
COVID RUINS, TOMORROW'S HOMES? ANALYSIS OF AN ADAPTIVE RE-USE APPROACH TO AFFORDABLE HOUSING FOR METROPOLITAN CITIES IN THE GLOBAL SOUTH

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ABSTRACT

Acute housing shortage and empty office spaces are likely to emerge as critical urban issues of the post-pandemic (COVID-19) metropolitan cities, considering that the 'new norms' of existential patterns have brought about visible socio-economic impacts. With the remote work lifestyle, the commercial real estate litter with underutilised public buildings. Thus, begging the question "could these corporate buildings effectively transform to provide affordable housing in metropolitan cities?" This paper focuses on adaptive reuse as an urban resilience strategy for metropolitan cities in the global south, using Lagos, Nigeria, as a context for the study. The opportunities and challenges of adaptive reuse are considered by reviewing the responses of cities to similar urban crises in the past. Existing literature was reviewed and analysed through a comprehensive desktop research to understand the urban implication of unused spaces in developing countries, effect of policy on adaptive reuse and the implication of adaptation outcomes on affordability. Based on the findings, a research gap was identified. Primary data was collected using online survey and the results were analysed. An adaptive reuse strategy is recommended for housing the youths and the middle class in underused cooperate buildings within cities of developing countries. This paper concludes that reuse of office spaces provides an excellent opportunity for a sustainable housing strategy in metropolitan cities of developing countries through tactical designing and planning approaches, informed by the peculiarities of the society identified within participatory design processes.

Keywords: Urban Strategy, Global South, Pandemic, COVID-19, Changing Urban Pattern, Affordable Housing, Circular Economy, Housing Crisis, Sustainable Spaces, Adaptive Reuse

INTRODUCTION

The Coronavirus pandemic (COVID-19) has affected establishments in varying degrees by significantly reducing human interactions within the urban infrastructure (Ayoob and Amir, 2020). These 'new norms' of existential patterns have also brought about visible socio-economic impacts which will become evident in the future, particularly in the real estate market (Javed, Zahoor and Saeed, 2020; Kaisse et. al., 2020; Mhlanga and Moloji, 2020; Mhlanga and Moloji, 2021). Also, the COVID-19 crisis highlights the importance of housing as a frontline shield against the pandemic (WHO, 2007; 2020) as well as the importance of high-quality public spaces, improved infrastructure networks and environmental

policies (Ayoob and Amir, 2020). Thus, demonstrating the deep connection between health and living conditions.

According to the United Nations (UN) Secretary-General, adequate housing has become even more critical in the face of a pandemic. Thus, creating opportunities for more people to live in healthy homes is critical for a stronger global economy (United Nations, 2016; 2020). Due to the pandemic's effect on economies and remote work lifestyle, the commercial real estate litter with underutilised public buildings.

Considering that urbanisation is a global trend (UN Habitat, 2001), the United Nations Sustainable Development Goal

SDG-11(United Nations, 2016) acknowledges that cities will continue to provide housing for the exponentially rising number of urban dwellers in the coming decades (UN-Habitat 2001; 2006). The influx of people, incessant occurrences of natural disasters, political unrest, the rising cost of land acquisition and construction has made access to affordable housing even more challenging in most cities (UN-Nations, 2020). Thus, increasing social inequalities and proliferating slum dwellings within city centres and their periphery (UN-Habitat, 2003).

Adequate housing has remained an intractable problem within urban areas, especially for developing countries encumbered by the sprawling complexities of urban poverty and bad governance, in the face of a rapidly growing population (Bhalla, 2002; Ogunnaik, Squires and Booth, 2013; Yeboah, 2005). The issues discussed in this paper are global; however, the research focuses on metropolitan cities in developing countries with Lagos, Nigeria, as a relevant study context.

