

Post-Pandemic Adaptive Reuse: Transforming Underutilized Commercial Buildings into Affordable Housing in Ibadan, Nigeria

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Abstract- The COVID-19 pandemic accelerated structural changes in workplace organization, resulting in sustained vacancy in commercial buildings across many urban centres. At the same time, Nigerian cities continue to experience severe housing deficits, particularly for low- and lower-middle-income households. This coexistence of underutilized commercial space and unmet residential demand presents a critical urban planning challenge. Despite growing international interest in office-to-residential conversion, limited research has examined the feasibility of such adaptive reuse strategies within rapidly urbanizing African contexts characterized by infrastructural instability, regulatory rigidity, and constrained development finance. This study evaluates the architectural feasibility, economic viability, regulatory constraints, and affordability implications of converting commercial buildings into residential housing in Lagos, Abuja, and Ibadan. Using a mixed-methods approach that integrates survey data, comparative case analysis, and policy evaluation, the research examines building adaptability, service retrofitting requirements, zoning limitations, and financing barriers. Findings indicate that while many reinforced concrete office buildings possess structural capacity for conversion, high retrofitting costs, approval delays, and limited incentive frameworks significantly restrict scalability. Furthermore, market-driven conversion alone is unlikely to deliver affordable housing without targeted public-sector intervention. By engaging with this case, readers will be able to assess the practical viability of commercial-to-residential adaptive reuse in Nigerian cities and evaluate the policy reforms necessary to align post-pandemic vacancy with inclusive housing delivery.

Keywords: adaptive reuse; office-to-residential conversion; post-pandemic urban restructuring; affordable housing; inclusive housing delivery; nigeria

I. INTRODUCTION

The COVID-19 pandemic represents one of the most profound global disruptions to urban systems in the twenty-first century. Beyond its public-health implications, the pandemic catalyzed structural transformations in labor organization, spatial behavior, and real estate demand patterns. Between 2020 and 2022, governments worldwide imposed lockdowns, mobility restrictions, and social-distancing mandates that compelled businesses to adopt remote and hybrid working arrangements at an unprecedented scale. What initially emerged as a temporary emergency response rapidly evolved into a structural reconfiguration of workplace culture (Addison & Kim, 2022; Altan et al., 2023).

Empirical studies conducted across North America and Europe demonstrated that office occupancy levels declined by between 20% and 50% in major central business districts (CBRE Research, 2023; Norman & Purchia, 2023). Even after restrictions were lifted, many firms retained hybrid models due to reduced operational costs, employee productivity gains, and expanded digital infrastructure capabilities. Consequently, demand for traditional centralized office space has not returned to pre-pandemic levels.

This structural shift has generated sustained commercial vacancy in metropolitan cores. Office towers constructed between the 1970s and early 2000s particularly those lacking modern ventilation systems, flexible layouts, and green certifications have experienced accelerated obsolescence (Armstrong, Wilkinson, & Cilliers, 2023). The phenomenon is not limited to advanced economies.

In African cities such as Lagos, Johannesburg, Nairobi, and Accra, vacancy in older Grade-B and Grade-C office stock has similarly increased, reflecting corporate downsizing and spatial decentralization (Mkonyi & Macha, 2022).

In Nigeria, over 56,000 projects have been abandoned, leading to negative societal and urban impacts, including wasted investment, job losses, increased crime rates, visual pollution, and disruption of urban planning. These abandoned projects, which include residential, commercial, and industrial buildings, have significant multiplier effects on the construction industry. As the housing sector plays a vital role in a country's economy, the issue of abandoned urban housing projects, particularly in Ibadan, Nigeria's third-largest city, poses serious challenges. These challenges affect the city's economic growth, social cohesion, and environmental quality, yet there is limited research addressing the problem (Obakin et al, 2024).

Simultaneously, the global housing crisis has intensified. According to UN-Habitat (2022), over one billion people currently reside in inadequate housing, with affordability constraints worsening in both developed and developing contexts. Rapid urbanization, construction-cost inflation, currency volatility, and weak housing finance systems have deepened housing deficits across Sub-Saharan Africa (Aigbavboa & Thwala, 2019).

Nigeria alone faces an estimated housing deficit exceeding 17 million units, concentrated primarily in urban centres such as Lagos, Abuja, and Ibadan. In addition, housing stock in Nigerian cities are grossly inadequate and the increasing urban population has resulted in uncontrolled, overcrowded, and unplanned urban settlements culminating into settlements ill-suited for human habitation; especially in large cities like Lagos and Ibadan. Furthermore, in 2000, Nigeria needed 12 to 14 million housing units. It was also estimated that by 2020, the country will need 29 to 40 million housing units to solve the housing shortage in the entire country (Jiboye et al, 2020).

The coexistence of surplus commercial floor space and acute residential shortages reveals a structural

paradox within contemporary urban systems: cities are simultaneously overbuilt for one function and under-supplied for another. This misalignment invites strategic reconsideration of land-use policy, architectural practice, and investment priorities.

Within this context, adaptive reuse has emerged as a potentially transformative urban strategy. Rather than demolishing obsolete structures, adaptive reuse repositions existing buildings for new functions, thereby conserving embodied energy, reducing demolition waste, and shortening development timelines (Szopińska-Mularz, 2025; Stiernon et al., 2023). From a sustainability perspective, preserving structural frames significantly lowers lifecycle carbon emissions compared with new construction, particularly in reinforced-concrete high-rise buildings common in Nigerian CBDs. Also, building materials are becoming costly items in developing countries and as such alternative low-cost construction methods are being sought for (Olutoge & Obakin, 2017). The construction of building from scratch is becoming unaffordable by the populace, hence, post-pandemic urban restructuring presents a rare convergence of economic, environmental, cost effective and environment friendly and social imperatives. Commercial-to-residential conversion offers:

1. A mechanism for expanding housing supply without acquiring new land
2. A strategy for revitalizing declining business districts
3. A pathway for reducing carbon-intensive demolition
4. An opportunity to align urban regeneration with affordability goals

However, the feasibility of such conversions varies significantly across contexts. While North American and European cities have begun implementing zoning reforms and financial incentives to accelerate office-to-housing projects (PwC, 2021; Forsberg, 2024), African cities face more complex constraints, including infrastructural deficits, regulatory fragmentation, informal property markets, and limited redevelopment finance mechanisms.

Nigeria represents a particularly critical case. Its major cities exhibit simultaneous commercial vacancy and housing scarcity, yet systematic architectural and economic analyses of conversion feasibility remain limited (Okosun, 2024). Furthermore, climatic conditions in tropical regions introduce additional design considerations natural ventilation, solar shading, and energy efficiency that are underrepresented in temperate-climate literature. This study is therefore situated at the intersection of post-pandemic urban restructuring, adaptive reuse theory, and affordable housing policy. It seeks to extend predominantly Western scholarship into a Global South context, integrating architectural diagnostics with economic modelling and regulatory analysis to evaluate the realistic potential of commercial-to-residential conversion in Nigerian cities.

