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Assessment of Urban-Planning Violations in the Peripheral Areas of Gumel, Jigawa State, Nigeria

By

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Abstract

Urban expansion in secondary Nigerian towns increasingly unfolds beyond statutory planning control, producing regulatory non-compliance and infrastructure deficits. This study assesses the typology, spatial distribution, and socio-institutional drivers of urban-planning violations in the peri-urban fringe of Gumel, Nigeria. Using a mixed-methods approach integrating multi-temporal Landsat 8 and Sentinel-2 imagery (2015–2022), GIS-based change detection, 48 stakeholder interviews, and systematic field transects, the study identifies three dominant violation categories: development without permits (58%), zoning conversion (27%), and setback encroachment (15%). Hotspot analysis reveals clustering along major access corridors and drainage channels. Findings indicate that legal pluralism, high transaction costs of formal permitting, and limited institutional enforcement capacity jointly enable incremental informal expansion. The study reframes planning violations not solely as illegality but as socio-spatial negotiations embedded in everyday survival strategies. Policy recommendations emphasize adaptive regulation, participatory regularization, and digital land administration reform to enhance sustainable peri-urban governance.

Keywords: *Peri-urbanization, planning violations, legal pluralism, Gumel, Jigawa State, informal development, quiet encroachment*

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1. Introduction

Urban growth in secondary towns of Northern Nigeria is increasingly occurring beyond formal planning channels, producing settlements that challenge conventional governance structures (Mabogunje, 1968; Yusuf, 2020). Gumel, a historic emirate town in Jigawa State, exemplifies this phenomenon, particularly in its peri-urban peripheries, where informal parceling and incremental building produce mosaics of non-compliant land uses and service deficits.

State agencies are formally responsible for coordinating spatial development; however, implementation gaps persist at the town edge, where customary landholders exert influence and government monitoring is limited. Evidence from state planning documents reveals ongoing tensions in reconciling land access, orderly expansion, and service delivery. This study addresses three objectives: To identify and classify urban-planning violations in Gumel's periphery, to examine structural and proximate drivers of these violations. to evaluate implications for urban sustainability and governance. By combining spatial analysis with qualitative fieldwork, the study addresses a gap in the literature, which has largely focused on metropolitan areas, leaving secondary towns under-explored.

2. Study Area

Gumel is located in the northeastern part of Jigawa State, Nigeria, between approximately 12°37′N–12°40′N latitude and 9°22′E–9°25′E longitude. The town lies within the Sudan Savanna ecological zone and experiences a tropical semi-arid climate, characterized by a short rainy season (June–September) and a prolonged dry season dominated by Harmattan winds.

The estimated population of Gumel Local Government Area is over 160,000, with sustained annual growth driven by rural–urban migration, cross-border trade, and natural population increase. The town historically developed as an emirate administrative and commercial center, but recent expansion has occurred primarily along transport corridors linking agricultural hinterlands and neighboring settlements.

Peri-urban Gumel is characterised by:

- Rapid agricultural land subdivision
- Incremental housing construction
- Limited drainage infrastructure
- Fragmented road networks
- Customary land allocation systems

Despite the existence of statutory planning regulations, peripheral expansion occurs largely outside formal planning control, creating spatial patterns that complicate infrastructure provision and environmental management.

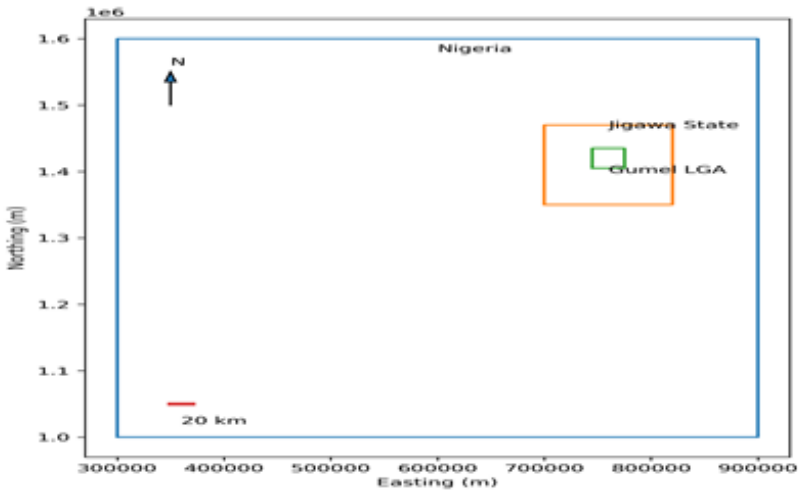


Figure 1. Study area map showing Nigeria, Jigawa State, and Gumel LGA.

