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The Factors Influencing Change of Use of Properties in Old-Bodija Estate, Ibadan, Oyo State, Nigeria

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Abstract: Urban development often leads to uncoordinated land use patterns as neighborhoods face growing demand for commercial spaces, causing them to lose their original local character. This study examines the conversion of residential properties to commercial uses, focusing on the extent of these changes and their influencing factors.

The research utilized a survey design, collecting data through structured questionnaires from 86 commercial property owners/occupants and 45 Estate Surveying and Valuation firms. Descriptive and inferential statistics, such as weighted mean scores, least square regression, the Mann Whitney U test, and factor analysis, were employed to analyze the data.

The drift schedules (rise or reduction) in the number of properties changed/modified between 2014 and 2022, showed a significant progression in property modifications through a linear trend analysis using least square regression models, with R^2 values of 0.1927 and 0.4102. The Mann Whitney U test revealed significant differences in opinions on factors driving property changes: planning regulations (p=0.001), use of complementary infrastructure (p=0.033), traffic jams (p=0.000), desire to maximize profits (p=0.000), commercial space demand (p=0.014), and investment potential (p=0.000). Factor analysis (chi-square=1618.722, $p \leq 0.000$) identified four primary components: demand, business, commercial agglomeration and planning regulations; property upgrades and governmental factors; supply, demand and increased economic activities; and accessibility and investment maximization.

Recommendations include revising land use strategies to enforce stricter controls aligned with master plans, retrofitting existing properties for enhanced energy efficiency and occupant satisfaction, thereby meeting the Environmental, Social, and Governance (ESG) standards, and; substantially reducing the need for the change of use.

Key words: land use, change of use, conversion, residential property, commercial property

I. Introduction

Land use over the ages has continued to change because of the increased population, commercialization, as well as rapid physical expansion of cities, with commercial land, uses continuously expanding and converting neighbouring residential land uses. Ankeli, Nuhu, Sule, Popoola and Ankeli (2021) noted that most Nigerian cities are currently facing a significant issue due to the rising tide of changes in property use. Nwachukwu and Ukpabi (2009) noted that property owners converted their properties' uses, particularly from residential to commercial purposes, to increase their rental income.

In many parts of Nigeria, the usage of buildings has changed, particularly from residential to other uses (Benedict, Emmanuel, and Samuel, 2016). Accordingly, Ebube and Emoh (2022) stated that the use of buildings is frequently changed from residential to commercial in cities in the developing world, with the latter having major effects or diseconomies on the nearby dwellings and their residents. Change of use of buildings may be in various forms; examples include conversion, modification, or rehabilitation; they may be completely demolished or only slightly altered and renovated. In ensuring change of use, the physical and functional characteristics of the properties are modified and/or changed to meet a new need, appealing to the society, aesthetically pleasing, and socially acceptable; with regards to advancing technology in the built environment. Properties can be changed from one use to the other for various reasons amongst which include; the improvement of the financial returns of the properties; improvement of the visual perspective, adequacy of accommodation details, prestige, or highest and best use purposes. Nevertheless, other factors contribute to a change of use and rebuilding of properties amongst which include natural acts of God and governmental regulations.

More so, Ankeli, Nuhu, Sule, Ankeli, and Alade, (2019) opined that the phenomena of trending change of use, particularly from residential to commercial applications, is gradually becoming a norm in most cities. Nearly all residential properties facing main streets or highways in Bodija have either undergone conversion to stores, offices, or business spaces, or are in the process of doing so. Additionally, the consistent influx of residents and businesses from neighbouring cities like Lagos worsens the situation , as commercial land uses increasingly displace residential ones. This poses a treat in the character of the land use. If not carefully considered and managed, the progressive changes of property use could therefore have severe economic, environmental, and aesthetic consequences. This foregoing is the reason a study of this kind is deemed justifiable, acceptable, and timely.

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The aim of this study therefore, was to examine the driving factors responsible for the change of use on the character of Old-Bodija, Ibadan with a view to enhancing on property investment. The specific objectives were to;

i. examine the level of change of use from residential to other uses in Old-Bodija, Ibadan; and

ii. identify the factors responsible for change of use in the study area;

Statement of the Research Problem

There is a growing trend of property use changes, particularly the conversion of residential properties to commercial ones, driven by global economic dynamics, increased demand for business spaces, and the quest for higher returns on investment. This shift in land use is leading to the erosion of residential landscapes, traditionally associated with tranquility and comfort, as commercial activities increasingly infiltrate these areas giving space for unplanned land use with hustling and other commercial characteristics taking the order of the day. Acknowledging this phenomenon, it is essential to investigate the extent of these changes and the factors influencing them.

