

Exploring Socio-Economic Design Implications of Public housing Transformation; The Nigerian Experience

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Abstract. Occupancy and funding are crucial attributes of culture in predicting public housing transformation in Nigeria. The study investigates the implication of occupancy and funding as salient socio-economic factors of housing transformation. Questionnaire survey method was used to assess users' experience which was analysed using statistical analysis with structural equation model (SEM). The result indicated a good model fit of occupancy and funding as socio-economic predictors that motivates residents' housing adjustment decisions. Thus, the study recommends that socio-economic indices of occupancy and ease of funding future public housing adjustments can be considered by developers at the design stage.

Introduction

Trends in public housing transformation has been observed in developing countries overtime [1]. Indeed the absence of indigenous cultural content in initial designs [2] have been attributed to these transformation decisions [3, 4]. However, policies recommended from these research outputs are rarely implemented [5]. It therefore becomes inevitable to focus on the transformation indices and relating it with design to pragmatically guide future design solutions.

Occupancy and source of funding housing transformation is viewed critical to households living in public housing. This is due to the disparity between family structure and allocated space areas of public housing units. A good percentage of these families consist of the vulnerable urban poor who considers public housing as a last choice [6]. Therefore, there is need for design solutions that projects future possible changes while taking care of current needs. Thereby, making it easier for households to adopt future changes in space use when deem necessary.

Purposeful samplings of ten (10) housing estates across five northern states of Nigeria where the major ethnic groups' in the region are in dominance were selected for the study. The states include Adamawa, Benue, Katsina, Niger and Sokoto states. Findings from the study established occupancy and funding as good indicators of public housing transformation motives and should be considered at the design stages of public housing design.

Literature Review

Culture and Design of Public Housing: Recent public housing studies by [7, 8] have shown that the significance of culture in the built environment cannot be undermined. Thus, culture delineates the occupation pattern of households and defines the direction of housing policy. Although, most housing policies in Africa particularly in Nigeria are geared towards owner occupation tenure [9], it has encountered little satisfaction from the potential occupants. Because existing patterns are faced with changes to meet up with cultural needs. These changes are usually unguided making the neighbourhood vulnerable to vices. Consequently, scattered uncontrolled layouts of public housing has exhibited some impact on crime patterns [10, 11]. Therefore residents' participation, is recognised in alleviating crime fear in high density public housing environment [12]. Ultimately, studying the socio-cultural pattern of users' and incorporating it into design will reduce the repulsion between users' requirement and public housing configuration. For instance, Abbaszadeh,

et al. [13] calls for design concepts that will accommodate repelling Persian socio-cultural needs. Echoing with Olowoyo and Khan [14] previous studies have inadequate evidence on cultural inclusion in the design process in Nigeria housing delivery.

Socio Economic indices of Public Housing: Socio-economic influence of users' living in public housing could vary due to factors such as environment, region, social history and geographical location. These certainly have varying impact on the users' choices and housing adjustment decisions. For instance, while socio-economic indices of age, household size, household income and housing price have similar effects on housing tenure choice in the west, quantity of employees and marital status have different effect [15]. In contrast the choice of housing in Africa particularly in Nigeria is observed to be first, based on the provision of shelter for the household; then, an anticipation of adjusting to meet household needs in order to accommodate the socio-economic indices later.

However, low income earners for whom public housings are primarily provided for are vulnerable to overcrowding with occupancy ratio exceeding acceptable standards [16]. Hence, the need for a paradigm shifts in the design of public housing from the provision of house to home in accordance with the peculiarity in socio-cultural preferences. For example, Elsinga and Hoekstra [17] asserted in an empirical research that homeowners considers design features, quality and cost as significant indices of housing satisfaction in the Netherlands and Denmark. Similarly, Kellekci and Berköz [18] in their work have associated improvement of housing satisfaction to demographic and socio economic features of the users. Also, Mohit, *et al.* (2010) in their study, revealed residents' dissatisfaction with socio-economic attributes of age, family size and working wives. Consequently, responsive housing must align with socio-economic realisms of its users [21].

Public Housing Transformation: To elucidate the choice of adjustment, Popkin, *et al.* [6] argued that rather than expose vulnerable households to challenges of relocation; public housing authorities should develop varieties of alternative choices to ensure residents' acquire steady and secure housing. Implicitly they make these alternative choices when they engage in housing adjustments to get maximum benefit in transformation decisions. For instance, in Australia home owners have preferred improving their homes to meet changing life time socio economic conditions [22]. Moreover, dynamism of socio economic indices of households requires flexibility that will allow for their future participation in changes according to their needs. Accordingly, Tipple [1] highlighted features of transformation benefits to include, improved design, user participation, more space for household, increased habitable space and improved economic status. Indeed, these features motivate homeowners to invest in housing adjustments in spite of the increasing cost on transformation.

