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Infrastructural Justice in the Realm of Sustainable Urban Development in Nasarawa State Nigeria

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Abstract **Original Research Article**

The primary purpose of this study is to evaluate the idea of infrastructure justice in the context of the Nasarawa State urban system. The Nasarawa urban system is characterized by a network of small and medium-sized urban centres. And studies have suggested that much of the urban growth in Africa is taking place in small and medium-sized towns where access to infrastructure is critical both for sustainability and quality of life. Consequently, it is critical to assess whether infrastructure is being allocated in a just and equitable manner to support even urban development in the face of tremendous growth and development that appears uneven. This study employs a mixed-methods approach to assess the distribution of urban infrastructure in the context of just and fair distribution. Data on the availability and accessibility of some basic urban services like energy, water, sanitary conditions, healthcare, transportation, and education in various Nasarawa State urban areas were collected. To address the issues, composite infrastructure distribution justice indexes were developed and structured into sub-indices (acceptability, affordability, and availability) to reflect the local needs of the disadvantaged urban areas. The indexes also rely on qualitative content analysis of Nasarawa state urban infrastructure distribution and development policy documents. However, stratification of the urban areas into three senatorial districts to enable a coherent selection of the urban areas and a purposive survey of selected urban areas for a detailed survey were applied. Weighted mean scores were computed and indexed to determine the overall accessibility, acceptability, and availability of urban infrastructure within the state. In addition, a key informant interview (KII) was conducted with major stakeholders like politicians, and community leaders using purposive sampling techniques. The interview provided useful insight about the variables impacting decisions on infrastructure distribution in the state. The location quotient (LQ) was used to evaluate the degree of concentration of the amenities, suggesting an uneven distribution of amenities across urban areas in the study area. This study emphasises that governments at all levels should prioritize the provision and development of infrastructure through an accepted Nasarawa State Urban Infrastructure Development Plan and also support efforts by urban communities regarding basic infrastructure development.

Keywords: Infrastructure; Justice; sustainable development, Urban and Nasarawa State.

Introduction:

The nexus between infrastructural justice and sustainable urban development is multidimensional. Access to basic amenities such as water, electricity, sanitation, and transportation plays a pivotal role in enhancing the quality of life for urban residents. However, disparities in infrastructure provision often exacerbate existing social inequalities, leaving certain urban communities underserved and

excluded from the benefits of urbanization (Luo, Tang, Xu, Zhang, Zhang, & Jia, 2022). That Urbanisation presents the best opportunity for exploiting economies of scale has been well encapsulated in studies (Alaci, Mngutyo & Dam 2019). According to Jerry (2015), cities and urban centres are more than a collection of buildings and streets but embody the ideas of progress, betterment, success, and construction and are also the mirror companions to failure, disappointment, tragedy, hopelessness, and destruction. This is directly proportional to the development of urban infrastructure. Accordingly, urban areas expand, the demand for infrastructure intensifies, and the distribution of these vital resources becomes a critical determinant of social equity and environmental sustainability (Ogunbajo, Lawal, & Adesoji, 2022, and Martinez & Nenger, 2023).

Urban system as deducted by Alaci et al, (2019) is a complex network of urban infrastructure, institutions, and social structures that support the functioning of urban region. However, the system often perpetuates social and economic inequalities, reinforcing existing power dynamics and disparities in access to basic infrastructure and opportunities. Therefore, if tenets of urban systems are to entrench then sustainability, equity, and social justice must be addressed in the urban region. This encompasses a network of small and medium sized urban areas in the system. These requires a holistic approach that integrates urban planning, policy-making, and community engagement to create more resilient, inclusive, and environmentally conscious urban systems in the provision of basic but also justified urban infrastructure (Ayeni, Tokede, & Adeyinka, 2019 and Ahmed, Hoque & Bhuiyan, 2020).

The Nigerian urban system like most developing countries is dominated by the network of small and medium-sized urban areas. The level of serviceability and liveability associated with this hierarchy in the urban system has implication on the sustainability of primary urban centres and the wide urban system. The role of this tier in the urban system has been well encapsulated in literature. This include production and distribution of goods and services to their rural hinterlands or regions, serve as centres for the growth and consolidation of rural non-farm activities and employment through the development of micro and small-scale enterprises, they attract rural migrants from the surrounding region through demand for non-farm labour, thereby, decreasing pressure on larger urban areas and also provide an effective forward linkage for hedge-free urban system that enhance economies of scale, connectivity, accessibility and urban-rural linkages (Alaci, 2010, United Nations, 2015, and World Bank, 2018). It is in this context that infrastructural justices become a matter of necessity in any urban system.

