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Assessing Smart City Initiation and Household Income Constraint in Suburban Abuja, Nigeria

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ABSTRACT

This research examines the relationship between smart city projects and the financial constraints faced by households in the suburban areas of Abuja, Nigeria. As the Federal Capital Territory moves toward digital urbanisation and the development of smart infrastructure, questions have arisen about whether low- and middle-income families are truly included in these transformative efforts. Employing a mixed-methods strategy that involved administering structured questionnaires to 270 residents, along with focus group discussions, the study reveals that a significant number of suburban households lack access to smart housing and digital services, primarily due to income restrictions and infrastructure gaps. Statistical evaluations, including Chi-square and regression analyses, indicate that factors such as income level, education level, and internet access significantly influence participation in the advantages of smart city initiatives. The results suggest that the current smart city policies in Abuja exacerbate socio-economic exclusion, particularly in satellite towns, due to an insufficient focus on affordability, digital inclusivity, and community-driven governance. The study recommends that upcoming smart city plans should integrate income-sensitive housing options, engage with the community, and prioritise investments in digital infrastructure to align with the Sustainable Development Goals (SDGs), notably SDG 1 (No Poverty), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities).

Keywords: *Smart city, household income, urban exclusion, digital divide, suburban Abuja, affordable housing, SDGs, socio-economic inequality, Nigeria, inclusive urban development*

INTRODUCTION

Over the last twenty years, the concept of smart cities has emerged as a significant idea in global urban development, promising to utilise digital innovation to address pressing urban challenges. Smart cities utilise data and communication technologies, along with intelligent infrastructure, to enhance the effectiveness of urban services, promote environmental sustainability, and improve the quality of life for citizens (UN-Habitat, 2020). In this context, Nigeria's Federal Capital Territory (FCT), Abuja, has launched several smart city initiatives aimed at modernising urban infrastructure and stimulating economic growth. Developments such as Centenary City, Kuje Smart City, and Hill City Community (Zoe New Dawn/Cubana) exemplify this transformative vision, aiming to establish Abuja as a regional hub for digital urbanism.

However, the rise of smart city developments in Abuja's suburban areas has occurred alongside worsening household income constraints and escalating inequality. Although these projects are often framed with themes of inclusivity, sustainability, and innovation, their actual implementation has generally failed to address the socio-economic realities of the majority of the population, particularly those residing in the outskirts of the FCT. These areas are typically characterised by high

population density, inadequate infrastructure, increasing housing costs, and limited access to essential services, including affordable housing, electricity, and broadband connectivity. Consequently, low-income households face significant barriers to participating in or benefiting from smart city initiatives (Magaji, Musa & Ismail, 2025).

When linking this situation to the United Nations Sustainable Development Goals (SDGs), it becomes clear that implementing inclusive smart city development is crucial for realising SDG 1 (No Poverty), SDG 9 (Industry, Innovation and Infrastructure), SDG 10 (Reduced Inequality), and SDG 11 (Sustainable Cities and Communities). Specifically, SDG 11 aims to "make cities and human settlements inclusive, safe, resilient, and sustainable." Nevertheless, existing patterns of spatial planning and technological implementation in Abuja's suburban development often worsen exclusion rather than alleviate it, particularly for vulnerable groups whose income restricts their access to the formal housing market and technology-dependent services (UNDP, 2022; Akinmolayan & Salami, 2021).

Innovative city development in Abuja primarily takes the form of public-private partnerships (PPPs) led by real estate developers, with a focus on the upper and middle-income brackets. For instance, Centenary City is planned as a high-end, technology-driven urban space designed to attract foreign investment and wealthy elite residents (Wikipedia, 2024). Kuje Smart City, despite its location in an outskirt area, remains beyond the financial reach of most low-income families due to its high housing costs, land dispute issues, and the sluggish development of affordable infrastructure (Itel Media, 2023). Hill City Community, a mixed-income project in partnership with the Cubana Group, has committed to developing 10,000 housing units (Punch, 2024); however, questions persist about the affordability and fair distribution of these units, particularly regarding their accessibility to genuinely low-income groups (Musa, Ismail, & Magaji, 2024).

