ISSN: 2971-7760 | VOL 10, ISS 1 | 25 NOVEMBER 2026
https://doi.org/10.5281/zenodo.24522847
NASARAWA STATE UNIVERSITY, KEFFI, NIGERIA

SOCIO-ECONOMIC PROFILES AND INFRASTRUCTURE DEFICITS IN PERI-URBAN INFORMAL SETTLEMENTS: EMPIRICAL EVIDENCE FROM KPADUMA, ABUJA, NIGERIA

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Abstract

The rapid expansion of informal settlements on the peripheries of planned capital cities represents one of the most critical urban development challenges in the Global South. This study provides an empirical investigation into the socio-economic dynamics, infrastructural deficits, and regulatory constraints characterizing Kpaduma, an indigenous informal enclave occupying 80.906 hectares within the Guzape District of the Federal Capital City (FCC), Abuja, Nigeria. Utilizing a mixed-methods empirical research design, the study establishes a demographic baseline by projecting the 2006 Census population of 41,852 to a 2024 population (N = 64,452) via an exponential growth model at a 3.0% annual growth rate. Applying the Taro Yamane sampling formula at a 0.05 level of significance yielded a primary sample size of n = 400 household respondents selected through stratified random sampling across residential clusters. Quantitative findings establish significant socio-economic vulnerabilities, including a youthful population structure where 54.0% of respondents are aged 18–34 years, a high dependence on the informal economic sector (62.2%), and low monthly household earnings, with 30.5% earning between ₦20,000 and ₦40,000. Assessment of utility infrastructure reveals critical structural deficits: 55.1% of households depend on unmonitored private boreholes and 21.5% on shallow wells, contrasted with a 15.5% connection rate to municipal pipe-borne water systems. Furthermore, 60.0% of internal access roads are classified as poor or severely eroded, while 59.2% of households lack organized solid waste collection services, resulting in widespread open dumping. Evaluation of existing governance mechanisms highlights acute regulatory failure, with 62.2% of residents identifying reliance on the outdated Nigerian Urban and Regional Planning Act of 1992. Institutional performance metrics were marked by severe deficiencies, with institutional transparency recording 5.5% (n=22) and overall policy effectiveness rated positively by only 4.0% (n=16) of respondents. Grounded in these empirical baseline metrics, the paper demonstrates the necessity of transitioning from traditional demolition and forced eviction paradigms toward structured, participatory in-situ urban upgrading and land tenure regularization. The empirical baseline established in this summary provides the foundational data necessary to interrogate the theoretical and spatial dimensions of informal peri-urban development analyzed in the subsequent sections.

Keywords: Peri-urban informality, Infrastructure deficits, In-situ upgrading, Urban spatial equity, Land tenure regularization, **Abuja Municipal Area Council**.

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1.0. Introduction and Conceptual Framework

Urbanization across Sub-Saharan Africa is defined by a persistent structural mismatch between spatial population growth and the institutional capacity of municipal authorities to deliver basic utility networks, formal housing, and structured land management systems (UN-Habitat, 2022; World Bank, 2023). Within post-colonial capital cities, this dynamic is amplified where state-driven master planning visions collide with the socio-economic realities of low-income population growth and indigenous population retention (Abubakar, 2021; Davis, 2021). The Federal Capital Territory (FCT) of Abuja, Nigeria, conceived under the 1979 Abuja Master Plan as a modern, dual-structured administrative capital, exemplifies this spatial contradiction (Federal Capital Development Authority, 2022). While central districts such as Maitama, Wuse, and Asokoro received primary infrastructural investments, peripheral and embedded indigenous settlements were largely marginalized or slated for deferred resettlement (Adebayo & Iweka, 2023; Essiet, 2021). Kpaduma Settlement, situated geographically within Phase II of the Federal Capital City layout inside the Guzape District, represents a critical manifestation of this peripheral informal expansion. Originally established as a small indigenous Gbagyi agricultural enclave, Kpaduma has absorbed rapid influxes of low-income migrants seeking affordable housing proximate to the employment nodes of central Abuja, resulting in dense, uncoordinated spatial growth that contrasts sharply with the high-end residential layouts of adjacent Guzape (Agbonogal, 2023).