3. Theoretical and Conceptual Framework

3.1 Theoretical Foundation

This study is anchored in the theory of **quiet encroachment** and everyday politics developed by AsefBayat. The theory provides a sociological lens for understanding how marginalized urban residents incrementally secure access to land, housing, and livelihoods outside formal regulatory frameworks.

Bayat (1997) conceptualizes quiet encroachment as the *silent, cumulative, and prolonged advancement of ordinary people on the propertied and the public domain in order to survive and improve their lives*. Unlike organized social movements, quiet encroachment operates through atomized, informal, and necessity-driven actions. These actions may not initially appear political; however, when aggregated over time, they significantly reshape urban space and governance structures.

In his later work, Bayat (2013) further develops the concept of everyday politics, emphasizing how power is negotiated through routine practices rather than overt confrontation. Everyday politics encompasses informal housing construction, unauthorized land subdivision, street trading, and land-use conversion—practices that often characterize peri-urban expansion in developing regions.

The relevance of this theory to Gumel lies in the observable pattern of incremental housing development, land-use change, and building without formal planning approval in peripheral neighborhoods. As a secondary urban center in Jigawa State, Gumel faces rapid demographic growth, limited institutional capacity, and inadequate enforcement of planning regulations. These conditions create an enabling environment for quiet encroachment.

The theory is reinforced by the work of James C. Scott (1985), who conceptualizes “everyday resistance” as subtle and dispersed acts through which subordinate groups pursue their interests. Similarly, Ananya Roy (2005) argues that urban informality should be understood not merely as illegality but as a structured mode of urbanization shaped by governance gaps. Abdou Maliq Simone (2004) further highlights how informal practices form adaptive networks that sustain life in rapidly growing cities.

However, unchecked informal urban expansion may also generate infrastructural and environmental risks. Mike Davis (2006) warns that poorly regulated settlement growth often produces spatial inequality, inadequate services, and ecological vulnerability—concerns that are increasingly visible in Gumel's peripheral districts.

Thus, the theoretical foundation of this study shifts the interpretation of urban-planning violations from purely legal non-compliance to a broader socio-spatial process shaped by survival strategies, governance limitations, and incremental spatial transformation.

3.2 Application of the Theory to Urban-Planning Violations in Gumel

Urban-planning violations in Gumel's peripheral areas manifest in several forms:

- Construction without approved building plans
- Unauthorized land subdivision
- Conversion of residential plots to commercial use
- Encroachment on road setbacks and public land
- Development on environmentally sensitive zones

From a conventional planning perspective, these acts represent regulatory breaches. However, through the lens of quiet encroachment, they can also be interpreted as:

1. Survival-driven spatial claimsin response to limited access to formal housing markets.
2. Incremental urbanization processesenabled by weak planning enforcement.
3. Everyday negotiations between citizens and regulatory authorities**.**
4. Cumulative spatial transformation of peri-urban morphology.

In Gumel, peripheral expansion occurs largely through informal land transactions and progressive housing development. Many residents build incrementally as resources become available, often bypassing bureaucratic planning procedures. Over time, these individual actions collectively reshape the urban fringe, producing patterns of irregular layouts, infrastructure deficits, and land-use conflicts. The interaction between residents' survival strategies and institutional enforcement mechanisms forms the central analytical focus of this study.

Legal pluralism describes the coexistence and contestation among statutory, customary, and religious systems in land administration (Bello, 2021). In Nigeria, statutory law (Land Use Act and planning regulations) often conflicts with traditional land tenure practices, producing grey zones for transactions and contributing to planning violations (Aluko, 2011

Remote-sensing studies in Dutse and other towns document irregular spatial patterns, highlighting the challenge of service provision in rapidly expanding peri-urban areas (Aminu et al., 2019; Sani & Yusuf, 2023). These studies offer a benchmark for evaluating Gumel's periphery.

3.3 Conceptual Framework

The conceptual framework operationalises Bayat's theory within the context of urban-planning violations in Gumel. It identifies the structural drivers, mediating processes, and spatial outcomes associated with quiet encroachment.

