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# FACTORS INFLUENCING HOUSING DEVELOPMENT PATTERNS IN INTERNATIONAL BORDER TOWNS IN OGUNSTATE, NIGERIA

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## ABSTRACT

*The estimation of determinants of housing development patterns in international border towns is essential to overcome some of the challenges facing development in these areas. However, few studies have detailed physical factors and neighbourhood characteristics as determinants of housing formation in international settlements. It is in this respect that the researcher aimed at evaluating these factors as regard housing formation pattern in international areas. The study systematically obtained the opinion of selected 361 residents in three selected towns between Nigeria and Benin-Republic using questionnaire instrument. Also, the relationship between housing development pattern and the determinants was hypothesized based life-cycle model of neighbourhood change using Structural Equation Modelling (SEM). Both models of SEM – Measurement model and Structural model – adequately fit the study data. From the structural model findings, it was discovered that both physical (0.13) and neighbourhood factors (0.11) significantly have direct effects on housing development pattern in international towns. Housing physical factors such as road network, land features, dwelling accessibility and vegetation have indirect effect on housing pattern just like neighbourhood factors in the area of drainage system, level of infrastructural facilities, condition of space, and condition of foundation and land acquisition finance. The study affirms that both physical factors and neighbourhood factors largely and significantly influence housing formation patterns in the international borders.*

*Therefore, there is need for Nigeria government most specially to take cognizance of these important factors when formulating or developing her housing development plan.*

**Keywords:** Housing, Development, Physical Factors, Neighbourhood Factors, Structural Equation Modeling

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## 1. INTRODUCTION

Human activities on earth keep on increasing in line with daily needs, individual needs are unlimited and the pressure to balance recent population in term of provision of basic needs leads to environmental degradation, naturally or through human activities. Poverty in border towns create problem for environmental functionality. Landuse compatibility is the adequate measure in ensuring good and healthy environment. Therefore, it requires sustainable development control instrument in balancing various landuse. Environmental degradation is one of the problems experiencing all over the world and a threat to human development and well-being. The major attributes of environmental degradation are land distortion, pollution, overpopulation and deforestation due to rapid growth in population. Therefore, there is a need for expansion which affects natural resources and results in climate change, also natural disasters such as earthquake, storms and flooding Donohoe, (2003) [1]. All have an effect on socio economic physical environment and health of residents.

Ogboru & Anga (2015) [2] investigated the impact of environmental degradation on the Nigerian environment, that includes plant and animal, social impact that poses threat to the well-being of people in urban areas and increases social vices. Yaro, Okon & Ukpali (2015) [3], observed that environmental degradation such as building collapse, destruction of farm land, roads and other facilities that affect the standard of living. "The most important factor that limits progress in improving housing and living conditions of low-income groups in informal settlements and slums is the lack of genuine political will to address the issue in a fundamentally structured, sustainable and large-scale manner [4].

Impacts of urbanization on an environment are observed in the aspect of increase in population, industrial activities and expansion of the area [5]. Uncontrolled development can lead to environmental degradation that can cause land insecurity, pollution, low quality of water and problem of waste disposal and management. The responses of a policy maker to the impact of environmental degradation on border settlement is low, the consequences of poverty on housing have a significance impact on health status of both young and old of the residents [6]. Inequality and segregation are common challenges of borders settlement; the causes of these challenges are location and accessibility to each town.

## 2. LITERATURE REVIEW

A settlement is not an isolated house. It is the form in which a group of people of variable number live in close proximity [7]. Settlement locations are affected by topography factors [8]. The physical element of the border environment goes far to fortifying or decreasing the view of contrast that appeared in the outskirt [9]. Munyoro & Nyamushamba (2016) [10] studied the impact of illegal settlements on economic development in Chirundu border town, Zimbabwe. Their findings revealed that inadequate serviced land by the government,

insufficient affordable housing units, increase in existing population, which impacted on health, crime, land degradation and economic development were major issues confronting the development of the borders.