The governance of land within Kpaduma is severely complicated by post-colonial administrative dualism. Under the Land Use Act of 1978, all land within the FCT was formally vested in the Federal Government, effectively overriding customary tenure rights held by indigenous Gbagyi families. Although the 1981 Presidential Ad-Hoc Committee on Resettlement established that indigenous populations residing within Phase II development boundaries should either be fully integrated into formal district plans or provided with equitable off-site resettlement, implementation has stalled for decades. Consequently, customary land transactions between Gbagyi landholders and incoming informal settlers operate in a legal gray area—unrecognized by the Federal Capital Development Authority (FCDA), yet serving as the primary mechanism for land access (Ali & Suleiman, 2021).

To conceptualize the dynamics of spatial inequality and service deprivation within Kpaduma, this study operationalizes the theoretical frameworks of *Infrastructural Self-Provisioning*, *Urban Service Exclusion*, and *Splintering Urbanism* (Mitlin & Satterthwaite, 2021; Pieterse, 2021). Urban Service Exclusion occurs when formal planning agencies and municipal utility boards systematically omit informal peri-urban enclaves from state-funded infrastructure networks—such as pipe-borne water grids, municipal sewage lines, asphalt road access, and structured solid waste management—due to legal ambiguities regarding land tenure or non-compliance with statutory building codes (Jones, 2023; Satterthwaite et al., 2021). This systematic omission reflects broader trends of splintering urbanism across African metropolitan corridors, where premium network spaces are constructed for commercial and high-income enclaves while low-income zones are bypassed (African Development Bank, 2024). In response to state network omission, excluded populations adopt mechanisms of *Infrastructural Self-Provisioning*, actively constructing alternative, decentralized infrastructure platforms to sustain household reproduction and micro-enterprise operations (Chen, 2021; Oteng-Ababio et al., 2022). In Kpaduma, self-provisioning manifests through informal groundwater extraction (shallow wells and unregulated private boreholes), off-grid fossil-fuel power generation, informal waste dumping, and

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incremental self-built housing using non-standardized materials (Amoako & Cobbinah, 2021; Roy, 2021).

While self-provisioning demonstrates community agency and adaptive survival strategies, critical urban scholars observe that decentralized informal utilities impose disproportionate financial burdens on low-income households while generating severe ecological risks and spatial vulnerabilities (Amis, 2024; Bardhan, 2022; Robinson, 2022). High nominal expenditures on fuel for small-scale petrol/diesel generators, unregulated water purchases from private vendors, and localized environmental degradation collectively exacerbate the urbanization of poverty (International Labour Organization, 2024; Organisation for Economic Co-operation and Development, 2021). Furthermore, the absence of statutory land titling leaves self-provisioned communities perpetually exposed to threats of state demolition, market-driven displacement, and speculative gentrification as formal municipal boundaries expand outward (Kamalipour & Dovey, 2023). The theoretical integration of infrastructural self-provisioning, service exclusion, and institutional dualism directly structures the methodological framework designed to measure and analyze Kpaduma's socio-economic and spatial baseline.

2.0 Study Area and Research Methodology

Generating actionable spatial governance strategies for peri-urban informal settlements requires a rigorous empirical methodology capable of capturing accurate socio-economic profiles and physical infrastructure metrics in unmapped, high-density environments (Agabaeze, 2023). Standard official statistics frequently undercount informal enclave populations, making baseline demographic modeling and stratified field sampling essential for policy formulation.

