

Discovering design implications of public housing adjustment benefits in Nigeria

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ABSTRACT: Heterogeneous spatial paradigm in public housing design is essentially inevitable and most avidly followed urban issue in Nigeria today. In contrast to the one time homogenous configuration provided which has proved ineffective overtime, layout patterns and benefits of transformation are less focused on. Equally, design solutions emerging from transformation benefits have limited empirical footing. In this circumstance, houses of urban public housing typology were studied after transformation. The study adopted conditional sampling of 42 public housings in five states of northern Nigeria. Social pattern analysis was used to assess the social pattern of the transformed spatial configurations, subjected to gamma analysis in establishing the spatial pattern of adjustments. The resultant graphical delineation indicated that the spatial system developed out of the social meaning imposed upon it by the social activities of the occupants. Thus, design implication requires developers to consider future transformation initiatives of occupants at the design stage.

Keywords: Discover, Design implications, Housing adjustment, Social pattern

1 INTRODUCTION

Emphasis on heterogeneity in public housing design tends to avail the benefits users achieve in the transformation process (Khan, 2014). Isah *et al.* (2014) suggested that the inclusion of users' socio-cultural inclination in the design process will enhance public housing sustainability. Indeed, socio cultural attributes have been identified as key in Nigerian housing delivery (Ayoola and Amole, 2014; Ibem *et al.*, 2012; Jiboye, 2011a, 2011b; Jiboye, 2010; Maina, 2013; Odediran *et al.*, 2013; Ogu and Ogbuozobe, 2001). This study therefore showcases the social pattern reflected in the spatial adjustment of public houses embarked upon by the users in order to achieve desired housing consumption. As part of a regional study, it examined contextually users' spatial changes to public housing unit in the transformation process. Accordingly, 42 houses were selected by stratified randomly sampling among transformed housing units in 10 housing estates purposefully chosen for the research. The findings categorised changes made by occupants into conversions, extension, addition and re-configurations of spaces reflecting both control groups and stress overtime as motivating forces. The design implication requires a rethink by developers to accommodate these considerations in initial spatial provisions to avoid violation of setbacks and building lines associated with

unguided transformation in attaining the benefits of transformation process.

2 BACKGROUND STUDIES

2.1 Housing transformation

Attaining household space needs with changes in housing consumption level is considered significant benefit in the transformation process rather than improving physical features (Tipple, 2000), thus reflecting social communication with civilization (Franklin, 2006). Advancement from prototype housing which has not proffer solutions to housing quality in Nigeria (Olotuah and Bobadoye, 2011) require consideration of the dynamism and benefits in heterogeneity experienced over time in public housings layouts as a result of occupants' action of housing layout adjustment. Thereby, reflecting the inevitability of housing transformation. Moreover, place attachment with social ties developed over time, familiarity and conveniences are identified as attributes that motivate occupants' choice to transform rather relocate dwellings (Seek, 1983). Even though (Clark and Onaka, 1983) concluded that factors such as lifecycle needs and socio-economic variables which motivates user transformation equally motivate residential mobility. However, low income

group are constrain to choose to transform than relocate due largely to financing with those who move lacking the option of further housing adjustment (Seek, 1983).

2.2 Design implications

Researchers have acknowledged as crucial design expectation in housing adjustments (Zinas and Jusan, 2012). Because liveability is declined due to design spaces not conforming with usage (Rosow, 1961). For instance, design and house size are important to users' housing satisfaction (Türkoğlu, 1997). Hence, the need to harmonise modern housing conception and indigenous perception of considering spatial design for its function rather than identifying spaces with names due to the multi-functionality role in space use (Habraken, 1998). Thus linking space configuration with social meanings (Bafna, 2012). This study contributes to harnessing the benefits of public housing adjustment by accessing user changes towards identifying crucial steps in minimising violations and incorporating transformation benefits as design solutions in order to achieve public housing sustainability. Accordingly, Isah et al., 2014, suggests harnessing users operational effectiveness at the initial design stage to enhance sustainability in future public housing design considerations.