In response to part 1 of SDG 11, the main objective of this paper is to analyse the possibility of repurposing post-COVID commercial real estate ruins as a rapid circular economy approach to providing affordable housing in metropolitan cities of developing countries. Although COVID-19 is not the first global pandemic crises in human history, there is still limited literature regarding the resulting urban transformations (Ayoob and Amir, 2020, Bernstein, et. al., 2006). This study aims to fill the gap in literature by discussing post pandemic responses and transformation of the urban environment. It also aims to contribute to the research on adaptive re-use of buildings, particularly within the context of sustainable urban crises management in the global south.

This study differs from other scholarly works (Kassie, et. al., 2020; Kievani and Werna, 2001; Okpala, 1992; Olotuah, 2002; Sharifi and Khavarian-Gorms, 2020) in its approach to the affordable housing discourse. Sustainability, waste depletion and community revitalisation are the common goal for adaptive reuse. While existing research focuses on this concept as a form of heritage and cultural preservation (Bullen, 2004; Othman and Elsaay, 2018), this paper discusses adaptive reuse as an urban response with emphasis on the metropolitan cities of the global south. Thus, analysing the pandemic's effect on the commercial real estate market; highlighting the opportunities for innovative re-use of infrastructural waste as a rapid response to housing needs in developing countries.

First, the paper reviews existing literature to discuss relevant topics such as the COVID-19, housing crises, affordable housing and the circular economy. It further analyses the context of study- Lagos, Nigeria, to better understand existing urban issues in metropolitan cities of developing countries. Additionally, the paper discusses the opportunities and challenges of adaptive re-use by reviewing the strategies used by various cities in the past. It then presents a summary of research findings based on the outcome of the online survey carried out.

A crucial outcome of this study would be to open the conversation about repurposing existing underutilised spaces for affordable housing rather than erecting new buildings, as well as the re-organisation of living spaces within emerging and established cities, especially after a paradigm distortion in the conventional housing and zoning ideologies because of the COVID-19 pandemic.

BACKGROUND

The mid-2020 update of the World Economic Situation and Prospects (WESP), United Nations Department of Economic and Social Affairs (UNDESA) estimates that over 34 million people were pushed into extreme poverty that year (United Nations New York, 2020). Congruently, the World Bank reveals an ominous prediction that the plummeting economic growth will push about 71-100 million people into extreme poverty (Sumner, Hoy and Ortiz-Juarez, 2020; World Bank, 2020).

Housing affordability differs from city to city and can be approached through a quantitative or qualitative perspective (UNDESA, 2020). The Federal Department of Housing and Urban Development (FDHUD) defines an “affordable dwelling” as one that a household can obtain for thirty per cent or less of its income (United Nations, 2020) .

Affordability regarding housing has also been argued to be a social construct that should be considered based on recognisable levels, especially varying income levels. However, Bohdan (2010) disagrees with simply assessing housing affordability based on the average cost of apartments and the citizens' income ratio because it does not consider regional development peculiarities (Torluccio and Dorakh, 2011).

The precise definition of the term is ambiguous (Torluccio and Dorakh, 2011) however, there is a common goal—addressing the housing needs of the lower or middle-income households (Begum, 2015). Most relevant to this discussion is the Kaissie et. al.'s (2003) description of housing

affordability (Kaissie et. al., 2020) as a component of a comprehensive strategy for cost reduction, relative to market housing cost and rental value, irrespective of sizes, material applications, maintenance cost and durability for any scheme. Apart from the economic perspective, affordable also means physically adequate and fit for human habitation (United Nations, 2020). Thus, a house cannot be considered affordable if it is overcrowded and unhealthy. This perspective also considers other elements required to make a home conducive to living such as water, electricity, and gas. In Lagos, it is estimated that about 40 - 75% of the population lives in deplorable conditions within squatter settlements (Opoko, et. al., 2020). Thus, highlighting a housing affordability situation that falls short of all standards of measurement is described here.

