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INVESTIGATING HOUSING CONDITIONS IN INTERNATIONAL BORDER TOWN IN OGUN STATE, NIGERIA

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ABSTRACT

Housing conditions have attending impacts on occupants and social development of neighbourhoods at large. However, research studies detailing the current state of dwelling housing at international border areas between developing countries is limited or non-available. This study, therefore, investigates housing conditions in these areas with a particular survey focus on international neighbouring town between Nigeria and Benin-Republic. Following a scientific process, a representative sample of 280 households was selected through multi-stage random sampling technique. A calibrated statistical model which initially used indices on measuring severity of poverty was utilized at 5% level of significance and all analyses were conducted via STATA 12 statistical software. With Headcount ratio, it was shown that large proportions of the buildings population studied are in severe housing conditions. Again, Average Normalized Severity Gap indicates that housing conditions in the study area on average generally fall below the severity line. This was further supported by statistic from Average Squared Normalized Severity Gap. In other words, the study affirms that housing conditions of dwelling buildings at international border towns between Nigeria and Benin Republic as developing countries are in critical or very deplorable condition.

Key words: Housing, Housing Condition, International Border, Severity Index.

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1. INTRODUCTION

Housing quality reveled through components, which incorporate to physical state of the structure, and distinctive services that make living in a specific area conducive. Housing quality reflects the extent to which inhabitants benefit from infrastructure in that community. Yakubu, Akaateba, Bernard, and Akanbang (2014)[1] established strong evidence that links issues of housing conditions, health of occupants and destitution levels. Jiboye (2010)[2] described housing quality in relation to environment and its social characteristics. Both characteristics were found to advance convenience, aesthetic, enthusiastic, and financial prosperity of the tenants. According to Amao and Ilesanmi (2013)[3], housing is not just a matter of bricks and mortar but it is an integral part of the borders' physical, economic, and social character. The quality of housing design and maintenance has connections to the wellbeing and personal satisfaction of individuals as reported by Yakubu, *et al.*, (2014)[1] [51]. This is because the built-up area forms the real architectural expression, which undeniably exists in an area [4]. The personal satisfaction of individual within an area is firmly interrelated with population change, healthcare facility, space, physical development [5] [52].

Housing is a key issue in socioeconomic functionality of any community because it accommodates the largest percentage of the working force. Therefore, housing should be a priority of any government, since it helps in nation building and supports health status of individuals. Houses can be developed in many forms, ranging from flats, high-rise to single room apartments. The production depends on resources available and household size. Inadequacy in housing production portrays housing policy as a failure to meet the needs of the populace. Impact of good housing on productivity and health status is not comparable. Therefore, policy interventions should not be limited to the urban cities alone. Border towns should also have opportunity in housing production to support inhabitants. The response to production of housing cannot be compare to consumable goods. Therefore, it requires slow and steady means to meet the needs of people.

2. LITERATURE REVIEW

Shelter is a basic need of human beings after food and clothing. Its importance cannot be over emphasized. In the history of human existence, provision of shelter was for survival. Housing is very important to society in terms of physical development and socio-cultural status. Housing was viewed as a physical structure with required services within and outside the building [6]. Housing reflects the cultural, social and economic approach of a society [7]. Globalisation and urbanisation coupled with population increase created more demand for housing [8]. Demand for residential units is been driven by increase in economic growth, which may not comply with available housing units [9]. In order to address global shelter needs, the United Nation's General Assembly in December, 1998 adopted the Global Strategy for Shelter to the Year 2000, which was formulated based on an enabling approach (UNCHS, 1991-2). Ingrained in the strategy were guidelines for shelter provision by individual countries. The extent to which the strategy has improved housing situations, globally and within individual nations is yet to be ascertained. Housing constitutes the largest space in every settlement and shape the regions in achieving require development patterns [10].