Previous studies, such as Iroham, Oluwuwnmi, Simon, and Akerele, (2014) in Akure, Kalu, Alozie, Oti, and Onyennah (2017) in Enugu, and Ebube and Emoh (2022) in Ogui-Enugu, have explored similar issues, showing that residential-to-commercial land use conversions are on the rise. However, there remains a gap in understanding the specifics of these changes and their drivers in different local contexts. For instance, Adegunle, Fateye, and Agbato (2016) studied factors affecting rental values in Abeokuta and found that alterations, particularly those for commercial purposes, were driven by factors like property management, safety, and population growth. Nonetheless, the research did not focus on the level of change or the particular dynamics of market trends, such as the interaction of supply and demand, retrofitting of properties, or the built up of commercial activities within the environment, which this study examined, adopting Ibadan metropolis as a case study.

Studies like Carrión-Flores and Irwin (2004), Xifilidou, Mangina, Spatalas and Tsioukas, (2015), and Ifediora (2020) considered the change of use to residential and not the reverse, where urbanization activities and spatial landscape should suggest a transformation from residential to commercial uses. For instance Carrión-Flores and Irwin (2004), and Xifilidou, Mangina, Spatalas and Tsioukas, (2015), report the progression of land use change from agrarian or rural settlement to residential land uses. Ifediora (2020) posits the change from commercial land use to residential land use due to factors of demand, income and mono-commercial ventures. However, these studies do not consider the growing form of urbanization and increasing population leading to the global trends in demand for commercial spaces, which could compel a change of use from residential to commercial.

Purwanto, Ernawati, and Wijaksono, (2017) considered land use pattern from settlements to commercial use studied on two streets in Surabaya; Ir.Soekarno/Merr, Rungkut Madya, and Medokan Ayu streets and posited that land values, earnings and neighbouring land values are the underlining factors that drive land use change from residential to commercial. However, there appears to be other germane driving forces like the demand for commercial needs and increased economic activities, commercial agglomeration, retrofitting, investment potentials and profit maximization.

Significance of the Study

With the current population growth in Old-Bodija, there is increasing pressure on commercial land use, causing commercial activities to spill over from central business districts into residential neighborhoods. It is therefore imperative to identify the specific factors causing the change of use of properties in this area, providing valuable information to aid property development and investment decisions. The findings will inform readers about the roots, patterns, and influences of changes in land use and how those changes have affected commercial properties through time. Property owners and users will have appropriate knowledge of the factors influencing how quickly commercial activity spreads into residential neighborhoods in the research region. This will increase their awareness of this trend. The outcome of this work will contribute to the body of knowledge previously available on factors influencing property conversions from initial uses. It will help urban planners address inefficiencies in land use restrictions, which in recent years have had a serious impact on land users' adherence to planning regulations.

Scope of the Study

The study focused on Old-Bodija in Ibadan, Oyo State, Nigeria, exploring the factors influencing the change of use from residential to commercial properties. Specifically, the research was geographically restricted to commercial properties located along Awolowo and Osuntokun avenues within Old-Bodija Estate. These locations were chosen due to their distinctive local characteristics, progressive growth, and the high incidence of building retrofitting or modifications, and essentially their transitions from residential to commercial uses. The study aimed to highlight the peculiarities of the local context and assess how market dynamics shape land use changes in this area.

Limitations of the Study

The geographically restriction of the study to Awolowo and Osuntokun avenues in Old-Bodija Estate, would perhaps limit the generalization of the findings to other parts of Ibadan or similar urban settings. Additionally, other potential land uses like industrial uses could have been excluded with the focus on the commercial emergence. Similarly, the study relied on responses from property owners/occupiers and real estate professionals, which could demonstrate subjectivity and potential biases in the

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data interpretation. The variability in their willingness to participate also may have affected the depth of the data collected. The secondary data retrieved from the Oyo State Housing Corporation could not be verified as it could be influenced by political forces and lackadaisical attitude of some government workers. Finally, changes in the dynamics of the use of land may be affected by recent policy changes after the study period in ways not covered by this research.

II. Literature Review

Land use change results from the complex interaction between humans and their environment, often involving alterations to the initially designated land use (Ogungbemi, 2012). Gomna and Yusoff (2016) defined land use change as modifying the intended function of a property to create an immediate impact. The Great Britain Building Act (2004) describes it as the transformation of land or buildings to a new usage type requiring complementary adjustments. Urban land use evolves due to demographic shifts, economic factors, infrastructure development, and policy frameworks (Harvey and Jowsey, 2004).