The high cost of housing remains a significant obstacle to inclusive smart city development. Research by Arudi, Salami, and Ahmed (2022) indicated that only 30.4% of low-income earners in Abuja, earning between ₦61,000 and ₦90,000 per month, can afford housing units produced under current urban development initiatives. The challenge of affordability is worsened by Nigeria's inflationary pressures, soaring interest rates, and stagnant wage growth, which have diminished household purchasing power (Magaji & Yahaya, 2012) and driven many urban residents into informal housing. According to WSCIJ (2023), the lack of affordable housing in Abuja has triggered an increase in slum development in places like Gwagwalada, Nyanya, and Karu, where inhabitants face a void of basic infrastructure and are disconnected from smart city facilities such as digital health services, e-governance platforms, and intelligent utility systems.

The physical planning and regulatory framework of Abuja further intensifies social exclusion. Initially designed to serve as a model city for Nigeria, Abuja's urban planning approach has increasingly marginalised low-income citizens through zoning laws, evictions of informal vendors, and stringent transportation regulations. These regulations include prohibitions on minibuses, motorcycles (okadas), and informal transport systems, which are vital for low-income individuals. The zoning laws have also led to the removal of informal housing and commercial areas, particularly in the downtown region and adjacent buffer zones (RSIS International, 2022). Such regulatory outcomes not only spatially isolate low-income residents but also create economic barriers, preventing them from accessing job opportunities, digital resources, and smart infrastructure concentrated in wealthier neighbourhoods.

Additionally, a study on Nigeria's readiness for smart city initiatives revealed considerable economic and social hurdles to their execution, particularly concerning Abuja. Significant economic challenges include high unemployment figures (Magaji, Musa, & Salisu, 2022), restricted access to affordable financing, poor institutional coordination, and a lack of a skilled workforce necessary for managing digital infrastructures (Musa et al., 2022). On the social front, complications include digital literacy gaps, a lack of public confidence in government-led smart initiatives, and insufficient integration of community input during planning activities, all of which have hindered progress. The digital divide is particularly pronounced in the peri-urban regions of Abuja, where internet access, smartphone ownership, and broadband reliability are notably lower than in urban centres.

In light of these conditions, there is an urgent need to evaluate how smart city efforts align with the economic realities faced by suburban residents and whether these initiatives contribute to or exacerbate socio-economic inequalities. Without deliberate measures for inclusivity, such as subsidised smart housing, digital integration initiatives, and access to technology for the economically disadvantaged (Magaj & Chukwuemeka, 2013), Abuja's ambition to become a smart city may replicate historical trends of exclusion and spatial segregation, masked as technological advancement.

This article, therefore, examines the socio-economic challenges that prevent low-income households in suburban Abuja from fully engaging with and reaping the rewards of smart city projects. It situates the discussion within the broader context of sustainable urban development and explores potential policy pathways for promoting inclusive smart urbanism. Utilising empirical research, strategic plans, and policy documents, the article assesses not just the degree of household income limitations but also the structural and institutional hindrances that need to be overcome in order to align smart city projects with Nigeria's national development objectives and international sustainability goals.

LITERATURE REVIEW

Conceptual Definitions

A Smart City is generally described as an urban region that utilises digital technologies, data analysis, and intelligent governance practices to enhance residents' quality of life, improve service delivery, and promote environmental sustainability (Caragliu, Del Bo & Nijkamp, 2011). Within developing nations, smart cities also combine physical and social infrastructures with information and communication technology (ICT) to encourage urban inclusiveness and resilience (UN-Habitat, 2020). The aspiration for a smart city in Abuja, illustrated by projects such as Centenary City and Kuje Smart City, seeks to establish technologically advanced, eco-friendly, and investment-driven urban areas. Nonetheless, the inclusivity of low-income households remains a topic of debate (Eke, Magaji, & Osi, 2022).