2.3 Social pattern

Social pattern reflected by adjusted spatial configuration pivots the conceptual perception to be empirically harnessed in public housing provision. Although, Hiller and Hanson affirm that spatial organisation is a function of social structure, Foster (1989) asserts that some social information is not related to spatial organisation even though spatial arrangements impart social information. However, the consideration and inclusion of socio-cultural patterns derived from users' experience in design will minimise the revulsion between user needs and public housing structures.

3 METHODOLOGY

As part of a regional study of transformation phenomena in northern Nigeria, ten (10) public housings were purposefully selected with establishment ages ranging between 5 and 50 years of existence, located in the five state of Niger, Sokoto, Katsina, Adamawa and Benue where major ethnic groups of Hausa, Fulani, Tiv, Nupe and Gwari can be found. Also, they are sited in the state capitals and accommodating low income group. Government initial controlled public housing estates which were later sold to occupiers were chosen for data collection. This was to avail the study with the types of transformation common during the government control period as well as owner control period. Data was extracted with the consent

Table 1. Summary of gamma diagram analysis relating types of occupants' transformation variety.

| Adjustment type | Fresh 1-5 (yrs) | Old 6-10 (yrs) | Older 11-15 (yrs) | Mature 16-20 (yrs) | Established >20 (yrs) | Total |
|-----------------|-----------------|----------------|-------------------|--------------------|-----------------------|-------|
| Conversion | 4 | 4 | 5 | 3 | 1 | 17 |
| New space | 3 | 1 | 1 | 1 | 1 | 7 |
| Reconfigured | 4 | 6 | 4 | 2 | 7 | 23 |
| Extension | 0 | 4 | 2 | 2 | 2 | 10 |

of household heads that were selected through stratified random sampling of transformed housing units in the selected public housing estates. The information largely captured as layout sketches and observations include the spatial configuration of the housing units at the time of study which was later analysed by comparison with the initial designs of these houses in order to determine the adjustments made to the housing units by the occupants. Consequently, social factors and adjustment types were identified in transformed spatial configurations of selected public housing estate. In addition the control periods by both the government and later occupiers were identified to influence the nature of changes irrespective of the stress saturation level.

Social pattern analysis was adopted to check for structured and re-structured spaces. Because social pattern analysis inspires maximization of samples drawn from multiple settings of the same culture and background (Zerubavel, 2007). Also, functional patterns reflected through social pattern analysis is significant in uncovering common features across different contexts (Zerubavel, 2007) by comparing spatial patterns (Harvey, 2010). Gamma diagrams were used to evaluate layout patterns which manifested the spatial transformation types which include conversions, extensions, addition and re-configuration of layout spaces. Table 1 summarizes the rate of these transformation types as typically depicted by the gamma diagrams presented in Figure 1.

4 DISCUSSION OF RESULTS & IMPLICATIONS

In the first instance, descriptive statistical analysis of occupants based on their occupancy duration was established. This was followed by representing spatial relationships using gamma diagrams as presented in Figure 1 to illustrate transformed layout patterns. The un-shaded portions are functional spaces that are in the initial design and not affected by the adjustments while the adjustments in are depicted by the shades portions in each case. The patterns indicated the introduction of additional spaces and functions such as habitable spaces like rooms, additional toilets, reception/outdoor relation area and increase in the living room space, represented by the shaded portion.