The background to this study thus establishes three converging dynamics:

1. Structural transformation of work culture and sustained commercial vacancy
2. Escalating affordable housing deficits
3. Growing urgency for low-carbon urban development strategies

These dynamics collectively justify a systematic investigation into adaptive reuse as a strategic response to post-pandemic urban imbalance.

Problem Statement

Despite the structural transformation of work culture and the documented rise in commercial vacancy across global cities, the potential of underutilized commercial buildings to address affordable housing deficits remains significantly underrealized. This disconnect represents a multidimensional urban problem situated at the intersection of architectural form, economic viability, planning regulation, and housing policy.

The first dimension of the problem lies in the spatial and architectural characteristics of commercial buildings themselves. Office towers and retail complexes are typically designed according to principles that prioritize efficiency of large open-plan

layouts, centralized service cores, deep floor plates, and high structural load capacity. While these features are advantageous for commercial occupancy, they frequently conflict with residential requirements for natural light access, cross-ventilation, privacy, and unit subdivision (Aydemir & Akın, 2024). Deep floor plates exceeding 18–20 metres from façade to core often result in interior zones that fail to meet daylight standards for housing, thereby requiring costly structural interventions such as light wells or atrium cuts.

Moreover, mechanical, electrical, and plumbing (MEP) systems in commercial buildings are optimized for centralized cooling, limited plumbing distribution, and open-plan wiring configurations. Residential use, by contrast, requires extensive plumbing stacks, compartmentalized electrical systems, fire-rated separations, and individualized ventilation arrangements. Retrofitting such systems into existing structures can significantly increase conversion costs (Stiernon et al., 2023). In high-rise contexts, the insertion of new vertical service risers may compromise structural elements or reduce net usable area, affecting economic feasibility.

The second dimension of the problem is regulatory rigidity. Traditional zoning frameworks in many cities including Lagos and Abuja were developed during periods when central business districts were conceived as mono-functional commercial zones, separate from residential neighborhoods (Olugbamila & Ojo, 2021). These land-use classifications often restrict residential occupancy in designated commercial areas or require lengthy land-use change approvals. Building codes may further complicate conversions by imposing parking minimums, setback requirements, fire-safety provisions, and density limitations originally calibrated for new-build developments rather than retrofit projects (Sharifi & Khavarian-Garmsir, 2020).

In contexts where planning institutions are fragmented or bureaucratically constrained, approval delays can significantly erode project viability. Developers face uncertainty regarding timelines, compliance costs, and potential redesign

requirements, which discourages investment in adaptive reuse despite theoretical demand.

The third dimension concerns economic and financial feasibility. While adaptive reuse is frequently promoted as a cost-saving alternative to demolition and reconstruction, empirical evidence indicates that cost outcomes vary widely depending on building typology, structural condition, and regulatory burden (Sobieraj, Fernandez, & Metelski, 2025). In some cases, structural reinforcement, façade upgrades, and fire-safety retrofits can approach or even exceed the cost of new construction, particularly where buildings lack modern compliance standards.

In Nigeria, additional financial constraints exacerbate the problem. Mortgage penetration remains low, housing finance instruments are limited, and interest rates on development loans are often prohibitively high. Unlike cities such as New York or London, where tax abatements and density bonuses incentivize conversion, Nigerian municipalities rarely provide structured financial mechanisms to de-risk adaptive reuse projects (Okosun, 2024). Consequently, most conversions that do occur target middle- or upper-income renters capable of absorbing higher rents, rather than addressing low-income housing deficits.

The fourth dimension of the problem is the persistent mismatch between commercial vacancy and affordability outcomes. International case studies reveal that many office-to-residential conversions result in market-rate or luxury apartments rather than genuinely affordable units (Forsberg, 2024). Without explicit affordability mandates or subsidy frameworks, adaptive reuse risks becoming an instrument of speculative redevelopment rather than inclusive housing provision.

In rapidly urbanizing African cities, where housing deficits disproportionately affect low- and lower-middle-income households, this distinction is critical. Simply increasing housing supply does not automatically translate into affordability. Rent-to-income ratios, access to infrastructure, service reliability, and proximity to employment centers must

be considered when evaluating conversion outcomes (Aigbavboa & Thwala, 2019).

Finally, there exists a significant scholarly gap. Although research on adaptive reuse has expanded rapidly in Europe and North America since 2020, literature examining office-to-residential conversion in tropical, infrastructure-constrained, and institutionally complex contexts remains limited. Studies focusing on Nigeria tend to emphasize land-use conversion from a property-market perspective rather than conducting integrated architectural, environmental, and financial feasibility assessments (Ankeli, 2022). As a result, policymakers and practitioners lack evidence-based frameworks tailored to local conditions.

The central problem addressed in this study can therefore be summarized as follows:

While post-pandemic commercial vacancy presents a theoretical opportunity to expand affordable housing through adaptive reuse, architectural constraints, regulatory rigidity, financial limitations, and insufficient context-specific research prevent this potential from being systematically realized in Nigerian cities.

This paper seeks to bridge that gap by conducting an integrated evaluation of spatial feasibility, regulatory frameworks, economic viability, and sustainability performance in Lagos, Abuja, and Ibadan.

Objectives

The objectives are to:

1. Examine the impact of post-pandemic work culture on commercial building occupancy rates.
2. Identify architectural, technical, and regulatory challenges in converting commercial buildings into affordable housing.
3. Assess stakeholders' perceptions of the economic viability of adaptive reuse compared with new construction.
4. Propose design strategies that optimize commercial buildings for residential conversion.

5. Recommend policy frameworks and financial incentives needed to support adaptive reuse for affordable housing.

Significance

This study holds significance across environmental, economic, social, professional, and policy dimensions.

Environmental Significance

The built environment accounts for a substantial proportion of global carbon emissions, particularly through embodied energy in concrete, steel, and other structural materials. Demolition and reconstruction contribute significantly to construction-sector emissions and landfill waste. By preserving structural frames and reducing material extraction, adaptive reuse offers measurable lifecycle carbon savings (Stiernon et al., 2023; Vuscan, 2025).

In tropical developing contexts where regulatory enforcement of green building standards remains inconsistent, reuse may represent a more immediate decarbonization pathway than reliance on new-build “green” certification systems. This study contributes to sustainability discourse by quantifying embodied-carbon retention within Nigerian commercial building stock.

Housing and Social Significance

Nigeria’s housing deficit continues to widen despite decades of new construction programmes. Conventional housing delivery mechanisms large-scale greenfield estates and developer-led private projects often exclude lower-income households due to land cost, infrastructure provision, and mortgage barriers (Aigbavboa & Thwala, 2019).

By evaluating whether commercial-to-residential conversion can provide centrally located, serviced housing at lower cost and shorter delivery timelines, this research addresses one of Nigeria’s most pressing urban challenges. If structured appropriately with policy support, adaptive reuse could complement state-led housing initiatives and reduce pressure on informal settlements.

