Journal of The Nigerian Institute of Architects (NIAJ)
ISSN: 2315-8913 (Print)
ISSN: 1595-4110 (Digital)

The Need to Develop Urban Green Spaces in Housing Estates in Enugu Metropolis

Okwuosa, Chiamaka *C*[1], Okere, Oluchi Jennifer[2], Okwaraejesu, Chimbuchi[3]

[1] Department of Architecture, Faculty of Environmental Studies, University of Nigeria, Enugu Campus.
chiamaka.ugwu@gmail.com
[2] Department of Architecture, Faculty of Environmental Studies, University of Nigeria, Enugu Campus.
jeniferasonze@gmail.com
[3] Department of Architecture, Faculty of Environmental Studies, University of Nigeria, Enugu Campus.
chimbuchialpho@gmail.com (Corresponding Author)

Abstract: ***This research delved into the necessity of creating urban green spaces within housing estates in Enugu metropolis, with a focus on their environmental, social, and economic advantages. The study employed case studies of five housing estates: Golf Estate, Ivory Estate, Loma Linda Housing Estate, New Abakiliki Road Layout Area A, and Riverside Estate. The findings underscored the significant impact of well-maintained green spaces on the residents' quality of life, including improvements in physical and mental health, strengthened social cohesion, and increased property values. The study also emphasised the environmental benefits such as air and water purification, carbon sequestration, and climate regulation. In Golf Estate, the well-maintained green spaces were extensively utilised and positively perceived by the residents, highlighting their importance in promoting health and social interactions. Despite the inadequate condition of green spaces in Ivory Estate, the residents acknowledged their potential benefits and expressed a willingness to support improvements. Loma Linda Housing Estate demonstrated the economic advantages of green spaces, as properties near these areas exhibited higher market values. New Abakiliki Road Layout Area A and Riverside Estate emphasised the urgent need for the development and enhancement of green spaces to fully realize their environmental, social, and economic potential. The study recommended an increase in investment in green infrastructure, improvement in maintenance and management, enhancement of accessibility and amenities, promotion of community involvement, implementation of safety measures, and the fostering of environmental sustainability. Strategic planning and active community participation were deemed crucial for the sustainable management of these spaces. The research provided valuable insights for urban planners and policymakers, highlighting the significance of green spaces in enhancing the livability and sustainability of urban areas. By addressing the identified challenges and leveraging the potential benefits, Enugu metropolis can significantly enhance the quality of life for its residents through the development and maintenance of urban green spaces.***
Keywords: Urban green spaces, Enugu metropolis, housing estates, environmental benefits

1. Introduction

Urban green spaces, including parks, gardens, and vegetated areas, are crucial for sustainable urban planning, especially in densely populated areas like Enugu metropolis. These spaces offer numerous environmental benefits, such as air and water purification, carbon sequestration, and climate regulation, which help mitigate the urban heat island effect—a significant concern in tropical cities (Bowler et al., 2010). Socially, green spaces enhance community well-being by providing recreational areas that reduce stress, improve mood, and foster social cohesion (Kuo, 2015; Maas et al., 2009). Economically, they increase property values, attract investments, and stimulate local economies (Crompton, 2001). For Enugu, which faces challenges like pollution, limited recreational spaces, and biodiversity loss due to rapid urbanisation, integrating green spaces into housing estates can significantly improve residents' quality of life and the city's sustainability. Therefore, urban planning policies prioritising green spaces are essential for the long-term resilience and livability of Enugu (Chiesura, 2004).

Physical Characteristics of Urban Green Spaces

The effectiveness and usability of urban green spaces are greatly influenced by their physical characteristics, such as size, design, and vegetation types. The size of green spaces determines the range of activities they can accommodate, with larger spaces offering opportunities for sports, picnics, and community events, while smaller spaces provide intimate settings for relaxation and social interaction. Design elements like pathways, lighting, and seating also play a crucial role in enhancing the functionality and safety of green spaces. Well-designed pathways can promote physical activity, while adequate lighting and seating areas ensure accessibility and safety, particularly during evening hours. In Enugu metropolis, where safety and accessibility are key concerns, thoughtful design of green spaces is essential to make them welcoming and usable for all residents.