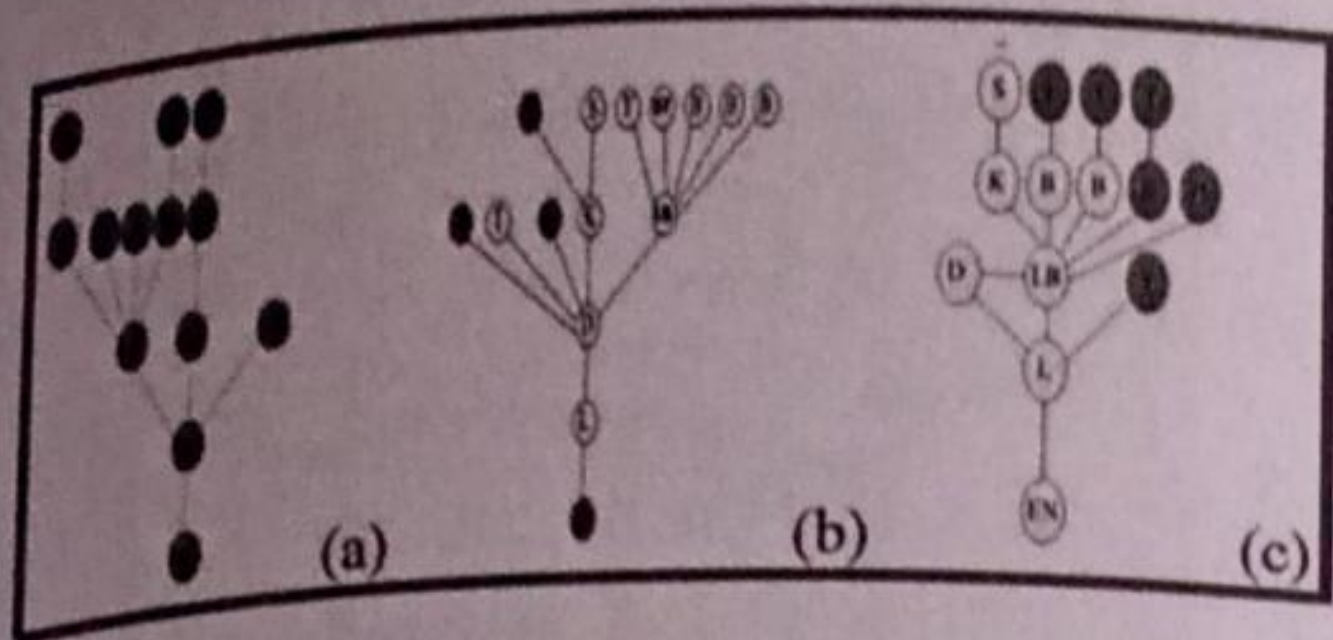


Figure 1. Gamma diagrams showing changes made by occupants overtime in the shaded portions.