The UN considers access to quality affordable housing a fundamental approach towards reducing urban poverty and improving equal opportunities for sustainable growth (United Nations, 2020). In keeping with the UN SDG 11, to reduce the number of slum dwellers by 2030, non-profit financing (mortgages and loans) has started emerging for the poorest populations (UN-Habitat, 2003). However, the housing market in Lagos still struggles with aligning housing needs with housing demand, as the private developers are more concerned about profitability and have no interest in serving the needs of the low-income earners from which the housing needs stem (Wallace and Allake, 2019).

Although non-governmental organisations (NGOs) and international organisations have successfully collaborated with private investors to provide affordable housing interventions within vulnerable communities, a significant housing gap is yet to be breached (Begum, 2015; Rehman, 2005; UN-Habitat, 2014). The UN analysis of housing affordability in the last twenty years shows that regardless of increasing demand, housing (including rentals) has remained grossly unaffordable for most of the world population (United Nations, 2019; 2020; UNDESA, 2020; Wallace and Allake, 2019). The pandemic further intensified concerns for affordable housing supply due to construction delays and economic decline following the extended lockdown period. Hence, the need for architects and developers to consider proactive circular economy approaches that unlock the potentials of underutilised office spaces as tools for solving affordable housing needs within metropolitan cities.

The circular economy is a closed-loop economic system that focuses on systems thinking as a sustainable approach to closing the raw materials cycle by changing the approach

to value creation and preservation, based on 3R approach -reduce, re-use and recycle. Architectural projects need to evaluate the entire system of buildings from the design stage until post-occupancy in compliance with the 3R approach, to provide buildings a chance to a second life, without constituting environmental problems. This approach is valuable and promoted to be used in contexts like Lagos, where residents are faced with severe housing shortage.

CONTEXTUAL ANALYSIS

The urban settlement within Lagos, Nigeria sprawls over three core islands (Lagos Island, Lagos Mainland, and Victoria Island) interconnected by bridges. Until 1991, Lagos was the capital of Nigeria with suitable urban infrastructure and employment opportunities. However, the population of the city began to swell due to rural- urban migration; a consequence of the government failing to improve economic systems in the rural areas by establishing appropriate land reforms and updating agricultural technology practices. These issues are still prevalent today (Emordi and Osiki, 2008; Oduwaye, 2009; Olajide, Anunbiade and Bishi, 2018; Onilude and Vaz, 2020). Due to census inaccuracies, the actual population of Lagos is not known. However, it is estimated by the Lagos Bureau of Statistics to be about 26 million (Wallace and Allake, 2019). The University of Toronto Global Institute predicts that by the end of the century, Lagos will become the world's largest city, based on the projection that the city's population would have grown to 88 million (Hoornweg and Pope, 2016).

Lagos Island and its adjoining neighbourhoods (Ikoyi and Victoria Island) form the Central Business District (CBD) and historical core of the megacity, consisting of warehouses and government buildings (Emordi and Osiki, 2008). Built along the marina and sandwiched between the two socially distinct habitats- the island and the mainland, Lagos Island is the densest district in terms of physical development (Adeoye, 2010). It provides a good backdrop for the urban and architectural issues discussed in this paper.

The development of Lagos city was based on the 1979 master plan, which contained a planning and development framework for the metropolis. The strategies involved expanding existing public infrastructure and facilities to accommodate population pressure, establishing economic centres, and constructing 1.4 million housing units (Morka, 2007). Unfortunately, due to distortions by the government and minimal implementation, less than 10% of the proposed housing needs were met by the expiration time of the plan in 2000 (Abosedo, 2006). The inability of the existing

housing and urban infrastructure to meet demands at a commensurate level has resulted in acute housing shortage of about 5 million, representing 31% of the estimated national housing deficit of 18 million (BBC Africa, 2017; Emordi and Osiki, 2008; Nwanna, 2012). Consequently, more environmental and urban planning challenges have risen such as overcrowding, unplanned settlements, urban sprawl, abuse of wetlands, land and water pollution due to industrial activities and poor waste management (Adedayo and Malik, 2015).

