Housing Themselves

Transformations, Modernisation and Spatial Qualities in Informal Settlements in Dar es Salaam, Tanzania.

Huba M. Nguluma
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Built Environment Analysis
Stockholm, March 2003
Dedicated to
Dr. Alex Nguluma who always encouraged and supported me

&

Lukundo- Emma, Thomas-Mbonesa,
Godwin-Mbezi and Paulina-Neema
Housing should be seen as a process of constant transformation and endless variation. There is certainly a lot to be learnt by looking at user transformation as it unfolds in a continuing open ended process of unexpected developments (Salama, 1998).
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Acronyms

BBA Built Environment Analysis  
CBO Community Based Organisation  
GOT Government of Tanzania  
IHSS Institute for Human Settlement Studies  
NCC National Construction Council  
NHC National Housing Corporation  
NHBRA National Housing and Building Research Agency  
RoB Registrar of Buildings  
TBR Tanzania Building Regulations  
THB Tanzania Housing Bank  
Tshs Tanzanian Shilling  
UCLAS University College of Lands and Architectural Studies  
UNCHS United Nations Centre for Human Settlements  
URP Urban and Rural Planning  
URT United Republic of Tanzania
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Huba M. Nguluma,
Stockholm, March 2003
Preface

My interest in housing issues dates back to early 1986 after graduating as an architect from the Ardhi Institute (Now University College of Lands and Architectural Studies-UCLAS), particularly when I joined the Building Research Unit under the Ministry of Lands and Human Settlements Development as a research architect. Although most of the work assigned to me then concentrated on the improvement of rural housing and traditional building materials, I developed an interest in urban housing. In 1990 I had an opportunity to attend a nine months course on Housing Planning and Building at the Institute of Housing Studies, Rotterdam. This was an opportunity which offered me the challenge to learn more about housing issues. In 1995 I had yet another opportunity, attending a short course in Lund University in Sweden. In this course I had an opportunity to learn about housing development issues from tutors and share experience with other participants from different parts of the world.

In 1993 I was employed by UCLAS to work at the Institute of Human Settlement Studies as an Assistant Research Fellow. In the course of my work at the Institute I was exposed to urban housing issues in urban settlements as a result of which my interest in urban housing especially informal settlements grew deeper everyday. In 1996 I had an opportunity to do a masters degree with the KTH in Stockholm. During this period I carried research looking into the strategies of improvement of infrastructure in informal settlements. In the course of the study I was astonished by the magnitude of housing transformations taking place. I was curious to learn and see how transformation activities are carried out and the reasons behind the emerging housing construction activities. In 1999 I had an opportunity to be enrolled as a PhD. candidate at the Royal Institute of Technology (KTH), department of Infrastructure, division of urban studies on the subject of Built Environment Analysis. That is when I took the opportunity to pursue the area of housing transformation. I started to search for reports related to housing transformation and discovered that most of the studies carried out had concentrated mainly on public housing. I identified few studies on informal settlements in other non-industrialised countries. I was convinced that by pursuing this subject in informal settlements I would contribute to knowledge on how housing transformation processes are taking place in informal settlements and their potentials and problems.

I also started to look for theories that explain the phenomenon I was keen to study. I came to read theories of modernism which explain some of the phenomenon especially the developmental aspects of house design. Nevertheless I could not find answers to some of the issues relating to housing transformations. My quest for explanations led me to theories such as housing adjustment theories and Lawrence’s theories on identification and classification of house types. The more I read the more I realised how ignorant I was. To me the four years of carrying out PhD. Studies have been an intricate learning process. Each day I discovered new concepts and ideas. I have similarly developed more interest in
reading which is part of the many positive results of my interaction with my fellow academicians during my many months in Sweden. There were many things which were of interest to me from the very first days in Stockholm. One of them being, when you get into a train almost every passenger is reading something. Carrying out part of my studies in Sweden have assisted me to develop the habit of reading and, therefore, learning something new each day.
Abstract

This thesis is an attempt to address issues of housing transformation in informal settlements. Transformation of houses is seen to be associated with modernisation forces whereby people adapt their houses to suit their needs and desires. On one hand the desire to own a “modern house” may lead to deterioration of spatial qualities, on the other hand fulfilment of the desire may contribute to the modernisation of urban settlements. The informal settlement of Hanna Nassif was chosen as a case study to illustrate the process of housing transformations in informal settlement. Knowledge on the transformation processes serves as an important tool to address issues of spatial qualities, housing modernisation, actors in the processes of transformation and use of space.

The results show that there is a wide range of transformation activities that have been taking place in terms of extensions and alterations. The desire to modernise their houses impels developers to use modern building materials. In some instances houses constructed with traditional building materials are replaced with industrially produced materials. Through transformation processes new house types emerge. The study identifies problems as well as positive aspects associated with the whole process of housing transformation. The positive aspects are those of increased indoor space, increase of rooms for renting and in other cases separation of functions. The problems emerging from this process include: decrease of outdoor space, increase of housing density, blockage of ventilation and light in the transformed houses.

The study concludes that housing transformation being one way in which low-income earners strive to get access to housing deserves government support, particularly in the absence of alternative housing supply. It is further observed that todate many urban dwellers have managed to secure housing as a direct result of house extensions effected by house owners. The house extensions are being carried out outside the established formal planning regulations. It is in the light of these developments that there is a cause for government intervention to guide housing development processes in informal settlements. Professionals like planners and architects should also assume a role for quality and sustainability to prevail. The study also suggests specific problem areas for further investigation.

Key words: Tanzania, housing transformation, informal settlements, modernisation, spatial qualities and house types.
1 INTRODUCTION

1.1 Background

A number of studies have developed around the area of housing transformation, especially in Asia, Africa and South America where considerable attention is paid to the transformation of public housing. Existing literature on the subject is significant but centred on government owned houses, especially in formal settlements. Studies focusing on the transformation of houses in informal settlements are scarce.

In Tanzania researchers show limited interest in the housing field, particularly in studying, how people get access to housing and issues of modernisation. This is caused by the kind of policies and strategies adopted by government over the years. National policies and strategies have concentrated on infrastructure, providing water, electricity, solid and liquid waste management. Research work is mainly concerned with settlement improvement, particularly in land issues and the provisioning of infrastructure.

In this study, the point of departure is to provide an in-depth analysis of housing transformation processes taking into account spatial qualities, house types and people’s own views of housing in informal settlements. Thus, the intention of the study is to bridge the gap in knowledge as stated, for the benefit of policy makers and researchers in the field of human settlements.

Efforts by individual urban dwellers to provide housing for themselves and for renting out, call upon government support by individuals in seeking to improve their houses and immediate surroundings. An investigation providing a deeper understanding of housing transformation in urban informal settlements, the existing and emerging house types as a direct result of the transformation processes and use of space, is considered important. This is a complex undertaking given the diversity of issues that have to be considered. The study analyses the prevailing prospects and limits of informal housing transformations. It is intended to examine how informal housing transformations are taking place, their consequences and possible future trends.

In non-industrialised countries individuals are often responsible for the construction of the houses they live in, the bulk of which takes place in informal settlements. The growing scale of housing needs has been paralleled by a change of attitude by governments, towards an increasing realisation of the positive and potential contribution from the informal housing sector to national housing stock. The growing demand for housing has generated a need for people to build houses for owner occupation and renting.

Different approaches have been adopted to address housing problems in non-industrialised countries. Turner views participation as a way in which governments, NGOs and the building industry can enable people to plan, build and manage their own houses in an affordable way. In the 1960s settlements built by the poor were viewed differently. It was a turning point in housing theory when Turner’s self-help
ideas were accepted among housing experts. According to Turner (1976) self-help is a process through which the lower income households get access to housing. He points out that a poor person needs a piece of land and some community facilities, where the users themselves know their needs better than government officials. He further asserts that the users have skills and motivation to build their houses, which will initially be cheaper and may gradually be improved physically with the improvement of the user's life situation.

In subsequent years the work of Turner was criticised by other researchers. The main criticism is that the concept of self-help considers mainly the use value of housing for individuals while the wider economic context is not taken into consideration (Burgess, 1982). Self-building is regarded as an increase in unpaid labour leading to exploitation. Despite the criticism, the self-help concept has been put into practice through site and services schemes, where people are provided with land and infrastructure to build their own houses. Upgrading of informal settlements is another positive aspect of the self-help housing concept. International agents like the World Bank and the United Nations adopted this conceptual foundation as an alternative to housing strategy by financing the housing programmes in non-industrialized countries; through land regularization, upgrading of squatter settlements and the provision of sites and services (Terekegn, 2000).

A majority of governments made commitments, on paper though not in practice, to provide housing for their people in the Habitat I conference held in Vancouver, Canada, 1976. A shift in policy focus was promoted in 1988 through "global strategy for shelter for the year 2002", whereby an enabling approach and partnership were emphasised. However, at the Habitat II conference in Istanbul 1996, there was a consensus that the implemented strategies and policies for housing provisioning did not take into account economic, political and socio-cultural conditions of each country. The solutions emphasised more on increasing the number of dwellings. The formal housing supply systems were found to be inadequate, taking into consideration the magnitude of demand.

According to Hamdi (1991) the worsening housing conditions in non-industrialised countries are caused by the fact that institutions and professionals are not aware of the realistic shelter requirements. Hamdi presents a historical account of the housing supply and land use planning in order to identify and focus on the significant shifts in practice and thinking. He identifies two strategies in the international debate and in government policies, his analysis focusing on housing. He aptly observes that:

As to what government can do to scale up the supply of affordable housing for low income people, two distinctive paradigms have been operative. The first which we may refer to as the provider paradigm is the one that had been dominant in housing history...the support paradigm is the one most encouraged now by multilateral agencies. It holds that controlling the production of housing even building lots of houses in the capital-intensive way in which governments and private industry usually do has not worked (Hamdi, 1991: 26-27).
According to Hamdi the modernist strategy, which he calls the provider paradigm, is the one most practiced, while the support paradigm has been developed mainly in theory. In the provider paradigm, the emphasis is to increase production through centralised control. This paradigm relied on regulations to insure standards and quality. Nevertheless, the provider paradigm is considered inappropriate, if practiced without the support paradigm.

![Figure 1.1: Supporters and providers according to Hamdi (1991:27).]

The support model (enablement) emerged as an alternative to the provider paradigm. This was considered important because government in most countries could no longer provide housing in a conventional way. However, Hamdi does not see the support paradigm as a panacea for solving housing problems in non-industrialised countries. Self-help housing can be successful only when combined with planning efforts by the authorities. A combination between top-down and bottom-up approach is considered essential. The government should take into consideration infrastructure provisioning, land use planning and plot demarcation while the people should take into account the provisioning of infrastructure services which do not need sophisticated technical solutions.

Figure 1.1 summarises elements between providers and supporters at the official level. The question mark on the right side of the figure indicates issues from the providers and supporters that could be combined, yielding successful results. The enabling approach was promoted and supported by the UNCHS (Habitat). The UN general assembly in 1988, with specific focus on non-industrialised countries,
proclaimed the global strategy for shelter for the year 2000. The intention being to facilitate the production of adequate shelter for all by the year 2000.

The World Bank is another organ which has supported the enabling approach through its shelter policy focusing on economic issues. The policy of the bank shifted from supporting the physical provisioning of low cost housing, like in the 1970s, to focus on housing finance institutions in the 1980s, and in the 1990s to support policies that enable housing markets work (Terekegn, 2000).

Crucial ideas for enablement planning which assist ordinary people were developed by Hamdi. One of it is incrementalism. He argues that:

... Incrementalism is an idea where most settlements grow consoidate, change and even disappear in a series of increments. Small businesses grow in a similar way as do houses and communities (Hamdi, 1991:103).

A major aspect of the enabling strategy is the promotion of affordable housing production taking into account the financial capacity of low-income groups. The users have to be given power to make decisions on how to solve their housing problems. Government intervention may be unavoidable if low-income groups are to get access to decent housing.

For many years tenants and landlords have engaged themselves in activities relating to alteration and extension of the houses they live in aimed at adapting them to better suit their needs. Buildings are changing in different ways by modification or changing parts of the structure are ways through which buildings are being transformed. In housing development, after the production process, the house is occupied and at this stage is seen as an end but in actual fact it is the beginning of several other processes. The house is not a static object; it is dynamic as it often goes through a process of transformation. Understanding transformation of houses provides insights into the relationship between occupants and their dwellings and the residents’ potential of playing a role in the transformation process. The direct significance of these activities are the benefits in terms of quality and size of the housing stock (Kellet et al, 1993:3). Increased understanding of the informal way through which people carry out housing transformations indicates that transformation is in fact an integral part of settlement growth. This might be a natural and inexpensive way in which most buildings are adapted and remain functional (Hamdi, 1991:57). This study sets out to explore the often neglected transformation processes.

Historically human beings have continuously developed their housing environment to meet essential needs imposed by variables that change from one period of time to another. It is not unlikely that transformation of housing affects the human environment economically, socially and culturally. It can be assumed that the determination to change emanates from the desire by the occupants to improve their surroundings, taking into account the physical characteristics of the building in which they live, but the ensuing changes can be assumed to have far reaching socio-economic implications.
Transformation of houses can be assumed as being related to modernisation in the sense that developmental aspects in house design are taken into consideration by the developers' in their desire to improve the houses to suit their changing needs and surroundings.

Individual’s expectations of improved housing seem to pose a challenge to the whole idea of housing transformation. This is of special interest to the study because it is assumed that the developmental factors in house design are the impetus to continued housing transformation.

1.2 Statement of the problem

In recent years, a great deal of attention has been given to the informal sector in the cities of non-industrialised countries. The hub of the consideration so far has been the area of general development and policies. The debate has centred on infrastructure and service provisioning. In Tanzania researchers have taken a keen interest in settlement improvement, focusing on the provision of infrastructure and land issues. A need arises for studies advancing beyond infrastructure and land management.

General observations made by the author, suggest that houses in informal settlements are extended and changed in spatial structure. It is also recognised that the use of space in informal settlements (in low rise housing areas) is very much based on close contact between indoor and outdoor space. The significance and recognition of houses in informal areas and their outdoor space prompted the need to explore the use of outdoor spaces especially their physical and functional characteristics. Housing transformation may influence transformation in the use of outdoor space. The different types of changes in terms of space usage and layout alteration or modification are identified and analysed. It is also the intention of this study to establish who are the agents of change. This, in turn, may reveal the reasons promoting change.