Infrastructure justice refers to the fair and equitable distribution of resources, benefits, and burdens related to the planning, design, implementation, and maintenance of infrastructure systems. This concept acknowledges that infrastructure can have significant impacts on communities, environments, and economies, and seeks to address the historical and systemic inequalities that have led to disproportionate benefits and burdens for marginalized and vulnerable populations. Effective urban systems are in lockstep with justified provision of urban infrastructure (Harvey, 1973 &2012).

Bhagat (2010) asserts that one important factor influencing urban quality of life is having access to fundamental urban infrastructure. According to Rossiter & Greig (2011), urban infrastructure is a crucial component of quality of life and is necessary to provide new urban areas with high-quality, societally acceptable, and sustainable urban outcomes. The supply of amenities ensures that population expansion is supported by a network of facilities and services that are reachable, reasonable, acceptable, and sensitive to the demands of the local community, which helps to establish healthy and sustainable communities (Rossiter & Greig, 2011). According to Anofojie, Adeleye, and Kadiri (2014), having urban infrastructure is a fundamental need that affects an area's socioeconomic well-being. According to Graham, and McFarlane (2014), development policy objectives can be met through urban

infrastructure projects, which can have a significant impact on urban development. This notwithstanding, disparities in the distribution of urban infrastructure among populations in emerging nations have been demonstrated by empirical investigations.

A 2006 report from the World Bank notes that many people living in developing nations lack access to basic urban infrastructure. According to Ujoh, and Kwaghsende (2014), the rapid population growth is making it harder to provide enough amenities and facilities. Otegbulu, and Adewunmi (2009) state that the main distinction between a slum and a non-slum area is the availability or lack of basic infrastructure. Nevertheless, Saed, Kamariah, Mohammad, and Johani (2015) clarify that a lack of urban infrastructure is a significant contributing factor to the emergence of squatter communities and the deterioration of housing conditions in urban areas. Thus, the low level of infrastructure in developing countries is attributed to a number of factors, including rapid urbanization, persistent political and economic crises, poor governance, ineffective infrastructure delivery systems, and low investment in the sector, according to NISER (2001), Onokerhoraye (2002), and Halpern & Mumssen (2006).

According to Duflo, Galiani, and Mobarak (2012), there is a specific pressure on existing infrastructure in cities and urban areas, especially when it comes to access to water and sanitation, and this pressure is growing faster than the infrastructure can handle. Accordingly, one of the biggest drawbacks to the quality of housing estates is the inadequate or non-existent amenities and services, as observed by Anofojie, Adeleye, & Kadiri (2014). It is commonly acknowledged that sustainable urban growth and development, along with the ineffectiveness of existing infrastructure, are the main causes of infrastructure-related difficulties. Pieterse, and Hyman (2014) emphasize that urban infrastructure inadequacies are more disturbing for developing countries due to the greater amounts of current infrastructure capital stocks that are crumbling and the increasing rates of urbanization that necessitate new infrastructure development.

Available information points to the fact that Nigeria is experiencing fast pace of urbanisation. The experienced are glaring in the medium and small urban centres. In terms of annual growth rate for example the estimate for 2015 is put at 3.15 per cent and 3.47 per cent for 2010, (Alaci et al 2019). Nasarawa state urban system is a network of small and medium sized urban area. The surge in population is rapidly transforming the landscape and demographic profile of the urban system, presenting both opportunities and challenges for sustainable development (Oche & Francis, 2000). The population surge across the 13 urban centres, including Lafia, the state capital, has led to an increased strain on existing infrastructure, ranging from transportation networks to water and sanitation systems. In this dynamic environment, the need for infrastructural justice is paramount to ensuring that the benefits of urban development are equitably distributed among urban residents, irrespective of socio-economic status or geographic location. The urbanization of Nasarawa State is a multifaceted phenomenon, and appears to be marked by increased migration from rural areas to urban centres in search of economic opportunities and improved living conditions.