2.1 Study Area Spatial Profile

Kpaduma is geographically situated at latitude 9^\circ35'\text{N} and longitude 8^\circ16'\ text{E} within the Abuja Municipal Area Council (AMAC) of the Federal Capital Territory, Nigeria. Occupying a total land area of 80.906 hectares, the settlement is positioned within the development boundary of Guzape District (Phase II of the Federal Capital City). The spatial morphology of Kpaduma reflects organic, non-linear growth patterns that adapt to localized topographic conditions (Akinmoladun, 2021). Kpaduma is characterized by a hilly terrain, underlain by granitic gneisses and basement complex geology, with localized basaltic formations. The vegetation falls within the southern Guinea savannah zone, heavily modified by human activity, agricultural land clearing, and continuous informal housing construction. The settlement experiences an average annual rainfall ranging between 136 mm and 162 mm, concentrated between March and October, with peak precipitation in August and September. Mean annual temperatures average 25.5^0c accompanied by a distinct harmattan dry season from November to March.

2.2 Demographic Projection and Sample Determination

The baseline population of Kpaduma, recorded during the 2006 National Population Census, was 41,852 inhabitants (comprising 58.0% males and 42.0% females). To establish the contemporary target population (N) for the year 2024, an exponential demographic growth model was applied using an annual growth rate (r) of 3.0% (0.03): This mathematical projection yields a target population of N = 64,452 residents for 2024. To determine an empirically representative household sample size (n) from the projected population framework (N = 64,452), the Taro Yamane formula for finite populations was computed at a 95% confidence level (e = 0.05 margin of error), to arrive at 398 sample for this study. To enhance statistical robustness and compensate for potential non-response, the sample size was rounded to n = 400 household respondents.

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2.3 Sampling Procedure and Data Collection Instruments

Primary data collection utilized a multi-stage stratified random sampling technique. The 80.906-hectare settlement was delineated into spatial residential clusters based on physical landmarks and historical family compound nodes (including the Abmizhi, Kabu, Eyibwi, Kpakunkpe, Gbefwi, and Idakwoyi compound zones). Structured household questionnaires (n=400) were proportionately administered across these spatial clusters using systematic random sampling intervals (selecting every k-th household along organic access paths).

Primary data collection instruments integrated quantitative household surveys, high-precision Garmin handheld Global Positioning System (GPS) spatial mapping of physical infrastructure points, structural condition observation checklists, and in-depth Key Informant Interviews (KIIs) conducted with community elders, traditional leaders (Chiefs), local planning officers from the Federal Capital Development Authority (FCDA), and Abuja Municipal Area Council representatives. Secondary data sources comprised high-resolution 2024 satellite imagery, official FCDA master plan documentation, cadastral surveys, regional development reports (African Development Bank, 2024), and statutory planning legislation. The empirical data collected via this methodological framework were subjected to descriptive statistical analysis and spatial mapping, the results of which are detailed in Section 3.

3.0 Results and Empirical Findings

Developing effective spatial integration frameworks for peri-urban informal settlements requires grounding planning policy in rigorous quantitative survey data and verified empirical baseline metrics. The empirical findings from the field investigation of Kpaduma (n=400) are presented below across two core analytical sub-domains: socio-economic stratification and basic infrastructure deficits.

3.1 Socio-Economic Characteristics and Demographic Stratification

The socio-economic profile of Kpaduma reflects a dynamic, predominantly youthful, low-to-middle-income community heavily integrated into Abuja's informal urban economy. Table 1 summarizes the core demographic and socio-economic variables derived from the field survey.

Table 1: Socio-Economic Profile of Respondents in Kpaduma (n=400)

Socio-Economic Variable	Category	Frequency (f)	Percentage (%)
Age Distribution	18–24 years	94	23.5
	25–34 years	122	30.5
	45–54 years	62	15.5
	55 years and above	16	4.0
	Subtotal [Youth 18–34 years]	*216*	*54.0*
Educational Attainment	Secondary Education	181	45.2
	No Formal Education	85	21.2
	Tertiary Education	84	21.0
	Primary Education	50	12.5
Occupational Status	Informal Sector Engagement	249	62.2
	Formal Sector Employment	86	21.5
	Unemployed	65	16.2
Monthly Household Income	₦20,000 – ₦40,000	122	30.5
	₦40,000 – ₦60,000	102	25.5
	Above ₦80,000	94	23.5
	₦60,000 – ₦80,000	82	20.5

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Source: *Field Survey Data.*

Demographic analysis indicates a clear youth concentration: 30.5% of respondents are aged 25–34 years, while 23.5% fall within the 18–24 age bracket. Combined, young adults aged 18–34 years constitute an absolute majority of 54.0% (n = 216). Middle-aged adults (45–54 years) represent 15.5%, whereas the elderly demographic (55+ years) accounts for only 4.0%. Educational stratification demonstrates a moderately literate population: 45.2% have completed secondary education, 21.0% hold tertiary qualifications, and 12.5% possess primary education. However, a significant minority of 21.2% reported no formal education.