A knowledge base on the use of space, how transformation affects spatial qualities and how people view housing modernisation is lacking. Despite the fact that there is a wide variety of housing in informal settlements, there is inadequate knowledge of what the existing and emerging house types are, as a result of transformation that could be better developed by professionals like architects and planners. Whether the transformed house types are efficient in terms of density, better spatial qualities allowing cross ventilation and enough light, is also not known. Given this knowledge gap, it is particularly difficult to address contemporary housing and planning problems in informal settlements.

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1 Developers in the context of this study mean individuals who take the responsibility to provide housing for themselves.
1.3 **Objectives of the study**

The main objective is to analyse housing transformation processes, the use of space and spatial qualities of indoor and outdoor space in informal settlements. The aim is to understand what is being transformed, how transformations take place, factors prompting the transformation and the outcome. The specific objectives are:

- To explore and analyse the transformation of houses in informal settlements, as an instrument to examine and understand housing development taking place.

- To identify and analyse changes taking place in housing in selected informal settlement with a view to identifying and classifying existing and emerging house types.

- To study outdoor and indoor use of space at house and plot level with a view to establishing the relationship between use of space and spatial qualities.

- To explore people’s understanding of housing modernisation.

These objectives are interrelated. They all seek to realise an understanding of housing transformation processes, to reveal the changes taking place, define house types, spatial qualities; and to establish the link, between housing transformation and housing modernisation in the existing and emerging house types.

**Research questions**

The main research questions are:

- How is housing transformation taking place?
- Who are the main actors in the process of transformation?
- What are the people’s attitudes and responses towards housing modernisation?
- How are spaces defined in practice and used over time?
- How can house types in informal settlements be classified and analysed?

1.4 **Significance of the study**

This study is considered as a contribution to the research community by addressing the processes of housing transformation, how densification affects spatial qualities; and the way people understand housing modernisation in informal settlements. The study also attempts to fill the knowledge gap in relation to the actors involved in the transformation processes. Furthermore this study identifies house types in the research area, which is yet another contribution to the knowledge of housing in
urban areas especially in providing professionals with contemporary knowledge about spatial qualities and house types in informal settlements. Research on informal settlements, especially on housing transformation and use of space, may contribute to an understanding of the way people intervene in the housing process and the relationship between spatial organisation and the developmental factors of house design. These findings could provide lessons for the improvement of informal settlements and for the professionals in the area, including house designers. The involvement of people in the housing process can be regarded as an element of enabling strategies. The “global strategy for shelter for the year 2000”, chartered in 1988, promoted a shift of policy towards an enabling approach and partnership. The new role of governments is seen as that of facilitating rather than providing in order to give an opportunity for other actors to participate in various levels of housing production. This strategy is supported by contemporary researchers in the field of housing. It has been stated that:

"Participation in housing is about shifting patterns of control, about communities and local organisations getting more of it, so enablement is the process by which people are empowered to exercise that control. Enablement is concerned with the practice of intervention and the operational side of the support paradigm (Hamdi, 1991:88)."

Housing provision in informal settlements becomes crucial given limited government capacities to provide shelter for the people. However, there are limits as to what people can actually do in the absence of government intervention. Government can enable people, for example, by providing basic infrastructure like roads, water and electricity and also accessibility to housing finance.

It is assumed that transformation is affecting the lifestyle of the people involved. Equally their change of lifestyle affects the transformation process. This research assumes greater significance by exploring how the dynamic qualities of houses in informal settlements could form a basis of housing development and improvement. It is assumed that the findings of this study will provide knowledge about the evolution of houses in informal settlements and the use of available space. The ongoing changes give landlords and tenants the opportunity of participating in the development of housing in urban centres. The study is also important as it avails the users the opportunity of giving their opinion, providing an avenue for a better understanding underlying the evolution of housing in informal settlements and the way urban dwellers act in shaping their built environment.

Research in built environment provides knowledge for people to understand the studied built environment. More specifically it may provide the focus necessary for the improvement of peoples’ living conditions. It is against this background that the author attempts to look into housing transformation processes so as to learn the positive and negative aspects of housing transformation and how the positive aspects could be of use to other informal settlements.
Knowledge of houses in informal settlements and the way they evolve and change is very scanty. Facts derived from this study will explain physical transformation processes as well as the scope of informal urban housing development in Tanzania generally, and particularly in Dar es Salaam. An understanding of house transformation with particular reference to the relationship between indoor and outdoor use of space are critical elements of this study. The broader issue as to why and how users intervene in housing transformation processes is also examined.

1.5 Relevance of this study within the field of Built Environment Analysis

This study is carried out within the subject of Built Environment Analysis, its discipline being derived from the subject known as Building Function Analysis, which was established in the school of Architecture at the Royal Institute of Technology, Stockholm. The discipline is defined as follows:

\[ \text{The academic field of Built Environment Analysis deals with relations between people, society and the built environment with the aim of acquiring knowledge for physical planning and the design of built environment (BBA).} \]

A model in a triangular form has been used to describe the relationship between environment, people and society. This model has been used to explore research problems in relation to people, environment and society. The research within this discipline takes into account qualities of the built environment.

![Built Environment Analysis triangle](source: Thiberg, 1975)

The model is specific at Swedish schools of architecture because the subject introduces an aspect of people in architecture. The role of people and the importance of assessing human relations in a built environment is considered relevant in this model.

The present housing transformation study falls within the area of Built Environment Analysis given the fact that it looks into the way in which people are involved in the transformation of the houses they live in. This is a point of
departure from existing documented studies, marking a significant characteristic in the subject of Built Environment Analysis. Central to this discussion is an understanding of the relationship between people and their built environment in informal settlements. When informal settlements are observed they may appear disorderly, chaotic and unplanned, especially in their early stages of development. However, in reality there is a certain order. These settlements respond to decisions and actions which are based on culturally constructed images of what dwellings are or could be.

The user perspective is important in Built Environment Analysis and also in this study on housing transformation. However, this study goes beyond user perspective as stakeholders’ analysis is taken into account, especially the role of actors in the transformation process. The study looks into the contribution of fundi, in the absence of professionals like architects, planners and local authority in the process of housing transformations.

Houses in informal settlements are built by people without government support. Transformation of housing is initiated by occupiers or owners on their own initiative. In the circumstances, there is a clear indication of a major relationship between houses and people in the built environment. The study seeks to expose how the transformation is taking place, people’s desires to own modern houses and the implications of change. The focus of the study is on the transformation process and why people are transforming their houses. Rapoport contends that “Studying the relationship between people and their environment indicates how designers could learn from the past about fundamental units of for example, a room” (Rapoport, 1970). Although Rapoport’s speciality is on vernacular architecture, his ideas are considered relevant for the purpose of this study. His ideas reflect the importance of built environment research.

House transformation results in different house types being introduced. The transformation brings more focus on the qualities of the house, especially in size, form and the relationship of a house to its surrounding outdoor space. These characteristics are often discussed in architectural design. The fact that in informal settlements houses are not necessarily designed by architects, the issue of appropriateness of emerging house types is bound to draw the attention of professionals. By studying a built environment the field of architecture, design and planning will be enriched and professionals in the area will learn the way people cope with built environment.

Dwellers in informal settlements have over the years been striving to solve the housing problem facing them. By transforming their houses they deal with functional issues, additional rooms which lead into an increasing number of housing units. Due to the high rate of urbanisation, there are inadequate houses in urban areas like Dar es Salaam to cope with social changes that are constantly

\[2 \text{ Fundi} \] is an informally trained artisan including masons, carpenters, electricians and plumbers who are actively engaged in construction work at local neighbourhoods. [Mafundi] is used with reference to more than one fundi.
affecting society and life styles. When houses are constructed the intention is to meet the urgent need of sheltering the occupants. The structuring of a house may however, become limited and lack the ability to meet the growing needs of the occupants, thus creating the need on the part of the owner or occupier to transform the house. By studying the built environment it becomes possible to understand the relationship between people and their residential environment. Understanding the transformation process is thus important as it expands knowledge on how the house functions and the relationship between household members, in particular, and the built environment in general.

A body of knowledge relating to factors like housing transformation, emergence of house types and use of space provides a basis for comprehending spatial qualities. By analysing housing transformation processes, house types and uses of space, an opportunity is provided linking research knowledge, practice and design which is considered fundamental in Built Environment Analysis. Research in the field of Built Environment Analysis is essential because it provides knowledge useful for the improvement of living conditions.

1.6 Research methodology

To meet the objectives of the research set out in section 1.2, various research methods are adopted. For house transformation interviews, measurements of houses, analysis of still and aerial photographs are applied. As for reasons behind transformation and ideas on modernisation, interviews are used. For spatial qualities and uses of space, observation and expert assessment are employed. From the very early stages of the research, the author carried out an extensive literature review and analysis. The latter undertaking is important to utilise previous works done on housing transformation as well as to establish theories in the subject of the study. The intention of the review and analysis is to understand and decide on terms and concepts relevant to the study.

Data collection tools used includes interviews, review and analysis of policy documents, photographic registration, observation and measurements.

The methodology used in this study provides a basis for analysing housing transformations in other built environment contexts that have similar socio-economic conditions to those existing in the field study area. The research methodology used will be discussed in detail in Chapter Four.

1.7 Organisation of the thesis

The thesis consists of eleven chapters. Chapter One covers the background to the research, research problem, objectives of the study and research questions. It also defines the significance of the study within the discipline of built environment analysis. Chapter Two encompasses the growth of Dar es Salaam city and housing development in general. It also describes informal settlements in Tanzania and efforts made so far to upgrade them. Issues of urbanisation and the emergence of the Swahili house type are also dealt with in this chapter.
Chapter Three reviews and discusses modernisation theories, housing adjustment theories, theories of determinants of house form and theoretical framework for classification and analysis of house types. It also defines concepts used in this work. Issues of traditional houses and spatial qualities are also discussed in this chapter. Chapter Four covers research methodology. The research design includes choice and justification of research methods used. Methods adopted for data collection are also explained. Issues of reliability together with methodological problems are outlined in the chapter.

Chapter Five discusses how housing transformation is taking place. Different types of transformation identified during fieldwork, reasons behind the transformation processes are also discussed. Positive and negative aspects of transformation are dealt with in the chapter. Chapter Six examines the role of actors in the transformation processes. Questions arising out of issues of design and building materials are also discussed. Chapter Seven presents the findings in relation to transformation and modernisation. Views on modern houses from the perspective of residents especially on separation of functions, comfort characteristics, rooms for renting and toilet facilities, are given.

In Chapter Eight the use of space and density is dealt with. Use of space in terms of cooking and eating, sleeping arrangements, storage of household goods and space for personal hygiene is also discussed. Issues of private, public and communal spaces are equally dealt with. Plot coverage and housing density are important issues discussed in this chapter. Chapter Nine presents different house types found in the informal settlement where the study was carried out.

Chapter Ten presents the emerging issues and a synthesis of findings from earlier Chapters. Different views on house transformations are presented and the basis for the recommendations made. Chapter Eleven offers recommendations about what should be done in the future in relation to housing.
2 URBANISATION AND HOUSING DEVELOPMENT IN DAR ES SALAAM

In the previous chapter a background to the research was given. This chapter provides an overview of urbanisation and informal housing development in Dar es Salaam. Given the close relationship between the development of formal and informal settlements the chapter reviews housing development in general before focusing on informal settlements. The housing development strategies are discussed in order to understand how housing programmes/schemes were implemented before and after political independence. Thus the chapter provides a premise for comprehending the causes of housing transformation and house types in informal settlements.

2.1 Urbanisation and housing transformation

Tanzania is one of the rapidly urbanising countries in sub-Saharan Africa. The annual urban growth rate is estimated at around 8-10\% (Kironde, 1994). It has been estimated that by the year 2002 about 40\% of the population would be living in urban areas (UNCHS, 1996). The total population in Tanzania was estimated to be 34 million in the year 2000. The rapid urbanisation rate has been associated with mainly rural-urban migration and recently in large towns by natural growth. People are migrating to towns in search of employment opportunities, better social services and other facilities not available in rural areas.

About 30\% of the national urban population is accommodated in Dar es Salaam. Every ten years the population of Dar es Salaam has been doubling. According to Kombe and Kreibich (2000), when the average growth rate was 8\% about two thirds of the population growth was contributed to by in-migration. In 1988 the growth rate had declined to 4.9\%. Natural growth has been the driving force propelling the population increase in the city now estimated at the rate of about 3.5\% per annum.

This urbanisation trend implies that room renting accommodates a large number of people, which in turn motivates house owners to provide this kind of housing through transformation where existing houses are extended. About 56\% of the dwelling units in private informal and 55\% in private formal housing areas constitute combined ownership-rental accommodation (Table 2.1).
Table 2.1: Housing stock by ownership and number of household per house in Dar es Salaam

<table>
<thead>
<tr>
<th>Housing units</th>
<th>Government / NHC</th>
<th>Institution / Employer</th>
<th>Private / Formal</th>
<th>Private / Informal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of housing units occupied by one household</td>
<td>100%</td>
<td>99%</td>
<td>45%</td>
<td>44%</td>
</tr>
<tr>
<td>Proportion of housing units occupied by more than one household</td>
<td>0%</td>
<td>1%</td>
<td>55%</td>
<td>56%</td>
</tr>
<tr>
<td>Average number of household per housing unit</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>


Table 2.1 shows that houses provided by the government National Housing Corporation (NHC) and different institutions and employers are mainly occupied by a single household. It is also apparent that a majority of people in Dar es Salaam are living in private houses in both formal and informal settlements and are sharing houses through room renting.

The private sector is by far the largest provider of housing. The private sector can be divided into formal and informal. A majority of the houses are occupied by both the owner’s household and one or more room renters. The relatively high figure for houses with more than one household is explained by the fact that Swahili house type is dominant.

Table 2.2: House types in Dar es Salaam by sector

<table>
<thead>
<tr>
<th>Housing units</th>
<th>Government / NHC N = 105</th>
<th>Institution / Employer n = 93</th>
<th>Private / Formal n= 161</th>
<th>Private/ Informal n = 249</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>3%</td>
<td>26%</td>
<td>31%</td>
<td>17%</td>
</tr>
<tr>
<td>Swahili house</td>
<td>1%</td>
<td>-</td>
<td>58%</td>
<td>68%</td>
</tr>
<tr>
<td>Core house</td>
<td>-</td>
<td>-</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Detached one family houses</td>
<td>20%</td>
<td>26%</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>Semi-detached</td>
<td>1%</td>
<td>13%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Row housing</td>
<td>24%</td>
<td>-</td>
<td>3%</td>
<td>-</td>
</tr>
<tr>
<td>Multi-storey</td>
<td>51%</td>
<td>35%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2.2 shows that the Swahili type house is the dominant house type in Dar es Salaam. Although Hoek Smit has given different house types found in Dar es Salaam she did not make an attempt to define these types of houses. Further discussion on the Swahili type house appears in section 2.3.

