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INFLUENCES OF MARKET-DRIVEN FORCES AND NON-ECONOMIC FACTORS IN THE SPATIAL PATTERN OF FUEL RETAIL OUTLETS IN IBADAN

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Abstract

This work analyzed the influence which non – economic tool of political patronage and the strictly economic factors of Retail Location Decisions (RLD) exerted in the spatial distribution of Fuel Retail Outlets (FROs) in Ibadan metropolis. Multistage and simple random sampling techniques were utilized to obtain information from 254 respondents who are owners/ managers of the studied FROs. A Logistic Regression Model (LRM) examined the relationship between dichotomous dependent variable [compliance of sited FROs in the metropolis to the existing Town Planning Authority Rules (TPR)] and the different independent explanatory variables (cost of landed property, haulage cost, business sustainability and non-economic factor of political patronage). Findings indicated that the predictor as a set truly differentiated between those who complied with TPR and those who did not (Chi-Square = 225.041, $P < 05$ with $df = 4$). The prediction rate showed that there was 93.5% rate of compliance to the TPR. The Wald criterion demonstrated that cost of landed property ($p = .000$) and haulage/transport cost ($p = .000$) both made significant contributions to the prediction (compliance). On the other hand, political patronage ($p = .550$) and business sustainability consideration ($p = .750$) were not significant predictors. The study advocated the utilization of Geographical Information System (GIS) in the planning of urban development for equitable allotment of land use to aid in the achievement of competitive business environment and sustainable urban land use management.

Keywords: Retail location decisions, Non-economic factors. Fuel retail outlets, Sustainable land use.

1.0 Introduction.

An indubitable truism that urban policymakers are daily confronted with is the fact that spatial configurations of contemporary cities are in a constant state of flux. It is equally impressionistic that the dynamical effects of retailing activities have resulted in significant morphological alteration of the master plan for most cities

in the developing world (Płaziak and Szymańska, 2014; Szymanska and Plaziak, 2014; Erkip et al 2014; Banai and Antipova, 2016; Ajayi and Mazinyo, 2020). Over time, urban policy makers have come to terms with the salient reality that retailing activities as one of the mainstays of urbanity are subject to intense competition for the most optimal locations among

business owners (Plaziak and Szymańska, 2014; Szymanska and Plaziak, 2014; Erkip et al, 2014; Banai and Antipova, 2016). Even with the growing profile of the smart city and e-retailing novelties, shreds of evidence shows that retail site selection within the urban space has evolved into a complex strategic decision which certainly affect a company's future in the long run. Although, e-retailing has continued its sustained deconstruction of the traditional brick and mortar global structure: it is instructive that over 78% (which amounted to a whopping US\$677 b) of the entire retailing activities conducted in the highly tech-savvy society of the United State (US) in 2020 were done offline (Fareeha, 2021).

In Nigeria, trading (in which retailing activities is a key subset) amounted to 17% of the country's Gross Domestic Product (GDP) [worth over US\$75b] in 2020 (Varrella, 2021). It is quite instructive that even with the obvious surge in the country's size of digital market in the last one-decade (users' penetration is estimated to hit 36.9% in 2021 and 52.5% by 2025) e-retailing still accounted for less than US\$0.6n in 2020 (less than 1% of the total revenue generated in the sector) [NBS 2021]. An incontrovertible reality that can be garnered from the statistics above is that while, it is obvious that futuristic projections are pointing to the burgeoning influence of online retailing as the predictable future of the sector, available present day realities are underscoring the relevance of brick and mortar retailing.

One major area that has been a subject of intense interest for scholars and various stakeholders within and outside the continent of Africa is how political power/office has been used subjectively by the ruling class to promote a 'culture of clientelism or patronage' among citizens to the detriment of sustainable economic

development of the region (Kopecky, 2011; Mamogale, 2013; Rasak et al, 2017; Ajayi, 2020¹). Various researches documented how, from the immediate post-colonial era, the ruling class in the continent has been responsible for the malfunctioning of governance through state-sponsored ills such as cronyism, nepotism, power capture, clientelism, power exclusion, and power asymmetry (Kopecky, 2011; Mamogale, 2013; Rasak et al, 2017; Syed and Meriem, 2018; Yagboyaju and Akinola, 2019). As should be expected, the resultant effect of such sustained misuse of political power has been the creation of fragile socioeconomic situations nudging most of the countries in the region in the direction of failed states (Kopecky, 2011; Mamogale, 2013; Rasak et al, 2017; Syed and Meriem, 2018; Masuku and Jillli, 2019; Yagboyaju and Akinola, 2019; Ajayi, 2020¹).

Literature search on the discourse detailed how abuse of offices by the ruling class in the appointment of public office holders, ceding of lucrative contracts to cronies and how the negative influence of these abrasive actions has succeeded in pushing most African countries to the edge of the precipice of 'failed states' (Kopecky, 2011; Mamogale, 2013; Rasak et al, 2017; World bank, 2017; Syed and Meriem, 2018; Masuku and Jillli, 2019; Yagboyaju and Akinola: Ajayi, 2020). Studies that examined how the influence which the ruling class exerts on the Organized Private Sector (OPS) performance through a seemingly innocuous factor such as securing of state given Certificate of Occupancy (C of O) [a legal document issued only by the government that indicates ownership and the purpose of a landed property] which determines retail sites for an ubiquitous product (petrol) in an urban location appeared scanty.

This study is therefore an exploratory attempt that analyzed the nexus between the non – economic tool of political patronage, the strictly economic factors of Retail Location Decisions (RLD) in the spatial distribution of Fuel Retail Outlets (FROs) and how these two factors influence the existing pattern of FROs in Ibadan metropolis. A further attempt was also made to examine the likelihood of relationship between non-economic factor (the usage of political patronage in the acquisition of operating licenses), purely economic factors: purchase of business site in choice locations, haulage costs for petroleum products, and sustainability consideration and their roles in the level of compliance to the extant town planning rules guiding the establishment of FROs in Ibadan metropolis. In the Nigerian clime, urban retailing activities for ubiquitous goods like petroleum products are governed by a potpourri of factors. Most often than not, location decisions boil down to careful analysis of economic factors by managers, the existence of any significance urban planning law guiding the location of the retail outlets and the non-economic factor bordering on the usage of political patronage as a tool to acquire 'choice site' depending on how competitive acquisition of landed property may be in such a location. This research provides an insight into the level of variation observed in the dependent variable (Compliance to Town Planning Rules) as explained by independent variables (cost of site, cost of transport and haulage overhead, sustainability consideration in the selection of business site and the influence of political patronage in the acquisition of choice retail site) in the logistic model.

