EXPLORING THE CONCEPT OF INCREMENTAL HOUSING IN THE DESIGN OF PROPOSED ABU PHASE-II STAFF HOUSING ZARIA

BY

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DECLARATION

I declare that the work in this Dissertation entitled "Exploring the Concept of Incremental Housing in the Design of Proposed Abu Phase-II Staff Housing Zaria" has been carried out by me in the Department of Architecture. The information derived from the literature has duly been acknowledged in the text and a list of references provided. No part of this Dissertation was previously presented for another degree or diploma at this or any other Institution.

_____ _____

ADEYEMO, Ayodeji .J Date

CERTIFICATION

This Dissertation entitled "EXPLORING THE CONCEPT OF INCREMENTAL HOUSING IN THE DESIGN OF PROPOSED ABU PHASE-II STAFF HOUSING ZARIA" by ADEYEMO Ayodeji .J. meets the regulations governing the award of the degree of Master of Science in Architecture of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This research project is dedicated to God Almighty and to my family especially my mother; MrsJ.A. Adeyemo, whose unwavering support and encouragement made this work a reality.

ACKNOWLEDGEMENT

I sincerely appreciate and acknowledge the effort and honest advice andcontribution of my diligent, understanding and hardworking supervisorsDr. G.O Mudashir and .Dr. Moukhtar M. Mai who despite theirtight schedules read every page of this work to make sure it isa success. Their guidance, advice and corrections made this research work a success.May the Almighty God bless and reward them abundantly.I would like to offer my profound gratitude to my Parent Mr. and Mrs. J.AAdeyemo, whose continuous prayers, care, concern love, financial assistance andsuggestions made this work a success. My thanks go to my siblings‟ Yetunde, Kayode,Kemi and Jumoke for their help and support during the compilation of the study. I alsoexpress my profound gratitude to my sweethearts Miyamta, Maryann, and Estherfor their encouragement and all roundsupport.

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ABSTRACT

The study investigated housing Adjustmentactivities in the neighbourhood in two selected public housing Quarters of ABU Zaria in Kaduna State. The analysis of these adjustmentsin Area II and Silver jubilee Staff Quarters of Ahmadu Bello University Samaru Zaria were carried out in terms of their features and Manner on the residential quality. The general approach to this study was exploratory and descriptive, based on both qualitative and quantitative research techniques because the qualitative enquiries helped to explore the diversities in a situation or phenomenon while the extent or magnitude was determined through the quantitative means. The survey method was employed using questionnaires. The respondents' were 112 residents of the housing quarters, randomly selected from a total of 248 residents in the two quarters. In addition, in-depth interviews were conducted as part of the qualitative data on 5 stakeholders purposively selected. The data collected were subjected to statistical analyses using frequencies, percentages, cross tabulations. The outcome of the research shows that 95 of the 112 residential units under study were adjusted (86.4%), especially through the addition of sleeping spaces and securing their respective units. Behavioural factors and response to the drive of gaining more accommodation/spaces through different means was the highest motivator accrued from such effort. Measuring residents' pattern to certainadjustments noticeable in the study areas, showed their acceptance level for direct labour method. The housing quarters have beenaltered from a homogeneous community to a heterogeneous community. Thus, the neighbourhood have become mixed even in relation to land use. The propensity of these housing adjustments implies that incremental schemes in residential design, especially for the urban poor is imperative.

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"The notion of literal adaptability presents problems when it is translated from the realm of the ideal into that of the real..." - Alan Colquhoun

1.0 INTRODUCTION

1.1 Backgroundto the Study

Housing is an essential part of human settlement that satisfies basic need and has a profound impact on the quality of life, health, welfare as well as productivity of man.Researchershave established that the quality of public housing in this country is generally poor (Ukoha and Beamish, 1997; Olatubara and Fatoye, 2006; Fatoye and Odusami, 2009; Jiboye, 2009; Ilesanmi, 2010; Clement and Kayode, 2012; Ibem and Amole, 2012;Lawanson and Onifade, 2013; Ibem and Azuh, 2014) and that this is more pronounced in housing quarters inhabited by the low/middle income earners.

Adjustment is synonymous to words like alteration change conversion, revolution, renovation and makeover. Aduwo, Ibem and Opoko (2013) describe housing adjustment as the change of original form and spatial configurations of dwelling units by the occupants in order to meet current needs and expectations.Housing alterationsis typical of both formal and informal residences, especially in developing economies like Nigeria. Adjustment of official residence of staff could be observed within the hierarchy of quarters, noticeable in residential concentrations where there are stocks of government-built housing.For various reasons, these quarters are presently exhibiting physical forms which are in most cases, a complete departure from what they hitherto were or should be. Numerous reasons may be responsible for this fast overwhelming practice. Therefore, it has become vital to lookinto this prevailing phenomenon in order to understand why it is gradually becoming a prominent feature in most low-cost public housing neighbourhoods.

A large proportion of the existing studies on housing Adjustmentare in developing countries but with a relatively smaller number in Nigeria (Adegbehingbe, 2011; 2012). However, little can be said concerning these chosen quarters in A.B.U Zaria, Kaduna

because one is not aware of any detailed research that has been carried out to highlight the significance of this phenomenon.

This research, therefore, centreson housing Adjustment/adjustments, with interest on the how they are carried out, why staff engage in it and what the physical characteristic of these alteration activities are in the built environment of Silver jubilee and the Area II Low-Cost housing quarters in Sabon Gari Local Government Council Area of Zaria.

1.2 Problem Statement

Adjustments in public housing has not satisfactorily attracted the expected attention of intellectuals in this part of the world. In recent time, most formal housing has undergone drastic alterations, which is gradually becoming the order of the day. These changes and extensions are generally known as "Adjustment," and may contain useful models for future policy concerning existing housing estates and policy on new developments

Initial designs of most A.B.U. staff quarters are rigid and inflexible to accommodate the changing lifestyle and housing needs of its occupants over time, which can triggerthe demand for adjustment actions by the occupants.This is due to the disparity between their lifecycle and lifestyle with their allocated housing units.

The present state of housing unit no longer caters for the needs of the occupants, observed from the rapid adjustment in most dwellings and their immediate environment. Although these alterations are associated with compromised aesthetic, congestion, environments devoid of the desired level of comfort and privacy, promoting unhygienic neighbourhood. Residents of these quarters are still on hype for adjusting their units.

Therefore, a research focusing on design solution that projects possible future changes while taking care of the current needs is necessary. Thereby, making it easier for households to adopt well integrated future changes in space use when deem necessary.

1.3 Aim and Objectives

The aim of this study is to examine housing Adjustments in some selected housing quarters in A.B.U. Zaria, so as to explore the concept of incremental housing in the design of proposed A.B.U. Phase-II staff housing Zaria with the following objectives:

i. Examine the reasons and attitude for housing adjustment in the selected staff quarters;
ii. Examine the manner in which these activities are executed; and
iii. Analyse the physical adjustment in the spatial organization of the buildings;
iv. To demonstrate research findings in the design of staff quarters.

1.4 Research Questions

i. Why did the users transform their dwelling unit?
ii. How did the users carryout Adjustment activities in these staff quarters?
iii. What are the fundamental characteristics of these physical adjustments that have taken place?

1.5 Justification

The outcome of this study will give a design proposal for a live housing for A.B.U staffs. Based on the World Bank Report (2014) on Nigeria Housing Financing, there are about 13 million housing units and there is still a deficit of 17 million units to cover for the housing requirements in Nigeria. The research result not only begins to fill a significant gap in the knowledge of Adjustment and sensitivity to the impact of Adjustment that have taken place in the physical forms and spatial orientations of buildings and the general fabric of the neighbourhoods in two selected staff quarters in A.B.U Zaria, But also contribute insight into the establishment of more occupant-appropriate living environments for homeless residents, generate prototype by which the

Government can successfully tackle its housing deficit requirement. Thus, provide a re-visit at this point in time and help to unravel the patterns and ways of Adjustment that will constitute a better platform for understanding the low/middle-income earners and their attitude towards housing.

1.6 Scope

This research can be solved from two perspective namely regulatory policies and by Design solution. However it is within the confines of solving the problem of housingAdjustmentin public housing using Architecture as a tool.It covers the physical location of the study which isstaff housing of A.B.U Zaria, in Kaduna state Nigeria. This is based on the premise that these neighbourhoods are inhabited by staff.

1.7 Limitations

The limitation of this study lies in the difficulty to access residents audience due to the fear of the exercise perceived to be by the university authorities. Also, gender restricted the author a lot of access into spaces treated as private in the study area.

1.8 Dissertation Structure

The research process followed by the researcher is itemised below. Firstly, the researcher identified the research problems based on available literature, personal observations and experience gained through field visits on the housing Adjustment situation in low cost staff quarters in A.B.U. Zaria. The theoretical background was determined after a detailed analysis of reported research and relevant literature. Then, the conceptual framework was developed and key variables of the research visualized. Afterwards, the empirical data collected from the field survey was analysed and findings, conclusions and recommendations were formulated and presented. Figure 1:1 below shows the chapter arrangement of the dissertation.

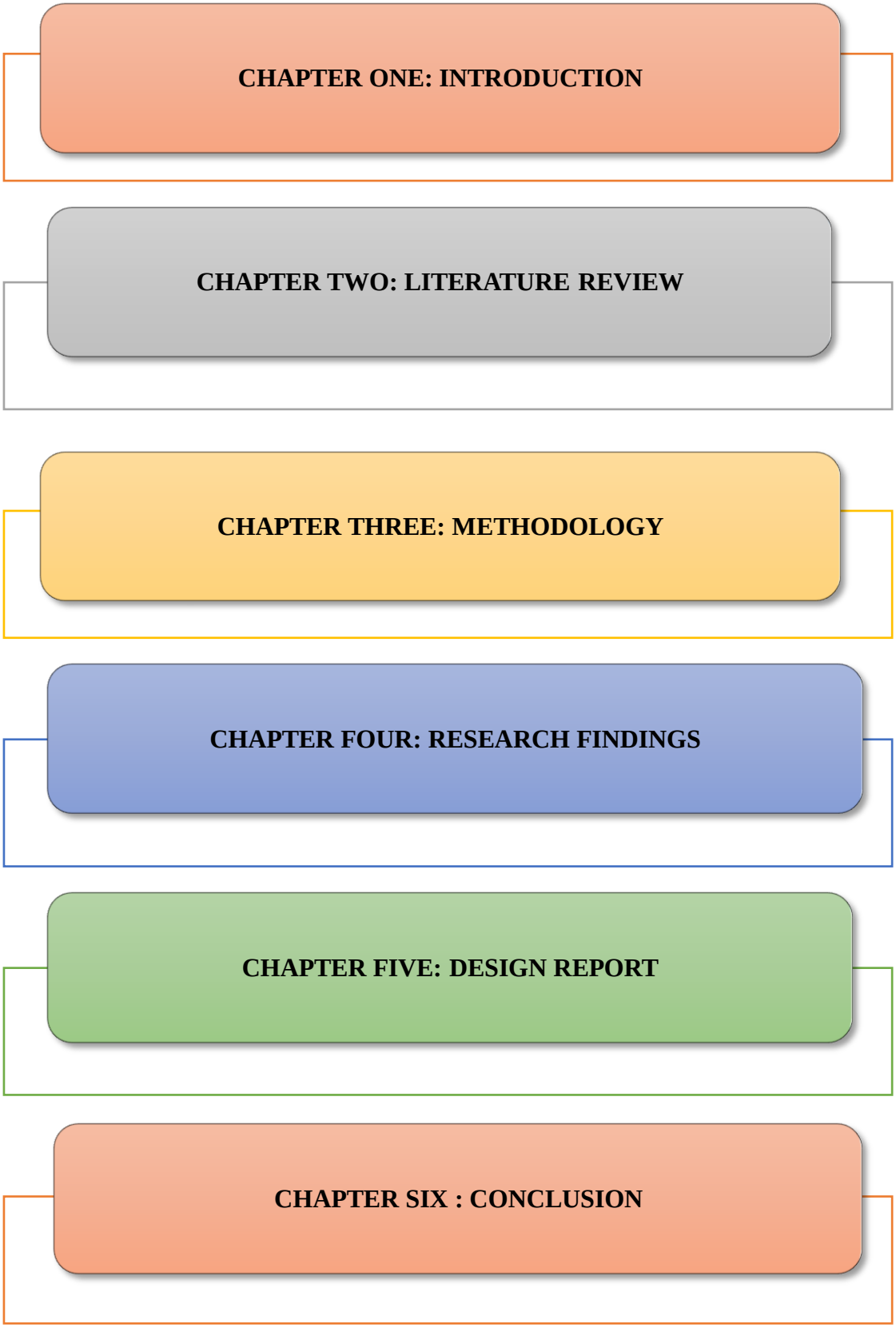


Figure 1:1 Dissertation Structure

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter focuses on establishing the concepts, theories and models of housing Adjustment as it occurs in developing countries,especially in Nigeria. Analyses of previous works by other researchers will be used for investigation and guidance. Previous studies will be reviewed with the aim of collating important architectural contributions. The review of literature will be organized under the following headings: (a) Housing Adjustment (b) Housing concepts underhousing Adjustment (c) Housing Adjustmentrelated topics (d) Conclusion.

2.2 HousingAdjustment

According to the Longman Dictionary of Contemporary English (2007), Adjustment simply means a complete or partial change, usually into something with an improved or disfigured appearance or usefulness. Adjustment is synonymous with words like alteration, transformation, modification and improvement as well as change which is said to be constant in life (Aduwo, 2011).Housing adjustment is a major livelihood strategy among low-income households in urban formal and informal settlements (Tipple, Owusu and Pritchard, 2004) which is carried out sometimes out of desperation.

Hasan (2006) noted that Adjustment is a response to the failure of the government of the day to cater for the housing needs of the people specifically the low and medium income groups. It is for this reason that illegal erection and general adjustment is a manifestation of lack of concern about the quality of their housing. The failure is because government policies on housing and the formal and informal developments are incompatible with the household structures**,** socio economic factors, housing needs, expectations and housing conditions of the low income staff which constitute only a small fraction of their requirements (Aduwo, 2013).

Adjustment in housing can be related to the urge by one to create a personalized environment and also to share that of others or to follow a trend. The need to give one's personal stamp is as important as the inclination to be obstructive (Avi, 2002). It all has to do with the need for a personal environment where one can do as one like; indeed it concerns one of the strongest urges of mankind; the desire for possession, to possess something one has to take possession. We have to make it part of ourselves, put our stamp on it. Something becomes our possession because we make a sign on it because it shows traces of our existence (Habraken, 1975). It is argued that one cannot really identify with an area unless one has made some contribution in the way of construction or alteration and that a sense of belonging can only really be achieved through leaving physical traces.

Popkin, Rich, Hendey, Hayes, Parilla, and Galster. (2012) also described housing adjustment to include activities ranging from the rearrangement of internal furniture and painting a room to structural amendments like addition of more rooms or even demolition of some housing units. Putting these definitions into context, housing adjustment can be said to be the changing of the original form and spatial configurations of a dwelling unit by the occupants in order to meet current needs and expectations. From literature search, we see that a number of theories have been put forward to explain the term housing Adjustments. One of such theories is the housing adjustment theory.

According to Morris and Winter (1975), people generally judge their housing conditions based on specific family and cultural norms. Mirmoghtadaee (2009) explained that this is because settlements are naturally designed and built to meet the needs, social norms and lifestyles of people. Norms in thiscontext refer to rules and regulations that determine the way of life and conduct of people in thefamily or society. Therefore,

when a household's current housing conditions do not confirm with the established norms and lifestyle as a result of changing needs over time, family life cycle such as increase in household size (e.g. arrival of new babies, elderly relatives) and income (Tipple, 2000a), there is bound to be what is called housing deficit which Mohit, Ibrahim and Rashid (2010) argued can manifest in housing dissatisfaction. This may eventually trigger housing stress, shocks and demand for adjustment actions by the households. Seek (1983) insisted that people always crave to overcome housing stress by adjusting and re-adjusting their levels of tolerance, but Carmon (1987) noted that when this reaches a critical point and in order to cope with the stress, people will either have to improve their housing conditions through the Adjustment of their residences or move to a better housing if they have the means and permission to do so. In a the same vein, Quercia and Rohe (1993) explained that households always seek a satisfactory residential environment at all times, and if the characteristics of their housing and/or neighbourhood no longer satisfy them because of changes in housing or neighbourhood conditions, or because of demographic or socioeconomic changes in the household itself, then the household experiences stress. They argued that housing adjustments are essentially aimed at mitigating the impact of housing stress on family members.

This appears to be in line with the proposition by Mohit, et al. (2010) that improvement of housing conditions through housing Adjustments affords households an opportunity to bring their housing environment into conformity with their needs, expectations and aspirations. Therefore, the theory of housing adjustment which provides insight into housing Adjustments has a strong link with housing satisfaction.

Researchers have asserted that housing adjustment promotes housing satisfaction not only by facilitating the inclusion of occupants' culture, but also by incorporating their changing limitless needs and desires (Isah, Khan. and Ahmad, 2014). This is because

housing adjustment remains inevitable as the needs and desires which are basic to households' existence remain dynamic.

Today, the occurrence appears to have taken a new dimension with various forms of adjustments transcending the low-income to high- income group even in the most eye-catching ways. Because the bulk of this observation occurs on public land, the removal or control of such development puts the authorities in the awkward position of being the oppressors of the people (which is the very exact case here in this researchafter the banned was placed), they would prefer to be seen as the protectors of the people. This may be seen as a manifestation of the deteriorating shelter condition of the middle/low-income household who would give their lives to remain in the staff quarters encouraged by few housing stock (Aduwo, 2011).According to Tipple (2000a), housing adjustments in developing countries are often illegal, involving modifications and extensions of the external and internal parts of dwelling units. Tipple further notes that small-scale contractors and artisans using locally available labour and materials carry out most Adjustments in these countries. Such Adjustments are often so extensive to the extent that the original dwelling units are hardly recognizable.

It must be highlighted at this point that the adjustment of houses can be from positive to negative and vice versa. Friedman (1992) considers a situation where households of a poorly developed neighbourhood seek to improve their dwelling quality to enhance better living (a positive intervention of adjustment).On the other hand, when a hitherto planned out setting, experiences attachments of many sorts in an unacceptable manner as to creating a negative impression, it goes from positive to negative.

2.3 Housing Concepts under Housing Adjustment

This section highlights various housing concepts and models under adjustments in housing.

2.3.1 Incremental Housing

Incremental housing approach is based upon the principle of increasing the responsibility of individual households and communities by encouraging decision making and responsibility of individual household or communities so that they take care of the aspects of housing for which they are in the best position to take (Mathabella, 1999). This can also be a kind of ‘’step by-step’’ configuration of the house in order to be built for people.

The origin of state involvement in incremental housing strategies was the reluctant acceptance that informal housing delivery systems performed much better than public attempts to build dwellings in a number of respects: they were affordable without recourse to public subsidy, they were flexible and responsive to the changing needs and unstable fortunes of poor urban families, they were self-managed and made few demands on hard-pressed public administrations, and they met the needs of the rapidly growing urban populations of developing towns and cities (Wakely and Riley, 2011).

So incremental housing comprises both the community participation and self-build processes. Observations of what ordinary families in urbanizing countries do, when they are free to act as they will, show that they prefer to live in large unfinished houses or even large shacks-rather than in small finished ones (Turner, 2007). These houses are also called ‘’core-houses’’. As defined by Napier (2002) the core was to be built by formal contractors. Both the core and the extensions were to be financed. The extensions were to be built according to plans supplied by the project developer. The main innovation in practice for its time was the enablement of a limited self-help contribution by the occupying household, supported by the stimulation of the materials supplier and small contractor sectors. The financial innovation was that the form of core provided would somehow relate to levels of affordability by the household to be

accommodated. Core housing was thus a highly managed and limited form of assisted self-help''. There is a strong network of this process which overcomes the financial problems of the individual while at the same time making connections with the experts and government in order to build their own houses with their own desires.

Incremental housing concept caters for gradually upgrade of initial building design to suit the motive for user adjustment, and ultimately a part of the outcome of this exercise.

2.3.2 Adaptable Housing

Adaptability in housing is considered as the provisional tendency of providing residents or potential occupants with forms and means that facilitate a fit between their space needs and constraints of their homes either before or after occupancy(Ozaki, 2004). The fit in this regard can be achieved through a search on the constant accelerated demographic diversity, economic, lifestyle and technological changes that are inevitable in societies like ours (ibid).

In an ever changing society, it is difficult to make accurate predictions by way of forecasting future demographic tendencies and national economic performance, identifying technologies that will transform industry and business or naming lifestyle trends that will prevail in time to come (Aduwo, 2011). Forecasting with any precision how housing will be designed or arranged in future is no exception. However it can be anticipated that homes will continue to reflect the taste, habits and lifestyle of the people who inhabit them and that they will be influenced by new technologies as well (Whitehand, Christine and Carr 1999).

All this put together will determine how people occupy, utilize, and modify or transform their dwellings. It has always been part of human habitation to adapt shelter to suit

theirvarying needs because the conditions that bring about housing adaptability are in fact, a result of fundamental paradox such as:

i. Houses design and built at a particular point in time, characterized by particular tendencies and technologies and as time progresses, the factors and decisions that gave birth to the original design get out-dated.

