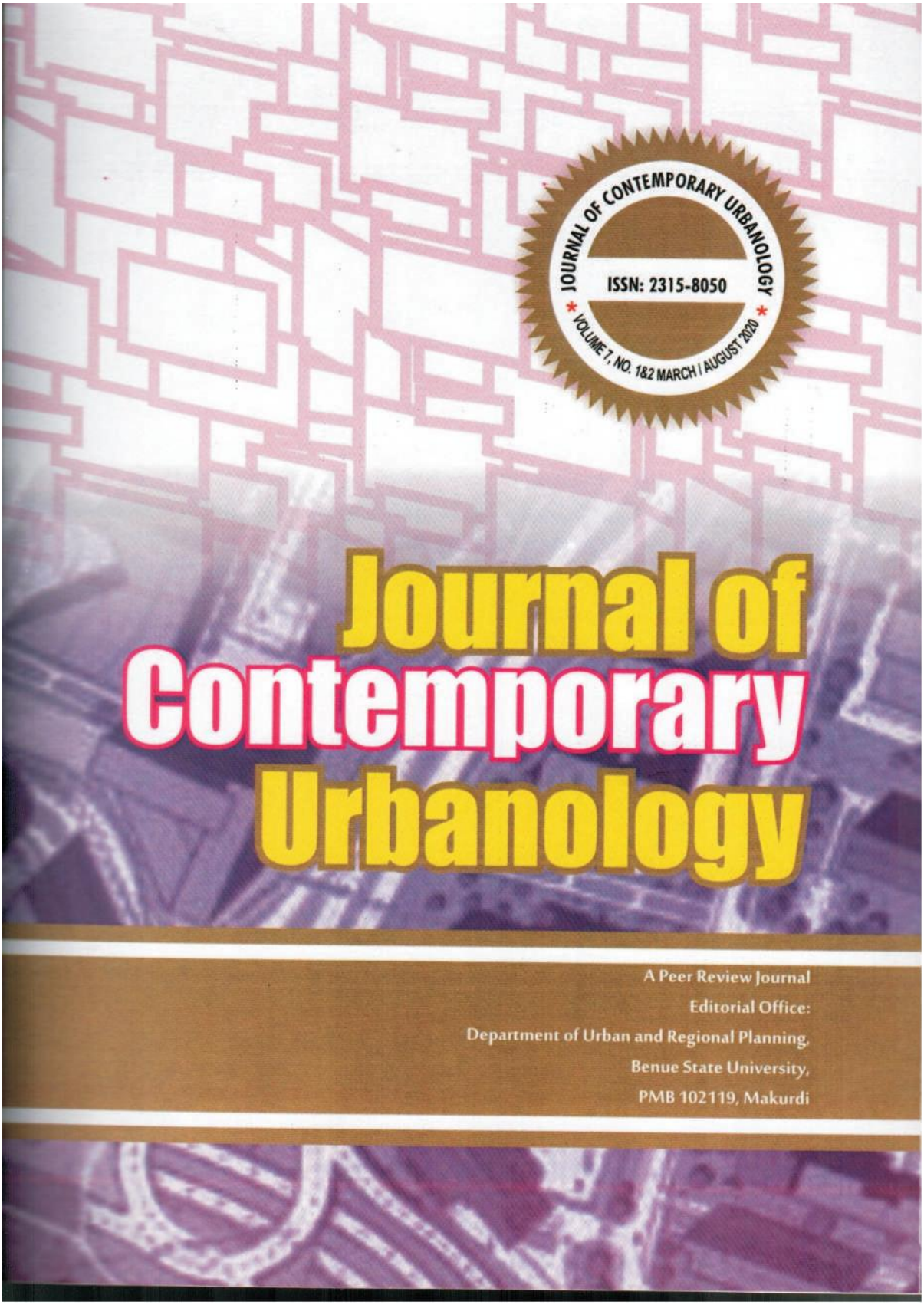
JOURNAL OF CONTEMPORARY URBANOLOGY
ISSN: 2315-8050
VOLUME 7, NO. 1&2 MARCH / AUGUST 2020
Journal of Contemporary Urbanology
A Peer Review Journal
Editorial Office:
Department of Urban and Regional Planning,
Benue State University,
PMB 102119, Makurdi

# Journal of Contemporary Urbanology

Volume7, No.1, March, 2020
Volume7, No.2, August, 2020
ISSN: 2315-8050

A Peer Reviewed Journal

**Editorial Office**
Department of Urban and Regional Planning,
Benue State University, Makurdi, Nigeria.

# Journal of Contemporary Urbanology

Volume 7, No.1, March, 2020
Volume 7, No.2, August, 2020 ISSN: 2315-8050





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Journal of Contemporary
Urbanology

Volume 7, No.2, August, 2020 ISSN: 2315-8050

# Contents

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# Incidence and Impact of Land Use Change on Physical Development in Ilorin Metropolis, Nigeria

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**Abstract**

*Land-use Conversion in cities of developing countries is growing at an unprecedented rate. This has continued to pose threats to physical development and residents' livability. It is against this background that this research seeks to investigate the abnormalities associated with land-use conversion, in Ilorin metropolis. This is with the view of suggesting measures of controlling and guiding land-use conversion in Ilorin metropolis. The metropolis was stratified into three zones (Central Business District, the zone of transition and zone of residence). Google earth was used to capture the number of buildings in the three zones. A sample of 4.6% of buildings in each zone was determined using Tarro Yamane statistical formula. Purposive sampling method was used to administer 382 copies of questionnaires to landlords or older tenants of buildings where conversion has occurred. Likert scale rating was employed to examine the opinion of respondents on factors and the impact of the land-use conversion on physical development. Analysis of variance (ANOVA) was used to test variation in the incidence of land-use change across the zones. The study revealed that mixed (49.5%) and commercial use (45.0%), was the dominant land use conversions in the study area. The major factor for land use conversion is a good location for trading (RAI 4.86) Most of these conversions are unauthorized and thus led to incompatible land use and uncontrolled development. The result of ANOVA (F= 9.653 and P= 0.000) indicated that there was a significant difference in the incidence of building conversion across the zones in the study area. The study, therefore, recommended that there should be adequate enforcement of the law on unauthorized building conversion, public orientation and environmental impact assessment (EIA) of building conversion is also recommended.*

*Key Words: Land use, Sustainability, Livability, Development, Urbanization*

**1.1: Introduction**

One constant element in life is change. Change is constant and it has affected many areas of life from technology, housing and most especially the landscape of the city. The dynamics of this change are based on three critical dimensions: time, space and decision making (Arowosegbe & Bello, 2014). Consequently, as the year advances different changes happen in space most especially within cities because of the developer decides decision to change their property from one land use to another. This process involves land use or building conversion from one use to another. The underlying key factor that influences the conversion is urbanization.

Urbanization refers to the growth of towns and cities, often at the expense of rural areas (Mabogunge, 1998). The consequences of high population density in urban areas have resulted in large-scale modification and land-use change of the environment in urban centers (United Nations, 2001). Similarly, building conversion is the consequence of the complex interactions between man and his physical environment (Farinmade, 2007). Specifically, Farinmade noted that building conversion occurs when a particular building is changed from

the use that it was originally subjected to as a result of invasion and succession of economic activities, economic rents, highest and best use as well as other factors that encompass urbanization as a whole. This phenomenon is also evident in Ilorin metropolis, most especially along the major roads.

The influx of residents from the surrounding towns around Ilorin into Ilorin city in search of white-collar jobs or other purposes has often led to the unprecedented development of the market center for the migrant. The unprecedented population poses a great demand for shops and housing and consequently causes an increase in land consumption and land-use conversion. Most of these conversions are premised on economic reasons such that land and buildings change its use from a lower order to higher order status to attain optimal use. Such changes usually result in land being allocated to its highest and best use culminating in higher economic returns without adequate attention on the impact of such changes on the life of the dwellers. Also, the building conversions directly or indirectly breach the planning law of compatibility because most of the changes do not in any way comply with the planning law and regulation, as evident in the study area. In most cases, incompatible land uses are located at close range to each other. For instance filling stations located within the residential area, markets, or shops located beside hospitals as well as the haphazard location of other land uses on physical development. Consequent to this abnormality and coupled with negativities associated with unauthorized building conversion in Ilorin, this research then seeks to analyse the level of land-use conversion and its impact on physical development in Ilorin. This will provide empirical data that will serve as a database to make policies on the control of unauthorized land-use change in Ilorin Metropolis.