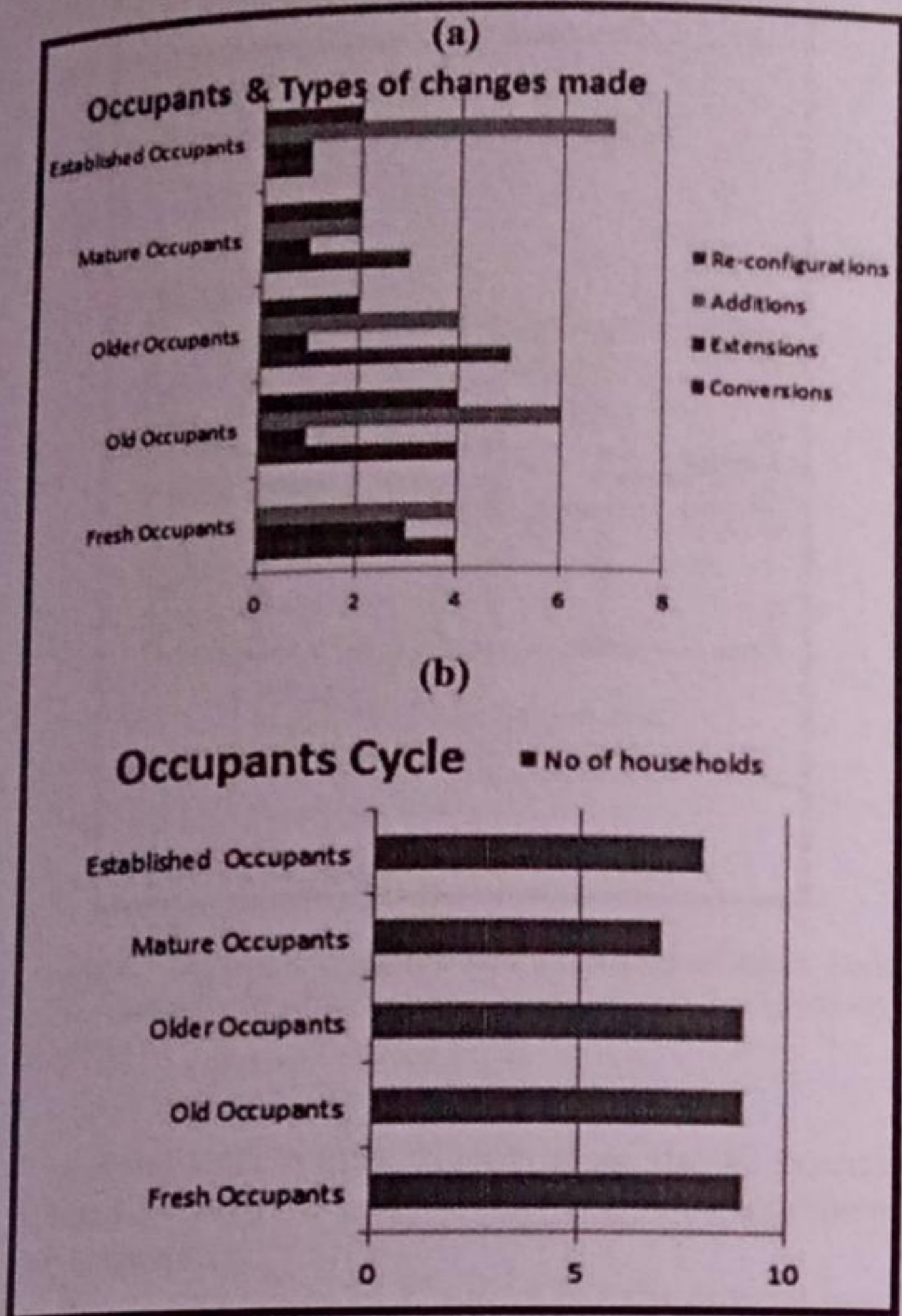


Figure 2. (a) Categorization of occupants & nature of adjustment carried out. (b) Categorization of occupants based on occupancy duration.

Figure 1(a) shows a complete spatial reorganisation by the occupants changing the entire layout from the initial design. In Figure 1(b) the occupant extended the entrance and kitchen exit while converting two functional spaces from their initial uses. In Figure 1(c) the occupant added new spaces to the existing layout.

Again, it was observed that these public housing estates had initial control of the government and later transferred to the occupants through owner occupier sales. This was reflected on the type of changes embarked upon by the occupants.

Therefore stress with occupancy duration was examined in order to comprehend transformation type common to categories of occupants as presented in Table 1, Figures 2 & 3 respectively. Seek (1983), in his