Some other factors have been found to be responsible for spatial change in homes and they include amongst others- (i) Family Adjustment, (ii) Avoiding unnecessary mobility, (iii) Fitting into new technologies, (iv) Social and economic dynamics (Whitehand, Christine and Carr 1999). Hence the gap discovered between the current needs of the contemporary day staff must be bridged and provided in the new design scheme.

2.3.3 Flexible Housing

The term “flexible” has a very broad definition in architecture, in part to allow the inclusion of a range of strategies that provides adaptability in respond to a particular change or need. In one definition flexible buildings are designed to respond easily to change throughout their lifetime (Kronenburg, 2007) and in another it is a building that can adjust to changing needs and patterns, both social and technological (Schneider and Till, 2007). Both definitions suggest that flexible buildings are designed with the ability to meet changes that will happen over time. The definition of change is also very broad as it can include social, cultural, economic and technical changes that can impact how housing would remain relevant.

Sousa (2012) opined that flexibility in the design of residential architecture is achieved with the integration of “long-term” consideration in the use of domestic units. Residential blocks and units consider flexibility under four themes: structural system, service spaces, architectural layout and furnishing for flexible use.

Sousa went on to explain that the main scope of flexibility and the related concepts of adaptability and typological variety in the housing context are to be presented throughout housing schemes offering a typological variety before occupancy, called "initial flexibility", and provide opportunity to users to make changes and adaptations in their houses according to their changing wishes and needs over time, called "permanent flexibility". Flexible design incorporates: Slack Spaces to actively invite future spaces, Neutral functionality, Joining and dividing spaces and Transformable and exchangeable partitions (Sousa, 2012).

Allowing enough flexibility so that households can expand and contract or for the space to be used in other ways can potentially have great benefit for owners and developers, and allow the building to last longer. With constant changes in our population demographics, lifestyle, and technology, incorporating simple flexibility strategies should become a standard practice.

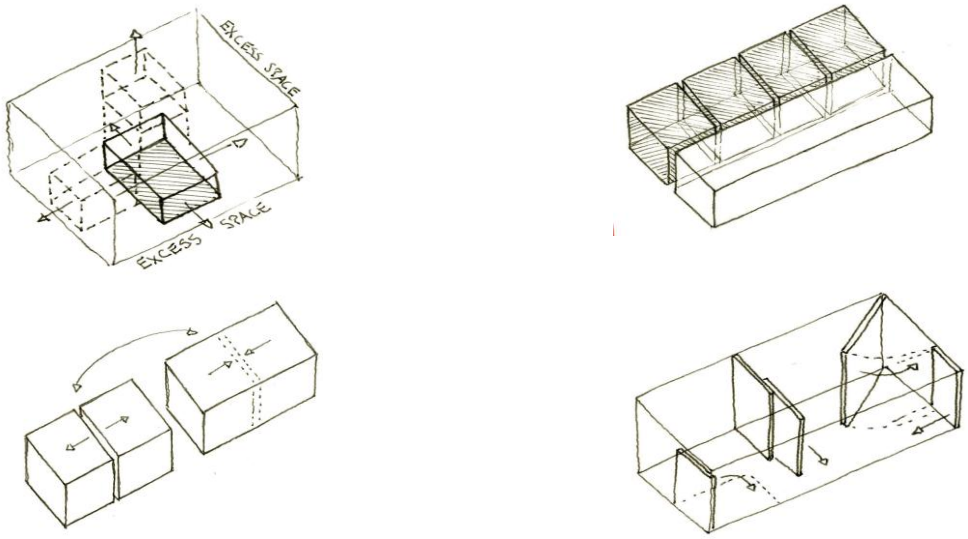


Figure 2:1 Showing Flexibility In Housing Source: Sousa, 2012.

2.3.4 Public Housing

Public housing refers to provision of residential housing and its attributes to the people by the government. It is usually geared towards ameliorating the difficulties faced by the people particularly the low-income earners in accessing decent housing for

themselves (Aduwo, 2011). Public housing is a form of housing tenure in which the property is owned by a government authority, which may be central or local. Government-owned housing units made available to low-income individuals and families, at no cost or for nominal rental rates, are specifically called public low-income housing. Public housing programmes have been criticised for failing to provide quality, affordable and adequate housing units to target population in most developing countries (Mukhija, 2004,).

Public housing in Nigeria, which would have brought succour to the teeming urban households, is burdened with so many shortcomings such as:

i. Lack of the necessary resources to match the housing needs of the target groups which includes the immigrants and the new households formed.
ii. The rising cost of public housing with rigid planning and building standards, corrupt practices and persistent cost and time overrun which make the public housing always miss its target groups (Oruwari, 2005).
iii. Inability of the housing finance institutions to keep up with the demand for housing loans and as a result they tend to remain patently conservative and inflexible when it comes to collateral requirements.

Invariably due to the above reasons, the low-income households were squeezed out in favour of the middle and high-income groups in the cities.

2.3.4.1 Trends in Public Housing Provision and delivery in Nigeria

Researchers carried out a lot of work and documented housing efforts in Nigeria by way of reviewing government housing policies and programmes which affect housing provision.

A review of literature shows that between 1950 and 2000, governments in many developing countries have engaged in different housing programmes and delivery

strategies. For example, previous studies have shown that successive administrations in Nigeria had launched a minimum of seven public housing programmes in the last few decades in a bid to address increasing housing challenges in the country (Ajanlekoko, 2002; Akinmoladun and Oluwoye, 2007; Ademiluyi and Raji, 2008).

However, substantial literature on public housing in developing countries has revealed two main streams of criticism (Mukhija, 2004). First, it is argued that most public housing schemes are inefficient and ill conceived, and thus failed to meet the needs of target population (Mba, 1992). Second, direct government involvement in housing provision is viewed as being negligible compared to the volume of housing provided by informal private sector (UN-HABITAT, 2006a; 2006c). Finally, government intervention in the housing market to check rising cost of housing is seen as counter-productive and an impediment to smooth operation of housing market and efficient housing delivery system (Sengupta and Ganesan, 2004; Mukhija, 2004). Deductively it can be said that public housing are expensive for the low-income earners to buy and are always few in number; with proposals usually not sensitive to the different Nigerian climatic, cultural and socio-economic environments. Thus, constituting major reasons why dwellers embarked on physical Adjustment as soon as they acquire their buildings. (Awotona,1994; Tipple 1994).

2.4 Salient Topics on Housing Adjustment

Salient factor which allows for the clarification of the concept of housing Adjustment are discussed below.

2.4.1 Lifestyle and Use of Domestic Space

The way and manner spaces are put into use is determined by the lifestyle of a people. Therefore there is certainly a link between lifestyle and how people manipulate space to

suit themselves. This observation consequently expresses meanings attached to the design of a home. It is worthy of note that meanings attached to a space do change over time because our homes keep serving new purposes.

In various perspectives and even sociology, “lifestyles” are seen as sets of shared values, practices and attitudes that make sense in particular contexts, such as pattern of social relations and consumption activities (Abercrombie et al., 1988).The concept of lifestyle explains what people do, why they do it, and what doing it means to them. Lifestyle reflects how people use what they have (Chaney, 1996) and the different ways of using goods, places and times. It creates bonds or distinctions among people (Featherstone, 1991).

In other words how we use domestic space in our daily lives expresses our lifestyle. It is true that what we do in our everyday life regulates our ways of using space. Rituals are attempts to maintain a particular culture or a particular underlying assumption by enacting them visibly, and therefore a ritualized activity such as cooking is to be seen as a cultural expression (Dobers, 2005).Lawrence (1995) explains, if we are to understand the meanings inscribed in the design of “homes”, we would need to analyse how our behaviours and activities are regulated by codes and norms. Rituals therefore have a central role in exploring use of domestic space. For these reasons people generally find it quite convenient to transform what they have or can afford at the moment to suit their life style and needs so that life can go on.

Housing has different meaning for different cultures, different groups and different individuals particularly in countries having major housing problem, it is necessary to study the various aspects of housing like neighbourhood layout and plan organization of the dwelling types (Ahsen and Gulcin, 2005). In such cases, it becomes valid that a look

into the modalities and motives behind what happens within dwelling units in public housing quarters.

2.4.2 Adjustment and the Need for Increase in Housing Space

Research has revealed that one of the main factors contributing to adjustment in housing forms is likely to be the shortage of accommodation and the desire for an increase in the space under their control (Mai and Shamsuddin, 2007). This can be further bolstered in the developing countries like Nigeria to express itself in the need for more space. Housing adjustment is therefore seen as anoperational way to achieve this desire for more space (habitable space) within and around a household.

Habitable space within a dwelling by definition "is that which is used as living dining and bedroom accommodation, this does not include spaces like the kitchen, bathrooms toilets, balconies, storerooms etc. (Ozaki, 2004).

2.4.3 Systematic Approach to Adjustment

History has it that in pre-industrial times and even today to some extent, in the developing countries, the inhabitants of dwellings, the designers and the builders were one and the same persons or members of a small social group (master builders). The process of housing adjustment and construction was guided by concealed procedural rules which produced physical settings integrally linked to their socio-cultural context on the one hand and to physical and technological constraint on the other. The unspoken rules as well as their products evolve incrementally over an extended time (Aduwo, 2011).

These builders usually inhabited the shelter they produced and subsequently altered them as required by their changing needs. When a household looks around for some space to expand, its attention is first directed to the easiest, cheapest, quietest as well as

existing space considered raw whose initial function is deemed dispensable e.g. porch, the garage, and setbacks. The increase in the number of households, the diminishing size of households also has implications for the existing stock of houses.

Tipple (2000a) noted that housing adjustment in developing countries are often illegal and involved modifications and extensions of the external and internal parts of dwelling units or both. He asserted that most adjustments in these countries are done by small scale contractors and single artisans using locally available materials and labour, and are so extensive to the extent that the original dwelling units could hardly be recognized. Manalang, et al. (2002) also viewed housing adjustment as self-built improvements, which apart from helping in understanding the adjustment behaviours of the residents, also indicates how the residents have augmented for the deficiencies in their current residences. This implies that housing adjustments are most often an initiative of housing owners and seek to improve housing conditions by providing more spaces to accommodate household needs.

2.4.4 Processes and of Housing Adjustment

Adjustmentis synonymous with alteration, transformation, modification and improvement, as well as change, which is said to be constant in life (Aduwo, 2012).

Tipple and Shahidul (1999) considered any user-initiated extension and alteration made to the original form of a building or neighbourhood for whatever reason anAdjustment. This was clarified by Aina (2005) when he observed that adjustment of housing in some third world cities were perpetrated by housing speculators for various reasons out of which economy comes paramount.

Housing and neighbourhood Adjustment can be induced either by internal or external forces depending on the direction from which the impact is pronounced (Galster,2001). For instance developers of public housing may speculate and build a number of

dwelling types for the wrong category of households and this is soon visited by rapid urge by occupants to transform such dwellings into more suitable units that would fit their taste and lifestyle.

Neighbourhoods also transform as a result of old age and dilapidation where an upgrade will result to a potential gain in property's economic and aesthetic value (Granovetter and Soong, 1986). It was noted that sometimes due to shortage of housing and the interest a household has in a particular geographical location, they may deliberately buy or occupy a dwelling with the intention to adjust. These practices are referred to as move-and improve strategy (Littlewood and Munro, 1997).

Adjustment pattern of housing forms and structure is seen as a form of behavioural pattern influenced by not just housing needs but also housing satisfaction, socio-economic factors, demographic changes and general attitude to housing matters (Aduwo, 2011). Seek (1983)in his article affirmed that sometimes it is not only because of their needs but also because they are not satisfied with the spaces as they are and may need to modify to suit their taste. This dissatisfaction he says may be reflected in the act of adding more space within and around the housing unit to increase the useable space available to the household. Studies have revealed that one of the main factors contributing to Adjustment in housing form is likely to be the shortage of accommodation for the many activities that households get involved as a matter of survival and way of life or even the basic desire for an increase in the space under their control (Goodchild 1997).

Housing adjustment is more visible in emerging countries where moving house is not a common and easy option in the society. These groups of people are generally associated with large and increasing family size. The size of a household is a major generator of the decision to transform their houses by extending boundaries. Another reason is the

changing needs for space and privacy, e.g. in a situation where residents gets older and possibly move, the vacant interior spaces are converted into other relevant uses.

2.4.5 Possible Causes of Housing Adjustment

Some major factors that may be responsible for housing Adjustmentfrom literature among othersinclude:

i. **Territoriality and Privacy:** This involves the tendency for humans to desire to take control and possibly ownership as well as access to a defined space and resource. Most public housing scheme for the low-income are given an open plan format which by virtue of their design generate territorial behaviour in their occupants. Adjustment is carried out to maximize their influence on the immediate environment by erecting fence walls/barriers and other forms of physical barricade like low fence, open gateways, changes in the texture of walking surfaces. This act is also made in order to serve as an antidote to crime and checkmate intruders into personal and private properties (Aduwo, 2011).

ii. **Over Commercialization** of an area could spurAdjustment in the sense that, (Jelili, Adedibu and Ayinla, 2006) developers- individuals, corporate bodies, and even government tend to develop or redevelop properties in the area to the fullest, with the ultimate aim of maximizing the use of space regardless of the whether or not such an action is in the interest of physical planning and wellbeing of the general household. Their actions are made more manifest in the process of conversion and redevelopment of properties to accommodate more businesses or less importantly more dwelling units.

iii. **Lack of Maintenance:** There is obviously the lack of maintenance of public housing by the appropriate authorities has led to uncontrolled dilapidation of

diverse measure and as a result, negative adjustment takes place. Adejumo (2005) defined maintenance as the combination of technical and administrative actions intended to retain an item in, or restore it to a state in which it can perform its required function. Maintenance is considered to be a core issue of administrative responsibility of policy formulation.Research has it that in spite of the huge resources most developing nation plough into project like public housing, there exist no policies on maintenance in place. There is need to have what can be referred to as planned maintenance in order to avoid any form of adjustment resulting from necessity to improve dwellings by occupants.

iv. **Economic Embellishment:**Economic activities have continued to be the bane of adjustment in dwelling units and around planned housing layouts. Households take advantage of the economic opportunities opened to them in locations population is highly concentrated. Varieties of informal sector business enterprises usually referred to as home base enterprise (HBEs) spring up within neighbourhood thereby attracting un-envisaged buying and selling. Thus transformers in estates whose locational value is high, i.e. those close to the large city centres, are likely to find their extensions better value for money than those in less advantaged areas (Aina, 2005). However, he concedes that, in some of the estates, values are so low that the cost of the extension will be higher than the added value. This practice if not controlled could inevitably lead to unpleasant societal menace.

v. **Deficit in Housing Supply:** The inability of the shelter delivery system of a society to cope with housing demand has brought about congestion and flagrant erection of attachment structures within planned out layouts. Tipple (1994) opined that few African countries have the resources to meet even a quarter of the

demand for new housing let alone catch up with the backlogs. He further noted that at the height of oil boom in Nigeria, the development plan envisaged in 1970-1980, the construction of 202,000 dwelling units by government agencies. However, only an appalling 28,500 units were actually constructed in nineteen state capitals.

vi. **Dissatisfaction:** With Original Plan and Layouts: This is usually due to lack of adequate consultation and consideration. Often times it has been observed that households find the architectural plan and general arrangement of most public housing grossly inadequate (Isah, 2014). This ranges from even the absence of some simple but vital features that could enhance the performance of such housing. It could be as a result of omission or deliberate disregard to the role these features play in the performers of the building. For example, issues like absence of window hoods in a dwelling could lead to adjustment because besides the fact it has aesthetic value, it plays a very important role as a shield to direct sun rays, rain water etc. (Aduwo, 2011).

vii. **Overpopulation and Densification**: When a neighbourhood experiences uncontrolled influx of people, there is a tendency to have overpopulation which overwhelms the infrastructure and facility present. Okosun (2005) noted that in Nigerian cities for instance, spatial concentration results in problems like cramped living condition, low urban neighbourhood quality and wide spread land-use conversion in dwelling units and the neighbourhoods. In the same vein, Aina (2005) emphasized which ultimately amounts to severe adjustment of availablespaces that the unprecedented population increase in urban areas which consequently develops into slums and unhealthy living environments.

viii. **Filtering:** This occurs due to inefficiency in the distribution of the existing public housing stock which is usually the case, the high income households obtain dwelling meant for the low-income despite the fact that they can afford much more expensive units. Filtering can occur in two ways, first, when a hitherto low-income house hold experiences economic advancement and its income increases to a better position of comfort yet prefers to remain in the same dwelling unit and begins to extend and facelift to reflect its present status. This leads to under consumption and a deprivation of the low-income. This is referred to as passive filtering.

Second, is where due to the housing crises and absolute shortfall in supply, the high income group deliberately takes over and occupies housing intended for low-income group.This is referred to as raiding syndrome or active filtering Tipple (1994) explains that incidence is common in African cities where supply tends to be very lumpy, providing too much of one type of accommodation and certainly not enough of another.

2.4.6 Public Housing PositiveAdjustment in Some Developing Countries

There has been amethodical spread of housing adjustment practices in the developing countries. Many scholars have studied housing adjustment However, the centre for Architectural Research and Development overseas (CARDO) University of Newcastle carried out research on physical adjustment in the following developing countries Bangladesh Egypt and Zimbabwe (Tipple, 2000). The centre concluded that physical Adjustment messes local population and generates higher population densities but tends to reduce occupancy ratio by providing more rooms, renews low-quality housing at no cost to the government, allows economic activities in houses, allows households to adjust their housing at their own pace and within their cost limits, and that for these

reasons, housing adjustment should be encouraged rather than discouraged (Tipple, Owusu and Pritchard, 2004).

2.5 Conclusion

This chapter was devoted to reviewing relevant literature that pertains to this study with the aim of identifying gaps which exist and highlighting the exact nature of the fast growing occurrence.A dearth of intense architectural research in housing adjustment, especially relating to heterogeneous formal setting was identified from literature.It was observed that core issues of housing adjustment involve lifestyle and the use of domestic spaces for economic and cultural activities. Others are the manner in which these activities are carried out in response to changing user needs.Adjustment are directed to the easiest, cheapest, quietest as well as existing space considered raw whose initial function is deemed dispensable. This functions are carried out by single artisans without professional know–how due to the high cost of adjustment.

Observed adjustmentfor this present research are categorized under 4 factors obtained from literature namely Behavioural, Socio-cultural, Spatial (Conversion, Addition, Extension, and Reconfiguration of Spaces) and Economic factors. Incremental housing also was put forward as a means of tackling the problem created from the disparity between the life cycle and lifestyle of the inhabitants and the spaces available. The next chapter gives a detailed process and philosophy of the research.

3.0 METHODOLOGY

3.1 Introduction

The purpose of this chapter is to introduce the research strategy and the techniques applied in order toexamine occupants' adjustment activities, how they did it, what they intend to transform and why, so as adapt changes in the design and policy for the new Phase II staff housing. In this research, case studies and interviews will be conducted using mixedqualitative and quantitative approach to examine the reflection of housing Adjustment patterns, execution and spatial configurationin the design of staff housing.

3.2 Method of Study

Research methodology is the philosophy behind the approach to the research and the methods of data collection and analysis method. It may be understood as a science of studying how research is done scientifically.

A cross-sectional survey method of research was adopted for the purpose of this research because it has advantages that can generate sufficient data in a short time and at a reasonably low-cost. Also, it can easily produce relevant data which can be generalized to a wider population and it also makes it possible for the researcher to reach an appropriate conclusion on issues concerning physical characteristics and socio-economic state of a population.

First a preliminary field survey method was initially used to select the two low-cost quarters among other low cadre staff quarters that would be suitable for the research. Attention was further narrowed to the two chosen Quarters due to their purposefulness in meeting the housing needs of the target group. The selected staff quarters maintaineda similar housing design common to all public housing schemes located in the country at large. This will encourage for easy generalisation of results. Moreover,

the chosen Quarters are old and as a result, have a 37years period of use and possible diverse adjustments and can be confirmed through observations.

The general approach to this study was case study based on both qualitative and quantitative research techniques. This is because the qualitative enquiries will help to explore the diversities in a situation or phenomenon while the extent or magnitude is determined through the quantitative means. These were applied through a field study to extensively cover the materials characterized by observations structured at a conceptual level. Such a combined approach was thought to minimize limitations that could originate from research techniques and contribute positively towards testing and increasing the validity and reliability of the data.

Mixed methods were employed in this survey. This approach is employed by similar housing studies (Mai and Shamsuddin, 2007; Aduwo, 2011; Maina, 2013). The advantage of employing this approach is for triangulation of results: quantitative data provides objective data and hard facts. Qualitative data provides more in-depth explanations and reasons behind established phenomena (Bryman, 2012).Qualitative methods through participant observation were employed to document common types of adjustment within the houses after household heads duly granted permission. While a prerequisite of the study, it meant that houses surveyed were in reality not truly randomly sampled.This is common in housing studies and surveys especially in traditional communities (Maina, 2015). Another notable disadvantage of employing mixed methodologies is that it is time consuming, often necessitating repeated visits to secure permission considering the reluctance of many respondents to grant access into households. This situation arose in part due to the insecure situation in northern parts of the country during the period the study was undertaken (July 2017-January 2018). Notwithstanding the aforementioned problems encountered, observed adjustments were

categorized under 4 factors obtained from literature namely: Behavioural, Socio-cultural, Spatial and Economic factors. Quantitative analyses were employed in form of survey questionnaires soliciting demographic data (gender income, length of stay; etcetera); types of adjustment, method of executing theseadjustments. The study employed 5 scale Likert and dichotomous scale responses. 112 questionnaires were distributed in each of the quarters for the survey. 110 were returned in 98% retrieval rate.