2.0 Literature Review

This literature review section utilized a thematic approach in examining pertinent

researches, theories and concepts that are relevant to the discourse on critical determinants of retail agglomeration within the urban space. Review of appropriate theoretical frameworks and concepts which were formulated to explain, predict, and understand the influences that economic and non-economic factors have on urban retail spatial configuration are done thematically. First, RLD that are strictly economic in nature are examined, while non-economic influence of political patronage and the environmentally inclined business sustainability roles are also analyzed.

2.1 Theoretical Frameworks of Central Place Theory (CPT) and the Principle of Minimum Differentiation (PMD) as Pivots for a Rational Decision on Retail Site.

This research employed two relevant classical location theories to provide the needed theoretical lens for the paper. The Central Place Theory (CPT) and the Principle of Minimum Differentiation (PMD) are two of the most popular theoretical underpinnings that has gained much popularity among scholars as being adept in the provision of needed pivot on the critical determinants of the spatial pattern of retail activities

The Central Place Theory was originally formulated by Christaller (1933/1966), and improved upon by Losch (1940). CPT is targeted at the provision of a concise explanation of the interrelationships between the size and spacing of activities within human settlements. CPT also provides an explanation of the distribution of facilities in cities and its influence on people's economic activities, especially their shopping behaviors. The original conceptualization of the theory was aimed at providing a perfect model depicting the

efficient organization of human settlements in a hierarchical order. Geographers overtime recognized there is a seemingly natural tendency for the spatial distribution of settlements within a particular region. Three interrelated functions that are usually responsible for this spatial arrangement are marketing, transportation, and administrative functions (Knox and Marston, 2007; Walmsley and Weinand, 2008; Mulligan *et al*, 2012). In the literature, central places are defined as settlements that are at the center of a region (or sometimes a city), in which certain types of products and services are available to consumers (Brown, 1993; Knox and Marston, 2007; Reigadinha *et al*, 2017). In other words, the dominant function of a central place is to provide market and supply services for the region. CPT construct recognized the fact that there are two key attributes that are germane to its optimal functionality: these are concepts of range and threshold (Christaller, 1933/1966; Knox and Marston, 2007; Mulligan, *et al*, 2012; Prosperi and Oner, 2015). Range is exemplified in the tendency for the hypothetical human being to be willing to travel some distances to fulfil a need (or needs) which can only be met in a central place, such travelled distance is referred to as the range, it is believed that at some point, the cost of incontinence (monetary and otherwise) will outweigh any benefit from the procurement of such goods. The threshold, on the other hand, is defined as the minimum market size required in ensuring the viability of a particular product or service offered in the marketplace by the seller (Knox and Marston, 2007; Mulligan, *et al*, 2012; Prosperi and Oner, 2015). Using these two constructs, the framework of CPT posited that there are needs that require daily fulfilments; such needs must be met within a short-range in terms of distance of commuting. The

hypothetical man according to CPT understood that the satisfaction of a daily need should naturally require less cost in terms of distance and time than what is expected from needs that are not necessarily daily required. While the threshold is the targeted market a seller intends to capture as his buying public. When these two inherent constructs of CPT optimally coincide on the fractal plane, then a hypothetically correct central place for particular goods or services are found (Mulligan, *et al*, 2012; Prosperi and Oner, 2015). In this study, the application of CPT is leveraged on the assumption that petroleum products are more of lower-order goods while the FROs dispensing the products are largely ubiquitously located within the urban space. FRO's facility managers being quintessential businessmen are aware that buyers are naturally inclined to minimize the distance travelled by buying at the nearest available FRO once such FRO satisfies the condition of centrality in relation to their residences/workplaces. The spatial configuration of FROs as outlined in this study strongly supported the thinking of various proponents of CPT, in the sense that it supported the assertion that the retailers are more of the hypothetical 'economical rational man' who will take the decision on the location of the facility in space by paying premium attention to adjoining zones purchasing powers, the prevailing pattern of land use in the zone, accessibility, presence of competition and perhaps the less economic but equally important factor of 'political correctness or influence' as the case may be (Walmsley and Weinand, 2008; Prosperi and Oner, 2015; Ajayi, 2020).

The PMD as outlined by Hotelling in his classical seminal contribution argued that it makes economic sense that retailers or producers situate their stores close to each other once they are in homogeneous trade (Hotelling, 1929). His original

conceptualization of the location of retailing activities in space emphasized the fact that agglomeration of similar retail firms is truly universal traits irrespective of differential in good types or urban location (Brown, 1993: Reigadinha et al, 2017: Martínez-Giralt and Usategui, 2018). While the constructs of PMD seemingly allude to a nearly perfect model of the impact which the location of a competitor can have on the situational pattern of a quintessential duopolist: the construct is weakened by the fact that most retailing markets for ubiquitous goods (like petroleum products) are not under the control of duopolists in real life (Brown, 1993: Baudewyns, 2000: Reigadinha et al, 2017). The reality for retailers merchandising ubiquitous goods like petroleum products in a regulated market environment like Nigeria is even more peculiar (Ajayi, 2020). The regulated market structure operational in the downstream sector of the petroleum industry in Nigeria makes it impossible for retailers to engage in the minutest of product differentiation as products are supplied by a singular government-owned behemoth (Nigeria National Petroleum Corporation) [Ajayi, 2020]. However, as observed by Baudewyns (2000), smart retailers often leveraged the availability of new public amenities (like new roads, shopping malls) to edge out competitors by being the first to open up new retailing points in such locations. This scenario is particularly factual for retailing activities in a location where product homogeneity and intermediate costs of transportation have robbed retailers of any significant ability to operate PMD (Brown, 1993: Baudewyns, 2000: Reigadinha et al, 2017: Martínez-Giralt and Usategui, 2018). On the basis of an incisive examination of these theories (CPT and PMD), their basics assumptions, and their applicative nature to the existing spatial pattern of fuel retailing activities in

Ibadan metropolis, it is safe to posit that they provided a well-substantiated explanation of the hypothetical premise that retailers (as rational economic beings) generally gravitate towards profit maximization considerations as a core determinant of the location decisions of FROs (Brown, 1993: Baudewyns, 2000: Reigadinha et al, 2017: Martínez-Giralt and Usategui, 2018: Ajayi, 2020). For example, in the older section of the metropolis clustering of FROs which is noticeable on routes in the CBD zone of Dugbe-Agbeni and adjoining zones of Oke-Ado, Ring road, Apata (to the south) and Mokola (to the north) can be argued to show some semblance to CPT. While the new wave of agglomeration of FROs is observed on routes in the newer sections of the metropolis which are mostly induced by the provision of new public amenities (particularly new road networks) [Baudewyns, 2000]. Clusters of FROs on relatively new routes like Iwo road interchange – Olodo expressway, Basorun-Akobo expressway, Akala-Elebu expressway, and Ologuneru- Eruwa routes depict more closely the predictive construct of PMD that provision of new amenities can spur a new wave of clustering in retail activities in the previously under-served section of a city (Baudewyns, 2000: Reigadinha et al, 2017).