A common form of land use change involves the conversion of residential properties to commercial use, driven by factors such as increased demand for commercial space, urbanization, and economic optimization (Ademola, 2012, and Tilumanywa, 2013). However, Ifediora (2020) studying on conversion from commercial to residential land use, opined that location factors drive the change. Ogungbemi (2012) and Bello and Arowosegbe (2014) earlier emphasized that land use transitions follow a natural progression, such as agricultural land converting to residential use before shifting to commercial purposes. This is refuted in Ifediora (2020) where the highest and best use prevails in a neighbourhood characterized by tertiary institutions with the need for residential spaces. The local character of a neighbourhood with the growing urbanization bringing greater demand for a particular land use, could influence the change. Such changes often lead to redevelopment activities like spatial reconfiguration, demolition, and intensified development.

Market forces specifically play a significant role in land use decisions, as external economic and demographic factors influence alterations in property usage (Pitkin, 2001). Renovation and structural modifications are frequently associated with land use changes, with methods including expansion, subdivision, and relocation of spaces (Omar, Rahman, and Salleh, 2012). Tipple (2004) highlights that existing property enlargement enhances living conditions, privacy and functionality. Subsequent studies further analyze these transformations in urban buildings (Mohd Jusan, 2010; and Omar, Endut, and Saruwono, 2011).

Aluko (2010) later posited that the conversion of residential land spaces into commercial properties has led to urban challenges such as overcrowding, rising rents, and informal settlements. In Enugu, the residential conversion rate has surpassed housing development, leading to a housing shortage (Nwachukwu and Ukpabi, 2009). Therefore, Nwachukwu and Ukpabi, (2009) claim that the availability of residential housing is declining at the same time that the rate of residential change of use is rising, as a result. Thus, the rate of residential production is lower than the rate of conversion and concluded that the rate of residential development negatively impacts change of use. Therefore, if sufficient residential properties are not provided to replace those converted, the residential property market may face supply constraints (Ogungbemi, 2012), as most of the factors are characterized by economic inconsistencies.

Several studies identify key drivers of land use change, including economic opportunities, intensity of use, physical obsolescence of properties, land values, and urban commercial expansion (Ogungbemi, 2012; Purwanto, Ernawati, and Wijaksono, 2017; and Farooq, Naomi, and Mohammed, 2019). Lean (2005) and Sedney (2012) link land use transitions to population growth, commercial demand, government policies and implementation, proximity and accessibility. Socioeconomic factors, transport networks, and neighborhood characteristics also influence these changes (Safariah, 2006).

In Osogbo, Nigeria, Ankeli, Nuhu, Sule, Popoola, and Ankeli (2021) analyzed trends in residential change of use and rental values, finding that economic and demographic variables significantly influence these transitions. The study demonstrates that conversions lead to higher annual rental values, reinforcing the economic motivation behind land use changes.

In conclusion, literature underscores that land use change from residential to commercial properties results from multifaceted set of factors. Key drivers include economic opportunities, urbanization, policy frameworks, investment potential of properties and infrastructure development. Specifically, the conversion of residential to commercial use is propelled by increasing demand for commercial spaces, location factors, economic optimization, and urban agglomeration. While such transformations can stimulate economic growth and shifts in land use priorities, they often introduce challenges like increasing property value, housing shortages and urban congestion and informal settlements. Addressing these transitions would therefore necessitate balanced policies that align urban development with sustainable land use practices.

III. Methodology

The research design employed for this study is a survey design, which is suitable for quantitative research problems. This design adopted the use of structured questionnaires to collect data from respondents. The primary data for this study was collected through the administration of structured questionnaires on two sets of respondents: Owners/Occupants of Commercial Properties and Estate Surveying and Valuation Firms. The sampling frame for Owners/Occupants of Commercial Properties was retrieved from the records of the Oyo State Ministry of Housing (2022) and a pilot survey, which revealed 86 commercial properties and 3 residential properties along Awolowo and Osuntokun Avenues in Old Bodija. Also, the sampling frame for Estate Surveying and Valuation Firms was retrieved from the 2023 directory of the Oyo State branch of the Nigerian Institution of Estate Surveyors and

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Valuers (NIESV), which indicated 45 practicing firms in Ibadan. Due to the sizeable number of properties and firms in the study area, a total enumeration sampling was adopted. Hence, the sample size of 86 and 45 was adopted for owners/occupants of commercial properties and Estate Surveying and Valuation firms respectively.