2.2 Growth of Dar es Salaam and its influence on house types

The city of Dar es Salaam has a history of growth, going back to slightly over 150 years. The city is not as old as many other East African stone towns, which were established in the 13th century and flourished in the 14th to 16th centuries. It emerged in the second half of the 19th century due to trading activities conducted by Arabs (Garlake, 1966:1). The emergency of Dar es Salaam dates back to 1860 when Sultan Seyyid Majid bin Said acquired a coastal strip of the East African coast and established an administrative centre in Dar es Salaam. In style and construction the buildings include features of traditional East African coastal architecture (Sutton, 1970:181). The dominant building materials used at the time were coral stones and mangrove poles. Stone buildings were for the upper class people, while mud and poles were for lower classes.

Following the rapid growth of Dar es Salaam and its good harbour potential, the German colonial government shifted the capital from Bagamoyo to Dar es Salaam in 1891. Dar es Salaam was found to be a natural sheltered harbour where vessels of large size could anchor safely (Kironde, 1994:106). German had the intention of establishing an administrative centre, so buildings of German architecture were put in place, where some buildings are still present, including, the Ocean Road Hospital built in 1897 (Sutton, 1970:182). Until the 1890s, the buildings that dominated the central part of the town had both Arabic and German architectural styles.

The present land use structure for Dar es Salaam and house types in the city centre have been much influenced by early colonial planning. The German colonial administration ensured that all the land along the coast was acquired for government use. Later several government houses, offices and quarters were constructed (Kironde, 1994:117). The city structure and house types were earlier influenced by the 1891 building regulations for Dar es Salaam. Under these regulations the planning ideas were based mainly on racial segregation. The City was divided into zones where various standards of buildings were applied.

Sutton described six zones which demonstrate different house types in Dar es Salaam until the 1970s:

- Low-rise house types located at the sea front to the southern part of the present city centre for the port facilities.
- Two to three storey house types of German and Arabic architectural style located at an administrative area zone extended from the railway station northwards to Ocean Road Hospital and State House.
- Three to four storey tenement buildings located in the commercial zone. Commercial activities taking place on ground floors and residents living in upper floors.
• One to two storey villa type houses located in the former European residential zone adjacent to the administrative area towards State House.
• Two to three storey house types in a medium density area in Upanga.
• Swahili house types located in the African residential areas of Kariakoo, Ilala and Magomeni (Sutton 1970).

New demands and uses have led to a change in house types especially in areas where re-development is transforming old Swahili type of houses to new multi-storey housing. These are typical trends in Kariakoo area.

Sutton’s main idea is not an analysis of house types. His description of house types can be used as a point of departure, but for the purpose of the present study one needs to make further analysis and classification.

Until 1949, the growth of Dar es Salaam was guided by detailed planning schemes that were prepared on a piecemeal basis of the zoning and building regulations. Emerging house types were a result of these schemes but also informal housing developments especially in the African inhabited settlements of Keko and Buguruni. It was not until 1949 that a comprehensive plan for Dar es Salaam was prepared, designating areas for low, medium and high density housing (Figure 2.1). The 1949 plan further earmarked areas for industries, administrative, port and commercial activities. Although this plan did not have considerable impacts on the emerging house types, it consolidated the colonial racially segregated zones for Europeans, Indians and Africans.
In 1922 plots in Kariakoo were allocated to African soldiers and civilians to build houses. Due to increased activities in Dar es Salaam, there was a huge demand for building plots by the local population. Gridiron plans for African areas (Ilala, Kariakoo and later in Magomeni) were laid out with plot sizes ranging from 250 to 300 square metres. These plot sizes are assumed to have played an influential role in the type of houses that were to be built in these areas, predominantly the Swahili type of houses (Vestbro, 1975).
The British colonial housing policy generally discouraged “natives” from residing in the urban part of Dar es Salaam. The colonial authority introduced right of occupancy as a way of enforcing development control. These were provided on a short-term basis to Africans to discourage them from developing permanent structures (Kironde, 1994).

The 1949 master plan recommended different urban designs commensurate with house types. These included cul de sacs with row-houses along the streets, curvilinear streets on sloping lands and row-house types, grid-iron patterns with detached house types, garden and working compounds with houses grouped around an open space, government and African housing on relatively longer plot sizes with single housing units and with linear streets providing accessibility to individual dwelling units. Included in this category were the African railway quarters with housing units clustered around a communal space, semi-detached houses grouped in four units with linear streets surrounding these houses (Figure 2.2).

An attempt has been made to show some house types especially in a formal settlement. Many types are still not shown. There are no studies so far done to classify house types, hence the present study seeks to identify and classify house types in informal settlements.

The housing programmes that were implemented following the colonial housing policy were based on ideas of racial segregation. There were separate housing schemes for Europeans, Indians and Africans. Housing schemes for Europeans were proposed to be located on attractive sites such as Kurasini and Oysterbay while housing for Asians were implemented at Upanga and Chang’ombe. Housing schemes for Africans were carried at four levels. The first one was African government housing. This applied to government employees. The second category
involved the African Urban Housing. This was meant for all Africans and not only government employees. The third scheme for Africans involved the sites and services plots. In these schemes, plots were demarcated and issued to Africans on short-term tenure for self-construction.

Figure 2.3: Colonial housing schemes of the 1940s – 1960s in Dar es Salaam. The colonial government implemented part of these schemes. The kind of house types that were constructed had their roots on the principles of racially segregated land use zoning for Europeans, Indians and Africans (Source: Kirunde, 1994:264).
Another scheme was the African Urban Housing Loan Fund. In this scheme, Africans who wanted to construct permanent houses in urban areas were provided with financial support and long security of tenure (Kironde, 1994:248). Among the areas that benefited from a directly constructed African Housing scheme is Ilala in Dar es Salaam (Figure 2.4). About 261 houses, many of them with two rooms, an external pit latrine and kitchen were constructed between 1946 and 1950 (Kironde, 1994). The houses were constructed using concrete blocks for walls and tiles for roofs. This was undertaken as an experiment for the local population. A scheme at Temeke was initiated whereby residential quarters were constructed. The scheme started in the 1950s and by 1953 some 242 houses had been constructed (Kironde, 1994: 267). The houses were meant to accommodate people who were wage earners. There were different categories of rent depending on the size of the house occupied. Out of 242 houses allocated, only half were occupied, the reasons being high rent charges and lack of services in the area. The area was also too far from the City centre.

Figure 2.4: An example of African quarter houses in Ilala Dar es Salaam. Walls are constructed by concrete blocks and roofing materials are clay tiles. The houses have two small rooms. Toilets and bathrooms are located outside the main house. Note that the windows are very small restricting cross ventilation (Photo: Dick Urban Vestbro).

In Magomeni and Kinondoni typical Swahili type of houses were constructed for mixed owner and rental occupation. Mud and pole houses were replaced by concrete blocks.

The Oysterbay area was designated an area for European residential development because it is located along the Indian Ocean. A good breeze to moderate the effects of the high humidity in Dar es Salaam was one of the reasons for selecting the area. The Europeans took the best areas because they thought local people do not deserve to live a comfortable life. The idea of developing this area was conceived in 1945 and by 1947 about 730 plots at Oysterbay were ready
for development. During this period, typical house types were one to two bedroom bungalows for European officials (Figure 2.5). Additional to the main houses there were servant quarters to the back or the sides of the main house to accommodate “house boys” and their wives. These bungalows were sited on relatively larger plots of 2000 square metres.

![Image](image.png)

Figure 2.5: An example of bungalow house type in Oysterbay area. Plots are big enough to have space for flower gardens, but most people these days use the plots to cultivate crops like maize. This was not typical during the colonial era (Photo: J. Lupala).

It was not until Tanzania got her independence in 1961 that specific housing programmes for the “indigenous people” were instituted. The aim was to provide “modern” good housing for all citizens of Tanzania (Kyhn, 1984:37). To implement these housing programmes for the whole country, and Dar es Salaam in particular, a number of institutions were established. These included the National Housing Corporation (NHC) in 1962, Registrar of Buildings (RoB) in 1971 and Tanzania Housing Bank (THB) in 1973. There were also some housing programmes such as Better Housing in 1974, in which workers and farmers were provided with loans to purchase building materials.

One of the housing strategies initiated in 1964, shortly after independence, was the slum clearance programme. The programme aimed at building permanent houses and demolishing “slums” constructed with traditional materials (mud and pole and thatched roof).

The referred housing programmes contributed significantly to the house types in Dar es Salaam today. For example the NHC constructed several four to five storey-housing blocks in Ilala, Mwenge, Ubungo, Keko, Tandika and Upanga areas (Figure 2.6 and 2.7). The same institutions built row housing, semi-detached and detached units in several locations within the Dar es Salaam city. The NHC also supported and facilitated the tenant purchase programme which was responsible for the widespread Swahili type of houses in Ilala, Magomeni, Kinondoni, Mwananyamala, Temeke and Kigamboni.
The tenant purchase scheme was initiated by the National Housing Corporation in 1963. In this scheme buildings of various designs were sold outright or on long-term repayments of 15-25 years (Kironde, 1994:336). The scheme was targeted to benefit civil servants of middle class positions. Houses were built in Mwananyamala, Magomeni, Kinondoni, Keko, Kigogo and Temeke. However,
later the scheme had to be abandoned as it proved too expensive and loan repayment proved to be a problem.

The National Housing Corporation constructed several housing units ranging from Swahili type houses for tenant purchase, two roomed quarters of housing and apartment blocks. There is no information indicating how the NHC house types were determined. However, Vestbro provides a personal explanation that one of the NHC house types was based on the “informal” Swahili type house. He states that:

Besides the privately built mud and pole Swahili type house there is the government built “low-cost” version of the same type, constructed of concrete blocks and factory joineries under the direction of the NHC of Tanzania” (Vestbro, 1975).

The NHC provided “soft loans” to plot owners for the purpose of improving “temporary houses” (mud and pole walls and thatch roof) by using industrial building materials such as cement and corrugated iron sheets.

The housing cooperatives programmes developed small-detached housing units at Mwenge. In 1971 a corporate body known as the Registrar of Buildings was established with the aim of managing nationalised houses under the Buildings Acquisition Act of 1971. The Act was intended to effect part of the economic policy of the day, that is public ownership of major means of production and national economy. Both the National Housing Corporation and Registrar of Buildings have little influence on the present pattern of house types notable in Dar es Salaam today.

Squatter upgrading and sites and services was another program introduced after the failure of the slum clearance scheme. While the upgrading programme was implemented in Manzese, Tandika and Mtoni, new sites were developed in Kijitonyama, Sinza, Tabata and Tegeta. This programme influenced house types that emerged in these areas, guided by specific development conditions. For example small plots of 288sqm. surveyed then produced different house types that were not intended under this scheme. While the idea was to develop small detached houses, rich people infringed the programme and developed large houses in small plots. This led to higher plot coverage and reduced outdoor spaces. In upgrading areas, provision of basic services such as access roads and storm water drainage which made it possible for vehicles to access the settlements was not considered.

During the mid 1960s the National Housing Corporation organised self-help schemes, in which people contributed labour and the corporation’s role was to give advice and supply building materials. Later other infrastructure facilities such as roads and dispensaries were incorporated in the scheme. The scheme was abandoned in 1968, after proving difficult to implement. The idea of self-help was good but a contradiction to modernisation which envisaged that sophisticated technologies would be used. The self-help scheme also failed due to lack of a strong institution to implement it, thus the failure of modernisation strategies.
The new formal housing areas developed after 1970 include the sites and services areas of Sinza, Mikocheni, Kijitonyama and Mbagala. Post sites and services areas of Mbezi beach, Tegeta and Tabata are also included. These areas are characterised by poor land services. Land was allocated without provisioning of roads. High quality houses are being constructed in these areas but in most areas they cannot be easily reached due to lack of access roads.

In the recently developed informal settlements houses have been developed with fairly low densities. A majority of the people living in these areas are high and low income earners. Emerging house types in these areas depict a mixture of relatively large detached houses and fairly small houses. The latter are often built incrementally by both low and high-income people.

On the basis of the foregoing discussion, the major categories of house types discernable in Dar es Salaam today can be summarised as follows:

• Swahili house types that dominate the city housing stock. These types of houses constituted about 43% of the total housing stock in Dar es Salaam (Hoek-Smit, 1991).
• Three to four storey commercial cum residential houses in the city centre of Dar es Salaam with compact layout design. The ground floors are predominantly used for commercial purposes and residential in the upper floors.
• Emerging multi-storey houses in Kariakoo area. This is a result of ongoing piecemeal redevelopment processes in this part of the Dar es Salaam settlement.
• Colonial residential quarters ranging from small detached units, semi-detached, row housing units to large bungalow house types built for Europeans in Oysterbay and Kurasini areas.
• Quarters developed by the NHC and scattered in many places within Ilala, Kinondoni and Temeke Municipalities.
• Three to five storey apartment flats developed by the NHC and other state organisations.
• Mixed detached single units and large detached type of houses in newly developing areas, both in formal and informal settlements.

The above house types have been defined based on number of storeys, spatial organisation, use and roof structure. There must be some other types especially in informal settlements which have not been defined taking into account the above categories.

The public sector is a minor contributor in shelter delivery system. Most of the existing public housing stock was built in the 1970s with limited additions in the 1990s. The main house producers in the public sector are the National Housing Corporation (NHC), National Social Security Fund (NSSF), Parastatal Pension Fund (PPF), Government and other parastatal organisations. Houses produced by the Government are meant for civil servants, while those produced by the NHC, NSSF and PPF are for rental to the general public. The ongoing privatisation policy
in the country since 1992 has led to the sale of a substantial number of houses owned by parastatal organisations to private individuals. In the second half of the year 2002 the government announced its resolve to sell to occupant civil servants 3,000 of its first rate houses in different parts of Tanzania. The sale has since taken place according to information released to the public. The house types produced by the public sector include single storey, semi detached, row houses and flats. The houses are usually produced as finished products usually without any provision for a transformation like extension.