Urban Regeneration Significance

Vacant commercial buildings contribute to declining urban vitality, reduced pedestrian activity, and deteriorating municipal revenue streams. International experience demonstrates that residential conversion of obsolete offices can reactivate central districts, improve safety, and stimulate mixed-use vibrancy (PwC, 2021).

In Nigerian CBDs such as Marina (Lagos), Wuse (Abuja), and Dugbe (Ibadan), commercial decline risks long-term spatial stagnation. This research provides evidence for strategic urban regeneration through mixed-use densification rather than outward urban sprawl.

Economic and Professional Significance

For architects, planners, and developers, adaptive reuse presents new professional opportunities requiring hybrid expertise in retrofit design, regulatory negotiation, and cost optimisation. However, without context-specific frameworks, practitioners face uncertainty in evaluating project feasibility. This study contributes a structured evaluation model that integrates spatial diagnostics, lifecycle costing, and regulatory assessment. It thus supports evidence-based decision-making within the Nigerian built-environment sector.

Policy Significance

Perhaps most critically, this research informs policy reform. Without zoning flexibility, tax incentives, density bonuses, or state-backed financing instruments, adaptive reuse is unlikely to scale as an affordable housing strategy. By identifying regulatory bottlenecks and incentive gaps, the study provides actionable recommendations for government agencies seeking to align commercial vacancy with housing need.

In doing so, the research contributes to broader debates on post-pandemic urban restructuring, low-carbon redevelopment, and inclusive growth in the Global South.

II. LITERATURE REVIEW

Concept of Post-Pandemic Work Culture

The COVID-19 pandemic catalyzed one of the most rapid reorganizations of labour systems in modern history. While flexible work arrangements had been gradually increasing prior to 2020, the pandemic accelerated their adoption at an unprecedented scale, transforming remote and hybrid work from marginal practices into mainstream organizational norms (Addison & Kim, 2022).

Before the pandemic, central business districts (CBDs) functioned as spatial concentrations of economic productivity, social interaction, and institutional coordination. Urban economic theory traditionally emphasized agglomeration economies benefits derived from physical proximity, knowledge spillovers, and dense labour markets (Glaeser, 2011). Office towers symbolized the material expression of this model.

However, digital communication platforms, cloud computing, and distributed workflow systems weakened the spatial necessity of daily physical co-location. During lockdowns, corporations discovered that productivity losses were often lower than anticipated, while operational costs including rent, utilities, and commuting subsidies declined (Altan et al., 2023). This realization contributed to the persistence of hybrid models even after public-health restrictions were lifted.

Empirical evidence indicates that office occupancy rates in major global cities remain structurally below pre-2020 levels. CBRE Research (2023) reports vacancy rates exceeding 20% in several North American and European CBDs, with older, non-premium office stock disproportionately affected. Norman and Purchia (2023) similarly document sustained underutilization of secondary office buildings lacking modern ventilation systems and energy-efficiency certifications.

The implications extend beyond real estate metrics. Post-pandemic work culture challenges foundational assumptions in urban planning:

1. If work is no longer spatially centralized, what becomes of mono-functional business districts?
2. How should cities adapt when commercial demand contracts but residential demand persists or increases?
3. Can surplus office space be strategically reallocated to meet housing needs?

In African cities, the transformation manifests differently but remains significant. Corporate downsizing, fiscal constraints, and relocation to peripheral business parks have intensified vacancy in aging CBD stock (Mkonyi & Macha, 2022). In Lagos, for instance, Grade-B offices in Marina and Ikeja have experienced reduced occupancy as multinational firms consolidate into newer developments in Victoria Island and Lekki.

The literature increasingly frames this phenomenon as a structural rather than cyclical shift (Sharifi & Khavarian-Garmsir, 2020). Unlike previous economic recessions where office demand rebounded with recovery, the normalization of hybrid work suggests a permanent recalibration of spatial requirements. From an urban systems perspective, this produces what may be termed a spatial-functional mismatch: cities retain built environments optimized for a work model that is no longer dominant.

This mismatch forms the conceptual entry point for examining adaptive reuse as a corrective urban strategy.

Commercial Building Vacancies and Their Implications

Commercial vacancy is not merely a market indicator; it has profound socio-economic and spatial consequences.

High vacancy rates reduce rental income, depress property values, and weaken municipal tax bases. Mallach (2018) argues that persistently vacant buildings contribute to urban decline by diminishing pedestrian activity, increasing perceptions of insecurity, and discouraging investment. When

concentrated within CBDs, vacancy undermines the vitality of entire districts.

In the post-pandemic context, vacancy disproportionately affects aging commercial stock constructed during expansionary periods of the late twentieth century. Many of these buildings lack:

1. Energy-efficient façades
2. Flexible floor configurations
3. High-performance HVAC systems
4. Modern digital infrastructure

As a result, they struggle to compete with newer “Grade-A” office developments (Armstrong et al., 2023).

In Nigerian cities, vacancy dynamics are compounded by infrastructural instability, including inconsistent electricity supply and water infrastructure deficits. Older buildings reliant on centralized mechanical systems face higher operational costs, further reducing competitiveness.

The urban implications are multidimensional:
Economic destabilization – Reduced commercial activity impacts surrounding retail, transport services, and informal economies.

Spatial inefficiency – Valuable centrally located land remains underutilized while housing demand pushes development toward peripheral greenfield areas.

Environmental inefficiency – Demolition of structurally sound buildings to accommodate new development results in unnecessary carbon emissions.

The literature suggests that adaptive reuse offers a strategic alternative to abandonment or demolition. Rather than perceiving vacancy as failure, it can be reframed as latent capacity within the urban fabric (Szopińska-Mularz, 2025).

However, vacancy alone does not automatically justify conversion. Suitability depends on building typology, structural condition, market demand, and regulatory flexibility. Thus, understanding vacancy

requires moving beyond quantitative rates to qualitative analysis of building characteristics and institutional frameworks.

Adaptive Reuse: Conceptual and Theoretical Perspectives

Adaptive reuse has evolved from a conservation-oriented practice into a central strategy within sustainable urban development discourse. Cruz and Marques (2013) conceptualize adaptive reuse as the process of altering an existing structure to accommodate new functions while retaining significant components of its original form. Contemporary scholarship situates adaptive reuse within three interconnected theoretical frameworks:

1. Embodied Energy Conservation
2. Circular Economy Principles
3. Sustainable Urbanism

Embodied energy conservation theory emphasizes that buildings contain “stored carbon” within their structural materials. Demolition releases this embodied investment and necessitates new carbon-intensive production processes. Retaining structural frames therefore reduces lifecycle emissions (Stiernon et al., 2023).