The major tool for data collection was a structured questionnaire containing both open-ended and closed-ended multiple-choice questions. This questionnaire was administered to the target populations to collect primary data. Data from the records of the Oyo State Housing Corporation, formed the secondary data. The data collected was analyzed using both descriptive and inferential statistics to assess the level of change of use and the factors responsible for the change of use. Specifically, for Descriptive Statistics, frequency, percentages, and weighted mean scores were used to summarize the data, while for Inferential Statistics, the KMO and Bartlett's test, communalities, total variance, and Mann Whitney U Test were used to test hypotheses and determine the significance of the factors influencing the change of use. To determine the correlation between the target population's responses to the study, the Mann-Whitney U test was used.

IV. Findings and Discussion

Level of Change of Use from Residential to Other Land Uses.

The study reveals a significant level of property change of use along Awolowo and Osuntokun Avenues in Bodija, Ibadan. According to estate firms in Ibadan, the level of change of use is categorized as very high (26.3%) and high (44.7%) along Awolowo and Osuntokun Avenues respectively. Similarly, property occupants along these avenues perceive the level of change as very high (23.8%) and high (48.8%). These figures indicate a substantial transformation in property use within the study area.

An analysis of change of use trends between 2014 and 2022, based on data from the Oyo State Housing Corporation, further supports this observation.

Table 1: No of Properties Changed and Converted Over The Years

Year		**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Total**
Number of Properties	**Awolowo Avenue**	1	3	2	0	1	2	3	8	3	**23**
	Osuntokun Avenue	2	3	0	1	5	3	2	1	0	**17**

Source: Oyo State Housing Corporation, Bodija, 2023

Table 1 indicated that in 2014, 1 property was remodeled or changed along Awolowo Avenue, while 2 properties underwent modifications along Osuntokun Avenue. The highest number of changes along Awolowo Avenue occurred in 2021, with 8 properties converted, whereas Osuntokun Avenue recorded its peak in 2018 with 5 conversions. Over the entire study period, 23 properties were changed or converted along Awolowo Avenue, compared to 17 properties along Osuntokun Avenue. This indicates a higher frequency of land use change along Awolowo Avenue than along Osuntokun Avenue.

The findings suggest that Bodija, particularly Awolowo and Osuntokun Avenues, has undergone notable land use transformations over the years. The increasing rate of change of use, as reported by both estate firms and property occupants, highlights the growing commercial appeal of these areas. The demand for property modifications aligns with urbanization trends, economic opportunities, and shifts in land use preferences. The higher number of changes of uses along Awolowo Avenue compared to Osuntokun Avenue suggests that Awolowo Avenue is experiencing a more rapid shift in land use. This could be due to factors such as better accessibility, higher demand for commercial spaces, or proximity to key urban infrastructures. Additionally, the spike in property changes in 2021 along Awolowo Avenue and in 2018 along Osuntokun Avenue may be linked to economic cycles, policy changes, or increased commercial activities during those periods. Overall, the research confirms a dynamic urban environment in Bodija, Ibadan, with a strong trend of residential-to-commercial change of uses. This trend could have implications for urban planning, property values, and infrastructure development in the area.

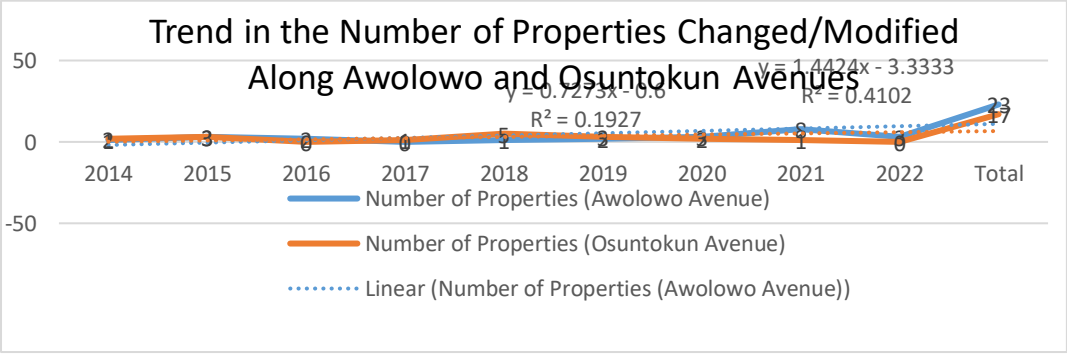

Fig 1: Trend in the Number of Properties Changed/Modified Along Awolowo and Osuntokun Avenues

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Source: Oyo State Housing Corporation, Bodija, 2023