## 2.1. Housing Types and Units

Housing units in a neighbourhood constitute a framework for assessing design and development patterns in a particular area. The basic housing units in border towns of Ogun State basically comprises of mud-walled, corrugated iron sheets, face-to-face, tenement building, usually with external kitchens and toilets. Despite the formulation of various housing policies and programmes in Nigeria to secure habitable dwellings for individuals, the housing situation in the country suffers setbacks, like increasing housing densities and poor condition of available ones [11].

Housing types around border towns are of different categories. The core areas mixed with newly housing types but retain old characteristics of traditional settlements. The establishment of border points and activities of government that increase commercial activities have led to increase in population. Therefore, types of housing development in the past tend to be low in quality and condition [12]: [13]. The rapid urbanisation of international border towns led to demand for housing and expansion to various villages for further accommodation [13]. The development has significant effect on suitability and sustainability of the environment. More so, border towns are associated with unplanned and lack of development control required for housing satisfaction.

## 2.2. FACTORS CONTRIBUTING TO HOUSING DEVELOPMENT PATTERNS

### *2.2.1. Land Use Pattern in Border Settlements*

Thuo (2013) [14] studied appropriate theoretical framework suitable for border settlements and discovered that there is no theory of land use that adequately explained land formation in fringe areas. Ballabh, Pillay & Hariram (2014) [15] and UN Habitat (2012) [16] described conditions of the physical environment as a factor that distinguishes human settlements and other related land uses in a particular area. Malikova *et al.,* (2015) [17] concluded that borders accommodate different stages of economic development and integration as a result of the increase in regional disparities. After a century of living in certain area or community, inhabitants had an opportunity to redefine spatial activities that would suit his or her own desires [18]. Human beings have become increasingly conscious of their ability to induce change and this self-knowledge has been applied more and more systematically [19]. Settlements undergo changes due to unpredicted growth and with time, they are incorporated into the ever-growing urban centre [20].

Anabestani (2014) [21] revealed that, housing patterns in Binalood County had 35.4 per cent of the housing patterns variation; in respect of social factors affecting the area include ethnicity, type of houses, family structure, migration, social stratification, security, religious beliefs, and traditions. Iranmanesh & Imantalab (2014) [22] argued that, the main effective factors in determine housing in particular area can be summarized in four items: morphology of land, livelihoods-based economy, climatic factors and socio-cultural status of people. Changes in neighbourhood particularly, the agrarian area towards the periphery is offering an approach to other land use patterns [23]. Williams (2007) [24] emphasised that, both safe housing and monetary needs ought to be catered for in settlement arrangement and usage. The settlement procedure likewise shapes a chain of exercises from arrangement, legitimate connection through land issues, planning, to execution. Social variables, specifically, seem to

drive settlement designs in spaces where people settle in clustered regions notwithstanding abundant accessible environment [25].

Adams and Okoampa (2011) [26] examined the relationship between settlements formation and economic development in the context of six communities in the central area of Ghana. The study indicates that the indigene-settler needs to understand challenges to promote economic development. Zhao, Lu & De Roo (2010) [27] agreed that, comprehensive development management be introduced to mitigate the negative impact of transportation caused by fragmented approaches to land use, housing, and transport development as a driving example in the city periphery of Beijing because movement determines land use pattern. Ballabh, Pillay & Hariram (2014) [15] argued that the distribution of settlements is very much affected by the morphometric attributes and physical environment in the region of Lesser Himalayas. There is higher diversity in the type of landscapes found across the regions compared to the pre-war era since the differences in natural landscapes are echoed by the differences in land use and settlement patterns [28]. Therefore, illegal and informal land subdivision is not limited land on the urban fringes but the process of raising densities in low- and medium-density [4].