The private sector accounts for the largest housing stock in Tanzania estimated to be 95% of the total housing stock in urban areas. The houses are produced by private individuals who mobilise financial resources from different sources. Most houses supplied by this sector are detached one family self-contained or multi-family units with shared facilities like toilets, bathrooms and cooking facilities. Most houses in urban areas are occupied by both owner household and tenants who rent one or more rooms.

In urban areas in Tanzania more than 90% of urban residents live in privately financed, constructed and owned houses either as owner-occupiers or tenants. Despite this important contribution of the private sector to the housing stock in the country, national policies during its development have not been supportive.

Housing and basic services deficit seem unmanageable when aggregated at the level of the city or nation. However, people still procure their houses although inadequate services are provided in the absence of adequate government action.

2.3 The Swahili house type and its transformation

As indicated above one of the dominant house types in Dar es Salaam is the Swahili type. The history of a Swahili type of house could be traced way back to the 13th century. An example of an original Swahili stone house is found in Bagamoyo. The characteristics of this house are high screen walls and a front veranda. Spatial progression is portrayed in the house as one moves from the narrow public street through a semi public area characterised by the veranda or front courtyard. Private areas follow culminating with semi-private spaces in the backyard (Vestbro, 1975). Evolution of social, economic and political conditions has lead to the establishment of an urban Swahili house type in the development of urban centres.

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3 Private sector includes individual house owners from both formal and informal settlements housing developers. Real estate companies are not included in this context because they do not operate in informal settlements.
Mud and poles constructed Swahili houses dominated in most of the coastal towns. In some urban centres, stone houses with spatial organisation similar to the early Swahili architecture could still be found.

The traditional mud and pole Swahili house consists of four basic special areas, the main house, the corridor, the veranda and the backyard. According to sources discussed by Vestbro (1975) it is likely that the main house consists of combined men’s bedroom and reception room adjoining the women’s bedroom. Another feature of this house is a corridor connecting the veranda in front to the backyard through the men’s reception room. Bedrooms are located on each side of the corridor (Figure 2.9).
The traditional house forms of the local people along the coast are not well known. However it is speculated that they had round houses. According to L. Swantz in Vestbro (1975:25) the Zaramo houses along the coast were round in shape. The reason is not known as to why they were changed to rectangular form. The rectangular houses are referred to as “Swahili” house type giving an indication that it exists all along the East African coast and not only in Zaramo territory. Donley-Reid points out that:

The earliest villages in Iran (a long term traditional contact with East Africans) are characterised by houses made of mud with rectangular rooms. This type of house has been common in Western Iran since the 17th millennium BC. It was natural to the Persian to want such houses at new trading posts. The rectangular houses were thus part of a foreign system as the foreigners gained power, their architectural forms also gained status but even today my data show that Africans refer to rectangular clay houses as “Swahili” houses. (Donley Reid, 1990:124).

Vestbro (1975:26) states that the traditional Swahili type houses are usually made from poles and mud, roofed with thatch (Figure 2.10). However, the historical development of these house types has not been sufficiently documented, indicating that there is lack of thorough research studies in relation to the evolution of this house type. Vestbro concludes: “the design of the Swahili house type probably owed its origin to the earlier Arab courtyard dwelling” (Vestbro, 1975:27).

Figure 2.9: Traditional Zaramo house, plan and section. The veranda defines the front elevation and through the passage one enters into the rooms (Source: Nkya, 1984:78).
Figure 2.10: Traditional Swahili house type plan and elevation (Source Vestbro, 1975:26).

Figure 2.11: Traditional Swahili house type. Walls are constructed from mud and pole and the roof is constructed from palm tree leaves (Makuti). This type of house is found in rural areas (Photo by Mpuya).

The improved traditional Swahili house in urban areas, which shows the same spatial organisation as a traditional Swahili house, depicts the basic evolution of the modern urban Swahili house.
The use of industrial building materials and modern construction techniques has resulted in a new type of dwelling, which originates from the traditional one but at the same time is different from it. The traditional Swahili house was a house for only one family, either nuclear or extended. The urban type usually contains more than one household. Often each room accommodates one household. This is an important aspect of the house regarding its evolution as an urban dwelling.

Figure 2.12: Typical urban Swahili house designed by National Housing Corporation. Plan, roof plan and section. Note the front veranda on the plan, each room is accessed through the corridor. Utilities are located at the backyard (Source: Nnkya, 1984:79).

Vestbro (1975:28) assumed that “Urban Swahili type house has developed from the traditional Swahili type house through an extension of the two roomed unit”.

The urban Swahili house can be defined as: “A house with a central corridor or passage leading from a veranda facing a street to a backyard with outbuildings and to private rooms on each side” (Vestbro, 1975:34).

In this house type one can see the main spatial areas of the traditional house that is the main house, the front veranda and the backyard. The number of private
rooms in the main house ranges from four to even twelve rooms, including backyard rooms.

2.3.1 Characteristics of a Swahili house

As for the colonial rulers mud and pole urban Swahili houses were considered a temporary solution. It used to be named semi-permanent, non-durable, third class and temporary house. These terms reflected the attitude of the colonialists in relation to native housing as unsanitary, cheap, uneconomic and ill suited to modern methods of city planning. Nevertheless the Swahili house has the following qualities

- The house has a character of functional generality because of the spatial organisation, except for the outer buildings, is not designed for a strict differentiation of household activities.
- The relatively large and quadratic rooms allow for versatility in furnishing and functional use. The arrangement of rooms around a central corridor allows for the division of the house into various combinations of household units.
- The division of spaces into indoor/outdoor, private/communal and protected/exposed provides a fairly high degree of freedom of choice between these spaces in the location of activities (Vestbro, 1975).

The Swahili house is flexible because the ground plan can be changed within the limits set by the basic structure. New doors and windows can be added while the old ones are blocked so that the spatial organisation may be adapted to the family cycle of occupants. The most common changes of this kind are to block a door towards the corridor and a new one made towards the side or to an adjacent room used by the same household. Vestbro further observes that:

- The house is elastic, it may be extended by adding new rooms, either directly to the main house or around the backyard. Sometimes additional habitable rooms are obtained by allowing the occupation of space originally for other purposes like storage and cooking.
- The types of versatility are related to the organisation of dwelling space. Therefore, a mud and pole urban Swahili house can be adapted to almost any combination of household types, for instance single persons, groups of bachelors, nuclear and extended families.

Kironde (1979) contends that:

- It is easy to build as there are many small-scale individual contractors who need no special training.
- The Swahili house design satisfies important practical and security needs. Generally, the shape is rectangular with independent rooms, a covered veranda at the front, a central corridor, a courtyard (usually enclosed), storage and toilet facilities. The front veranda is used for relaxing and socialising or it can be occupied by informal business for example tailoring, watch or shoe repair, or similar activities.
The central corridor is useful as a passage, as a store and it is sometimes used to store cool drinking water. The individual rooms being independent of each other can be rented or occupied by separate households. Kironde further notes that:

- It is cheap to construct and maintain a Swahili type house.
- It is considered to be of a low status.
- It is technically easily adapted in terms of spatial organisation because of its special capacity to absorb innovations, building techniques and new materials.

Use of charcoal and kerosene energy for cooking means that occupants of the Swahili house type are exposed to indoor pollution caused by incomplete combustion of charcoal and other fuels. Also cooking in corridors and in rooms could lead to fire accidents.

The pre and post-independence housing policies have seen a stagnant housing production for all income levels as a result of which these houses have become “housing for all”. For Mwaiselage (1993) “inside a Swahili house is a reflection of all income levels, educational levels and tribes”. National Housing Corporation has long stopped building this house type but individual developers continue to build them in both informal and formal settlements. The motive is to build and rent out rooms. It has nothing to do with traditional needs, functional needs or even technical needs. The motive is more based on economic needs.

A key question is whether the transformation of a Swahili house type is intended to modernise the traditional Swahili type house? It is assumed that the extensions and alterations to an originally built Swahili type house will lead to different house types. Since the focus of this study is on housing transformation in informal settlements, the following section elucidates informal settlement dynamics in these areas and policy implications.

2.4 Informal settlement dynamics and policy implications:
The influence on house types

2.4.1 Overview of informal settlements

Tanzania informal settlements provide housing accommodation to more than 70% of urban dwellers. It has been estimated that 50% of the residential land in Dar es Salaam city is occupied by informal settlements (Kombe and Kreibich, 2000:40-41). The fact that these settlements accommodate more than 70% of the city population may imply that most housing conditions in these areas are congested as compared to formal settlements. The 1982 National Housing Policy proclaimed an official recognition of informal settlements in Tanzania. The state started to take measures to upgrade these settlements as late as 1972 by provisioning of basic services and facilities hand in hand with improving the supply of surveyed and serviced residential plots. Only very few informal settlements have been upgraded.

Unlike informal settlements, the formal statutory land delivery includes designation of land ripe for urban development, land acquisition and payment of compensation to land occupiers, preparation of planning schemes, surveys,
provision of trunk services and land allocation through administrative criteria (Kombe, 1995:37). Usually informal settlements develop before land is planned and surveyed.

Figure 2.13: Informal and formal settlements in the City of Dar es Salaam in mid-1990s (Source: Kombe and Kreibich, 2000:42).
2.4.2 Characteristics of informal settlements

In Tanzania informal settlements accommodate a wide range of social and economic groups of people, from poor to wealthy households. This is contrary to the situation attaining in many other countries where a strict demarcation of the two groups of people is notable (Kombe and Kreibich, 2000:41).

In terms of physical characteristics the use of “permanent building materials” in informal settlements is another difference that distinguishes these settlements as compared to other countries. In Tanzania most buildings are of fairly good quality, built with permanent materials such as concrete blocks and corrugated iron sheets. Houses without permanent building materials are being improved over time depending on the financial status of the owner. Taking the case of Hanna Nassif, for example, by 1998 about 90% of all buildings were built of concrete blocks and roofed with corrugated iron sheets (UCLAS, 1998:5). With the advent of infrastructure improvement in the area, the remaining 10% of the temporary houses are gradually being replaced with permanent dwellings. Thus, the difference between formal and informal housing in Tanzania in terms of building materials quality is generally insignificant.

Another distinctive feature is the issue of land ownership. The present government policy on informal settlements has generally been supportive, except for housing on flood prone areas. The 1999 Land Law gives nationals the right to own land through customary tenure. Ownership of lands secured through established customary rights is protected under the referred law. This differentiates Tanzania from most other African countries where informal settlements are often threatened to be demolished, as occupation in such lands is unlawful (Kombe, 1995:45).

Another feature of land tenure relevant to informal settlements is that in Tanzania all land is vested in the state. The President has right to all land in the country. The president may acquire any land for public use, provided compensation for exhaustive development is assessed and paid. Land has legally no value but the developments made thereon. However, in actual practice land is sold like any other commodity. Often residents of informal settlements sell plots of land and housing units. In view of the contradiction between law and practice, it may be worthwhile for the government to recognise and enshrine in law private ownership of land. This will enable the state to charge commercial land rents which will assist in providing essential services to various settlements.

Most informal settlements are characterised by the lack of basic public services and facilities. These facilities include clean water, access roads, sanitation, drainage and effective solid waste collection and disposal systems (Nguluma & Lupala, 2000). Others include adequate education facilities such as schools and health facilities such as clinics and dispensaries. According to a base line survey conducted by UCLAS in Hanna Nassif in 1998, out of a total of 1897 houses surveyed about 60% (that is, 1138 houses) were not accessible by road, only 20% of houses had a private water connection and 93% of all houses had a pit latrine as a form of
sanitation. Further in the survey it was noted that almost all households dispose of solid waste haphazardly with no trucks collecting waste from the settlement. The two primary schools built in the area then were overcrowded whereas nursery schools were non-existent. These deficiencies characterise many informal settlements in Tanzania (UCLAS, 1998).

2.4.3 Densification of informal settlements

Informal settlements are a common feature in Tanzania urban centres. The proliferation of informal settlements in Tanzania is linked to the diminishing capacity of the authorities responsible for supplying land for housing. Shortage of planned and surveyed land to meet the increasing demands for housing has resulted in further densification and the emergence of other informal settlements.

Densification of informal settlements can be viewed from two perspectives. First is the increase in the number of houses and population within the settlements as indicated above. The second view is the increase in number of informal settlements. When the latter view is examined, it is notable that the number of informal settlements has increased hand in hand with an increase in demand for accommodation of urban dwellers. In 1980 Dar es Salaam had 25 informal settlements. By the end of 1992, this number increased to 40 informal settlements in the city. The increase includes settlements in marginal lands such as Msimbazi, Ubungo, Sinza and Keko valleys.

According to Kombe and Kreibich (2000:40), the number of houses in informal settlements in the city in 1960 was estimated to be 5,000. A study conducted by the Town Planning Division based on an aerial photographic survey revealed that there were 7,000 houses in informal settlements in 1963. By 1973 the number of houses in informal settlements had increased to about 28,000 (Kironde and Rugaiganisa, 1995).
Figure 2.14: Part of Hanna Nassif informal settlement. Hanna Nassif is one of the oldest informal settlements in Dar es Salaam. The streets are organic in pattern which is the characteristic of many informal settlements in Dar es Salaam (Source: Sliuzas, 1999).
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<tbody>
<tr>
<td>I</td>
<td>Infancy stage</td>
<td>Land development in the periphery. This is the starting stage. Predominantly agriculture or bush land, scattered houses mostly owned by indigenous land occupiers but where land is increasingly being cleared by non-settlers and landlords for non-subsistence farming activities.</td>
</tr>
<tr>
<td>II</td>
<td>Consolidation stage</td>
<td>This is a “booming stage”. An area where land use intensification (densities) as well as changes of use from agriculture to residential area are rampant. Gradual displacement of the indigenous (often poor) by immigrants from the inner city.</td>
</tr>
<tr>
<td>III</td>
<td>Saturation stage</td>
<td>This is often the development in the inner part of informal areas where land markets have heated up. Intensification through extensions, infill and gentrification</td>
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*Figure 2.15: Typical informal settlements growth pattern showing stages in which densification process takes place (Source: Kombe 1997 and Kironde 1994:463).*

In all the three phases shown in figure 2.15 of informal settlement growth pattern, the most visible result is that the densification process facilitates availability of
affordable housing to low-income people. However, due to lack of state involvement in informal housing land parceling, transactions and development, severe environmental problems with serious effects upon local communities and individual households have been observed (Kombe, 1997).