3.3 The Study Area

Ahmadu Bello University covers a land area of about 7,000 hectares and encompasses two campuses, twelve Faculties, a Postgraduate School and 82 academic departments. The total student enrolment in the University's degree and sub-degree program is about 35,000, drawn from every State of the Federation, Africa and the rest of the world. Currently, the University has about 1,400 academic and research staff and over 6000 non-teaching, senior and junior administrative staff.



Plate I Google earth map showing the location of area of study; showing the two staff quarters ABU Zaria, Kaduna. Source: Field work, 2017.

Plate I shows a Google earth map of the selected housing quarters. The university has a total number of 13 housing quarters with a total of 1,184 housing units.The study was carried out in two staff quarters located in A.B.U Zaria Kaduna State. These quarters were the Silver jubilee and the AreaII housing quarters in Sabon Gari Local Government Council Area of Zaria. The adoption of these staffs' quarters for this study was because they harbour similar characteristics in many perspectives including the fact that they were dedicated and built purposely to provide housing for the Low cadre in the university society (appendix 14). Moreover, these quarters have been observed to exhibit mass cases of Adjustment and as a result, would allow for comparative analysis.

3.3.1 Silver Jubilee Quarters

Plate II shows a Google earth image of silver jubilee quarters which comprises of 200 houses. The houses consist of semidetached bungalow only. The houses in the estate commenced in 1979 under the regime of Shehu Shagari as a Head of State but completed under prof. Nayaya Mohammed the then vice chancellor of the university giving the university ownership over the housing quarters. The housing quarters were allocated to junior staff of different institutes within the university.



Plate II Google earth map showing silver jubilee staff quarters ABU Zaria, Kaduna.Source: Fieldwork, 2017.

3.3.2 Area II staff quarters

Plate III shows a Google earth image of Area II staff quarters which comprises of 48housing units. The houses consist of semidetached bungalow. The houses in the estate were built in 1980 under prof. Nayaya Mohammed the then vice chancellor of the university giving the university ownership over the housing quarters. The housing quarters were allocated to junior staff of within the university.



Plate III Google earth map showing Area II staff quarters ABU Zaria, Kaduna. Source: fieldwork, 2017

3.4 Population of Study

Population of study for this research consists of all housing units within the two chosen Housing Quarters namely Silver jubilee and the Quarter II staff quarters Zaria. The housing units were considered along with their respective immediate outdoor spaces because housingencompasses more than built-up interior spaces. Thestaff quarters chosen for the purpose of this study are self-serving and suitable because they exhibit a mass of adjustment phenomenon in form of physical, spatial and façade changes, extension and addition of extra units, change of use and function. A sample size of

112(one hundred and twelve) was chosen through statistical calculations to adequately provide a picture of the actual situation prevalent in the total population.

The total housing units in the two Housing Quarters under survey is therefore 248 (two hundred and Forty-eight) and they come in number and location as stated below.

Table 3:1: Distribution of selected staff quarters by number

S/n	Housing area	No. Of houses
1	Silver Jubilee Quarters	200
2	Area II	48
	Total	248

Source: (A.B.U housing and Passages, 2016).

The study looked into Adjustment in two public Low-cost staff quarters namely, Silver jubileeand the AreaII staff quarters Zaria. Presently, these Quarters are actively relevant in the provision of accommodation for a proportion of staffs' residents and activities as they are presently strategically located within the main frame of the original residential zones of the university.

3.4.1 Sampling Method

Sampling is the process of selecting a few numbers from a bigger group which will be used as a basis for estimating or predicting the prevalence of an unknown piece of information, situation, or outcome regarding the bigger group (Ranjit, 2005). A combination of two sampling methods were considered appropriate for this research because it synchronizes the advantages of each one of them to present a more formidable representative analysis.A sample therefore is a representative sub group of the population one is interested in.

The sampling methodis the proportionate stratified random sampling(which involved choosing twostaff housing that would specifically address the objectives of this study from amongst others) and then sampling, the number of elements from each quarters in relation to its proportion in the total population.

3.4.2 Sample Size

Sample size in a research is the total number of items from which the required informationis extracted. Sample size is critical to ensuring the validity of a research because if properly determined a number of influencing factors like, the purpose of study, the population size etc. justifies collected data to help make meaningful inferences.

The sample size in this research was determined by ensuring that it does not fall below the representative size obtained from some statistical estimation theory which is based on the degree of confidence it carries. The number of houses/households for thisStudy as determined by the researcher was given as (n_1), assuming a confidence level of 97%, probable error was given as not more than 0.03%. Adapting the following mode of determination, as given by Frank-Nachimias *et al* (1992) as cited in Aduwo (2011).

A more appropriate equation for this study is given as:

$$n_1 = \frac{n}{1 + \frac{n}{N}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: n = desired sample size when population is more than 10,000

N_f=desired sample when population is less than 10,000

N = Size of population (sample frame)

N (The total size of population/ sample frame) =248 houses and their households in the two selected Quarters.

Adopting a confidence level of 97%, then, Z = 1.96 (see table for confidence levels in Spiegel, 1961, p.157as cited in Aduwo, 2011). For a 97% confidence level (which means that there is only a 3% chance of one's sample results differing from the true population average), a good estimate of the margin of error (or confidence interval) is given by $1/\sqrt{N}$, where N is the number of participants or sample size (Yamane, 1967, p.886as cited in Aduwo, 2011), d is thus 0.03.

$$\mathbf{n_1} = \frac{\boldsymbol{n}}{\mathbf{1} + \mathbf{N}(\boldsymbol{e})^{\mathbf{2}}} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (\mathbf{2})$$

Where:

n_o = the sample size,

N = the population size, =248and

E= the level of precision. When this formula is applied to the above sample, we get:

$$n_1 = \frac{248}{1 + 248(0.03)^2} \cdots\cdots = 203$$

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (3)$$

$$n = \frac{203}{1 + \frac{203 - 1}{248}} \cdots\cdots = 112 \; house\ to\ be\ sampled$$

The sample sizes for each of the typologies in the twoquarters were further selected proportionately using the formula given in Kumar (1999) as follows:

$$\text{Proportion (p)} = \frac{\text{No of elements in each estate (x)}}{\text{Total population size (N)}} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (4)$$

$$\text{Number of elements selected in each estate(n)} = \text{sample size x (p)} \cdots\cdots\cdots\cdots\cdots\cdots (5)$$

Where:

Sample size (total) = 112

x = Number of each of the typologies in each estate or on a street

N = Total population (248)

The sample size for silver jubilee is:

$$\frac{200}{248} \times \frac{112}{1} = 90 \text{ units to be sampled}$$

The sample size for area II quarters is:

$$\frac{48}{248} \times \frac{112}{1} = 22 \text{ units to be sampled}$$

3.5 Data Collection

The researcher visited two housing staff quartersin A.B.U. Zaria to collect primary data from the respondents using a structured questionnaire developed by the researcher.

Further, individual interviews with selected staffs were carried out to collect primary data about their opinions of the research subject. The main tool of the research was the structured questionnaire that the researcher used to collect primary data from the staff sample selected from each quarters. The structured questionnaire was administered to a selected group of 112 families in selected A.B.U. staff quarters. The researcher visited households individually and collected data through the questionnaire with extra aid of two research assistants who lived in the study area. Visual observation was also employed to assess the condition of the individual building Adjustment.

Apart from primary data, the researcher collected secondary data from published books, university publications, web sites and the Internet. Documentation /Historical Materials (From Archives) of the A.B.U. estate department were used as secondary data source to obtain secondary data such as Google images, architectural drawings and site of each the staff quarters. Thus, in this research, the researcher has used both qualitative and quantitative methods for data collection.

3.5.1 Comprehensive and Detailed Observations and Documentation

This instrument was used to gather data on space characteristics of the Quarters since they consist of homogeneous prototype units. For the purpose of this study, each of the Quarters was defined spatially in alignment with their homogeneity of the neighbourhoods" and the physical characteristics of the buildings and their conditions (emboldened by photographs and sketches).This instrument was developed to ensure that indicators such as attributes that define territoriality, surveillance image, etc. that ascertain the defensible space characteristics of the housing units can be used. This is to highlight the present condition of the Quarters such as the housing units that exhibit obvious physical Adjustment and those that still remain in their original states.

This extracted information was used to identify the individual building and their locations on the master plan which served as a guide to the sampling method adopted for the study.

3.5.2 In-depth interviews

This instrument was used on total of four (4) purposive sampled households' particularly the allocated staff and one (1) official of the respective authority over seeing university housing allocation (Housing Secretary A.B.U Zaria.). The interview sessions were guided by a semi structured interview schedule targeted at capturing issues that could not be exhaustively examined through the questionnaire. These interviews as scheduled took place between 10.00 am and 12.00 pm on week days, Saturdays between 4.00 pm and 6.00 pm and Sundays 2.00pm and 6.00pm. This strategic timing helped to ensure that the expected respondents would have enough time to spare and furnish the researcher with sufficient information that will aid the extraction of data such as:

i. How the Housing Adjustment began initially?
ii. What comes to mind when they hear Housing Adjustment?

The instrument used to source this data assured an opportunity to explain even the silent issues to respondents except that it was painstaking, expensive and time consuming.

3.5.3 Structured Questionnaire

This instrument had a list of structured questions which formed a basis for the extraction of information from respondents of the residents. These questions were as much as possible self-explanatory and interactive to encourage maximum corporation from the respondents. The questionnaire was administered to staff allotees or their representatives to obtain relevant information to fulfil the objectives of this study, and it

was divided into four sections. Section A deals with the demographics, section B analyse the of physical Adjustment that has taken place in the spatial organization and design of the buildings while section C deals with issues bothering on occupants view on Adjustment activities and section D on Adjustment satisfaction. The questionnaire was self-administered

3.5.4 Detailed Methodology by Objective

This section gives detail of the specific methodology employed to achieve the objectives of the study. Plate IV shows the researcher distributing questionnaires and interacting with survey respondents in the field to collect required data.



Plate IV : Showing researcher administering questionnaires and interview Source: Field work, 2017

Objective 1: To examine the reasons and attitude for housing Adjustment in the selected staff quarters; staff quarters.

Data used: To achieve this objective, it was needful to know why residents transformed their houses. From the knowledge of the original building type, original number of bedrooms available and also personal benefits/gains derived from Adjustment it was possible to examine the reasons behind their actions.

Source of data: The data required to achieve this objective were addressed in the households, on the sites and archival materials obtained in the agencies in charge of the Quarters. As a result, most of the data were sourced from the respondents.

Data instrument: Direct questions in the questionnaire were the most relevant instrument employed to gather the required data to achieve this objective. Interviews were also conducted to help capture the exact data used to address issues bordering on personal preferences needed to carry out a qualitative analysis.

Objective 2: Toexamine the manner in which these activities are executed.

Data used: To achieve this objective, it was needful to know how residents source the fund for Adjustment. With the information from the demographics and direct questions in the questionnaire survey it was possible to achieve this objective.

Source of data: This information was obtained from the residents on site through questionnaires and interviews.

Data instrument: Direct questions in the questionnaire were the most relevant instrument employed to gather the required data to achieve this objective. Interviews were also conducted to help capture the exact data used to address issues bordering on personal needed to carry out a qualitative analysis.

Objective 3: To analyse the physical Adjustments in the spatial organization of the buildings.

Data used: To achieve this objective, data such as site plans, Architectural designs, sketches of present designs and forms indicating the extent of Adjustment through measurements, photographs of some observation, types of Adjustment, activities being carried out in the transformed spaces. Specific location and orientation of the building were noted to understand how these have affected the type of Adjustment carried out.

Source of data: These data were obtained during visits to the estate department, personal sketches and photographs taken, Google earth images.

Data instrument: Data was obtained from site plans, Architectural designs, and sketches of present designs and forms indicating the extent of Adjustment, and photographs, questionnaire was also used to obtain vital information on certain aspects of interest to the study like orientation of buildings.

3.6 Data Analysis

The data thus collected was processed qualitatively by identifying themes apparent from the transcripts. The trends established are then triangulated (compared) with frequencies obtained from quantitative sources. Going by the fact that the study was both exploratory and descriptive in nature, and dataused were both qualitative and quantitative, descriptive statistics were used inanalysing the data. Data derived from the questionnaire instrument were analysed using descriptive statistical tool with the help of SPSS V.20. The results are presented in tables, percentages and graphic illustrations using Microsoft excel for better graphical advantage over SPSS.

3.7 Regulatory Factors by University Authority

The research happening in a formal, institutionalised setting puts an infringement on Adjustment. But however from data collected from the field survey, this shows that the laws governing Adjustment in the study area are more of a flexible rule than a rule of thumb. Residents carry on Adjustment on their housing unit as they are financial responsible for it. From the interview with the secretary of housing and passages, he stated “permission is to be sought from estate department before you build of change your house in anyway”. However estate department do not adhere to this rule as permission from them takes years before approval so residents go on with their self-

financed Adjustment, since their housing unit no longer can support their needs. For the purpose of this study, it is assumed that the laws concerning Adjustment in the university environment is flexible to enable a thorough study of this activities without which a premise for the study wouldn't exist to provide a framework for Adjustments within legal environment.

3.8 Conclusion

The Chapter gave a detail description of the methodology adopted in this study. A mixed method, qualitative quantitative study establishes the pattern of housing Adjustment, and its impact on the residential quality. It explained how the survey approached was undertaken and how an appropriate sample size 112 (one hundred and twelve) was calculated out of a total population of 248.The tool selected for the study was the structured questionnaire, interviews, visual observation, documentation of units/historical materials on the subject matter and the data was processed and analysed using Statistical Package for Social Sciences (SPSS Version 20), adopting both the quantitative and qualitative approaches. The next chapter presents the findings.

4.0 FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents and discusses the details of the research analysis, discussions and findings as it relates to the threeresearch objectives of justification,manner of execution and characteristicsof Adjustment in the selected staff housing in ABU Zaria. The chapter is in three sections. Following the introduction is the discussions and analysis for the research objectives respectively.

4.2 Demographics

4.2.1 Age of Respondents

The study examined the age profile of the Staffs in the quarters in order to give an understanding of the kinds of attitudinal display of the majority of the residents within the Quarters because it is possible to relate people's behavioural display to their ages (Verhetsel, 2006). Table 4.1 presents the data on the age profile of the residents of both Quarters separately and then as a whole. Silver jubilee as presented in the Table shows that the highest percentage (46.4%) of residents are between fifty one and sixty of age (51-60). Next are those between forty one and fifty (41-50) years who account for 19.1% while this figure was followed by Staffs who were between twenty five and forty (25- 40) years who constituted 14.5% of the respondents. It was also discovered that Area II had residents to the tune of 10.0% who were mostly between 41 and 50 years of age followed by a percentage of 6.4% for those who were between 51 and 60 years of age, while the age group with the least presence in this quarters was those between 25 and 40 years which accounted for barely 3.6%.

There was an indication from Table 4.1 that the ages of the Staffs in Silver jubilee were not evenly dispersed across all the ranges. This distribution was quite obvious even by mere observation of the people in the Quarters, suggests that the oldest age group (51

and 60) who were found to be present in large percentage (46.4%) in this quarters may have lived much longer than any other age group in the Estate and are most likely part of the first generation of residents whom witnessed the first transformation activities considering the age of the Quarters (about 36years). There are also indications that the youngest age group of respondents 25-40 years being present in small number, may mean that some of the houses have been taken over through retirements and possible promotions of the first set of residents which makes them come under what can be referred to as second or third generation owners of the houses.

In general, the results show that there are more adult Staff allotees and the largest being the age group between 51 and 60 years age in both Quarters. This pattern of age distribution may have an impact on the vibrancy and kinds of activities that might be taking place within these neighbourhoods. On the other hand a young age group may imply that more transformation is expected in the future considering the stage in the life cycle.

Table 4:1 Age Distribution of Respondents

			Respondent Age range			Total
			25-40	41-50	51-60	
Neighbourhood Name	Area II Silver Jubilee	Count	4	11	7	22
		% of Total	3.6%	10.0%	6.4%	20.0%
		Count	16	21	51	88
		% of Total	14.5%	19.1%	46.4%	80.0%
Total		Count	20	32	58	110
		% of Total	18.2%	29.1%	52.7%	100.0%

4.2.2 Length of Stay in the Estate

The knowledge of the length of stay of the respondents in Quarters under study was considered important to this research particularly in the fulfilment of the objectives. These data are expected to highlight how long the various residents have lived in the area as this might help to give suggestion of how they have handled the houses within

the period of their stay and the extent of emotional and psychological attachment they have with the houses in particular, and the Neighbourhood in general. This factor could also be expressed in the way they have handled their houses in terms of how they have maintained or transformed to make them remain convenient for the households even as their social and economic status changed over time.

Table 4:2: Length of Stay in the Quarters

		Length of stay in the Quarters			**Total**
		2-7yrs	8-15yrs	16yrs+	
Area II	Count	8	5	9	22
	% within Neighbourhood	36.4%	22.7%	40.9%	100.0%
Silver	Count	22	27	38	87
Jubilee	% within Neighbourhood	25.3%	31.0%	43.7%	100.0%
Total	Count	30	32	47	109
	% within Neighbourhood	27.5%	29.4%	43.1%	100.0%

Table 4:2 explains the result obtained in Silver jubilee in this regard, suggest that 43.7% of the respondents have lived in the quarters for over sixteen (16) years. A little below this percentage 31.0% have stayed for between eight and fifteen years (8-15) and those who have lived for between two and seven years (2-7) account for the lowest percentage of 25.3%. The results obtained in this regard concerning Area II showed that majority (40.9%) of the respondents have lived in this Area for well over 16 years (16+). Little below this percentage was 36.4% for those have spent between two and seven years (2-7) while the lowest percentage (22.7%) of the respondents have spent as long as between eight and fifteen years (8-15) in the neighbourhood.

4.2.3 Grade level

The investigations on income classification of the residents of the Quarters were, based on the personal information given by the concerned individuals. The individuals were asked to indicate which of the stated classification they belonged to. At time of original allocation.

Figure 4:1 shows thatmost (58.7%) of the respondents in Silver jubilee belonged to the senior staff grade level group while 22.0% of the respondents were junior staffs. In Area II a different case was observed with 14.7% junior staff and 5.5% senior staff.

Their present grade level gives a result of 72.2% senior staff and 4.6% in silver jubilee while that of Area II gives a similar case of 17.4% senior staff and 2.8% junior staff respondents. This result suggested that majority of the initial grade level of residents in the Silver have consistently remained Changed from the intended social status. This may be the reason why there was hardly no house that had not been transformed in this Quarters. Area II with more intended target group at allocation has also experienced drastic changed at present to a higher percentage of senior staff grade level. This was confirmed by one of the residents who said this house was allocated to me while I was still single, but now am married with four children. We buy in new equipment and definitely we need space to keep them so we have to make room to accommodate these changes. Thus, the ability to retain stability and regain equilibrium after the shift by demographic and socio-economic forces drives the motivation in housing adjustment choices (Khan, 2014b).

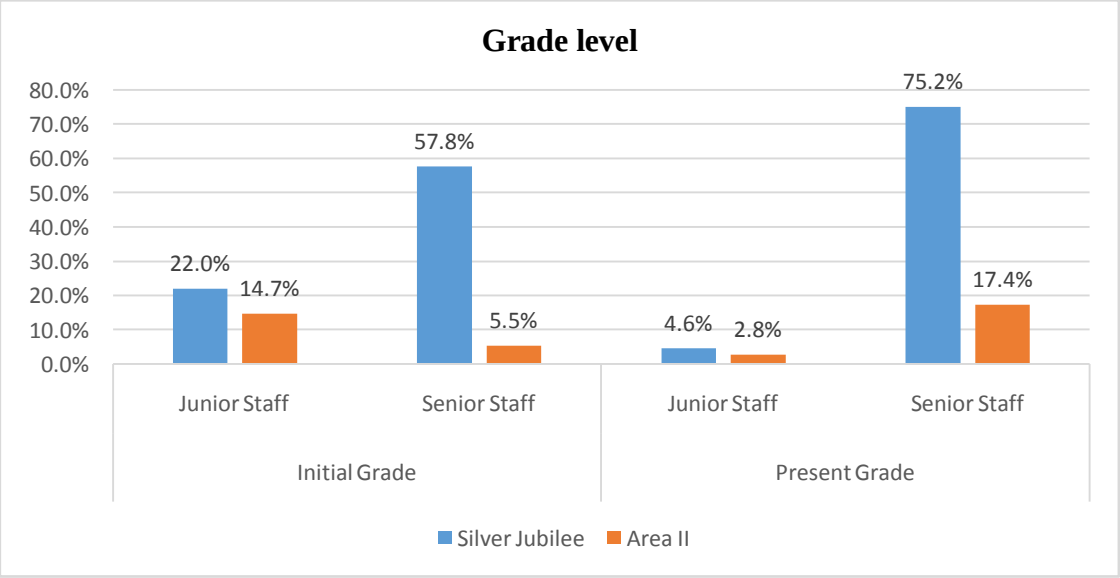


Figure 4:1 Grade level of Respondents

Generally, the data suggested that as at the time of this investigation, only about 92.6% of the residents in these supposed I and J quarters where senior staffs while 7.4% were not. This was either because most of the initial beneficiaries had been promoted to higher income group or they moved out to other quarters when free space was available. This fact can be considered as a social transformation in terms of the income level of the residents. It was observed from this research that transformation activities was carried out more with the senior staff grade level still leaving within the original allocation of I and J (intermediate and junior staff) quarters.