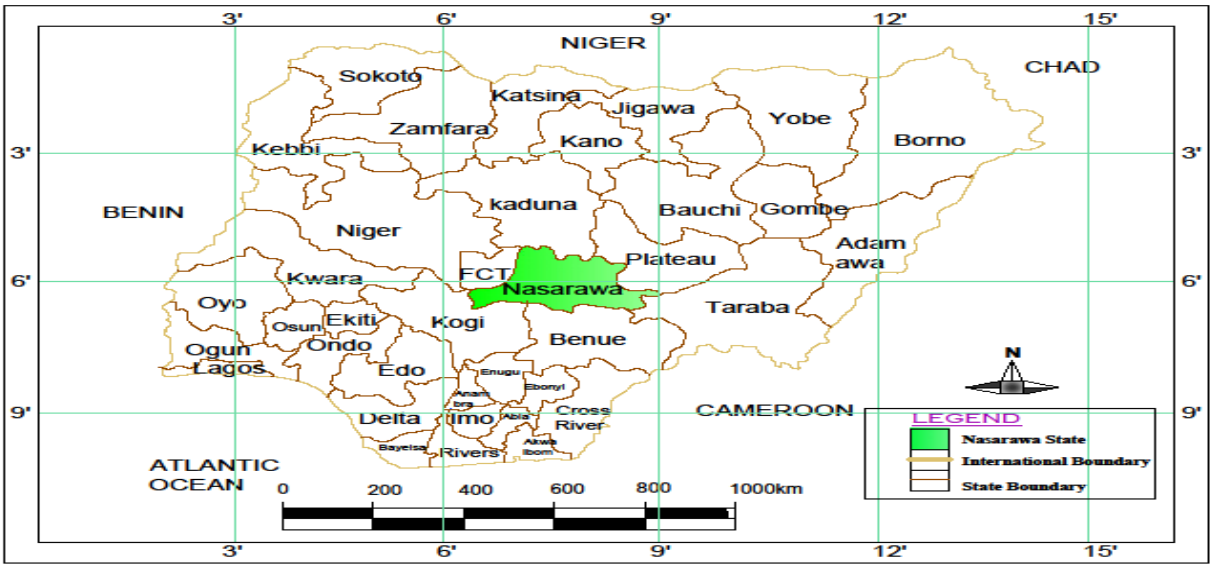

Figure 1: Map of Nigeria showing Nasarawa State**,** 2025

Figure 2: Map of Nasarawa State showing the urban areas,2025.

The consequence of this population surge is a higher demand for housing, transportation, water supply, and sanitation facilities. The strain on existing infrastructure becomes more pronounced as urban areas expand, and the need for these essential services becomes more acute (Francis, Jibrin, & Ozovehe, 2020). As urbanization rapidly transforms Nasarawa State, Nigeria, the equitable distribution of urban infrastructure emerges as a critical challenge amidst opportunities for sustainable development (UNDP, 2016). The projected

surge in urban populations by the United Nations underscores the urgency of addressing disparities in infrastructure provision to accommodate the growing urban populace (UNDP, 2017). However, despite these projections, disparities persist in the State, exacerbating social inequalities and hindering the attainment of sustainable urban development goals (Adama, 2017 and World Bank, 2018). As cities and urban centres expand, the demand for infrastructure intensifies, amplifying the need for equitable distribution to ensure that all residents have access to essential services and opportunities (Ogunbajo, Lawal, & Adesoji, 2022, and Martinez & Nenger, 2023). Consequently, the research aims to investigate the concept of infrastructural justice within Nasarawa State, within the frame of evaluating the current state of urban infrastructure provision, the inherent disparities in the provision across urban areas; analyze the relationship between infrastructural justice and sustainable urban development and identify the key challenges and barriers to achieving infrastructural justice in the State. The study is premised on the global commitment to Sustainable Development Goals (SDGs), with Goal 11 specifically addressing the need for inclusive, safe, resilient, and sustainable cities. Studies by Adama (2017) and the World Bank (2018) highlight the swelling challenges faced by urban areas in Nigeria, presumably peculiar to that of Nasarawa State, in coping with the rapid urbanization process. The strain on transportation networks, for instance, is evident in the increasing congestion and inadequate road infrastructure. This not only hampers the efficiency of transportation systems but also exacerbates the difficulties faced by residents, particularly those in peripheral or underserved areas. Similarly, water and sanitation systems are struggling to meet the growing demand, leading to issues such as water shortages and inadequate sanitation facilities in certain parts of the state.

Infrastructural justice, as a concept, encapsulates the fair distribution of resources and opportunities related to infrastructure development (Gartner, 2014). This is rooted in the social justice movement, as put forward by Harvey (1973 & 2012), Soja (2010), and Moroni (2020). Moreover, it has procedural, recognitional, and distributional implications. Research on distributive issues is predominant as it reaffirms the importance of generating better access to a clean and healthy urban environment, regardless of the social characteristics of urban communities (Jarumi & Davide, 2023). They emphasize the ethical dimension of urban planning, highlighting the importance of ensuring that vulnerable and marginalized urban communities receive adequate access to essential services, which is a step toward entrenching sustainable urban development. In the case of Nasarawa State, as retreated by Adefila (2013), understanding and addressing the existing disparities in infrastructure provision are crucial steps towards fostering sustainable urban development.