Methodology

Psychometric evaluation using structural equation model was used to test the manifestation of occupancy and funding as prime socio-economic indices of public housing transformation. First, exploratory analysis showing factor analysis using Kaiser-Meyer Okin measure with Bartlett test (KMO) was found to be significant for both factors at $< .001$. Secondly, dimensions reduction using principal axis factorisation extraction was performed to ascertain the loading coefficient of the items. Table 1 shows the loading coefficient of the items from factor loading analysis. Variable items with loadings ≤ 0.399 , (Items 62, 65 and 66) were not considered for further analysis. Furthermore, Confirmatory factor analysis (CFA) was conducted for the remaining 13 items in order to achieve a reasonable model fit. The result shows GFI = .904, CFI = .805, CMIN/DF = 2.804 and Ramsea 0.81 indicating an acceptable model fit [23, 24]. Impliedly the model fit the sample representing the population for the study. Thus, Fig 1 shows the factors proposed as socio-economic determinants of transformation.

Table 1: Factor loadings

Occupancy Rate		Funding	
Item	Loading Coefficient	Item	Loading Coefficient
ITEM 1	.675	ITEM 10	.639
ITEM 2	.572	ITEM 11	.603
ITEM 3	.567	ITEM 12	.572
ITEM 4	.545	ITEM 13	.489
ITEM 5	.535	ITEM 14	.319
ITEM 6	.515	ITEM 15	.305
ITEM 7	.488		
ITEM 8	.459		
ITEM 9	.367		

Results and Findings

Correlation Analysis: The correlation coefficients indicate that the factors have strong positive relationship in predicting the phenomenon with $r = 0.68$ and $p < .001$ loading coefficient in their association. Table 2 shows the covariance estimate with the p value $< .001$.

Regression analysis: In order to predict the strength of the determinants in the phenomenon, regression analysis was carried out. The result indicated occupancy rate as the best predictor factor while, retirement economic support; family growth and phases of changes; lack of occupancy standards and lack of social security as better predicting variables that determine occupancy rate. However, all item attributes are significant predictors of the factors with univariate estimate values considerably high and p -values significant at $< .01$ (Table 3).

Table 2: Covariance Analysis

			Estimate	S.E.	C.R.	P
Occupancy rate	<-->	Funding	.244	.057	4.265	***

Table 3: Regression Analysis

Item -factor			Estimate	S.E.	C.R.	P
Unrestricted lease to a third party	<---	Occupancy rate	1.000			
Retirement socio-economic support	<---	Occupancy rate	.964	.109	8.811	***
Family growth & phases of changes	<---	Occupancy rate	.718	.102	7.053	***
Changed need from house to home	<---	Occupancy rate	.658	.095	6.937	***
Lack of occupancy standards	<---	Occupancy rate	.721	.102	7.084	***
Lack of adjustment restrains	<---	Occupancy rate	.708	.101	6.992	***
Lack of communal social security	<---	Occupancy rate	.790	.112	7.064	***
Tenure occupancy	<---	Occupancy rate	.696	.107	6.523	***
Home based entrepreneur	<---	Occupancy rate	.684	.115	5.948	***
Allocation eligibility	<---	Funding	1.000			
Source of adjustment fund	<---	Funding	1.243	.284	4.374	***
Access to mortgage finance and housing loans	<---	Funding	2.131	.423	5.034	***
Access to cooperative societies' input	<---	Funding	2.066	.433	4.775	***