2.2 Examination of the Influence of Non-Economic Criteria (Political Patronage and Sustainability) in RLD in Nigeria

Various research materials alluded to the fact that the ruling class in the sub-Saharan Africa region has used the instrument of office overtime to nepotistically control civil service governance and administration (Osoba, 1996: Kopecky, 2011: Arowolo, 2010: Ijewereme, 2015: Ipadeola, 2016: Yagboyaju and Akinola, 2019). Basically,

most of these researches employed the use of qualitative research techniques (interpretivism philosophy) of historical analysis (Osoba, 1996: Arowolo, 2010) theoretical modelling (Ijewereme, 2015), and, Focus Group Discussion (Ipadeola, 2016). It is obtrusive that there is a dearth of researches which employed quantitative techniques to examine the stifling influence of political office holders on private sector performances in sub-Saharan Africa. This is despite the fact that documented evidences has shown that the ruling class in Africa (particularly in mineral-rich states of Congo, Nigeria, and Angola) sometimes corruptly divert rents from the private sector (meant for the state coffers) into their pockets.

Williams (2011) posited that “they do this by tailoring laws to the advantage of private sector agents in exchange for privileges, nepotistic gains, and outright embezzlement of public funds through shell companies”. Review of the extant literature on the discourse, particularly outside the African region revealed that attempts have been made to provide measurable constructs to evaluate the obvious nexus between the corrupt utilization of political office and private enterprise performances (UNODC, 2009: Campos et al, 2010: Williams, 2011: Bader, 2014: Gazenov, 2017). Analysts, (available pieces of evidence have shown) however, regularly utilized quantifying techniques such as composite indices (a method of combining a variety of statistical data into a single indicator) and experts’ governance assessments to empirically analyzed secondarily sourced data (longitudinal studies) from government agencies which are then used to build corruption related indicators (UNODC, 2009: Williams, 2011: HDI, 2020). The use of quantitative techniques to empirically examine the overarching influence of corruption on the delivery of

good governance gained traction, in recent times, among the research community for some of the following reasons: first, empirical analysis is a veritable platform for the synthesizing of multi-dimensional data gotten from a variety of sources, that can then be leveraged to provide a dispassionate system to rank countries or cities on corruption index across the world (UNODC, 2009: Williams, 2011: HDI, 2020). Second, application of quantitative techniques to aggregate data have been used to build corruption-related indicators like Business Environment Risk Intelligence (BERI), Human Development Index (HDI) and Corruption Perception Index (CPI) [UNODC, 2009: Campos et al, 2010: Williams, 2011: Bader, 2014: Gazenov, 2017]. Results obtained from the application of these indicators often provide credence of causality between the abuse of political office and poor economic performances in affected states (UNODC, 2009: Campos et al, 2010: Williams, 2011: Bader, 2014: Gazenov, 2017).

Lastly, it has also been argued that the production of composite indices of corrupt practices perpetuated by the ruling class has presented an objective way to draw attention to the issue of corruption worldwide and to convey the message that its measurement is possible (UNODC, 2009: Campos et al, 2010: Williams, 2011: Gazenov, 2017: HDI, 2020). The use of quantitative techniques on secondarily sourced data (from governmental agencies) is not, however, without some limitations: firstly, data are often supplied from different and sometimes poorly verified sources (UNODC, 2009). Secondly, distinctions are also hardly made on relational but divergent corruption indices (for example, clientelism, poorly governed business environment, lack of transparency in public budgeting/ expenditure are rarely differentiated). Thirdly, the lumping of such

data together, analysts posited, often make it frequently unclear 'what is being exactly measured by the index' (Williams, 2011).

The clamour for sustainability consideration in the decision-making process for businesses gained global attention in the last three decades due to the realization that the achievement of liveable environment for the present and future generation was becoming difficult (Berr, 2015: Boyer et al, 2016: Purvis et al., 2019; Ajayi, 2020²). The rapidity in occurrences of environmental crises (like desertification, tsunamis, hurricane, flooding, drought, and heat wave) on yearly basis in different parts of the world, and their intense negative effects on livelihoods has become a subject of concern globally (Berr, 2015: Purvis et al., 2019; 2020: Ajayi, 2020). These realities are responsible for campaigns for positive changes in techniques employed for the SCM of energy products (like petrol), such changes are meant to encourage sustainability, environmental management, reduce waste, reduce risk and increase the quality of lives (Berr, 2015: Boyer et al, 2016: Purvis et al., 2019: Ajayi, 2020). The inclusion of the sustainability factor as one of the independent variable of RLD is to have an insight, into how well integrated such an important environmental consideration is in the process of decision making by the business community in the study area. There are scanty shreds of evidence in the available literature that

indicated the depth of the incorporation of sustainability goal in the achievement of overall enterprise profitability goal among members of OPS in Nigeria (Anekwe et al, 2019: Ajayi, 2020²). As revealed from findings in this work, the incorporation of sustainability as a part of strategic planning is not yet popular among the business community in Nigeria due to the fact that, sustainability tenets or principles are seen by respondents as not having immediate directional impact on profitability. This research therefore, provides a lens to empirically ascertain how well incorporated is the sustainability goal in the decision-making process behind the site selection of FROs and the maintenance of these facilities in the study area.

3.0 Study Area and Methodology

3.1 Study Area

Ibadan lies between the geographic coordinates of 7°23'47"N and 3°55'0"E. It is on record that from the latter part of the 19th century, the growth in the expanse of Ibadan assumed a phenomenal dimension. As of 1952, the total area of the city was put at 103.8 km² with only 34.8% (36.2 km² being the built-up zone while the remaining 67 km² were devoted to non-urban uses). The spatial extent of the city had a symmetrical growth with the attainment of Nigeria's independence in 1960.). The spatial extent grew from 136 km² in 1981 to 210–240 km² in 1989.