#### *2.2.2. Poverty*

The relationship between housing and poverty is the inability of housing supply to meet demand in terms of quality, location, affordability, and security. Poverty is living below standard. There is no international consensus in determining poverty, but absolute poverty thresholds are determined by measuring survival needs related to food and shelter. Therefore, UNESCO described poverty in either relative or absolute terms. Absolute poverty measures poverty in relation to the money available to meet the basic needs such as food, clothing, and shelter while relative poverty is measured by prevailing standard set aside as a yardstick. Therefore, a person falling below or lacking all mentioned above is considered to be living in absolute poverty. The international standard in measuring extreme poverty is when the person falls below one dollar per day. The United Nation addresses poverty as a multidimensional that includes housing poverty which has effects on human life. Chandrasekhar & Montgomery (2010) [29], discovered that, poverty lines in India focus on basic nutritional needs of the residents while ignoring basic needs for housing. Meanwhile, both food and housing play very important roles in poverty reduction.

### 2.3. Land Tenure System in Border Settlements

Land is a critical element in the border. A borderland can be considered as peripheral because its location is related to social, historical, political, legal and economic factors experienced within the areas [30]. The process of addressing land issues is complex, time-consuming and highly expensive [31]. Housing and land demands in suburbs should meet the innovative and vision of governance frameworks. Land tenure is the mode of land holding together with the terms and conditions of occupancy [32].

Siakilo (2014) [33] studied the characteristics and state of land ownership tenure in Nairobi Kenya. He found that, lack of systematic dissemination of land information and updated land information contributed to uncoordinated land issues, therefore undermining the efficiency of environmental planning and lack of back up on registration of the land document. A planned settlement has a legal land tenure system, with adequate provision of infrastructure while unplanned settlements accommodate a large number of people closer to employment opportunities with insufficient services [34]. Land rights are crucial to housing development and a sustainable tool for future physical planning [35]. Security of tenure is a critical factor contributing toward people's housing development processes [36].

Agunbiade, Rajabifard & Bennett (2011) [37] in their study identified land, as a major factor in production and crucial for adequate housing production and adequate housing production, needs efficient land tenure system, land use map and land development analysis. Bizimana, Mugiraneza, Twarabamenye & Mukeshimana (2012) [38] examined land tenure security in Kigali city and revealed that, in Muhima, there was uncertainty of tenure security that may affect housing production. Therefore, they recommended that land management unit should exercise much effort in land matters. Current policies, institutions framework, laws and regulations govern access to land must not be overlooked [39]. Informality in land tenure system is a key factor in the development of informal settlement.

Informal housing is associated with land tenure procedures. Land tenure security means the owner will continue to occupy the land and benefit from the resources without threat and eviction [33, 38, 40]. The unsatisfactory land tenure system is caused by an individual by not able to have access to loan services in Kenya, where about 60% live in informal settlements due to financial problem to purchase suitable land, it also affects livelihood [41].

Payne & Durand-Lasserve, 2012 [42] and Csatari *et al.,* (2013) [43] suggested that land tenure should be viewed as a social entity embedded with rules and regulations that determine how land is acquired and utilized. The rights to land relied on the understanding between the owner and occupants. Land transfer from one person to another and inheritance are traditionally overseen in Nigeria by community or family rules and regulations, it can lead to informal housing planning. The procedures for accessing land undermine the efficiency of normal land use allocation, ownership and redistribution mechanisms [44]. From the perspective of environmental protection and site preservation, each unique and creative form of land ownership has its advantages and disadvantages [45].

Owusu & Asamoah (2005) [45] investigated overhauling land for housing improvement in peri-urban zones of Kumasi, Ghana, four measures were suggested: funding for infrastructure provision by landowners, collaboration between traditional authority and public sectors agencies/departments, enforcement of planning and development regulation and adoption of site and services approach should be adopted. In sub-Saharan Africa, customary landowners are the major providers of land for housing, their right to the land is not recognized by the state but play a major role [4]. Adam (2014) [47] concluded that land document is mainly obtained by trust without any legal written documents for a formalization of the agreement and dispute were settled by traditional ruler when matter arise.