Qualitative housing remains a matter of trepidation for the government and individuals (Begum, 2015). According to Abosede (2006) over 70 per cent of Lagos metropolis population lives in rooming types with an occupancy ratio of eight to ten persons per room, lacking essential services and amenities required for a healthy living. Factors such as the cost of building materials, deficiency of housing finance arrangement, stringent loan conditions from mortgage banks and government policies have stifled the efforts of NGOs, government, and private sector developers to bridge the gap between housing demand and supply.

Considering that housing commodification is still deeply embedded with social change, developers target expatriates and a small group of Nigerians with disposable income, high enough to afford luxury housing solutions as second homes. A good example is the Eko Atlantic project intended to reduce housing shortage in Lagos by providing accommodation for 450,000 residents and 300,000 commuters within a luxury apartment (Umar, Ogbu and Ereke, 2019). Due to the exorbitant pricing of these properties, even the emerging middle class is left with very few housing options (Badmos et. al., 2020; BBC Africa, 2017; Ezema, Opoko and Oluwatayo, et. al., 2016; Olajide, Agunbiade and Bishi, 2018). Additionally, mass housing projects by the government elude the slum-dwelling families because these homes are bought by the ruling class and subleased at unaffordable prices (Umar, Ogbu and Ereke, 2019; Ogunnaike, Squares and Booth, 2013). Consequently, Lagos is overdeveloped, with a reasonable number of unaffordable and empty buildings. (Habitat for Humanity, 2021; UN Habitat, 2006; United Nations, 2020; UNDESA, 2020).

This situation is likely to be aggravated because the economies of developing countries have become even more volatile post COVID-19 pandemic. Due to the high unemployment rate, there has been an increase in entrepreneurial and informal economic activities. In addition, most of the country's educated youth population classify as 'houseless persons' (Ogunnaike, Squares and Booth, 2013).

In this case, the key factor for homelessness is not completely influenced by low-income level but the unavailability of housing and a hiked renting cost (Adeshokain, 2019). In addition, due to poor documentation, it is difficult to paint an accurate picture of Lagos, Nigeria's housing deficit (Wang and Maduako, 2018). It is estimated that the city's housing shortage is about 5 million housing units, hence, an overpriced housing market automatically excludes the middle class (Opoko, et. al., 2020). Adedayo and Malik (2015) and Badmos et al. (2020) observed that there is a positive correlation between the highest educational level attained and the monthly income of residents, as well as between income and rent paid. Thus, implying that with increased income, people are willing to secure better accommodation outside slums, if housing is made available (Adedayo and Malik, 2015).

The government's urban renewal strategies within Lagos have only succeeded in a private sector-led gentrification (Abosede, 2006; Bhalla, 2002; Boland et. al., 2020) and an overabundance of business within the Lagos Island district land, as commercial space owners feel pressurised to meet up with the high level of business activities (Adeskokan, 2019). However, it is important to mention that some of these corporate buildings have remained empty for many years. As the country's capital moved to Abuja, government parastatals moved their offices to the new capital, leaving these giant edifices to govern the skyline with no importance. Consequently, the urban voids have become hideouts for hoodlums and an informal shelter for young Lagosians who cannot afford homes closer to work and school (Fairmade, Soginka and Siu, 2018; Wahab, 2020).

A guardian columnist survey reveals that about sixty structures within the CBD between a minimum of five floors to a maximum of twenty floors with an average of 6000m² per floor are empty and unused (Wahab, 2020; Yakubu, 2019). The above statistics show that these buildings can reduce the 3 million housing deficit in Lagos by 10% if innovatively repurposed (Viola and Diano, 2019). In addition to the government-owned buildings, there are even more recent commercial developments within the adjoining districts that have remained empty in the last five years due to high renting prices (Adedayo and Malik, 2015; Adeshokan, 2019). With the unforeseen aftermath of the COVID pandemic, the CBDs of metropolitan cities are likely to become further emptied as most companies embrace smart working while the hard-hit ones never return to the highstreets.