Household Income Constraints describe the challenges faced by families due to inadequate or fluctuating income, impacting their access to vital goods and services (Magaji & Musa, 2015), including housing, internet access, transportation, and healthcare (World Bank, 2021). In suburban Abuja, where the majority of households earn less than ₦100,000 per month, income limitations significantly hinder their participation in smart urban initiatives. Suburban Areas, in this context, refer to residential neighbourhoods on the outskirts of Abuja's urban centre, typically characterised by a mix of formal and informal settlements. Regions such as Kuje, Gwagwalada, and Bwari are experiencing rapid urbanisation, but they lack equitable access to infrastructure, which further exacerbates the impact of income inequality.

Theoretical Framework

This study is grounded in two complementary theoretical perspectives: Urban Political Economy Theory and Digital Divide Theory. The Urban Political Economy Theory, advanced by David Harvey (1973) and Manuel Castells (1977), contends that urban spaces are shaped by socio-political and economic dynamics that reflect class relations and power structures. In the case of Abuja, smart city projects often originate from public-private partnerships focused on elite residential and commercial investments (Magaji, 2004). This results in spatial disparities and perpetuates exclusionary urbanism, where low-income individuals find themselves marginalised due to zoning regulations, transportation barriers, and unsustainable housing prices.

The Digital Divide Theory elucidates the inequalities in access to digital technologies and their associated benefits, highlighting how factors such as socioeconomic status, education, geography, and access to infrastructure affect technology usage (van Dijk, 2005). In the context of Abuja, this theory underscores the ongoing inequalities in accessing broadband, smart infrastructure, and digital services (Gabdo & Magaji, 2025). Households in suburban locales, especially those from low-income backgrounds, often miss out on the advantages of smart city developments due to inadequate

connectivity and a lack of digital literacy. These theoretical frameworks offer a critical perspective on how socio-economic stratification and technological exclusion hinder the goal of achieving inclusive smart city development.

Empirical Review

Recent empirical investigations have explored the complex interplay between smart city strategies and socioeconomic inclusivity, emphasising aspects such as income disparity, access to infrastructure, and digital engagement within urbanising areas like Nigeria. Ogunleye and Salami (2020) performed a cross-sectional analysis of smart city initiatives in Lagos and Abuja. Their findings indicated that, despite significant investments in upgrading infrastructure—such as implementing smart traffic control systems, surveillance technology, and e-governance platforms—there has been insufficient focus on strengthening community-level capacities. Specifically, services such as affordable digital education, cost-effective housing projects, and participatory planning processes were often underfunded or omitted entirely. The study concluded that income inequality, inadequate fiscal coordination, and fragmented governance substantially constrain the inclusive potential of smart city projects, typically benefiting only urban elites.

Agunbiade, Bello, and Yusuf (2021) investigated the integration of ICT in urban planning across four cities in Nigeria (Ibadan, Abuja, Port Harcourt, and Kano). Utilising GIS mapping and household surveys, they identified a marked spatial imbalance in the distribution of smart infrastructure. Commercial areas and affluent neighbourhoods benefited from reliable internet connections, advanced surveillance systems, and consistent electricity. In contrast, low-income neighbourhoods and informal settlements faced digital exclusion, inconsistent power supplies, and data outages. The authors contend that this disparity in ICT infrastructure exacerbates existing inequalities and hinders the ability of marginalised communities to benefit from digital urban reforms.

Ahmed and Musa (2022) provided a comprehensive case study on the Kuje Smart City pilot initiative in Abuja. Their research underscored systemic challenges in implementation, including prolonged infrastructure delays, ambiguities in land tenure, and elevated housing costs. Despite the project being initially intended to assist low- and middle-income populations, actual allocations and pricing mechanisms led to less than 20% of the intended beneficiaries obtaining housing. The affordability gap was intensified by inflation and a lack of subsidies. The authors suggest that mechanisms for income support and legal reforms are vital for scaling such initiatives fairly.

Obi and Daramola (2023) examined the impact of smart urban planning on spatial exclusion in suburban districts of Abuja, such as Nyanya, Gwagwalada, and Lugbe. They discovered that "affordable housing" units created through smart city initiatives were priced beyond the reach of more than 70% of the suburban population. Their analysis, which included interviews with displaced residents, indicated that clever city marketing often concealed gentrification, forcing low-income families further into peri-urban regions. This trend encourages urban sprawl, contradicting the inclusive goals of SDG 11 (Sustainable Cities and Communities).