Housing remains a problem for Nigerians residing in both rural and urban areas. The policy makers in Nigeria have formulated various policies to ensure that citizens have access to safe and decent accommodation that will promote healthy living. In border areas, the physical expansion and cross-border activities increase socioeconomic activities through migration. Increasingly, the problem of housing shortage and inadequacy is getting more attention in border areas because of inability of the government to provide housing accommodation for migrants either for business or for residence. Habitable housing plays a significant role in an area and improves wellbeing. It reduces extra spending on drugs and vaccines and increases human productivity. Housing problems in developing countries including Nigeria comprise of quantitative inadequacy, deficiency in housing stock and poor environmental condition [11].

The problem facing housing sector in the country always traced to years of neglects, uncoordinated housing finance institutions, inadequate and low-income level. UN Habitat (2005)[12] examined housing development patterns as a multi-sectoral issue, influence by sufficient and insufficient finance, security of tenure or any other regulatory framework. Housing development and patterns in border communities are not supported by adequate and effective social amenities such as motorable roads, water supply and drainage system. Shortage or unavailability of these infrastructure cause non-functionality of a settlement and result in environmental degradation.

Many developing countries struggle to solve their housing problem. They often find that there is lack of adequate knowledge and experiences in housing. The housing poverty is not only linked to economic poverty but also linked to knowledge poverty and skills poverty [13, 14].

In achieving the Millennium Development Goals (MDGs), Affordable housing must be available as a strategy to reduce rate of sickness in an area, as emphasised in the seventh goal of the MDGs. Hove, Ngwerume and Muchemwa (2013)[15] pointed out that, uncontrolled urbanisation increases spatial and socio-cultural problems of developing countries, and causes inability of the citizens to secure affordable housing units, which encourage high number of households to reside in unplanned and slum settlements. In the past, various environmental legislation to create conducive environments were formulated. Yet, the highest proportion of urban residents lives in unconducive housing with lack of facilities that can promote living condition. The need for housing is a major problem in developing countries where both physical expansion and economic activities are taking place rapidly. Therefore, policy makers should clearly focus on the need to achieve millennium development goal number seven that focuses on adequate housing and environmental sanitation.

Hamman (2014)[16] observed that inability of settlements to absorb the housing needs of migrants' causes over utilisation of existing infrastructure and emergence of slum. Housing is a prerequisite for enhancing functional environments that promote quality of life, reduce slum formation, and reduce cost of medical expenses. Therefore, Arnott (2008)[17] studied housing policy in developing countries with a focus on subsidizing shelter for low-income households and provision of amenities to support them. Osumanu, Kosoe and Dapilati (2016) [18] concluded that, nature of problems facing housing in low-income settlements cannot be resolved by mere traditional production of shelter by individuals. Housing is regards as an expensive commodity possessed by households. Low-income household find it difficult to build in areas of their choice. The cost of acquiring land, building elements and materials as well as cost of providing facilities within and outside of the house pose a challenge for individuals with low income. Housing provision by government should be as part of their responsibility to improve the economy and reduce the cost of governance by purchasing extra vaccines to cure infections arousing from bad housing.

UN-Habitat (1996b)[19] affirmed that human beings are very important and point of concern when considering sustainable development. Development includes habitable housing that improves living condition. Abimaje, Akingbohungbe and Baba (2014)[20] studied housing affordability in Idah, Nigeria. Their finding shows that high percentage of population pay more than 30% of their income on housing which have effect on standard of living, with little amount of money on other needs.

2.1. Housing Quality

Statistics New Zealand (2015) described housing quality as an external and internal quality of a dwelling structure and neighborhood. The concept of housing quality is broad and comprises both the physical characteristics and satisfaction [21]. The indicator of housing quality should encompass housing environment, housing hardware and ecological attributes of the area. The indicator considering housing quality in international border towns may be different from those in city centers due to the peculiarities in culture and settlement locations. Indicators are the parameters describing a phenomenon and state of environment [22]. Quality of housing is determined by the residents' perception as identified by Adeleye, Azeez and Yusuff [23]. The Nigerian government showed its concern for housing situation in the country by establishing finance institutions with responsibility of providing adequate and affordable funds for residents. Unfortunately the institutions have had little impact on the people [24]. The relationship between residents and environment explains the component of housing quality and safety of neighbourhood include street lighting, good roads, community facility, it improves sustainability of environment. The relationship between external structure, internal structure and internal environment contributes to housing quality.