Additionally, the type and arrangement of vegetation are important factors to consider. Diverse plant species can boost biodiversity and create visually appealing environments, while trees and shrubs offer shade and improve user comfort. Incorporating native plant species that are well-suited to local conditions in tropical climates like Enugu ensures the sustainability and resilience of

green spaces. By focusing on these physical characteristics, urban planners and policymakers in Enugu can develop multifunctional and attractive green areas that cater to the diverse needs of the community.

Social Benefits

The advantages of urban green spaces have been extensively documented. Having access to green spaces has been associated with better mental health, decreased stress, and improved physical health (Kuo, 2015). Maas et al. (2009) discovered that green spaces encourage social interactions and reinforce community bonds, resulting in increased social unity. For individuals residing in Enugu's housing estates, these advantages are especially important due to the crowded and often tense urban living conditions. Green spaces also serve as locations for recreational activities, which can enhance overall quality of life. They provide secure and easily accessible settings for physical activity and leisure, contributing to healthier lifestyles. The existence of parks and gardens within housing estates can greatly improve the quality of life in these areas by giving residents a natural escape from the urban surroundings (Wolch, Byrne, & Newell, 2014).

Economic Benefits

The economic benefits of urban green spaces are significant as well. According to Crompton (2001), green spaces have the potential to raise property values, thus increasing the appeal of housing estates to potential buyers and investors. This rise in property value can lead to economic growth and progress in urban areas. Additionally, green spaces can play a role in boosting local economies by drawing in tourists and serving as venues for various events and markets. They can also generate job opportunities in landscaping, maintenance, and tourism industries. By incorporating green spaces into housing estates in Enugu, the city's attractiveness could be enhanced, ultimately driving economic activities and benefiting both residents and the wider community.

Challenges and Barriers

Although there are undeniable advantages, incorporating green spaces into urban areas encounters various obstacles. Notable barriers include inadequate urban planning, a lack of political determination, and insufficient funding (Jim & Chen, 2009). In numerous cities, such as Enugu, rapid urbanisation frequently places greater emphasis on infrastructure development rather than environmental concerns, resulting in a shortage of green spaces. Public awareness and community engagement are also vital for the prosperous execution of green space initiatives. By implementing effective policies and planning that take into account the needs and preferences of the community, the sustainability and usability of urban green spaces can be enhanced (Kabisch et al., 2016).

The importance of creating urban green spaces within housing estates for environmental, social, and economic benefits is emphasised in the literature. In Enugu metropolis, focusing on the development of green spaces can help tackle various urban challenges and greatly enhance the quality of life for its inhabitants. By drawing inspiration from successful strategies worldwide and customising them to fit local conditions, Enugu has the potential to boost its urban sustainability and resilience.

2. Study area

Enugu Metropolis comprising of South, North and East local government areas is in Enugu State, southeast Nigeria (see figure 1). Enugu metropolis is the state capital and seat of administrative authority of Enugu State located on 060210N and 060300N latitude and between 070260E and 070370E longitude. In the early 1960s it was the regional headquarters of the Old eastern Nigeria region (Okeke et al., 2021). It has evolved from been a small coal mining camp to an urban area, housing currently over 1.1 million people (Ecendu et al., 2020). The predominant ethnic group is Igbo which as Okosun et al. (2023) highlighted, accounts for over 90 percent of the population. Enugu city has undergone rapid development and expansion in recent decades according to Okeke et al. (2020) with burgeoning commercial activities and increasing immigration.