## 1.2: Literature Review

### 1.2.1: Concept of Land use

Land use is simply defined as the use to which land is put as a result of man activities (Essaghah, 1997). The term ‘‘land use’’ relates to human activity or economic functions associated with a specific piece of land (NRSA, 2003). There are different types of land uses which are residential, commercial, industrial, public and semi-public, recreational land use ( parks, playground and other organised open spaces with setbacks for water bodies), transportation, agricultural and forestry Lawal, (2017). Some land-use determinant factors also influence the land-use changes in urban centres. These are economic determinants, social determinant, public interest, land use charges, land tenure system among others (William, 2014). For this study, land use is conceptualised as the use to which a property is put. This is as human activities mostly take place within the shell (buildings). Thus, buildings are the primary reflector of human activities.

### 1.2.2: Factors Responsible for Land Use Change

According to Oyebanji (2003), several factors influence land use in Nigeria, especially on property value which directly or indirectly influences land-use change. He gave the factors as population change, change in fashion and taste, institutional factors (culture, religion issues, and legislation), economic factors, location, complimentary issues, transportation and

planning control. Studies by Nelson, (1999); Hack, (2002) & Chesterton, (2002) concluded that properties near the rail station or transport routes gain slightly higher value compared with properties farther away. They remarked that transport routes have high impacts on the extent of land-use change. Urbanisation is one important factor that has influence land-use change, thus changing the physical settings of the city in many ways. With urbanisation, the transformation of human activities has become one of the main natural phenomenon (Li *et al*. 2011). With urbanization, the increase in urban population, urbanization level, leading to the city "internal restructuring" and "peripheral geographic expansion", undoubtedly make great changes to occur in urban land use patterns. The internal restructuring leads to land-use change which is mostly from residential to commercial at the city centre, forcing the previous residents to settle at the suburb and the effect of this is urban sprawl towards the suburb.

A very critical implication of land-use change in urban forms often had little regard for their impact upon environmental quality. In both developed and developing societies, this disregard is most evident in the rise of urban sprawl and incompatible land uses as the primary form of urban development, one which has come under increased criticism in recent years because of its negative environmental, social and economic effects (Newman & Kenworthy, 1989). To find a solution to the problems arising from land-use change and to guide physical development, well-founded research is needed (Alabi, 2015).

### 1.2.3: Land Use Change and Development Control

Ardill (1994) defines development control as the process and procedures concerned with controlling the development of land and building. Development can also be defined as the process of implementing approval of planning standards that is, the process of ensuring the development is carried out following the approved planning standard. Approved planning standard is referred to as planning regulations, codes or law (Obateru, 2001)

From the definition of Ardill, it is evident that development control is significant in regulating urban growth in the provision of security and maintenance of a satisfactory physical environment for various economic and social services. Also, to bring the use of land in conformity with the planned arrangement for a particular piece of land, at the same time prevent the development of land contrary to the approved plan to have a conducive, hygienic and aesthetic environment to live in. It will also help prevent the incompatible land uses close to each other and conserve land for future use. Development control is needed to secure the satisfaction of building and spaces of a single, new building in the existing group or street or a locality in general. Development control of the Ilorin metropolis has not been effective as evident in the illegal and uncontrolled land-use change and other factors that hinder the control activities.

### 1.2.4: Urban and Regional Planning Decree 1992 as a Development Control Tool.

This law imposes an obligation on the different bodies of planning authority (commission, board, and local authority) to have a department to be known as the development control department, vested with the power over control of development on all land within the federal,

state and local government respectively. Any person who seeks to develop any land in the area of jurisdiction of either federal, state or local government shall submit a development plan for approval of such development to the development control department of his/her area of jurisdiction. (F.R.N.G, 1992). This implies that every development, be it a new development or land-use change must be approved by the planning authority in that jurisdiction where such development is to take place.

**2.1: The Study Area**

Ilorin city is one of the large cities in Nigeria and the capital of Kwara State. It lies between longitude $4^0$32'0″ and $5^0$00'0″ East of Greenwich meridian and between Latitude $8^0$20'0″ and $8^0$44'0″ North of Equator as shown in Figure 1. It is bounded in the north by Moro L.G.A; in the East by some villages within Ilorin LGA itself, and Ifelodun L.G.A; while in the South and to the West, by Asa LGA as shown in Figure 1. The city of Ilorin is also the headquarters of Ilorin West LGA. Therefore, the city plays a dual administrative roles-as the capital of Kwara State and as the headquarters of Ilorin West LGA. Hence, Ilorin West, East, and South as well as Asa and Moro LGAs constitute what is known as Ilorin emirate while the Ilorin metropolis comprises of Ilorin West, East, and South (Iroye and Abejirin, 2012). According to Olanrewaju, (2009) Ilorin has an area of about 100km$^2$. It serves as a gate between the South and the North. In other words, Ilorin is a frontier settlement between the Northern Hausa culture and the Southern Yoruba Culture.

Ilorin city has grown tremendously in physical and population size and it is among the fastest-growing cities in the country. The first population estimate of Ilorin after the establishment of the colonial administration was made in 1953 which gave it a population of 36,343. The 1963 population census figure for the town was 40,994 which rose to 208,546 in 1976 (Master plan, 1976). It has increased from about 570,000 in the 1991 census to 766,000 in 2006 with a growth rate of 2.6% (NPC,2009).

The elevation of the area varies from 273m to 333m on the western side with an isolated hill (Sobi hill) of about 394m above sea level while on the eastern side it varies from 273m to 364m (Ajibade and Ojelola, 2004). The lowest level is along the river valley of Asa and Oyun while the highest point is Sobi Hill. Ilorin is mainly drained by Asa River which flows in a South-North direction (Ajibade and Ojelola, 2004). The pattern of the drainage system of Ilorin is dendritic. Asa river occupies a fairly wide valley and goes a long way to divide Ilorin into two parts; namely the eastern and western parts. The eastern part covers those areas where the GRA is located while the core indigenous area of Ilorin falls under the western part.

The climate is tropical according to Koppen classification characterized by raining and dry seasons. The rainy season often occurs between March and November. The annual rainfall varies from 1000mm to 1500mm with a peak in September to early October. The average monthly temperature is generally high throughout the year (Ajibade, 2002). The minimum temperature range from $21.1^0$C to $25^0$C with an average maximum temperature of $38^0$C, while relative humidity is about 77.50% and daily sunshine of about 7.1h (Olanrewaju, 2009)

Vegetation and climatic condition viz-a-viz. other factor dictates the vegetation type found in the area, the favorable climate is also a factor that attracts residents to reside in the Ilorin thus leading to quest for more land and also resulted in building conversion.

The people's occupational activities are lumbering, blacks-milting, pottery, cloth weaving, farming and trading of arable and vegetable crops such as Maize, Groundnut, Tomato, Rice to mention but few (Ajadi *et al*., 2011). The availability of loamy soil, good relief and good drainage system of Ilorin couple with several rivers make people settle at Ilorin for farming occupation. However, the development that occurred over the years in Ilorin has turned the farming occupation into secondary occupation such as trading activities., The farmers were then forced to move to the suburb for their farming activities, although, the suburb is currently been encroach on by urban expansion. Premised on this, the paper analyses land-use conversion and its impact on physical development