Tukahirwa (2002) [22] observed that security of tenure is a prerequisite for land utilization either by individual or collective ownership which can also be affected by exogenous factors like migration. Kyessi (2010) [48] study on enhancing the security of land tenure in Hanna Nassif settlement, Dares Salaam, Tanzania, revealed that, the degree at which security of land tenure can reduce poverty is one of the objectives of formalization of property rights. He observed also that the nature and extent of the use of security of tenure to access finance are not well documented in Tanzania. Access to land and security for residential purposes and improvement are basically government effort for every fringe settlement. Spatial arrangement must be in conjunction with physical planning unit to oversee land subdivisions of the area and new patterns of land use [49].

## 3. METHODOLOGY

The study employed Structural Equation Modelling to evaluate how physical and neighbourhood characteristics influence housing formation pattern. Although SEM is a single technique it is a family of related procedures, with a number of important characteristics in common [50]. Purposively, SEM can be used to solve complex issues simultaneously [51]. Life-Cycle Model of Neighbourhood Change theory implies that neighbourhoods pass through

invasion or succession life stage developments processes and as such the development processes are complex in nature. This is because the stages initialize from transitional development to finally advancements of neighbourhoods both in urban areas and suburbs. Thus, the method suits the complex issues surrounding housing development patterns at international border areas. In addition, SEM consists of both measurement model and structural model [52]. In measurement model, the relationship that suggests how observed variables represent a factor variable is specified. On the other hand, structural model specifies relationship that exists among the factor variables through recursive and non-recursive process [50].

The linear model equation formula can be stated mathematically as thus:

$$\boldsymbol{PATTN} = \boldsymbol{\alpha} + \boldsymbol{PHYSI}\beta_{\text{PHYSI}} + \boldsymbol{NEIGH}\beta_{\text{NEIGH}} + \varepsilon$$

Where

PATTN = Development Pattern;

PHYSI = Physical Factors;

NEIGH = Neighbourhood Factors;

$\alpha = \text{constant};\ \varepsilon = stochastic\ term$

In this study, housing physical factors are measured by layout design (*layde*); physical features of areas *(phyfe)*; road network *(roane)*; housing quality *(housq)*; land features *(lanfe)*; accessibility to dwelling houses *(acces)*; vegetation *(veget)*; and land topography *(topog)*. Similarly, neighbourhood characteristics were captured by level of drainage system *(drain);* level of infrastructural facilities *(infpr)*; tenure status *(testa)*; land acquisition status *(laacq)*; means of land acquisition finance *(lacfn)*; condition of space *(bucos)*; condition of foundation *(bucof)*; and materials for roofing *(bumar).*

The study was conducted in Ogun State, southwest Nigeria. That share boundary with Republic of Benin, the choice of the state was predicated on the fact that the State has large border areas with moderate growth rates [53] and it has followed the national trends of increasing border population, [54]. The study results should, therefore, be fairly representative of large Nigerian border towns. Specifically, three towns were purposively selected for the study. These towns were selected given their high population densities and presence of government activities along the border within their jurisdictions. They are Idi-iroko in Ipokia Local Government Areas (25,415) Ilara in Imeko Afon Local Government Areas (11,905) and Ohunbe in Yewa North Local Government Areas (2,935) [54]. The study used existing base map of the settlements generated through google website to identify total number of buildings in the three selected towns. The results indicate 4,111 buildings in Idi-Iroko town; 1,905 in Ilara town; and 1,331 buildings in Ohunbe town. However, a pilot survey was conducted to identify habitable residential buildings and to pre-test the study schedule in order to validate the process and research instruments. In addition, pilot survey as a preliminary study was also used to re-examine study variables as stated by [55, 56]. Therefore, the available habitable buildings were identified in the process. Through this process, the habitable residential buildings as follows: Idi Iroko town- 3,802; Ilara town - 1,480; and Ohunbe town- 821 respectively. Hence, the population of the study comprised of 6,103 habitable residential buildings in the three selected towns for the current study.