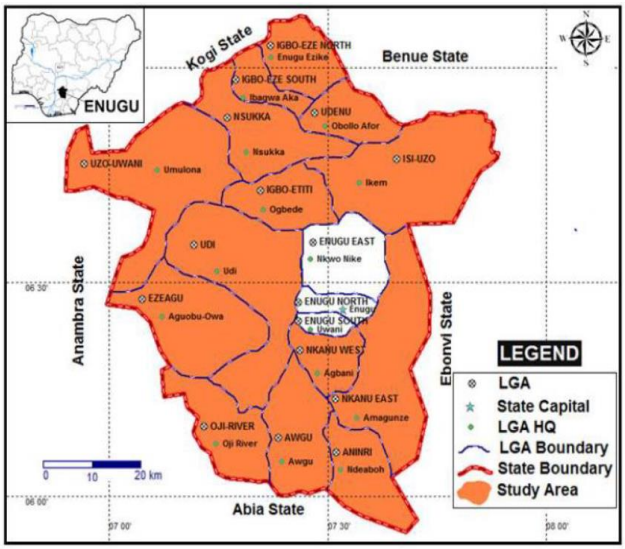

Figure 1: An Operational Model of Architecture Practice

Enugu metropolis, experiencing rapid urbanisation, faces significant environmental and socio-economic challenges, making it an ideal study area for the development of urban green spaces within housing estates. The city's environmental issues, such as the urban heat island effect and air pollution, can be mitigated by green spaces, which also enhance biodiversity and air quality. Enugu's socio-economic diversity and health needs highlight the universal benefits of green spaces in improving mental health, reducing stress, and promoting physical activity.

Additionally, the supportive policy environment and the city's rich cultural heritage provide a unique context for exploring sustainable urban development. Thus, Enugu offers a compelling setting to examine and implement strategies for integrating urban green spaces to enhance livability and sustainability.

3. Research Methodology

The research method employed in this study is the Qualitative Method, an approach that focuses mainly on the use of Case studies as the primary source of data. This is because it is the most credible approach given the extensive nature of the research topic, and as it is systematic and rigorous, and seeks to reduce bias and error. By employing case studies as the research design, it allows for a nuanced and detailed exploration of urban green spaces in Enugu metropolis. This approach provides a comprehensive understanding of the diverse impacts of green spaces across different housing estates, offering valuable insights that can inform targeted urban planning and policy interventions. The research population for the proposed study will be estates in Enugu metropolis that have been selected for detailed case studies.

S/N	Location/Estate	Socio-Economic Status	Green Space Availability	Geographic Location	Rationale for Selection
1	G.R.A – Golf Estate	High-income residents	Well-maintained green spaces, parks, and tree-lined streets	Centrally located, often considered one of the most prestigious areas in Enugu.	□ Provides insights into the benefits and management of well-established green spaces. □ Offers a contrast to estates with fewer green spaces.
2	Trans-Ekulu – Ivory Estate	Middle to lower-middle-income residents.	Sparse green spaces, primarily small community parks and open areas.	Residential area on the outskirts of the city, experiencing rapid development.	□ Highlights the issues related to urban expansion and the need for more green spaces. □ Useful for assessing the impact of green space scarcity on residents' well-being.
3	Mary Land – Loma Linda Housing Estate	Middle-income -Lower income residents.	Limited green spaces, with some community parks and scattered greenery.	Located in a busy urban area, experiencing significant population growth.	□ Provides a perspective on the challenges and benefits of green spaces in a densely populated, developing area. □ Useful for exploring potential improvements and resident perceptions.
4	Emene – New Abakiliki Road Layout Area A	Mixed-income residents, including industrial workers.	Varies, with some industrial areas lacking green spaces while residential zones have small community parks.	Located near industrial zones, experiencing mixed-use development.	□ Offers a unique perspective on the interplay between industrial development and residential green space needs. □ Useful for studying the environmental impacts of green spaces in mixed-use areas.
5	Abakpa – Riverside Estate	Lower-middle to low-income residents.	Minimal green space, with few parks or public gardens.	Densely populated area with significant infrastructural challenges.	□ Provides insights into the social and health impacts of limited green spaces in low-income areas. □ Highlights the necessity for equitable green space development.

Figure 2: Research population for the proposed study

These estates represent a range of socio-economic backgrounds, levels of green space development, and geographic distribution within the city. The sampling technique adopted in this study is Purposive sampling, as it is based on a specific criterion for analysis (Heath 2023). This sampling method is often used in qualitative research which is the adopted research method in this study.