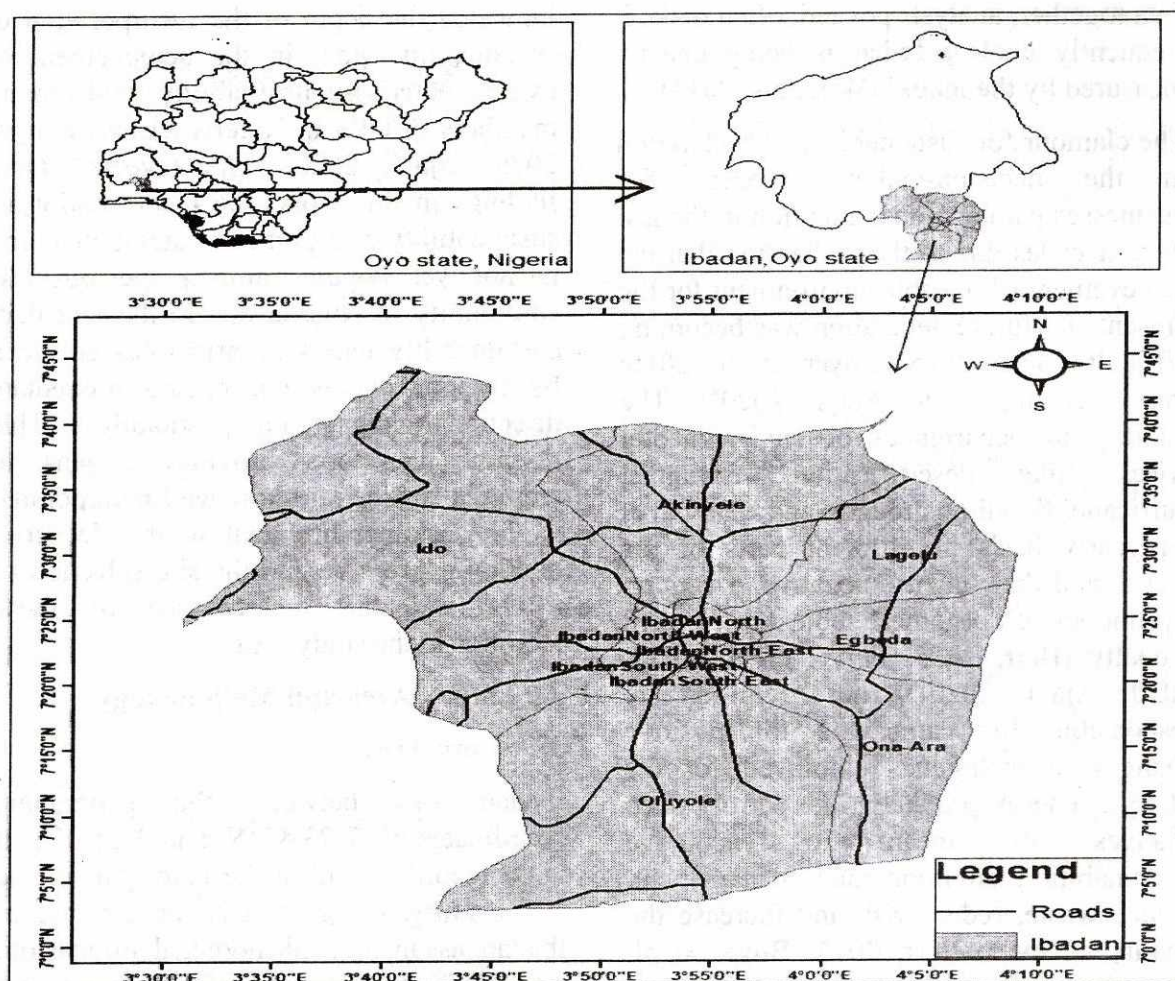


Figure 1. Map of Ibadan Metropolis

The size grew to around 400km in the year 2000, as of today it is estimated that Ibadan metropolis presently covered over 600 km² (Mabogunje, 2002: Fabiyi, 2004: Ajayi, 2016: Falola et al, 2018). Ibadan presently is spatially divisible into two, particularly when the spatial densities or clustering of structures within the city is considered. There is the core which is the older section of the city, where the ancient city originated from and the 'European planned section' of the city. This section of the city was the site of development before and immediately after the advent of colonialism. It is also the residents of the first set of elites in the city and also the hub of commercial activities.

By the 1960's this section of the city became densely populated and the development extended to the surrounding peripherals of the Ibadan city. The peripherals of Ibadan metropolis has been the zone where unabated structural developmental activities has been on-going in the last five decades (save for some cases of gentrification in the older section of the inner city). It should be noted that the peripherals section of the city do not enjoyed the detailed planning seen in some zones of the older city originally planned by the European colonialists. Due to this oversight, the newer section of the city do not enjoy an even distribution of basic

amenities, commercial activities and governmental institutions when compared with the European planned section of the inner city (Mabogunje, 2002; Fabiyi, 2004; Adenekan, 2016; Ajayi, 2016). The main Central Business District (Dugbe-Agbeni) and the emerging Central Business District of Iwo Road are both located in this section of the city. The peripherals, though, presently with lesser clustering of structures, it have stronger evidences of disobedience to urban planning standards guiding land use. There are more indications of mixed land uses (for example the unethical location of commercial activities in residential zones) in this section of the city (Mabogunje, 2002; Fabiyi, 2004).

Historically, one key determinant of urban spread in the peripheral section of Ibadan metropolis is the opening up of expressways and the attendant commercial activities on such routes. In the 1980s, the Ibadan-Lagos expressway generated the greatest urban sprawl (east and north of the city), followed by the Eleyele expressway (west of the city). Presently, the newly reconstructed Akala expressway in Podo axis of the city (the southern tip of the city), the Akobo-Bashorun and the Arulogun-Ojoo expressways (the northern axis) are some of the new zones generating greatest urban sprawl. The city has a functional airport and a railway terminus which provides linkages to other cities in the country. Ibadan is Nigeria's third largest city in terms of population size although it is the largest when physical size is considered is an important economic growth pole in the south-western region of the country. Economically, it is the capital of the state with the fourth largest GDP in Nigeria and the second largest non-oil state economy in after Lagos state (Falola et al, 2018; Ajayi, 2020). With its strategic location as a frontier zone between the forest zone of

South Western Nigeria and the grassland of Northern Nigeria, it has evolved over time to an important break-of-bulk-of trade point.