The number of people living in old informal settlements in Dar es Salaam such as Hanna Nassif, Manzese, Keko Mwanga and Buguruni has more than doubled over the past 15 years. Taking the case of Hanna Nassif over a period of 13 years, the population and the number of houses have doubled while the gross built up area has increased by only 25% (Kombe, 1995:69). Housing densities in old informal settlements such as Keko Mwanga range between 40 and 50 houses per hectare (Kombe and Kreibich, 2000:80); 38 houses per hectare in Msasani Makangira (Lupala, 2002:156) and 40 houses per hectare in Hanna Nassif (UCLAS, 1998:4). Similarly, population density in these settlements is relatively high reaching 258 persons per hectare in Msasani (Lupala, 2002:156).

Most of the houses in informal settlements are characterised by single storey house types depicting horizontal densification. The fact that rapid urbanisation plays a major role in influencing the growth of informal settlements with predominantly horizontal densification, the costs of provisioning of basic infrastructure services and community facilities are increasingly becoming prohibitive. The emerging house types are further limiting the capacity of the city authorities to efficiently and effectively supply these services due to, inter alia, low floor area ratios.

2.5 Hanna Nassif settlement, the case study area

2.5.1 Background information to the settlement

Hanna Nassif is an informal settlement, in Kinondoni District, located about four kilometres from the city centre. The settlement shares borders with the formal housing areas of Kinondoni, Mwananyamala and the Msimbazi creek covering an area of approximately 50 hectares.

The settlement started as a coconut plantation belonging to a Greek person named Hanna who later transferred it to Nassif, hence the name Hanna Nassif. The first inhabitants settled in this area in 1965. These were the ex-workers of the plantation who divided the area amongst themselves into large farm plots. They then subdivided the land into smaller lots to new arrivals leading to densification of the area.

The rapid densification of the settlement resulted in an overcrowded housing environment, especially in the low-lying central area. This part of the settlement experienced seasonal flooding due to absence of proper drainage systems. Until 1992 the road network was very poor in the whole settlement, to the extent that a large number of houses lacked vehicular accessibility. Existing roads were further invaded by house extensions narrowing them to the extent that only one car can pass through at a time. A survey conducted by UCLAS in 1998 revealed that about 60% of 1,897 houses had no vehicular access. A previous survey conducted in 1994
revealed that 56% of the houses were not accessible by vehicles. Before upgrading initiatives undertaken between 1993-2000, the drainage condition in the settlement was very poor. For example, on 10th of May 1991 it rained heavily, 72 houses collapsed and the whole of the central depressed area was flooded. Pit latrines were flooded and human excreta got mixed with rainwater. Together with uncollected solid waste, the settlement was reduced to an unhealthy living environment.

The settlement was then upgraded under ILO, UNDP and Ford foundation support in two phases. The first phase took place from March 1994 to March 1996 while the second phase started from 1996 to the year 2000. The upgrading programme included construction of the main and lateral drainage system to drain the central low-lying area and other points of the settlement. Improvement of road networks and side drains, solid waste as well as water supply constituted phase II of the upgrading works. Today Hanna Nassif stands as an upgraded informal settlement with a relatively improved and conducive living environment. This improvement has contributed towards increased land and property values. This has triggered house owners to transform their houses as the settlement attracts many people searching for rental accommodation.

2.5.2 Land use and settlement densification

Residential and commercial activities are the dominant land use in Hanna Nassif. A study by UCLAS (1998) indicates that 89% of the total buildings are residential, 10% for residential cum-commercial and the remaining 1% for commercial purposes. Notable changes that are apparent in this settlement include the densification of the settlement that is building extensions on plots, the densification of the compounds (several buildings within a single plot), completed new buildings and replacement of the originally temporary residential structures with commercial ones and other uses.

Housing development in the settlement has progressed very fast. The process of land subdivision continued until 1994 when the area was saturated with buildings. In 1974, there were only 955 housing units. This figure increased to 1200 in 1975, and to 1316 houses in 1982. By 1988 the number of houses reached 1640; and by 1998 the number of houses had increased to 1897 units. Due to increased land and property value accompanied with demands for residential and commercial uses today houses constructed of mud and pole are offered for sale to new developers. Buyers demolish old structures and construct new houses largely of concrete blocks (UCLAS, 1998).

When population density is examined, current estimates indicate 380 persons per hectare as compared to 232 persons per hectare in 1975. With regards to housing density, it has been shown that it has risen from 19 units in 1975 to 43 units per hectare in 1998. Hanna Nassif is relatively a dense settlement when compared with other consolidated informal settlements such as Msasani (350 persons and 38 houses per hectare) and Keko Mwanga 40 houses per hectare. In 1998 the average number of habitable rooms per household was established at 1.8 rooms while the average number of households per house was 2.8 with an
occupancy rate per house standing at 11 persons. This figure was higher than 9 persons per house as indicated in the 1994 base line study. This implies that the number of persons in houses has increased in an interval of 4 years.

Figure 2.16: Hanna Nassif settlement in 1941. The whole area was cultivated with coconut plantations (Source: Bersani and Bogoni, 2001:29).

Figure 2.17: Hanna Nassif settlement in 1965. A few layout of plots were designated on the northern part of the settlement. The typical “unplanned” area was still dominated by coconut plantation (Source: Bersani and Bogoni, 2001:30).
2.5.3 Characteristics of housing and buildings

The 1998 baseline study indicates that there were a total of 1,897 residential properties. The total number of habitable rooms was 9,271 accommodating a total of 5,045 households. This gave an average number of habitable rooms per household at 1.8 while the average number of households per house was 2.8 and occupancy per house to be 11.2 persons. In the previous 1994 baseline study occupancy characteristics was noted at 9 persons per house. This indicates an increasing rate in housing densification between 1994 and 1998 and is accompanied by an increased population density.

The 1998 baseline study further indicates that 37% of all houses in Hanna Nassif were occupied by their owners, 45% by tenants and 18% were exclusively occupied by tenants. It was also revealed that over 50% of the present land occupiers obtained their land through purchasing the same from initial land occupiers. The other means of access to land as revealed in the 1998 socio-
economic study included buying finished and semi-finished structures. This is summarised in table 2.3.

Table 2.3: Accessibility to land in Hanna Nassif

<table>
<thead>
<tr>
<th>Means of accessibility to land</th>
<th>% of people interviewed</th>
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<tbody>
<tr>
<td>Buying</td>
<td>52.2</td>
</tr>
<tr>
<td>House purchase</td>
<td>37.7</td>
</tr>
<tr>
<td>Inheritance from families</td>
<td>6.5</td>
</tr>
<tr>
<td>Given by relatives and friends</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Source: UCLA, 1998

In 1998, it was revealed that the initial occupiers of the land remained with only about 30% of the total land in Hanna Nassif that was acquired in the 1970s and about 70% of the total land was under new inhabitants. Generally, over 50% of the present land occupiers in Hanna Nassif acquired it in the 1980s and about 12% between 1993 and 1998. This implies that more consolidation in housing in Hanna Nassif took place in the 1980s.

2.5.4 Infrastructure conditions

The improvement of infrastructure conditions, mainly road networks, drainage system and water supply has increased the value of land and buildings in the settlement. Property owners are enjoying an increased housing rent while the poor property owners are currently being bought out of the settlement, letting new buyers construct new houses either for residential, commercial purposes or both. Before the improvement of these lines of infrastructure, the unsanitary environmental conditions discouraged rich people from investing in housing in the settlement. To date the situation is different as the settlement accommodates middle and low-income earners, though the latter are tempted to sell their properties due to good offers from buyers. Taking the case of road improvement, before the upgrading, taxi drivers refused or charged very high rates to enter the inner part of the settlement because of the poor road condition. The improvement of the three main access roads in phase one and two has made the settlement accessible in all seasons and taxi drivers are no longer hesitant to enter the inner parts of the settlement. The road improvements were carried out together with improvement of the drainage system, starting with the main drain and then lateral drains including side drains. This drainage improvement system has substantially reduced the flooding problem prevalent in the low-lying central areas of the settlement, consequently reducing associated waterborne and water related diseases (Nguluma, 1997).
3 THEORETICAL FRAMEWORK

This chapter reviews and discusses theories and concepts relevant to the study. The intention is to find a theoretical framework with relevant variables for analysing the process of housing transformation in relation to ideas of modernism and modernisation, house types, use of spaces and spatial qualities. The main underlying assumption is to view the on-going housing transformation in relation to the developmental aspects entrenched in modernism and modernisation. Specific concepts are also discussed.

3.1 What is a theory?

Theories and concepts are tools for human thinking. A theory is a system in which a number of concepts and propositions have been systematically ordered (Lundequist, 1999). According to Nachmias and Nachmias:

Scientific theories are abstractions representing certain aspects of empirical world; they are concerned with how and why of empirical phenomena, not with what should be (Nachmias and Nachmias, 1997:37).

Scientific theories help to explain and understand a phenomenon. According to Lundequist (1999:26) “the world is seen through concepts”. He argues that the world is interpreted by the way we see things. As changes occur in society concepts also change. Further, concepts also change as relations to one another change, and as our way of seeing the world changes. Nachmias and Nachmias (1997:26) define concepts as abstractions of a phenomenon from which a meaning or way of seeing the world can be apprehended. Scientists begin the process of research by forming concepts as a shorthand for describing the empirical world. They are foundations for communication. Without sets of agreed upon concepts it is difficult for scientists to communicate their findings.

It is against this background that modernisation theories, a theoretical framework for classification and analysis of house types, housing adjustment theories and theories determinant of house form are being reviewed and discussed. Their relevance to this study are examined.

3.2 Traditional versus modern houses and building materials in the transformation process

Traditional houses are usually built with local building materials, which are easily collected around the village. Houses are usually built by members of the household and craftsmen often with assistance from friends and neighbours. Both technology and tools used are simple. “Specialisation in the traditional houses enriches the technological resources as each craftsman passes on what he learns, and adds to the store of know-how” (Oliver, 1990:148). The change from traditional to modern
building materials symbolises modernity and cash economy because houses are built by industrially produced building materials like concrete blocks, corrugated iron sheets and concrete tiles that require financial resources to purchase. People living in urban areas in Tanzania originate mostly from rural areas where many people live in traditional houses. However, when they shift their residences to large urban centres like Dar es Salaam they adapt themselves to urban ways of life. Thus whereas some may initially build houses using traditional building materials, they later change to “modern” building materials. A question could be raised whether houses in which people live reflect their ways of life, like their economy. Why is it that people are transforming their houses from traditional to industrially produced building materials? Taking into consideration the use of “modern” building materials and therefore an aspiration to have “modern” houses, could this be related to the change to urban lifestyle? These questions are the subjects of discussion in the subsequent chapters. It is, however recognised that traditional housing knowledge is not a single phenomenon and cannot be studied in general terms. According to Oliver:

“the know-how is inextricably bound up with specific nature of cultures which employ its countless forms. To understand the full implications of technologies used it is necessary to consider them in relation to their cultural contexts as well as in terms of their efficiency or performance. In the modern world traditional housing are fast disappearing or is a subject to accelerating social change. The knowledge of traditional housing in the past has been developed over a long period of time (Oliver 1990:157).”

Those who are building traditional houses are coping with the problems taking into account a long period of experience. For instance, experience in timber structures are applied to concrete structures which are likely to serve the same purpose.

The study of housing transformation is taking into account the modernisation of houses, but it does not directly trace this transformation from the traditional point of view. However, the concept of a traditional house is considered important to be understood within the context of this study.

What characterises a traditional house? In Tanzania, traditional houses are directly related to traditional society depending on self-subsistence. Traditional houses are associated with simple, undeveloped building methods that result in relatively poor houses which are not durable (Larsson and Larsson, 1984). However, traditional houses can be quite sophisticated.

A combination of traditional building methods which use local skills produced a built environment which most people need (Norton, 1999:101). Norton further notes that in the past thirty years there has been an increase of interest in indigenous building methods. This reflect the widening appreciation that there are important lessons from these undertakings that can lead into meeting building and planning needs for the future. According to Norton there are problems when one wants to transfer traditional technology to urban areas. He states that:
The factors such as demographic growth, shifts from rural to urban areas, natural and human made resources depletion, and significant changes in expectations and life styles, all combine in their various ways to erode the viability of traditional approaches to shelter provision (Norton, 1999:101).

The skills used to build traditional houses were passed from one generation to another (Denel, 1990). This task was a duty for members of the family. Usually the construction details of traditional houses in each tribe were known. Traditional building techniques used in Tanzania involve much time-consuming activities and processes. Builders are often required to produce their own building materials and components, as well as to put up with hard physical labour, sometimes under very adverse weather conditions, a factor which greatly impedes building production efficiently (Kimati, 1995).

Traditionally, builders used to obtain their building materials at or near the site of construction. In this case there was no element of transport costs. However, with increasing depletion of raw materials at or near building sites, either due to intensive exploitation as a result of growing demand, or simply due to bad conservation practices, builders are now required to go to far away sources to obtain the materials. This is already happening in many places in the rural areas particularly in the more arid parts of the central, western and lake zones of Tanzania, where local builders travel considerable distances to obtain good poles and even special soils (clay or red) for building their houses. Norton states that:

There are aspects of traditional approaches that still work well, some aspects may have become inefficient or unworkable, or in general, unsustainable that is local resources may no longer be available; the sheer concentration of people may require a different sort of building or simply more buildings more quickly, or the source of finance may have changed or may be insufficient. (Norton, 1999:101).

There are some other problems associated with traditional building techniques like that of unpredictable weather as well as hard physical labour conditions under which builders may find themselves working. It is common to see local builders operating under harsh weather conditions, e.g., heavy rains, severe colds, scorching sun etc., using very crude tools and equipment, the result of which is not only reduced productivity but also serious health consequences (Kimati, 1995:59).

3.3 Theory of determinants of house form

Rapoport in his book “House Form and Culture” presents a theory of determinants of house form. He analyses the factors determining house form in vernacular architecture emphasising that there is no single determinant. He, for instance, argues that:
House form is not simply the result of physical forces or any single causal factor, but is the consequence of a whole range of socio-cultural factors seen in their broadest terms (Rapoport, 1969:47).