3.1 Results

Case Study 1: G.R.A – Golf Estate, Enugu

The G.R.A (Government Reserved Area) – Golf Estate in Enugu was selected as a case study to evaluate the existing green spaces and their impact on residents. This area is known for its high socio-economic status and relatively well-maintained green spaces.

Site Observations

a. Green Space Availability: The Golf Estate boasts several well-maintained parks, tree-lined streets, and private gardens. Public green spaces are regularly used by residents for various recreational activities.
b. Usage Patterns: Green spaces are frequently used for jogging, walking, family picnics, and social gatherings. During weekends and evenings, these areas see a higher concentration of users.
c. Maintenance: The green spaces are well-kept, with regular landscaping and waste management services ensuring cleanliness and aesthetic appeal.
d. Insights:
e. The presence of well-maintained green spaces in Golf Estate enhances the overall aesthetic and livability of the area.
f. High usage patterns indicate that residents value these spaces for recreational and social purposes.

GIS Mapping

Analysis:

a. Spatial Distribution: GIS mapping showed that green spaces in Golf Estate are evenly distributed, making them accessible to all residents within a short walking distance.
b. Proximity: Most residential areas are within a 5-minute walk to the nearest green space, indicating good accessibility.

Insights:

a. The equitable distribution of green spaces contributes to their high usage and positive perception among residents.

Environmental and Economic Assessments

Environmental Benefits:

a. Air Quality: Measurements indicated that areas within and around the green spaces have better air quality compared to more built-up sections of Enugu.
b. Temperature Regulation: The green spaces help mitigate the urban heat island effect, providing cooler microclimates.

Economic Impact:

a. Property Values: Proximity to well-maintained green spaces has a positive impact on property values. Properties near these spaces were found to have a 10-15% higher market value.

Insights:

a. The environmental benefits of green spaces are significant, contributing to better air quality and temperature regulation.
b. Economic assessments highlight the added value that green spaces bring to real estate in the area.

Case Study 2: Trans-Ekulu – Ivory Estate, Enugu

Trans-Ekulu, particularly Ivory Estate, was selected as a case study to evaluate the existing green spaces and their impact on residents. This area is known for its middle to lower-middle-income demographic and has sparse green spaces compared to other parts of Enugu.

Site Observations

a. Green Space Availability: Ivory Estate has limited green spaces, with a few small community parks and scattered greenery. Most green areas are either privately owned or poorly maintained.
b. Usage Patterns: The existing green spaces are underutilised due to their poor condition and lack of amenities. When used, they are primarily for children's play and occasional gatherings.
c. Maintenance: The few available green spaces suffer from irregular maintenance. Overgrown grass, litter, and lack of proper landscaping are common issues.

Insights:

a. The scarcity and poor condition of green spaces detract from their potential benefits.
b. Underutilisation highlights the need for improvements and better maintenance.

GIS Mapping

Analysis:

a. Spatial Distribution: GIS mapping revealed that green spaces in Ivory Estate are unevenly distributed, with some residential areas having no access to nearby parks.
b. Proximity: Many residents have to walk more than 10 minutes to reach the nearest green space, indicating poor accessibility.

Insights:

a. The lack of equitable distribution and accessibility of green spaces necessitates strategic planning to address these gaps.

Environmental and Economic Assessments

Environmental Benefits:

a. Air Quality: Measurements showed minor improvements in air quality around the few green spaces compared to more built-up areas.
b. Temperature Regulation: Green spaces provide slight cooling effects, but their limited size and poor condition reduce overall effectiveness.

Economic Impact:

a. Property Values: Proximity to the few green spaces has a modest positive impact on property values, but this is not significant due to the poor condition of these spaces.

Insights:

a. Environmental benefits are present but limited by the poor condition and small size of green spaces.
b. Economic benefits are not fully realised due to the inadequate development of green spaces.

Case Study 3: Mary Land – Loma Linda Housing Estate, Enugu

Mary Land – Loma Linda Housing Estate in Enugu was selected to evaluate the existing green spaces and their impact on residents. This estate is known for its middle to upper-middle-income demographic and moderate green space availability.