Infrastructural justice is a multidimensional concept that revolves around the fair distribution of resources and opportunities associated with infrastructure development (Harvey, 2012 & Schlosberg, 2013). It encompasses the ethical dimension of urban planning, emphasizing the need to ensure equitable access to essential services, such as water, electricity, sanitation, and transportation, for all segments of the population (Agyeman, Bullard, & Evans, 2009). This definition underscores the interconnectedness of infrastructure and social justice, positioning infrastructural justice as a critical consideration for sustainable urban development.

Methodology

In view of the multi-nature of the urban areas in the state, a multi-method approach was adopted as methodology. Weighted mean scores as well as the key informant interviews (KIIs) and location quotients (LQ) were strategically combined to provide a nuanced understanding of the current state, challenges, and potential pathways for achieving sustainable urban development with a focus on equitable infrastructure provision. Sampling size of 1534 using the Krijcie & Morgan (2016) sample sizes table at 2.5% margin error and 95% confidence across all the 13 urban areas spread across the three senatorial districts were sampled. A

stratified random sampling approach is employed to ensure representation from various socio-economic and geographic strata within the state. Urban residents, local authorities, urban planners, and experts in infrastructure development were included in the study. Key informants were also selected based on their knowledge and expertise in the subject matter.

A structured survey was conducted to assess the state of infrastructure in the selected 13 urban areas. Criteria such as the number of urban infrastructures, accessibility, quality, and inclusivity were the data used to obtain the weighted mean scores. Additionally, Location Quotient (LQ) results were plotted to visually represent the concentration and/or scarcity of specific infrastructure in different urban areas by using the basic infrastructure such as educational institutions, health institutions, the number of urban roads, the supply of urban waters (number of public boreholes), electricity (number of transformers), and the number of refuse collection points and refuse dumps.

Data analysis and discussion

Understanding the state of infrastructural justice is proportional to knowing the current state of infrastructure in Nasarawa State. Therefore, it is essential to analyse the availability and quality of key infrastructure such as roads, water supply, sanitation, healthcare, and education facilities. According to Adama (2017), urbanisation in Nigeria often leads to uneven development, with some areas receiving more attention and resources than others. This trend is evident in Nasarawa State, where significant disparities exist between urban and rural areas.

Adefila (2013) conducted a spatial analysis of socio-economic development in Nasarawa State and found notable regional inequalities. Urban areas such as Lafia, the state capital, and Karu benefit from better infrastructure and services compared to rural areas. This disparity is exacerbated by factors such as policy failures, corruption, and the lack of a comprehensive urban planning framework.

The inequitable distribution of infrastructure in Nasarawa State has far-reaching socio-economic implications. Access to basic amenities such as clean water, sanitation, healthcare, and education is crucial for improving living standards and promoting sustainable development. However, as Oche and Francis (2000) noted, many rural areas in Nasarawa State lack adequate infrastructure, leading to poor health outcomes, low educational attainment, and limited economic opportunities.

The concept of infrastructural justice, as discussed by Agyeman, Bullard, and Evans (2009), emphasises the need for fair distribution of resources to ensure that all communities, regardless of their socio-economic status, have access to essential services. In Nasarawa State, achieving infrastructural justice requires addressing both historical inequities and current challenges in infrastructure provision. Sustainable urban development in Nasarawa State hinges on the equitable distribution of infrastructure. Ahmed, Hoque, and Bhuiyan (2020) highlighted the importance of sustainable urbanisation, which involves not only the physical development of urban areas but also the social and environmental dimensions. In Nasarawa State, the lack of infrastructure in certain areas leads to overburdened facilities in others, creating an unsustainable cycle of development.

The United Nations' Sustainable Development Goals (SDGs), particularly Goal 9 (Industry, Innovation, and Infrastructure) and Goal 11 (Sustainable Cities and Communities), provide a framework for addressing these issues. However, as the World Bank (2018) noted in its Nigeria Urbanisation Review, leveraging urbanisation for development requires concerted efforts to improve infrastructure equitably across all regions. Thus, addressing infrastructural disparities in Nasarawa State requires a multi-faceted approach involving government policy, community involvement, and private sector engagement. The findings of this study suggest several policy implications.