The study analyzed the trend in change of use along Awolowo and Osuntokun Avenues in Bodija, Ibadan, between 2014 and 2022. Figure 1 illustrates the pattern of properties modified over the years, with a linear trend analysis applied to establish the trajectory of these changes. A least squares regression method was utilized to develop the trend outlines, providing a predictive model for the future number of properties expected to be changed or modified. The analysis produced two trend equations, with R-squared (R^2) values indicating the strength of the observed trends. The first equation, **$Y = 0.7273 – 0.6$,** yielded an **R^2 value of 0.1927,** while the second equation, **$Y = 1.4424x – 3.3333$,** showed an **R^2 value of 0.4102.** These values suggest a notable increase in property modifications over the study period, with a stronger trend observed in the second equation. Further investigation into the state of properties before conversion revealed that both Awolowo and Osuntokun Avenues were originally dominated by prototypical detached 4-bedroom houses, typically designed with one bedroom and conveniences on the ground floor and three bedrooms upstairs. Initially, the most common form of modification was garage conversions into kiosks or neighborhood shops. However, after conversion, the area witnessed a surge in commercial properties, including lounges, restaurants, and clubs, among other commercial developments.

Types of Property Modifications

Data retrieved from the Oyo State Housing Corporation indicated that along Awolowo Avenue, property changes primarily occurred through: Extensions (60%), Modifications (25%), and Redevelopment (15%). Similarly, data from the Ministry showed that along Osuntokun Avenue, property changes were mainly through: Extensions (60%), and Modifications (30%). These findings indicate that property extensions are the dominant form of modification on both avenues, followed by modifications, with redevelopment occurring less frequently.

Discussion on the Level of Change of Use in Bodija, Ibadan

The analysis confirms a progressive trend in change of property use along Awolowo and Osuntokun Avenues. The R^2 values suggest an increasing rate of property modifications, reflecting growing commercial activity in the area. The shift from residential to commercial use, particularly in the form of lounges, restaurants, and clubs, highlights the evolving economic and social landscape of Bodija. The prevalence of extensions (60%) in both avenues suggests that property owners primarily seek to adapt existing structures rather than completely redevelop them. However, the higher proportion of redevelopment (15%) along Awolowo Avenue indicates that it is experiencing a more intensive transformation compared to Osuntokun Avenue. Overall, the findings underscore a significant and ongoing shift in property use in Bodija, with commercial developments replacing traditional residential structures. This transformation reflects broader urbanization trends and increasing demand for commercial spaces in prime locations. The observed trends also have implications for urban planning, property values, and infrastructure needs in the region.

Factors Responsible for Change of Use in Bodija, Ibadan

The study examined the perspectives of Estate Surveying and Valuation firms as well as property occupants along Awolowo and Osuntokun Avenues regarding the key factors driving the change of use of properties in Bodija, Ibadan. To evaluate any significant differences in opinions between these two groups, a Mann-Whitney U test was conducted. Respondents assessed 16 factors influencing the shift from residential to commercial use, which include: Investment Potential, Interaction between Supply and Demand, Influx of Residents and Businesses, Demand-Pull for Commercial Space, Agglomeration of Commercial Activity, Accessibility, Space Demand, Desire of Business Owners to Maximize Profits, Demographic Change, Population Size, Inability of Central Business Districts (CBDs) to Contain Growing Economic Activities, Planning Regulations, Upgrading of Older Structures, Use of Complementary Infrastructure, Traffic Jams, and Government Policy.

Table 2 presents the results of the Mann Whitney U test of difference in the opinion of the respondents (Estate firms and the occupants of properties along Awolowo and Osuntokun Avenues, Bodija, Ibadan. The opinion of Estate firms in Ibadan showed that the major factors include Investment potential which was ranked 1st with a mean score of 4.7105 while Interaction between supply and demand was ranked 2nd with a mean score of 4.6579. More so, the Influx of residents and businesses was ranked 3rd with a mean score of 4.7316 while the demand pull for commercial space was ranked 4th with a mean score of 4.6053. Agglomeration of commercial activity was ranked 5th with a mean score of 4.5789. Incidentally, demand for space and the desire of business owners to maximize profits ranked 6th respectively with a mean score of 4.3158. This is contrary to the general opinion that the need for additional space and desire for profit maximization could lead to a change of use. The least considered factors include the Use of complementary infrastructure which was ranked 14th with a mean score of 3.6842 while traffic jams were ranked 15th with a mean score of 3.6579 and Government policy was ranked 16th with a mean score of 2.9637.