Site Observations

a. Green Space Availability: Loma Linda Housing Estate has several green spaces, including small parks, tree-lined streets, and communal gardens. However, the overall green space coverage is moderate.
b. Usage Patterns: The green spaces are actively used by residents for jogging, walking, children's play, and occasional social gatherings. However, usage is less frequent compared to estates with more extensive green space amenities.
c. Maintenance: The green spaces are generally well-maintained, but some areas show signs of neglect, such as overgrown grass and insufficient waste disposal facilities.

Insights:

a. Green spaces are valued by residents, but there is room for improvement in maintenance and facilities to enhance their utility and appeal.
b. Usage patterns suggest that residents would benefit from additional amenities and better maintenance.

GIS Mapping

Analysis:

a. Spatial Distribution: GIS mapping showed that green spaces in Loma Linda Housing Estate are relatively well-distributed, making them accessible to most residents within a short walking distance.
b. Proximity: Most residential units are within a 5–7-minute walk to the nearest green space, indicating good accessibility.

Insights:

a. The equitable distribution of green spaces enhances their accessibility and potential for use by residents.
b. Areas slightly further from green spaces could benefit from additional small parks or green corridors to improve overall access.

Environmental and Economic Assessments

Environmental Benefits:

a. Air Quality: Measurements indicated that areas with green spaces have better air quality compared to more built-up sections of the estate.
b. Temperature Regulation: Green spaces help mitigate the urban heat island effect, providing cooler microclimates in their vicinity.

Economic Impact:

a. Property Values: Proximity to well-maintained green spaces positively impacts property values. Homes near these areas showed a 5-10% increase in market value compared to those further away.

Insights:

- The environmental benefits of green spaces in Loma Linda are significant, contributing to better air quality and temperature regulation.
- Economic assessments highlight the added value that green spaces bring to real estate within the estate.

Case Study 4: Emene – New Abakiliki Road Layout Area A, Enugu

Emene – New Abakiliki Road Layout Area A was selected as a case study to evaluate the existing green spaces and their impact on residents. This area is characterised by its mixed-income demographic and limited green space availability, with a combination of residential and industrial areas.

Site Observations

a. Green Space Availability: The New Abakiliki Road Layout Area A has very limited green spaces. There are a few small patches of greenery and undeveloped open spaces that are not formally maintained or utilised as parks.
b. Usage Patterns: The available green spaces are sporadically used by children for informal play and by a few residents for brief walks. The lack of amenities and poor condition of these spaces limits their use.
c. Maintenance: The green spaces are poorly maintained. Many areas have overgrown grass, litter, and lack basic amenities such as benches, pathways, or playground equipment.

Insights:

a. The scarcity and poor condition of green spaces highlight the need for significant improvements and investments in green infrastructure.
b. Limited usage patterns suggest that enhancing the quality and accessibility of green spaces could increase their utilisation and benefits to residents.

GIS Mapping

Analysis:

a. Spatial Distribution: GIS mapping revealed that green spaces in Area A are unevenly distributed. Large portions of the residential areas have no immediate access to green spaces, with some residents needing to walk more than 15 minutes to reach the nearest open area.
b. Proximity: The lack of nearby green spaces for many residents underscores the need for more strategically placed parks and green corridors to improve accessibility.

Insights:

a. The uneven distribution of green spaces requires strategic planning to ensure that all residents have equitable access to green areas.
b. Introducing more parks and connecting existing green spaces through green corridors could significantly enhance accessibility and usability.

Environmental Assessments

Environmental Benefits:

a. Air Quality: Limited green spaces contribute minimally to air quality improvement. Areas with some greenery showed slightly better air quality compared to densely built-up sections.
b. Temperature Regulation: The small and poorly maintained green spaces offer minimal cooling effects. The urban heat island effect is prevalent, with higher temperatures recorded in more built-up areas compared to green patches.

Insights:

a. Enhancing green spaces can provide significant environmental benefits, such as improved air quality and better temperature regulation, which are currently lacking due to the limited and poorly maintained green areas.