However, the distribution of basic amenities and services in urban areas of Nasarawa State reveals significant disparities, as indicated by the various metrics and indices analysed in the study, as

shown in Tables 1 and 2. Urban areas such as Lafia and Doma in the Nasarawa South Senatorial District exhibit a higher concentration of essential services like public primary and secondary schools, primary health care, and water supply, reflecting their relatively developed infrastructure. These urban areas have location quotient (LQ) values above 1, indicating that they have a higher-than-average share of these amenities compared to other urban areas in the state. Conversely, areas like Keana and Awe show much lower concentrations, with LQ values significantly less than 1, suggesting a severe lack of critical infrastructure and services. The unequal distribution of amenities indicates a need for strategic planning and resource allocation to address these gaps and promote equitable development across all urban areas.

Furthermore, the acceptability of urban amenities and services highlights Nasarawa State's infrastructural deficiencies. Table 4 reveals that a substantial portion of the urban populace expresses strong dissatisfaction with the current state of infrastructure, particularly in areas such as refuse collection and dumps, electricity, and water supply. Over 57% of respondents strongly unaccepted of the current level of amenities, while 32.84% were unaccepted, pointing to a pervasive sense of inadequacy and unmet needs. This widespread dissatisfaction underscores the urgent need for improvements in urban infrastructure to ensure sustainable urban development. Addressing these disparities requires a focused effort to enhance service delivery, improve the reliability and availability of facilities, and ensure that all urban areas have equitable access to essential services.

Nasarawa State's urban areas face significant challenges in transportation, water supply, and sanitation systems due to rapid urbanization. The rapid population growth, as highlighted in the data, puts immense pressure on the existing infrastructure, resulting in severe congestion and the deterioration of urban roads. The level of acceptability of urban amenities and services reveals a general dissatisfaction, with a considerable percentage of the populace strongly rejecting the current state of infrastructure. The data from Table 4 shows that 49.96% of the population strongly rejected the services rendered in electricity and 35.40% in water supply. This reflects a widespread inadequacy in meeting the basic needs of the urban population, leading to frequent disruptions in essential services and decreased quality of life for residents.

Moreover, the sanitation systems in Nasarawa State are struggling to cope with the demands of a growing urban populace. The high percentages of strong unacceptability in refuse collection and dumps, at 57.20%, indicate a critical shortfall in waste management infrastructure. Inadequate waste collection services and a lack of proper dumpsites contribute to unsanitary conditions, posing health risks to urban residents. The state's inability to efficiently manage water supply, as evidenced by the dissatisfaction levels, exacerbates these challenges, leading to water scarcity and poor sanitation. This lack of proper infrastructure not only hampers sustainable urban development but also affects the overall health and well-being of the population, necessitating urgent and comprehensive measures to address these infrastructure deficits.

Additionally, infrastructural justice is a cornerstone of sustainable urban development, as it ensures the fair and equitable distribution of resources and services, which is crucial for fostering social equity, economic stability, and environmental sustainability. In Nasarawa State, the disparity in the distribution of public infrastructure, as highlighted in Tables 1 and 2, reveals significant imbalances across different urban areas. For instance, Lafia and Doma in the Nasarawa South Senatorial District show higher concentrations of public primary and secondary schools, primary health care, and water supply infrastructure. In contrast, urban areas like Keana and Awe display much lower concentrations of these essential services. Such uneven distribution hampers the overall development of the state by creating pockets of underdevelopment where residents lack access to basic amenities, thereby perpetuating cycles of poverty and social exclusion.

Equitable resource distribution is fundamental to achieving sustainable urban development in

Nasarawa State. By addressing the infrastructural disparities identified in urban areas, the state can promote more inclusive growth that benefits all its residents. For instance, enhancing the availability and accessibility of health and educational facilities in underserved areas like Wamba, Keana, and Awe could significantly improve the quality of life and economic opportunities for their inhabitants. Moreover, investments in infrastructure such as water supply, electricity, and roads, especially in areas with low location quotient (LQ) values, would not only bridge the development gap but also foster economic activities, reduce migration pressures on more developed urban areas, and contribute to balanced regional development. This holistic approach to infrastructural justice ensures that all urban areas in Nasarawa State can contribute to and benefit from sustainable urban development, ultimately leading to a more resilient and equitable society.