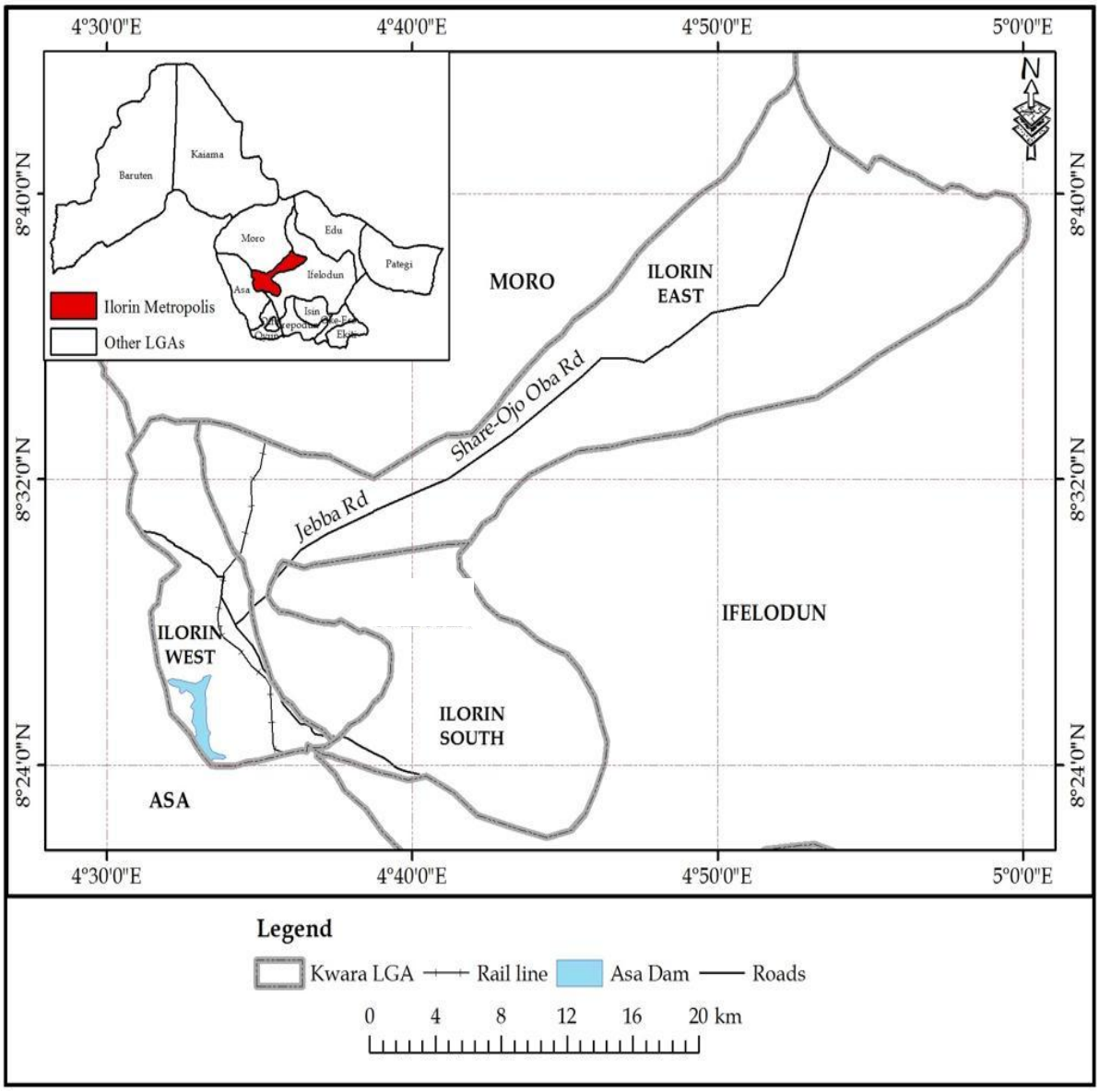


**Figure 1:** Ilorin within the context of Kwara State
**Source:** Kwara State Ministry of Housing and Urban Development

### 3.1: Materials and Methods

This research adopts three major data collection methods which are observation, interview and questionnaire administration. Prior to this, reconnaissance survey method was employed to get familiar with the study area; particularly on the issues of land-use change. Direct observation was employed to take inventory of predominant land use in the study areas, and photographs were taken to support the observation. Interview was employed to elicit information from the Ilorin metropolis (Ilorin East, West and South) town planning authority on land-use change matters. Structured questionnaire was also designed and used to obtain information on the incidence of land-use changes and the level of land-use change, factors responsible for land-use changes; types and nature of land-use changes in the study area; impacts of land-use change on the physical development among other relevant questions.

The sampling frame for this research was determined based on the concentric model. Ilorin metropolis was stratified in three zones, using the concentric model as postulated by Park & Burges (1925). The three rings were Central Business District, Zone of Transition and Zone of Residence. The CBD is characterized by commercial activity and area with the highest land-use changes, the zone of transition is dominated by both residential and commercial activities while the zone of residence is dominated by residential land use as observed during the pilot survey**.** The Locality that formed each of these zones was determined through field survey. The sample size was purposively determined by selecting areas with predominant land use within the three zones (see Table 1).

Google earth was used to capture the imageries of the selected areas and counting was done to ascertain the number of buildings in the selected area. Ground truthing was equally adopted to confirm the data extracted from google earth. There are a total of eight thousand three hundred and forty-two (8,342) buildings in the selected areas. Out of the total number of buildings in each zone 4.6% of buildings were selected for questionnaire administration with the use of Tarro Yamane statistical formula. This proportion is justified because of its appropriateness in reducing the larger population that cannot all be sampled and has been adopted by many scholars, including Asadu *et al* (2018).

$n = N / (1+N (e)^2$

n the sample size

N the population under study

e the margin error

$n = 8342 / (1+ 8342 (0.05)^2)$

$n = 8342 / (1+8342 (0.0025)$

$n = 8342 (1 + 20.855)$

$n = 8342 / 21.855$

$n = 382$

382 questionnaires were used as total sample size for the study. To determine the sample size for each zone the formula below was employed to get the same 4.6% used as the total sample size for the study. See Table 1 for breakdown of questionnaire administered in each zone.

$$\frac{\text{Number of buildings in each zone}}{\text{Total number of building selected}} \times 382$$

Purposive sampling techniques were adopted to administer questionnaires to residents in identified buildings where change had taken place in the selected areas. The questionnaire was administered to the landlords or older tenants in the selected buildings where changes occurred. Data obtained were subjected to descriptive and inferential statistics. This includes percentage, crosstab and Likert scale measurement. Likert scale measurement was used to measure the opinion of respondents on factor influencing land-use change and the impact of land-use change on the residents. This was measured through the Likert scale range from Not Agreed at all (1), Not Agreed (2), Partially Agreed (3), Agreed (4) and Very much Agree (5), the average weight was compared with the index mean value. Content analysis was used to analyse the Information obtained from the planning authority. The inferential statistics utilized were Analysis of Variance (ANOVA) and Chi Square, ANOVA was used to check the variation of the incidence of land-use change across the zones, while Chi Square was used to check the relationship between the types of land use mixed across the zones.

**Table 1 Names of Areas across the Zones, Number of Buildings, and Number of Questionnaires Administered**

| Classification and names of Rings | List of locations across the zones | Selected areas for field survey | Number of building | Sample size at 4.6% of total number of building. |
|---|---|---|---|---|
| Central Business District (CBD) | Post office, Challenge, Taiwo, unity, Maraba, Agric, Sango, Offa Road, Oja Oba, Asa-Dam, General, Oja tuntun, Ipata, Isale Oja, Itaamodu, Okoolowo, Adifa, Ita-Ajia, Gambari, Idi-Ape, Agaka, Baboko | Post office, Challenge, Taiwo, Unity, Maraba, Ipata, Gambari, Isale-Oja, Oja Oba, Asa-Dam, General, Ojatuntun, Itaamodu | 3, 867 | 177 |
| Zone of Transition | Offa Garage, Odota, Sawmill, Gerin Alimi, Tanke Road, Pipeline, Gaa Akanbi, Atiku road, Elekoyangan, Oloje, Mandate, Opomolu, Niger, Okoerin, Emir's road, Olunlade, Fate | Offa Garage, Odota, Sawmill, Gerin Alimi, Tanke Road, Pipeline, Gaa Akanbi, Atiku road, opomolu, Okoerin, Mandate | 3,264 | 150 |
| Zone of residence | Alagbede, Oke odo, Oke Oyi, Ojuekun, Omoda, Edun, Kankantu, Itaadu, Adualere, Isalekoko, Gaa-saka, Olorunsogo, Alanamu, Okefomo, Sanni-Okin, Wara, Pakata, , Oke-Kere, Adeta, Alore, Agbooba, Okelele, Alagbado, Akerebiata, Ita merin, Gerewu, Okesuna | Alagbede, Oke odo, Agbooba, Okelele, Itaadu, Olorunsogo. Adeta, Edun, Okefomo, Pakata | 1,211 | 55 |
| **TOTAL** | | **34** | **8,342** | **382** |

**Source: Authors' Field Work (2018)**

### 4.1: Results and Discussion

#### 4.1.1 : Land Use Change across the Zones

The result of land-use changes across the zones as presented in Table 2 revealed the differences in land use change. At the central business district (CBD), the previous use was majorly residential land use (100%), while currently, commercial land-use (63.2%), mixed use (35.6%) and educational land use (0.6%) have replaced residential land use. In the zone of transition, the previous land use was majorly for residential purposes (75.3%) next to it was educational (16.0%) and commercial (8.7%). However, the dominant land use in the zone currently is mixed-use (55.3%), next to it is commercial use (32.0%), religious use (4.7%) and industrial use (4.0%). The educational land use recorded the least in the zone (3.3%)

The result of the analysis shows that in the zone of residence, the previous land uses were mostly residential (89.0%), next to it was commercial (5.5%) and educational (5.5%). But this has changed to mixed-use (74.55%) which is mostly (residential and shops), commercial uses (20.0%) while residential land used reduced to (5.45%). The dominance of commercial and mixed-use in the three zones does not mean that proportion used for residential land use is missing in the zone, but most of the residential land use where changes have taken place is now mixed with other uses, most especially with commercial land use (see Table 4). This agrees with Oyebanji's (2003) findings that economic factor is responsible for land-use changes and supported by Stratton (2008) that the concentration of commercial activities affect the choice of property purchase and land-use changes.