Economic Assessments

Economic Impact:

a. Property Values: Proximity to the limited green spaces has a marginal positive impact on property values. Homes near the few green areas are slightly more valued compared to those further away, but the overall impact is minimal due to the poor condition of these spaces.
b. Insights:
c. Developing and properly maintaining green spaces could significantly boost property values in the area, attracting more investment and improving the overall economic landscape of the neighborhood.

Case Study 5: Abakpa – Riverside Estate, Enugu

Abakpa – Riverside Estate in Enugu was selected as a case study to evaluate the existing green spaces and their impact on residents. This area is characterised by its lower to middle-income demographic and has some green spaces, though their quality and distribution vary.

Site Observations

a. Green Space Availability: Riverside Estate has several small to medium-sised green spaces, including a few community parks and undeveloped open areas. However, the overall green space coverage is limited, and many areas lack formal green spaces.
b. Usage Patterns: The green spaces are used irregularly by residents for various activities, including children's play, informal gatherings, and occasional recreational activities. The lack of amenities and proper maintenance limits the frequency and variety of their use.
c. Maintenance: Maintenance of the green spaces is inconsistent. While some areas are relatively well-kept, others suffer from neglect, with overgrown vegetation, litter, and lack of infrastructure such as benches, pathways, and lighting.

Insights:

a. The limited availability and inconsistent maintenance of green spaces highlight the need for improved green space management and development.
b. Irregular usage patterns suggest that enhancements in facilities and regular maintenance could increase the utility and attractiveness of green spaces.

GIS Mapping

Analysis:

a. Spatial Distribution: GIS mapping revealed that green spaces in Riverside Estate are unevenly distributed. Some residential areas have easy

access to green spaces, while others are more than a 10-minute walk away, indicating gaps in green space provision.

b. Proximity: The lack of green spaces in certain parts of the estate underscores the need for more strategically placed parks and green corridors to improve accessibility for all residents.

Insights:

a. The uneven distribution of green spaces necessitates targeted interventions to ensure equitable access. Adding new parks and connecting existing green spaces can significantly enhance accessibility and usability for all residents.

Environmental Assessments

Environmental Benefits:

a. Air Quality: The limited and poorly maintained green spaces contribute minimally to air quality improvement. Areas with some greenery showed slightly better air quality compared to densely built-up sections.
b. Temperature Regulation: Green spaces provide some cooling effects, but their limited size and poor condition reduce their overall effectiveness. The urban heat island effect is evident, with higher temperatures recorded in more built-up areas compared to green patches.
c. Insights:
d. Enhancing green spaces can provide significant environmental benefits, such as improved air quality and better temperature regulation, which are currently limited due to the inadequacy of existing green areas.

Economic Assessments

Economic Impact:

a. Property Values: Proximity to green spaces has a marginal positive impact on property values. Homes near green areas are slightly more valued compared to those further away, but the overall impact is limited due to the poor condition and limited amenities of these spaces.

Insights:

a. Developing and properly maintaining green spaces could significantly boost property values in the area, attracting more investment and improving the overall economic landscape of the neighborhood.

4. Discussion

Urban green spaces are widely acknowledged for their significant impact on the quality of life in cities, providing numerous health, social, environmental, and economic benefits. The case studies of various estates in Enugu metropolis, such as Golf Estate, Ivory Estate, Loma Linda Housing Estate, New Abakiliki Road Layout Area A, and Riverside Estate, offer practical insights that support existing literature on the subject.

Research consistently shows that well-maintained urban green spaces enhance physical and mental health, promote physical activity, reduce stress, and improve overall well-being (Ulrich et al., 1991; Maas et al., 2006). The high usage and positive perceptions of green spaces in Golf Estate highlight their importance in promoting residents' health (Hartig et al., 2014). Similarly, despite the poor condition of green spaces in Ivory Estate, residents recognize their potential health benefits, driving their willingness to support improvements (Lee & Maheswaran, 2011). Urban green spaces also play a crucial role in fostering social interactions and community cohesion by providing venues for social activities that strengthen community bonds and reduce social isolation (Peters, Elands, & Buijs, 2010). Frequent social gatherings in Golf Estate's green spaces illustrate their role in enhancing social interactions (Gehl, 2011). However, in Ivory Estate and Riverside Estate, the limited and poorly maintained green spaces hinder their potential social benefits, highlighting the need for better management and community involvement (Coley, Sullivan, & Kuo, 1997).