Table1: *Quantity of Public Urban Infrastructure in Nasarawa State*

S/N	Urban Areas	Pop	1a	1b	1c	2a	2b	3	4	5a	5b	6	Total	%
Nasarawa South Senatorial District														
1	Lafia	1,720,000	15	10	2	10	5	30	42	50	29	2	195	30.7
2	Keana	258,000	2	1	0	2	1	5	2	4	3	0	20	3.1
3	Obi	301,000	2	2	0	3	1	4	3	4	3	0	22	3.5
4	Doma	301,000	7	4	0	7	2	6	6	3	5	0	40	6.3
5	Awe	215,000	2	1	0	2	1	3	3	3	2	0	17	2.7
Total		*2,795,000*	*28*	*18*	*2*	*24*	*10*	*48*	*56*	*64*	*42*	2	294	46.3
Nasarawa Central Senatorial District														
1	Wamba	301,00	2	1	0	2	1	4	3	3	3	0	19	3.0
2	Akwanga	645,000	5	3	0	4	4	8	8	5	4	0	41	6.5
3	Nassarawa Eggon	430,000	3	1	0	3	1	2	4	2	4	0	20	3.1
Total		*1,376,000*	*10*	*5*	*0*	*9*	*6*	*14*	*15*	*10*	*11*	0	80	12.6
Nasarawa West Senatorial District														
1	Keffi	1,075,000	8	9	3	8	15	20	21	8	8	0	100	15.7
2	Karu	1,290,000	5	8	0	5	5	12	20	6	8	2	71	11.2
3	Toto	215,000	2	2	0	2	1	4	3	2	3	0	19	3.0
4	Nasarawa	645,000	7	6	1	4	3	5	12	5	6	1	50	7.9
5	Garaku	430,000	3	2	0	2	1	3	4	3	3	0	21	3.3
Total		*3,655,000*	*25*	*27*	*4*	*21*	*25*	*34*	*60*	*24*	*28*	3	261	41.1
GRAND TOTAL		*5,676,000*	*63*	*50*	*6*	*54*	*41*	*106*	*131*	*98*	*81*	5	635	

Source: *Field survey, 2025.*

Key: 1a= Public Primary Schools, 1b = Public Secondary Schools, 1c = Public Post-Secondary Schools, 2a= Primary Health Care, 2b = Public Post Primary Health Care, 3= Public Water Supply (Borehole), 4= Electricity Supply (transformers), 5a= Minor Road, 5b= Major Road and 6= Refuse collection Point/Dumping.

Table 2: *Urban Areas' location quotient for urban infrastructure in Nasarawa state*

S/N	Urban Areas	Pop	1a	1b	1c	2a	2b	3	4	5a	5b	6	Total	%
Nasarawa South Senatorial District														
1	Lafia	1,720,000	0.8	0.7	0.9	0.6	0.4	0.9	1.1	1.7	1.2	1.3	1.0	30.7
2	Keana	258,000	0.6	0.4	0	0.7	0.5	0.9	0.3	0.8	0.7	0	0.6	3.1
3	Obi	301,000	0.6	0.8	0	1.1	0.0	0.8	0.4	0.8	0.7	0	0.6	3.5
4	Doma	301,000	2.2	1.6	0	2.6	1.0	1.1	0.9	0.6	1.2	0	1.2	6.3
5	Awe	215,000	0.8	0.5	0	0.9	0.6	0.7	0.6	0.8	0.6	0	0.8	2.7
Total		*2,795,000*	*0.9*	*0.7*	*0.6*	*0.9*	*0.5*	*0.9*	*0.9*	*1.3*	*1.1*	0.8	0.9	46.3
Nasarawa Central Senatorial District														
1	Wamba	301,000	0.6	0.4	0	0.7	0.5	0.8	0.5	0.6	0.7	0	0.6	3.0
2	Akwanga	645,000	0.7	0.5	1.3	0.7	0.9	0.7	0.6	0.5	0.4	0	0.5	6.6
3	Nassarawa Eggon	430,000	0.6	0.3	0	0.7	0.3	0.2	0.4	0.3	0.6	0	0.4	3.1
Total		*1,376,000*	*0.7*	*0.4*	*0.6*	*0.7*	*0.6*	*0.6*	*0.5*	*0.4*	*0.6*	0	0.5	12.6
Nasarawa West Senatorial District														
1	Keffi	1,075,000	0.7	0.9	2.3	0.8	1.9	1.0	0.8	0.4	0.5	0	0.8	15.7
2	Karu	1,290,000	0.3	0.7	0	0.4	0.5	0.5	0.7	0.3	0.4	1.7	0.5	11.2
3	Toto	215,000	0.8	1.0	0	0.9	0.6	0.9	0.6	0.5	0.9	0	0.8	3.0
4	Nasarawa	645,000	1.0	1.1	1.3	0.7	0.7	0.4	0.8	0.5	0.7	1.8	0.7	7.9
5	Garaku	430,000	0.6	0.5	0	0.5	0.3	0.4	0.4	0.4	0.5	0	0.4	3.3
Total		*3,655,000*	*0.6*	*0.8*	*0.9*	*0.6*	*1.0*	*0.5*	*0.7*	*0.4*	*0.5*	0.9	0.6	41.1
GRAND TOTAL		*5,676,000*												