**Table 2 Land Use Change across the Zones**

| Zone within the city | Land Use Type | Land use Changes | | | |
|---|---|---|---|---|---|
| | | Previous Use | | Current Use | |
| | | **Freq** | **%** | **Freq** | **%** |
| Central Business District | Residential | 177 | 100.0% | 1 | 0.6% |
| | Commercial | 0 | 0.0% | 111 | 63.2% |
| | Educational | 0 | 0.0% | 1 | 0.6% |
| | Mixed | 0 | 0.0% | 64 | 35.6% |
| | Industrial | 0 | 0.0% | 0 | 0.0% |
| | Religious | 0 | 0.0% | 0 | 0.0% |
| | Total | 177 | 100.0% | 177 | 100% |
| Zone of Transition | Residential | 113 | 75.3% | 1 | 0.7% |
| | Commercial | 13 | 8.7% | 48 | 32.0% |
| | Educational | 24 | 16.0% | 5 | 3.3% |
| | Mixed | 0 | 0.0% | 83 | 55.3% |
| | Industrial | 0 | 0.0% | 6 | 4.0% |
| | Religious | 0 | 0.0% | 7 | 4.7% |
| | Total | 150 | 100.0% | 150 | 100.0% |
| Zone of Residence | Residential | 49 | 89.0% | 3 | 5.45% |
| | Commercial | 3 | 5.5% | 11 | 20.0% |
| | Educational | 3 | 5.5% | 0 | 0.0% |
| | Mixed | 0 | 0.0% | 41 | 74.55% |
| | Industrial | 0 | 0.0% | 0 | 0.0% |
| | Religious | 0 | 0.0% | 0 | 0.0% |
| | Total | 55 | 100% | 55 | 100.0% |

**Source: Author's Field Survey (2019)**

### 4.1.2 : Type of Land Use Mixed within Zones

The type of land use mix as presented in Table 3 revealed the spatial pattern of land use within the three zones sampled. The R% means the percentage of different mixed-use in each zone, while C% is the total percentage of different mixed-use in the three zones combined. Most of the mixed-use in the CBD, Zone of transition and zone of residence are commercial and residential representing 96.9%, 97.6% and 100% respectively. Other categories of mixed-use are: residential/industrial (2.4%) for the zone of transition, while residential/institutional and residential/public use recorded 1.6% each for CBD. The larger proportion (97.9%) of mixed-use for residential and commercial in all three zones is an indication of land-use change. This was spurred by the development of economic activities particularly in CBD and zone of transition. This result is in agreement with the finding of Goodall (1972) that high income appears to be the major determinant of land-use change which makes a change to residential/commercial use rampant in urban centres (see plate 1/2). The result of the chi-square analysis for the three zones reveals that there is no significant relationship between land-use changes across the zones with $X^2$ of 6.543 and P-value of 0.355.

**Table 3 Types of Mixed Use within Zones**

| **Type of zone** | **Type of mixed use change** | | | | **Total** |
|---|---|---|---|---|---|
| | Residential/ commercial | Residential/ industrial | Residential/ institutional | Residential/ Public use | |
| **CBD** | 62 | 0 | 1 | 1 | 64 |
| **R%** | 96.9% | 0.0% | 1.6% | 1.6% | |
| **C%** | 33.2% | 0.0% | 100.0% | 100.0% | 33.5% |
| **Zone of transition** | 82 | 2 | 0 | 0 | 84 |
| **R%** | 97.6% | 2.4% | 0.0% | 0.0% | |
| **C%** | 43.9% | 100.0% | 0.0% | 0.0% | 44.0% |
| **Zone of residence** | 43 | 0 | 0 | 0 | 43 |
| **R%** | 100.0% | 0.0% | 0.0% | 0.0% | |
| **C%** | 23.0% | 0.0% | 0.0% | 0.00% | 22.5% |
| **Total** | 187 | 2 | 1 | 1 | 191 |
| **C%** | 97.9% | 1.0% | 0.5% | 0.5% | 100.0% |

$X^2 = 6.543$, P = 0.355.

**Source: Author's Field Survey (2019)**


**Plate 1: Building use for Both Residential/ Commercial along Tanke Road**
**Source: Author's Field Survey (2019)**

**Plate 2: Building use for both Residential/ Commercial, Kulende Area Zango**
**Source: Author's Field Survey (2019)**

### 4.1.3: Pattern of Observed Changes in Land Use

Figures 2 and 3 shows the land use pattern of the Ilorin metropolis, the inner circle is the Central Business District, (CBD) followed by the zone of transition and zone of residence. Figure 2 revealed the previous land-use as follows; the CBD, dominated by residential uses, the zone of transition dominated by residential use but has little commercial and educational uses while the zone of a residence was dominated by residential use. The implication of this is that Ilorin was previously dominated by a residential use. This is in agreement with Onokerhoraye and Omuta (1986) that urban land use in Ilorin was largely dominated by residential uses.

Current land use as revealed in Figure 3 shows a significant change in the pattern of land-use in the Ilorin metropolis. The CBD is now dominated by commercial and mixed-use. The zone of transition is dominated by mixed-use and some commercial use while the zone of residence is dominated by residential use and mixed-use. The mixed-use in the zone of residence is majorly residential and commercial as revealed in Table 3. The implication of this is that commercial activities have taken over the city centre of the Ilorin metropolis and it is spreading outward at an unprecedented rate. This reflects the high level of land-use conversion taken place in the Ilorin metropolis.