Green spaces improve environmental quality by enhancing air quality, reducing urban heat islands, and providing habitats for biodiversity (Gill et al., 2007). The case studies of Loma Linda Housing Estate and New Abakiliki Road Layout Area A demonstrate these benefits, although they are limited by the current state of green spaces. These findings align with studies showing that strategic planning and investment in green infrastructure are essential to maximising environmental benefits (Bowler et al., 2010). Proximity to well-maintained green spaces can increase property values and attract investment (Crompton, 2001). This economic benefit is supported by the case study of Loma Linda Housing Estate, where properties near green spaces had higher market values, underscoring the importance of investing in green space development and maintenance to drive economic growth (Troy & Grove, 2008).

Effective urban green space management requires strategic planning and active community involvement. The experiences of New Abakiliki Road Layout Area A and Riverside Estate highlight the need for comprehensive planning and investment to enhance green space quality and accessibility (Kabisch et al., 2015). Community involvement, as seen in the willingness of residents in Ivory Estate to participate in improvement efforts, is critical for the sustainable management of these spaces (Chiesura, 2004). The case studies of various housing estates in Enugu metropolis reveal diverse challenges and potential benefits associated with urban green spaces. Golf Estate demonstrates the significant benefits of well-maintained green spaces, while Ivory Estate and Riverside Estate highlight the need for substantial improvements. Loma Linda Housing Estate and New Abakiliki Road Layout Area A emphasize the importance of strategic planning and community involvement. These insights align with existing literature and provide valuable guidance for urban planners and policymakers to enhance green space provision in Enugu metropolis,

ensuring equitable access and improved quality of life for all residents.

5. Recommendations

To enhance urban green spaces in Enugu metropolis, a significant increase in investment and strategic funding is crucial. This involves allocating more resources for the creation and maintenance of green spaces, including new parks and the refurbishment of existing ones. Public-private partnerships should be encouraged to support these efforts, bringing together government bodies, private stakeholders, and non-governmental organisations to fund and maintain these spaces effectively. Additionally, hiring specialised personnel or providing training for existing staff can ensure professional management and high maintenance standards for urban green areas.

Improving accessibility and amenities is another critical step. Green spaces should be equitably distributed, ensuring all residential areas have access within a 10-minute walk. This may involve creating new parks in under-served neighborhoods and enhancing connectivity through green corridors. To cater to a diverse range of activities and age groups, green spaces should be equipped with various amenities such as playgrounds, fitness equipment, benches, lighting, and pathways. Moreover, safety measures, including adequate lighting, surveillance systems, and design principles that enhance visibility and reduce hiding spots, are essential to making these areas safer and more inviting.

Fostering community involvement and promoting environmental sustainability are vital for the sustainable management of green spaces. Initiating community programs and conducting awareness campaigns can encourage local residents to participate in the planning, development, and maintenance of green spaces. Using native plant species in landscaping can enhance biodiversity and reduce maintenance costs. Sustainable water management practices, like rain gardens and permeable pavements, should be implemented to manage runoff and improve water quality. Regular monitoring and evaluation using performance metrics, along with feedback mechanisms for residents, can help urban planners and policymakers continuously improve the condition, usage, and impact of green spaces, thereby significantly enhancing the quality of life for all residents in Enugu metropolis.

References

Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., & Pullin, A. S. (2010). Urban greening to cool towns and cities: A systematic review of the empirical evidence. *Landscape and Urban Planning, 97*(3), 147-155.

Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning, 68*(1), 129-138.

Coley, R. L., Sullivan, W. C., & Kuo, F. E. (1997). Where does community grow? The social context created by nature in urban public housing. *Environment and Behavior, 29*(4), 468-494.

Crompton, J. L. (2001). The impact of parks on property values: A review of the empirical evidence. *Journal of Leisure Research, 33*(1), 1-31.