3.2 Material and Method

This study employed the positivist paradigm. It is also a cross-sectional study, where primarily sourced data were collected from a representative subset of the general population at a specific point in time. The research protocol was approved by the ethical committees of the Redeemer's University (Nigeria) and University of Fort Hare (Republic of South Africa). All participants were properly notified of the aim behind the research. Thereafter, informed consent was obtained from each of the participants. This is in line with the guiding principles of the ethical protocol; it also provided necessary reassurance of confidentiality for all participants in the study. Furthermore, to strengthen the confidentiality of the sourced information, all sourced data were documented by code, rather than the respondent's name.

The research took place in Ibadan metropolis between December 2018 and June 2019. The studied population comprised of managers/owners of all Fuel Retail Outlets [FRO] within the metropolis at the time of the research. Available records from the registers of Department of Petroleum Resources (DPR) {of the Nigeria National Petroleum Corporation (NNPC)} and Oyo state Town Planning Authority. From the records, it was indicated that 702 licensed FROs are operational in the metropolis at the time the research was done. A simple random sampling technique was employed in selecting respondents for the study. The research team used the DPR register which has addresses of all FROs in the metropolis to do this. Every odd-numbered FROs on the register was marked as a potential study site. The research team thereafter visited such sites.

and attempts were made to sample the manager/owner of such FROs for the research exercise. A total number of 351 respondents were sampled from which 254 questionnaires were retrieved for this analysis (a response rate of 72.36%). The questionnaire which was comprised of five (5) sections contained pre-tested items which measured the study objectives.

The information retrieved from the questionnaires was transferred into Microsoft Excel (2010) workbook sheet which was the platform where the database management was done; this helped in putting the data in good shape. The statistical analyses were performed using IBM SPSS (Statistical Package for Social Sciences), version 23. First, Snell's R-Square was used to examine the 'likelihood' relationship among the variables. This analysis provided an explanation in the level of variation observed in the dependent variable (conformity to the Town Planning rules guiding the location of FROs) as explained by independent variables (cost of real estate, cost of transport and haulage overhead, sustainability consideration in the selection of business site and the influence of political patronage in the acquisition of choice retail site) in the logistic model. Furthermore, the Logistic Regression Logistic Regression Model (LRM) was used to test the existence of significant relationships between the dichotomous dependent variable (compliance to Town Planning stipulations guiding the location of FROs) and the different independent explanatory variables (cost of real estate, cost of transport and haulage overhead, sustainability consideration in the selection of business site and the influence of political patronage). Logistic Regression as a classification algorithm is ideal for predicting a binary outcome (yes or no) given a set of independent variables.

3.2. Scale Development

This research, amongst other things, filled a gap in the body of the extant literature on the discourse by constructing measurable scales for roles which non-economic criterion like 'the influence of political patronage on the ownership of choice location for FRO in Ibadan metropolis' played in the situational pattern of retail outlets in the metropolis. The development of a research instrument which provided a scientific calibration of research objectives as represented in the questionnaire is quite novel and central to the achievement of the aim of this research. Providing scientific measurement for various Retail Location Decisions' criteria has always been part of the classical foundation of the discourse laid by Losch (Losch, 1940; Isard, 1956; Płaziak and Szymańska, 2014; Dixtit et al, 2019). Traditional RLD constructs which have been used as determinants of retail sites in available literature include: transportation cost, availability of labor, real estate cost, constructions costs, tax incentives, labor and resource availability, proximity to suppliers or markets. Examination of contemporary literature, however, shows that novel criteria like sustainability, proximity to industry clusters, nearness to anchor institutions, the presence of an innovative culture and social networks are also gaining prominence among the research community in recent times (Płaziak and Szymańska, 2014; Widaningrum, 2015; Dixtit et al, 2019). It is a truism that the development of scientific measurements for both the 'traditional' and contemporary RLD depended largely on existing scales (Fernie and Sparks, 2009; Taylor, 2015; Gopinath and Radhakrishnan, 2018). Therefore, a Likert-like scale was used in the development of these variables. Some of the variables like the cost of the retail site in choice locations, transport cost, have scales developed and utilized for them in some

earlier researches ((Taylor, 2015: Gopinath and Radhakrishnan, 2018).

On the other hand, fresh operational constructs were made to asses' variables that have scanty representation in the available literature. Therefore, measurable operational definitions were provided for constructs like sustainability consideration and influence of political patronage in the acquisition of choice retail location. The research team held a pre-field exercise which helped in ensuring the validity and reliability of the research instruments. Moreover, the Cronbach alpha test was done on each of the constructed multi items instruments in order to observe their internal reliability and ability to effectively measure the research variables. As a rule of thumb a Cronbach's alpha lower than 0.60 means poor reliability, values between 0.6 and 0.7

are acceptable and values equal to or higher than 0.70 indicate good scale reliability (Churchhill 1979; Simchi-Levi et al. 2003; Quesada et al. 2012; Ajayi 2016: Ajayi, 2020³). The cost of the retail site in competitive locations (real estate) subscale which consisted of 9 items have a Cronbach's alpha of .82 ($\alpha = .82$), consideration for transport and haulage overhead subscale with 10 items have a Cronbach's alpha of .85 ($\alpha = .85$), the provision of sustainability consideration in site selection with 7 items have a Cronbach's alpha of .85 ($\alpha = .85$), and lastly the influence of political patronage in the acquisition of choice retail location with 7 items have a Cronbach's alpha of .71 ($\alpha = .71$). Furthermore, descriptive and inferential statistics are used to analyze the data and to test the derived hypotheses.

