In line with the key appraisal deductions, a public-concerned review aiming at people of Milan and its outlying villages to comprehend healthier and the way people gain within the domain of the city green environs. the study classify health result into cardiovascular, obesity, respiratory, neoplastic and mental fitness but discovered that undesirable connotations exist among ailment occurrence and city green environs general amount. They maintained that size, apparent superiority and convenience were strongly descriptive problems. The conclusion highlighted that urban areas are gradually turning to dangerous topics for numerous developing municipal strength tests and recommended that town planners, prominent participants, representatives and groups were required to reserve and intensification prevailing green areas, and to advance Public Health across the cities.

The analytical work of Gianfredi, Buffoli, Rebecchi, Croci, Oradini-Alacreu, Stirparo, Marino, Odone, Capolongo, and Signorelli (2021) examined the connotation of publicly accessible urban green spaces contact, and mental health result using review carried in 2000/01/01 to 2020/09/30 through PubMed/Medline and Excerpta Medicadata BASE (EMBASE). The findings submitted that non-effect or adverse impact on mental health foodstuffs, while the remaining factors on positive impact of urban green space contained both MH and PA. Though, their findings harassed not the solitary position of green space available, then again the standing of care, makeover, and familiarity to residential districts with the attendance of collaborating actions, and apparent safety facets. The investigation decided that little procedural confines of the involved analysis and domino effect were agreed on signifying that greens zones of the city proved possibly valuable impacts about mental health and physical actions. Therefore, suggest importance for community health specialists and officials inclusive in spatial arrangement of cities, public health elevation, and development of wellbeing and common fairness.

A perception study by Marianne, and Eco (2019) investigated the co-advantages of green spaces using multi-sectorial alliances and donation of model for communal association that discourse multifaceted factors such as temperature alteration and lingering sicknesses, by the communal involvement of green spaces. In connection to the co-value green spaces offers to human health and the atmosphere. The decrease of many long-lasting sickness and allied indications, comprising anxiety, obesity and cardiovascular ill health, has remained connected with the attendance and admittance to green space. According to the authors, Green spaces too donate quantity of ecological health aids and proved the decrease the probability of flooding, advance air quality and deliver of cooling and shadow. Slater, Christiana and Gustat (2020) opined that everything about nature or green space contained positive physical and mental health aids as propinquity to parks and green spaces in the era of COVID-19 epidemic reduces the choices of physical motion which could affect susceptible inhabitants further than others. They maintained both small -term and extended term endorsements to inspire access to green space for individuals while permitting for physical isolation. The significance of attractive in several kind of morphological bustle habitually, between physical and mental health, when established very well, which could be chiefly helpful in safeguarding the body and restraining the impairment produced through the deadly coronavirus virus 2019 (COVID-19). In consideration of 5,148 populations from the Behavioral Danger Factor Surveillance System held in 2006 at Washington State and across 98 zip-codes comprising urban and rural zip-codes, Abdullah, Celestina and Kerry (2016) compare overall description or precise sorts of green spaces related to mental and general health and percentage of green spaces were derivative of the National Land Cover Dataset. The analysis of Bivariate correlations and multilevel regression analysis regulating the age, sex, race, income, education level, size of green space, and zip-code populace and socio-economic condition designated 'combined green space' were not allied with mental and total health. Outside that, sampled personnel in the areas with higher forests

information less days of mental health grievances in entire sample. The outcome further pointed that additional urban green space was linked to lesser days of mental health criticisms in urban zip-codes. Furthermore, extent of forest within the urban zones was related to fewer days of mental health grumbles. Their result recommend that kinds of green space must be put in place separately instead of combined as 'just green' and 'size' of woodland in cities observed to be significant issues that may affect the association between green space and cerebral health.