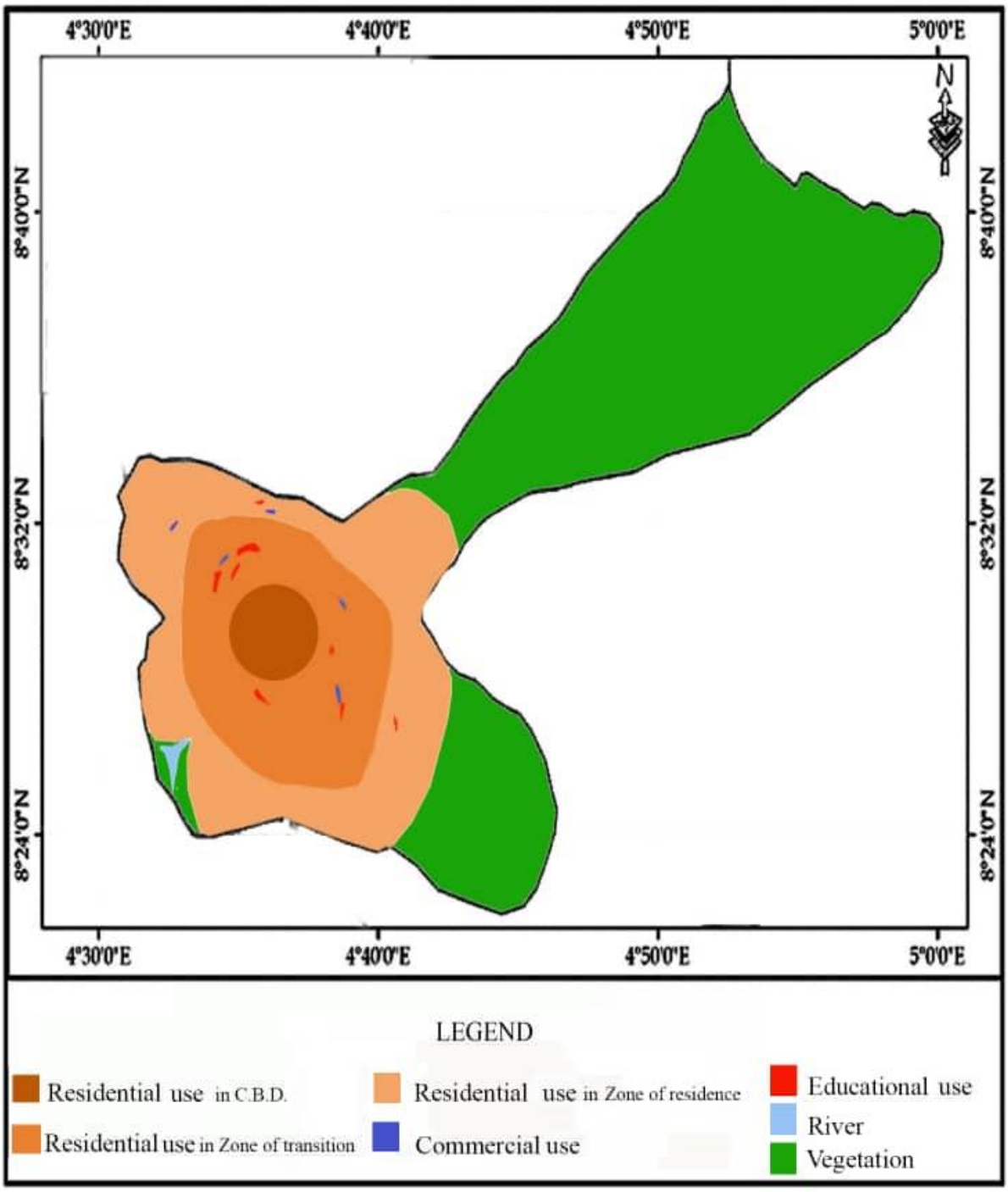


**Figure 2: Spatial Variation of Previous Land Uses within Zones of Ilorin Metropolis**

**Source: Author's Field Survey (2019)**

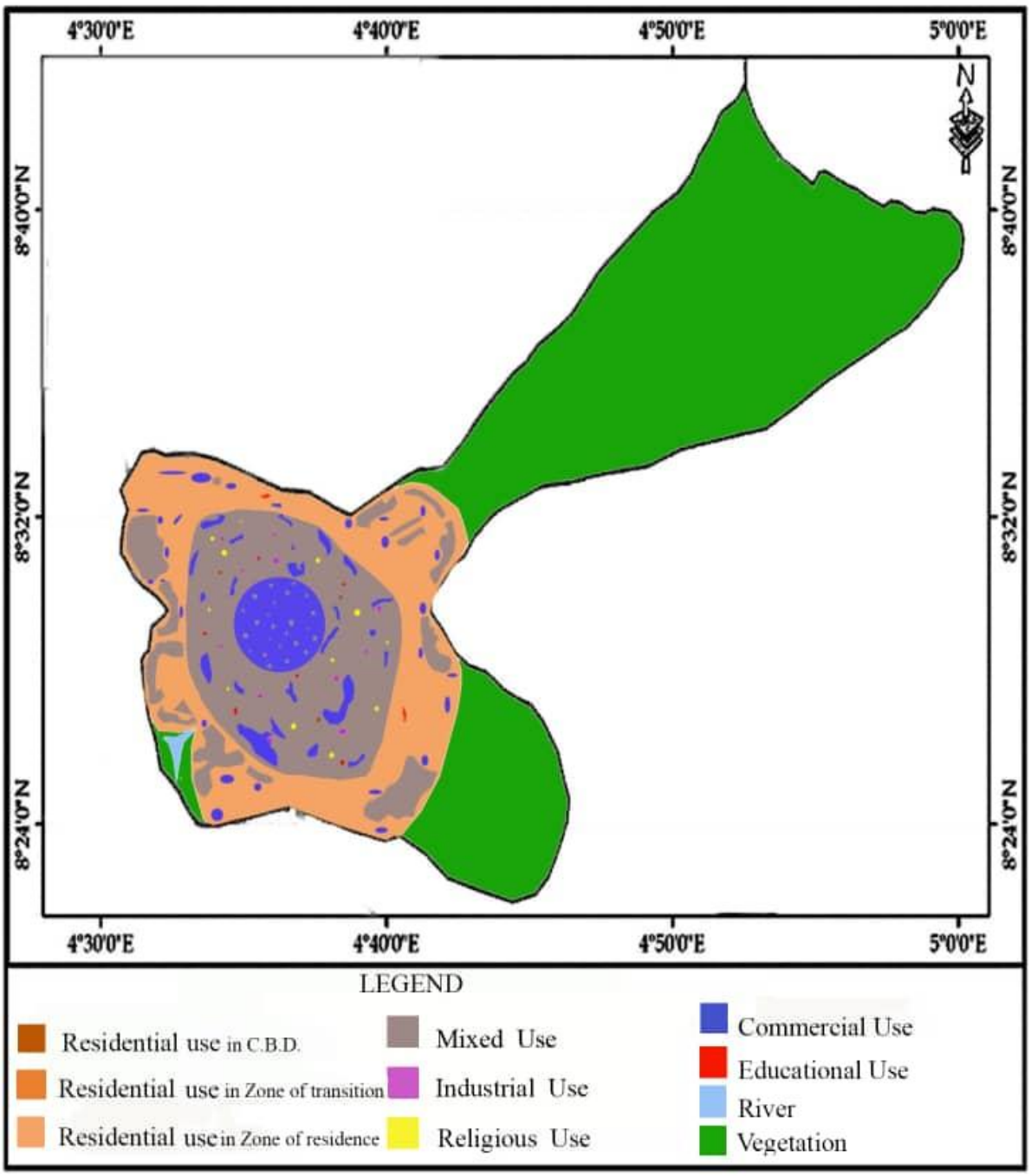


**Figure 3 : Spatial Variation of Current Land Use within Zones of Ilorin Metropolis**

**Source: Author's Field Work (2019)**

### 4.1.4: Incidence of land use change Across the Zones in the Metropolis

The result of the analysis of variance (ANOVA) on the incidence of change of use across the zones as summarized in Table 4 shows that there is a significant difference in the incidence of land-use change across the zones with F value = 9.653 and P-value = 0.000. It suggests that the null hypothesis is rejected. This implies that there is a significant difference in the change of use of building across zones.

**Table 4 Incidence of Land Use Change across the Zones**

| Source of Variation | Sum of Square | df | Mean-square | F | Sig |
|---|---|---|---|---|---|
| Current use of the building within zones | | | | | |
| Between Groups | 21.959 | 5 | 4.392 | 9.653 | .000 |
| Within Groups | 171.077 | 376 | 455 | | |
| Total | 193.037 | 381 | | | |

**Source: Author's Field Survey (2019)**

### 4.1.5: Factors Responsible for Land Use Change

Table 5 presents a summary of the perceived factors that influence land-use change in the study area. Likert scale was employed in measuring the weight of responses of the respondents on their level of agreement on the factor that is responsible for the land-use change in the study area. The responses were grouped into five classes to determine the degree of importance on the index placed by the residents. The variables (Very agreed, agreed, partially agree, not agree and not agree at all) were used to determine its level of agreement as this was assigned weight 5,4,3,2 and 1 to the ratings respectively in decreasing order of relevance.

It is revealed from the analysis that a good location for trading (RAI 4.86), security advantage (RAI 4.81) and an increase in profit (4.75) recorded the highest acceptability index. This implies that they are the major factors strongly perceived to influence land-use changes. Other factors associated with land-use change include; accessibility to the road (RAI 4.50), aesthetic purposes (RAI 4.29) and agglomeration of common commodities (RAI 4.23). This also suggests that these variables influence location of business ventures and consequently land-use change. In addition to these factors, availability of electricity and pipe bore water (RAI 4.21), proximity to the place of work (RAI 3.44) and good location for religious activities have little influence on land-use change. This is premised on the fact that they recorded a low deviation about the mean of 4.23. The computed standard deviation was 0.59 while the variance was 0.35 and the coefficient standard deviation was 13.94%, implying that there is a scattered distribution about the mean of 4.23. These findings support the assertion

of Ligman (2009) and Yeh (1997) that an increase in profit and proximity to road enhances business location and land-use change. The agglomeration of banks, most especially along Unity road, Challenge and Tanke junction were also premised on security reasons (see plate 3/4). The finding is also in agreement with the multiple nuclei theory postulated by Harris & Ullman (1945) and explained in Gosh (2008) that there emerges natural clustering tendency of similar activities that group together because they benefit from proximity.