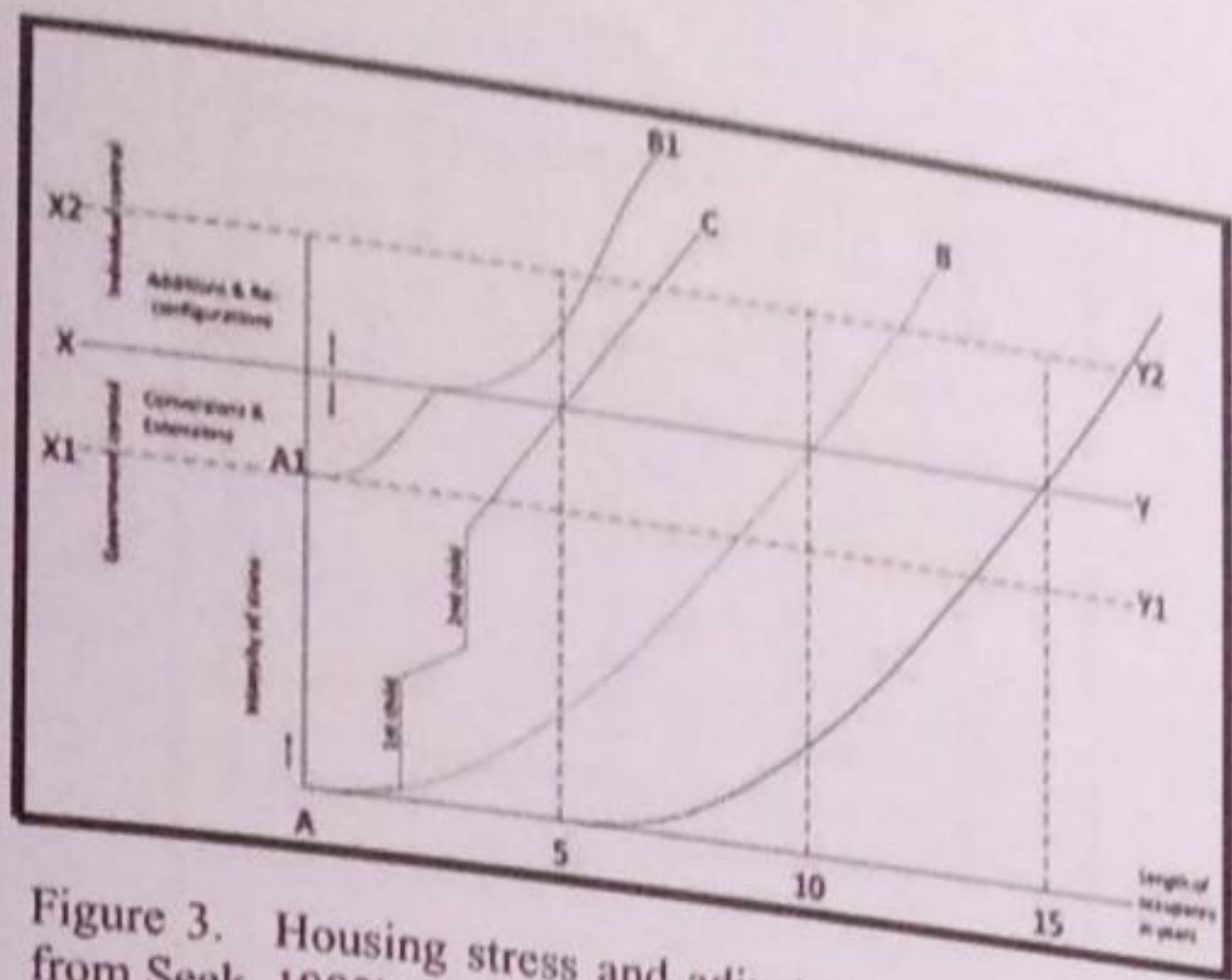


Figure 3. Housing stress and adjustment timing (adapted from Seek, 1983).

stress and housing adjustment model related the intensity of stress to be directly proportional to the length of occupancy with housing consumption adjusted with change in demand. Further stress overtime results in critical level which ignites decision on the best course of action to adopt in its alleviation. In contrast, it is observed that in the circumstance under consideration government ownership and control required that any alteration has to receive approval from authorities. This they often deny occupants as their stay was viewed to be temporary until government reversed its decision to sale the houses to the occupants. This action subjected occupants to increased stress with fresh, old and older occupants limited to space conversions during this period. Also occupants do not want to invest much resource, just to lose the investments at the point of eviction or tenancy expiration. This action forced occupants' to tolerate the housing stress in spite of their changing family structure and needs. Similarly, during the occupier control period after the houses were sold on owner occupier basis layout re-configuration by occupants of all categories was embarked on to alleviate existing and further stress.

It was observed that conversion of spaces accounted second after complete re-configuration in the nature of transformation by households. This is associated with two reasons. First, these houses were owned and controlled by government and later given out based on owner occupier bases. Consequently, most conversions occurred during the government controlled period irrespective of the critical tolerance level. Secondly, conversions were common among the fresh occupants and tenants as they adapt to the building. However, additions and reconfigurations occurred mostly during individual household control period predominantly after attaining the critical tolerance level. Stress curve A1-B1 in Figure 3 shows that households attain housing stress upon occupation during government control period as house allocated from inception do not tally with household size. For this reason conversions and extensions are immediately considered as adjustment choices. Further stress level attainment then results into addition of spaces and reconfigurations upon occupier ownership control.