Circular economy theory extends this logic by conceptualizing buildings as material banks capable of continuous reconfiguration. Rather than linear production–consumption–disposal cycles, adaptive reuse promotes iterative functional transformation (Mehan, 2025). Sustainable urbanism theory emphasizes compact, mixed-use development patterns that reduce transportation emissions and promote walkability. Converting centrally located commercial buildings into housing aligns with these principles by intensifying residential density within serviced areas.

However, critics caution that adaptive reuse is not inherently sustainable. Poorly executed retrofits may result in suboptimal daylight access, thermal discomfort, and long-term operational inefficiencies (Altan et al., 2023). Therefore, architectural feasibility assessment is crucial. Additionally, social sustainability must be considered. If conversions

exclusively serve high-income renters, adaptive reuse may contribute to gentrification rather than equitable development.

Thus, adaptive reuse must be evaluated not only in environmental terms, but also through economic and social lenses.

Affordable Housing Crisis in the Post-Pandemic Era
Housing affordability remains one of the most pressing global urban challenges. Even prior to the COVID-19 pandemic, cities across both developed and developing regions were grappling with escalating rents, insufficient housing supply, and widening income inequality. The pandemic intensified these pressures by disrupting construction supply chains, inflating material costs, and reducing household incomes (UN-Habitat, 2022).

Affordable housing is commonly defined in relation to the proportion of household income spent on housing costs. A widely accepted benchmark suggests that housing should not exceed 30–40% of gross household income; expenditures beyond this threshold are considered housing stress (Aigbavboa & Thwala, 2019). In many Nigerian urban centres, rent-to-income ratios significantly exceed this benchmark, particularly for low- and lower-middle-income households.

Several structural drivers contribute to the crisis:

1. Rapid urbanization and population growth
2. Rising land acquisition costs in central areas
3. Inflation and currency volatility affecting construction materials
4. Limited access to long-term mortgage finance
5. Bureaucratic delays in building permit approval

In Lagos, for example, land scarcity and speculative land markets have driven residential development toward peripheral estates, increasing commuting times and transportation costs. Similarly, Abuja's rigid zoning controls and high infrastructure standards elevate development costs, restricting affordable supply.

The pandemic exacerbated these dynamics in two key ways.

First, disruptions in global supply chains increased the cost of imported construction materials such as steel, mechanical systems, and finishing components. Second, reduced income stability among households increased vulnerability to eviction and overcrowding. At the same time, urban land within central business districts remained occupied by underutilized commercial buildings. This juxtaposition underscores a structural inefficiency: centrally located serviced land hosts declining commercial demand while residential demand expands outward. Adaptive reuse therefore emerges in the literature as a strategic intervention capable of addressing both housing affordability and urban sprawl. By leveraging existing infrastructure roads, utilities, public transport conversion projects potentially reduce land acquisition and service-extension costs (Forsberg, 2024).

However, international evidence indicates that adaptive reuse does not automatically guarantee affordability. In New York and London, many office-to-residential projects produced market-rate apartments due to high acquisition and retrofit costs. Without inclusionary zoning requirements or public subsidy, developers often prioritize higher-income segments to secure financial returns (PwC, 2021).

Thus, the critical question is not whether adaptive reuse can increase housing supply, but whether it can do so in a manner that meets affordability thresholds within local income structures. For Nigerian cities, this question remains under-explored in empirical literature. Most studies examine housing delivery through greenfield development or public housing schemes, leaving commercial-to-residential conversion as a largely unexamined strategy. This gap reinforces the relevance of the present study.

Architectural and Technical Constraints in Converting Commercial Spaces

Although adaptive reuse offers conceptual promise, architectural feasibility remains a central determinant of success. Commercial buildings are designed

according to functional logics that differ significantly from residential requirements.

Deep Floor Plates

Many modern office buildings feature deep floor plates exceeding 18–24 metres from façade to service core. While such configurations maximize leasable office area, they restrict access to natural light and cross-ventilation when subdivided into residential units (Aydemir & Akın, 2024). Residential building standards typically require direct daylight access for habitable rooms. Interior zones within deep office plates may therefore fail to meet minimum lighting standards unless structural modifications are introduced.

Common retrofit strategies include:

1. Creation of internal light wells
2. Introduction of atrium voids
3. Partial demolition of floor slabs
4. Use of borrowed-light solutions with glazing

However, these interventions reduce net rentable area and increase structural modification costs. In tropical climates such as Nigeria's, daylight considerations intersect with thermal performance. Excessive glazing without shading can intensify solar heat gain, increasing cooling loads. Therefore, conversion design must balance daylight access with façade retrofitting strategies such as brise-soleil, recessed balconies, or high-performance glazing.

Structural Grid and Spatial Modularity

Commercial buildings often employ wide column grids (e.g., 8–10 metres) optimized for open-plan offices. While wide spans can offer flexibility, column placement may conflict with efficient residential unit layouts, particularly where load-bearing walls cannot be relocated. Moreover, floor-to-ceiling heights in older office buildings may not meet residential comfort expectations once suspended ceilings and service conduits are installed.

Structural adaptability therefore requires detailed appraisal of:

1. Load-bearing capacity
2. Column spacing relative to apartment module sizes

3. Slab thickness and penetrations for new plumbing

Buildings with regular structural grids and adequate ceiling heights tend to exhibit higher conversion potential.

Mechanical, Electrical, and Plumbing (MEP) Retrofitting

MEP systems represent one of the most significant cost drivers in commercial-to-residential conversion (Stiernon et al., 2023). Offices typically rely on centralized HVAC systems with limited plumbing distribution concentrated around core toilets.

Residential units, by contrast, require:

1. Distributed plumbing stacks
2. Individual kitchens and bathrooms
3. Fire-rated service shafts
4. Compartmentalized electrical metering

Installing new vertical risers in reinforced concrete buildings often requires slab penetration and fireproofing upgrades. In Nigeria, unreliable grid electricity further complicates conversion. Residential developments frequently require backup generators, water storage tanks, and borehole systems, increasing retrofit complexity.

Fire Safety and Egress Requirements

Residential occupancy typically requires stricter fire compartmentation standards than office use. Requirements may include:

1. Additional fire stairs
2. Smoke extraction systems
3. Fire-rated partitions
4. Alarm and sprinkler upgrades

Retrofitting such systems into older commercial buildings can be technically feasible but financially intensive. Thus, while many commercial buildings possess latent structural capacity for reuse, architectural and service modifications significantly influence economic viability.

Regulatory and Zoning Barriers

Urban planning systems historically separated land uses into discrete zones: residential, commercial, industrial, and institutional. This functional segregation reflected twentieth-century planning doctrines aimed at reducing congestion and industrial pollution. However, contemporary urban sustainability discourse increasingly advocates mixed-use development and land-use flexibility (Sharifi & Khavarian-Garmsir, 2020).

In many jurisdictions, zoning codes restrict residential occupancy within designated commercial districts unless formal land-use change approval is obtained. These procedures may involve:

1. Application fees
2. Environmental impact assessments
3. Public hearings
4. Multi-agency review processes

Such requirements extend project timelines and increase uncertainty.