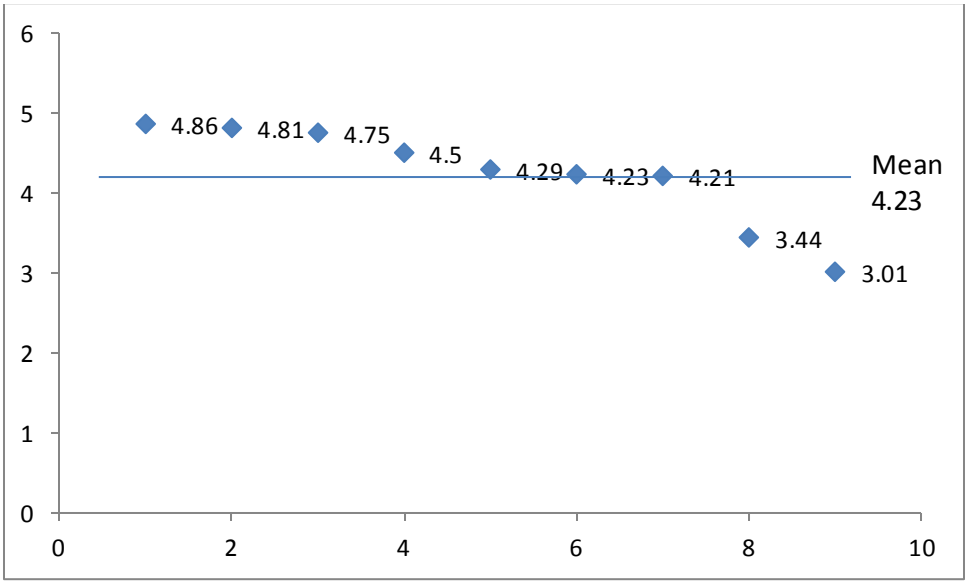


**Figure 4: Scattered Distribution of Variables in Table 5 about the mean Value**
**Source: Author's Field Survey (2019)**

**Table 5: Factors Influencing Land Use Change in the Study Area**

| Factor Influencing Change of Use | NAA | | NA | | PA | | A | | VA | | TWV | TOTAL | RAI (X) TWV/N | (x-x) | $(x-\dot{x})^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $f_{(1)}$ | $W_{(1)}$ | $f_{(2)}$ | $W_{(2)}$ | $f_{(3)}$ | $W_{(3)}$ | $f_{(4)}$ | $W_{(4)}$ | $f_{(5)}$ | $W_{(5)}$ | | | | | |
| **Good location for trading activity** | 1 | 1 | 1 | 2 | 6 | 18 | 35 | 140 | 339 | 1695 | 1856 | 382 | 4.86 | 0.63 | 0.3969 |
| **Security advantage** | 0 | 0 | 1 | 2 | 2 | 6 | 66 | 264 | 313 | 1565 | 1837 | 382 | 4.81 | 0.58 | 0.3364 |
| **Increase in Profit** | 0 | 0 | 0 | 0 | 2 | 6 | 90 | 360 | 290 | 1450 | 1816 | 382 | 4.75 | 0.52 | 0.2704 |
| **Accessibility to road** | 0 | 0 | 0 | 0 | 11 | 33 | 170 | 680 | 201 | 1005 | 1718 | 382 | 4.50 | 0.27 | 0.0729 |
| **Aesthetic purposes** | 0 | 0 | 2 | 4 | 19 | 57 | 227 | 908 | 134 | 670 | 1639 | 382 | 4.29 | 0.06 | 0.0036 |
| **Agglomeration of common commodity** | 0 | 0 | 1 | 2 | 16 | 48 | 258 | 1032 | 107 | 535 | 1617 | 382 | 4.23 | 0.00 | 0.000 |
| **Availability of electricity and pipe borne water facility** | 1 | 1 | 1 | 2 | 43 | 129 | 208 | 832 | 129 | 645 | 1609 | 382 | 4.21 | -0.02 | 0.0004 |
| **Proximity to place of work** | 1 | 1 | 1 | 2 | 231 | 693 | 126 | 504 | 23 | 115 | 1315 | 382 | 3.44 | -0.79 | 0.6241 |
| **Good location for religious activities** | 1 | 1 | 31 | 62 | 321 | 963 | 21 | 84 | 8 | 40 | 1150 | 382 | 3.01 | -1.22 | 1.4884 |
| **Total** | | | | | | | | | | | | | 38.10 | | 3.1931 |
| **Mean FICGI** | 4.23 | | | | | | | | | | | | | | |

**Source: Author's Field Work (2019)**

Where TWV means Total weight value, Variance = $\Sigma (x-\dot{x})^2/9 = 3.19/9 = 0.35$, Standard Deviation = $\sqrt{\text{Variance}} = \sqrt{0.35} = 0.59$

Co-efficient of Variation (CV) = S.D x 100/Mean RAI = 0.59 x 100/4.23 = 13.94%, Total = Total number of respondents, RAI(X) = Resident Agreed Index , F=Frequency of different reply, W= Weighted Index, Mean = $\Sigma$RAI/N = 38.1


**Plate 3: Concentration of Banks at Challenge Area, Ilorin**
**Source: Author's Field Survey (2019)**

**Plate 4: Concentration of Commercial Activities along Tipper Garage, Ilorin**
**Source: Authors Field Survey (2019**

### 4.1.6: Impact of Land Use Change on Physical Development

The mean (RAI) score on the opinion of residents on the impact of land-use changes on physical development is shown in Table 6. The scores were derived by assigning weight to variables ranging from very agreed as 5 points, to not agree at all as 1 point using a Likert scale. The summation of each item was divided by the number of respondents in each item. It is revealed from the Table 6 that land-use change affected the city landscape as buildings were converted from bungalows to skyscrapers (RAI 4.92), improvement in aesthetic of the city (RAI 4.88) and reconstruction of dilapidated buildings (4.88). The finding also shows an improvement in infrastructures like Road maintenance (RAI 4.87), Provision of drainage (RAI 45.84) and provision of electricity (RAI 4.82). These were highly perceived by respondents because it recorded the highest RAI indexes above the mean value (4.47). The implication of this is that land-use change has positive development in the city. This follows a decreasing order of perception in the level of agreement on impact for physical development for road expansion (RAI 3.73), development of street light (RAI 3.69) and provision of water facilities (RAI 3.57). The level of impact on physical development was perceived very low and this suggests a little impact on physical development. Since these three variables are below the mean value of (4.47). The standard deviation was 0.57 while the variance was 0.32 and the coefficient standard deviation was 12.75%, implying that there is scattered distribution about the mean value. The result of findings supports the finding of Robert (2000) that ‘‘land-use change leads to the resolution of urban problems and seeks to bring about an improvement in the economic, physical, social and environmental conditions of an area that has been subjected to change”. Similarly, through the reconnaissance survey, it was observed that some of the developers provided some infrastructural facilities like step-down transformers, electric pole, and construction of drainages to

accommodate the redevelopment of land use and functionality of the area. The land-use change also contributed to the transformation of the landscape of the study area (see plate 5/6).

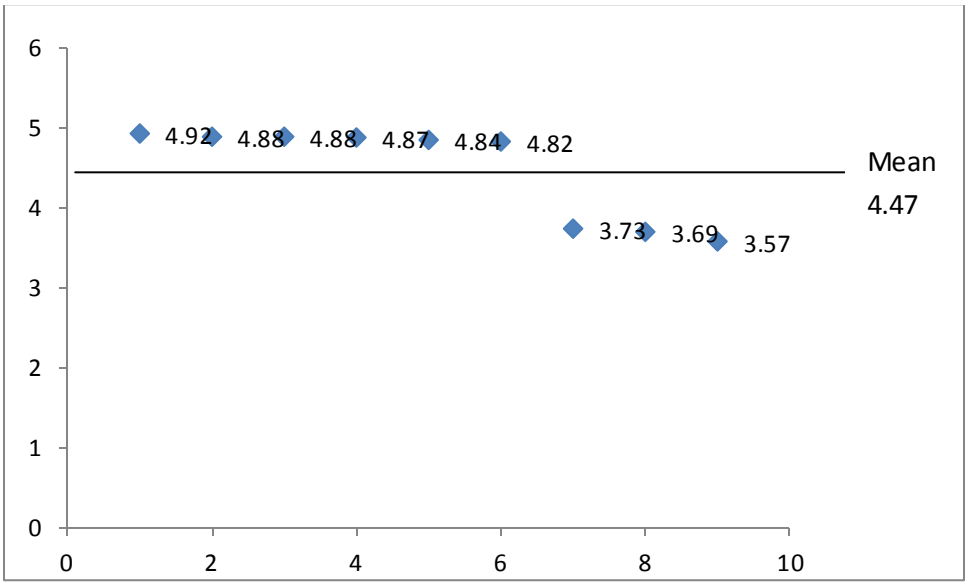


**Figure 5: Scattered Distribution of Variables in Table 6 about the mean Value**
**Source: Author's Field Survey (2019)**