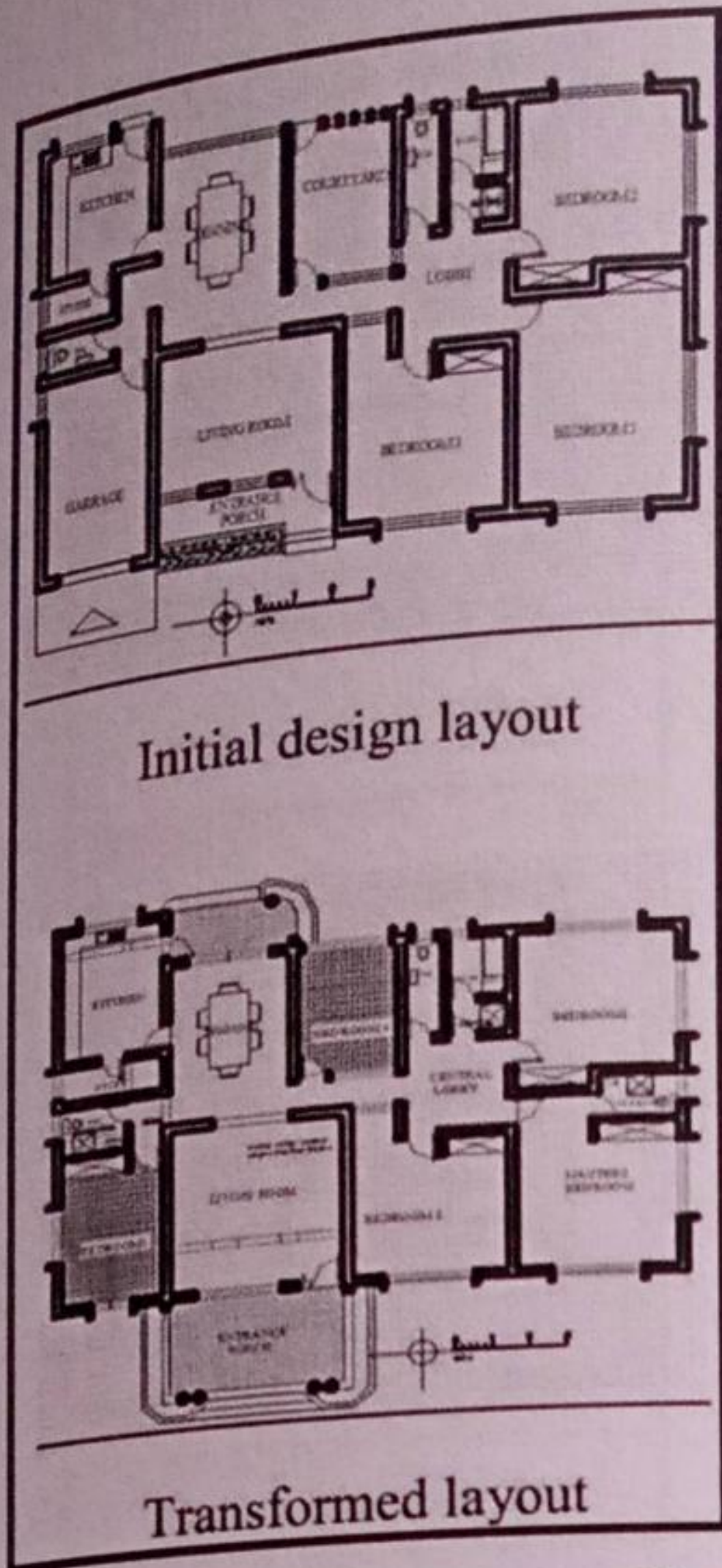


Figure 4. Typical conversion and extension of three bedrooms initially designed public housing unit in Markudi, Nigeria.

Subsequently, typical layouts from the 42 houses studied showing the various categories of adjustment are discussed.

The second layout in Figure 4 has the shaded portions showing the garage and courtyard converted into bedrooms and an extension of the entrance reception and the kitchen exit respectively. The prime focus of this transformation is to gain additional habitable space for the household, an outdoor relaxation and guest reception at the entrance of the house common to the Tiv community in Nigeria.