4 Results

Table 1: Socioeconomic attributes of Respondents

Attributes	Total Number of Respondents	Male (%)	Female (%)
Gender	254	194 (76.37)	60 (23.63)
Age			
21-25	18(7.08)	10 (55.55)	8 (44.45)
26-30	30 (11.81)	21 (70)	09 (30)
31-35	37 (14.56)	27(72.97)	10(27.03)
36-40	63 (24.80)	50 (79.36)	13 (20.63)
41-45	55 (21.65)	47 (85.45)	8 (14.55)
46 and Above	51 (20.07)	39 (76.47)	12 (23.53)
Marital Status			
Single	99 (38.97)	53 (53.53)	46 (46.47)
Married	136 (53.54)	124 (91.17)	12 (8.82)
Widowed/Separated	19 (7.48)	17 (89.48)	2 (10.52)
Educational Status			
Primary School Leaving Certificate	13 (5.11)	10(76.92)	3 (23.08)
Secondary School Leaving	157(61.32)	110 (70.06)	47 (29.94)

Certificate			
Ordinary National Diploma	60 (23.43)	52 (86.66)	8 (13.34)
HND/BSc	24 (9.40)	22 (91.66)	2(8.34)
Years of Experience in the Present Place of Work			
1-4 Years	19 (7.43)	17 (89.47)	2 (10.4)
5-9 Years	83 (32.42)	81 (97.59)	2 (2.41)
10 Years and Above	152(60.15)	96 (61.84)	56 (38.16)
Status of Employment of Respondents			
Owner of Business	74 (29.13)	43 (38.10)	31 (41.90)
Employed by Outsourcing Enterprise for the Oil Company	17 (6.69)	14 (82.35)	3 (17.65)
Employed directly by the Oil Company	163 (64.17)	135 (82.82)	28 (17.18)

Source: Author's analysis

Table 2 Analyses of FROs Determinants

Ownership structure of FROs	Frequency	Percentage (%)
Privately owned	134	52.75
Dealership	80	31.49
Franchised	40	15.74
Total	254	100
Years of operation of FRO	Frequency	Percentage
Between 1 and 5 years	79	31.10
Between 6 and 10 years	49	19.30
11 years and above	126	49.60
Total	254	100
Factors which influences location decisions of FROs		
Cost of real estate	98	38.58
Cost of haulage	84	33.07
Political patronage consideration	30	11.84
Sustainability consideration	22	8.66
Others	20	7.87
Total	254	100
Incorporation of sustainability goals into strategic		

planning		
Fully integrated	30	11.81
Partially integrated	37	14.56
Excluded from strategic plans	187	73.62
Total	254	100
Areas where sustainability is incorporated by management		
In facility location decision only	8	11.94
In facility and fleet management	10	14.92
Promotion of the 3 Rs (reduction, reuse and recycle of environmental resources)	42	62.68
In all of the above	7	10.46
Total	67	100

Author analysis 2021

Table 3 Model Summary

Step	-2 Log likelihood	Cox Snell R Square	Nagelkerke R Square
1	89.227	.598	.842

Table 4 Variables in Equation

	B	S.E.	Wald.	Df	Sig	Exp (B)
Cost of landed Property	-.305	.512	32.645	1	.000	1.97
Transport/Haulage cost	-.287	.857	13.992	1	.000	.959
Political Consideration	-.927	.895	15.248	1	.055	.074
Sustainability Consideration	-.047	.301	.028	1	.750	.364
Constant	13.01	1.925	46.65	1	.000	22.6875.70

a. Variable(s) entered on step 1: Cost of property, Haulage cost, Political consideration, Sustainability consideration.

4.1 Analyses of Socioeconomic attributes and determinants of FRO

Analysis of socioeconomic attributes (Table 1) of the respondents as presented in table indicates that overwhelming majority of sampled respondents are male 194 (76.37%), with preponderance of the population also above the thirty years age group 206 (81.10%). The age analysis could be critical factor in the ability of the respondents to provide the right quality of information needed for the research. This is particularly factual when it is taken alongside the information on numbers of years spent by respondents on the job. 152 (60.15%) of respondents admitted that they have spent ten years and above working in the same organization. This piece of information is germane because nearly half of the FROs, 126 (49.6%) have been operating for more than ten years (Table 2). The research team discovered that to get the required information from respondents, the longevity of their stay in a particular FRO is apropos. 241 (94.88%) of the respondents had more than basic schooling (six years or primary school education), the import of this is that the purpose behind the research was more easily understood by respondents. 163 (64.17) of respondents who participated in the study are direct employees of the retail outlets, while 74 (29.13%) are owners of the outlets. The lengthier historical affinity (many years of working experience) which the larger proportion of the sampled respondents (nearly 84%) have with the retail outlets helped in obtaining detailed information needed for the research exercise.

Table 2 present a further descriptive analysis of respondents' views on the determinants of sites of FRO in the study area. When analysis of the identified factors was done, 98 (38.56%) of respondents posited that cost of real estate is the major

factor that motivated their choice of their present retail site. 84 (33.07%) of respondents affirmed that haulage cost consideration is the main determinant factor behind the choice of their retail site. Findings from studies which were centred on land value determinants in Lagos metropolis (Oduwaye, 2004; Oladiti et al, 2018) indicated that retailers also take these two factors as critical determinants. Findings from these studies further affirmed that retailers are not unwilling to invest more in real estate (purchase costly retail site), once there is a guarantee flow of shoppers (Oduwaye, 2004; Oladiti et al, 2018). Results gotten from this study lend credence to this fact. On the other hand, the third identified economic factors (business sustainability consideration) have the lowest score (22: 8.6%) among the considered factors (Table 2). To further buttress how unimportant it is considered in the estimation of retailers, an analysis that evaluated retailers' management of sustainability goals indicated that a mere 30 (11.81%) of respondents admitted that their retail outlets fully incorporated sustainability goals as a part of their strategic planning. This figure painted a worrisome picture as it can be assumed to be a reflection of the mindset of the OPS to issues surrounding 'green or sustainable business' in Nigeria. A recent study which assessed the importance attached to the achievement of the business sustainable goal among industrialists in Nigeria (sustainable utilization of environmental resources in the course of production) indicated that, setting of business strategic goals and their implementations are yet to gain traction among them (Ajayi, 2020²). It is therefore not surprising that respondents in this study also indicated a rather tepid interest in its role as a determining factor in the choice of their retail site. The sole non-economic factor among the selected

determinants is: the influence that political patronage plays as a determinant of retail outlet in the study area. 30 (11.84%) among sampled respondents actually believed that getting a choice location as a retail outlet is mainly due to how 'politically correct' or how 'well connected' a retailer is. Ordinarily, the proportion of respondents who actually believed that political patronage or clientelism is a major consideration in the determining the choice of FRO is seemingly negligible (11.84%) and should not be a source of concern. The reality however is that, such a factor is ordinarily not a part of issues considered in developed economies, when retailing site decisions' are made (Losch, 1940: Isard, 1956: Goodchild, 1984: Ferni and Sparks, 2009: Erkip et al, 2014: Plaziak and Szymańska, 2014: Banai and Antipova, 2016: Sides and Amient, 2018: Dixit et al, 2019). It can therefore be surmised that such perception is an indication of lack of faith behind the process governing the issuance of operating licenses for retailers.