The cost of building materials and land determined quality of housing [25]. Ebehikhalu and Dawam (2015)[26] observed that, poverty is widespread and the income level of the people determines the condition of housing and standard of living of the people. Hataminejad, Yazdi and Hosseinnejad (2014)[27] described settlement informality as obvious facets of urban destitution in most of immigration and vulnerable cities. Developing countries inability to take prudent environmental and public health measures, significantly increase pollution and environmental degradation for the poor [28]. Zehadul-Karim (2013)[29] conducted a research on living conditions in residential areas of Malaysia. He observed that improving quality of life of residents, requires improvement in their socio-cultural and recreational facilities. Magigi and Majani (2006)[30] revealed that, unplanned housing development areas represent a key development challenge for urban planners and professionals in the built environment.

Housing quality depends on indicators as yardstick for measuring housing performance. Indicators are tools used informally with a long of time, especially in economics, to assess the situation of the country and progress towards national goal (UNCHS/ World Bank, 1991-2). The needs of the people have priority over the environment to achieve neighbourhood development. Maleki, Ahmadi and Rabbani (2012) [31] concluded that housing indicators are valuable measuring tools for understanding living conditions of inhabitants

Housing indicators consist of accessibility, neighbourhood facilities, quality of infrastructure, spatial adequacy, housing quality, fixtures, and fitting aesthetics, free from pollution and insecurity [3]. It should be able to satisfy minimum housing quality for the benefit of inhabitants and their health status. Poor housing condition affect household functionality [32]. The key indicators of housing quality are the required high percentage of dwelling with amenities and average number of habitable rooms[51]. Indicators are not data but variables required for measuring quality, which can be understood, by lawmakers and the general populace

2.2. Life-Cycle Model of Neighbourhood Change

Hoover and Vernon in 1959[33] developed Life-Cycle model of neighbourhood change to illustrate invasion or succession life stage developments processes that a neighbourhood passes through. These developments stages are development, transition, downgrading, thinning out and renewal [34]. These development stages are considered crucial for transitional development and advancement of neighbourhoods both in urban areas and suburbs. In particular, the stages are more important for housing units in suburbs and rural areas of developing countries like Nigeria. This is premised on the general poor state of housing units conditions as documented by extant literature such as Okoye, Ezeonkwo and Mbakwe (2017)[35]; Federal Government of Nigeria Habitat III (2016)[36]; Olotuah and Taiwo (2015)[37]; Olotuah (2015)[38]; Jaitman and Brakarz (2013)[40] and others. In other words, the relevance of the model can be associated with housing conditions developments in suburb and rural areas as the present poor situation transit to improved conditions. More importantly, the model provides framework for assessment of physical characteristics and neighbourhood characteristics of neighbourhoods that explain features and nature of social structure of the inhabitants' environment. This is because neighbourhood itself does not represent settlement alone but includes other features such as housing units, social structure and spatial dimension.

3. METHODOLOGY

Idiroko is located on the Nigeria-Benin border along the Lagos-Badagry-Porto Novo highway. Idiroko is the largest town in Ipokia LGA in the west of Ogun State, sharing boundary with Benin Republic. It is situated 6032'00"N2^{0}51"00"E along the Nigeria- Benin Republic border and was a major official border route since the1960s. The location of the route serves as an official cross-border post because of commercial activities in the area, Idiroko has developed from a rural to urban. The inhabitants of town are multilingual due to their mixed culture and intermarriages.

Housing conditions is a crucial indicator of housing quality. However, the idea behind considering housing conditions is very important and as such combined both the physical attributes of structure and satisfaction with housing [41]. In other words, the perfect set of measures and indicators to measure the state of housing should provide information about the physical attributes of the housing and the wider environmental features of the areas where such dwelling buildings are assisted. It is in line with this view that the current study aims at examine housing conditions in international border area holistically with particular focus on housing characteristics, environmental characteristics and housing costs. The inclusion of housing costs as part of the factors for evaluating housing conditions is premised on the fact that housing costs constitute a large share of the household budget [41].