The occupants opined that the factors responsible for change of use include Investment potential (4.9500); Desire of business owners to maximize profits (4.8250); Interaction between supply and demand (4.7250) which have been ranked 1st, 2nd and 3rd respectively. It is observed that the opinion of occupants shows that the desire of business owners for profit maximization is ranked 2nd unlike the ranking of the Estate firms, which was 6th. The demand pull for commercial space and Accessibility were ranked 4th respectively with a mean score of 4.7000. The least considered factors include the upgrading of older structures (3.600); Government policy (2.8500) and Traffic jams (2.7750) which were ranked 14th, 15th and 16th respectively.

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The results of the Mann Whitney U test provided in Table 2 showed that there were no significant differences in the opinion of the respondents because $p \geq 0.005$ except for Planning regulations (0.001); Use of complementary infrastructure (0.033); Traffic jams (0.000); Desire of business owners to maximize profits (0.000); The demand pull for commercial space (0.014) and Investment potential (0.000) which showed that a p value≤ 0.05 which implied that there were the ones that showed significant differences in the opinion of the respondents. These results indicate that while most factors were agreed upon, Estate firms and occupants significantly differed in their perception of government regulations, infrastructure needs, traffic congestion, and economic motivations such as investment potential and profit maximization.

Table 2: Mann Whittney U Test of Difference on the Factors Responsible for Change of Use in the Study Area

Factors Responsible for Change of Use	**Estate Firms**			**Occupants of Properties**			**Mann Whittney U Test**			
	Mean	**Std. Dev**	**Rank**	**Mean**	**Std. Dev**	**Rank**	**Mann-Whitney U**	**Wilcoxon W**	**Z**	**Asymp. Sig. (2-tailed)**
Investment potential	4.7105	.45961	1st	4.7250	.59481	3rd	1386.00	2127.00	-1.019	.308
Interaction between supply and demand	4.6579	.53405	2nd	4.4500	1.07797	8th	1002.00	1743.00	-3.411	.001**
Influx of residents and businesses	4.6316	.48885	3rd	4.0000	1.12509	12th	1167.00	1908.00	-2.130	.033*
The demand-pull for commercial space	4.6053	.49536	4th	4.7000	.64435	4th	1366.00	2107.00	-1.165	.244
Agglomeration of commercial activity	4.5789	.50036	5th	4.2000	1.08383	10th	1314.00	2055.00	-1.288	.198
Accessibility	4.5526	.72400	6th	4.6250	.86236	6th	1344.00	2085.00	-1.306	.191
Space demand	4.3158	.66191	7th	2.8500	1.26391	15th	1401.00	4641.00	-.711	.477
Desire of business owners to maximize profits	4.3158	.66191	7th	2.7750	1.06706	16th	813.00	4053.00	-4.229	.000**
Demographic change	4.2368	.71411	9th	4.0750	.82332	11th	1388.00	4628.00	-.837	.402
Population size	4.1842	.65162	10th	4.2250	1.03085	9th	1458.00	2199.00	-.391	.696
Inability of the central business districts to contain the ever-increasing economic activities	4.0263	.63616	11th	4.8250	.49746	2nd	854.00	1595.00	-4.935	.000**
Planning regulations	3.9211	.99679	12th	4.7000	.78595	4th	1208.00	1949.00	-2.452	.014**
The upgrading of older structures	3.7895	.77661	13th	3.6000	.86566	14th	1339.00	4579.00	-1.118	.263
Use of complementary infrastructure	3.6842	.84166	14th	3.9000	1.1648	13th	1467.00	2208.00	-.325	.745

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					9					
Government policy	2.9737	1.1737 4	16th	4.9500	.21932	1st	1156.00	1987.00	-3.633	.000**
Traffic jams	3.6579	.90871	15th	4.6000	.77296	7th	1340.00	2081.00	-1.282	.200

Source: Field Survey, 2023

Factor analysis was further conducted to discern the factors responsible for the changes in use and the results are as presented in the proceeding tables:

Table 3: KMO and Bartlett's Test on the Factors Responsible for Change of Use

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.808
Bartlett's Test of Sphericity	Approx. Chi-Square	1618.722
	df	120
	Sig.	.000

Source: Field Survey, 2023

The Bartlett's test of sphericity and smpling adequacy are shown in Table 3 and demonstrates that the sample utilized is sufficient as the chi-square of 1618.722 is significant at $p \leq 0.000$. The KMO of 0.808 shows that the sample used was sufficient. Factor analysis is applicable since Table 3 shows that the Bartletts test is extremely significant ($p \leq 0.000$).