4.3 Reasons for Adjustment

This section investigates the reasons given by the residents for transforming their housing. It begins with discussions of some reasons outlined by the residents to be responsible for Adjustment. This ranged from economic reasons to their level of satisfaction with specific aspects of their houses. Next is a measurement of those who still intend to transform was also carried out in order to find out how much more Adjustmentwas likely to surface in future.

4.3.1 Residents Who Have Transformed

The question whether a respondent has transformed or not was probably the most sensitive variable in the questionnaire and even in the interview. But it received definite responses which were readily confirmed by physical observation. Table 4:3 shows a remarkable percentage (86.4%) of the respondents agreed that they had in one way or the other transformed their houses. This figure is sharply in contrast with only 13.6% of the respondents who had not transformed their houses in any way. Tipple and Shahidul (1999) considered any user-initiated extension and alteration made to the original form of a building or immediate surrounding for whatever reason as Adjustment.A further

breakdown of the respondents who transformed their houses shows that 47.5% did so for economic benefits through rent they get from extra rooms and shops added to their houses, 70.9% transformed because they needed to provide more and better space to accommodate their growing families and to ensure privacy and security of life and properties (spatial factor), 73.6 % of Adjustment was behavioural borne out of some external or internal factors (Behavioural factor), while 63.6% did so because apart from providing more rooms to accommodate their families, they needed to also make spaces available for cultural and other indigenous lifestyles (Socio-cultural factor). (See appendix IV).

Table 4:3: The Percentage of those who have transformed and those who have not

		Have you changed (transformed) your house in anyway		**Total**
		No	Yes	
Area II	Count	1	21	22
	% within Neighbourhood	4.5%	95.5%	100.0%
	% of Total	0.9%	19.1%	20.0%
Silver Jubilee	Count	14	74	88
	% within Neighbourhood	15.9%	84.1%	100.0%
	% of Total	12.7%	67.3%	80.0%
Total	Count	15	95	110
	% of Total	13.6%	86.4%	100.0%

The data obtained in Silver jubilee also shows that majority of the residents (84.1%) agreed that they had in one way or the other transformed their housing while only 15.9% of the respondents had not transformed their housing in corresponding scenario to Area II where 95.5% of the residents have transformed their housing and a minute percentage (4.5%) haven't altered their housing units in any way.

4.3.2 Reasons for Adjustment

The reasons presented either for transforming or for not transforming were quite diverse as each of the respondents anchored their actions on comfort, convenience, social,

economy, privacy or security. These reasons as emphasized by the residents in these particular Quarters also appeared to be interwoven between Economic Factor, Socio-cultural Factor, Behavioural Factor andSpatial Factors.

In order to sufficiently understand the character of the residents concerning the various shades of Adjustment which they had carried out, it was necessary to subject the data to further analysis. As a result, a breakdown of the 85.5.% (see appendix ii and iv) respondents in the study areas who had transformed, showed that 47.3% did so purely for economic gains through rents they got from the extra rooms and shops they attached to their houses. A large percentage of 63.6% for Socio-cultural factors, 73.6% for Behavioural reasons and 70.9%did so in order to provide more and better space to accommodate their growing family and security. It was observed that Adjustment just to have additional space or ensuring high security was not much of a priority to the residents of these Quarters as Behavioural factors caused by both internal/ external factorsbecause as a respondent claimed the level of maintenance of the authorities is very poor. Hence that kind of Adjustment exceeds the expected increase in bedrooms frowned upon by the authorities.

4.3.2.1 Economic factors:

This tries to investigate whether economic status of the respondent is among the factors that cause Adjustment, some of the things that were investigated are provision of rentable rooms for accommodation, provision of spaces for petty trading by house hold members/ relatives and provision of space for animal shed/ poultry. These are the major factors that cause Adjustment based on economic factors.

One of the fastest growing means through which the residents claimed they make money was the additional housing units attached to existing structures, to perimeter fence walls or probably built within an open space circulation area around their houses.

Construction of shops which residents use personally or rents out to people, converting an entire residence into office or outfits like schools, clinics, small and medium enterprises etc. Such small and medium scale businesses which are carried out from places of residence are generally referred to as home based enterprise (HBEs). Appendix viii shows the examination with 7.3% has a provision for rentable rooms/ accommodation, 16.7% has a provision of spaces for petty trading by house hold members/ relatives, 41.7% has provision of space for animal shed/ poultry. This reveals that economic factor has no strong influence on the Adjustment that the total numbers of respondents embark on,because 52.7% of transformers haveno Adjustment as against 47.3% who transformed their houses based on the factors mentioned above.

4.3.2.2 Socio cultural factors:

This tries to investigate to what extent does the socio cultural factors such as culture, religion, belief etc. Affect the Adjustment of the dwelling units, attributes that were investigated are: restricting direct access in to the main living areas i.e. sitting rooms and court yard for privacy/cultural reasons, provision of outdoor cooking/ kitchen apart from the original kitchen and provision of indoor garden for domestic purpose these are the major factors causing Adjustment based on socio cultural factors. Appendix viii shows that the result of the examination reveals that, 17.7% of the respondents restrict direct access in to living areas i.e. sitting rooms and courtyards for privacy/cultural reasons, 42.7% of the respondents provide outdoor cooking/ kitchen apart from original kitchen, and 50% of the respondents provision of indoor garden for domestic purpose. This result reveals that socio cultural factors has a strong influence on the Adjustment because, 63.6 % of the transformer respondents' made changes spurred by socio cultural factors.

4.3.2.3 Behavioural factors:

This tries to investigate on to what extent does the behaviour of the respondents affects the Adjustment, that is, to what extent does the respondents transform their houses to their own taste of preference?. The common Adjustment under this factor which were tasted are: renovation/ modification of the facade to modern trends/ standards, improving the quality of the living spaces through tiling, painting, ceiling, etc., improving the quality of bedrooms/sleeping areas/ WCs, improving service spaces such as WCs, courtyards, kitchen by plastering, tiling, painting, etc. Appendix viii shows that the result of the examination reveals that: 28.1% of the respondents renovate/ modify the facade to modern standard, 71.9% of the respondents improve the quality of their living spaces, and 64.6% of the respondents improve the quality of their service spaces. This shows that a behavioural factor has a great influence on the Adjustment because 73.6% of the transformer respondents transform their houses based on this factor.

4.3.2.4 Spatial Factors:

This tries to investigate whether the spaces provided are satisfied for the house hold, some of the things that were tasted are: Fencing the entire plot to demarcate property/ house for security, increasing the number of sleeping spaces such as bedrooms, provision/conversion of storage spaces. Appendix viiishows that the result of the examination reveals that, 52.5% fence the entire plot to demarcate house/ property, 61.5% of the respondents increase the number of sleeping spaces, and 40.6% of the respondents for provision/conversion of storage spaces. This shows that spatial factor has a great influence towards Adjustment of these staff quarters as 70.9% transform their houses based on this factor.

4.3.3 Lack of Satisfaction with Some Aspects of Housing Features and Attributes.

It was learnt in the course of this study that one of the fundamental reasons for the conception and actualization of the Quarters being studied was to improve the difficulties faced by the I and J staff in accessing decent houses in the late seventies. This of course might not have allowed for adequate consultation as to the real basic needs of the would be resident considering the versatility of human wants and as a result, it was not out of place to encounter some staffs who claimed not to be satisfied with some aspects of their housing.

Housing satisfaction is a subject that is frequently looked at and it is an important issue which if properly explored could serve as a guide for such future developments because the behavioural response of physically altering their houses is one way in which their reactions are expressed. An investigation into the residents' level of satisfaction with some Housing features and attributes showed significantly that quite of number of available features and attribute do not satisfy the residents. A descriptive analysis was done to ascertain the feature with the maximum satisfaction and that which falls least on the satisfaction mean list (Appendix xii)

The RSI (Relative Satisfaction Index) of the features and attributes was calculated which is computed as a ratio of the sum of actual satisfaction scores (SSac) and the maximum possible satisfaction scores (PSSmax) on a 5-point Likert scale for each functional space (Ibem, Opoko, Adeboye and Amole, 2013). Mathematically, this is expressed as:$RSI=\Sigma SSac/\Sigma PSSmax1$ with the highest satisfaction from Quality of air in living spaces with 64% and Sizes of kitchen, cooking and storage spaces at 47% least (satisfaction).

This results in Figure 4:2, gives validity and insight into reasons why some adjustmentswere carried out by the occupants. Although the average mean for this

analysis was on 3.00 only few attributes and features exceed this with a clear margin. The level of satisfaction of the residents with the features and attributes particularly with some specific aspects of their houses may be one of the reasons responsible for the massive adjustment observed within the Quarters. A space is considered satisfactory if RSI > 60 % in this study.

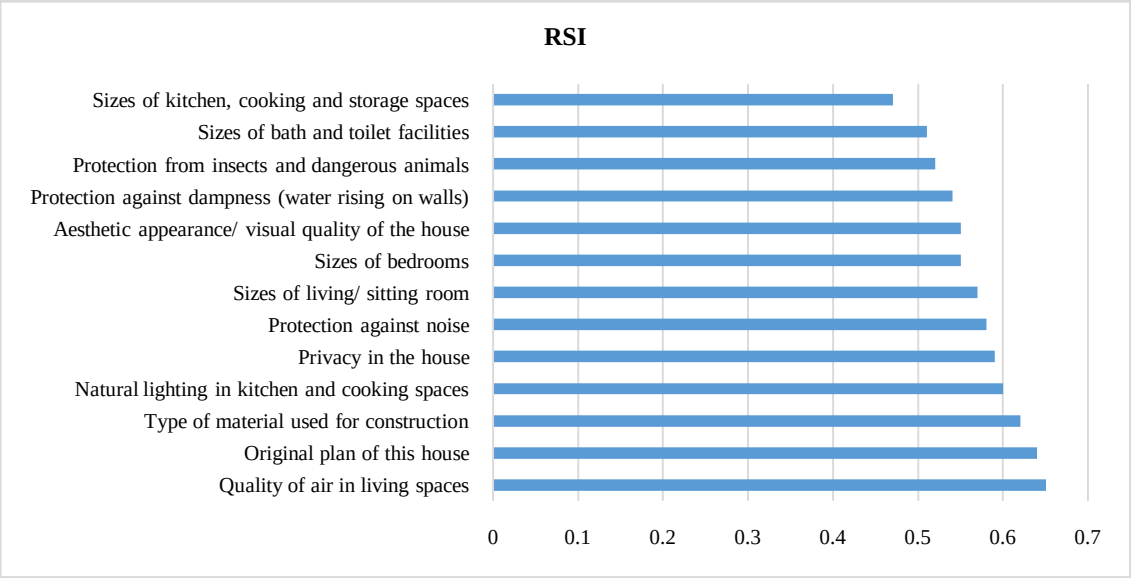


Figure 4:2 : Relative Satisfaction Index

4.3.4 Reasons for not Transforming

Figure 4:3, refers to the 14% of total respondents who claim not to have altered their building in anyway besides regular renovations.

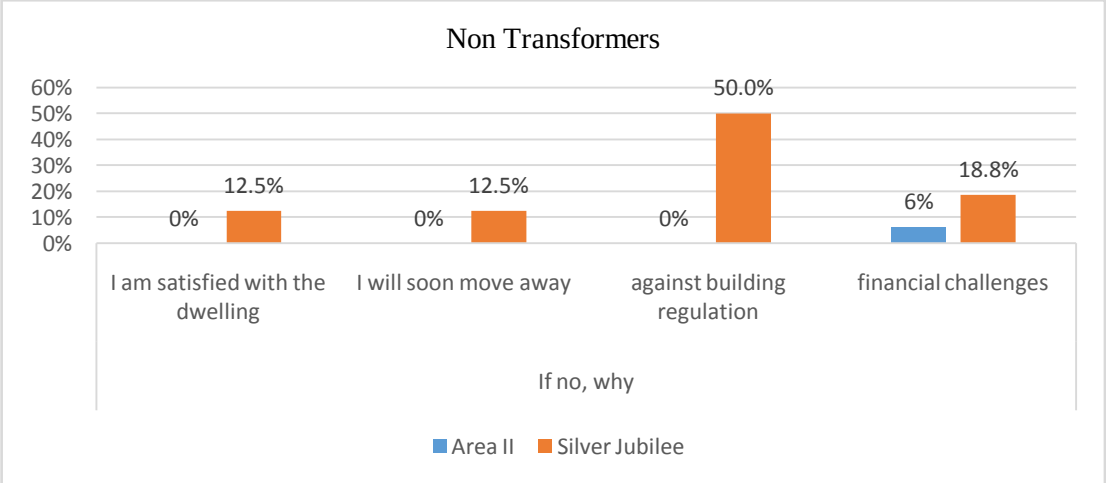


Figure 4:3 Reasons for not Transforming Source: Field work, 2017.

However results from the surveys show that the 17 units who stated they haven't transformed, 25.0% of the total number of respondent didn't transform due to financial constraint, 50.0% avoided Adjustment of the opinion that it is against building regulation, 12.5% will soon move away due to retirement or better accommodation elsewhere and 12.5% are actually satisfied with the present condition of their allocated building.

4.3.5 Intention to Transform

The question of whether the respondents still intends to transform received responses which suggested that most of the residents have actually not exhausted their available spaces and as a result can implement new forms of Adjustment if they so desire .

Table 4:4, shows that the availability of immediate outdoor space where household could transform on was one of the major factors that determines how far a household intends to continue with transforming their houses therefore the result obtained on this issue shows that (20.6%) residents in Silver jubilee as compared to just 6.5% in Area II Quarters still nurse the intention to transform if the opportunity comes. The level of congestion and indiscriminate encroachment was found to be higher in Silver jubilee than in the former where there still exist a handful of households who still maintain their external scape even though they may have tampered with their original buildings.

Spaces and actions intended to be added and done by these respondents includes Fencing, Garage, Kitchen, Landscape, Room, Reservoirs, Renovations and Store. (Appendix ix).

Table 4:4: Intentions to add or remove from your housing unit

		Do you intend to add or remove from this house		Total
		Yes	No	
Area II	Count	7	14	21
	% of Total	6.5%	13.1%	19.6%
Silver Jubilee	Count	15	71	86
	% of Total	14.0%	66.4%	80.4%
Total	Count	22	85	107
	% of Total	20.6%	79.4%	100.0%

4.3.6 Residents' Attitudes towards the Impact of Transformation

The respondents were asked to measure their personal level of agreement with various statements which are meant to suggest their views about the transformation of their houses. The ranking of the respondents' general level of satisfaction and how they felt about their houses and neighbourhood as shown in appendix XIII indicates that the general view of the people that transformation in all its ramifications in these Quarters makes life better ranking first. Interestingly, a feeling of satisfaction with the present state of the housing unit ranked last as it appears everyone is partaken of the practice. The second ranked view of the respondents about transformation was that Economics purposes played a major role in the residents' assessment of satisfaction as most of them agreed that transformation allows the residents to adjust their housing at their own pace and within their cost limit.

Some other points of assertion indicated by the respondents which ranked fairly high included the fact that their houses draw attention and give them a sense of belonging now more than ever before. However, it is pertinent to mention here that most of the respondents agreed that in as much as the act of carrying out transformation is unavoidable, the practice can be controlled to reduce the inevitable adverse impact on the built environment.

4.3.7 Main Attitudes of Respondents to Transformation

Descriptive analysis is a method that can help provide a relatively clear explanation to attitudinal issues of research. The 11 items which were used in measuring the attitudes of the respondents to transformation were subjected to Descriptive analysis and their mean values were obtained. These 11 items were grouped under four factors (See appendix XIV).

The first factor explained 79.1 % of the transformer respondent and represented renewal and upgrade of housing more or less through self-help system suggesting that the initiative of some transformers could amount to inadvertently helping the Government to upgrade their houses and possibly some other facilities which were not provided. As noted by some residents who claimed that the original house forms were too poor and devoid of every sense of beauty so with transformation, they have managed to remodel their houses to make them suitable and user friendly.

Following closely in the attitude of the residents towards transformation with 76.4% is housing comfort. The variables that loaded on this factor were; easier life afforded by transformation; as well as cautiousness of the increase in population and pressure on infrastructure that sometimes result from transformation. (See in appendix XIII). The implication of this was that the attitudes displayed by the respondents were based on the assessment of how comfortable they were considering the transformation that had taken place. In this regard, it may be possible that through transformation, the residents have been able to make their houses better ventilated, lighted and even more spacious to allow comfortable living within the houses or have made it impossible for some interior spaces to be properly ventilated and light. With bigger and more interior spaces and other functional spaces which a household may consider necessary for convenience, easier life may be attained too. The concern for housing comfort was also expressed in

terms of increase in population in most of the transformed houses which may negatively affect the performance and durability of some infrastructural facilities thereby leading to discomfort. Most households as observed on field provide for themselves some basic needs like, electricity (generators).

The issue of helplessness in housing was the third factors representing 68.2% in attitudes of the respondents to transformation. With variables of lack of adequate concern for housing needs of the low-income; a sense of satisfaction with the results of transformation. It may suggest that some of the respondents were pleased with the outcome of transformation probably because by their judgment, transformation has helped to tackle problems arising from inadequate housing.

Loading on the fourth factor was the attainment of social esteem goals of housing which accounted for 62.7%. Variables loading on this factor are that the houses serve as status symbol meaning that transformation may have given the household an opportunity to belong to an elite class of house those who live in the neighbourhood irrespective of the state of the house. The mean of these variables as seen in appendix XIII shows the level of agreement respondents have with the statements.

4.3.8 Addressing Research Objective One

The Adjustment activities observed from the study area majors on the fact that their housing units could no longer support their present needs because their life style has totally shifted from that which could be sustained by the original which the original housing scheme. From the research conducted it was observed that behavioural factor, which has to do with the preferences of individuals in their housing unit quality, was ranked as the major course of Adjustment activities seen in the study area.

Fromthe results gotten from the demography of the occupants, we can constructively see how the age range of respondents affect the manner and approach of adjustment.

The elderly seem to have carried out more changes than the younger age range. This is because they have transformation and adjustment activities are time bound. The vibrancy of the younger age group in a community also suggest the possibilities of future adjustments as their preference will change as their life cycle stages advances. This also has a strong relationship with the length of stay of the occupants within the neighbourhood. The longer one gets to stay in a particular environment the more the changes that individual is likely to affect so that the environment carries his/her identity. Results shows that 46% of the occupants have been in the staff quarters above sixteen years. And as a result of this, the resultant correlation of their status and grade level promotion did not match their housing allocation anymore inducing them to make changes to the existing house to suit their status and new life style.

Improving the quality of living ranked highest suggesting that a regular upgrade and maintenance check should be implored by the authorities to deter this haphazard alteration. Another striking Adjustment type is the increasing the number of sleeping spaces. This apparently validates the notion that any expectation that occupants in public housing in Nigeria will make do with the original design of their residences is unthinkable (Aduwo, 2011). Therefore with this said, the major consideration to adopt of this will be the prediction of future physical Adjustment and for such Adjustment within legal and environment framework. Hence this necessitates the need for an adaptable house to accommodate different family cycles and life styles within a given framework. Example is the HBEs (home based enterprises) and domestic gardening embarked by most residents in this study area, rapidly is becoming a national phenomenon. Hence these newly induced necessities ought to appear as fundamental activity areas in public housing schemes.

The 14% non-transformers think of Adjustment in view of great physical alteration alone. They see regular self-motivated renovation as a different type of activity and not Adjustment. Seek (1983) defines home improvement/ Adjustment as additions, alterations or renovation of dwellings. This further buttresses the fact that housing Adjustment is inevitable in public housing, hence authorities should have adequate understanding of user needs for identifiable categories of target users should be well documented and updated from time to time for design purposes.

With result showing a significant 29.2% willingness to add more rooms to the original housing scheme paints a vivid picture of the failure of a rigid building concept for public housing. Respondentintention to add more spaces like garage too shows the need to readily include these spaces as the fundamental housing requirement of the contemporary ABU staff housing needs. Some intention to transform were induced by the availability of virgin land next to some housing unit which has been converted to farmland and animal shed etc. this Adjustment can be curbed by giving every housing unit a standard well fenced plot without encroaching public spaces.

4.4 Method of Executing the Adjustment: Research Question Two

The cost of Adjustment spent by the residents on Adjustment activities was mostly sourced through personal savings. This was affirmed by all the interviewed respondents. This suggested that the value the residents placed on Adjustment may have led them into the painstaking effort towards saving some money for Adjustment. The built environment is inundated with several methods of construction techniques ranging from self-help method to the use of advanced construction techniques.

The Low-cadre in the society as expected may be limited to methods which they can conveniently afford particularly in terms of finance. Sometimes, time is not a yardstick as they tend to carryout Adjustment at their own pace and as dictated by the inflow of

the required cash and material resources. Knowledge of the methods adopted by the resident to effect Adjustment will enlarge the understanding of step by step stages that were involved in turning the quarters to what it is today.