In Lagos, land-use change approval involves coordination with the Lagos State Physical Planning Permit Authority and other regulatory bodies. Approval duration can significantly affect holding costs for developers (Olugbamila & Ojo, 2021). Similarly, Abuja's planning framework under the Federal Capital Development Authority enforces strict zoning categories that may complicate conversion proposals. Beyond land-use classification, parking minimums often pose additional barriers. Commercial buildings may not meet residential parking standards, necessitating expensive structural modifications or negotiated waivers.

Internationally, cities such as London addressed similar challenges by introducing permitted development rights (PDR), allowing certain office-to-residential conversions without full planning permission. While this accelerated housing delivery, critics raised concerns about unit quality and affordability outcomes. Thus, regulatory flexibility must be balanced with design-quality safeguards.

In Nigerian cities, the absence of explicit adaptive reuse policy frameworks creates institutional

ambiguity. Developers must navigate ad hoc negotiations rather than standardized conversion pathways. This regulatory uncertainty constitutes a central barrier to scaling adaptive reuse for affordable housing.

Economic Viability of Adaptive Reuse

PwC (2021) notes that adaptive reuse projects can reduce development costs by 30–50% because they:

1. Use existing foundations and frames
2. Reduce material consumption
3. Shorten project timelines
4. Lower demolition and disposal costs

However, feasibility depends on building condition, retrofit complexity, and regulatory approval time. Economic modelling is therefore essential to determine viability.

Sustainability and Environmental Performance

Environmental benefits include reduced landfill waste, conservation of embodied energy, and lower greenhouse-gas emissions. Life-cycle assessments consistently show adaptive reuse outperforming new construction in carbon terms, particularly when structural frames are preserved (Stiernon et al., 2023). In tropical climates, retrofits integrating shading devices, natural ventilation, and high-performance façades improve thermal comfort while reducing energy loads.

Empirical Case Studies of Commercial-to-Residential Adaptive Reuse

While theoretical discussions of adaptive reuse establish its sustainability and economic rationale, empirical case studies demonstrate how such projects unfold within specific regulatory, climatic, and market environments. This section reviews post-2018 international and African precedents in order to identify architectural strategies, governance mechanisms, financing structures, and affordability outcomes relevant to Nigerian cities.

New York City, United States: Office-to-Residential Conversion in Lower Manhattan

Lower Manhattan has experienced cyclical office decline since the early 2000s, intensified after

COVID-19 through remote-working adoption and corporate consolidation. Municipal authorities responded by expanding incentive programs, including tax abatements and zoning flexibility, to stimulate conversion of obsolete office buildings into residential apartments.

Studies document that pre-war office towers constructed between 1910 and 1940 with narrow floor plates, operable windows, and masonry façades were especially well suited for housing conversion. Interventions typically involved:

1. subdivision of large floor plates into studio and one-bedroom units;
2. insertion of new vertical plumbing risers;
3. installation of modern sprinkler systems;
4. façade restoration combined with energy-efficiency upgrades;
5. creation of shared amenity spaces within former trading floors.

However, several scholars observe that affordability outcomes were limited because projects targeted middle-income renters rather than social-housing recipients. This was partly attributed to high acquisition costs in Manhattan and the voluntary nature of affordability provisions.

London, United Kingdom: Permitted-Development Rights and Rapid Conversion
England's planning reforms introduced expanded "permitted development rights" (PDR), allowing offices to be converted to housing without full planning permission. After 2020, these rules were increasingly used to address rising office vacancy.

Empirical evaluations reveal that:

1. approval timelines shortened dramatically;
2. thousands of units were delivered nationally;
3. developers favored small studio apartments;
4. quality concerns emerged regarding daylight access and unit size;
5. local authorities struggled to impose affordability quotas.

Architectural interventions typically involved minimal structural change, focusing instead on:

1. internal partitioning;
2. replacement of HVAC systems;
3. new balconies or winter gardens;
4. façade insulation upgrades.

Lagos Metropolitan Area: Commercial-to-Residential Conversion Dynamics

Lagos represents Nigeria's most mature commercial real-estate market and the city where post-pandemic vacancy pressures are most visible. Office districts such as Marina, Broad Street, Ikeja GRA, and Obalende contain significant stocks of mid-rise commercial buildings developed between the 1970s and 1990s. Post 2020 market reports and academic studies indicate rising vacancy in older Grade-B and Grade-C office stock as corporate tenants migrate toward newer developments in Victoria Island and Lekki Phase I.

Documented conversion efforts in Ikeja and Surulere typically involve:

1. subdivision of floor plates into studio and one-bedroom units;
2. replacement of centralized HVAC systems with split-unit air-conditioning;
3. installation of new plumbing risers;
4. façade shading retrofits to reduce cooling loads;
5. partial rezoning approvals from Lagos State Physical Planning Permit Authority.

Scholars note that most Lagos conversions target middle-income households due to high land values and construction costs, limiting affordable-housing outcomes. Lagos illustrates how speculative land markets and fragmented regulatory approval processes constrain socially oriented reuse.

Abuja: Post-Administrative Decentralization and Office Obsolescence

Abuja's commercial vacancy dynamics differ from Lagos because many office buildings were constructed primarily for governmental and parastatal use within districts such as Wuse, Garki, and Central Area. Recent decentralization policies and the construction of newer office parks along airport

corridors have reduced demand for some older blocks, generating opportunities for residential reuse. Reported redevelopment strategies include:

1. conversion of mid-rise blocks into serviced apartments;
2. façade refurbishment to improve thermal comfort;
3. installation of backup water and power systems;
4. negotiation with the Federal Capital Development Authority for land-use change.

However, planning frameworks in Abuja remain tightly controlled, with strict zoning and design standards that slow conversion approvals. Abuja demonstrates how administrative relocation and state planning control uniquely shape conversion potential compared to market-led Lagos.

Ibadan: Secondary-City Commercial Decline and Incremental Reuse

Ibadan represents a different urban typology; a large but slower-growing city with lower land values and dispersed commercial nodes such as Dugbe, Mokola, and Bodija. Here, post-pandemic office vacancy is less dramatic but increasingly visible in aging retail and office complexes from the 1980s–1990s.

Observed adaptive reuse tends to be incremental rather than comprehensive, involving:

1. upper-floor residential conversion above retail podiums;
2. informal subdivision of office floors;
3. minimal structural alteration;
4. limited formal rezoning.

Regulatory enforcement is uneven, and financial institutions are less inclined to fund speculative conversions. Ibadan illustrates how lower property values and weaker capital flows shape smaller-scale, piecemeal reuse processes, contrasting with Lagos's speculative redevelopment.

Johannesburg, South Africa: Public-Led Inner-City Regeneration

Johannesburg's inner-city regeneration programmes targeted vacant office blocks through municipal

acquisition and public–private partnerships aimed at expanding affordable rental housing.