He further demonstrates that even under conditions of severe constraints of climate, economies, materials and technology, there is always a certain “freedom of choice” concerning house form. Socio-cultural factors influencing the house form include basic needs, position of women, family, privacy and social intercourse (Rapoport, 1969:61). The factors need further analysis in order to be properly comprehended. Further Rapoport states that the factors which determine the house form take into account how people understand the ideal life. He states that:

Given a certain climate, the availability of certain material, and the constraints and capabilities of a given level of technology, what finally decides the form of a dwelling and moulds the space and their relationship is the vision that people have of ideal life (Rapoport, 1969:47).

Rapoport further observes that the impact of socio-cultural forces on house form differ according to the way people understand these forces and the degree of their existence and importance in the society. Thus according to his discussions the nature of man and his institutions contain elements of both constancy and change, which affects the built form. These he considers to have a direct relationship to the biological nature of human beings, their perception and behaviour. According to him the house form retains validity and usability long after the culture within which it was developed has changed. He states that some features of behaviour and ways of life are constant, or change slowly. He observes that old buildings are replaced not because they are less liveable, useless or inadequate to the present way of life, but merely because of glory of newness.

Rapoport further points out that “there is always a freedom of choice” that allows socio-cultural factors to influence house form. He also notes that there is a variation in the extent of freedom for socio-cultural factors to influence house form according to material factors. According to him material provides a framework in which socio-cultural factors are allowed to work, implying that people tend to make the best use out of the existing building materials taking into account climate of the area and, therefore, making the house as comfortable as possible. One can question to what extent house builders consider and use existing building materials for their climatic and comfort attributes as well as their socio-cultural settings.

Rapoport (1990) emphasises the importance of the comparison of different built environments within a given cultural context. He argues that there are elements of built environments which change rapidly and others which persist over a long period of time and change very slowly. He then relates the importance of elements to their degree of change. He observes that if the elements are changing rapidly they are less important than if they are changing slowly or not changing at all. He
notes, however, that some retained elements are sometimes transformed to conform to economic, political, technical and other values.

Rapoport theory on socio-cultural forces has been criticised by other scholars. Vestbro (1975) criticises Rapoport’s theory for having a static standpoint as it assumes that vernacular buildings retain great uniformity in space and time. Rapoport is also criticised by Lawrence (1987) for using general terms and reliance on secondary sources in his illustration of the importance of socio-cultural factors in his definition of vernacular architecture. According to Lawrence, Rapoport’s discussion is made at a general level particularly with reference to the relationship between design and the use of space, and how the changes in lifestyles are reflected in the dwelling designs; similarly, on the spatial organisation of houses and settlement patterns, the adaptation and use of dwellings to suit the inhabitant’s interest.

Vestbro’s and Lawrence’s discussions against Rapoport’s theory may be relevant in the sense that the house form is influenced not only by socio-cultural factors but various social-economic and political factors. For instance, space use may become a determinant factor whether a building form should be retained given socio-economic advantages to be derived from a new building form although the old form is still liveable and satisfies many perceptual needs of the users. Similarly, political reasons may override socio-cultural or economic reasons whether or not a building is retained. Despite the criticisms Rapoport’s theory on socio-cultural forces, which influence house form bears relevance to the housing transformation study in general and in analysing house types in particular. The assumption here is that apart from the multiple factors influencing house forms, socio-cultural factors are more impelling. This is because people transform their houses to accommodate demands from increased household sizes and separation of functions so as to enhance privacy within the specific cultural settings.

3.4 What constitutes a house type?

This study aims at analysing housing transformation in informal settlements, where most houses have not been designed by architects. Discussion on house types is of relevance to assess how emerging house types are related to forces propelling transformation. According to Lawrence:

> Type refers to a kind, class or category of people or things that have characteristics in common. It is therefore possible to identify particular types of objects, events, setting and people with respect to specific characteristics (Lawrence, 1994:271).

He further defines type as that object by which something is symbolised or figured. Anything having a symbolic signification. While type refers to objects with characteristics in common, typology refers to “the study of symbolic representation of the origin and meaning of scripture types as well as the study of classes with common characteristics”.

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Types have to be defined in a context. For example “monuments are a type of human made structure found in all human societies their purposes and meanings vary rather than being universal” (Lawrence, 1994:274).

The continuation process of transformation allows the architect or builder/artisans to extrapolate from the type or change its use. Different types can be used together to produce a new type. Moneo defines typology as a “concept which describes a group of objects characterised by the same formal structure” (Moneo, 1978:79). He further gives an example that:

One may speak of skyscrapers in general, but the act of grouping pushes towards speaking of skyscrapers as huge, distorted renaissance places, as gothic towers, etc. The idea of type, which ostensibly rules out individuality, in the end has to return to its origin in the single work (Moneo, 1978:79).

Rossi defines the type as “a concept which describes a group of objects characterised by the same formal structures” (Rossi, 1975:153). He also contends that the type could further be abstracted into some kind of scheme of spatial relationship. According to Rossi (1975:12) type is located in time as well as in place, but there is an argument that the place location is relative, as objects found on different spots can be gathered in one typological class. Type can be subject to a lot of transformation in a way that it could be said that every type is derived from another or several others. The operation of adopting a well-known type resulting in a new type is called “typological transformation.” Transformation can be of all sorts like mixing of more than two types by adding some features of the one to the other, an extension or exaggeration of a certain feature or alternative of scale. An example can be seen in colonial houses resulting from a certain European style but borrowing characteristics of the native house. He further states that typological transformation is not only a phenomenon observed while analysing the existing, but it is also a powerful instrument for conceiving the new. In this study the relevance of typological transformation is being studied. The main purpose is to analyse and classify house types in informal settlements.

3.5 Theoretical framework for classification and analysis of house types

For the purpose of this study it is important to sort out on how to classify house types in informal settlements. Ways of classifying these house types are being reviewed. There are different ways of classifying house types. Lawrence (1994) states that by an analysis of architectural plans, followed by site visits it is possible to classify house types. Lawrence further provides several criteria that could be used for house type classification. These criteria include:

- Stylistic conventions related to the composition of building facades (e.g., classical, neo-gothic, modern). These criteria account for the explicit professional knowledge of an architect and a builder, which is frequently
recorded in pattern books or other professional publications. There is rarely any consideration of the point of view of lay people.

- Socio-economic variables related to the income and professional status of the inhabitants (e.g., working class or middle class, blue-or white-collar workers). People in all walks of life are generally aware of their position in society when it is defined according to these criteria.

- The number, size, layout of dwelling units on each floor level of residential buildings (e.g., two or three rooms, although floor plan or only one façade with fenestration). These criteria are frequently used by architects, property owners, and estate agents to classify and assess urban house types.

- The layout and construction of the buildings (e.g., timber framed, brick or stone walled) which is not only used by professionals to interpret the nature of physical boundaries (e.g., walls, fenestrations, door openings), but also by lay people to attribute social values to residential buildings.

- The spatial organisation of the floor plan in relation to the means of access from the public realm of the street to the private realm of each dwelling unit (e.g., passing through a private outdoor space, a shared external space, and/or an internal space (Lawrence, 1994:276).

Lawrence’s criteria are good but based on his experience from apartment blocks in Europe. His criteria can be useful for the purpose of this study with some modifications. The relevance of these criteria are discussed in Chapter Ten.

In the present study the last criterion is considered more central in classifying house types. Although these criteria were applied in formal settlements and in industrialized countries they are regarded as relevant in non-industrialized countries as well as in informal settlements. The documented plans during the fieldwork are analysed and classified. Particular attention is given to the spatial layout of these houses.

This kind of analysis is therefore only informative about spatial characteristics of the house. This is the main concern of the present study where the issue is to examine different house types and whether they could be adapted to meet the developmental aspects of house design such as thermal comfort, adequate light in the house and good sanitary facilities.

### 3.6 Modernity and modernisation

Heynen (1999:8) discusses modernity by identifying it with three basic levels of meaning. First and what she calls the oldest sense modernity, referring to “present, or current or applying as its opposite the notion of earlier, of what is the past”. The second meaning is referred to “new as opposed to the old”. Here the term is used to describe a present time that is experienced as a period, possessing certain specific features that distinguish it from previous periods. Thirdly, modernity is also described as being a break with tradition, and as typifying everything that rejects the inheritance of the past. She further contends that modernity refers to typical
features of modern times and to the way that these features are experienced by the individual. Modernity stands for the attitude toward life that is associated with a continuous process of evolution and transformation, with an orientation towards a future that may be different from the past and from the present (Heynen, 1999:10). Modern societies are directly related to modernity. It is seen as a condition in its plurality both culturally and institutionally. It is a complex condition but having a lot of opportunities. Giddens (1990) states, “An important characteristic of the modern world is the intensification of the relationship between the local and the global”. Tran Hoai Anh (1999) finds that “a crucial element of modernity is a new perception of the individuals role in the society”. Individuals are seen as active agents who can change their own destinies, nature and society.

In trying to understand the relationship between modernisation of houses and poor qualities of utility in modern low-cost housing, Larsson (1990) adopts a gender perspective. To Larsson this has given an important explanation of the housing transformation in Botswana. The gender perspective has also allowed her to illustrate the connection between a modern housing sphere and women’s domestic sphere (Larsson, 1990:32). Traditionally women used to build houses but this responsibility has been taken away from women because men are the ones who have the cash for purchase of imported building materials. The role of building materials and technology in the process of modernisation of dwellings in Botswana is emphasised by Larsson. This goes together with the description of the life style practised inside the dwellings. She observed that a good number of activities are still practised in the traditional way.

Larsson (1990) states it clearly that modernity in developing countries is a powerful vision full of images, which is promising and at the same time threatening. Poverty is affecting many people and economic benefits of modernisation are limited. Larsson further argues that housing transformation may be interpreted as an evolution from traditional to modern dwelling if looked upon superficially or as a linear transformation where traditional housing elements are gradually being replaced by modern ones. Such transformation is put in line with a modernisation paradigm, which is one of the main currents in development theory within the social sciences. According to Larsson transition from traditional to modern housing involves a number of aspects, which include building materials and techniques and the use of space and the layout of dwelling.

The kind of modernisation discussed in this research takes cognisance of the kind of houses people were occupying when they started living in informal settlements. The efforts made by people themselves to improve the situation by extending, making alterations, demolishing and building up new structures is the point of departure for this research. However, is that all of what is called the modernisation of existing structures improvements? It is important to develop critical views when discussing housing modernisation especially in poverty dominated contexts or situations.

According to Larsson (1990) the origin and essence of modernity has been an area of interest to many scholars. She elaborates that it is difficult to find situations
in today’s non-industrialised countries corresponding to events in Europe or America. To her, modernisation is:

Generally closely related to economic growth induced by recent technology. Technological impact on the economy on one hand and processes dependent upon technology on the other hand has to be distinguished (Larsson, 1990:31).

She further observes that “there is a sharp division between industrial societies and non-industrialised countries, from the industrial centres the process of modernisation radiates outward into less modern societies”.

In her study of “Modern Houses for Modern Life”, Larsson concludes that housing modernisation implies housing improvements. However, she found that the actual improvement was scarce where a number of deteriorations occurred, mainly related to a decrease of available space. It is assumed that by having rooms for tenants in a house it is a departure from traditional to modern ways of living. Renting rooms is a phenomenon that is linked to urbanisation and formal restrictions on house building which in turn often creates a demand for rooms to rent (Larsson, 1990). Further, Larsson concludes that modernisation of housing consists mainly of change from traditional to modern building materials and change in use of space. Other factors leading to the transformation of houses in Botswana were given as the change in the economy from subsistence to a cash economy and the ambition to live a modern life. She points out that in a modern society houses are considered a means for income generating where houses or rooms are rented out, while in traditional society a dwelling has only use value. It is assumed that this is also the case in urban Tanzania where rooms are rented in houses. It is also assumed that changes made in houses are the result and an attempt to cope with the modern way of living.

3.6.1 Modernisation and housing transformation

It might be considered interesting to discuss modernisation of houses in informal settlements where houses are of poor quality and most people living in these houses are low-income earners. The author finds that discussions on modernisation and modernity have to be done carefully. The concepts have to be used in a particular context. For instance, the process of transformation of houses taking place in informal settlements in Tanzania could be related to modernisation considering the process of change, which is taking place. It could, however, be associated with other factors.

According to Kabwogi (1997:127) housing problems in Tanzania can be related directly to shortage of “modern” housing and an increase of low quality housing in informal settlements. Kironde (1979:15) points out that the shortage of “modern” housing is not necessarily the result in the increase of low quality housing in informal settlements. According to Kironde there are many factors which shape each problem. The argument put forward is that both problems arise from rapid urbanisation and poverty among households.
In Dar es Salaam, there is a general conception that “employment is easier to secure than an accommodation to rent” Kabwogi (1997:127). The truth of this matter has however never been demonstrated by any empirical evidence, therefore, this phenomenon could be an exaggeration. Kabwogi further argues that the fact of housing shortage in urban areas is more of a qualitative than quantitative nature. It can be assumed that transformation of housing is taking place to deal with the issue of both quality and quantity. Kironde (1979:16) points out that “the high demand for good housing has been aggravated in recent times by rising tempo of social-economic development.” Urban residents prefer to live in “modern” houses and of certain standards due to the transition to a contemporary economy, especially those who have attained a certain level of social status in terms of good education, successful business and public employment.

Tran Hoai Anh (1999) argues that although modernisation in the third world is seen as “westernisation” house design has much to do with “people’s own aspirations, will and life strategies”. An assumption is made that the transformations taking place could be explained as a reflection of aspirations of the people involved, towards living in better houses in terms of durable materials, good finishing and well functioning. Criticism that housing modernisation in non-industrialized countries is westernisation or copying ideas from the west is debatable. One would not call it copying but rather learning and adapting to what people think suits them in their life ideals and styles.

In the context of Tanzania, the migration of people from rural areas to urban centres makes urban dwellers to be regarded by their rural peers as modern persons because of the difference in the living conditions between rural and urban areas. It is assumed that people who aspire to be modern change their houses in different ways. For Tran Hoai Anh the crucial issue of modernisation in the third world is related to the impact of modernisation on local cultures.