Table 4:5 highlights the direct labour system of execution had the highest patronage of 38.0% in Silver jubilee. This practice involves the direct engagement of the different artisans and work men separately under completely different agreements with all geared towards achieving the same end result. This was followed by those (21.7%) who carried out their Adjustment by engaging the services of contractors.Self-help system which played a vital role in helping to actualize Adjustment in this quarters, is one by which individuals personally assemble required materials together and also execute the construction themselves. This may not be uncommon in a situation where most of the Low-Income earners are tradesmen trained on one or more hand works and most often one finds out that an individual becomes knowledgeable in several skills. While most of the respondents who engaged other methods of execution, a small group (17.4%) busied themselves with the self-help.The same pattern of distribution changed itself out in Area II where the largest percentage (15.2%) engaged the Contractor system.little of them (7.6%) within this Quarters were more inclined to the Direct labour system with no adoption of the self-help method.

Table 4:5 Method Adopted in the Execution of Adjustment in Study Area

		How did you carry out this extension and alteration			**Total**
		Self-Help	Contractor	Direct Labour	
Silver Jubilee Area II	Count	16	20	35	71
	% of Total	17.4%	21.7%	38.0%	77.2%
	Count	0	14	7	21
	% of Total	0.0%	15.2%	7.6%	22.8%
Total	Count	16	34	42	92
	% of Total	17.4%	37.0%	45.7%	100.0%

4.5 Adjustment of the Houses

The details of the research findings as it relates to two aspects of Adjustment were studied. First is the physical Adjustment that has taken place in the spatial organization and design of the buildings within the two quarters, change of use and addition of spaces. The issues were first discussed separately for the two concerned quarters and later together to give a holistic picture of the Adjustment experience generally. This analysis involved first, the types of physical alterations that had been made both in the interior spaces of their individual houses and the exterior as well as even the open spaces. It also discusses briefly some of the uses into which the transformed spaces have been put.

Second are the different processes through which Adjustment took place. It begins with a description of the first forms of Adjustment that took place as indicated by the individual respondents, what exactly has been done and the availability or absence of building plans or approval documents showing the proposed development in order to know how well the residents have complied with the preliminary building and planning rules/regulations.

4.5.1 Types of Houses Originally Provided

The type of houses in this research refers to the housing typology as originally built and allocated to the initial residents. In this regard Fig 4:4 and Fig 4:5 shows, the type of houses and the number of bedrooms available was homogenous two bedroom bungalow for both Staff quarters. This reason is responsible for the desire for variety in uniformity of the houses. Various typologies would have helped curtail the urge for a newer housing unit to fit the growing family size or lifecycle.

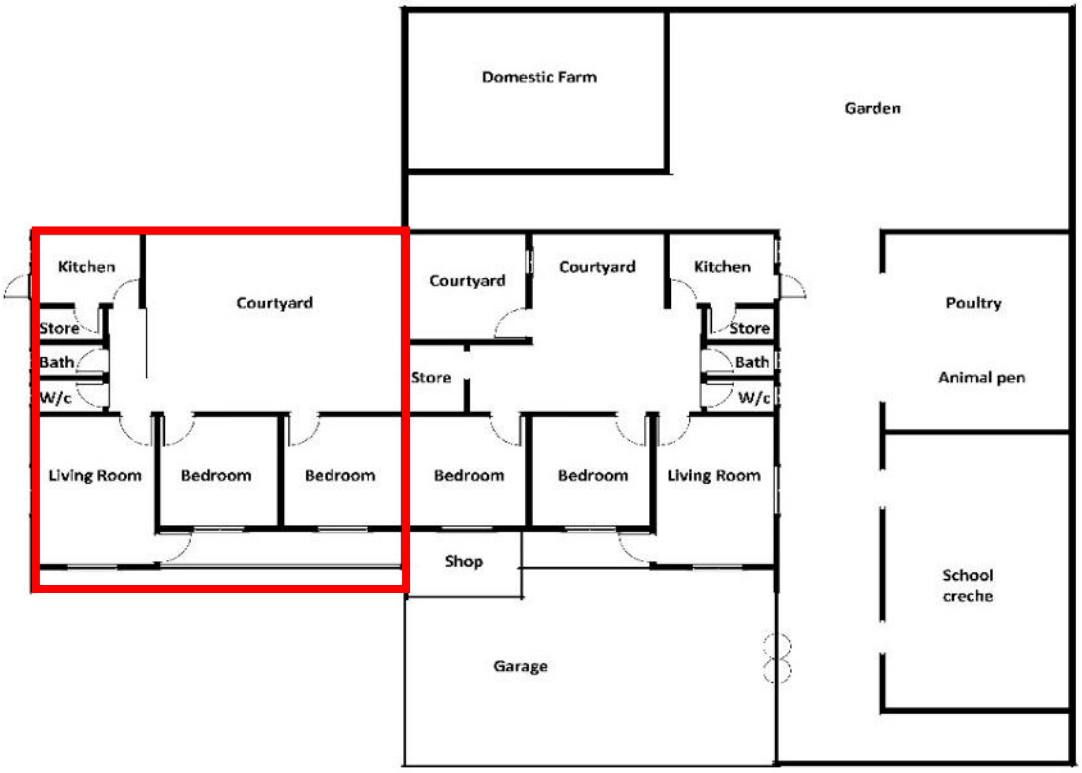


Figure 4:4 : Silver Jubilee Floor Plan with the additions that were made by the residents

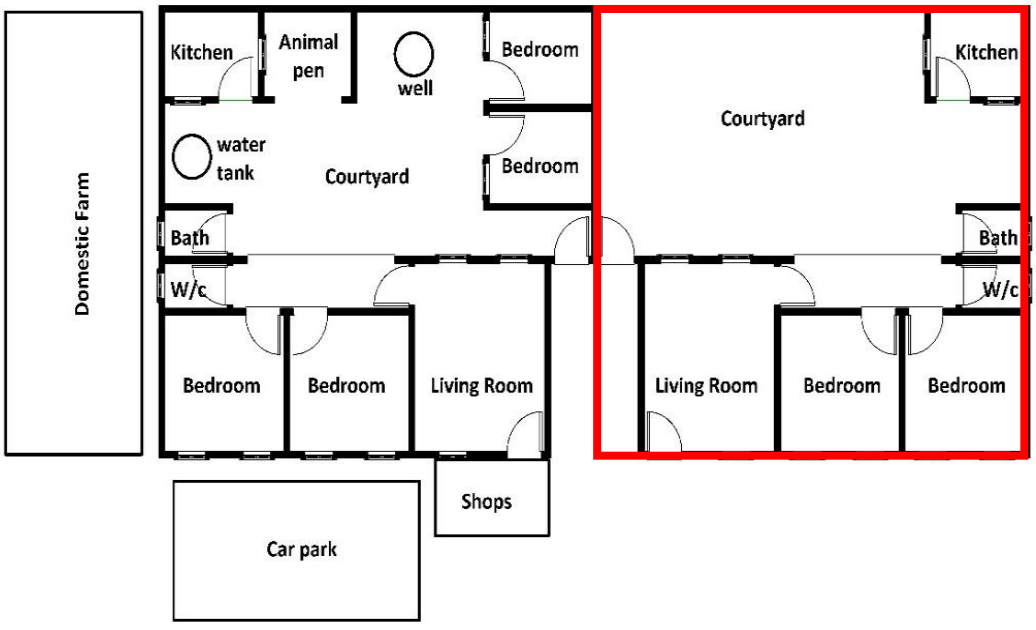


Figure 4:5: Area II Floor Plan with the additions that were made by the residents

4.5.2 Forms of Adjustment Embarked Upon by Respondents

It is expected that Adjustment process of any sort must have started at a point depending on what was of most priority to the household. The Junior Staff group may require some things that were not provided in the initial plan of the house and as such, this could have led to the urgency or otherwise with which most of them embarked on Adjustment to help themselves provide for what they regarded was a necessity to survive. Interviews carried out in Silver jubilee reveals that, erecting of perimeter fencing was the first Adjustment, these was gotten from a respondent who said that "*people didn't see that as anAdjustment act as they just wanted to protect their fruit trees from intruders and stubborn neighbourhood kids whom will keep stoning to pluck guava fruits from their backyard*" as far back as early 1990s. Of a contrary opinion were Area II residents who claimed to have embarked on the construction or addition of more bedrooms before any other form of Adjustment. This they claimed was to make available more rooms for their own use. A respondent answered "my *children grew in this very house, but the girls and the boys after sometime can no longer stay in the same room, so we had to build another room in the compound for the boys to stay and gives their sisters space"*.. The original space allocation can no longer support the family life cycle

4.5.3 Availability of Building Plan and Acquisition of Necessary Approval

The plan of a house or building is that document that shows the details of a proposed development taking into consideration all necessary building regulations guiding against unlawful physical development. It shows the different approvable standards and their level of compliance to merit an approval to carry out the construction work. It is expected that with the laid down rules and regulations for approval, every intended construction work whether fresh, modification, alteration or Adjustment within these Quarters must pass through appropriate channels at the university planning offices as

designated over seeing agencies. In the course of study it was discovered that there has been several additions/Adjustment made to the original plans and even encroachment into open spaces. This development spurred the researcher to ask the respondents particularly those who have transformed if they have building plans for their new additions and the data obtained from the Respondents revealed that only (11.8%) of the residents actually have building plans while (4.5%) of them have their Adjustment plans approved.Having a building plan does make a building approvable or permit construction work to commence without first seeking all necessary approval from the appropriate quarters.

Table 4.6shows the reality on ground shows that only 30.8% of those who 13 respondents whom had transformed and have building plans had all the necessary approvals while 69.2% do not have either because they did not seek for it or that they did but were not given.From the interviews conducted, it was discovered that the authorities frowned on addition of new structures, be it permanent or temporary without due process which was considered to be time consuming by the residents. Built garages, car porches, animal pen, poultries as well as stray animals are prohibited by the housing authorities. These therefore make the residents neglect the need to follow due process as they readily see the authorities discarding their needs even before applying for a permit.

Table 4:6: Possession of a building plan and approval for the effected Adjustment.

Do you have a building plan for the extension					
		Frequency	Percent	Valid Percent	Cumulative
Valid	No	97	88.2	88.2	88.2
	Yes	13	11.8	11.8	100.0
	Total	110	100.0	100.0	

If yes, was the building plan approved					
		Frequency	Percent	Valid Percent	Cumulative
Valid	No	105	95.5	95.5	95.5
	Yes	5	4.5	4.5	100.0
	Total	110	100.0	100.0	

4.5.4 Addressing Research Question Three

Findings revealed that most spaces are inherently not to the standard need of most occupants and are likely to be a source of dissatisfaction. This dissatisfaction are a major catalyst to the adjustments made in the study area. Some of these includes factors like climate change, technology which are not the main focus area of this study. In order to improve their living condition by personal preference with modern technologies like air-conditioners, the external wall structure and integrity had to be compromised owing to the fact that the existing building did not provide adequate thermal comfort to their desired level. Plate V shows Climatic factoreffects on housing adjustments like locally constructed window hoods to cater for shading devices as well as preventing driving rain from entering the interior of the building.



Plate V: Addition of Extra storage space and window hood to the Building at Silver Jubilee

The addition of bedrooms for private uses and benefit of the individual households was the most important reason to transform because most of the respondents claimed that the types of houses and available number of bedroom were not adequate for their house unit.There is no doubt that the bedroom is a vital component of any residence, and as

such its availability in the right quantity and size in line with each household's needs contributes to privacy, security and comfort of the family members. The large percentage of those who have transformed by increasing the number of bedrooms in their houses is quite understandable as most of them have children and perhaps dependants that needed sleeping spaces. Indeed, the result reveals that 86% of the respondents have transformed their houses to accommodate children's room. The 14% who had not transformed their bedrooms may probably be younger families who were yet to havechildren.Dining spaces were omitted in the residences as the survey data suggest, the households have over the years developed adaptive and coping strategies, which reduced their desire to physically modify their unit to accommodate this space. However, the same cannot be said forthe bedrooms which are very important spaces

The spatial reconfiguration observed in the study area basically is addition of spaces, followed by usage or redefinition of slack spaces in the original design such as verandas, courtyards, stores etc. major structural changes were not observed on the field. Immediate environment were fenced using zinc to help demarcate their property line. Some of the transformers made these slack spaces into a day-care, gym, poultry shed, animal shed, and farmland for domestic purposes. The character of these Adjustments mimics that of a free growing organism. Most of the Adjustment activities in the study area are made of non-durable materials like zinc, wire mesh, maize stalk, mud etc. hence the aesthetic appeal of the neighbourhood is lost to these activities.

Another form of In addition to the main activity areas in the residences, some of the households were found to have carried out other forms of Adjustments. It was observed that greater portion of the Adjustments outside the main activity area included the addition of outdoor cooking spaces as the given kitchen space doesn't suit their lifestyle. Generally speaking, evidence in this study is in support of findings in literature

on the nature of and motivations for Adjustment in public housing in the developing countries (see Tipple, 2000a).Indeed, findings of this study have further shown that the physical Adjustments in of public housing are basically a reaction to the inadequacies of public housing by the residents as pointed out by Hasan (2006).

4.6 Conclusion

This section examines thoroughly the analysis, discussions and findings of the research objectives. This section opens examining specifically the various reasons highlighted by the respondents to have been responsible for the diverse forms of Adjustment embarked upon by the residents.Findings showed that the drive to make their houses to their own taste of preference through different means was the highest motivator for the residents (Behavioural factor). Almost all the respondents were of the opinion that Adjustment indeed had an impact on the neighbourhood and fortunately as they claimed, the positive impacts outweigh the negative impacts.

Secondly the exact magnitude of Adjustment within the study areas which revealed that a huge 86.4% of the residents irrespective of their income class had actually effected one form of Adjustment. Amongst the 13.6% who claimed not to have transformed their houses were residents who still hoped that a time would come when they would have the opportunity to carry out their desired forms of Adjustment. The spatial identity the housing unit in the study area are physically transforming by external extensions and minor alteration without approved building plans or an authorization from the relevant agencies to carryout Adjustment, a situation which may have been responsible for the general poor quality of work.

Finally an attempt was made to further highlight the findings of this study in respect to method of executing Adjustment which is in agreement with the objectives of this research. The cost of Adjustment which was spent by the residents on

Adjustmentactivities was mostly sourced through personal savings. This suggested that the value the residents placed on Adjustment may have led them into the painstaking effort towards saving some money for Adjustment. The most common method of carrying out the exercise was predominantly through direct labour system.

5.0 DESIGN REPORT

5.1 Introduction

This chapter centres on the preliminary design proposaland laid down consideration to tackle the phenomenon under study to offer a design based solution to the problems identified. Also serve as benchmark which would inform the design of the "Phase II Staff housing ABU Zaria". Following this introduction is the design brief, thirdly the site location, fourthly site analysis of the proposed staff housing, fifthly site development concept for the new design. Finally a summary was penned to further highlight salient principles and considerations made.

5.2 Design Brief

Ahmadu Bello University is seeking to engage the creative and innovative talents of its students to undertake conceptual design development for the phase II staff housing 'Model Staff Housing' with state of the art innovations and facilities for the University community and its environs.The current housing prototype schemes has undergone several alteration giving a clear cut sign of its inability to meet the average housing needs of residents. However, investigations have revealed that the existing facilities are severely degraded and do not meet industry's minimum standards. Moreover a number of building spaces and buildings are inappropriate for the functions they serve. This accounts for the need for an appropriate design.

5.3 Site Location

The University management in its quest to accommodate the present and future space needs and also decongest the main campus decided to utilize the vast land available by commencing the development of phase II of the main campus. The Phase II project involves planning, designing and construction of new buildings for some faculties and

other supporting facilities. The land to be used is adjacent to the present location of the main campus, only separated by the natural stream channel that drain in to the existing dam. The available land for the phase II development covers a total area of approximately 1681.183 hectares.

5.4 Site Analysis

The selected site was analysed based on several parameters that will aid the proposed A.B.U Phase II Staff housing design. All the features of the site was carefully studied and incorporated into the design.

5.4.1 Climate characteristics

The climatic condition of the proposed site is the one reported for Zaria. Mean annual average rainfall is 1099.3mm. The daily mean temperature peaks in April at 35.18c and is low in December/January at 15.10c. The mean relative humidity value is 15.9% in February and 78.1% in August.

5.4.2 Infrastructures and Services

At present, the proposed site can only be easily access by the un-tarred road leading to the neighbouring villages behind the University, passing through Area BZ. Although mobile telecommunication service extends to the area, it is yet to be serviced with electricity and water supply.

5.4.3 Topography

The site has a gentle terrain lying on heights ranging between 670m and 660m above sea level. The plain land lies to the south and west covering approximately 15 Ha. The site generally slopes northward toward the stream with a height difference of nine (9) meters.

5.4.4 Slope Analysis

Except around the northern edge of the site, where slope of more than 7% is registered, the remaining land is between 0.5-3.5 percent. Therefore the entire site is developable. The area considered most suitable for development fall between 0.5-3.5 percent. This is found at the Western and Southern part of the site, while the area with up to 7% is considered fairly suitable.

5.4.5 Relative Humidity

At the start of the dry season, relative humidity falls from 68% in October to 36% in November with the stabilization of the easterly winds. It further falls to 35% in January and 20% in February. Mean relative humidity reaches its maximum value of 80% in the month of August.

5.4.6 General Geology

Large part of the subsurface of this area consists of crystalline rocks of the basement complex and the rest is underlain by sandstone and the sedimentary formation of the Nupe sandstone. The surface area is predominantly sedimentary terrain belonging to the Patti Formation. Figure 5:1 shows a CAAD design analysis of the proposed site.

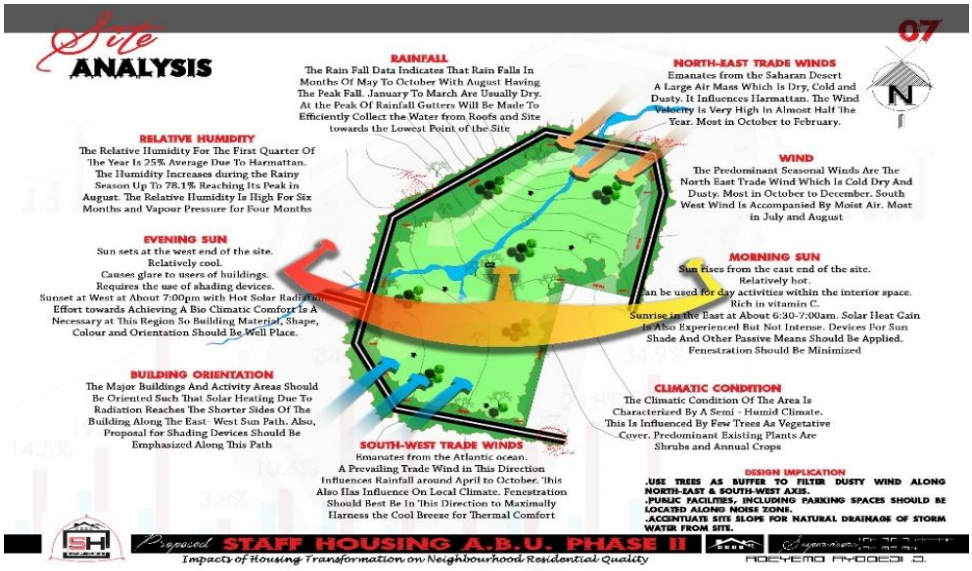


Figure 5:1: Site Analysis source: Fieldwork 2017

5.4.7 Ground Water Profile

The Geophysical investigation conducted at the ABU phase II site indicated that there is a good water exploration potential in area. The water table is in the range of 7m to 10m deep. The Drilling should be done to a depth exceeding **53.8m** to allow for large reservoirs within the lower aquifers unit to be tapped. The result interpretation suggests that the area is underlain with substantive Patti formation, but the water table is a depth of about 10m (ten metres), and there exist an indication of good aquifer at a depth of 50m (Fifty Metres) for the points 1 and 2, but point 3 indicated some rocks out crops.

5.4.8 Sunshine

Zaria being in the northern part of Nigeria has its sun movement from east through north to the south. The sun rises from the east and gently warms up to itsmaximum heat intensity in the afternoon. As the sun moves over to west its intensity witnesses a reduction till it is finally sets.

5.4.9 Rainfall

Rainfall starts in April and increases from 161.5mm in June to 281.6mm in August to its maximum throughout the year. Annual total rainfall lies within a range of 960mm to 1150mm.

5.4.10 Wind Pressure

In Nigeria there are two types of wind which prevails: Tropical Continental Air Mass and Tropical Maritime Air Mass. The tropical continental air mass (Harmattan wind) carries little or no moisture with it and therefore dries. This wind blows from northeast and predominantly prevails during the dry season. Its impact is more on the northern region of the country. The tropical Maritime air blows from southwest across the country and carries with it moisture (rainfall) which reduces from southern to northern

region. This wind predominantly prevails during the wet season. The speed of both winds in Zaria ranges from 93kph for month of March to 43kph for month of December. Higherspeeds are sometimes recorded during Harmattan period. Micro winds are occasionallygenerated by local air currents.