Source: *Field survey, 2025.*

The location quotient (LQ) values of infrastructure in Nasarawa state urban areas show varying concentrations of various types of public infrastructure, as shown in Tables 1 and 2. Lafia and Doma have higher concentrations of public primary schools, secondary schools,

primary health care, and water supply, while Akwanga and Keffi have lower concentrations. Karu has a notable concentration of refuse collection points and dumps. Public water supply has the highest overall LQ value (46.3%), indicating a significant concentration of infrastructure across all urban areas. Lafia and Doma have a higher concentration in public primary schools, secondary schools, and public postsecondary schools, indicating a specialization in communication infrastructure. Other urban areas have moderate-to-low concentrations. Lafia, Keana, Obi, Doma, Akwanga, Keffi, Karu, and Nasarawa have notable concentrations in public water supply, electricity supply, urban roads, and refuse collection points. These urban areas exhibit varying degrees of specialization in different infrastructure types, reflecting diverse development patterns.

Table 3: *Mean Location Quotients in Nasarawa state urban areas*

S/N	Urban Areas	N	Mean
Nasarawa South Senatorial District			
1	Lafia	10	0.96
2	Keana	10	0.49
3	Obi	10	0.52
4	Doma	10	1.12
5	Awe	10	0.55
Total			0.86
Nasarawa Central Senatorial District			
1	Wamba	10	0.48
2	Akwanga	10	0.63
3	Nassarawa Eggon	10	0.34
Total			0.51
Nasarawa West Senatorial District			
1	Keffi	10	0.93
2	Karu	10	0.55
3	Toto	10	0.62
4	Nasarawa	10	0.90
5	Garaku	10	0.36
Total			0.69

Source: *Field survey, 2025*.

Further analysis of the Location Quotient (LQ) Means Values of Infrastructure in Nasarawa State Urban Areas, as shown in Table 3, with a reference to the analysis in Table 2, represents the concentration of various types of public infrastructure in each urban area compared to the

total for the entire state. The survey of the urban infrastructure in the Lafia urban area of Nasarawa South Senatorial District shows a relatively higher concentration of most public urban infrastructure with LQ mean values above 1. Doma urban area also shows a higher concentration of several urban infrastructures, particularly in the public primary schools, public secondary schools, primary health care, and public water supply. Akwanga urban area in the Nasarawa Central Senatorial shows a higher concentration of public postsecondary infrastructure. Other urban areas in the senatorial district generally have LQ mean values close to or less than 1, suggesting a lower concentration in most of the public urban infrastructure. Keffi urban area Nasarawa West Senatorial District stands out with higher LQ mean values in public secondary schools, primary health care, public post-primary health care, public water supply, and total, indicating a concentration in these types of infrastructure. Karu Urban also has a notable concentration of refuse collection points and dumps. Deduction from the analysis shows that so many urban areas are deprived of the basic urban infrastructure that transcends sustainable urban development.

Table 4: *Level of acceptability of urban Amenities and Services in Nasarawa state*

S/No	Acceptability indicators	Strongly unaccepted	Unaccepted	Neutral	Accepted	Strongly accepted	Total
EDUCATIONAL INSTITTUTIONS							
1	Services rendered	150	484	300	300	300	1,534
2	Reliability of services rendered	150	383	383	383	235	1,534
3	Availability of the facility	450	383	235	231	235	1,534
4	Accessibility to the Facility	300	536	248	300	150	1,534
5	Satisfaction of services rendered	238	536	150	334	276	1,534
Total		1,288	2,322	1,316	1,548	1,196	7,670
%		16.80	30.27	17.16	20.18	15.59	
HEALTH INSTITUTIONS							
1	Services rendered	235	235	251	430	383	1,534
2	Reliability of services rendered	140	373	140	805	76	1,534
3	Availability of the facility	383	616	235	150	150	1,534
4	Accessibility to the Facility	500	600	60	300	74	1,534