Tran Hoai Anh discusses the modernisation of underdevelopment, terms she borrowed from Berman (1982). In her work it is observed that there is a distinction between the modernisation process of the industrialised and non-industrialised countries. The difference given is “lack of individual freedom caused by the suppression of controlling government forces”. Tran Hoai Anh referring to Berman contends that “modernisation of underdevelopment means the struggle between the repression conducted by the governmental mega-policies and the growth of modern consciousness from within the individual”. Another difference given is the ‘incompatibility’ of “material conditions and the development of modern consciousness”. The modernism of developed societies is built directly on a modernised material reality, while the modernism of underdevelopment arises from “backwardness” and underdevelopment built on fantasies and dreams of modernity (Tran Hoai Anh, 1999:44). According to Berman (1982:125) modernity is unavoidable and, therefore, people in non-industrialized countries are as much condemned to modernity as their fellows in the industrialised countries. He further argues that modernisation can proceed along a number of different roads and that there are different modes of modernisation in the third world. An interesting part
of Berman’s argument is his emphasis on the complex city and plurality of modernity and his focus on people and their experiences of modernisation. Berman’s observations on modernity would tend to fit in the realm of this study, similarly the argument of Tran Hoai Anh on the incompatibility of material conditions and the development of modern consciousness, as indeed the socio-economic foundations and formations, including the culture and educational levels of industrialised countries differ substantially with those of non-industrialized countries like Tanzania. However, we differ with the rest of her observations on “suppression/repression” as these are highly subjective and a subject of in-depth study outside the parameters of this study.

3.7 Modernisation theory in non-industrialised countries

The dominant development strategy for the non-industrialised countries in the 1950s and 1960s was modernisation (Burgess, 1982:76). This theory presented itself in social, economic, cultural and political exposition. The main argument is:

The transition from agricultural and peasant societies to modern urban industrial societies could be achieved by the non-industrialised countries emulating the historical pattern of capitalist development followed by the industrialized countries (Burgess, 1982:76).

The main motive of modernisation was to increase the output of manufacturing and services through substantial capital investment and to decrease the share of agriculture in employment and output. Burgess contends that “the key to the modernisation process was the transformation of values, by imitating the North American and European value patterns”. In order to accommodate the transformation of “traditional” to “modern” values, the transformation of social and cultural institutions would take place and this was considered a prerequisite for the overall process of modernisation and development. Modernisation was also related to development. Essentially development was understood as a process of economic advancement measured in terms of GDP per capita, and output had to be expanded at a rate considerably faster than the rate of population growth. The primary goal was to go for growth. Burgess further explains that one of the proposals put forward by modernisation theory was the development of the nuclear family and a breakdown of traditional kinship patterns. Through formal education the social status of a person would be determined. What was also considered an important element concerned the maximum mobility of factors of production (land, labour and capital). The outcome of this was the breakdown of communal and feudal rights through the transformation of land ownership towards a system of transferable property rights. Burgess argues that:

Urbanisation was an effect of industrialisation and economic growth. It is established that the policy makers encouraged rural urban migration. A labour force for industries was expected to come from rural areas anticipating that there
will be no fall in agricultural output. There was an expectation that population growth would adjust automatically as modernisation proceeded. For developing countries modernisation meant going all out for industrialisation (Burgess, 1982:77).

Modernisation in the housing sector meant that most industrialised housing was based on the idea of universal cultural and technical standards. Therefore, the dominant policy in the 1950s and 1960s in Latin America and the rest of non-industrialised countries was the “conventional” housing, which took into account “western” cultural and technical standards. The policy also went to the extent of advocating slum clearance with its inhabitants to be re-housed in modern conventional housing. The capacity of the institutions responsible for promoting and putting up conventional housing was thus not really questioned.

Burgess also shows that the housing policies associated with modernisation strategies failed. The demolition of squatter settlements and the movement of those displaced into housing built according to modern western standards had little impact on achieving housing needs. Conventional housing was expensive for the majority of the people. Also failed to accommodate what is considered necessary for the survival of low-income groups, like the use of a residence as a work place and renting out rooms as a source of income. Modernisation was criticised and considered a failure.

The above discussion entails that modernisation in its conventional sense failed. The question to ask is: Does it mean that there were no positive aspects in relation to development which could be taken aboard? The discussion seems to be based mainly on the negative impacts of the modernisation process but has not explored the positive aspects.

Another issue, which has featured in the discussion, is the use of industrially produced building materials as a sign of “modernity” and the adoption of standards from industrialised countries. It can be argued that as long as the materials and standards are adopted to suit the situation, the local context, and finally led to the improvement of housing, modernisation theory cannot be said to have failed completely. In this case there is a need to carefully examine the modernisation theory so as to identify and adapt its positive aspects.

Industrialised and non-industrialised countries are both affected by the process of modernisation, it is, therefore, a universal phenomenon. However, modernisation in non-industrialized countries is taking place under the dictates of poverty and rapid urbanisation. In non-industrialised countries informal settlements can be seen as a transition phase in urban development. These settlements are playing major role in the urban housing market. The majority of people in urban areas get access to housing provided by the informal sector. It is assumed that it is possible to have the growth of healthy informal settlements, if there is an adequate

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4 Conventional housing represented houses in formal settlements built of industrial materials such as concrete/burnt bricks and roofed with corrugated iron sheets or materials of the like, standardised layouts and plans provided by the public sectors.
government regulatory framework based on public health and town planning considerations.

3.8 Theory of modernism and developmental aspects of house design

Modernism in art and architecture is usually defined as an expression of industrialising society. Tran Hoai Anh (1999) contends that modernism is used in two different but related ways. She notes that in a broader sense it refers to cultural or artistic expression of modernity and modernisation. In a narrower sense it refers to only modern architecture in Europe and northern America. Tran Hoai Anh raises a concern that it is in this narrower sense that modernism is often seen as a Western phenomenon. Architectural modernism is referred to:

- **Style of design that expresses the ethos of the machine age through use of abstract forms with most of the materials being industrially mass produced and with extensive use of a mechanical system for servicing the building.** Early European modernist also emphasised social factors such as health, climatic comfort, service equipment and other functional qualities that would promote productivity and welfare (Vestbro, Nawangwe and Sanya, 2002:2).

Northern Europe modernism in architecture became successful due to the introduction of town planning legislation, where health and comfort were considered to be important. Housing programmes produced in mass, taking into account industrial building techniques, standardization, building codes and minimum requirements for light and noise and other functional standards were put in place (Vestbro, 2002:2).

The theory of modernism is perhaps one of the theories with the strongest elements of a developmental perspective. To a large extent the discussion of modernism in architecture and town planning focuses on the outer form of buildings. However, one important aspect of the original classical modernist thinking was how building design and spatial organisation could affect human behaviour. Also its contribution to forming a new human being in accordance with a modernising society. The social feature of modernism was particularly expressed in Scandinavian countries. Modernism that drew its insights from functionalism emphasised design for measurable qualities such as basic requirements of light, air, separation of functions within the house and standard equipment for rational living. According to Vestbro other aspects of modernism include:

- Functional differentiation of space for separation of activities such as cooking, hygiene, sleeping, working at home, socialising with relatives and friends.
- Designs and standards that promote health in order to provide for a more productive labour force.
• House development for nuclear family living and individualism is believed to promote less tradition bound affinities and thinking.
• Promotion of communal facilities with a recreational and educational function such as playground for children, sports grounds, clubrooms for political discussions and adult education (Vestbro, 1997).

Modernism in housing as defined by Vestbro, refers to housing built on land which has been planned and surveyed and has fulfilled formal building requirements.

Some of the points raised by Vestbro can be seen as of relevance in non-industrialised countries and can be taken as food for thought by those contemplating exploring options for improving the housing conditions. For example, developmental aspects related to separation of functions, design for health and comfort are some of the main issues of concern in this context. It thus seems necessary to examine modernism in the context of non-industrialised countries especially in relation to the developmental aspects of houses; their design and the way spatial organisation and subsequent transformations affect the lives of people especially in informal settlements, where modern town planning is seldom applied.

According to Gehl (1987) functionalism took into account knowledge from the medical field developed during the 1800s and the first decade of the 1900s. This lead into healthy designs in the 1930s. Houses were expected to have natural light, air, ventilation and access to open space. This led to a decision to orient buildings towards the sun.

Vestbro (2000:8) argues that if there is a reason to question modernism in architecture and town planning as a leading principle in industrialised countries, there is also a reason to promote at least part of the same principles in non-industrialised countries. The main point is to consider modernism within developmental aspects of house transformations. Emerging from this discussion are the main variables that underpin the developmental aspect of house design, can be summarised as: separation of function, design for health and comfort, promotion of modern life style and design for promotion of productivity.

**Separation of functions and health**

Although the issue of health is obvious it is not always promoted. In any house a smooth operation of different activities is of great significance. It is argued that to separate functions in order to achieve a functioning in every day life in a house is one way of promoting development. One example is in cooking areas where charcoal, paraffin and wood fuels are used. These areas ought to be separated from sleeping and living areas to avoid health problems like those associated with carbon monoxide from fuel combustion. Also pit latrines ought to be located at a reasonable distance from other functions of the house to avoid contamination.
Comfort

A good design of a house is expected to take into consideration climatic comfort. This may also be regarded as a developmental aspect. Vestbro notes that in architecture, "classical modernism focused on achieving a high degree in control of temperature, noise insulation, room differentiation, standardisation for new home equipment and on the dimensioning of rooms for multi-purpose furnishing" (Vestbro, 2000). Other aspects of comfort includes cross ventilation, plants for cooling and enjoyment and view of greenery areas. It is assumed that the primary goal in these design variables are aimed at achieving comfort living in modernised houses. The question raised here is: to what extent are the housing transformations taking place in informal settlements consistent with climatic requirements or comfort needs of the humid coastal climatic prerequisites characterising the study area?

Design for promotion of modern lifestyles

With increased urbanisation in non-industrialised countries, where people migrate from rural to urban areas with high natural growth rates, there are tendencies among people to change their lifestyle to cope with the conditions in urban areas, where people with different socio-cultural backgrounds live together. Often they rent rooms in the same house in informal settlements. In order to bring harmony into the house they have to adapt themselves to new urban lifestyles. For instance, in urban areas there is a tendency to intensively use or jointly share the limited space available, including open and built-up areas. Separation of functions, like having different sleeping rooms for boys, girls and parents tend to increase privacy, and has been viewed as an aspect of modern life style. Vestbro, for example, contends that:

Design for spatial differentiation may facilitate individual and nuclear family living a gradual downgrading of kinship ties, increased possibilities to avoid social control, and improved chances to express individual status in interior and exterior design of buildings (Vestbro, 2000:9).

In the present study, an investigation on whether informal housing transformation is leading to designs for promotion of modern lifestyle is being made. Among other things issues related to separation of functions, house as a status symbol are some of the influencing factors in modern lifestyles. Modernist designs can also stimulate new ways of thinking.

Modernist architecture is not only or even most fundamentally an argument for a new technology in building construction. It is new building typologies and planning conventions that were developed as an instrument of social change (Holston, 1989:54).
Modernist design also refers to abstract form, industrially produced, and mass production of standardised houses. The above views are relevant to the discussion of houses in informal settlements despite the fact that Holston refers to planned areas. The research attempts to find out whether there are housing types that have emerged in informal settlements to reflect social change among house developers. The pertinent question being raised is: do the transformed houses reflect the changed social status of both the owners and tenants?

**Design for promotion of productivity**

Another idea under classical modernism is that which advocates design and town planning for the promotion of productivity. It has been argued that productivity may increase if health, safety and good sleep are facilitated. Tipple for example states that:

> The productive worth of housing per se has been difficult to prove even though it seems self evident that better housing conditions will promote a wealthier, happier and more productive population (Tipple, 2000:138).

Modernists also maintains that the separation of functions, the provision of privacy and the abolishment of street as a social space would promote a more rational human being. People in the non-industrialised countries are still struggling to acquire shelter. As long as they have a roof over their heads it may be considered an achievement. But if modernism has proved to increase the standards of houses in industrialised countries one may wish to assess or explore what value judgements of modernism are relevant in order to increase living standards in informal settlements in non-industrialised countries.

### 3.9 Informal settlements

Terms like informal, unplanned, squatters are debatable concepts. Huque (1982) contends that such concepts are “applied to conceptualise shanty towns, where the application of these terms also suggest the existence of a complimentary concept”. According to Huque different authors have used different terms in an attempt to define ‘slums’ and ‘squatter settlements’. He discusses different names that have been used to depict these types of settlements, including spontaneous settlements, shanty towns, squatter settlements, pirate towns, autonomous settlements and slums. Given such a different context, it is difficult to have a generalisable concept of informal settlements.

Observations made by Okpalla (1987) indicate that in most African societies, those referred to as informal have identifiable rights over the land they occupy or seek to occupy through tradition and customary land ownership; as such, unlawful possession of land is an imported concept. This observation has also been made by Petrella and You (1991) who state that informal housing and settlements were beginning to be recognised as economic investments, representing the fixed capital assets of the poor, offering a degree of flexibility in the use of their income and
savings unmatched by the formal sector housing delivery systems. In many countries informal settlements began to attain de facto status, acquired through the length of time for which a settlement had been tolerated or ignored, or through the extension of administrative recognition and the provision of municipal and urban services. In many instances, de facto recognition was also acquired through ad hoc mechanisms rooted in moral or customary authority.

Informal settlements in the context of Tanzania refers to housing areas which have developed outside official land development process and procedure. According to Kombe (1995:45) informal settlements developed before the land is planned and surveyed, so unlike the term squatter settlements, the emphasis is not on the illegality of land ownership or occupation but rather on the nature of a land development process. To make a distinction between the Tanzanian context, and other countries where access to land has not been secured from legitimate occupiers or owners, the term squatter or spontaneous settlements is used because land has been occupied illegally. This suggests that informal settlements in Tanzania refer to basically residential agglomerations where the status of land occupation is not illegal but the settlements have not been conventionally planned, surveyed and sanctioned by government institutions responsible for urban housing land delivery and management. Areas like these have been developed without the formal approval of public and land allocation authority.

Arguments put forward by Kombe (1995:45) show that the overall psychological connotation towards informal housing provides a contrast with other countries, for often informal settlements in Tanzania are not spatially alienated from the rest of the urban areas. This must be attributed to the government attitude of tolerance towards informal settlements, which might have indirectly contributed towards an improvement of housing quality.

According to Nnkya (2002:228) most informal settlements in Tanzania are developed and accommodate people of all socio-economic status. Another unique characteristic of informal settlements in Tanzania is the kind of houses found in these settlements. Nnkya states that:

Most informal settlements in Tanzania have relatively good quality of shelter and related services and infrastructure not significantly different from those built in formal housing areas (Nnkya, 2002:228).