Similarly, in the 2 number two bedroom semi-detached layout (sharing party wall) public housing unit in Figure 5, one of the occupants reconfigured his unit layout gaining additional space for the living room, while introducing an additional room, visitors' toilet and extending the entrance verandah. However, in attaining this pattern, other spaces suffered decrease in size. This is a typical illustration of occupants who completely rearrange the internal configuration of their housing units after gaining ownership control.

Likewise in the typical two bedroom initial design layout located in Minna, Nigeria and presented in Figure 6, the occupant adjusted the building by utilising

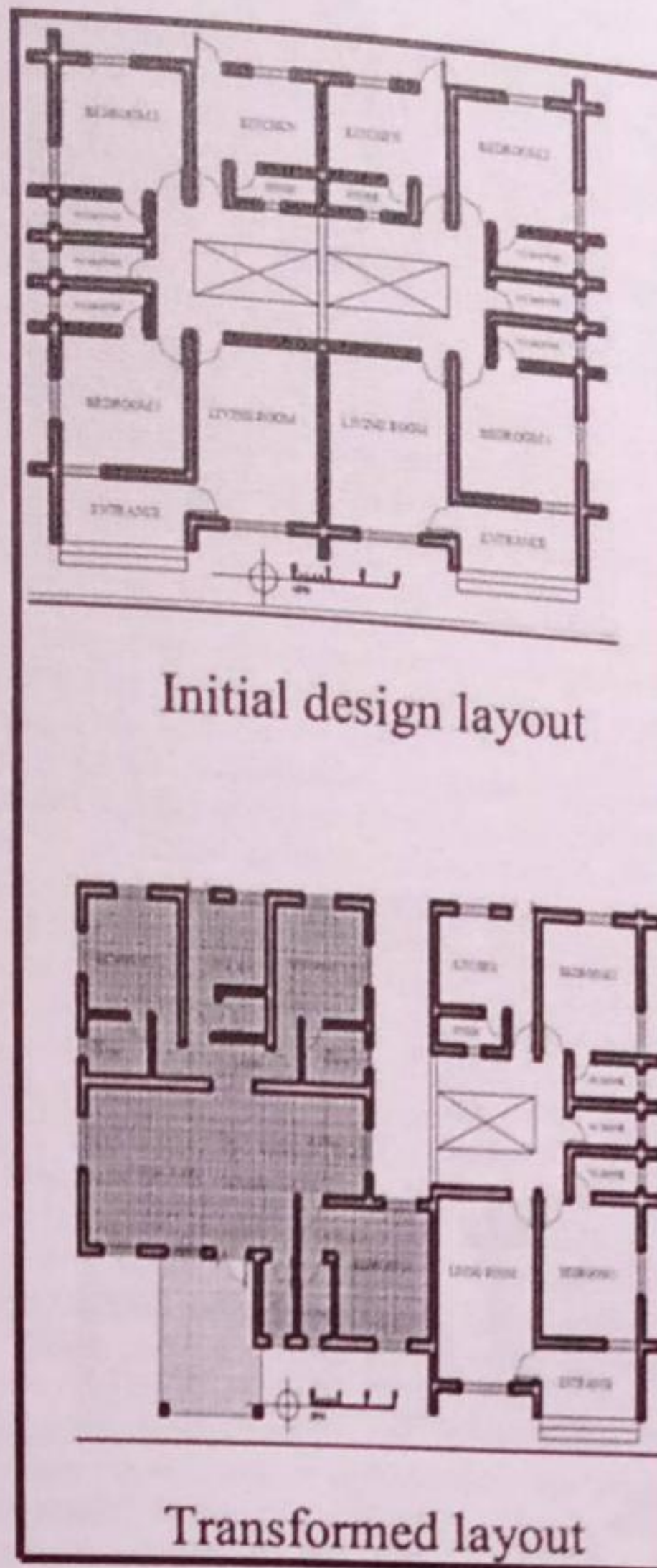


Figure 5. Typical re-configuration of two bedrooms initially designed public housing in Makurdi, Nigeria.

the available open space opposite the existing bedrooms to position additional two bedroom (indicated by the shaded portion of the transformed layout) in order to meet the required needs of the household.