4.2 Inferential Statistics

The main objective of this study is to examine the likelihood of relationship between non-economic factor (the usage of political patronage in the acquisition of operating licenses), purely economic factors: purchase of business site in choice locations, haulage costs for petroleum products and sustainability consideration and their roles in the level of compliance to the extant town planning rules guiding the establishment of FROs in Ibadan metropolis. Inferential statistical tool of Logistic Regression Logistic Regression Model (LRM) was used to test the existence of significant relationships between the dichotomous dependent variable (compliance to Town Planning Rules in the study area) and the different independent explanatory variables (Cost of real estate,

Haulage cost for vehicles transshipping products to the FRO, Influence of political patronage and Business sustainability consideration). The choice of Logistic Regression Model for such a test is based on the premise that as a classification algorithm, it is most suitable for predicting a binary outcome (yes or no) given a set of independent variables. In this case, it is used to predict the compliance to the extant rules guiding the location of FRO in Ibadan based on the selected independent variables.

In Nigeria, the process behind the granting of operational licenses to retailers dispensing fuels is governed by two governmental bodies. These are Town Planning Rules (which originate from the Ministry of Lands and Urban Planning) and Department of Petroleum Resources (DPR). TPR dictate rules guiding the location of FRO within communities, for example, a section of the rule balkanized road network in the country into three, these are; grade A (Federal Government-owned interstate roads) grade B (State Government-owned road which links the various local government areas in a state) and grade C (Local Government-owned roads which are access or street networks that link neighborhoods to each other and main routes) [Dogara, 2017: Adenigbo et al, 2017: Ajayi, 2020²]. The TPR has it that FRO must only be sited on grade A and B routes, while locating FRO on grade C routes is illegal. Setbacks of ten (10) meters must also be observed from the roads on which they are sited. The rule also stipulates that FRO must be sited at a distance not lesser than 400 meters from one another within urban centers and at a distance of 800 meters in suburban/rural communities. The rule equally state that the building plan of FRO must be approved and ensure that the building plan strictly comply with laid down rules on the provision of critical Health Safety Environment (HSE) facilities

like the muster point (for emergency) portable water system and parking space with enough width to take haulage trucks offloading fuel products. The DPR which is an affiliate of the NNPC is a body that regulates technical requirements guiding the retailing of petroleum products in Nigeria. Some of the DPR stipulations include specifications on the conveyance of petroleum products which a trucker conveying petroleum products is expected to comply with. Another rule enforced by the DPR include regulation of Environmental Impact Assessment (EIA) which every prospective builder of a FRO must carry out before the commencement of actual construction activities. Others include types and conditioning of fuel dispensing pumps which should be utilized by FRO among other rules (Nigerian Urban and Regional Planning Act 1992: Mabogunje, 2002: Oduwoye, 2004: Omole and Akinbami, 2012 Oladiti et al, 2018).

Table 3 shows the Cox and Snell's R-Square which is like Multiple Regression R-Square. Its function is to measure the 'likelihood' relationship among the dependent and independent variables. In this case, readings from the table give an empirical explanation (the level of variation) between the dependent variable (compliance to Town Planning Rules) explained by independent variables in the logistic model. The Cox and Snell R Square value obtained here is 59.8% (Table 3). The rule of thumb is to pay minimal attention to the Cox and Snell R square value because of the smallness of its value (usually less than 1.0, making it difficult to interpret) and because it is generally considered as a *pseudo* R^2 (Allison, 2012: Smith and McKenna, 2013: Ajayi and Mazinyo, 2020).

On the other hand, the Nagelkerke R^2 modification which ranges from 0 to 1 provides a more reliable measure of the

relationship. Nagelkerke's R^2 will normally be higher than the Cox and Snell measure (Allison, 2012: Smith and McKenna, 2013: Ajayi and Mazinyo, 2020). The table reading of Nagelkerke's R^2 is 0.842, which indicated a very strong relationship of 84.2% between the predictors and the prediction.

The result of the logistic regression analysis was therefore used to predict compliance to TPR guiding the location of FROs based on perceptions of 254 owners/managers of FROs using their views on Cost of real estate, Haulage cost for vehicles transshipping products to the FRO, Influence of political patronage, and Business sustainability consideration as predictors. Furthermore, a test of the full model against a constant only model (Table A1, see appendix) shows that the predictor as a set truly differentiated between those who complied with TPR and those who did not (Chi-Square = 225.041, $P < 0.05$ with $df = 4$). The prediction success overall (Table A2, see appendix) was 93.5% (95.1% for compliance and 91.4% for noncompliance). The Wald criterion demonstrated that the cost of real estate (land) ($p = .000$) and transport/haulage cost ($p = .000$) made significant contributions to the prediction. On the other hand, the use of political patronage ($p = .550$) and sustainability consideration ($p = .750$) were not significant predictors. Readings of Exp (B) values indicate that if for example, the cost of landed property is increased by a unit (a new retailer with a higher perception on the cost of real estate being responsible for compliance is added to the model) the odd ratio is 1.97 times (or approximately twice) large (for the cost of landed property to influence the model) and therefore retailers are more likely to comply with TPR (Table A2).

5.0 Discussion

This study unravels some facts that informed retail site determinants in the study area. As evinced from the literature search on the discourse, classical determinants of retail locations include two of the variables utilized in this study, these are the cost of real estate and the cost of haulage (Losch, 1940: Isard, 1956: Płaziak and Szymańska, 2014: Dixit et al, 2019), it is not surprising, therefore, that the two positively predicted compliance to TPR rules guiding the establishment of FROs in the study area. Empirical findings from previous researches indicated that these two aforementioned factors will naturally influence retailers judgment when deciding on where is most suitable to site retail outlets (Losch, 1940: Isard, 1956: Płaziak and Szymańska, 2014: Dixit et al, 2019). The fact that costs of real estate for commercial/retail properties are always higher at business hubs (Central Business District) or busy routes, make them rational choices for establishment of retail outlets (they have a guaranteed flow of shoppers at such locations). [Oduwaye, 2004: Erkip et al, 2014: Sides and Amient, 2018]. Scientific evidence shows that haulage cost is another traditional RLD factor (Losch, 1940: Płaziak and Szymańska, 2014: Sides and Amient, 2018: Dixit et al, 2019). The cost of transshipping products to be retailed from the production point to the point-of-sale (retail outlets) has always been of premium importance to retailers. Incurring an additional overhead expense due to the cost of haulage would often influence the eventual retail price a retailer will sell products, and this will have the resultant effect on how competitive such retailer will be.