For sampling selection procedures, the two-way statistical approaches established by Cochran (1977) [57] for finite population was adopted. In other words, the study effective sample size was calculated via two stages. Firstly, formula for calculating sample size when the population was applied and illustrated below as;

$$n_0 = \frac{z^2 pq}{e^2} \quad (1)$$

Where, $n_o$ is the sample size, $z$ is the selected critical value of desired confidence level, $p$ is the estimated proportion of an attribute that is present in the population, $q$ = 1 - $p$ and $e$ is the desired level of precision [57].

The study assumes the maximum variability to be 50% (p =0.5) and taking 95% confidence level with ±5% precision, the calculation for required sample size will be as follows;

$p$ = 0.5 and hence $q$ =1-0.5 = 0.5; $e$ = 0.05; $z$ =1.96

So,

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$$

$$n_0 = 384$$

Given the fact that *no* derived is greater than 5% of the population size (6,103). This, thus, brings the need to use correction formula to calculate the final sample size. The theorist, Cochran, points out that if the population is finite, then the sample size can be reduced slightly. This is predicated on the fact that a very large population provides proportionally more information than that of a smaller population [57]. He proposed a correction formula to calculate the final sample size which is given below as;

$$n = \frac{no}{1+\frac{(no-1)}{N}} \quad (2)$$

Here, $n_o$ = 384 is the sample size derived from equation (1) and $N$ = 6,103 is the population size.

By interpolation, equation (2) becomes;

$$n = \frac{384}{1+\frac{(384-1)}{6{,}103}}$$

$$n = 361$$

Therefore, in this case the representative sample size for the study is 361. This represents the number of habitableresidential buildings sampled through questionnaire from a sampling frame of 45 communities (being 20 from Idi-Iroko; 15 from Ilara; and 10 from Ohumbe respectively) by the residents; with household head as unit of analysis. Accordingly, the study employed proportional allocation method originally proposed by Bowley (1926) [58] to determine sample size for each of the three towns under study.

The formula is given as

$$n_i = n\frac{Ni}{N}$$

Where $n$ represents sample size (361), $N_i$ represents population size of the $i^{th}$ town (3,802 buildings in Idi-Iroko; 1,480 in Ilara; and 821 buildings in Ohunbe) and $N$ represents the population size (6,103). Systematic random sampling technique was employed to select the respondents (household heads) of the study with first observation randomly selected and afterward every fifth housing unit. This method ensures efficient sampling process and representation [59, 60]. The summary of sample size of residents by towns is shown in Table 1.

**Table 1** Summary of Sample size of Residents by Towns

| S/N | Local Govt. Area | Settlements/ Towns | Population of buildings | Sample Size of Residents |
|---|---|---|---|---|
| 1 | Ipokia | Idi-Iroko | 3,802 | 224 |
| 2 | Imeko-Afon | Ilara | 1,480 | 87 |
| 3 | Yewa-North | Ohunbe | 821 | 50 |
| | **TOTAL** | | **6,103** | **361** |

# 4. PRESENTATION OF RESULTS

## 4.1. Constructs preliminary test

Initial analysis of the study focused on preliminary test for all the constructs. The tests covered in this aspect include stability, internal consistency, mean, standard deviation, shared variance, and correlation analyses. A measurement model for the three constructs via SEM was estimated to this effect. Information revealed in Table 2 indicates that all the constructs internal consistency reliabilities were greater than 0.7. Thus, the constructs possess high reliability and as such acceptable. On stability of the parameter, a retrieval of 274 sampled opinions indicates sufficient and adequate data for the study given the number of proposed estimated parameters. Fourteen (14) respondents or participants were removed from the data set due to missing information on key variables. This gives a final sample size of 260 participants. The Cook's distance in STATA 12 was employed to evaluate the supposition of multivariate normality and linearity. Using this technique. Absence of univariate or multivariate outliers was employed. For multicollinearity incidence, information in Table 2 illustrates weak but positive relationship between the predictors of the variables for the study. Still in Table 2, the high values of square roots of the shared variance between the constructs and their measurements indicate evidence of convergent and discriminant validity for the study constructs. In addition, due to normal distribution of the study data the researcher utilized maximum likelihood estimation method in STATA 12 was utilised to analyse both measurement model and structural model in table 2.