**Table 6: Impact of Land Use Changes on Physical Development**

| Factor Influencing Change of Use | NAA | | NA | | PA | | A | | VA | | TWV | TOTAL | RAI (x) TWV/N | (x- ẋ) | $(x-ẋ)^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $f_{(1)}$ | $W_{(1)}$ | $f_{(2)}$ | $W_{(2)}$ | $f_{(3)}$ | $W_{(3)}$ | $f_{(4)}$ | $W_{(4)}$ | $f_{(5)}$ | $W_{(5)}$ | | | | | |
| **Change in landscape of the city** | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 116 | 353 | 1765 | 1881 | 382 | 4.92 | 0.45 | 0.2025 |
| **Improvement on aesthetic of city** | 1 | 1 | 0 | 0 | 3 | 9 | 34 | 136 | 344 | 1720 | 1866 | 382 | 4.88 | 0.41 | 0.1681 |
| **Reconstruction of dilapidated buildings** | 0 | 0 | 0 | 0 | 7 | 21 | 32 | 128 | 343 | 1715 | 1864 | 382 | 4.88 | 0.41 | 0.1681 |
| **Road maintenance** | 0 | 0 | 0 | 0 | 11 | 33 | 27 | 108 | 344 | 1720 | 1861 | 382 | 4.87 | 0.40 | 0.16 |
| **Provision of drainage** | 0 | 0 | 1 | 2 | 9 | 27 | 42 | 168 | 330 | 1650 | 1847 | 382 | 4.84 | 0.37 | 0.1369 |
| **Provision of electricity** | 0 | 0 | 0 | 0 | 3 | 9 | 64 | 256 | 315 | 1575 | 1840 | 382 | 4.82 | 0.35 | 0.1225 |
| **Road expansion** | 0 | 0 | 6 | 12 | 138 | 414 | 192 | 768 | 46 | 230 | 1424 | 382 | 3.73 | -0.74 | 0.5476 |
| **Development of street light** | 1 | 1 | 2 | 4 | 142 | 426 | 206 | 824 | 31 | 155 | 1410 | 382 | 3.69 | -0.78 | 0.6084 |
| **Provision of water facilities e.g borehole** | 4 | 4 | 19 | 38 | 154 | 462 | 166 | 664 | 39 | 195 | 1363 | 382 | 3.57 | -0.90 | 0.81 |
| **Total** | | | | | | | | | | | | | 40.20 | | 2.9241 |
| **Mean** | 4.47 | | | | | | | | | | | | | | |

**Source: Author's Field Work (2019)**

Where TWV means Total weight value, Variance = $\Sigma (x-ẋ)^2/9 = 2.92/9 = 0.32$, Standard Deviation = $\sqrt{}$Variance = $\sqrt{}0.35 = 0.57$

Co-efficient of Variation (CV) = S.D x 100/Mean RAI = 0.57 x 100/4.47 = 12.75%, Total = Total number of respondents, RAI(X) = Resident Agreed Index, F=Frequency of different reply, W= Weighted Index, Mean = $\Sigma$RAI/N = 40.20/9=4.47

**Plate 5: Changing of City Landscape from Bungalow to Skyscrapers, Tanke, Ilorin**
**Source: Author's Field Survey (2019)**

**Plate 6: Provision for the Community, at Unity Area, Ilorin**
**Source: Author's Field Survey (2019)**

### 4.1.7 : Challenges of Land Use and on Residents

Land-use change has some positive impact on physical development, despite these positive impacts, it has also undoubtedly led to various environmental problems. The challenges range from incompatible land uses, illegal land-use changes, destruction of ecosystems among others. The result of the analysis of the opinions of residents on the challenges of land use changes is summarised in Table 7. Likert scale was adopted in rating the opinions of residents, it was observed that incompatible land-use changes (RAI 4.73), dust generation during conversion posing health risk (RAI 4.66), traffic congestion (RAI 4.62) were strongly perceived as the challenges of land-use changes in the study area. This is because they recorded a high positive deviation about the mean. This is followed by air pollution from heavy traffic (RAI 4.52) and noise pollution (RAI 4.47) from commercial activities and related uses. These two variables also pose a significant challenge to the residents in the study area when compared to the mean. Variable with lower RAI than mean value include land pollution (RAI 3.62) and water pollution (RAI 3.56). These were perceived as very low compare to mean value and thus pose little challenges to the residents.

The result is in agreement with the observation carried out during the reconnaissance survey. It was observed that there are some incompatible land uses like filling stations built very close to residential use in the study area. Thus poses threat to the safety of people as illustrated in (plate 7) and banks been located within the residential buildings which may also be dangerous to the safety of the people in cases of arm robbery (see plate 8). The standard deviation was 0.46 while the variance was 0.21 and the coefficient standard deviation was 10.67%. The result is also in consonance with the finding of Famarinde, (2007) that land-use changes increase pollution, lead to the housing shortage, traffic congestion, incompatible land uses and uncontrolled development.

**Table 7: Opinions of Respondents on challenges of Land Use Change on the Residents**

| Factor Influencing Change of Use | NAA | | NA | | PA | | A | | VA | | TWV | N | RAI (x) TWV/N | (x-ẋ) | $(x-ẋ)^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $f_{(1)}$ | $W_{(1)}$ | $f_{(2)}$ | $W_{(2)}$ | $f_{(3)}$ | $W_{(3)}$ | $f_{(4)}$ | $W_{(4)}$ | $f_{(5)}$ | $W_{(5)}$ | | | | | |
| **Incompatible land use** | 0 | 0 | 0 | 0 | 1 | 3 | 102 | 4O8 | 279 | 1395 | 1806 | 382 | 4.73 | 0.42 | 0.1764 |
| **Health risk** | 0 | 0 | 0 | 0 | 6 | 18 | 119 | 476 | 257 | 1285 | 1779 | 382 | 4.66 | 0.35 | 0.1225 |
| **Traffic congestion** | 0 | 0 | 1 | 2 | 2 | 6 | 139 | 556 | 240 | 1200 | 1764 | 382 | 4.62 | 0.31 | 0.0961 |
| **Air pollution from heavy traffic** | 1 | 1 | 0 | 0 | 11 | 33 | 156 | 624 | 214 | 1070 | 1728 | 382 | 4.52 | 0.21 | 0.0441 |
| **Noise pollution** | 0 | 0 | 0 | 0 | 1 | 3 | 202 | 808 | 179 | 895 | 1706 | 382 | 4.47 | 0.16 | 0.0256 |
| **Land pollution due to waste generated** | 2 | 2 | 2 | 4 | 156 | 468 | 201 | 804 | 21 | 105 | 1383 | 382 | 3.62 | -0.69 | 0.4761 |
| **Water pollution** | 10 | 10 | 5 | 10 | 161 | 483 | 174 | 696 | 32 | 160 | 1359 | 382 | 3.56 | -0.75 | 0.5625 |
| **Total** | | | | | | | | | | | | | 30.18 | | 1.5033 |
| **Mean** | 4.31 | | | | | | | | | | | | | | |

**Source: Author's Field Work (2019)**

Where TWV means Total weight value, Variance = $\Sigma (x-ẋ)^2/7 = 1.50/7 = 0.21$, Standard Deviation = $\sqrt{\text{Variance}} = \sqrt{0.21} = 0.46$

Co-efficient of Variation (CV) = S.D x 100/Mean RAI = 0.46 x 100/4.31 = 10.67%, Total = Total number of respondents, RAI(X) = Resident Agreed Index , F=Frequency of different reply, W= Weighted Index, Mean = ΣRAI/N = 30.18/7=4.3


**Plate 7: Building Conversion to Hostel beside Filling Station at MFM Junction, Tanke.**
**Source: Author's Field Survey (2019)**

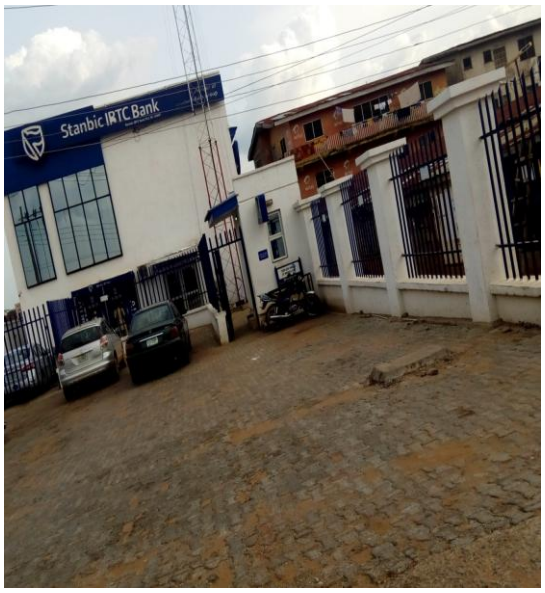


**Plate 8: Banks within residential Buildings Along Unity Road, Ilorin**
**Source: Author's Field Survey (2019)**

### 4.1.7: Response of Ilorin Metropolis Planning Authority to Land Use Change.

Different land-use changes were observed within the metropolis and most of these land use are not compatible with existing ones. The evidence of this incompatibility is illustrated in plate 7 and 8. Information gathered from an interview conducted to staffs of Town Planning Authority to verify the numbers of plans submitted and approved for land use change reveals that;