Table 4: Communalities on the Factors Responsible for Change of Use in the Study

Factors Responsible for Change of Use in the Study	**Initial**	**Extraction**
Interaction between supply and demand	1.000	.719
Planning regulations	1.000	.776
Use of complementary infrastructure	1.000	.905
Accessibility	1.000	.708
Population size	1.000	.802
Influx of residents and businesses	1.000	.762
Government policy	1.000	.796
Traffic jams	1.000	.657
Demographic change	1.000	.847
Space demand	1.000	.742
Desire of business owners to maximize profits	1.000	.794
The demand-pull for commercial space	1.000	.774
The upgrading of older structures	1.000	.523
Inability of the central business districts to contain the ever-increasing economic activities	1.000	.761
Investment potential	1.000	.791
Agglomeration of commercial activity	1.000	.738
Extraction Method: Principal Component Analysis.		

Source: Field Survey, 2023

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Table 4 displays the communalities of the variables, which represent the percentage of variance that is accounted for by the shared factors responsible for change of use in the study. The values range from 0 to 1, with 0 denoting that none of the variances in the variable are explained by the common components (extracted) and 1 denoting that all of the variance is explained by the common factors. The higher the communalities, the better the correlation. Higher communality indicates that larger amount of the variance in the variable has been extracted by the factor solution. For better measurement of factor analysis, communalities should be 0.4 or greater. The outcome of the communalities demonstrates that every variable is perfectly and entirely fitted with the factor solution, ruling out the possibility of removing any from the analysis. Communalities in Table 4 therefore indicate that all extraction values vary between 0.523 and 0.905 which are well above the acceptable value of 0.4 or greater. Since all variables demonstrated strong communalities, the results confirm that the factor analysis solution is robust and captures the underlying dimensions influencing land use change in the study area. Hence, the Communalities of the current study are well acceptable to precede final results of factor analysis. Table 4 shows that 90.5% of the variance out of 16 variables was linked to the use of complementary infrastructure, 71.9% of the variance linked to the variable (Interaction between supply and demand) was shared or common variance, while the upgrading of older structures have 52.3% of the variance.

The eigenvalues for each linear component (factor) before extraction, after extraction, and after rotation are listed in Table 5, a total of 16 linear components were found in the data set before extraction based on the variables responsible for change in use of properties. The proportion of variance explained in the table is based on the eigenvalues associated with each factor, which represent the variation explained by that particular linear component. The data also reveals that four (4) components were recovered with an eigenvalue minimum of 6.829. The four (4) components resulted in normalized cumulative sums of squared loading of 75.587%. This demonstrates that 75.587% of the traits of the sixteen (16) isolated factors are represented by the four (4) components. In other words, the cumulative effect of the four (4) extracted components accounts for 75.587% of the overall variation in the factors responsible for the changes in land use in Bodija, Ibadan. Therefore, efforts to determine the factors responsible for the changes in land use in Bodija, Ibadan should be concentrated on the four (4) identified primary factors.

Table 5: Total Variance Explained of the Factors Responsible for Change of Use in the Study Area

Factors Responsible for Change of Use in the Study Area	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
Interaction between supply and demand	7.820	48.873	48.873	7.820	48.873	48.873	6.229	38.928	38.928
Planning regulations	1.909	11.933	60.805	1.909	11.933	60.805	2.507	15.670	54.598
Use of complementary infrastructure	1.272	7.952	68.758	1.272	7.952	68.758	1.714	10.712	65.310
Accessibility	1.093	6.829	75.587	1.093	6.829	75.587	1.644	10.277	75.587
Population size	.930	5.810	81.397						
Influx of residents and businesses	.754	4.713	86.110						
Government policy	.531	3.318	89.429						
Traffic jams	.402	2.516	91.944						
Demographic change	.346	2.163	94.108						
Space demand	.234	1.460	95.567						
Desire of business owners to maximize profits	.200	1.252	96.819						
The demand-pull for	.137	.856	97.67						

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commercial space			5						
The upgrading of older structures	.123	.767	98.442						
Inability of the central business districts to contain the ever-increasing economic activities	.107	.670	99.111						
Investment potential	.078	.486	99.597						
Agglomeration of commercial activity	.064	.403	100.000						
Extraction Method: Principal Component Analysis.									