**Table 2** Preliminary Test of Constructs (Measurement Model)

| | ICR | Mean | S. Dev. | $\sqrt{\sigma^2}$ | PHYSI | NEIGH | PATTN |
|---|---|---|---|---|---|---|---|
| **PHYSI** | 0.82 | 3.40 | 0.030 | 0.77 | 1.000* | | |
| **NEIGH** | 0.78 | 2.42 | 0.028 | 0.84 | 0.118** | 1.000* | |
| **PATTN** | 0.85 | 0.88 | 0.55 | 0.89 | 0.633* | 0.587** | 1.000* |

* $p < .01$; ** $p < .05$

Source: Author's Computation from STATA 12 Outputs, 2018

Note: i. ICR: Internal Consistency Reliability

ii. $\sqrt{\sigma^2}$: Square root of the shared variance between the constructs and their measurement items.

iii. *Diagonal* elements represent Pearson Correlation coefficient between constructs (PHYSI= Housing Physical Characteristics; NEIGH = Neighbourhood Characteristics; PATTN = Housing Pattern)

## 4.2. Evaluation of measurement model

The measurement model depicts the relationship that suggests how observed variables represent a factor variable are specified and measured. Factor variables in measurement model are not directly measured [61] rather captured through observed variables. From the information in Figure 1, it was shown that housing physical characteristics in the study area are significantly determined by physical features of areas *(phyfe),* road network *(roane),* land features *(lanfe),* accessibility to dwelling places *(acces)* and vegetation *(veget)* although the result suggests negative effect of land features in the area. In a similar fashion, Neighbourhood characteristics in the studied towns are largely influenced by level of infrastructural facilities *(infpr),* condition of space *(bucos),* condition of foundation *(bucof),* and means of financing land acquisition *(lacfn)*. The result shows further that low level of required finance to acquire land negatively affects Neighbourhood settings.

Further, the error term component (e) in the measurement model indicates unexplained variation in observed indicator by the latent variable. A non-significance covariance between the latent factors shows that they are both uncorrelated. Meanwhile, the non-significant value of Chi-square in Table 3 indicates that the measurement model of the study is satisfactorily fit. This implies that the model covariance structure is not significantly different from the study observed covariance structure. Again, Normed Fit Index (NFI = 0.96); Incremental Fit Index (IFI = 0.95); Tucker-Lewis (TLI = 0.94); Comparative Fit Index (CFI = 0.95); Standardized Root Mean Square Residual (SRMR = 0.06); and Root Mean Square Error of Approximation (RMSEA = 0.04) all indicate good fit of the measurement model. The next sub-section discusses the result of the structural model assessment.