As findings from this study shows, retailers affirmed that these two traditional RLD significantly predict their compliance to

TPR guiding location of FRO in the study area. Ordinarily, retailers who are motivated by desires to make gains will naturally wish to prioritize 'economic RLD' over any other considerations even if this negates extant TPR. However, as discovered from this research, respondents (retailers) believed that two out of the three 'economic' RLD (cost of real estate and haulage cost) positively predict compliance to TPR while one (business sustainability consideration) does not. Research findings from previous researches have shown that TPR are sometimes selectively enforced within the urban space in Nigeria (Mabogunje, 2002: Fabiyi, 2004: Oduwaye, 2004: Adelekan, 2016: Oladiti et al, 2018: Ajayi, 2020). Shreds of evidence have shown that strict enforcement of TPRs are more observed in high-income zones, CBD, and major interstate routes within the city (Fabiyyi, 2004: Omole and Akinbamijo, 2012: Adelekan, 2016: Oladiti et al, 2018: Ajayi, 2020¹). The result of this research clearly agreed with these earlier findings. It is also obvious from findings in the study that, consideration of sustainable goals is not a priority for retailers in the study, it accounted for the least score (8.66%) among the considered factors that determine the retail site and is not also a significant predictor ($p = .75$) of compliance to TPR. The implication of this result is the undeniable reality that the achievement of business sustainability goals or eco-friendly business practices is not seen as important considerations by sampled retailers. On the other hand, political consideration or the 'use of political connection' has a relatively low score (11.84%) in estimations of respondents as a determining factor that influences the location of FRO in the study area. The factor (political consideration) is not also a significant predictor ($p = .055$) for compliance to TPR in the study area. As earlier noted (in section 4.1), pieces of

evidence from the more developed Western societies showed that the use of any form of political 'connection' is ordinarily alien to the process of determining a retail location within an urban space. Its identification by retailers in this study is, therefore, a cause for concern. As already indicated in the course of this research, documented evidences have shown that the public sector or civil service in Nigeria is infamous for its 'institutionalized' corrupt acts (Osoba, 1996; Arowolo, 2010; Ijewereme, 2015; Ipadeola, 2016; Yagboyaju and Akinola, 2019), findings from this research is a sad reflection that the OPS is not also spared of the evil influence of corrupt acts. The fact that political consideration is not perceived by retailers as a significant predictor for compliance to extant TPR guiding the location of retail outlets (whereas pure economic factors like real estate and haulage costs did), could be, a reflection of how ineffectual enforcement of these rules based on the perceptions of retailers. It will not be far-fetched to surmise that perhaps a vast majority of retailers believed that with the 'right political connection' a retailer may not necessarily need to comply with some aspects of the TPR.

6.0 Conclusion

This research is an exploratory attempt on how the interconnectedness between economic and non-economic factors determined the location of FRO in Ibadan based on the perceptions of retailers. The study also provides empirical facts on how identified economic and non-economic retail site determinants predicted compliance to extant TPR. Arising from findings unearthed in the course of this research, the following suggestions are therefore made: First, the governing authorities in Ibadan need to embark on the equitable implementation of urban development in different parts of the

metropolis. The pressure or stiff competition being witnessed for the acquisition of retail outlets on some routes or zone in the metropolis could be traced to what this research has brought to the fore – costs of real estate and haulage services are indications of regular patronage. Competition for spaces among retailers on busy routes like Iwo road, Lagos-Ibadan Expressway, Dugbe –Mokola –Ojoo Expressway, and Ring road-Challenge Expressway are pointers to the fact that these routes/neighbourhoods are perceived by retailers as 'choice locations'. Second, in order to stem the evil tide of the 'of non-economic factor' (possibly the use of political clout to acquire choice retail site) as a determinant of the retail site in the metropolis, the use of contemporary land-allocation tool like Geographical Information System (GIS) should be employed (Harris and Elmes, 1993; Abdulkader, 2015; Widaningrum, 2015). Experiences have shown that the employment of GIS as a tool for optimal location of facilities within urban space reduces 'human interference' (pressure from politicians or the ruling class). Manipulation or alterations of digital cadastral information which can be stored in a cloud storage system are more difficult to achieve since such information is in the public domain. It is surprising that Ibadan is not employing a comprehensive, digital city cadastral map like what is practiced in Abuja (Abuja GIS) and other cosmopolitan cities across the world. One of the steps that various environmental advocacy groups are vigorously pursuing in order to deepen gains in the field of sustainable urban development is to incorporate sustainability into urban gentrification programs (Mees and Driessen, 2011; Ahem, 2013; Immergluck and Balan, 2018; Finewood et al, 2018).

Business communities in Western societies are encouraged to consider 'the greening of their infrastructural development' either in construction of new business sites or in gentrification exercises to revamp existing structures. Such measures include the adoption of green roofs, construction of resilient parks, provision of greenways, rain gardens and detention basins to store flood water for subsequent uses (Ahem, 2013: Immergluck and Balan, 2018: Finewood et al, 2018). Taking a cue from this, the business community in Nigeria should, as a matter of urgency start the incorporation of these measures as a part of key

considerations in their RLD programs. Experiences from the developed economies has shown that these measures when fully operational militate against adverse climatic conditions such as flooding, urban heat and landslides (Mees and Driessen, 2011: Ahem, 2013: Immergluck and Balan, 2018: Finewood et al, 2018). Such 'green developmental' programs are of critical importance in Ibadan particularly, given the city's unenviable historical records of poor urban flood management, that has led to preventable loss of lives and properties in the past (Mabogunje, 2002: Fabiyi, 2004: Adenekan, 2016).

APPENDIX

Table A1 Omnibus Test of Model Coefficient

	Chi Square	Df	Sig
Step	225.041	4	.000
Step 1 Block	225.041	4	.000
Model	225.041	4	.000

Table A2 Classification Table^a

	Observed	Predicted		
		TPR		Percentage
		Yes	No	
Step 1 TPR	YES	163	9	95
	NO	8	22	91.4
Overall Percentage		-	-	95.5

TPR (Town Planning Rules)

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