Occupational data reveal that 62.2% (n=249) of respondents operate within the informal economic sector—engaged in petty trading, artisanal crafts, informal construction labor, commercial transport, and micro-services. Formal sector employees account for 21.5%, while 16.2% are unemployed. Household income distribution reveals widespread financial vulnerability: 30.5% earn between ₦20,000 and ₦40,000 monthly, 25.5% earn ₦40,000 to ₦60,000, 20.5% earn ₦60,000 to ₦80,000, and 23.5% earn above ₦80,000.

Evaluating the analytical implications of these metrics reveals that the concentration of informal sector employment (62.2%) combined with low monthly earnings (56.0% earning ₦60,000 or less) severely limits household financial capacity to self-fund structural building improvements or purchase legal real estate titles in formal municipal markets. This economic vulnerability restricts residents' resilience against forced state evictions or speculative market gentrification driven by high-end private real estate expansion in neighboring Guzape. Furthermore, while the 54.0% youth demographic presents an active labor force, the 16.2% unemployment rate and low tertiary qualification rate (21.0%) underscore the urgent necessity of incorporating targeted vocational training and micro-enterprise space allocations within any official spatial integration plan.

3.2 Infrastructure and Basic Service Deficits

The physical assessment of Kpaduma confirms severe infrastructural exclusion across major utility networks. Table 2 details the quantitative percentages of utility access, internal road network conditions, and solid waste disposal practices.

Table 2: Infrastructure and Basic Utility Infrastructure Deficits in Kpaduma (n=400)

Utility / Infrastructure Sector	Primary Mode / Status Category	Frequency (f)	Percentage (%)
Water Supply Source	Private Unmonitored Borehole	220	55.1
	Shallow Hand-Dug Well	86	21.5
	Municipal Pipe-borne Water	62	15.5
	Others (Vendors, Streams)	32	8.0
Electricity / Power Source	AEDC Public National Grid	201	50.2
	Petrol / Diesel Generator	119	29.75
	Solar Energy Systems	80	20.1
Internal Road Network Condition	Poor / Unpaved / Severely Eroded	240	60.0
	Fair / Partially Motorable	98	24.5
	Good / Paved	62	15.5
Solid Waste Management	Lacking Collection / Open Dumping	237	59.2
	Access to Waste Management	163	40.8

Source: Field Survey Data.

The primary domestic water supply data indicate extreme dependence on off-grid self-provisioning: 55.1% (n = 220) rely on private boreholes, while 21.5% (n = 86) rely on shallow hand-dug wells. Municipal pipe-borne water connections served by the FCT Water Board cover

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only 15.5% of households, with the remaining 8.0% relying on informal water vendors or surface streams. Power infrastructure presents similar instability: while 50.2% are connected to the Abuja Electricity Distribution Company (AEDC) national grid, regular load shedding forces 29.75% to rely primarily on fossil-fuel generators and 20.1% on small-scale solar systems.

Physical accessibility within Kpaduma is restricted: 60.0% (n=240) of internal access roads are unpaved, eroded, lacking drainage channels, and rated in poor condition. Only 15.5% of internal circulation routes are classified as good/paved. Solid waste management represents a critical environmental hazard, with 59.2% (n=237) of households lacking access to municipal waste collection, leading to widespread open dumping on vacant plots, steep slopes, and natural drainage channels.