5.5 Site Development Concept

The process of concept generation encompasses a handful of important steps. Understanding the project and then consolidate ideas and choose direction to go with. The site development concept makes use of zoning. From the extensive research carried out, the proposed site is divided into four different zones where the noise prone commercial activities are located at the entrance, next the quiet residential zone, the agriculture designated area and final future development. This is to help curb the menace of pollution exhibited in current housing schemes. Hence a well-controlled and serene home zone front with tranquillity was coined by separating noise generating activities from the dwelling units. The research suggests that housing scheme should be done in phases. This is to the end that the issue of inadequate land to provide new housing stockto cater for future changes and housing needs be eliminated.

5.6 Implications and Applications of findings on design

i. Family cycle influences design hence typological variety is necessary for flexibility and adaptability.

ii. It was observed that due to housing shortage academic staff agreed to move into the quarters affirming the move and improve strategy (littlewood and munro 1997) and filtering. Hence housing provided should be flexible and adaptable to accommodate different lifestyles. Housing should not be concentrated on one cadre of staff, but having in mind future stock shortage opportunities and tackle filtering.

iii. Some spaces provided were not adequate for their functions, so the new design should adhere to the revised standards of space accommodation.

iv. Plot needs a reasonable size to allow for higher levels of extension for the future.So design should take into consideration a modern neighbourhood.

v. Stalls and shopping outlets were discovered to generate the highest noise source in the neighbourhood hence should be provided outside the home zone to enhance zoning in the neighbourhood to reduce noise and enhance security. HBE`s (home based enterprises) that may cause pollution should be discouraged within formal settlement.

vi. Most respondents have domestic farm hence design should provide for a neighbourhood green farm within safe distance from the residential areas to avoid animal attacks.

5.6.1 Design Consideration

In order to harness the natural environment, the building has been oriented in relation to the solar chart. Consideration has also been made to ensure adequate day lighting to existing and future development in the neighbourhood via the building proportion, size and shape using solar path, sunshades (both horizontal and vertical) area also designed to shield windows from excessive heat gains during the daytime.Design took these into consideration;

i. Concordance of architectural and technical concepts;

ii. Simplicity of form, structure and technical equipment;

iii. Weather protection of facades; and

iv. Respect for the surrounding environment and ecosystem

5.6.1.1 Water recycling

Rain water is harvested for treatment and later channelled into the building for domestic use in flushing, irrigating and washing amongst others.

5.6.1.2 Building Materials, Finishes and the External Environment

In order to incorporate measures to maximize long-term sustainability performance in all aspects of the buildings operation, all specifications incorporates sustainable design, construction and operation including whole life costing and maintenance requirements. Considerations were given to longevity, durability, vulnerability to vandalism as well as cost effectiveness.

5.6.1.3 External Works

Well-defined vehicular and pedestrian circulation routes were clearly outlined, while separate solar covered parking facilities were provided for vehicles, motorcycles and bicycles. However, soft landscaping were considered as against hard landscaping.

5.6.1.4 Building and Facility Security

Security and access control were an important component of the design. A combination of passive crime prevention design strategies, physical, mechanical and electronic access and monitoring systems were employed.

5.6.1.5 Sustainability

The opportunity to use the housing scheme to encourage approaches to sustainability was harnessed, by designing for minimum energy use and water use, choosing locally sourced, or other low environmental impact materials.

5.6.1.6 Maintenance

Careful considerations were made of maintenance implications of all specifications to help to minimise running costs and ensure long-term viability of the housing scheme. Robust high-quality materials and products where used.Unusual fixtures and fittings (such as taps, toilets, boilers and shutters) that may cause maintenance difficulties for the residents through cost, availability of spares were avoided.

5.6.1.7 Flexibility

The building design allowed for maximum flexibility of use, which considered both the short term to cater for current requirements, and in the longer term, asneeds changeswith time. Design solutions that give flexibility through planning and space organisation were used. For longer term change, designs easily accommodate internal reorganization and addition of spaces by allowing space for future extension is desirable.

5.6.2 Services

5.6.2.1 Water supply

The centre will be equipped with water supply from the new Kaduna State Water Boardplant that is presently under construction and a borehole water supply is also proposed for the centre as an alternative source.

5.6.2.2 Power supply

Power shall be tapped from the Power Holding Company of Nigeria (PHCN)’s national grid. However, the design shall also cater for its own power needs. There is provision for a power substation, with power generating sets and synchronization panel, to cater for power failure.

5.6.2.3 Refuse disposal

Waste bin is provided in every unit and along main circulation route. Small incinerator alsolocated atremote part of the site. Waste treatment plant, to cope with all refuse generated on site is located far from the residential area.

5.6.2.4 Waste water and sewage disposal

Waste water from water closets are drain through the central sewer line to the sewage treatment plant for treatment and subsequently disposed by Kaduna State Environmental Protection Agency.

5.6.2.5 Storm water drainage

The slope of the site will encourage natural drainage of storm water off the site. But drainage channels should be provided to take care of water run-off fromroof.

5.6.3 Design

The proposed site is divided into four different zones where the noise prone commercial activities are located at the entrance, next to the quiet residential zone, the agriculture designated area and final future development. The HBEs which doesn't produce much noise are located close to the home zone. Every resident is entitled to farming spaces allocated within the agricultural spine to foster sustainability and the principle of permaculture. Plot sizes were demarcated with short picket fences to promote social interaction and also give a jurisdiction limit to each resident.

The concept behind the plan is such that it is well laid out for growing. 2 growing prototypes were generated. This was to cater for the different life cycle within the neighbourhood. Plan spatial concept was based on simplicity and flexibility. The ground floor plan consists of an entrance porch leading into the living room. Three prototypes were generated for the oneunit growing from one bedroom to three bedrooms. The two

bedroom and three bedroom typologies are spaced out in detached bungalow styles to give residents core privacy.The second typology is a stand-alone two bedroom bungalow which can be transformed into threebedrooms when the need for more habitable space arises.All prototypes have an open courtyard to integrate spaces and create spaces for relaxation and house hold chores (yard work). The design featured many sustainable practices ranging from solar panel on roof tops, rain water harvester, to biogas digester in toilets for cooking gas. Design was done in phases to eliminate the present issue of inadequate land for housing expansion.

5.7 Conclusion

This section examines thoroughly the design principles and consideration for the proposed design scheme. The core requirement of the design brief (which is mainly an organised pattern of growing building to accommodate the changing lifestyles and needs of the 21st century A.B.U. staff.), Site and services (with sustainability taking the lead role in both services, planning and material selection.) and the core consideration of housing type with basic emphasis on flexibility to permit ease of alteration for both prototype i.e. the one unit growing to three and that of two unit growing to three.

6.0 SUMMARY OF FINDINGS AND CONCLUSION

6.1 Introduction

This chapter presents highlights of the major findings and inferences drawn from the findings based on the data presented and analysed. It will give some recommendations, listing out ways to solve the identified problems and the major contributions to knowledge. The chapter will be organized under the following headings (a) Summary (b) Conclusion (c) Recommendation (d) Contribution to knowledge.

6.2 Summary

This research was established to understand occupants' adjustment activities, execution, what they intend to alter and why?So as to adapt changes in the design and policy for the new Phase II staff housing.Housing Adjustment is seen as a form of behavioural pattern highly influenced by satisfaction, attitude to housing and needs where inhabitants in one way or the other find satisfaction in altering their housing forms including their immediate environment.The practice of Adjustment as observed is so popular that it may be reasonable to ask whether Adjustment is a universal phenomenon wherever it is allowed either actively or passively.

A house is more than just a dwelling to the occupants; it is a source of identification and status booster and a place of assembly. It begins in the imagination of the people who build it and it is gradually transformed for better or for worse by the people who occupy it, since their housing need could not be met.Qualitative and Quantitative research strategy was adopted using case study research approach. A proportionate stratified random sampling technique was employed to select two staff quarters. Both primary and secondary sources of data were used, and the instruments of data collection used were questionnaires and interview. Staffs at the university were interviewed. The design

strategies adopted from literature were used in assessment of selected cases. The research objectives were met.

The following points summarize the major research findings:

i. The main factor contributing to Adjustment in housing form is the shortage of accommodation and the desire for an increase in the space under their control seen as the most effective way to achieve the desire for more space within and around a household. It was also understood that the space being highly needed in this drive for expansion is what can be referred to as habitable space.

ii. The Attitude of respondents towards these adjustments with a 79.1 % of the transformer respondent is represented by the need for renewal and upgrade of housing unit.

iii. The nature of Adjustments that had taken place were such that had been dictated by several factors including the type of housing, number of some of the interior spaces available to this group of people. The foremost types of Adjustment that have taken place were orchestrated by Behavioural reasons in order to improve the living quality of their growing family and security. It was observed that Adjustment just to have additionalspace for rental or ensuring high security was not much of a priority as Behavioural factors.

iv. The cost of Adjustment which was spent by the residents on Adjustment activities was mostly sourced through personal savings. This suggested that the value the residents placed on Adjustment may have led them into the painstaking effort towards saving some money for Adjustment. The most common method of carrying out the exercise was predominantly through direct labour system.

v. Though numerous reasons were tied to why the residents had transformed, the number of bedrooms present and even the sizes of the available interior space, the original houses were considered grossly inadequate for the Low-Income earners who probably have a large nuclear family and an over-bearing extended family to contend with. This stimulated a quick hold on the Adjustment option.

vi. Spaces such as HBEs, Gardens, Farm lands, Garages and other facilities which are needed for easy living in the staff quarters are missing from the initial design concept; hence facilitated user induces Adjustments for facilities which were not provided by the original scheme.

6.3 Conclusion

The following are the conclusions drawn based on the findings of the study:

i. The main factor contributing to adjustments in housing form is the shortage of accommodation and the desire for an increase in the space under their control.

ii. The foremost types of adjustments that have taken place were orchestrated by Behavioural reasons in order to improve the living quality of their growing family and security.

iii. The most common method of carrying out the exercise was predominantly through direct labour system from personal savings.

iv. The original houses are grossly inadequate for the occupants' lifestyle and cycle.

v. There was inadequate understanding of user needs for identifiable categories of target users as well as poor documentation and updatesof users need from time to time for design purposes.

6.4 Recommendations

i. Sustainability in public housing cannot be achieved if the potential users' operation efficiency 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.

ii. Interviewed staff complained bitterly that the university should embark on quota renovations to upgrade the conditions of the existing neighbourhood.

iii. All applications for alteration and extension (physical Adjustment) should be made by a coordinating office in each quarter at no cost and approval to be communicated within a practicable time limit.

6.5 Contribution to knowledge

i. Identification of the spatial requirement for the contemporary A.B.U Staff housing need.

ii. This study came up with a solution- the action model for new designs that will give occupants of the new phase ii staff housing the opportunity of incremental housing to cater for their changes in life-cycle.

6.6 Area for Further Study

Further study should therefore investigate theeffect of changing climate on housing Adjustment, Gender sensitivity in housing adjustment and Informal housing Adjustment as a squatter behaviour.Finally, a multi-disciplinary approach on tackling the menace of housing Adjustment phenomenon should be carried out.

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APPENDICES

Appendix I: Questionnaire

Hello, I am Adeyemo J.A. MSc. Architecture student from dept. of Architecture, ABU Zaria. Conducting research on "Exploring incremental housing concept in the design of proposed ABU phase II staff housing" using your quarters as a case study. The information you provide will be strictly for research. It will also be treated with utmost confidentiality. Kindly append your signature/date in the space provided as a mark of consent to freely participate in the survey. Thank you.

Signature_____ date_____ (my contact: 08170099065, ifemi2950@gmail.com)

SECTION A: DEMOGRAPHICS

Staffs Gender: Male [ ] Female [ ] **Age**: 25-40 [ ] 41-50 [ ] 51-60 [ ] **Neighbourhood Name**: ……
Marital status: Single [ ] Married [ ] Widow [ ] Widower [ ] Divorced [ ] Separated [ ] others ……
Ethnicity: Yoruba [ ] Igbo [ ] Hausa [ ] Others …… Religion: Christianity [ ] Islam [ ] Others …….
Highest Level of education:WASSCE [ ]OND [ ] HND / B.Sc. /BA [ ], Masters [ ], Others ……
Length of stay in the Quarters: 2-7yrs [ ] 8-15yrs [ ] 16yrs + [ ] **No. of expected guest per year**: 1-2[ ] 3-4 [ ] Others
Family size at initial Occupancy time: 1-3 [ ] 4-6 [ ] 7+[ ] **Family size at present**:1-3 [ ] 4-6 [ ] 7+[ ]
Grade at housing allocation: Junior staff [ ] Senior staff [ ] **Present Grade**: Junior staff [ ] Senior staff [ ]

SECTION B: ADJUSTMENT

Have you changed (transformed) your house in anyway? Yes [ ] No [ ]

S/No	Type of Adjustment		
1	Provision of rentable rooms/accommodation	Yes [ ]	No [ ]
2	Provision of spaces for petty trading by household members/ ventures	Yes [ ]	No [ ]
3	Provision of space for animal shed/ poultry	Yes [ ]	No [ ]
4	Provision of outdoor cooking/ kitchen apart from the original kitchen	Yes [ ]	No [ ]
5	Restricting direct access in to main living areas i.e. sitting room for privacy/ religious reasons	Yes [ ]	No [ ]
6	Provision of indoor garden for domestic purpose	Yes [ ]	No [ ]
7	Renovation/ modification of the façade to modern standards/ trends	Yes [ ]	No [ ]
8	Improving the quality of living through air conditioning, tiling, painting ceiling etc.	Yes [ ]	No [ ]
9	Improving service spaces such as plastering, tiling, painting WCs, courtyards e t c	Yes [ ]	No [ ]
10	Fencing the entire plot to demarcate the property/ house for security	Yes [ ]	No [ ]
11	Provision/Conversion of storage spaces e.g. garage, store etc.	Yes [ ]	No [ ]
12	Increasing the number of sleeping spaces such as bedrooms	Yes [ ]	No [ ]

S/No	Housing and environmental features and attributes (5-Strongly satisfied, 4- satisfied, 3- Neutral, 2-Dissatisfied, 1- Strongly dissatisfied)					
1	Housing type (semi-detached e.g. No. 24 A/ 24B housing style)	5	4	3	2	1
2	Sizes of bedrooms	5	4	3	2	1
3	Sizes of living/ sitting room	5	4	3	2	1
4	Sizes of kitchen, cooking and storage spaces	5	4	3	2	1
5	Sizes of bath and toilet facilities	5	4	3	2	1
6	Privacy in the house	5	4	3	2	2
7	Natural lighting in kitchen and cooking spaces	5	4	3	2	1
8	Quality of air in living spaces	5	4	3	2	1
9	Protection against noise	5	4	3	2	1
10	Aesthetic appearance/ visual quality of the house	5	4	3	2	1
11	Protection against dampness (water rising on walls)	5	4	3	2	1
13	Protection from insects and dangerous animals	5	4	3	2	1
14	Type of material used for construction	5	4	3	2	1

If No, why? I am satisfied with the dwelling [ ], I will soon move away [ ], against building regulation [ ], financial challenges [ ],Others……

Do you intend to add or remove from this house? Yes [ ], No [ ]

If yes, what else would you need to add or do? Please specify……

How did you carryout this extension and alteration (physical Adjustment)?

Self-Help (You built it directly by yourself) [ ], Contractor [ ], Direct Labour (separate tradesmen/ Labourers) [ ].

SECTION C: OCCUPANTS VIEW

What are people's views/reactions to the physical Adjustment activities taking place in this neighbourhood?

Unconcerned [ ], Worrisome [ ], Helps in Upgrading Environment [ ] Helps in providing infrastructure/facilities which government could not provide [ ]. Others specify ……

Which of these facilities is /are mostly affected negatively by these Adjustment activities? (Tick as many as you consider necessary). Roads [ ], water supply [ ], electricity [ ], pedestrian/ vehicular circulation [ ], Drainage [ ], none of them [ ], All of them. [ ]

Which of the following communal facilities were available within the neighbourhood at the time you moved in?

Health centre [ ], Shopping centre [ ], Educational facilities [ ] Recreational facilities/chill-out spots [ ], None [ ]

SECTION D: ADJUSTMENT SATISFACTION

S/No	Statements (5-Strongly agree, 4- Agree, 3- Neutral, 2-Disagree, 1- Strongly disagree)					
1	This house after the modifications provides attention and sense of belonging for my household	5	4	3	2	1
2	This house now provides pride of social status for my household now than before the changes	5	4	3	2	1
3	Housing needs of staffs in this quarters were not adequately met originally	5	4	3	2	1
4	The acts of carrying out extensions or alteration (Physical transformation) is unavoidable	5	4	3	2	1
5	People are expressing not only of housing needs but the desire for identity, a sense of belonging and a search for status among neighbours	5	4	3	2	1
6	Physical transformation/ changes helps to renew or upgrade low- quality housing at no cost to the government	5	4	3	2	2
7	I like my house the way it is now more than what it was before the changes happened	5	4	3	2	1
8	Transformation encourages increase in population leading to higher pressure on utilities and public services e.g. borehole	5	4	3	2	1
9	Transformation allow house-holds to adjust their housing at their own pace and within their cost limit	5	4	3	2	1
10	Transformation has negative effect on the available infrastructural facilities e.g. borehole due to increase in population from extra spaces created.	5	4	3	2	1
11	Transformation makes life easier for the residents	5	4	3	2	1

What have you gained from the Adjustment? (Tick as many as you consider necessary). More income for the Household [ ], More accommodation/spaces [ ]. To effect aesthetic change on my house/facelift [ ]. Privacy [ ]. Others (specify)……

(Source: Adapted from Aduwo (2011**)**

THANK YOU.

Appendix II: Adjustment types and Factors

S/No	Type of Adjustment	Factor
1	Provision of rentable rooms/accommodation	Economic
2	Provision of spaces for petty trading by household members/ ventures	Economic
3	Provision of space for animal shed/ poultry	Economic
4	Provision of outdoor cooking/ kitchen apart from the original kitchen	Socio-cultural
5	Restricting direct access in to main living areas i.e. sitting room for privacy/ religious reasons	Socio-cultural
6	Provision of indoor garden for domestic purpose	Socio-cultural
7	Renovation/ modification of the façade to modern standards/ trends	Behavioural
8	Improving the quality of living through air conditioning, tiling, painting ceiling etc.	Behavioural
9	Improving service spaces such as plastering, tiling, painting WCs, courtyards e t c	Behavioural
10	Fencing the entire plot to demarcate the property/ house for security	Spatial
11	Provision/Conversion of storage spaces e.g. garage, store etc.	Spatial
12	Increasing the number of sleeping spaces such as bedrooms	Spatial

Appendix III : The Percentage of those who have transformed

		Neighbourhood Name		Total
		Silver Jubilee	Area II	
Provision of rentable rooms/accommodation	Count	4	3	7
	% of Total	4.2%	3.1%	7.3%
Provision of spaces for petty trading by household members/ ventures	Count	11	5	16
	% of Total	11.5%	5.2%	16.7%
Provision of space for animal shed/ poultry	Count	34	6	40
	% of Total	35.4%	6.2%	41.7%
Provision of outdoor cooking/ kitchen apart from the original kitchen	Count	33	8	41
	% of Total	34.4%	8.3%	42.7%
Restricting direct access in to main living areas i.e. sitting room for privacy/ religious reasons	Count	9	8	17
	% of Total	9.4%	8.3%	17.7%
Provision of indoor garden for domestic purpose	Count	39	9	48
	% of Total	40.6%	9.4%	50.0%
Renovation/ modification of the façade to modern standards/ trends	Count	20	7	27
	% of Total	20.8%	7.3%	28.1%
Improving the quality of living through air conditioning, tiling, painting ceiling	Count	55	14	69
	% of Total	57.3%	14.6%	71.9%
Improving service spaces such as plastering, tiling, painting WCs, courtyards e t c	Count	49	13	62
	% of Total	51.0%	13.5%	64.6%
Fencing the entire plot to demarcate the property/ house for security	Count	43	10	53
	% of Total	44.8%	10.4%	55.2%
Provision/Conversion of storage spaces e.g. garage, store etc.	Count	26	13	39
	% of Total	27.1%	13.5%	40.6%
Increasing the number of sleeping spaces such as bedrooms	Count	43	16	59
	% of Total	44.8%	16.7%	61.5%
Total	Count	75	21	96
	% of Total	78.1%	21.9%	100.0%

Percentages and totals are based on respondents.
a. Dichotomy group tabulated at value 1.

Appendix IV: Factors influencing Adjustment

	Yes		No		Total	
	N	Percent	N	Percent	N	Percent
EconomicFactor	52	47.3%	58	52.7%	110	100.0%
Socio-culturalFactor	70	63.6%	40	36.4%	110	100.0%
BehaviouralFactor	81	73.6%	29	26.4%	110	100.0%
SpatialFactor	78	70.9%	32	29.1%	110	100.0%

Appendix V: Method Adopted in the Execution of Adjustment against Present Staff grade

			How did you carry out this extension and alteration			Total
			Self-Help	Contractor	Direct Labour	
Junior Staff	Silver Jubilee	Count	1	3	0	4
		% of Total	14.3%	42.9%	0.0%	57.1%
	Area II	Count	0	2	1	3
		% of Total	0.0%	28.6%	14.3%	42.9%
	Total	Count	1	5	1	7
		% of Total	14.3%	71.4%	14.3%	100.0%
Senior Staff	Silver Jubilee	Count	15	17	34	66
		% of Total	17.9%	20.2%	40.5%	78.6%
	Area II	Count	0	12	6	18
		% of Total	0.0%	14.3%	7.1%	21.4%
	Total	Count	15	29	40	84
		% of Total	17.9%	34.5%	47.6%	100.0%

Percentages and totals are based on responses.