> *''.... No plans were submitted to the planning authority for approval for land-use change because the Kwara State Government gave the responsibility to the Ministry of Housing and Urban Development. The ministry comprises of various disciplines, such as estate valuers, surveyor, architect and even those with just SSCE occupies the position of leadership in the ministry and also grant approval for change of use, Planning Authority only approve new plans''. (Mr. Oki, Town Planning Area officer for Ilorin South)*

As it was revealed from information gathered from the officers in Planning Authority that Planning Authority was not given any responsibility as to land-use changes in Ilorin, the major problem faced by planning authority is lack of involvement in the land-use change approval, management or monitoring. This poses a great challenge to the profession (i.e Town Planners) since they are the main custodian of physical development according to Urban and Regional Planning Decree of 1992. A Town Planning officer reported that;

> *'' I will not say anything as to the challenges we are facing because I do not want to lose my job but I know that the law is not well enforced*

*in this country, that is why we have many problems in planning..'' (Mr. Taye, Town Planning Area officer for Ilorin West Local Government)*

### 5.1: Conclusion and Recommendation

The study has established that land-use conversion is predominant in the study area. This conversion is evident across the zones within the metropolis. Since land-use changes have positive impact on physical development as reported in this paper, it should be encouraged but well monitored and guided for the betterment of physical development. The effect of land-use change in the metropolis often forced people out of the metropolis to settles at the fringe, thereby leading to city expansion. It is therefore concluded that the government should give physical development a priority by making physical development a critical aspect of government agenda through the implementation of appropriate policy such as the writing of environmental impact assessment (EIA) report for land use or building. This is highly recommended for approval of land-use change or any building conversion.

The government needs to provide a framework for effective utilization of the Urban and Regional Planning Law of 1992. The law gave responsibility to the planning authority to plan, guide and monitor the physical development of her jurisdiction. No other agency constituted by the government is entitled to do such. This will help the planning authority to respond adequately to the challenges of land-use change.

The violators of the planning law should be sanctioned according to the law. If the offenders are punished according to the Urban and Regional Planning Law of 1992, it will serve as a warning to other developers not to go against the planning laws. This will go a long way in having law-abiding developers that will follow all the planning laws and thus create a functional, aesthetic, pleasing and sustainable environment.

**References**


Ajadi, B., Adeniyi, A. & Tunde, M. (2011). Impact of climate on Urban Agriculture, Ilorin, Nigeria. *Human and Social Science*, 11(1), 45-54

Ajibade, L. T & Ojelola, A.O (2004) 'Effect of Automobile Mechanics on Soils in Ilorin. *International Journal of Environment and Policy Issues 2(1), 18-27*

Ajibade, L. T. (2002) ''Indigenous Systems of Land Evaluation in the Yoruba Speaking Area of Kwara State. *Being Unpublished PhD Dissertation submitted to the Obafemi Awolowo University (OAO), Ile-Ife, Osun State, Nigeria*

Alabi, M. O. (2015) ''Determinant of Urban Land Use Dynamics in North Central Nigeria. *An M,Sc Thesis Submitted to the Department of Urban and Regional Planning''. University of Nigeria. Nsuka*

Ardill, J, (1994). *The New Citizen Guide to the Town and Country Planning*, TCPA London

Arowosegbe O. S & Bello I. K (2014). Factors Affecting Land-Use Change on Property Values in Nigeria. *Journal of Research Economics and International Finance. 3(4), 79-82*

Asadu, C. A. & Ayuwo J. G. (2018) Knowledge and Observance of Road Communication Signs among Commercial Drivers in South-South, Nigeria. *New Media and Mass Communication, 67 (3), 112-119.*

Chesterton, G. K. (2002) Property study, working of the property 32 prepared for jubilee line extension impact study unit. London: University of Westminster.

Essaghah, A. (1997). *Urban Planning Concepts, standards and symbols.* Lagos*;* Amfitop Books.

Farinmade, A. (2007). Land use conversion in surulere local government, Lagos, Nigeria. Paper presented at the Department of Urban and Regional planning, Uiversity of Lagos Akoka-Yaba, Lagos.

Federal Republic of Nigeria Gazette (1992). Urban and Regional Planning Decree 1992, No 75, Vol 79. Printed and Published by the Federal Government Press, Lagos Nigeria.

Ghosh, S. (2008) *Introduction to Settlement Geography*, Orient Blacksawn, Kolkata, pp. 108.

Goodall, B. (1972). The Economics of Urban Areas, Oxford Pergamon.

Hack, J., (2002) The role of Transit investment in Urban Regeneration a spatial Development: A review of research and current practice. *Paper presented at CIP Annual Conference, Canada.*

Iroye, K. A., & Abejirin O. J., (2012): Community Perception of Climate Change in Ilorin Metropolis. *Geo-Studies; Forum 5(1), 7-9*

Lawal A, (2017). *Neighbourhood Layout Planning and Site Design Guidelines*, CIDDER, Ibadan

Li G, Lu D, Moran E & Hetrick S.(2011). Land-Cover Classification on the most Tropical of Brazil with Landsat Thematic Mapper Imagery. *International Journal Remote Sensing 3(32), 207 - 230.*

Ligmann, Z. A., (2009) The impact of risk-taking attitudes on a land use pattern: An agent based model of residential development. *Journal of landuse science, 4(4), 215-232*

Mabogunje, A. L., (1998). The debt to posterity: Reflections on a national policy on Environmental Issues and Management in Nigeria Development by P. O. Sada and F.O. Oemerho (Eds). *Evans Brothers Nigeria Limited, Ibadan Pp. 17-26*

National Population commission, (2009) Federal Republic of Nigeria, Official gazette. Legal Notice on Publication of 2006 Census Final Results. Federal Government Printer, Abuja 2009

National Remote Sensing Agency, (2003). Integrated Coastal Zone Management for Tuticorin, Tamil, India: Using Geo-Spatial Technology'' Presented at a Seminar *Titled Remote Sensing as a Management tool.* Organised by the Department of Remote Sensing, Bharathidasan University, Tiruchirappalli, India 15th August, 2003.

Nelson, A. (1999) Transit stations and commercial property values: A case study with policy and land use implications. *Journal of public transportation, 2(3), 77-93*

Newman, P & Kentnolly, J. (1989). *Cities and Automobile Dependency*. Aldershot Publications, U.K Gowan.

Obateru, O. (2001). '*Development Control and Planning Standards'* in Tunde Agboola, (2nd ed.) Macmillian Nigeria Publisher Limited, Lagos P. 132

Oki. M., (2019) Town Planning Area Officer for Ilorin South Local Government. Interviewed 19th September, 2019

Olanrewaju, R.M (2009). The Effect or Urbanisation in a City of Developing Country: The Case Study of Ilorin, Kwara State, Nigeria. Ethiopian Journal of Environmental Studies and Management 2(2), 67-72

Olanrewaju, R.M. (2009). Climate and the growth of yam plant in the Guinea Savannah Ecological Zone of Kwara State, Nigeria. *Meteorological and climate Science, 2(2), 43-48*

Onokerhoraye, A. G. & Omuta, G. E. (1986). ‘‘Urban System and Planning. The Geography and Planning. Series of Study Notes, University of Benin, Benin City

Oyebanji, A. O., (2003) *Principles of Land Use Economics*. Lagos: CEPDM

Stratton, A. (2008) Making an investment Decision with Commercial property Analysis http://www.streetdirectory.com/travel_guide/64278/property_tips/making_an_investment_decision_with_commercial_property_analysis.html, Retrieved, 12 November, 2019

Taye. M. (2019). Town planning Area Officer for Ilorin West Local Government. Interviewed 19th September, 2019

Roberts A. R., (2000): Crisis intervention handbook: Assessment, treatment, and research (2nd ed.). New York: Oxford University Press.

United Nations, (2001). The State of the World’s Cities. United Nations Centre for Human Settlements. Nairobi, Kenya.

William O. I. (2014). *Land Use Planning, Principles, Techniques and Practice* (2nd eds) Ukwa Printing Press, Benin City.

Yeh, A. (1997) Urban planning and GIS, Geographical Information System, Management and applications, 2(62), 877- 888