5	Satisfaction of services rendered	530	695	82	150	77	1,534
Total		1,788	2,519	768	1,835	760	7,670
%		23.31	32.84	10.01	23.92	9.91	
WATER SUPPLY (No. of Boreholes)							
1	Services rendered	509	690	76	184	75	1,534
2	Reliability of services rendered	450	616	300	91	77	1,534
3	Availability of the facility	450	450	300	257	77	1,534
4	Accessibility to the Facility	690	616	76	77	75	1,534
5	Satisfaction of services rendered	616	616	150	77	75	1,534
Total		2,715	2,988	902	686	379	7,670
%		35.40	39.00	11.76	8.94	4.94	
ELECTRICITY (No. of transformer)							
1	Services rendered	616	509	267	77	65	1,534
2	Reliability of services rendered	692	616	74	75	77	1,534
3	Availability of the facility	690	610	76	75	83	1,534
4	Accessibility to the Facility	454	455	68	300	257	1,534
5	Satisfaction of services rendered	690	616	76	75	77	1,534
Total		3,142	2,806	561	602	559	7,670
%		49.96	36.58	7.31	7.85	7.29	
URBAN ROADS							
1	Services rendered	300	450	150	300	334	1,534
2	Reliability of services rendered	377	450	257	300	150	1,534
3	Availability of the facility	377	450	257	300	150	1,534

4	Accessibility to the Facility	444	456	257	300	77	1,534
5	Satisfaction of services rendered	454	456	217	257	150	1,534
Total		1,952	2,262	1,138	1,457	861	7,670
%		25.45	29.49	14.84	19.00	11.23	
REFUSE COLLECTION/DUMPS							
1	Services rendered	781	600	77	30	46	1,534
2	Reliability of services rendered	874	509	75	46	30	1,534
3	Availability of the facility	872	510	76	46	30	1,534
4	Accessibility to the Facility	930	450	75	46	33	1,534
5	Satisfaction of services rendered	930	450	77	45	32	1,534
Total		4,387	2,519	380	213	171	7,670
%		57.20	32.84	4.95	2.78	2.23	

Source, *Field survey, 2025.*

Table 4 provides an analysis of the level of acceptability of urban amenities and services in Nasarawa state urban areas in the aspects of public educational institutions, health institutions, water supply, electricity, urban roads, and refuse collection and dumps. Services rendered, reliability, availability of the facility, accessibility, and satisfaction were the indexes used in weighing acceptability. However, 57.20% of the urban populace were strongly unaccepted, and 32.84% indicated unacceptance of the quantum of urban infrastructure in Nasarawa State, as shown in Table 4. The revelation is a clear indication that the state is deprived of necessary but basic urban infrastructure and is inimical to sustainable urban development.

Conclusion and Recommendations

The research findings indicate that there is an uneven distribution of public educational institutions, health care centres, major roads, portable water, electricity, and waste disposal sites among the 13 urban areas in Nasarawa State, Nigeria. These shown that urban systems in Nasarawa states are not effective for a sustainable urban growth and development. The results are in line with those of Morenikeji (1995), who discovered an unequal distribution of social facilities in some areas of Ondo State; Adefila (2013), who documents regional disparities in Nassarawa State's socioeconomic development; and Efobi & Anienobi (2014), who detailed an unequal distribution of public utilities like water and electricity supplies, solid waste management facilities, road and rail transportation networks, health and education facilities, and recreational facilities throughout 20 neighbourhoods in Enugu State, as well as that of Ogunbajo et al. (2022) on distribution and access to Urban Infrastructure by Residential Property Occupiers in Minna, Nigeria.

This study emphasizes the necessity of more but just urban infrastructure provision and distribution, especially in the depressed urban areas which happened to be the small urban centres such as Toto, Awai, Garaku, Wamba respectively. Thus, achieving this will entrench even and sustainable urban development in the state. Furthermore, through stratifying the urban areas into 1st, 2nd and 3rd classes urban centres will further enable strategic distribution of infrastructures and also make the urban system coherent. This can be achieved through government policy direction where Lafia, Akwanga, Keffi, Karu and Nasarawa be given the status of First-class urban centres, Obi, Doma, Wamba and Toto be Second-class urban centres whereas the remaining four urban centres be considered Third-class urban centres respectively. However, to prevent unnecessary agitation, the apparent holes should be filled as soon as possible. Governments can accomplish this by establishing more conducive and inclusive policies and regulatory frameworks, developing avenues for increased investor participation in the advancement of infrastructure provisions, and making sure that favourable returns are commensurate with the attainment of social and economic objectives. This can be achieved through genuine attention to urban and regional planning as a goalkeeper.

This is because even if every infrastructure has a unique set of management challenges, effective planning and management may help improve performance in many crucial areas and provide the push for adequate solutions to current and future difficulties. It is in this premise that governments at all levels should prioritize the provision and development of infrastructure through an accepted Nasarawa State Urban Infrastructure Development Plan in line with 1st, 2nd and 3rd urban classes orders and also support efforts by urban communities regarding basic infrastructure development. This will ultimately not only help address infrastructure gap, it will address the overt disparity and injustice that currently characterise the infrastructure distribution within the Nasarawa state urban system.

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