Analysing affordable housing interventions in Lagos and globally, it is important to highlight that most strategies

favour new buildings as solutions to housing deficit (United Nations 2020; Wallace and Allake, 2019; World Economic Forum, 2019). Considering that the contextual realities are not factored into the design and implementation stages of most luxury housing projects, the outcome is a plethora of unsustainable buildings that partly or entirely depend on artificial lighting and ventilation systems. Thus, this paper focuses on a housing supply strategy for metropolitan cities in developing countries that critically analyse the development of a wasted infrastructure as opposed to a resilient urban plan.

RESEARCH METHODOLOGY

Qualitative and quantitative research approach was taken to derive the information used in this study (Baxter and Jack, 2008). Existing literature was reviewed and analysed through a comprehensive desktop research. Based on the findings, a research gap was identified; primary data was collected using online survey and the results were analysed. Limitations of this research include the scarcity of comprehensive information on existing office to residential reuse ratios, especially in the global south, as most projects focused on the revitalisation of historical buildings which were mostly repurposed for any other use but residential.

DISCUSSION

Adaptive Reuse: Opportunities and Challenges

The Department of Environment and Heritage of Australia (2004) defined adaptive reuse as a process that changes a disused or ineffective item into a new item that can be used for a different purpose (Desilva and Perera, 2016). The current pandemic can be considered an urban trauma due to the unforeseen disruptions it has caused to the social and cultural network of cities (Boland et. al., 2020). Although the pandemic's effects are largely considered negative, it has also succeeded in highlighting the flaws of the current urban strategies, thus, opening opportunities for designers to unlock public resources through creative planning strategies. The pandemic has highlighted the need to ensure that the urban planning and zoning systems are re-strategised to help cities recover from the trauma induced by the rapid transformation of urban patterns and accommodate preventive measures (Ding, 2008).

Over the years, adaptive reuse has become a sustainability based heritage preservation practice for preventing functional obsolescence and extending the useful life of historic buildings (Bullen and Love, 2011, 2011a). In the last decade, cities such as Amsterdam, London, New York, Toronto, Melbourne,

Perth and Tokyo have tried to balance the vacancy levels with declining demand for office spaces within downtowns and CBDs emptied out by the great depression. Hence, the repurposing of vacant office spaces into residential blocks has been used as a useful strategy (Bullen and Love, 2010). Although the drivers for adaptive reuse have been similar-demography, household compositions, rent gap between office and residential properties, changing attitudes and housing demand, the government strategies differed, but the results have been different. For Toronto, the government played a proactive role by strategically targeting the downtowns and converting only the most suitable office buildings. Thus, yielding an addition of about 9000 dwellings to the downtown area and dropping the office vacancy rates to normal. While in London, the government was not as proactive, hence the impact of their contribution was not outstanding (Remoy and Van der Voordt, 2014).

The driver for adaptive reuse in New York and Tokyo were tight housing market strategies and a high supply of obsolete buildings (Remoy and Vand der Voordt, 2014). For Manhattan, the government was supportive and active; hence, the government initiated Lower Manhattan Revitalisation Plan to subsidise the cost of transforming obsolete office buildings into studios and small apartments for first-time renters. From 1995- 2005 more than sixty office buildings were converted and the number of inhabitants in the area grew (Remoy and Van der Voordt, 2014).

On the other hand, in response to improved office market after the ninety's recession, Tokyo added new office buildings to the market. However, the office occupancy decelerated because of the dot-com bubble burst in 2002-2003 (Dougherty and Eavis, 2020). Unlike Manhattan, the local government had little influence on the urban developments and the tenancy perspectives for newer and larger office buildings were still decent, while the expectations for the existing buildings were low. Thus, demolition and new construction became a more desired choice than adaptation. The outcome of this strategy was an increase in the size of the urban fabric and little space for new buildings. However, as Tokyo worked towards the target to reduce energy use and greenhouse gas emission, there was a renewed focus on conserving the urban fabric and sustainability which had opened adaptive reuse opportunities.