This study was conducted among the households in selected housing in an international border town between Nigeria and Benin-Republic named Idi-Iroko town. The population of the study area at 1996 was 20,965 [42] with no other reliable or published data available till the current period. Hence, the researcher used Malthusian Growth Model (MGM) to estimate current population of the study area. According to Okoye et al (2017)[35] Malthusian Growth Model (MGM) predicts an exponential increase in the population with time. MGM is estimated using this equation:

$$\boldsymbol{P_n = P_o e^{rt}}$$

Where $P_o = the\ initial\ population\ (base\ year)$

$$P_n = Current\ population\ (required\ population)$$

r = growth rate (average population growth rate); e = exponential; t = time interval (years)

The average population growth rate at state level, local government level and towns that make up Ogun State is estimated at 3.35% (0.0335) by National bureau of Statistics (2011)[43] while the time interval between base year population and current year population estimation is 22 years. In other words, the current population of the study is estimated at 43,806 people.

The study applies two way statistical approaches recommended by Cochran (1977)[44] for finite population given the study population of 1,036 dwelling buildings. The sample sizes were calculated by two stages formulae. Firstly, by formula for calculating sample size when the population is infinite this is given as thus;

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

Where, n_o is sample size, z is the selected critical value of desired confidence level, p is the estimated proportion that represent populations, q = 1 - p and e is the desired level of precision (Cochran, 1977)[44].

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, however, brings the need to use appropriate formula to determine the sample size. The theorist, Cochran, indicate that if the samples is finite, then the sample size can be less in size. Because huge population provides more information than a little population (Cochran, 1977)[44]. The correction formula to determine the final sample size is stated as follow;

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

Here, n_o = 384 is the sample size derived from equation (1) and N = 1,036 is the population size.

By interpolation, equation (2) becomes;

$$n = \frac{384}{1+\frac{(384-1)}{1,036}}$$

$$n = 280$$

Therefore, in this case the representative sample size for the study is 280. This represents the number of households that will be selected for the current study. The households here are conceptualized as a person or group of persons that live together typically under one building or roof or in the same compound with a head of household. In the main, the heads of each household that would be selected serve as the units of the analysis. A multi-stage sampling

procedure was employed to select the samples for the study using simple random sampling. The first stage involves selection of buildings through simple random sampling and second stage was carried out for household selection via same sampling procedure. A random sampling was employed to select 70 buildings and 4 households randomly selected from each building. In all, 280 households were sampled and administered well-structured questionnaire to obtain opinions and perceptions about the housing conditions. Moreover, to further ensure fair representation of respondents, weights were attached to each selected observation in each household of the study area. The weights are determined by taking the inverse of probability of observation inclusion in the survey process; however, weight derived depends on the relative size of the household.

The opinions and perceptions obtained were rated on a 5-Likert scale ranging from least deplorable to very deplorable and analyzed with a modified poverty index by Foster, Greer and Thorbecke (1984)[45] class. The current study made extensive and substantial modification to three poverty indices from the Foster, Greer and Thorbecke (1984)[45] class, FGT (α). The purpose here is to transform the indices into severity index statistics that would be applied to assess the current conditions of housing buildings in the study area. Again, the thrust of the model calibration is also premised on the need to arrive at empirical tool that could be employed by current and future research studies in this area as bunch of previous studies relied heavily on descriptive statistics. The real poverty index model by Foster, Greer and Thorbecke is given as follows:

$$\boldsymbol{FGT}\ (\propto) = \sum_{\boldsymbol{i=1}}^{\boldsymbol{n}} \boldsymbol{F1}\{(\boldsymbol{z}-\boldsymbol{yi})/\boldsymbol{z}\}^{\propto}\boldsymbol{Ii}$$

Where, *FGT (α)* = Poverty Index; *Fi = wi/N* and $N = \sum_{i=1}^{n} wi$. The poverty line is *z* with present income as *yi*, and the poverty gap for person *i* is *max (0, z – yi). Ii = 1 if yi < z and Ii = 0* otherwise.