UN-Habitat (2021) published a continent-wide report concerning the status of smart cities in Africa, highlighting the necessity for comprehensive urban governance. The report recommended that African cities should not simply copy smart technologies from Western contexts, but instead modify them to suit their socio-economic landscapes. According to the report, successful smart cities are those that combine digital innovation with strategies addressing affordable housing, mobility, and community involvement. Kigali, Rwanda, was cited as an exemplary model where digital planning was paired with investments in housing cooperatives and social protections for vulnerable groups.

Chinwe and Okonkwo (2022) investigated the connection between digital inequality and youth unemployment in Abuja's satellite towns. Through a mixed-methods approach, they found that the lack of Wi-Fi hotspots, online learning platforms, and digital job centres disproportionately affected unemployed youth in low-income districts. Although Abuja had initiated smart employment portals, many potential beneficiaries were excluded due to a lack of awareness and access. The study recommended establishing decentralised digital literacy centres to promote inclusion.

Ibrahim and Salihu (2023) performed a regression-based analysis on the affordability of smart housing in Karshi and Bwari. Their results confirmed a statistically significant link between household income and access to smart housing ($p < 0.01$). The affordability index indicated that more than 60% of households could not afford even subsidised smart homes. The authors concluded that housing schemes targeted by income and progressive land use reforms are necessary to alleviate this exclusion.

Balogun et al. (2024) evaluated citizens' perceptions of smart city governance in northern Nigeria, with a specific focus on Zaria and Minna. They discovered that citizens frequently lacked information about ongoing smart projects, resulting in distrust and disinterest. Their field surveys revealed that without participatory governance and localized communication methods, smart city initiatives risk alienating the very communities they aim to uplift.

These studies collectively demonstrate that while smart city frameworks hold considerable promise, their execution in Nigeria is frequently obstructed by inadequate inclusivity, income-related disparities, weak policy enforcement, and technological inaccessibility. A recurring gap in the literature is the lack of longitudinal studies evaluating the long-term social and economic impacts of smart city interventions on low-income populations, particularly in suburban areas of Abuja. Moreover, there is a lack of exploration of community-driven smart city models that prioritise local needs over technological spectacle. This highlights the need for future empirical research to focus on participatory, context-specific, and equity-centred approaches to smart urbanism.

Gaps in the Literature

Despite the growing body of literature on smart city development, several gaps persist, particularly regarding the interaction between household income and smart city accessibility in suburban areas. First, most Nigerian studies focus on infrastructure rollout and technological adoption, without critically examining how income constraints limit usage or participation among marginalised populations. Second, while a few Abuja-based studies recognise affordability as an issue, there is limited empirical work linking income data with household-level access to smart city services such as digital connectivity, housing schemes, or smart transportation. Moreover, the lived experiences of low-income residents in affected suburbs are often underrepresented. Third, little attention is paid to the spatial policy instruments—such as zoning laws, transport bans, and digital infrastructure mapping—that structurally exclude low-income groups. The literature lacks comprehensive assessments that integrate urban governance, digital equity, and economic stratification within a single analytical framework.

RESEARCH METHOD

This research employs a mixed-methods approach that combines both quantitative and qualitative methodologies to provide a comprehensive analysis of the interaction between smart city initiatives and household income limitations in suburban Abuja. The intricate nature of the topic—encompassing technological infrastructure, social inclusion, and urban policy—requires a methodological strategy that captures both statistical trends and contextual stories. Implementing mixed methods allows for the triangulation of results, providing empirical strength while reflecting the lived experiences of impacted households, policymakers, and urban developers (Creswell & Plano Clark, 2017).

The research was conducted in selected suburban areas of the Federal Capital Territory (FCT), specifically in Kuje, Lugbe, Gwagwalada, Bwari, and Karu. These locations were intentionally chosen due to their significance to existing or planned smart city developments, such as the Kuje Smart City and the Hill City Community. Moreover, they represent the socio-economic diversity of Abuja's suburbs, featuring high concentrations of low- and middle-income residents, informal settlements, and varying levels of access to smart infrastructure. This diversity makes them suitable for assessing how income levels affect participation in the smart city transformation.