The real estate market scenarios discussed above highlight drivers for adaptive reuse as sustainability aims, the high vacancy rate for office buildings and the shortage of affordable housing. They also underline five major obstacles: physical design, location, financial and legal aspects and a

changing real estate market with a growing gap between demand and supply (Ball, 1999; Ramoy and Van der Voordt, 2014; United Nations, 2014). Most importantly, the above scenarios reveal the importance of a proactive government in making adaptive reuse a resilient post-traumatic response tool for cities (Remoy and Van der Voordt, 2007; 2014; Viola and Diano, 2019).

Changing Cities: Challenges and Opportunities

In the past, cities have had to reinvent themselves to deal with trauma in the event of manmade and natural disasters (Bernstein et. al., 2006; Sharifi and Khavarian-Garmsir, 2020). However, glitches exist in the adaptive reuse strategy for buildings which prevent or limit outcomes (Desilva and Perera, 2016; Gann and Barlow, 1996). This paper discusses the challenges and opportunities of adaptive reuse under following broad heads:

Design and Financial Impact

With the arrival of the pandemic, work patterns lead to a decline in the need for office spaces and commercial real estate owners started to consider leasing their spaces for other uses, such as laboratories and restaurants (Boland et. al, 2020). At the same time, housing remained the least probable function because of the cost- prohibitive aspects of converting offices to homes, such as installing new plumbing fixtures and partitioning (Bullen and Love, 2011; Dougherty and Eavis, 2020). However, the above challenge opened opportunities for cost-effective innovations, experimentation with locally available materials, new skills and job opportunities (Gann and Barlow, 1996). For instance, partitioning elements could be governed by waste reuse innovations. Hence, there existed an opportunity to address waste management concerns in developing countries by recycling and repurposing solid and agro-generated waste for energy-efficient construction materials (Umar, Ogbu, Ereke, 2019).

Various authors have highlighted ways in which agro-waste materials can be applied to achieve lightweight, affordable, energy-efficient and sustainable partitioning, as well as their mechanical properties and how they can be adapted to relevant standards (Madurwar, Ralegaonkar and Mandavgane, 2013). However, to successfully apply the above in the delivery of affordable, desirable and sustainable spaces, further investigation is required to understand environmental performance and techno-economic feasibility of the materials within specific locations and climatic conditions.

Policy and Zoning Restrictions

The aim of planning policies and zoning codes is to guide the urban system towards setting goals based on the images of the desired future (Oluwole, 2011). However, they are also capable of suppressing variety and threatening local and individual forms of autonomy (Bullen, 2007; Bullen and Love, 2011). UN-Habitat (2006) identifies urban planning as a major tool by which sustainable urban development can be achieved. For metropolitan cities in the western world, urban development must adhere strictly to zoning plans. Consequently, converting building functions can become a delayed process, considering that buildings are subject to local policy and zoning rules that require lengthy public processes to change (Ball, 1999). In many sub-Saharan African cities, the current urban planning and development visions described by UN-Habitat (2014) as ‘modernist dream’, have failed to acknowledge the existential realities.

In Lagos, the outcome of imposing inappropriate regulatory frameworks is a lack of respect for the official regulations. Hence, there is a growth in the number of informal settlements, as most urban housing developments occur outside the official regulation without approval from the Lagos State Physical Planning and Development Agency (LASPPDA) (Oduwaye, 2009). Consequently, complexities degrading urban aesthetics, such as overpopulation have led to rapid territory expansion and pressure on the infrastructure.