Appendix VI : Possession of a building plan and approval for the effected Adjustment within the Quarters against Adjustment

Do you have a building plan for the extension			Have you changed (transformed) your house in anyway		Total
			No	Yes	
No	Silver Jubilee	Count	14	67	81
		% of Total	14.4%	69.1%	83.5%
	Area II	Count	1	15	16
		% of Total	1.0%	15.5%	16.5%
	Total	Count	15	82	97
		% of Total	15.5%	84.5%	100.0%
Yes	Silver Jubilee	Count		7	7
		% of Total		53.8%	53.8%
	Area II	Count		6	6
		% of Total		46.2%	46.2%
	Total	Count		13	13
		% of Total		100.0%	100.0%

Do you have a building plan for the extension			If yes, was the building plan approved		Total
			No	Yes	
No	Silver Jubilee	Count	80	1	81
		% of Total	82.5%	1.0%	83.5%
	Area II	Count	16	0	16
		% of Total	16.5%	0.0%	16.5%
	Total	Count	96	1	97
		% of Total	99.0%	1.0%	100.0%
Yes	Silver Jubilee	Count	5	2	7
		% of Total	38.5%	15.4%	53.8%
	Area II	Count	4	2	6
		% of Total	30.8%	15.4%	46.2%
	Total	Count	9	4	13
		% of Total	69.2%	30.8%	100.0%

Appendix VII: Neighbourhood Change and Present grade Cross tabulation

Present Grade			Have you changed (transformed) your house in anyway		Total
			Yes	No	
Junior Staff	Silver Jubilee	Count	4	1	5
	Area II	Count	3	0	3
	Total	Count	7	1	8
Senior Staff	Silver Jubilee	Count	69	13	82
	Area II	Count	18	1	19
	Total	Count	87	14	101

Percentages and totals are based on respondents.

Appendix VIII : Adjustment type against Neighbourhood Cross tabulation

Adjustment type		Neighbourhood Name		Total
		Silver Jubilee	Area II	
Provision of rentable rooms/accommodation	Count	4	3	7
	% within Adjustment type	57.1%	42.9%	
	% within Neighbourhood	5.3%	14.3%	
	% of Total	4.2%	3.1%	7.3%
Provision of spaces for petty trading by household members/ ventures	Count	11	5	16
	% within Adjustment type	68.8%	31.2%	
	% within Neighbourhood	14.7%	23.8%	
	% of Total	11.5%	5.2%	16.7%
Provision of space for animal shed/ poultry	Count	34	6	40
	% within Adjustment type	85.0%	15.0%	
	% within Neighbourhood	45.3%	28.6%	
	% of Total	35.4%	6.2%	41.7%
Provision of outdoor cooking/ kitchen apart from the original kitchen	Count	33	8	41
	% within Adjustment type	80.5%	19.5%	
	% within Neighbourhood	44.0%	38.1%	
	% of Total	34.4%	8.3%	42.7%
Restricting direct access in to main living areas i.e. sitting room for privacy/ religious reasons	Count	9	8	17
	% within Adjustment type	52.9%	47.1%	
	% within Neighbourhood	12.0%	38.1%	
	% of Total	9.4%	8.3%	17.7%
Provision of indoor garden for domestic purpose	Count	39	9	48
	% within Adjustmenttype	81.2%	18.8%	
	% within Neighbourhood	52.0%	42.9%	
	% of Total	40.6%	9.4%	50.0%
Renovation/ modification of the façade to modern standards/ trends	Count	20	7	27
	% within Adjustment type	74.1%	25.9%	
	% within Neighbourhood	26.7%	33.3%	
	% of Total	20.8%	7.3%	28.1%
Improving the quality of living through air conditioning, tiling, painting ceiling	Count	55	14	69
	% within Adjustment type	79.7%	20.3%	
	% within Neighbourhood	73.3%	66.7%	
	% of Total	57.3%	14.6%	71.9%
Improving service spaces such as plastering, tiling, painting WCs, courtyards e t c	Count	49	13	62
	% within Adjustment type	79.0%	21.0%	
	% within Neighbourhood	65.3%	61.9%	
	% of Total	51.0%	13.5%	64.6%
Fencing the entire plot to demarcate the property/ house for security	Count	43	10	53
	% within Adjustment type	81.1%	18.9%	
	% within Neighbourhood	57.3%	47.6%	
	% of Total	44.8%	10.4%	55.2%
Provision/Conversion of storage spaces e.g. garage, store etc.	Count	26	13	39
	% within Adjustment type	66.7%	33.3%	
	% within Neighbourhood	34.7%	61.9%	
	% of Total	27.1%	13.5%	40.6%
Increasing the number of sleeping spaces such as bedrooms	Count	43	16	59
	% within Adjustment type	72.9%	27.1%	
	% within Neighbourhood	57.3%	76.2%	
	% of Total	44.8%	16.7%	61.5%
Total	Count	75	21	96
	% of Total	78.1%	21.9%	100.0%

Percentages and totals are based on respondents.

a. Dichotomy group tabulated at value 1.

Appendix IX : Intention to Transform

what else would you need to add	Neighbourhood Name				Total	
	Area II		Silver Jubilee			
	Count	% of Total	Count	% of Total	Count	% of Total
No	3	12.5%	0	0.0%	3	12.5%
Fencing	0	0.0%	1	4.2%	1	4.2%
Garage	0	0.0%	2	8.3%	2	8.3%
Kit/ Garage	0	0.0%	1	4.2%	1	4.2%
Landscape	1	4.2%	0	0.0%	1	4.2%
Renovation	3	12.5%	1	4.2%	4	16.7%
Restructure	0	0.0%	1	4.2%	1	4.2%
Room	1	4.2%	6	25.0%	7	29.2%
Room/ Reservoirs	0	0.0%	1	4.2%	1	4.2%
Room/Garage	0	0.0%	1	4.2%	1	4.2%
Rooms	1	4.2%	0	0.0%	1	4.2%
Store & Room	1	4.2%	0	0.0%	1	4.2%
Total	10	41.7%	14	58.3%	24	100.0%

Appendix X: Frequencies of Adjustment Benefits

	Responses		Percent of Cases
	N	Percent	
What have you gained more income for the Household from the Adjustment	16	8.9%	17.0%
What have you gained more accommodation/spaces from the Adjustment	71	39.7%	75.5%
What have you gained aesthetic change on my house/facelift from the Adjustment	34	19.0%	36.2%
What have you gained privacy from the Adjustment	58	32.4%	61.7%
Total	179	100.0%	190.4%

a. Dichotomy group tabulated at value 1.

Appendix XI: Approved rents for ABU Quarters (source ABU housing and passages).

S/n	Areas	No. of houses		Rate per Annum (₦)	
	Senior Staff			Bungalow	
				Proposed	Council Approved
1	Area A	198	1 Bedroom	100,000	60,000
2	Area Bz	130	2 Bedroom	125,000	75,000
3	Area C	128	3 Bedroom	180,000	108,000
4	Area E	82	4 Bedroom	210,000	126,000
5	Area F	187	5 Bedroom	250,000	150,000
6	Area G	81		Duplex	
7	Area H	57	2 Bedroom	175,000	105,000
8	Napri	44	3Bedroom	225,000	135,000
9	Savannah	18	4 Bedroom	250,000	150,000
	Junior Staff			Bungalow	
10	Silver Jubilee	200	1 Bedroom	40,000	24,000
11	Area II	24	2 Bedroom	75,000	25,000
12	Area III	35	3 Bedroom	95,000	57,000

Appendix XII: **Housing and Environmental Features and Attributes against RSI, Mean and Sum**

Housing and environmental features and attributes	**RSI**	**N**	**Sum**	**Mean**
Quality of air in living spaces	65%	110	359	3.26
Original plan of this house	64%	110	352	3.20
Type of material used for construction	62%	110	345	3.14
Natural lighting in kitchen and cooking spaces	60%	110	329	2.99
Privacy in the house	59%	110	325	2.95
Protection against noise	58%	110	318	2.89
Sizes of living/ sitting room	57%	110	315	2.86
Sizes of bedrooms	55%	110	305	2.77
Aesthetic appearance/ visual quality of the house	55%	110	305	2.77
Protection against dampness (water rising on walls)	54%	110	297	2.70
Protection from insects and dangerous animals	52%	110	286	2.60
Sizes of bath and toilet facilities	51%	110	282	2.56
Sizes of kitchen, cooking and storage spaces	47%	110	257	2.34

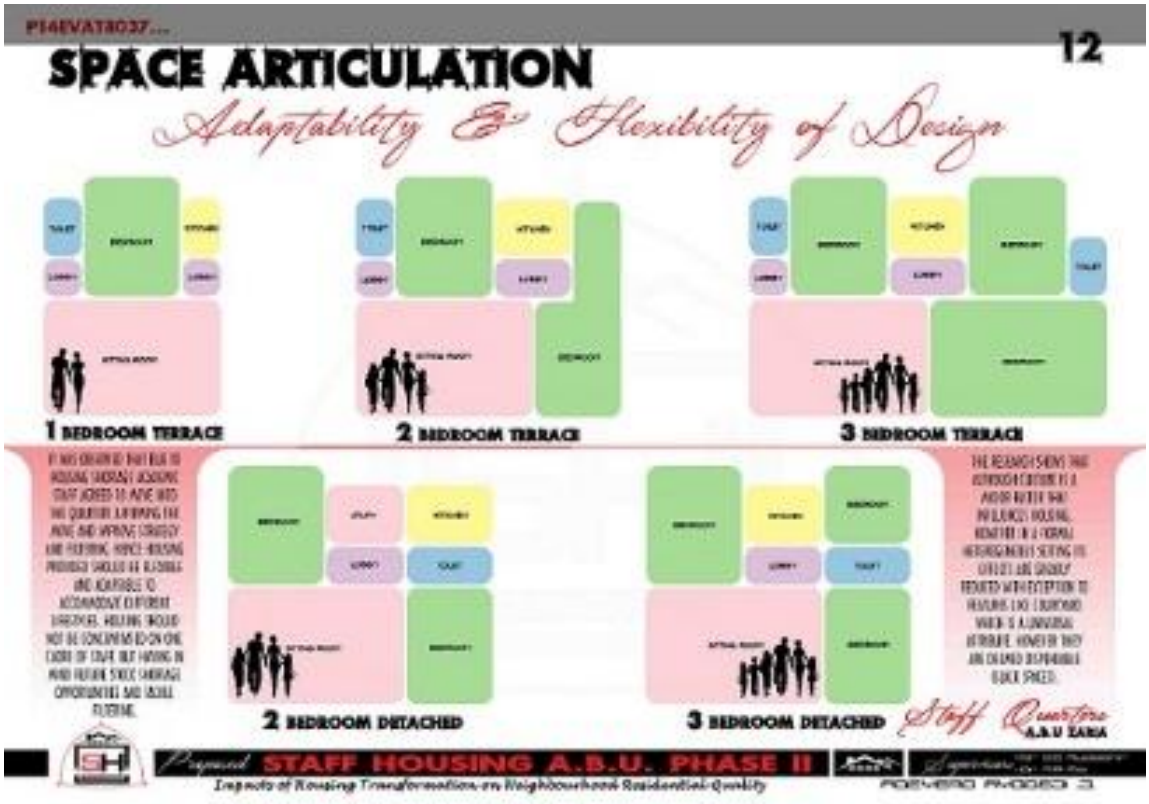
Appendix XIII: Respondents attitudes against factors

Variables	**Factors**
Transformation makes life easier for the residents	Concern for housing comfort
Transformation allow house-holds to adjust their housing at their own pace and within their cost limit	Renewal and upgrade initiative
Housing needs of staffs in this quarters were not adequately met originally	Helplessness and housing needs
This house after the modifications provides attention and sense of belonging for my household	Renewal and upgrade initiative
Physical transformation/ changes helps to renew or upgrade low- quality housing at no cost to the government	Renewal and upgrade initiative
The acts of carrying out extensions or alteration (Physical transformation) is unavoidable	Helplessness and housing needs
Transformation encourages increase in population leading to higher pressure on utilities and public services e.g. borehole	Concern for housing comfort
People are expressing not only of housing needs but the desire for identity, a sense of belonging and a search for status among neighbours	Attainment of Social Esteem
This house now provides pride of social status for my household now than before the changes	Attainment of Social Esteem
Transformation has negative effect on the available infrastructural facilities e.g. borehole due to increase in population from extra spaces created	Concern for housing comfort
I like my house the way it is now more than what it was before the changes happened	Attainment of Social Esteem

Appendix XIV: Descriptive Statistics showing mean

Descriptive	**N**	**Sum**	**Mean**
Transformation makes life easier for the residents	95	393	4.14
Transformation allow house-holds to adjust their housing at their own pace and within their cost limit	95	364	3.83
Housing needs of staffs in this quarters were not adequately met originally	95	357	3.76
This house after the modifications provides attention and sense of belonging for my household	95	353	3.72
Physical transformation/ changes helps to renew or upgrade low- quality housing at no cost to the government	95	348	3.66
The acts of carrying out extensions or alteration (Physical transformation) is unavoidable	95	337	3.55
Transformation encourages increase in population leading to higher pressure on utilities and public services e.g. borehole	95	335	3.53
People are expressing not only of housing needs but the desire for identity, a sense of belonging and a search for status among neighbours	95	326	3.43
This house now provides pride of social status for my household now than before the changes	94	315	3.35
Transformation has negative effect on the available infrastructural facilities e.g. borehole due to increase in population from extra spaces created	95	310	3.26
I like my house the way it is now more than what it was before the changes happened	95	290	3.05
Valid N (list wise)	94		

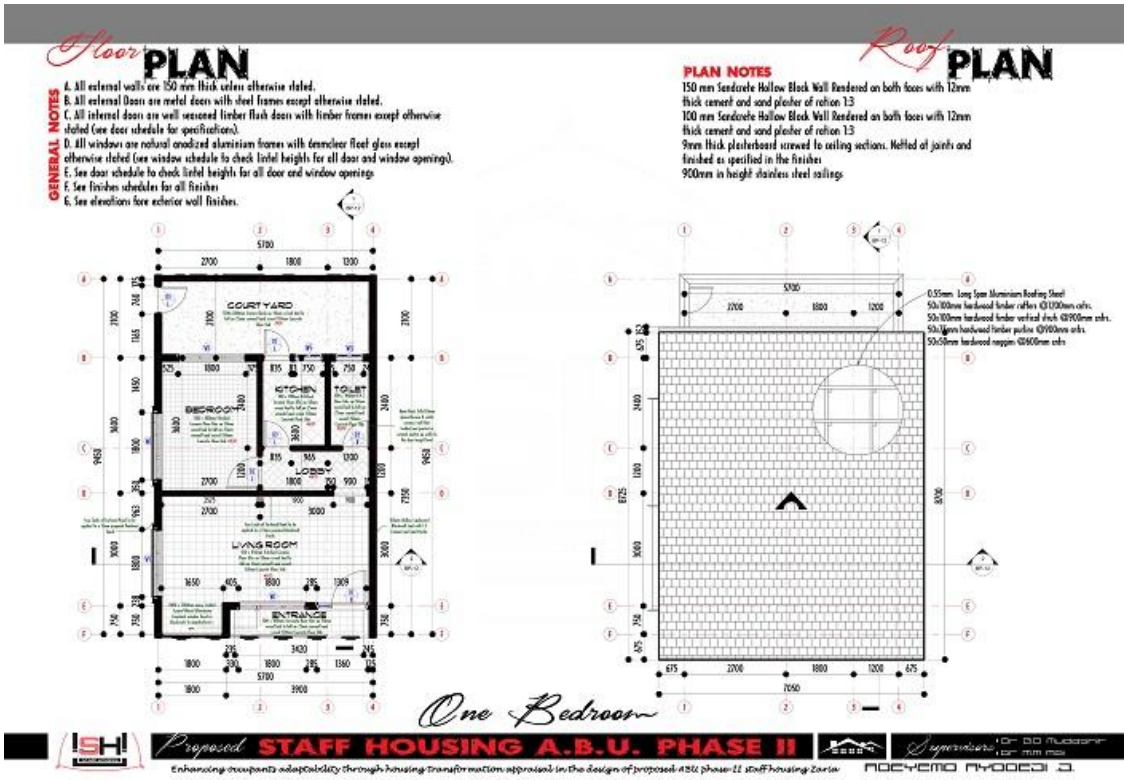
*Appendix XV:***Space Articulation Design Sheet**



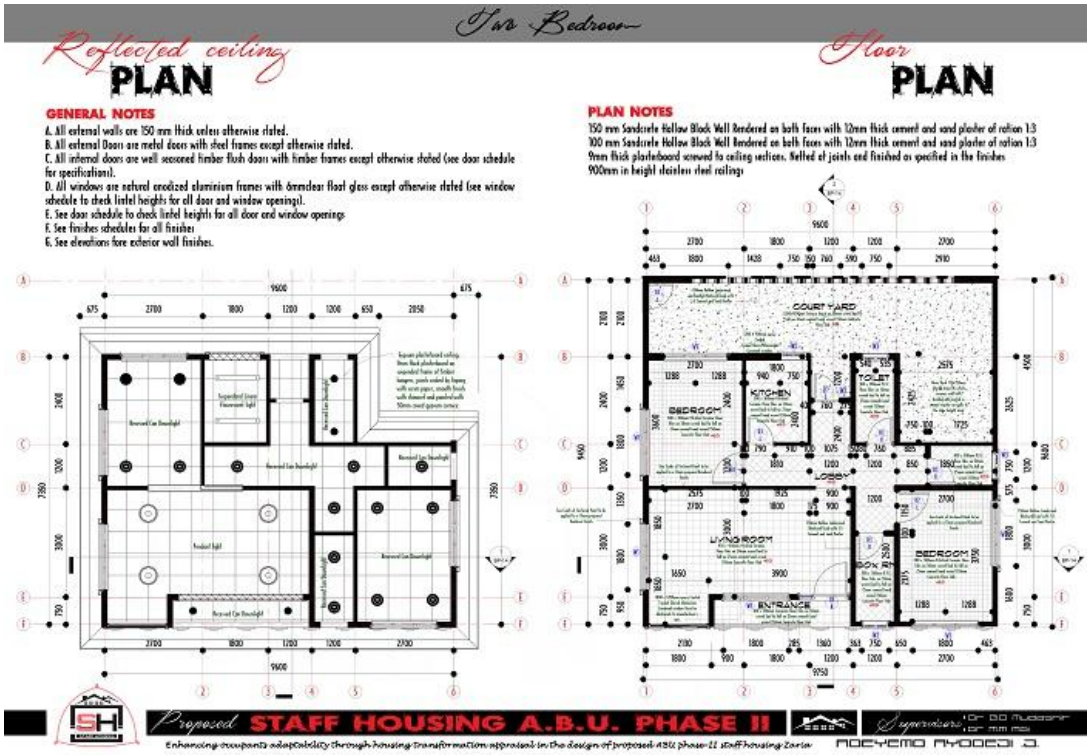
Appendix XVI: Proposed Site Plan with Land Use Information



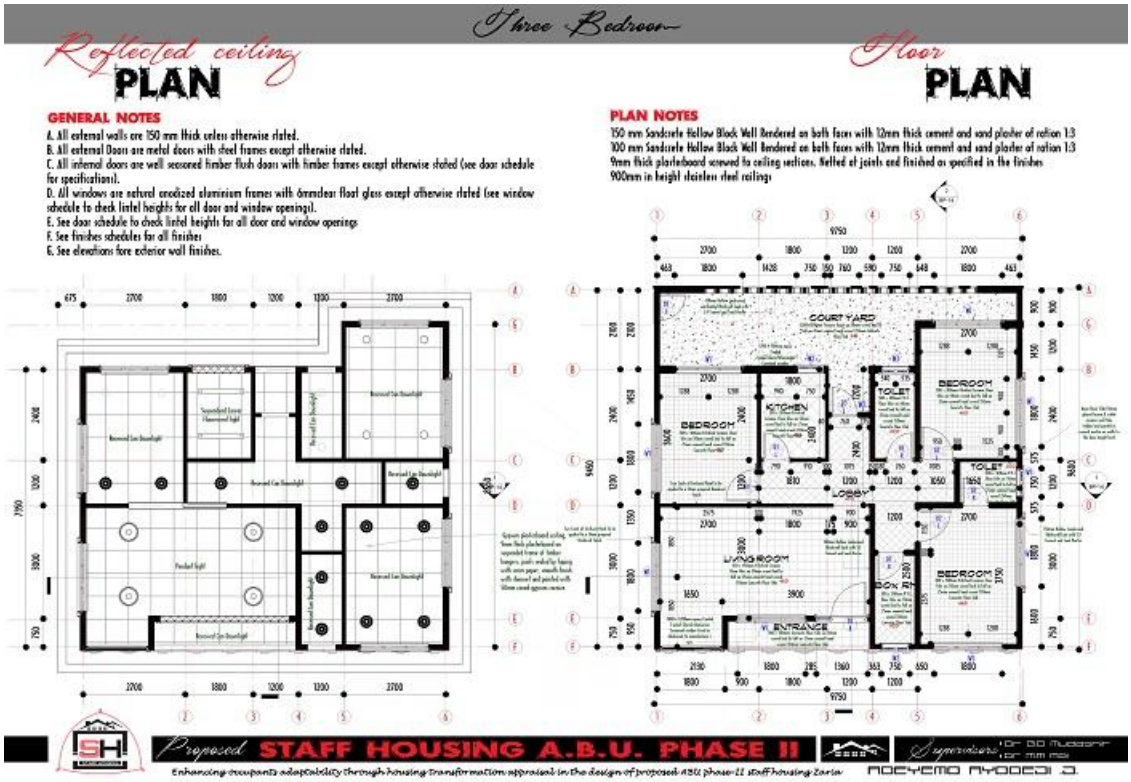
Appendix XVII: One Bedroom Floor Plan.