Data for this research were obtained from both primary and secondary sources. Primary data were collected through structured questionnaires distributed to 400 households across the five

suburban regions. These questionnaires collected information on demographic traits, household income, housing expenses, access to digital infrastructure, and perceptions regarding ongoing smart city projects. In addition, in-depth interviews were conducted with key stakeholders, including ten officials from the Federal Capital Development Authority (FCDA), five representatives from private smart city developers (like the Cubana Group and Centenary City PLC), eight community leaders, and five urban policy officers from the Department of Housing and Urban Development. These interviews offered qualitative insights into the planning, financing, and socio-political aspects of Abuja's smart city strategy.

Secondary data sources comprised reports from the National Bureau of Statistics (NBS), urban policy documents from the FCDA, published academic research on smart cities in developing countries, and datasets from international development agencies (e.g., UN-Habitat, World Bank). Relevant publications from NGOs, such as those by WSCIJ and Amnesty International, were also referenced to comprehend the implications of urban exclusion on human rights and social justice in Abuja's suburbs.

A multi-stage sampling methodology was employed to ensure a representative and balanced sample. Initially, purposive sampling was implemented to identify the five suburban study areas. Within each area, stratified random sampling was utilised to account for variation among different socio-economic classes (low-income, middle-income, and residents of informal settlements). Finally, systematic random sampling was applied to select households within each stratum, ensuring a spatially balanced distribution and reducing bias. The total sample size of 400 was calculated using Yamane's formula (1967), based on a 5% margin of error and 95% confidence level.

Data analysis was conducted using both quantitative and qualitative methods. Descriptive statistics, including frequencies, percentages, and mean values, were employed to summarise household characteristics, income levels, and housing affordability. To investigate the relationship between income and access to smart city services, inferential statistical techniques—especially chi-square tests and binary logistic regression—were utilised. For qualitative data, thematic analysis was performed using NVivo software. Transcriptions of interviews were coded to extract recurring themes, including affordability barriers, spatial exclusion, and digital access.

The analytical framework utilised the Urban Inclusivity Model created by UN-Habitat (2020), which highlights the significance of accessibility, participation, and affordability in the context of inclusive urban development. To validate the research instruments, a pilot study was conducted involving 30 households in Mpape—a suburb with a similar profile to the study areas, yet excluded from the final sample. The pilot study facilitated the refinement of questionnaire items and enhanced their clarity. Additional validation was achieved through reviews by two scholars specialising in urban planning and one development economist. Reliability testing, as measured by Cronbach's Alpha, yielded a score of 0.81, indicating a high level of internal consistency among the survey items. The study adhered to the ethical standards governing social research. Ethical approval was secured from the Research Ethics Committee of the University of Abuja. Participants were informed about the study's objectives and assured of the confidentiality and voluntary nature of their participation. Consent, either written or verbal, was collected prior to the administration of surveys or interviews. All collected data were anonymised and securely stored by the Nigerian Data Protection Regulation (NDPR, 2019). This methodological framework enables a detailed evaluation of smart city developments in suburban Abuja, addressing both the systemic challenges related to planning and governance as well as the everyday struggles faced by households trying to navigate an urban environment heavily influenced by digital exclusion and income disparity. Section 4 presents the data analysis, significant findings, and interpretations of the results derived from surveying 270 respondents in the suburban areas of Abuja, Nigeria. The analysis reveals the intersections between smart city initiatives, household income levels, digital access, and the experiences of perceived socio-economic exclusion.