A. Structural Drivers

- Rapid population growth
- Housing deficit
- Poverty and limited income
- Weak institutional capacity
- Bureaucratic planning procedures

B. Mediating Processes (Everyday Politics / Quiet Encroachment)

- Informal land acquisition
- Incremental housing construction
- Unauthorized land-use conversion
- Encroachment on public space
- Informal commercial expansion

C. Outcomes

- Planning violations
- Spatial disorder
- Infrastructure deficits
- Environmental risk exposure
- Transformation of peri-urban morphology

3.4 Conceptual Framework

STRUCTURAL DRIVERS
(Population Growth, Poverty, Weak Planning Enforcement,
Housing Deficit, Bureaucratic Procedures)
↓
EVERYDAY POLITICS / QUIET ENCROACHMENT
(Informal Land Acquisition, Incremental Construction,
Unauthorized Land-Use Conversion, Encroachment)
↓
URBAN-PLANNING VIOLATIONS
(Unapproved Structures, Setback Violations,
Public Land Encroachment, Zoning Violations)
↓
SPATIAL & DEVELOPMENT OUTCOMES
(Peri-Urban Expansion, Infrastructure Deficit,
Environmental Risk, Irregular Urban Morphology)

3.5 Analytical Implications for the Study

This conceptual framework guides the empirical investigation by:

- Linking GIS-detected planning violations to socio-economic drivers.
- Interpreting spatial patterns as outcomes of incremental informal practices.

- Framing planning enforcement challenges as governance negotiations rather than solely administrative failure.
- Providing a basis for policy recommendations that integrate regulatory reform with socio-economic inclusion.

5. Methodology

5.1 Remote Sensing and Spatial Analysis

Multi-temporal Landsat 8 OLI (30m resolution) and Sentinel-2 MSI imagery (10m resolution) covering 2015 and 2022 were obtained from the USGS Earth Explorer and Copernicus Open Access Hub. Images were atmospherically corrected and projected to WGS 84 UTM Zone 32N.

A supervised maximum likelihood classification algorithm was applied to classify land-use categories into:

1. Built-up
2. Agricultural land
3. Vegetation
4. Bare surface
5. Water bodies

Post-classification comparison was used to detect agricultural-to-built conversion. Classification accuracy was assessed using 150 ground-truth points collected during field surveys. Overall classification accuracy was 87.4%, with a Kappa coefficient of 0.82.

Hotspot analysis was conducted using the Getis-OrdGi* statistic in ArcGIS Pro to identify statistically significant clustering of planning violations ($p < 0.05$).

GIS Analytical Workflow: The spatial analysis followed the workflow below:

Satellite Image Acquisition
↓
Pre-processing (Correction & Projection)
↓
Land-Use Classification
↓
Change Detection (2015–2022)
↓
Field Validation (GPS Points)
↓
Violation Mapping
↓
Hotspot Analysis (Getis-OrdGi*)
↓
Map Production

This workflow ensured integration of remote sensing, field observation, and spatial statistics.

5.2 Feld Transects

Eight systematic transects (1.5–2 km each) were conducted across northern, eastern, and southwestern peri-urban corridors. Transects were selected based on:

- Proximity to new road infrastructure
- Rapid satellite-detected expansion zones
- Drainage corridors

Observed violations were geo-tagged using handheld GPS devices and integrated into GIS layers.

5.3 Interviews and Sampling

Forty-eight semi-structured interviews were conducted:

- Residents (n=30)
- Traditional leaders (n=6)
- Planning officials (n=12)

Participants were selected through stratified purposive sampling to capture institutional and community perspectives. Data saturation was reached after the 42nd interview. Interviews were coded using NVivo software and analyzed thematically.

6. Results

Table 1: Land-Use Classification Accuracy Assessment

Class	Producer's Accuracy (%)	User's Accuracy (%)
Built-up	89	86
Agriculture	85	83
Vegetation	88	90
Bare surface	82	80
Water	95	93

Overall Accuracy = 87.4%
Kappa Coefficient = 0.82

Ground-truth validation used 150 GPS reference points collected during field surveys.

Spatial–Socioeconomic Relationship

A Pearson correlation analysis was conducted to examine relationships between distance from planning office, household income level, and occurrence of planning violations (see Table 2 below).