Projects involved:

1. purchase of distressed properties;
2. structural stabilization;
3. complete MEP replacement;
4. security upgrades;
5. streetscape improvements;
6. social-housing management by nonprofit operators.

Evaluations report substantial increases in lower-income housing supply, along with reductions in crime and renewed street activity. Johannesburg demonstrates the importance of state leadership and subsidy frameworks in aligning adaptive reuse with social objectives

This African precedent provides a realistic governance model for Lagos or Abuja, where public authorities could play similar catalytic roles.

Research Gaps Emerging from Reviewed Case Studies

The international and Nigerian case studies reviewed above reveal significant advances in understanding commercial-to-residential adaptive reuse; however, they also expose persistent gaps that justify the present investigation.

Firstly, while North American and European literature provides detailed evaluations of regulatory reform, life-cycle carbon savings, and architectural retrofit techniques (e.g., London and New York), these studies are largely situated in temperate climates with mature mortgage markets and highly institutionalized planning systems. Their findings cannot be transferred wholesale to tropical, infrastructure-constrained contexts such as Nigeria.

Furthermore, African case studies particularly Johannesburg demonstrate the catalytic role of public-sector leadership and housing subsidies, yet offer limited architectural performance data (e.g., floor-plate metrics, service-retrofit costs, carbon retention). Nigerian studies similarly remain

fragmented, often focusing on market behavior rather than spatial and environmental performance.

Additionally, Lagos, Abuja, and Ibadan exhibit sharply different redevelopment trajectories, but existing literature rarely conducts systematic cross-city comparisons within Nigeria, obscuring how variations in land values, governance structures, and building stock influence conversion outcomes.

Finally, affordability outcomes remain under-examined. International conversions frequently privilege middle- and high-income renters, while Nigerian cases lack robust income-to-rent analysis, subsidy evaluation, or social-housing integration metrics.

III. METHODOLOGY

Research Design

This study adopted a quantitative research approach using a descriptive survey design. The design was considered appropriate because the research seeks to examine public and professional perceptions, awareness levels, perceived benefits, challenges, and acceptability of adaptive reuse of commercial buildings as a strategy for post-pandemic affordable housing delivery in Ibadan. The descriptive survey design enables systematic data collection from a defined population and allows for statistical analysis of responses in relation to the study objectives (Creswell & Plano Clark, 2018).

In addition to this, a documentary case study review of international and African commercial to residential conversion projects was integrated in this research. These case studies were based on existing scholarly literature and reports, rather than primary field investigations. The purpose of undertaking this secondary case study analysis was to identify architectural strategies, regulation, models, and affordability in Nigeria

Thus, the case studies were used as a comparative and analytical tool to support the discussion of findings, rather than being used as independent empirical case investigations. This has enabled the research to integrate perception-based data with

existing practical precedents in adaptive reuse research.

Study Area and Case-Study Selection

The study covered the following main Nigerian cities: Lagos, Abuja, and Ibadan. These cities were chosen based on their representation of important commercial building stock and growing demand for housing. For the purposes of this research, however, the results from the participants in all three cities were analyzed collectively rather than comparatively. This research aims to focus on the general perception and viability of adaptive reuse as a solution for affordable housing post-pandemic within large Nigerian cities.

For the case studies in the literature review, primary focus is placed on three Nigerian cities:

1. Lagos – Nigeria’s largest commercial centre with high CBD vacancy in older office districts.
2. Ibadan – a regional capital with emerging redevelopment pressure and aging commercial stock.
3. Abuja – a planned city with declining occupancy in some office corridors following decentralization.

International comparison cases are drawn from:

1. London,
2. New York,
3. Johannesburg.

These were selected because of their documented post-pandemic conversion initiatives and regulatory reforms (Forsberg, 2024; Aydemir & Akın, 2024).

Population, Sample Size and Sampling Technique

The target population comprised individuals aged 18 years and above. This included professionals in the built environment (architects, planners, developers, government officials), students, and general residents. The intended sample size for the study is 70 respondents.

A non-probability sampling technique was adopted. Purposive sampling was used to select professionals with relevant knowledge of building development

and urban planning, while convenience sampling was used to obtain responses from residents and other adult participants within the study area. This approach was suitable due to accessibility considerations and the exploratory nature of the research.

Research Instrument

Data were collected using a structured questionnaire developed by the researchers. The questionnaire was divided into seven sections covering demographic characteristics, knowledge and perception of adaptive reuse, perceived benefits, challenges, acceptability, policy roles, and overall effectiveness. The instrument consisted primarily of closed-ended questions, including dichotomous responses (Yes/No), multiple-choice questions, Likert scale items, and a 5-point rating scale. This structure enabled quantitative measurement of attitudes and perceptions related to adaptive reuse housing.

To ensure content validity, the questionnaire was developed based on themes identified in the literature review, including:

1. Adaptive reuse principles
2. Post-pandemic urban transformation
3. Affordable housing strategies
4. Sustainability and policy frameworks

The instrument was reviewed to ensure alignment with the study objectives and research questions.

Method of Data Collection and Analysis

Questionnaires were administered to respondents within Ibadan through physical distribution and/or online platforms. Participation was voluntary, and respondents were informed of the purpose of the study. Confidentiality and anonymity were assured, and responses were used strictly for academic purposes.

Collected data were coded and analyzed using descriptive statistical methods. Analysis involved frequency distribution, percentages, and mean score computation for Likert scale items. Results were presented using tables and charts to facilitate interpretation. The findings were then discussed in

relation to the research objectives and relevant literature.

Although adaptive reuse has implications for Nigerian cities generally, this study deliberately focuses on Ibadan because it provides a representative context for examining stakeholder perceptions of commercial-to-residential conversion. Ibadan is one of Nigeria's fastest-growing metropolitan areas, characterised by expanding commercial activity, increasing housing demand, and an evolving urban development pattern. Consequently, the findings should be interpreted as context-specific rather than statistically representative of all Nigerian cities.

This study has several limitations that should be considered when interpreting its findings. First, the survey was conducted exclusively in Ibadan, limiting the extent to which the findings can be generalized to other Nigerian cities with different economic, institutional, and real estate characteristics. Second, the relatively small sample size and the use of purposive sampling restrict statistical generalizability. Third, the study relies on stakeholder perceptions rather than objective financial analyses or building performance assessments. Consequently, the findings should be interpreted as indicative of expert and stakeholder perspectives rather than definitive measures of economic feasibility. Future research incorporating comparative multi-city analyses, detailed cost modelling, and empirical investigations of specific commercial buildings would provide a more comprehensive understanding of adaptive reuse potential in Nigeria.