3.3 Ecological and Environmental Health Assessment

The empirical concurrence of a 59.2% municipal waste management deficit and a 21.5% reliance on unmonitored shallow hand-dug wells creates severe environmental health hazards. Uncontrolled solid waste accumulation in unlined pits and natural depressions leads to leachate percolation into the shallow groundwater table. Because shallow wells extract water from unconfined aquifers, residents face ongoing risks of fecal microbial contamination and toxic chemical exposure, increasing community vulnerability to waterborne disease outbreaks such as cholera and typhoid. Furthermore, the 60.0% unpaved internal road deficit, combined with absent stormwater drainage systems and Kpaduma's hilly topography, accelerates severe gully erosion during peak monsoon months (August–September), destabilizing housing structures built without formal engineering oversight. These findings highlight how physical infrastructure exclusion translates directly into heightened socio-environmental vulnerability, framing the discussion on governance and spatial equity in Section 4.

4.0 Discussion: Informality, Spatial Inequity, and Governance Dilemmas

The empirical data gathered from Kpaduma highlight the critical spatial and institutional contradictions surrounding informal settlement management within the Federal Capital Territory. Analyzing these findings reveals broader dilemmas concerning spatial justice, urban citizenship, and regulatory reform in rapidly expanding African capitals.

4.1 Historical Precedents and Governance Lessons: The Garki Integration Scheme

a) Attempts to address indigenous peri-urban settlements within Abuja's urban planning history offer essential lessons for evaluating Kpaduma's future integration. In 1992, the Federal Capital Territory Administration implemented the *Garki Village Integration Scheme* within Phase I of the city master plan (Abubakar, 2021). The scheme evaluated three distinct planning options:
    a) **Option I:** Comprehensive evacuation and off-site resettlement of all 800 household heads in the village.
    b) **Option II:** Partial resettlement accompanied by monetary financial compensation for structures and immovable assets.
    c) **Option III:** Partial in-situ integration, wherein 60% of households directly affected by proposed arterial road networks were compensated and resettled within designated public/private plots inside the village precinct, while non-affected residents were regularized on-site.

Option III was selected for Garki Village, involving the re-allocation of revoked city plots to absorb displaced villagers. However, top-down implementation, insufficient municipal funding, legal disputes over plot revocations, and inadequate community consultation stalled the project

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midway. Ultimately, state authorities abandoned full in-situ integration, forcibly relocating large segments of the population to Apo Resettlement town along the Outer Southern Expressway (Abubakar, 2021). The partial failure of the Garki scheme demonstrates the instability of top-down planning interventions that treat informal settlements as transient spatial obstacles rather than permanent functional urban neighborhoods.

4.2 Evaluation of Regulatory Frameworks and Institutional Failures

The regulatory dilemmas observed in Kpaduma stem directly from an over-reliance on centralized, outdated legal instruments coupled with weak institutional enforcement mechanisms. Table 3 presents survey data evaluating resident awareness and institutional perceptions of existing urban planning frameworks within the settlement.

Table 3: Regulatory Framework Awareness and Performance Ratings (n=400)

Governance Indicator / Legislative Instrument	Primary Identified Framework / Performance Metric	Frequency (f)	Percentage (%)
Primary Regulatory Reference	Nigerian Urban & Regional Planning Act (1992)	249	62.2
	Abuja Master Plan (2006 Revision)	86	21.5
	FCT Urban & Regional Planning Act (2010)	65	16.2
Institutional Performance Ratings	Relevance of Framework	94	23.5
	Institutional Efficiency	100	25.0
	Administrative Accountability	62	15.5
	Institutional Transparency	22	5.5
	Overall Policy Effectiveness	16	4.0

Source*: Field Survey Data.*

The empirical results reveal that 62.2% (n = 249) of respondents view the general Nigerian Urban and Regional Planning Act of 1992 as the primary legal framework governing development, while context-specific instruments, such as the Abuja Master Plan (21.5%) and the FCT Urban and Regional Planning Act of 2010 (16.2%), exhibit significantly lower awareness.