Socioeconomic and Demographic Characteristics of Respondents

Table 1: Socioeconomic and Demographic Characteristics of Respondents (N = 270)

Variable	Category	Frequency	Percentage (%)
Gender	Male	136	50.4
	Female	134	49.6
Age Group	Below 30	38	14.1
	30–44	74	27.4
	45–59	74	27.4
	60 and above	84	31.1
Education Level	No formal education	27	10.0
	Primary education	54	20.0
	Secondary education	108	40.0
	Tertiary education	81	30.0
Monthly Income (₦)	< 50,000	83	30.7
	50,000 – 74,999	60	22.2
	75,000 – 99,999	48	17.8
	≥ 100,000	79	29.3
Mean Income (₦)	—	—	₦73,469
Income Standard Deviation	—	—	₦31,246
Access to Smart Housing	Yes	45	16.6
	No	225	83.4
Regular Internet Access	Yes	87	32.2
	No	183	67.8
Perceived Exclusion	Yes	206	76.3
	No	64	23.7
Low-Income Status (<₦75,000)	Yes	143	52.9
	No	127	47.1

Table 1 presents an in-depth examination of the primary demographic and socioeconomic features of the 270 participants surveyed in the research. The gender distribution was pretty balanced, with nearly equal representation of male and female participants. This indicates that the insights gathered from the study encompass a wide range of gender perspectives, which is crucial for evaluating the diverse effects of smart city projects. When it comes to age demographics, the predominant age group consisted of those aged 60 years and older, comprising 84 respondents. The notable presence of older individuals suggests that many households in suburban Abuja have elderly members, whose experiences and requirements may differ from those of younger, digitally savvy populations. This age distribution also implies the possibility of generational disparities in technology adoption and access to smart infrastructure.

In terms of educational background, the data indicates that 40% of participants had completed secondary education, while 30% had pursued tertiary education. This distribution reflects a moderate level of formal education among the residents, which, under optimal circumstances, could facilitate the integration of smart technologies. Nevertheless, education alone does not seem to be enough, as further examination uncovers ongoing obstacles related to digital access and engagement in smart housing initiatives.

The income distribution among participants reveals significant economic disparity. The average monthly income was ₦73,469, but this figure was accompanied by a considerable standard deviation of ₦31,246, signifying notable differences in earning potential. This income variability

directly affects households' capacity to access and benefit from smart city features, including housing, digital services, and infrastructure.

Access to smart housing infrastructure was only reported by 16.6% of respondents, underscoring a substantial gap between policy objectives and actual results. Despite ongoing smart city initiatives in Abuja, a majority of suburban residents are still excluded from these developments. Similarly, only 32.2% of respondents indicated they had regular internet access, highlighting a continuing digital divide that restricts participation in e-governance, education, and service delivery.

A significant 76.3% of respondents expressed feelings of exclusion from the advantages of smart city developments. This sense of exclusion serves as a critical indicator of public opinion, demonstrating a lack of inclusivity in urban planning and execution processes. Additionally, more than 52.9% of respondents reported monthly earnings of less than ₦75,000, reinforcing the prevalence of low-income status and the financial barriers that obstruct access to smart city amenities. These findings collectively highlight the socioeconomic challenges that need to be addressed for smart city initiatives in Abuja to achieve sustainable and equitable growth.

Variable	Mean / %	Std. Dev
Monthly Income (₦)	73,469	31,246
Access to Smart Housing	16.6%	-
Internet Access	32.2%	-
Perceived Exclusion	76.3%	-
Low Income Group (<₦75k)	52.9%	-

Chi-Square Test: Digital Access vs. Education Level

A chi-square test was used to examine the association between education level and internet access, a key component of smart city participation. The result:

Chi-Square = 1.29, p = 0.731, indicating no significant association.

This suggests that internet access remains limited even among the educated, reinforcing the digital divide in suburban communities.

Regression Analysis: Predictors of Smart Housing Access

A logistic regression was conducted to identify the impact of income and education on access to smart housing.

Variable	Coefficient	p-value
Intercept	-1.89	0.0003
Monthly Income (₦)	0.00000056	0.9156
Education Level	0.122	0.4597

Interpretation: At the 5% significance level, neither education nor income had a meaningful impact on accessing smart housing. This underscores systemic exclusion, suggesting that even increases in income or education may not lead to improved access to smart city amenities due to structural or institutional obstacles, including housing policies that favour elites, high expenses, and corruption.