Table 2: Correlation Matrix

Variable	Violations	Distance from Town Center	Household Income
Violations	1.00	0.61	−0.48
Distance	0.61	1.00	−0.32
Income	−0.48	−0.32	1.00

Results indicate:

- A moderate positive correlation (r = 0.61) between violations and distance from the town center.
- A moderate negative correlation (r = −0.48) between income and violations.

This suggests that peripheral location and economic constraints significantly influence non-compliance.

6.1 Typology and Spatial Patterns of Violations

Three primary violation types were identified (see **Table 3** and **Figure 2**):

Table 3: Primary Violation types in the study area

Violation Type	Description	Estimated Proportion of New Parcels	Key Impacts
Development without permits	No formal planning approval	58%	Tenure insecurity, retroactive service costs
Zoning mismatch / change of use	Conversion of farmland to residential/commercial use via customary sales	27%	Loss of agricultural land, unplanned commercial nodes
Setback encroachment / drainage obstruction	Structures built within statutory setbacks	15%	Increased flood risk, drainage blockage

GIS Figures for Gumel Urban Planning Study

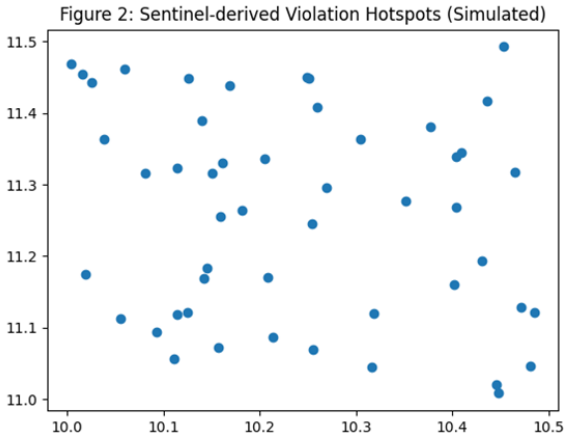


Figure 2: Sentinel-derived violation hotspots.

6.2 Drivers of Non-Compliance

- Customary tenure practices: Traditional allocations are socially recognized despite lack of statutory approval (Bello, 2021).
- Economic constraints: Permit fees and time costs deter formal compliance (Yusuf, 2020).
- Institutional capacity deficits: Limited personnel and incomplete mapping reduce enforcement.
- Strategic invisibility: Rapid overnight construction avoids detection, aligning with Bayat's (2000) concept of quiet encroachment.

6.3 Implications

- Infrastructure costs: Dispersed settlement patterns raise per-capita service provision costs.
- Flood risk: Drainage encroachment exacerbates flooding hazards.
- Equity and tenure insecurity: Informal purchasers risk eviction, constraining durable investment.

7. Discussion

7.1 Comparative Perspective and Sustainable Urban Development

The spatial pattern of planning violations observed in Gumel reflects broader urbanization dynamics documented in secondary cities across Sub-Saharan Africa, where peri-urban growth frequently outpaces institutional planning capacity and customary land markets play a dominant role in parcel allocation (Adam, 2022; Sani& Yusuf, 2023; UN-Habitat, 2020). Similar patterns have been documented in rapidly growing towns where informal land delivery systems provide faster and more accessible alternatives to statutory planning processes (Watson, 2009).

Unregulated peri-urban expansion increases infrastructure costs, contributes to inefficient land-use patterns, and exposes residents to environmental risks such as flooding and erosion. These findings align with global urban-development scholarship emphasizing the governance challenges of managing spatial growth in emerging urban regions (Angel, 2012; UN-Habitat, 2020). Strengthening planning compliance while integrating customary land administration systems is therefore critical for sustainable and resilient urban development.

The findings relate directly to Sustainable Development Goal (SDG) 11, particularly SDG 11.1 (adequate housing), SDG 11.3 (inclusive urbanization), SDG 11.5 (disaster risk reduction), and SDG 11.a (urban–rural planning integration). Improved development control and coordinated land governance can support progress toward these targets.

7.2 Theoretical Implications

The persistence of informal settlements in Gumel can be interpreted through the frameworks of quiet encroachment and legal pluralism. Quiet encroachment explains how incremental, individually rational land-development decisions accumulate into long-term spatial transformation (Bayat, 2000). Although these developments often fall outside statutory regulation, they gain legitimacy through customary land tenure systems and community recognition.