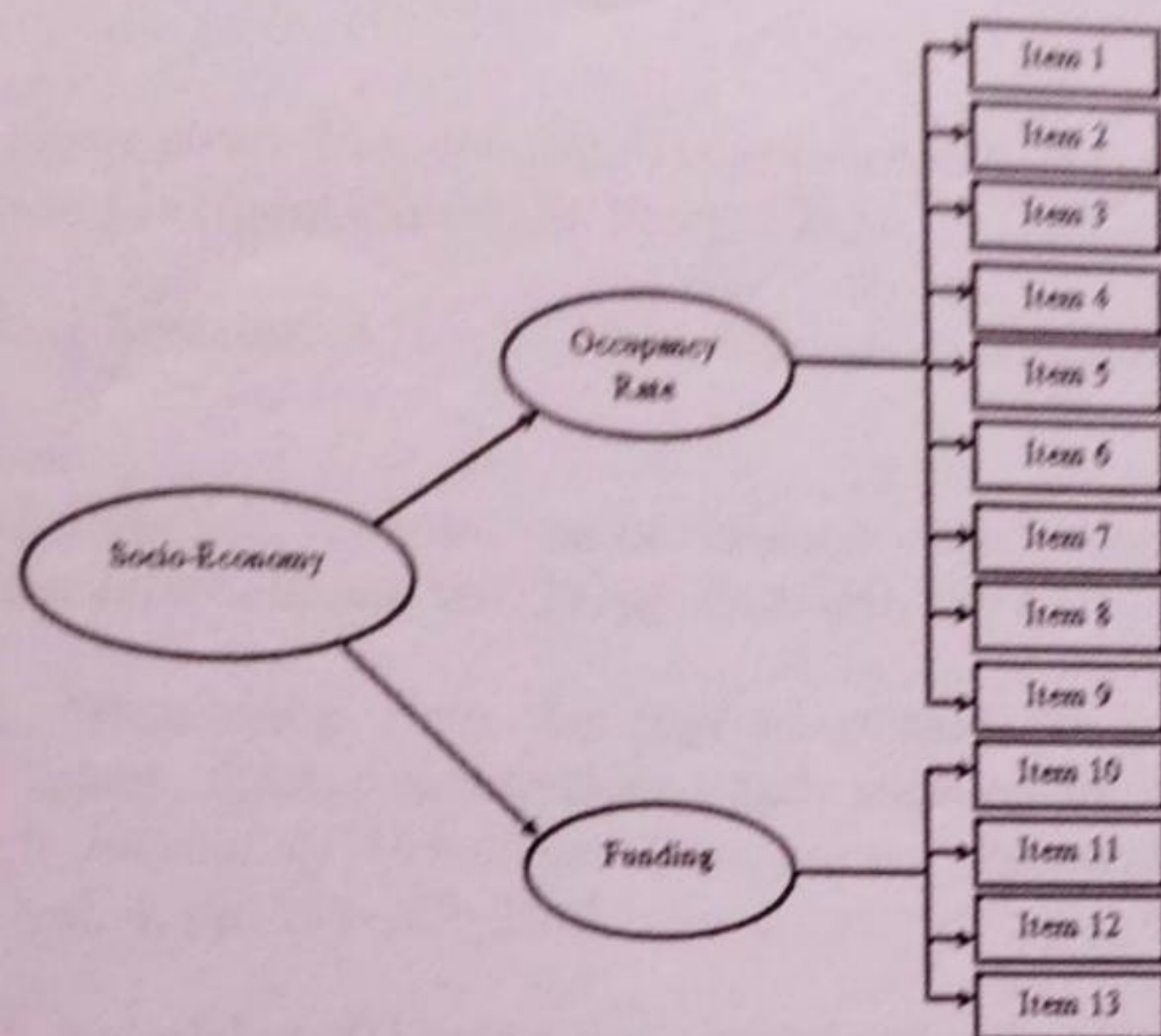


Fig 1 Proposed Structural Model of Socio-Economic composite of Public Housing Transformation

Discussion and Conclusions

Varying socio-economic attributes particularly demographics of households was found to increase users' satisfaction [18]. In congruence this study found retirement economic support for households with change in family size experienced to have acted on the non-clarity in occupancy standards and fear of social security as a path in transformation decision. As a result, households become more vulnerable to social challenges due to extensions whose impact manifests in spatial density of housing configurations. The development of this configuration extends out to the open spaces without planning considerations. Previous studies suggested modification policies on public housing environment that will reflect users' appropriation of adjoining home space [25]. Furthermore, with the urban poverty on the rise and particularly with public housing residents, funding housing transformation with competing family demands will not allow for qualitative and orderly housing transformation. In addition, securing loans from financial institutions and co-operative societies for such purposes is not a common idea. As a result household remain constrained in achieving transformation objectives notwithstanding the challenges. This in turn gradually changes the initially planned neighbourhood into squalor environments with health and security hazards. This finding is in line with previous works like [26].

Recommendation

Sustainability in public housing cannot be achieved if the potential users' operation efficacy is not considered at the design stage. Therefore, the design implication of this study is that developers should project possible occupancy ratio by comparing and harmonising the existing situation with the provisions in regulations to ease future housing adjustment burden on homeowners. Such considerations should manifest in both the initial design and projections for future alterations.

This study is limited to the conceptual consideration of occupancy and funding as factors of transformation from the socio-economic perspective. Further studies should focus on empirical investigation of household size and amount of money spent on transformation to enable developers reduce unguided future extensions by initial design considerations.

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