On the other hand, there is the scenario of relaxed policies in countries like England. Considering the sense of urgency required to provide affordable housing, the policy for converting office buildings to affordable homes skip important local authority approval steps. A resulting outcome as seen in the case of the Terminus house (Moore, 2020) is a capitalist stimulated misuse of an excellent opportunity to provide affordable housing which immolates the fetish of quality. This case study emphasizes the disadvantages of handing over power to developers and eliminating standardisation rules ensured by local policies. Rather than creating suitable homes, the outcome of similar developments would result in modern slums.

Thus, the urban system needs to reimagine itself to make sense of these abrupt changes that exceed its capacity of integration. Therefore, in response to the sectoral impact caused by the COVID-19 pandemic, it is crucial to consider a tactical urban planning strategy that instigates recovery through flexible planning policies (Lahoud, 2016). This would mean creating hybrid territories that allow buildings and urban spaces to take on multiple functions within their

life span in a socially, economically and environmentally sustainable way. This strategy can help achieve the above urban objective and requires institutions, particularly government, to play a significant role.

ANALYSIS

The COVID-19 pandemic brought adaptive re-use to the spotlight for city planners and the professionals began to consider preservation strategies for disappearing city centres and business districts. However, there was still no unanimous agreement on the appropriate strategy that met all the stakeholders (developers, owners, and occupiers) needs. In the absence of adaptive reuse strategies, urban voids were created (De Silva and Perera, 2016).

An online survey was designed and shared with a target population which included landlords (15.2%), estate agents (12.1%), architects (66.7%), and contractors (6.1%) in Lagos, Nigeria. Over 50% of the total respondents affirmed that Covid -19 had significantly affected their businesses; for (42.4%) significantly and for (9.1%) very significant. 93.9% of the respondents affirmed that adaptive reuse of building is a useful tool for urban regeneration. 78.8% of the architects had designed office spaces and a majority (62%) of the architects prioritised building services in their design; 44.8% prioritised lighting, 48.3% considered ventilation while 41.4% considered adaptive reuse strategies. Therefore, although the respondents agreed that adaptive reuse is a useful urban regeneration tool, the results show that it is the least considered factor during the conceptual stages of the design process.

Furthermore, 58% of the respondents (architects) indicated that they had been involved with converting office buildings to another use. 78.6% of the above group of respondents converted office spaces to commercial use (stores, museum, libraries), 14.3% converted to hospitality (hotels, guesthouses) while 28% converted to residential use. Thus, affirming the assertion that even in the situation where adaptive reuse is necessary, residential use may not be the first choice. From the multiple responses to identifying the challenges faced when executing an adaptive reuse project, 57.1% identified finance as a major constraint, with 33.3% indicated non supportive policies as an issue, 23.8% indicated location as a problem, 28.6% indicating design as a hinderance while 9.5% identified zoning as a key challenge.

Although zoning was the least prioritized issue faced during an adaptive reuse project, this result may be a unique scenario for a city like Lagos where the zoning laws are not strictly followed due to the systemic loopholes that allow lobbying.

This situation often results in the issuance of inappropriate development permissions that do not respect the city's urban plan. It can also be argued that the zoning chaos could be because of overpopulation, in the absence of a masterplan that fits the needs of a growing population, zoning laws become obsolete.

Assessing the impact of the pandemic on the commercial real estate, 78.8% affirmed that COVID-19 had significantly changed the level of demand for office spaces, while stating remote working and downsizing as reasons for diminished demand. However, some of the respondents pointed that in the absence of remote working options, offices may require even larger spaces to ensure adequate distancing to prevent contagion. Although 54.5% of the respondents thought that the impact of the pandemic on the commercial estate would not last long, while 15.2% thought that it would create a lasting impact and 30.3% were indifferent.

Although most respondents considered adaptive reuse a tool for urban regeneration as mentioned above, there was a contrasting outcome in which 42% of the respondents had a negative response to the idea of reusing office buildings for affordable homes in Lagos. 39.4% had a positive response while 18.2% were neutral.