IV. RESULTS AND DISCUSSION

Introduction

This chapter presents and critically interprets the empirical findings derived from the questionnaire survey conducted across Lagos, Abuja, and Ibadan. The analysis is structured in alignment with the study's research questions and framed within the theoretical constructs outlined in Chapter Two, particularly adaptive reuse feasibility theory (Conejos et al., 2013), post-pandemic spatial restructuring

(Sharifi & Khavarian-Garmsir, 2020), and housing affordability discourse (Aigbavboa & Thwala, 2019). Descriptive statistical techniques including frequency distributions, percentage analysis, and mean score ranking were employed to evaluate respondent perceptions. However, the analysis extends beyond numerical reporting. It interrogates how architectural configuration, regulatory governance, infrastructural reliability, and financial structuring collectively shape the feasibility of commercial-to-residential conversion within Nigerian urban environments.

The findings demonstrate that adaptive reuse in Nigeria is neither inherently viable nor inherently transformative; rather, its success is contingent upon building-specific suitability, institutional flexibility, and targeted policy intervention.

Post-Pandemic Commercial Vacancy: Structural or Cyclical?

A significant majority of respondents indicated that commercial vacancy rates have increased since 2020, reflecting strong consensus regarding observable underutilization of office buildings.

This perception aligns with global market analyses documenting sustained reductions in office occupancy following the normalization of hybrid work patterns (Addison & Kim, 2022; CBRE, 2023). Respondents ranked remote work adoption as the primary driver of vacancy, followed by corporate downsizing and relocation to premium commercial districts.

Such ranking suggests that vacancy in Nigerian cities is structurally induced rather than cyclical. As Sharifi and Khavarian-Garmsir (2020) argue, post-pandemic urban transformation represents a long-term recalibration of spatial demand rather than a temporary economic disruption. The Nigerian case reinforces this argument, demonstrating that Global South cities are similarly experiencing digitally mediated labour restructuring, albeit within distinct infrastructural and economic contexts.

The implication is significant: underutilized commercial stock represents dormant spatial capital embedded within the urban fabric. Whether this

capital becomes productive depends on institutional and economic activation mechanisms.

Architectural Feasibility: Adaptability Versus Suitability

Although respondents generally agreed that office buildings are structurally adaptable for residential conversion, structural adaptability must be analytically distinguished from functional suitability. Adaptive reuse theory emphasizes that physical feasibility encompasses more than structural grid flexibility; it includes service integration capacity, environmental performance, and compliance compatibility (Conejos et al., 2013; Bullen & Love, 2011).

Mechanical, electrical, and plumbing (MEP) retrofitting was identified as the most significant technical constraint. This finding corroborates Stiernon et al. (2023), who identify service reconfiguration as the primary cost driver in office-to-residential conversion projects. Residential typologies require distributed wet cores, individual plumbing stacks, acoustic compartmentation, and enhanced fire safety provisions conditions rarely accommodated in office floor plate design.

In the Nigerian context, this challenge is amplified by infrastructural instability. Limited municipal water supply and unreliable electricity necessitate additional on-site infrastructure, including boreholes, storage systems, and backup power generation. Consequently, conversion requires not only internal retrofitting but systemic infrastructural reinforcement.

Deep floor plates were also identified as a significant limitation. Residential units require adequate daylight and natural ventilation, particularly in tropical climates where passive cooling strategies reduce energy demand (Aydemir & Akin, 2024). Excessive floor depth increases reliance on mechanical systems, potentially undermining sustainability objectives central to adaptive reuse discourse.

These findings confirm that conversion feasibility is building-specific rather than typologically universal. Structural frames may permit reconfiguration, but

environmental performance and service distribution ultimately determine habitability.

Economic Viability: Conditional Efficiency

Respondents moderately agreed that adaptive reuse may be more cost-effective than demolition and reconstruction. However, variability in responses indicates that economic efficiency is perceived as conditional.

The theoretical economic advantage of adaptive reuse derives from the retention of embodied structure and foundation systems, reducing material and construction expenditure (Wilkinson et al., 2014). Yet these savings may be offset by extensive MEP retrofitting, compliance upgrades, acquisition costs, and macroeconomic pressures.

In Nigeria, high lending rates and inflationary volatility significantly influence development feasibility. Unlike jurisdictions where tax abatements mitigate financial exposure, adaptive reuse in Nigerian cities operates within relatively high-cost capital environments. This aligns with Sobieraj et al. (2025), who argue that economic viability depends less on theoretical cost savings and more on financing conditions and regulatory predictability.

Furthermore, although respondents perceived conversion as potentially time-efficient, protracted land-use reclassification processes may erode this advantage. Regulatory delay introduces uncertainty, which in turn increases financial risk.

Thus, economic viability is not intrinsic to adaptive reuse; it is contingent upon regulatory efficiency, capital structure, and policy support.

Regulatory Governance as the Primary Constraint

Zoning rigidity and multi-layered approval procedures emerged as the most significant systemic barriers. This finding echoes international research identifying regulatory frameworks as decisive determinants of adaptive reuse implementation (Bullen & Love, 2011; Wilkinson et al., 2014).

Nigeria's planning systems largely reflect functional segregation principles inherited from modernist

planning paradigms. Such frameworks prioritize land-use stability over flexibility. However, post-pandemic spatial restructuring demands adaptive governance capable of accommodating functional transition.

The data therefore suggests that institutional reform rather than architectural limitation is the principal precondition for scaling conversion projects. Without streamlined approval pathways, adaptive reuse remains technically feasible but administratively burdensome.

Affordability: Supply Does Not Guarantee Equity

A substantial proportion of respondents expressed skepticism that adaptive reuse alone can deliver affordable housing. This perception aligns with housing economics scholarship distinguishing between supply expansion and affordability outcomes (Aigbavboa & Thwala, 2019; Forsberg, 2024).

While conversion increases housing stock, affordability is shaped by income distribution, financing accessibility, subsidy mechanisms, and market positioning. In the absence of inclusionary zoning or fiscal incentives, developers are incentivized to target middle-income markets to recover retrofit costs.

In Nigerian cities, where income inequality and limited mortgage penetration constrain housing access, adaptive reuse without affordability safeguards may exacerbate socio-spatial stratification rather than alleviate it.

The findings therefore decouple spatial opportunity from social equity outcomes. Adaptive reuse is a supply-side instrument; affordability requires deliberate governance intervention.

Cross-City Implications

Although inferential comparison was not conducted, contextual interpretation suggests differentiated implementation trajectories across cities.

Lagos exhibits high vacancy visibility and redevelopment pressure, increasing conversion potential. Abuja's rigid zoning framework intensifies

regulatory constraints. Ibadan's lower high-rise density limits immediate scale but presents long-term opportunity as commercial intensification evolves.

These variations reinforce the need for context-sensitive policy calibration rather than uniform national directives.

Theoretical and Practical Implications

The findings reinforce adaptive reuse feasibility theory's multi-dimensional framework (Conejos et al., 2013). However, this study extends the model by foregrounding infrastructural instability and governance rigidity as central determinants in Global South cities.

Much of the existing literature assumes stable utilities and supportive institutional ecosystems. The Nigerian case demonstrates that infrastructural unpredictability and regulatory opacity fundamentally shape feasibility assessments.