Evaluating the institutional performance ratings reveals severe administrative failure. Mathematically derived from the survey sample (n=400), institutional efficiency recorded a frequency of 100 respondents, representing exactly 25.0%. Institutional transparency recorded a frequency of 22 respondents, representing 5.5% (22/400=5.5%). Meanwhile, overall policy effectiveness received the lowest rating, with only 16 respondents evaluating it positively, yielding an effectiveness rate of 4.0% (16/400 = 4.0%). Administrative accountability was positively rated by 15.5% (n=62), and framework relevance by 23.5% (n=94).

This institutional crisis is exacerbated by administrative dualism under the Land Use Act of 1978 and the unfulfilled directives of the 1981 Presidential Ad-Hoc Committee on Resettlement. Statutory planning agencies prioritize Master Plan compliance over social equity, deploying land revocation threats and demolition notices rather than negotiating tenure security or extending municipal utilities (Ali & Suleiman, 2021; Federal Capital Development Authority, 2022; Mkandawire, 2021). This disconnect reflects a rigid planning bureaucracy that operates independently of indigenous socio-spatial structures (Adebayo & Iweka, 2023).

4.3 Theoretical Synthesis: Sub-Saharan Informality, Splintering Urbanism, and Citizenship Recovery

Contemporary scholarship on African urban informality emphasizes that self-provisioned settlements like Kpaduma are not temporary spatial aberrations destined for eradication; rather,

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they serve as critical mechanisms for structural urban housing and labor market integration (Brenner, 2021; Chen, 2021; Pieterse, 2021). The low overall policy effectiveness rating (4.0%) recorded for existing planning regulatory frameworks underscores a systemic failure to bridge formal statutory controls and informal livelihood strategies (Roy, 2021).

Integrating Kpaduma into the formal urban fabric of Guzape District represents a key pathway for overcoming splintering urbanism and reclaiming urban citizenship rights (Buscher, 2023; Payne & Durand-Lasserve, 2021). De-facto and de-jure tenure regularization, combined with municipal utility extensions, converts informal real estate assets into legally recognized capital, expanding the local property tax base while safeguarding low-income households from displacement (Bardhan, 2022; World Bank, 2023). Moving away from punitive eviction paradigms toward inclusive spatial governance requires translating these analytical insights into actionable planning recommendations.

5.0 Conclusion and Policy Recommendations

5.1 Conclusion

This study has provided an empirical baseline analysis of the socio-economic characteristics, physical infrastructure deficits, and governance challenges defining Kpaduma Settlement within the Guzape District of Abuja. The empirical findings confirm that Kpaduma is characterized by acute infrastructure exclusion, evidenced by a 55.1% household reliance on unmonitored boreholes, a 60.0% deficit in motorable paved internal roads, a 59.2% absence of municipal solid waste collection, and low institutional ratings for regulatory effectiveness (4.0%). Despite these physical deficits, Kpaduma supports an active, youthful population (54.0% aged 18–34 years) heavily engaged in the informal economy (62.2%), providing vital labor and micro-services to the broader Federal Capital City.

The major theoretical and planning contribution of this research reinforces the consensus that informal peri-urban enclaves are structural components of rapid African urbanization that require spatial, physical, and institutional integration rather than eviction or demolition. Attempting to clear settlements like Kpaduma exacerbates urban housing shortages, disrupts fragile social safety nets, and creates spatial polarization. Aligning spatial planning interventions with empirical socio-economic baseline metrics offers a sustainable pathway toward spatial equity and inclusive urban growth in Abuja.

5.2 Policy Recommendations

To operationalize sustainable in-situ integration, the following evidence-based planning recommendations are structured across four core intervention pillars:

1. In-Situ Urban Upgrading & Tenure Regularization
    a) Establishment of Progressive Land Titling Frameworks: The Federal Capital Territory Administration (FCTA), operating through the Abuja Geographic Information Systems (AGIS) and Development Control Department, should institute a flexible land regularization scheme. This involves issuing legal Titles/Certificates of Occupancy (C of O) or long-term occupancy rights to indigenous and long-term informal residents. Regularizing plot boundaries into the municipal cadastre protects the 62.2% informal workforce from forced displacement while expanding the municipal property tax base.
    b) Modification of Rigid Building Codes: Statutory building regulations under the FCT Urban and Regional Planning Act 2010 should be amended to accommodate incremental, non-standardized construction materials, provided structural safety standards are maintained.
2. Targeted Infrastructure Provision & Resettlement Management