The model is calibrated to suit the need of the current study as;

$$\boldsymbol{SEV}\ (\propto) = \sum_{\boldsymbol{i=1}}^{\boldsymbol{n}} \boldsymbol{F1}\{(\boldsymbol{x}-\boldsymbol{yi})/\boldsymbol{z}\}^{\propto}\boldsymbol{Hi}$$

Where, *SEV (α)* = Severity Index of Housing Conditions and *α* ranges from *1 to 2*; *Fi = wi/N and* $N = \sum_{i=1}^{n} wi$ where weights are attached to the samples selected to ensure true representation and as well to variables of interest. The severity line is *z* with present housing condition as *yi*, and the housing condition gap for building i is *max (0, x – yi). Hi = 1 if yi < x and Ii = 0* otherwise. For the purpose of the current study, a severity line of 0.5 as the model z – statistics is put forward. The axiom here is that housing condition is potentially believed to improve if a dwelling housing SEV (1) or SEV (2) reaches a value above severity line. Lastly, it is important to disclose that the current study applies the same procedure of FGT (α) estimation in STATA. The study utilized STATA 12 statistical software application to analyze SEV (α) index.

4. PRESENTATION, INTERPRETATION AND DISCUSSION OF FINDINGS

The outcome of severity of housing conditions in the study area is presented in Table 1

Table 1 Housing Condition Severity Index

Housing Condition	α = 0		α = 1		α = 2	
	Index	Sig	Index	Sig	Index	Sig
Roof type	0.6827	.000	.0361	.004	.0674	.000
Doors and Windows	0.5239	.000	.0154	.012	.0254	.000
Dwelling Walls	0.5034	.000	.0320	.008	.0433	.000
Floors	0.4834	.003	.0264	.030	.0567	.000
Building Services	0.8631	.042	.0419	.000	.0213	.000
Spatial Configuration	0.5310	.000	.0134	.000	.0621	.000
Crime or Violence	0.5521	.000	.0144	.010	.0534	.000
Noise Pollution	0.6542	.000	.0398	.000	.0632	.000
Air Pollution	0.5219	.008	.0432	.005	.0746	.000
Building cost	0.7290	.011	.0322	.011	.0544	.000
Utility Cost	0.5780	.000	.0543	.000	.0233	.000
Total Number of Obs.	280					
Weighted total number of Obs.	15258					
Number of observation severe	196					
Total Number of Observation severe	10432					

SEV (0): Headcount ratio (proportion severe)

SEV (1): average normalized severity gap

SEV (2): average squared normalized severity gap

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

4.1. Interpretation of Results

The information in Table 1 illustrates the result findings of FGT transformed poverty index to Severity Index through STATA 12 statistical software application. From the Table, key findings emerged. With Headcount ratio, it was shown that large proportions of the buildings population studied are in severe housing conditions. This is reflected by SEV (0) estimate for each of the housing condition indicators. For roof type and condition (68%); doors and windows condition (52%); dwelling walls condition (50%); floors conditions (48%); building services, e.g. electrical, toilet, bathroom (86%); spatial configuration (53%); crime or violence (55%); noise pollution (65%); air pollution (52%); building cost (73%); and utility cost, e.g. cost of electrical, roads, water (58%) are in severe conditions. The result indicates that housing characteristics (such as building services and roof type), environmental characteristic (noise pollution) and housing cost (building cost) constitute the most apparent severe housing conditions in the study area.