Source: Field Survey, 2023

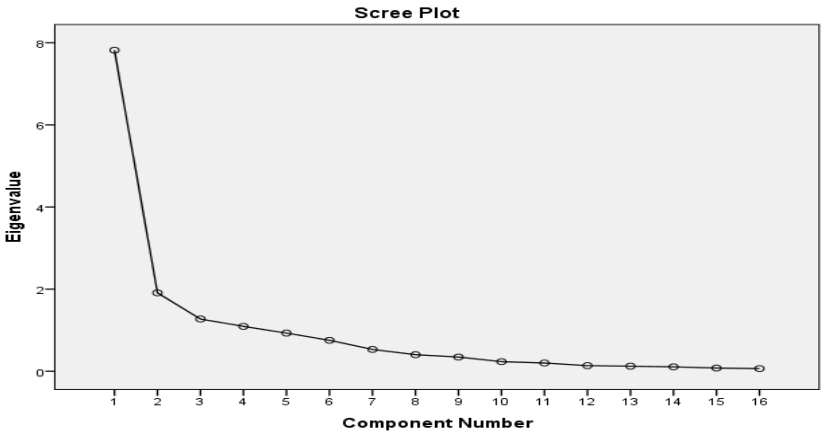

Figure 3: Scree Plot of The Factors Responsible for Change of Use

Source: Field Survey, 2023

Four (4) components were retrieved for rotation using the Varimax method from the Scree plot, with a clear cut at the fourth point.

Table 6: Rotated Component Matrix[a] of The Factors Responsible for Change of Use in the Study Area

Factors Responsible for Change of Use in the Study Area	**Component**			
	1	**2**	**3**	**4**
Interaction between supply and demand	.421		.613	
Planning regulations	.843			
Use of complementary infrastructure	.540		.684	
Accessibility	.640			-.454
Population size	.691			
Influx of residents and businesses	.801			
Government policy		.854		
Traffic jams		.677	-.438	
Demographic change	.654	.533		
Space demand	.703			
Desire of business owners to maximize profits	.727			.478
The demand pull for commercial space	.861			

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The upgrading of older structures		.694		
Inability of the central business districts to contain the ever-increasing economic activities	.760		.427	
Investment potential				.856
Agglomeration of commercial activity	.820			
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 10 iterations.				

Source: Field Survey, 2023

Table 6 displayed the factor loadings into the four (4) principal components after factors with loadings less than 0.4 were suppressed to ensure quality and ease of result interpretation. The values in Table 6, which range from 0 to 1, showed the correlation between the variables and their corresponding components. A variable's correlation to the target component is higher the higher its loading. A negative value denotes an inverse relationship, while a positive value denotes a direct link.

Factor analysis revealed four principal components driving land use change: Component 1 is **Demand, Business, Commercial Agglomeration, and Planning Regulations** – includes "Planning Regulations," "Agglomeration of Commercial Activity," "Influx of Residents and Businesses," and "Demand Pull for Commercial Space.". Component 2 is **Property Upgrades and Government-Related Factors** – includes "Government Policy," "Traffic Jams," and "Upgrading of Older Structures.". Component 3 is **Supply, Demand, and Increased Economic Activities** – includes "Interaction Between Supply and Demand," "Use of Complementary Infrastructure," "Inability of the Central Business District to Contain Economic Activities," and "Traffic Jams." Component 4 is **Accessibility and Investment Maximization** – includes "Accessibility," "Desire of Business Owners to Maximize Profits," and "Investment Potential."

V. Conclusion

It is common to witness various changes in the character and types of properties in Bodija and most especially along Awolowo and Osuntokun Avenues which has resulted in a plethora of modern and various types of properties being developed, as well as repairs, extensions, and other works been conducted on the hitherto built properties. In this regard, the research scrutinized the level of change of use of properties, and the factors influencing such changes. Formerly characterized by prototype buildings, these areas have seen a change in residential property use into lounges, clubs, shopping complexes, banks, and educational properties among others. The study identified four principal components influencing these changes, reinforcing that investment potential, business expansion, accessibility, and planning regulations play pivotal roles in land use transformation in the study area.

VI. Recommendations

Based on the findings, the study recommends that property developers, investors, and policymakers should consider key factors influencing land use changes when making investment decisions. Land use strategies should be revised to include stricter controls and ensure compliance with master plans. Government regulations must align the change of use projects with planning and building laws so as to maintain environmental sustainability. Also, property users should carefully review renovation designs to prevent substandard structures. Urban regeneration efforts should also focus on revitalizing aging properties to create smarter urban centers. Urban planning should prioritize highest and best use through proper land use allocation, thereby minimizing unapproved change of use. Lastly, retrofitting existing properties can improve sustainability, efficiency, and occupant satisfaction, thereby meeting the Environmental, Social, and Governance (ESG) standards, and substantially reducing the need for land use changes.

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