Echendu, I. F., Okeke, F. O., & Nnaemeka-Okeke, R. C. An investigation of challenges in the existing pattern of intra-city traffic in Enugu metropolis. *TEMA: Journal of Land Use, Mobility and Environment* **13**(2), 191-208 (2020)

Forsyth, A., & Musacchio, L. R. (2005). Designing Small Parks: A Manual for Addressing Social and Ecological Concerns. *John Wiley & Sons*.

Gehl, J. (2011). Life between buildings: Using public space. Island Press.

Gill, S. E., Handley, J. F., Ennos, A. R., & Pauleit, S. (2007). Adapting cities for climate change: The role of the green infrastructure. Built Environment, 33(1), 115-133.

Hartig, T., Mitchell, R., de Vries, S., & Frumkin, H. (2014). Nature and health. Annual Review of Public Health, 35, 207-228.

Heath, C. (2023). Purposive Sampling: A Methodological Approach for Qualitative Research. Journal of Qualitative Inquiry, 15(3), 217-230.

Jim, C. Y., & Chen, W. Y. (2009). Ecosystem services and valuation of urban forests in China. *Cities, 26*(4), 187-194.

Kabisch, N., Strohbach, M., Haase, D., & Kronenberg, J. (2015). Urban green space availability in European cities. Ecological Indicators, 70, 586-596.

Kabisch, N., Qureshi, S., & Haase, D. (2016). Human–environment interactions in urban green spaces—A systematic review of contemporary issues and prospects for future research. *Environmental Impact Assessment Review, 50*, 25-34.

Kaplan, R., & Kaplan, S. (1989). The Experience of Nature: A Psychological Perspective. *Cambridge University Press*.

Kuo, F. E. (2015). How might contact with nature promote human health? Promising mechanisms and a possible central pathway. *Frontiers in Psychology, 6*, 1093.

Lee, A. C., & Maheswaran, R. (2011). The health benefits of urban green spaces: A review of the evidence. Journal of Public Health, 33(2), 212-222.

Maas, J., van Dillen, S. M., Verheij, R. A., & Groenewegen, P. P. (2009). Social contacts as a possible mechanism behind the relation between green space and health. *Health & Place, 15*(2), 586-595.

Maas, J., Verheij, R. A., de Vries, S., Spreeuwenberg, P., Schellevis, F. G., & Groenewegen, P. P. (2006). Green space, urbanity, and health: How strong is the relation? Journal of Epidemiology & Community Health, 60(7), 587-592.

McPherson, E. G. (1992). Accounting for benefits and costs of urban greenspace. *Landscape and Urban Planning, 22*(1), 41-51.

Nassauer, J. I. (1995). Messy ecosystems, orderly frames. *Landscape Journal, 14*(2), 161-170.

Okeke, F., Echendu, I., & Rosemary, N. O. Determinants of intra-urban travel in southeast Nigeria, evidence from the city of Enugu. *Transport Problems* **16**(4) (2021)

Okeke, F. O., Sam-Amobi, C., & Okeke, F. I. Role of local town planning authorities in building collapse in Nigeria: evidence from Enugu metropolis. *Heliyon* **6**(7) (2020).

Okosun, A.E., Okeke, F.O., Igwe, A.E., & Ezema, E.C. Transit, walking and cycling infrastructure and sustainable development in Enugu city, Nigeria. *IOP Conference Series: Earth and Environmental Science* **1239**, 012022 (2023)

Peters, K., Elands, B., & Buijs, A. (2010). Social interactions in urban parks: Stimulating social cohesion? Urban Forestry & Urban Greening, 9(2), 93-100.

Troy, A., & Grove, J. M. (2008). Property values, parks, and crime: A hedonic analysis in Baltimore, MD. Landscape and Urban Planning, 87(3), 233-245.

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology, 11*(3), 201-230.

Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'. *Landscape and Urban Planning, 125*, 234-244.

Nigerian Institute of Architects (NIA). (2017, November). Annual Report 2017. Presented at 57th Biennial General Assembly and conference (BGM 2017), Abuja.

Ogunrotifa, B. (2009). Federal Civil Service Reform in Nigeria: The Case of Democratic Centralism. *Urban Studies*, (12): 2537-2554.