Health And Environmental Implications of Greens Walls

Pressure and violence reduction may be benefited from parks, garden spaces, street trees, and landscaped traffic islands that provides more than a pretty view and effectively reducing the stress of our daily lives by invoking a feeling of equanimity, as stressed individuals feel better after exposure to natural scenes. Accordingly, green spaces also reduce instances aggression and violence by increasing good health for human existence. Areas with high scientific spread of trees and recreational places like parks combat heaviness and diabetes. For example, developed environment of word particularly the United States of America recorded individuals that regain their health and became stress-free when they contacted green areas that lowered blood pressure and mortality rates than sick groups whose environment are stressful and contact to quality green is impossible. Environmentally, urban green spaces wipes and refreshes the air for better and quality environment, by trees filtering pollutants and cleansed the air by distancing nitrogen dioxide, sulphur dioxide, and carbon monoxide. Moreover, vegetated environs similarly offer assistance to combat the "heat island consequence" instigated by the heat-trapping eminence of asphalt, concrete, and building materials, as air under a tree's canopy is better to human health. On social dimension, crime reduction is recorded in low income neighbourhood of developing nations, urban green spaces increased increase crime rate by serving as hide out for criminals and their tendencies. But in medium and higher density areas, urban open green spaces are usually measured harmless. In view of this, green spaces usually lessen crime in most districts (lower and medium density) of urban centres and expurgated it little in higher density as a result of population intensification. However, the green spaces mitigate mental pressure to violence by declining worry. Also greened pavements may enhance social benefit (Harmless driving) by reducing the driver's tiredness, anger, aggression, fear and stress of automobile drivers. A study that applied videotapes to simulate differing levels of vegetation along roadside suggests that parkway design and roadside vegetation reduces frustration among drivers. (For information about Delaware's roadside vegetation program, consult the document "Enhancing Delaware Highways: Roadside Vegetation Concept and Planning Manual," available at http://www.deldot.gov/information/pubs_forms/manuals/edh/index.shtml. Accordingly, trade and industry may be stimulation or encouraged when the redesigned shopping environment or green boulevard is beautified with trees and other street landscapes in the inner city shopping or commercial neighbourhood was ranked very high and preferable by the assessments held by the city population as green trees foster not only communities sense of location, but well-managed streetscapes increases population opinion concerning the quality of goods and services obtainable.

II. Method and Procedures

The study in cooperated both ancillary and first-hand data usage. The ancillary sources of data considered in this analytical research comprise those from preceding studies concerning urban green spaces and environmental injustice on neighbourhoods and correlated parts from available and unavailable research materials. The available or published sources of ancillary data were obtained from numerous references involving books, investigation studies, meeting/seminar and working articles, administration records and professional reports etc.

Primary Source: Questionnaire: A questionnaire survey was design for the research to produce feedback from the residents of various neighbourhoods to identify with issues such as the green and blue spaces impacts of the environment, aesthetics and health implications for residents and districts of the areas under study, and factors considered most when mapping out areas for buffer and greenery.

Sampling

The research shared the neighbourhoods on the basis or grounds of numerical densities/strength after which eight urban villages or localities' were designated for searching. An overall of 350 photocopies of questionnaires survey were dispersed to the general public in eight decided neighbourhoods of dissimilar densities (low, medium and high density) 215, demonstrating 82.1percent were returned to the study area (Port Harcourt metropolis). The high density consumed the maximum quantity of questionnaire with 150 representing (71. %), middle density secured 25 questionnaire in lieu of (12. %) and low density 40 questionnaire in place of (17. %) of the sample scope. See the table 1 below).

Table 1: selected and sampled neighbourhoods populations for the study Area

S/N	Region	Density	Projected Residents	Household Residents	Sampled Size	Percent
1	Abloma	Low	25,891	5,905	15	07.00
2	FimieAma	“ ;;	12, 863	3, 756	10	05.00
3	Nkpogu	High	49,176	16, 459	70	31.00
4	Orominieke	“	35,431	12, 804	35	15.00
5	Bundu	“	38,229	14,109	45	25.00
6	PH Town	Medium	27,103	7,231	0 7	3.00
7	Rumuoparali	“ “	29,459	9,645	0 8	4.00
8	Ogbunabali	” “	31,821	10, 908	10	5.00
TOTAL			249,973	80,817	215	100.00

Source: Researchers Discovering 2022

III. Result and Discussion

Health implication of Green Infrastructure in Port Harcourt Urban of Nigeria

The findings of the research through regression table below showed joint benefits of urban green spaces (Promotes mental and physical health, reduces morbidity and mortality, enhance psychological relaxation, stress alleviation, and reduces exposure to ill health, air pollutants, heat and noise) significantly predicts good and quality health condition of human population. The R value at 0.857 showed that there is a higher degree and positive relationship between joint benefits of urban green spaces and quality of health for human existence thus implying that improvement or developing of urban green spaces will enhance quality of human life and urban environment in Nigeria. In the same vain, the R^2 Adj. at 0.729 showed 72.9% of the variance observed in advantages of green space among the respondents is due to the joint benefits of the independent variable or operational variables. Findings showed that the joint benefits yielded an $F_{(5, 490)}$ value of 266.224 and a p value of $0.000 < 0.05$. Therefore enhancement of human health in the urban environment is connected to build and developed green infrastructure or spaces.