However, the headcount ratio just like in adopted FGT Model ignores the depth of severity. In FGT model, if the poor become poor the headcount remain unchanged [31, 46]. Hence, the use of average normalized severity gap is required. Average normalized severity gap, SEV (1), according to the current study estimates the depth of severity of housing conditions by taking cognizance how far, on the average, dwelling housings are from severity line. This moderately statistic (average normalized severity gap) indicates that housing conditions in the study area on average generally fall below the severity line. The result from Table 1 depicts that the degree of housing condition severity gap is high for indicators such as utility cost (0.054); air pollution (0.043); building services (0.0419); noise pollution (0.0398); roof type (0.036); building cost (0.032); dwelling walls (0.032). On the other hand, such severity gap is less for variables like spatial configuration (0.013); crime or violence (0.014); doors and windows (0.015) and floor conditions (0.0264).

Similarly, average normalized severity gap index has a drawback in the sense that it ignores inequality among the housing dwellings. Therefore, adjusting for the inequality among the housing dwellings through weights attachment implies that the use of average squared normalized severity gap will be preferable to other measures. However, the absolute value of the severity index has no clear interpretation and often difficult to interpret [31]. The measure is simply a weighted sum of severity gaps where the weights are the proportionate severity gaps themselves. Unlike average normalized severity gap index which attach equal weights to severity gap squared normalized severity gap index attach weights that are proportionate to severity gaps. For instance, weights of 4% and 2% are assigned to roof type and condition and doors and windows respectively. The implication here is that squared normalized severity gap implicitly puts more weight on housing condition indicators that fall well below the severity line. In other words, housing condition indicator becomes worse with an increase in the value of squared normalized severity gap and vice versa.

5. DISCUSSION OF FINDINGS

This study critically assess the state of dwelling housing in international border area between two developing countries, Nigeria and Benin-Republic, with a particular focus on a neighbouring town connecting the two countries. The findings from the data collected through a sophisticated statistical approach reveal that housing conditions in the study area are in very deplorable (or severe) state. It was discovered that housing conditions in the study area on average generally fall below the severity line. This is reflected by the degree of housing condition severity gap which is high for indicators such as utility cost, air pollution, building services, noise pollution, roof type, building cost, and dwelling walls. Such severity gap is less for indicators like spatial configuration, crime or violence, doors and windows, and floor conditions. This result is similar to previous findings about urban/slum housing conditions in Nigeria such as Okoye et al (2017)[35]; Abimaje et al (2014)[20]; Opoko (2013) 53; Olotuah (1997; 2005; 2015)[47, 39,38]; Adegbehinde (2011)[48]; Onu and Onu (2010)[11]; Arayela (2004)[49]; Nkwogu (2001)[50]. Deductively, the outcome of the current study implies that there is incidence of poor and critical state of dwelling housing units in neighbouring town at international border between Nigeria and Benin-Republic. This was particularly observed and noticeable in Idi-Iroko town.

The significance of the current study stems from the fact that it specifically focused on an international bordering town which has few standards housing and substandard or slum settlements. This brings out the difference compared to previous studies which either focused on urban housing or slum settlements. More importantly, the outcome provide a framework for assessing housing conditions of dwellings at international border areas in terms physical characteristics, environmental factors and housing costs. Further, the use of calibrated severity index from FGT Poverty Index or Severity Index clearly ensures the unique of the current study compared to previous studies. On the other hand, emphasis on one town could limit the effectiveness of generalization to other non-covered towns. However, taking into consideration all classes of housing in the study area and obtaining the responses of household heads with diverse socio-economic features improves the validity of the current study and generalization thereof.

6. CONCLUSIONS

Housing conditions are important indicators of measuring the standard of dwelling housing which has attending impacts on occupants and neighbourhoods at large. Due to the opportunities of investment, economic growth and social development potentials of vibrant housing formation at international border areas, the current research provided evidence on

housing conditions in one of these areas. The findings by the current research indicates that housing conditions of dwelling buildings at international border towns between Nigeria and Benin Republic as developing countries are in critical or very deplorable condition. This finding is consistent with previous findings on housing conditions within Nigeria territorial areas. The uniqueness of this study stems from the use of newly innovative statistical technique (applied FGT Severity Index) to extensive coverage of varying degrees of housing as a difference to prior studies that either covered urban housing or slum settlement buts not both. However, an application of the intuitive technique to analyse a wider data (that is, covering more than one town) provides ground for future research.

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