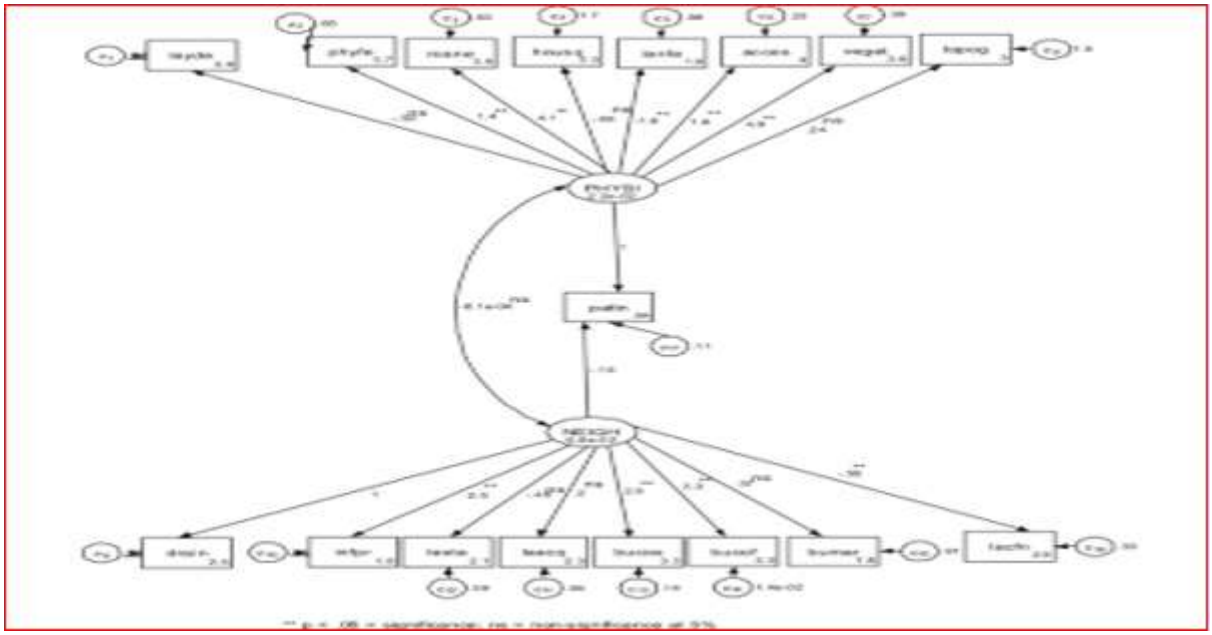


**Figure 1** Measurement Model

Source: STATA 12 Graphics Output, 2018

**Table 3** Goodness of Fit Indexes

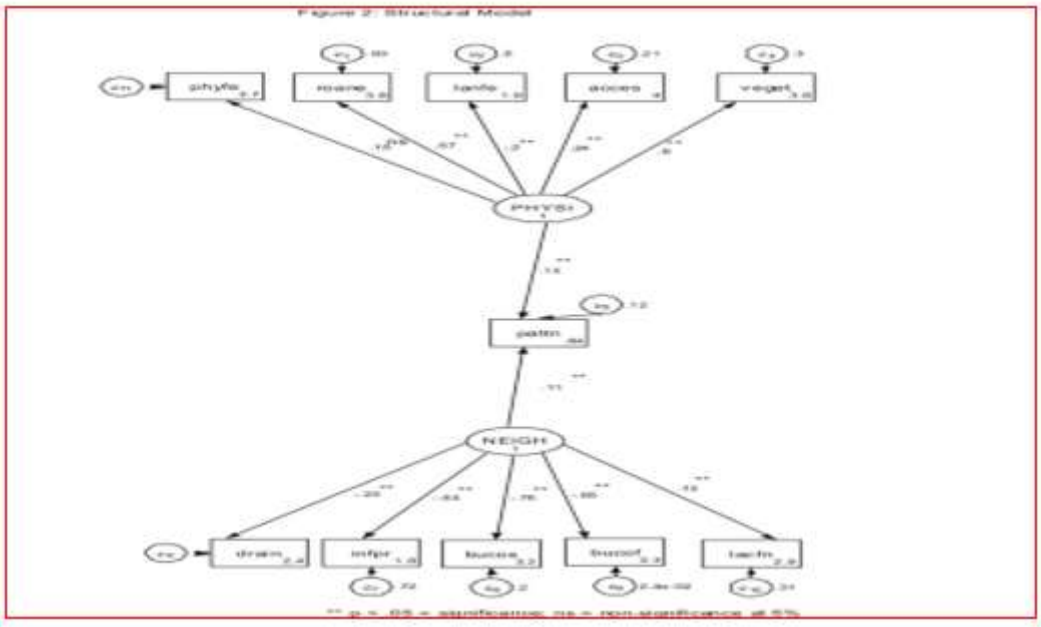
| Indexes | Shorthand | Sig. | Measurement Model | Structural Model |
|---|---|---|---|---|
| Chi-Square | $X^2$ | .785/.422 | 332.29 | 628.54 |
| Akaike Info. Criterion | AIC | | 4292.36 | 4152.21 |
| Normed Fit Index | NFI | | 0.96 | 0.97 |
| Incremental Fit Index | IFI | | 0.95 | 0.98 |
| Tucker-Lewis Index | TLI | | 0.94 | 0.95 |
| Comparative Fit Index | CFI | | 0.95 | 0.96 |
| Standard Root Mean Square Residual | SRMR | | 0.06 | 0.07 |
| Root Mean Square Error of Approximation | RMSEA | | 0.04 | 0.03 |