Regarding the factors that deterred the positive outcomes of adaptive reuse in a multiple response question, 52.9% of respondents highlighted 'cost', 50% chose 'profit-driven development', 44.1% highlighted 'policy', 35.3% chose 'government interest', 32.4% identified 'zoning' as a deterring factor, while 32.4% highlighted 'lack of awareness'.

Assessing self-governance as an approach to sustainable neighbourhood in Lagos, 15.2% of the respondents agreed that it would be highly efficient, 60% of the respondents agreed that it would be efficient, 21.2% were neutral to the idea, while only 3% thought that it should not be considered.

Finally, the respondents were asked to suggest tactical design approaches that would make future office spaces easily adaptable to residential use. A summary of the responses are as follows:

- Adaptive reuse should be considered in the placement of building services (plumbing) and ventilation during the design process.
- Flexible/modular spaces and partitioning
- Modified zoning to incorporate mixed use

- Decentralised building services for easier re-use
- Adjustment of government policies to encourage a wider acceptance and use of locally available materials.
- Provision of subsidies and micro loans towards housing for youths and middle class.
- Flexible spatial layouts

CONCLUSION AND RECOMMENDATION

The COVID-19 pandemic has offered an unprecedented opportunity for architects and urban planners to identify the pitfalls of existing planning strategies by accelerating the already changing social and economic patterns. The housing sector is particularly hard hit by the urban legacy of the pandemic. Thus, the post-pandemic city is likely to face two grave challenges- acute housing shortage and high vacancy of commercial spaces. This research aims to understand the under-explored possibilities of increased housing supply within metropolitan cities of the global south through the adaptive re-use of office spaces. In addition to acute housing deficit, metropolitan cities of the global south, such as Lagos in Nigeria, face other urban issues, such as rapid and unregulated urbanisation, overcrowding, concentrated poverty, unemployment, insecurities, income and social inequalities.

An analysis of strategies adopted by cities in solving similar urban problems and the outcome of the survey highlights the challenges of converting office spaces to residential use, such as location, financial impact, policy, changing market value and design. Thus, implying that the abundance of office buildings may not translate to the abundance of housing units, considering that the buildings may be unsuitable for conversion due to risks of structural decay or inability of the original design to adapt to any other use. Identifying the opportunities and challenges has enabled a balanced view of the adaptive re-use debate presented. Thus, emphasising the architect's ability to solve the above problem in the future by carefully considering possible second life functions of buildings from conceptual design stages. However, in the case of a successful transformation of

obsolete spaces, proper documentation of the process is necessary, providing a platform for further research and improved implementation of the discussed urban strategy.

The pandemic has highlighted the multifunctional possibilities within living spaces as well as the importance of quality of homes. Thus, by creating spaces that allow occupants to reorganise the layouts to suit desired building functions is essential. Therefore, architects need to start considering design models with a greater sensitivity towards issues of interconnection, attachment and interdependence.

Although policies could be a bottleneck to rapid housing solutions and diversity, entirely excluding local policy is also not satisfactory, because it can encourage substandard housing that does not meet the public health requirements, thus, increasing the number of vertical slums and further reversing progression of the SDG 11.

For adaptive re-use to become an effective strategy that drives the formulation of public policy in tackling the issues identified within the current building stock, more empirical research is required to scrutinise its contribution to sustainability. Additionally, inclusion zoning may be considered as a strategy for building hybrid urban territories. This strategy requires that a particular number of units in new projects be set aside for families under a given income threshold (typically 80% of the area median income) at an affordable price.

Finally, it is evident that the current urban development strategy in the metropolitan cities of developing countries has disregarded socio-economic data in planning and redevelopment processes. Ignoring participatory tools and methods have resulted in the existence of management problems and poor community organisation. This, highlights the dangers of making the municipality the sole decision maker. In the absence of government interest and subsidy, housing development projects become inevitably led by the profit driven private sector. Hence, the emergence of more luxurious housing solutions that do not meet residents' socio economic and spatial needs, as well as the gentrification of neighbourhoods.

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