Appendix XVIII: Two Bedroom Floor Plan



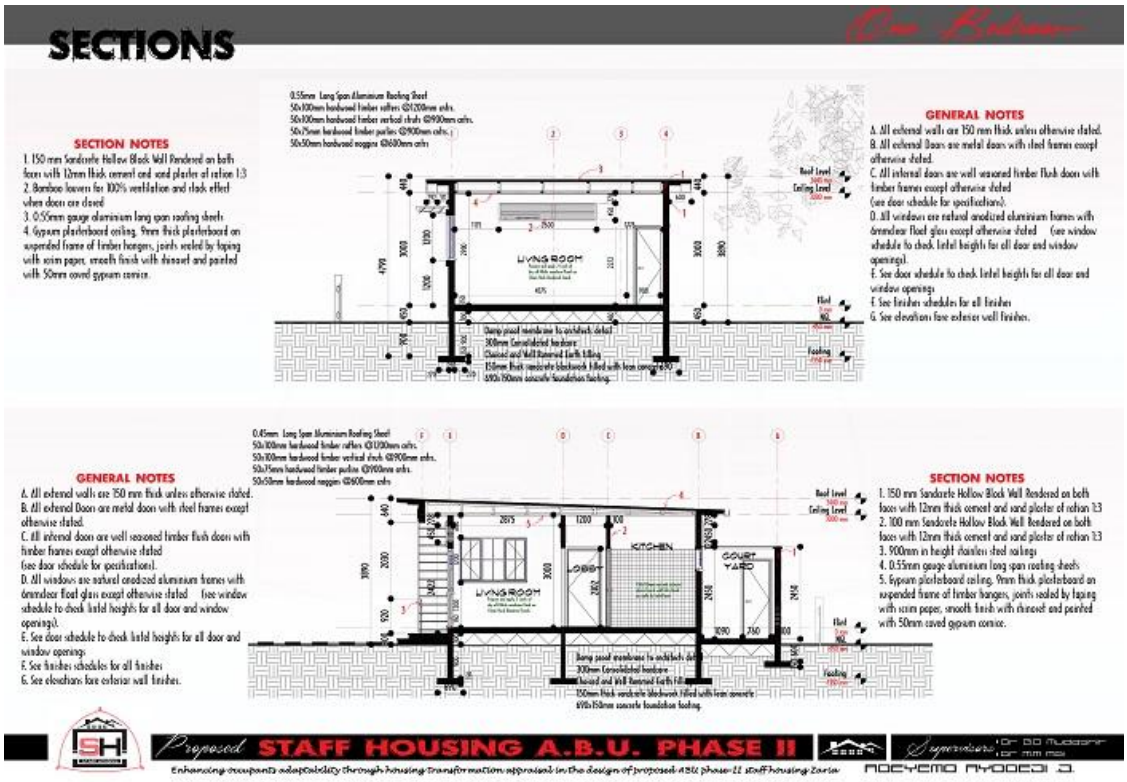
Appendix XIX: Three Bedroom Floor Plan



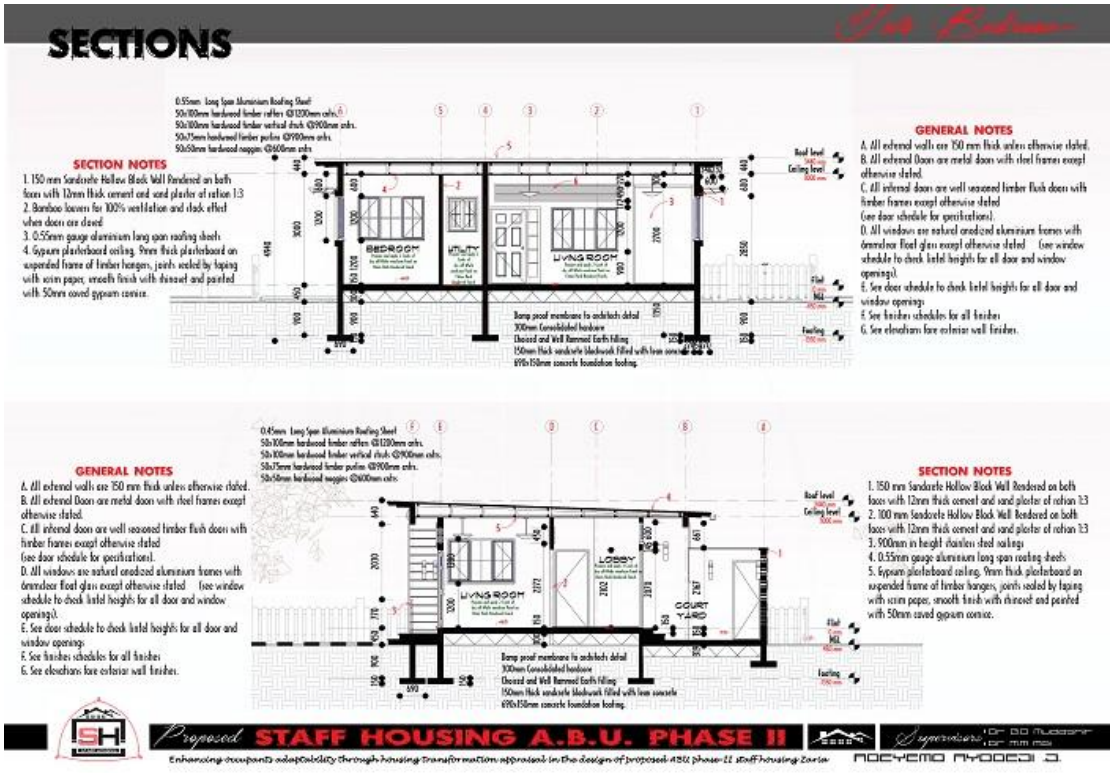
Appendix XX: One Bedroom Elevations



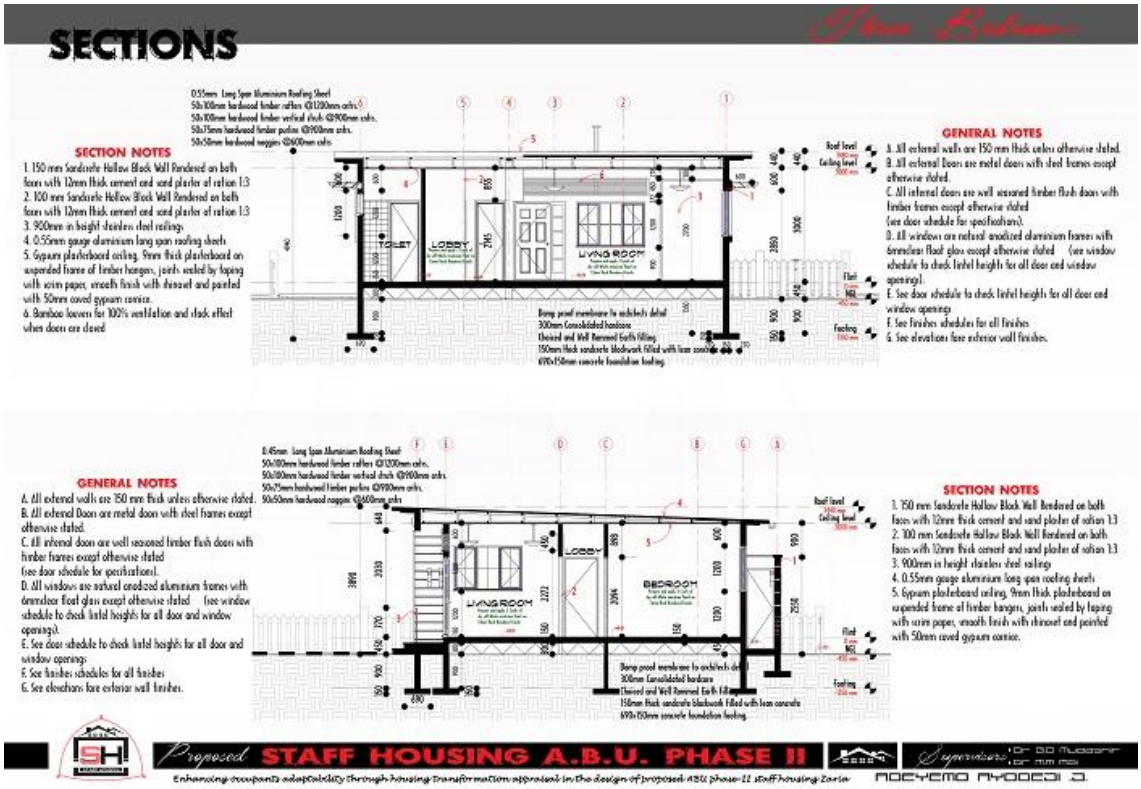
Appendix XXI: One Bedroom Section



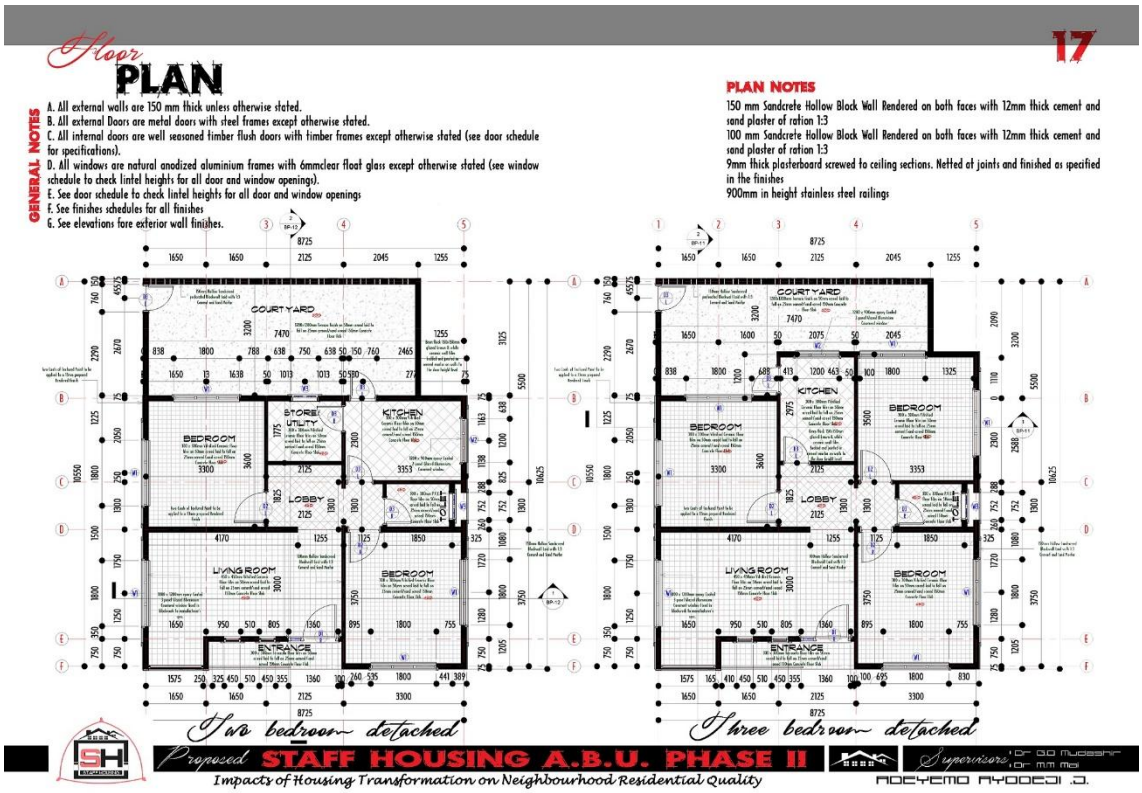
Appendix XXII: Two Bedroom Section



Appendix XXIV: Three Bedroom Section



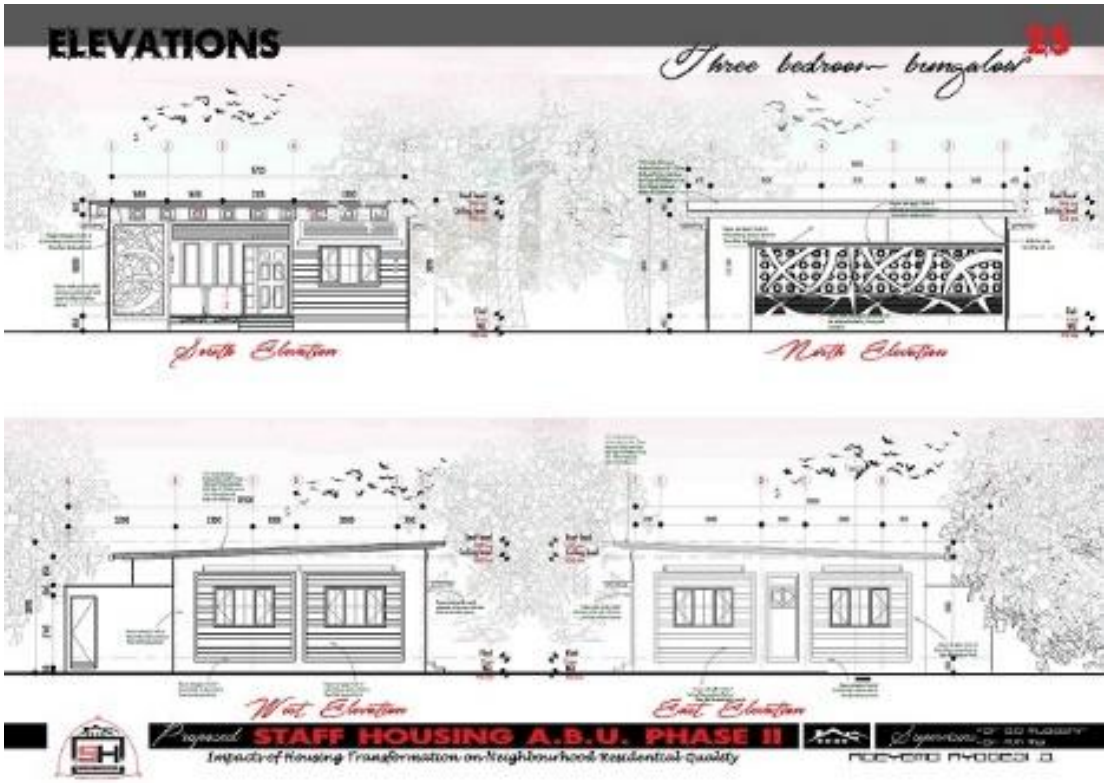
Appendix XXIII: Two to Three Bedroom Floor Plan



Appendix XXV: Two Bedroom Elevation



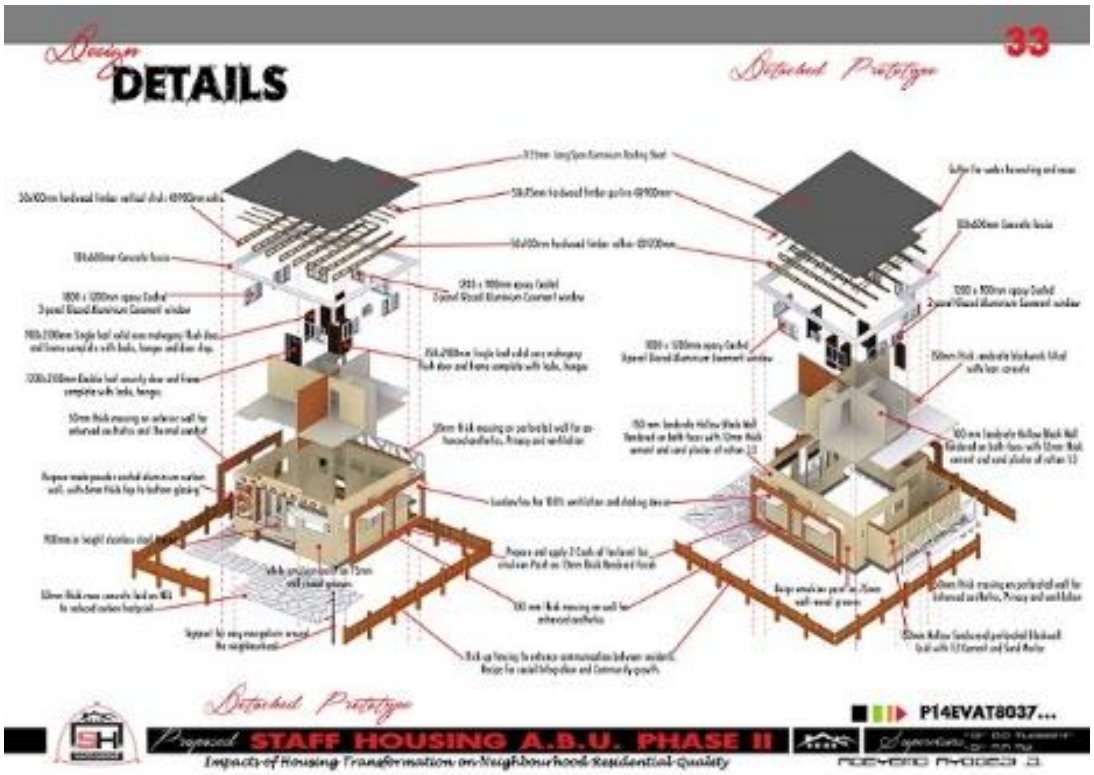
Appendix XXVI: Three Bedroom Elevation



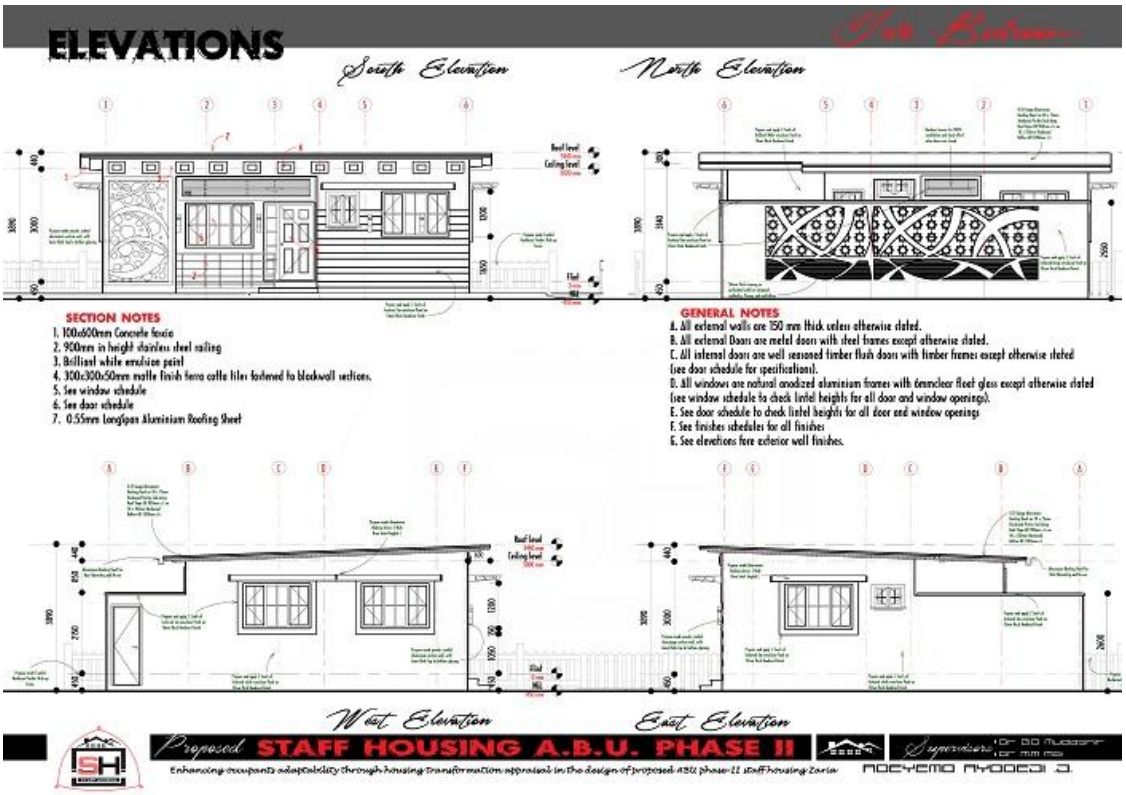
Appendix XXVII: Three dimensional Section



Appendix XXVIII:Three Dimensional Detail



Appendix XXX: Two Bedroom Elevation



Appendix XXIX: Three Bedroom Elevation