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a) Extension of Municipal Water and Power Networks: The FCT Water Board must prioritize extending high-pressure pipe-borne water mains into Kpaduma to eliminate reliance on contaminated shallow wells (21.5%) and unmonitored groundwater boreholes (55.1%). Concurrently, the Abuja Electricity Distribution Company (AEDC) should upgrade transformer capacity to stabilize power supply, reducing generator fuel expenditures (29.75%).
b) Arterial Road Expansion and Resettlement Logistics: Planning authorities must execute the proposed road dualization and internal street paving scheme (rectifying the 60.0% road deficit). Adapting Option III of the evaluated Garki precedent, internal road widening and arterial dualization will affect between 350 and 375 households whose existing structures lie directly within proposed circulation corridors. These affected household heads must receive fair financial compensation for structures and be allocated replacement residential/commercial plots directly within the regularized integration sectors, preventing off-site displacement.

3. Community-Driven Environmental Management

a) Solid Waste Collection Hubs: To eliminate informal open dumping (59.2%), the Abuja Environmental Protection Board (AEPB) should establish neighborhood waste collection hubs managed via Public-Private-Community Partnerships (PPCPs). Local informal waste collectors should be formalized and equipped to manage micro-collection from narrow inner residential compounds.
b) Environmental Protection Zones: Steep slopes and natural runoff channels within Kpaduma's 80.906-hectare boundary must be designated as non-buildable green conservation belts to prevent structural collapse during heavy rainfall.

4. Participatory Neighborhood Layout Planning

a) Adoption of a Modified Neighborhood Concept: Spatial restructuring should adopt the evaluated Neighborhood Planning Concept, reallocating land budgets to address critical spatial shortfalls while minimizing residential displacement. Table 4 details the strategic land-use budget reallocation designed for Kpaduma's 80.906-hectare footprint.

Table 4: Proposed Strategic Land-Use Budget Reallocation for Kpaduma (80.91 Ha)

Spatial Land-Use Category	Existing Area (Ha)	Existing Share (%)	Required Planning Standard (%)	Proposed Area (Ha)	Proposed Share (%)
Residential Layout	36.82	45.50	50.0 – 60.0	44.50	55.00
Circulation Network (Roads)	3.45	4.26	15.0 – 20.0	12.95	16.00
Educational Facilities	1.20	1.48	4.0 – 6.0	3.40	4.20
Public & Semi-Public Facilities	2.54	3.14	3.0 – 5.0	3.24	4.00
Commercial Facilities	1.60	1.98	2.0 – 4.0	2.43	3.00
Open Space / Utilities / Conservation	36.90	45.64	15.0 – 20.0	14.39	17.80
Total Spatial Footprint	**80.91**	**100.00**	**—**	**80.91**	**100.00**

Source: *Author's Integration Proposal Design.*

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Executing the spatial land-use reallocation presented in Table 4 expands internal circulation routes from 4.26% to 16.00% (incorporating concrete drainage channels), reserves 4.20% for educational infrastructure (constructing 2 new nursery/primary and 1 secondary school), and allocates 3.00% for designated neighborhood commercial markets. The spatial reallocation directly accommodates the 350 to 375 affected households realigned during street widening into the expanded residential zone (55.00% proposed share).

Implementing structured in-situ upgrading, tenure regularization, and participatory land-use restructuring in Kpaduma offers a transformative, inclusive urban planning model for the Federal Capital Territory, providing a precedent for managing peri-urban informal settlements across rapidly urbanizing metropolitan regions throughout Sub-Saharan Africa.

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ISSN: 2971-7760 | VOL 10, ISS 1 | 25 NOVEMBER 2026
https://doi.org/10.5281/zenodo.24522847
NASARAWA STATE UNIVERSITY, KEFFI, NIGERIA

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