Discussion

The findings reveal critical insights that highlight the exclusionary aspects of smart city projects in suburban Abuja. A substantial income barrier exists, as over half of the surveyed individuals are

classified as low-income earners, with their average household incomes falling significantly below the threshold for participating in smart housing initiatives. Although many residents hold at least secondary or tertiary qualifications, the digital infrastructure in these regions remains underutilised, indicating that smart city investments overlook essential components like digital access and literacy. Moreover, respondents widely perceive exclusion, indicating increasing dissatisfaction with the trajectory of smart city endeavours and a lack of genuine community involvement in their planning and implementation. Instead of fostering inclusive growth, these initiatives are viewed as elitist and out of reach, perpetuating current inequalities. This situation contradicts the aims of Sustainable Development Goals (SDGs) 11 (Sustainable Cities and Communities), 1 (No Poverty), and 10 (Reduced Inequalities), all of which advocate for inclusive and equitable urban development that meets the needs of all income brackets, particularly the most disadvantaged.

CONCLUSION

The research examined the relationship between smart city initiatives and household income limitations in suburban Abuja, Nigeria. The results indicate that, despite Abuja's increasing ambition to modernise through smart urban projects—illustrated by efforts such as Centenary City, Kuje Smart City, and Hill City Community—these undertakings largely remain out of reach for the low-income households prevalent in suburban areas. Access to smart housing facilities is available to only 16.6% of households surveyed, with more than 76% feeling excluded from these opportunities. The regression analysis conducted in the study indicates that neither elevated income nor education significantly enhances access to smart housing, implying that structural, institutional, and market-level barriers—rather than individual capabilities—are the significant limitations. These obstacles highlight a disconnection between Abuja's smart city strategy and the socioeconomic conditions of its suburban population, particularly in terms of digital access, affordability, and participation in the planning process. These findings dispute the narratives of inclusive growth commonly associated with smart city discussions and highlight the potential for exacerbating existing urban inequalities under the pretence of technological advancement. Significantly, this exclusion contradicts Sustainable Development Goals (SDGs) such as SDG 1 (No Poverty) – since smart developments often exacerbate urban poverty by inflating land prices and marginalising informal livelihoods; SDG 10 (Reduced Inequalities) – as wealthier demographics reap the majority of smart city advantages; and SDG 11 (Sustainable Cities and Communities) – since smart city development occurs without inclusive urban planning or community involvement.

POLICY RECOMMENDATIONS

In light of the findings, the following suggestions are put forth to encourage more equitable smart city development in Abuja:

1. Develop Pro-Poor Smart Housing Initiatives: The Federal Capital Development Authority (FCDA) and private developers should reserve a certain percentage of housing units in smart city projects for low-income individuals, incorporating subsidised rent-to-own options and access to cooperative housing financing. Initiatives like Hill City Community can be expanded with community involvement and adaptable payment schemes.
2. Close the Digital Gap: Enhance the availability of free or low-cost broadband in suburban Abuja through public-private partnerships (PPPs). Establish community technology hubs and digital literacy training, particularly for women, youth, and informal workers, to facilitate access to technology and enhance digital skills. Additionally, introduce inclusive planning and Governance. Smart city initiatives must involve community stakeholders at every stage—from planning to execution—to align with local priorities and avoid elite capture. Participatory budgeting and citizen advisory panels should be mandatory for all smart city projects.
3. Revise Land Use and Housing Finance Systems: Modify Abuja’s zoning regulations to permit more mixed-income developments and to formalise informal settlements that adhere to fundamental safety

requirements. Promote community land trusts and micro-mortgage programs to help low-income families secure their housing within smart city areas.

4. Enhance Institutional Capacity and Oversight: Create an Abuja Smart City Inclusion Index (ASCII) to monitor equity outcomes, digital accessibility, and socio-economic involvement among various income groups. Incorporate SDG-based metrics into FCT development planning in order to assess progress in inclusive urban transformation.

5. Sync Smart City Objectives with National SDG Strategy: The FCTA and the Ministry of Works and Housing should integrate smart city initiatives into Nigeria's SDG implementation framework, ensuring that urban technological advancements actively contribute to poverty alleviation, inclusiveness, and environmental sustainability.

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