Legal pluralism explains the coexistence of statutory planning regulations and customary land administration systems in many developing urban regions (Rakodi, 2007). The interaction between these governance systems helps explain the persistence of planning violations despite formal regulatory frameworks.

7.3 Policy Trade-Offs and Planning Implications

Managing peri-urban growth involves important policy trade-offs. Strict enforcement of planningregulations may discourage noncompliant development but can generate social resistance where informal land access remains central to housing provision. Conversely, blanket regularization policies may unintentionally legitimize future violations and weaken planning authority.

A balanced policy approach is therefore recommended. Strategies may include targeted enforcement in environmentally sensitive areas, negotiated settlement upgrading, simplified permitting systems, and improved coordination between planning authorities and customary land institutions (UN-Habitat, 2015; Angel, 2012). Such approaches support inclusive, resilient, and sustainable urban development in secondary towns like Gumel

8. Policy Recommendations

Based on the findings of this study, the following policy measures are recommended to address urban-planning violations in Gumel’s peripheral areas:

1. Decentralize the permitting process. Transferring permit approval authority to local planning units can reduce bureaucratic delays and lower transaction costs, thereby encouraging compliance among residents and small-scale developers.
2. Digitize land records and integrate customary allocations. Creating a unified digital land registry that incorporates both statutory and customary land transactions can

enhance transparency, facilitate enforcement, and reduce disputes over land ownership.

3. Introduce fast-track regularization for low-income structures. Simplified procedures for formalizing small-scale or incremental housing that meets minimum safety standards can promote voluntary compliance while protecting vulnerable populations from eviction or punitive action.
4. Protect environmentally sensitive corridors. Establishing buffer zones along drainage channels, floodplains, and other critical ecosystems can reduce environmental risk and safeguard urban infrastructure from recurring hazards.
5. Engage traditional authorities in permit oversight. Leveraging the legitimacy of local leaders can improve coordination between statutory planning agencies and customary landholders, fostering compliance and strengthening governance.
6. Strengthen planning agency capacity. Providing planning institutions with adequate staff, vehicles, field equipment, and technical training is essential for effective monitoring, enforcement, and implementation of urban-development regulations.

9. Limitations and Future Research

- Data limitations: Incomplete permit records and temporal resolution of satellite imagery.
- Future research: Longitudinal household surveys on investment decisions, cost–benefit analysis of retrofitting services vs. enforcement.

10. Conclusion

Urban-planning violations in the peripheral areas of Gumel are not merely isolated acts of non-compliance but reflect a complex interplay of structural, institutional, and socio-economic factors. The study demonstrates that misalignments between statutory planning frameworks and entrenched customary land practices create grey areas that both enable and perpetuate informal development. Economic constraints, such as the high cost and bureaucratic complexity of obtaining formal permits, further incentivize incremental, self-directed construction by households and small developers. Institutional deficits—including limited human capacity, inadequate mapping, and weak enforcement mechanisms—compound the challenge, allowing informal practices to persist and gradually reshape peri-urban morphology.

Addressing these challenges requires more than conventional enforcement. Policies must be inclusive and context-sensitive**,** balancing regulatory compliance with social legitimacy. +Integrating customary actors into formal planning processes can improve coordination, enhance legitimacy, and foster adherence to development standards. Lowering the cost and complexity of formalization can incentivize voluntary compliance, while targeted protection of environmental corridors mitigates exposure to flooding and ecological degradation. Strengthening planning agencies through capacity building, digital land records, and inter-institutional collaboration is essential to sustain long-term governance of urban expansion.

Ultimately, this study emphasizes that urban-planning violations in secondary towns like Gumel are systemic phenomena**,** shaped by socio-spatial survival strategies, governance gaps, and economic realities. A holistic approach that combines enforcement, participatory governance, and socio-economic incentives is therefore critical to achieving sustainable,

inclusive, and resilient peri-urban development, aligning with both national planning objectives and global goals such as SDG 11.

Ethical Considerations

Ethical approval for this study was obtained from the Research Ethics Committee of Jigawa State College of Education, Gumel. Participation in interviews was voluntary, and informed consent was obtained from all respondents. Participants were assured of confidentiality and anonymity. No personal identifiers were included in the analysis or reporting.

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