Source: Author's Computation from STATA 12 Outputs, 2018

## 4.3. Assessment of Structural Model

This section discusses the relationship between exogenous variables and the endogenous variables of the study. The relationship is important to highlight the effects of the study constructs (housing physical and neighbourhood characteristics) on the endogenous variable (housing development pattern). Such influence is diagrammatically represented in Figure 2. From the structural model presented in Figure 2 it is revealed that both physical factors and neighbourhood factors have direct significant and positive direct effect on housing development pattern in the study area. For instance, for every favourable state of housing physical factors and neighbourhood factors housing development pattern in the study area improves by 0.13 and 0.11 in figure 1 respectively. This result is further reinforced by adequate fit as revealed via AIC (4152.21) compared with result from measurement model; NFI (0.97); IFI (0.98); TLI (0.95); CFI (0.96); SRMR (0.07) and RMSEA (0.03).

**Figure 2** Relationship between variables




Source: STATA 12 Graphics Output, 2018

## 5. DISCUSSION OF FINDINGS AND IMPLICATIONS

The study hypothesised the relationship between housing development pattern in international border and its main determinants in terms of housing physical factors and neighbourhood factors through SEM. This hypothesised relationship was underpinned by the theory of life-cycle model of neighbourhood change. The two components of SEM – measurement model and structural model – were diagrammatically drawn to depict the hypothesised relationship. The study performed such SEM analysis based on data obtained from 260 residents in three selected international border towns between Nigeria and Benin-Republic in Ogun State. From the analysis, it was revealed that both physical and neighbourhood characteristics significantly and positively have direct effect on housing development patterns in international border towns. The settlements were majorly occupied by the Yoruba's with culture of mutual relationship, this allowed clustered building formation. The significance positive effect of housing physical factors is largely determined by road network, land features, accessibility, and vegetation while effect of neighbourhood characteristics on housing development pattern are determined by drainage system, level of infrastructural facilities, condition of space, condition of foundation and land acquisition finance. Moreover, the non-significant of the study model chi-square indicates good fit. Specifically, physical factors such as road network, land features, dwelling accessibility and vegetation of an area significantly determine housing development patterns in international border towns between Nigeria and Benin-Republic. This finding is consistent with Zhang *et al* (2014) [8]. Again, it was discovered that drainage system, level of infrastructural facilities, condition of space, condition of foundation and land acquisition finance as neighbourhood factors largely determine housing development pattern in the study area. This result is consistent with Ogundele, Ayo, Odewumi and Aigbe. (2011). [62]; [63]; [64];

## 6. CONCLUSION AND RECOMMENDATIONS

The estimation of housing development patterns in international border towns is essential to overcome some of the challenges facing development in these areas. This is particularly more important relative housing development programmes of international countries. Therefore, the determinations of factors that determine patters of housing formation in these areas deserve research attention. From the data obtained among residents in international towns between Nigeria and Benin-Republic it was discovered that both housing physical characteristics such as road network, land features, dwelling accessibility, vegetation and neighbourhood factors like drainage system, level of infrastructural facilities, condition of space, condition of housing foundation, and finance of land acquisition have significant effect on housing development patterns. More specifically, physical and neighbourhood impacts on housing development patterns are significantly in direct dimension. The study recommends that there is need for Nigeria government to take cognizance of these important factors when formulating or developing her housing development plan. Again, Nigeria governments need to upgrade all existing and moribund infrastructural facilities in those towns between her and Benin-Republic.

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