Table 2: Joint Benefits of Independent Variable on Residents Health in Port Harcourt

Model Summary					
			Adjusted R Square	Std. Error	
R	R Square		Square	Estimate	
.854	.733		.729	1.54317	
ANOVA					
	Sum Square	Df	Mean square	F	Significant Level
Regression	2844.786	5	548.7572	266.224	.000
Residual	1011.018	490	2.061		
Total	3753.804	495			
A. (Constant –Urban Greenery) Promotes Mental and Physical Health, Reduces Morbidity and Mortality, Enhance Psychological Relaxation, Stress Alleviation, And Reduces Exposure To Ill Health, Air Pollutants, Heat And Noise					
B. Dependent Variable: QUALITY ENVIRONMENTAL &HUMAN HEALTH					

Source: Survey 2022

Effect of Green Infrastructure Scarcity on Public Health of Nigeria Cities Dwellers

Adopting the mean score gained from the scale of item, 7 public health and joint physical planning implications were identified whenever an urban area developed without the physical incorporation of green infrastructure. This is abridged on table 3. The Promotion of chronic stress emerged as the utmost disadvantage of greenery scarcity in Port Harcourt metropolis, with a mean account of 3.50. This implies that poor income class or population who do not have greens in their environs are exposed to chronic stress and un-green environment unlike higher income group who are exposed or highly associated with environments characterised by green infrastructure. That is why many people in low cadre environment of the society are eager to gain more income or resources to change their socio economic status and associate themselves with environments whose design component encompasses green zones and escape environment without green infrastructure and as well associated problems. This effect was carefully trailed according to ranking by insufficient physical activities (3.22), flooding menace and poor infiltration, given the current nature and flood vulnerability in the country, households are hunger of green spaces in their neighbourhoods since the infrastructure encourage human health and expel environmental problems while poor environmental aesthetics and exposure to anthropogenic hazard, non-exciting social organization in planning ranked (3.20), (3.15) and (3.05) respectively.

Table 3: Joint Effect/Public Health Implications of Greenery Scarcity in Nigeria Cities

S/N	OPERATIONAL VARIABLES	X	SD	REMARK
1	Promotion of chronic stress	3.50	1.24	Accepted
2	insufficient physical activities	3.22	1.28	Accepted
3	poor environmental aesthetics	3.20	1.29	Accepted
4	exposure to anthropogenic	3.15	1.34	Accepted
5	non-exciting social organization in planning	3.05	1.42	Accepted

Source: environmental survey 2022

IV. Conclusions

Increasingly, Cities are becoming critical points for many emerging Public Health problems. The reasons why green space is differentially distributed within the urban landscape are varied, including the philosophy of park design, history of land development, evolving ideas about leisure and recreation, and histories of class and ethno-racial inequality and state oppression (Byrne, 2012, Byrne and Wolch, 2009). Urban green space, such as parks, forests, green roofs, streams, and community gardens, provides critical environmental services. Also green space promotes physical activity, psychological well-being, and the general public health for urban residents. However, urban greens (UG) are considered as a strong instrument that benefits the health and wellbeing of urban residents. though there is growing evidence that benefits are not equally distributed, as environmental health considers the natural, built and social environments significant, implying that a better understanding of the way they impact on human health, and accepting that the built environment also plays an important role .

The study has revealed that green spaces developed in urban areas can serve as a public facility that treat physical stress, chronic mental health and as well as development of smart environment Unfortunately, this has not been an area of focus by the green space policy maker for urban development. However, policy imitators on green space management do not see green infrastructure as a measure to improve health conditions for man and his environment though the scarcity of green infrastructures in towns and cities are associated with negative effect (environmental problem and other health challenges). With the reality of urban green and its impact on the environment and human existence, the need to make these a road map and strong component of physical planning and institutionalised it has become more imperative.

V. Recommendations

The guaranteed way to make urban greens health therapy for human and physical environment is articulated as part of the recommendations.

The many facades and disadvantages of urban greenery scarcity has contributed to chronic stress, insufficient physical activities, poor environmental aesthetics, and inadequate exposure to anthropogenic activities and incomplete land use development that requires an all-inclusive physical planning attention for quality health and environment of the urban population and residents'. The first and last significant phase to proceed is the appraisal of the intervening order for development of greens in Port Harcourt. As it viewpoints the interim growth that stipulated the portion of allotted spaces that green infrastructures must occupied when developing

urban centres and residents micro plots or parcel of space which must serve as an opportunity for obtaining quality health facilities if land developers are compared to make provision for greens and its spaces on a substantial percentage. The appraisals should also make development of various land uses landscape mandatory and the only way to achieve it is to include tree planting and greening as a strong measure or condition for land use development. In that way, it will be possible to correlate positively rise number of landscape and tree surrendered land uses. This calculation is to consolidate other green elements including the conditions of greenery to be compulsory component of blue print development, making greenery a basic portion for physical development, preparation and implementing of land use maps containing green space among others. Irrespective of parks and provision of gardens, guiding the development of green spaces, the plans that contained urban green spaces must ensure that the uniqueness of delicate environment would be accounted for, just the way natural ideal makes use of such zone like swamp spaces, water ways may be connected. In furtherance, this will enhance greening encouraged environmental friendly and quality health condition including urban farms that may be simulated across urban and suburb zone of Port Harcourt and Nigeria.

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