5 CONCLUSION

Findings of this research advances a practical step of design solutions over (Sinai, 2001) who suggested some housing adjustment attributes as useful in formulating housing policies. Thereby a foundation in public housing designs.

Conclusively, the benefits of transformation process are reflected in the spatial patterns developed overtime by occupants. This is better harnessed during user control period as such ownership should be transferred after the provision of core units. Consequently, homogeneous designs can serve as core provisions in public housing provisions allowing for flexibility for future transformation which is inevitable and should be guided at the design stage. This will accommodate anticipated changing user needs and minimise violations in the course of adjustments by prospective

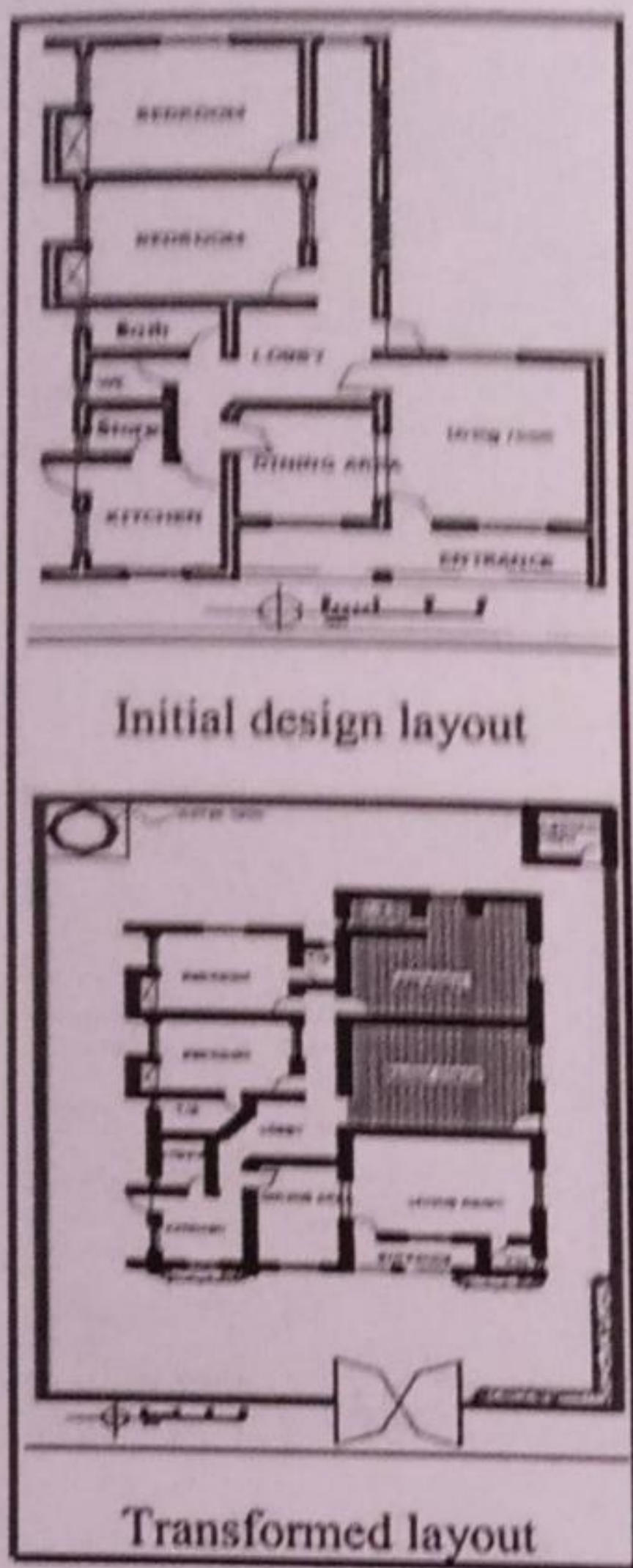


Figure 6. Typical addition to a two bedroom initially designed public housing in Minna, Nigeria.

occupants. Operationalization of the design patterns that evolve practically from real live context is an applicable foundation in public housing study as step in proffering solutions to public housing provisions and quality in Nigeria.

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