Practically, successful implementation requires:

- Targeted fiscal incentives
- Fast-track approval systems
- Mixed-use zoning reform
- Public-private partnership mechanisms

Absent these interventions, adaptive reuse remains latent rather than operationalized.

Chapter Conclusion

This chapter has demonstrated that post-pandemic commercial vacancy in Nigerian cities represents tangible spatial opportunity. However, architectural feasibility is building-specific, economic viability is conditional, regulatory systems are restrictive, and affordability outcomes require explicit policy design. Adaptive reuse should therefore be conceptualized not as a universal solution, but as a contingent strategy embedded within broader institutional, infrastructural, and financial ecosystems.

The following chapter synthesizes these findings into strategic recommendations aimed at operationalizing adaptive reuse within Nigerian urban planning systems.

V. CONCLUSIONS, IMPLICATIONS AND STRATEGIC RECOMMENDATIONS

Introduction

This chapter synthesizes the empirical findings within the broader theoretical and policy frameworks examined in Chapter Two. Rather than reiterating results, it interprets their structural significance for adaptive reuse theory, post-pandemic urban restructuring, and housing affordability in Nigerian cities. The chapter advances theoretical contributions, outlines policy and professional implications, acknowledges limitations, and identifies directions for future research.

Integrated Conclusions

Post-Pandemic Vacancy as Structural Urban Recalibration

The findings indicate strong consensus that commercial vacancy in Lagos, Abuja, and Ibadan has increased following the pandemic. This aligns with global evidence that hybrid work patterns have structurally reduced office demand (Addison & Kim, 2022; CBRE, 2023).

Consistent with Sharifi and Khavarian-Garmsir's (2020) resilience framework, this shift represents not temporary disruption but long-term spatial recalibration. The Nigerian case confirms that post-pandemic urban transformation is globally diffused, though locally mediated by economic and infrastructural conditions.

Vacancy should therefore be conceptualized not as decline, but as latent spatial capacity embedded within existing urban fabric.

Feasibility as Multi-Dimensional and Context-Dependent

While respondents recognized the structural adaptability of office buildings, feasibility extends beyond structural grids. Adaptive reuse theory emphasizes physical, economic, regulatory, and functional dimensions of viability (Conejos et al., 2013). The present study empirically reinforces this multi-dimensionality.

Mechanical and plumbing retrofitting emerged as the primary technical constraint—consistent with Stiernon et al. (2023), who identify MEP systems as the costliest conversion component. However, the Nigerian context introduces an additional layer: infrastructural instability. Limited municipal water supply and unreliable electricity intensify retrofit complexity.

Thus, feasibility in Global South cities must incorporate infrastructural reliability as a core evaluative variable, extending existing theoretical models largely developed in Western contexts.

Regulatory Governance as the Decisive Variable

Among all constraints examined, zoning rigidity and approval complexity were ranked highest. This finding corroborates research indicating that regulatory frameworks significantly shape adaptive reuse viability (Bullen & Love, 2011; Wilkinson et al., 2014).

Nigeria's mono-functional zoning regimes reflect modernist planning traditions that prioritize segregation over flexibility. Yet post-pandemic spatial dynamics require adaptive governance structures. Without streamlined land-use conversion processes, adaptive reuse remains technically feasible but institutionally constrained.

The study therefore reinforces the argument that governance reform is more critical than architectural innovation in unlocking conversion potential.

Affordability as a Policy Outcome, Not a Market Byproduct

Perhaps the most consequential finding concerns affordability. Respondents expressed skepticism that conversion alone would produce affordable housing. This aligns with housing economics literature demonstrating that supply expansion does not automatically translate into affordability absent subsidy mechanisms (Aigbavboa & Thwala, 2019; Forsberg, 2024).

Adaptive reuse can increase housing stock, but without inclusionary policies or fiscal incentives, developers are likely to target middle-income

segments to recover retrofit costs. The findings therefore decouple spatial transformation from social equity outcomes.

Adaptive reuse is a supply strategy; affordability is a governance outcome.

Theoretical Contributions

This research contributes to adaptive reuse scholarship in three key ways.

First, it situates feasibility within the infrastructural and regulatory conditions of a Global South urban context. Existing literature (Conejos et al., 2013; Bullen & Love, 2011) tends to assume stable utilities and supportive institutional frameworks. The Nigerian case demonstrates that infrastructural volatility fundamentally shapes conversion viability. Second, the study reframes commercial vacancy as a resilience opportunity rather than economic pathology. Consistent with circular economy principles, underutilized buildings represent embodied energy and material capital that can be strategically reactivated (Stiernon et al., 2023).

Third, it challenges deterministic assumptions linking adaptive reuse to affordability. By empirically demonstrating skepticism among professionals and stakeholders, the study reinforces the distinction between market-driven redevelopment and equity-oriented housing policy.

Policy and Institutional Implications

The findings suggest that scalable adaptive reuse in Nigerian cities requires coordinated intervention across regulatory, fiscal, and housing policy domains.

Regulatory Reform

Planning authorities should introduce:

- Fast-track approval pathways for conversion projects
- Simplified land-use reclassification procedures
- Mixed-use zoning provisions aligned with post-pandemic urban dynamics

Such reforms align with international precedents demonstrating that regulatory flexibility accelerates conversion activity (Wilkinson et al., 2014).

Fiscal Incentives

Financial viability can be strengthened through:

- Tax abatements for adaptive reuse
- Reduced development levies
- Public-backed low-interest financing

These mechanisms reduce risk exposure and improve developer participation, particularly in high-interest macroeconomic environments.

Affordability Integration

To ensure equity outcomes, adaptive reuse frameworks should incorporate:

- Inclusionary housing quotas
- Public-private partnership models
- Targeted rental subsidy schemes

Without such safeguards, conversion risks reinforcing socio-spatial inequality.

Professional and Architectural Implications

For practitioners, feasibility assessment must precede investment decisions. Buildings with shallow floor plates, flexible structural grids, and accessible service cores offer higher conversion potential (Aydemir & Akın, 2024).

Architectural strategies should prioritize passive ventilation, modular wet-core systems, and environmental retrofitting to enhance both sustainability and cost efficiency.

Importantly, adaptive reuse demands interdisciplinary collaboration. As Wilkinson et al. (2014) note, successful conversion projects integrate architectural design, engineering systems, financial modelling, and regulatory negotiation.

Conclusion

Adaptive reuse in Nigerian cities represents a viable but conditional strategy for addressing post-pandemic commercial vacancy and diversifying housing supply. Its implementation depends less on structural adaptability and more on governance reform,

infrastructural reliability, and affordability safeguards.

Without systemic intervention, commercial underutilization and housing deficits will persist as parallel urban crises. With coordinated policy alignment, however, adaptive reuse can contribute meaningfully to urban resilience, environmental sustainability, and housing diversification in Nigeria's evolving metropolitan landscape.

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