This characteristic can be explained by two basic factors as stated by Nnkya that is, political security of tenure enjoyed by the property owners, who for almost thirty years, since the change of government policy from slum clearance to settlement upgrading, residents have lived in the belief that planning authorities will not displace them unless under very special circumstances. In such a case they would be entitled to compensation, for whatever improvements in the land use. Another factor is the relatively low price of land in these settlements, therefore the residents can spend less on land and more on housing development.
In view of these trends it is important to study the processes of housing transformation in informal settlements and analyse the spatial qualities. This is particularly interesting because unlike the formal housing land delivery system on which modernism theory was premised, the system through which informal housing land is acquired is not regulated or guided by formal institutions. As such one might be in a position to find out the actors, extent and manifestation of modernity in informal housing areas.

3.10 Housing transformation

Housing transformation is not a new concept. In this study it refers to changes. It embraces the variables of physical alterations, extensions and replacement.

Transformation of a dwelling is defined as “an alteration or extension involving construction activity and using materials and technology in use in the locality” (Tipple, 1991:4). In his study on “Self-help Transformation of Low Cost Housing”, he includes erecting bamboo-matting walls in Bangladesh, although they might not be regarded as construction in another context. There are some activities excluded in his study, which could also be considered as transformation. These are repainting, changing the design of doors and window frames, hanging curtains to divide rooms and changes in the use of spaces. These changes lead to important discussions on housing quality because they also contribute to “household’s enjoyment and identification with their dwelling”. Alterations, on the other hand have been defined as “internal changes to the layout of the units without increasing the overall net floor area” (Tipple, 1991:20). Extensions involve built additions, which add at least one functional component per unit (Tipple, 1991:20). Tipple also states that the activity of altering and extending housing by self-help, and using the space for household accommodation or economic gain, could be seen as an expression of this demand and a means to satisfy it.

Consistent with Tipple’s argument, Salama, who carried out a study on public housing transformation in Egypt, dealt with the definition of the concept transformation. He states:

As a result of the inappropriateness of public housing and its failure to respond to user needs, many families decided to take over their housing and started engaging in informal building activities inside the formal sector. This engagement was embodied through a variety of modifications and extensions – referred to as user transformations carried out in government built housing projects (Salama, 1998:32).

Salama went further to identify various types of transformation. These are interior and exterior transformation. Interior transformation refers to modification in the use of interior space, modification of interior walls in order to change room size, other smaller modifications like repositioning of doors, using curtains to separate space for privacy reasons and making provision for extra storage space.
Exterior transformation according to Salama involves creating privacy by closing up the parapets of an exposed balcony, making new windows by creating openings in flank walls of a block, an extension of an existing room and appropriating public open space for room extensions. He further argues that:

**User transformation of housing should not be considered as a simple space enlargement process, rather as a result of a complex set of inter-related determinants associated with both context and dwelling characteristics** (Salama, 1998:32).

According to Kironde (1992:226) the term extension is used in urban Kenya to mean accommodation constructed on a plot over and above the legal or original main house. The main features of extensions found in Kenya is that the accommodation created is supposed to be used separately from the main house, usually by tenants.

Larsson (1999) found that the transition from traditional to modern housing involves a number of aspects related to building materials and techniques, use of space and the layout of a dwelling. Other characteristics are use of space in relation to activities performed in the dwelling such as, household chores in relation to meals and laundry, personal hygiene, informal income in the dwelling, storage, gardening and keeping domestic animals.

A study on dweller initiated changes and transformation of social housing in Chile was carried out by Kellet *et al.*, in 1993. The study focused on change initiated by the users themselves, using their own resources. The question of how and why users intervene in the housing process is also addressed. In this study the researchers identified different types of transformation which “involved change of space usage layout, physical alterations or modifications to the existing structure as well as extensions” (Kellet *et al.*, 1993:4). The changes were initiated by either an individual household or groups of neighbours. A list of explanations on why changes are made were given as incomplete, deficient or inadequate dwelling for the context, change of dwellers requirements, aspirations and expectations of the occupants change, change in response to efforts to personalize dwelling, change made in order to generate income. It is the interest of the present study to find an explanation to how and why housing transformation is taking place in informal settlements in Tanzania in relation to these theoretical premises.

Transformation may take place in all types of housing. To understand its importance we need only realise that even in non-expanding settlements transformation be it positive or negative, takes place continuously. Transformation takes place through unplanned or planned changes. Some parts of houses are repaired, maintained or improved upon. A house, which is getting too old and no longer serves its purpose, may as well be replaced.

In Tanzania, so far no studies have been attempted on the subject of housing transformation. Thus efforts are yet to be made to explore and define the transformation process going on in housing areas, especially in informal settlements.
where conventional planning guidelines are not applied. In this study, the concept
given by Tipple 1991 is adopted with the definition given by Salama. In this case
transformation means extension of rooms, alterations where for example, walls are
demolished to combine two rooms or a change in the repositioning of windows
and doors by using the available building materials and technology. Salama states
that “understanding the phenomenon of transformation is a prerequisite to any
attempt to provide better quality housing environments and to improve living
conditions of the existing ones” (Salama, 1998:32).

3.11 Housing adjustments theories

Housing adjustment theory explains why people adjust their housing. Although the
theory is largely based on industrialized countries, Tipple finds it useful in non-
industrialized countries as well. He states that in industrialized countries
households have options of whether to move or stay in the house and make
changes. He defines this strategy as a ‘move and improve’ choice. According to
Tipple, the decision to make house adjustments is explained as a two way process:

- The first is a decision to adjust housing consumption, the second is a choice
  between moving or improving or a combination of both. The first decision springs
  from a mismatch between consumption and demand. The second depends on the

Increase in the size of a household through additional children or dependants or
the reduction of household members where grown up children decide to move out
to form their own household, changes the need and demand for space. This trend
is explained by both Seek (1983) and Tipple (2000) as a growing mismatch over
time between current levels of housing consumption and demand and preference
of occupiers. The term ‘housing stress’ is used to explain the gap between
consumption, the demand and preferences, which grows gradually but with
increasing intensity over time.

Households will vary in their threshold of stress, the point at which some action
is taken to relieve rather than to continue to tolerate it. They may adopt various
forms of coping behaviour until their threshold is reached and something is done
to relieve it. Even when previously intolerable situation is reached, financial and
other circumstances might make it impossible to change housing conditions
(Tipple 2000:24).

There are also discrete events called ‘shocks’. These are arrival of new children, on
the job promotion or a change to a better job, which usually increase housing stress
(Seek, 1983). There is a variation in household threshold whereby some actions are
taken to relieve the situation rather than continue to tolerate it. Various forms of
coping behaviour are adopted until their threshold is reached and something is
done to relieve it (Tipple, 2000:24). Both Seek (1983) and Tipple (2000) states that
household members have the choice between moving and improving when house adjustment is needed. According to Seek most households improve rather than move because moving creates costs in terms of transactions, with the household goods and furniture.

Invariably the extension of a house, whether in an industrialised or non-industrialised society, has economic advantage and this is acted upon when it is necessary to relieve housing stress.

Whatever choice is made in response to the need for adjustments, the perceived benefits must be seen to cover the dissatisfaction and adjustment costs before action is taken. At the same time, the householder is likely to anticipate future shocks in order to lengthen the time before another adjustment has to be made (Tipple, 2000:25).

The above discussion is set in the context of industrialised countries where the housing market is well developed. The theory they represent may be useful to consider in non-industrialized countries' formal and informal settlements. A relevant question worth examining in relation to this theoretical account is: What are the major motives for the ongoing housing transformation in informal settlements in Tanzania?

3.12 Spatial qualities

The concept of spatial quality draws its meaning from the concept of space. While space has varied meanings, the quality of space also has varied interpretations depending on the perspective from which a given space is being judged. For example, Rapoport (1975) argues that since space is interpreted differently from one specific culture to another, any meaningful evaluation on spatial quality should be linked with use of such spaces. In view of the foregoing observations it would seem logical to evaluate spatial quality from the users perspective. However, Krier (1979) distinguishes two main spheres of urban spaces namely, internal and external space. While an external space is an open, unobstructed space for movement in the open air with public and semi-public characteristics, internal space are for indoor activities and primarily for private uses. This meaning cuts across different cultures.

In this study qualities for outdoor and indoor space are evaluated. Similarly the use of both indoor and outdoor space in relation to housing transformations is examined. The climate of Dar es Salaam is hot and humid. The way houses are designed and their orientations are important to facilitate cross-ventilation and comfortable indoor temperatures. Kyhn (1984) suggests that there are protective mechanisms in extreme weather like planting trees which can give shade, filter the sunlight and reduce air temperature by evaporation and therefore enhance comfort outside and inside houses. Kyhn also advocates adequate roof overhang which can provide shade and protect walls from rain. She further observes that indoor comfort depends on the flow of air movement and solar radiation from heating the structures and therefore the need for well-insulated walls and roofs with reflective
surfaces and design that allows cross ventilation. She discourages enclosure walls for fencing that obstruct wind movement and advises on the use of perforated fencing walls. Shading from trees and full utilisation of cross ventilation in a house can greatly enhance the indoor and outdoor spatial qualities.

The present research intends to analyse spatial qualities in relation to housing transformation taking into account variables of cross ventilation, indoor thermal comfort and sufficient light in the house.

Kent (1990) explores the question of why some people segment or partition their domestic architecture and use of space more than others. According to him there is speculation from other researchers that increased differentiation in architecture and the use of indoor space cross-culturally is vaguely associated with cultural influences or development. However, they have not ascertained precisely what those influences or developments are (Kent, 1990:127). It can be argued that the separation of functions may contribute to healthy or improved buildings, for instance separation of toilets from sitting and cooking. It also follows that segregating females and males in different rooms contributes to increased privacy. These examples assume that by having a separation of functions there is also an improvement in the quality of life which could be very well related to an improvement of housing conditions.

### 3.13 Use of space

All human settlements are divided into spaces of different kinds regarding private and public character. The organisation of the built environment to a very high degree determines the private and public relationship and thereby also the conditions for social life.

Public space is related to use and control of space. Habraken (1998:158) defines public space as “space used by those who do not individually control it”. Getting into public area from private space is a right to individuals. Public space is always open to each and everyone. “Public space is communally shared among those from similarly included territories (Habraken, 1998:158). The use of public space is without exercise of control. Some people from a different territory could be admitted from outside and they may have different attitudes to those entering from the same territory. Those from different territory may feel like guests in a particular public space, but the use is specifically granted and temporary in nature.

Basing himself partly on experience in Bombay, India, Correa (1985:34) categorises outdoor space into four levels of space:

A. Space needed by the family for exclusively private use, such as cooking, sleeping and storage which can be regarded as private.

B. Areas of intimate contact, which are the front doorstep where children play, or one can chat with a neighbour. These can be regarded as semi-private spaces.

C. The neighbourhood meeting places where one becomes part of the community.
D. The principal urban areas used by the whole city which can be regarded as public.

Figure 3.1: Hierarchy of spaces, where private, semi-private and communal spaces are shown (Source: Correa, 1985:34).

Correa (1985:36) notes that covered as well as open to sky spaces are of fundamental importance to poor people in non-industrialised countries since almost all of them are located in warm tropical climates where a number of essential activities can and indeed do take place, such as cooking, sleeping, entertaining friends and children playing. This situation also applies to Tanzania especially in the coastal tropical areas where the climate is hot and humid.

Concepts of personal space, territory and crowding are important for understanding public/private relationship. The issue of privacy has been treated as a universal factor although it is manifested differently in different areas. It can be said that the common element in privacy is the control of "unwanted interpersonal interaction and communication" (Sanders, 1990:43). The flow of information and communication at individual, group or social level are influenced by the rules of privacy. Privacy can be related to "ideas of free will and freedom to control or not to control the flow of information" (Sanders, 1990:50). Due to the fact that individuals want to control privacy there is an establishment of rules to govern access to certain spaces, territories both spatially and visually. These ideas can be linked with space defining elements such as barriers, hedges, partitioning that define limits of spaces and space uses.

Rapoport relates privacy to population density and overcrowding. He puts forward an argument that density is a variable. He sees density and crowding problem in terms of unwanted interaction and hence defines privacy as the ability to control interaction. Privacy could be achieved through rules, manners, time scheduling, physical barrier or spatial organisation. These can be seen as defence against unwanted interaction, as ways of achieving desired levels of interaction (Rapoport, 1975).

Human beings usually establish visible and invisible boundaries and zones of interaction. Wilk (1990:51) asserts that in the definition of personal space and territoriality, the boundaries are marked and privacy mechanism can be seen as a form of boundary control. Lawrence (1987) expresses the importance of the concept "boundary". He finds that one of the fundamental items in the analysis of domestic space is the concept "boundary". There is also a psychological implication of boundaries. He defines conceptual boundaries as:
- Physical barriers for communication.
- Symbolic makers, often with a decorative or aesthetic value, expressing different domains.
- Judicial borders defining limits of legal possession.
- Administrative limits for the management and control of domains.

The kind of boundaries has significant implications on the design and use of houses namely “transition spaces and thresholds”. For instance, with a symbolic boundary the accessibility and visibility depends on social rules contrary to the case of a space enclosed by physical barriers.

Use of space is very much related to control of space. If we are to discuss ‘control’ of space we must first of all try to understand what it means to control space. Habraken (1998:126) states that, “control of space cannot simply imply transformation of space”. It is also different from control of form. He further asserts that, “control of space denotes the ability to defend that space against unwanted intrusion”. The space, which is under control, is considered “territorial”. The ability to close a space, entry restriction is regarded as “territorial control”. If the space is occupied and there is a selection of what is getting out and what is getting in, the phenomenon is said to be “fundamental territorial”. The built environment can be observed as “space under the control of agents”.

Rapoport defines territory as “a particular area which is owned and defended, whether physically or through rules or symbols which identify an area as belonging to an individual or group. These symbols may be walls, fences, posts, changes in texture and one important way in which people terrorise is through personalisation” (Rapoport, 1970:180). The discussions of territory put forward by both Habraken and Rapoport are relevant in the present study of housing transformation. By studying use of space both indoor and outdoor one delineates how the space has been partitioned, controlled and transformed. In this study observation on how people in informal settlements usually make demarcation to mark the boundary of their plot areas is explored. A pertinent question that is being raised is to what extent people use boundaries to define privacy and as a way to control unwanted interaction? Can these acts of increasing privacy be considered as a motive towards modernisation? How are boundaries achieved in informal settlements where conventional building rules do not apply?

There is a common tendency that plans are taken as generic. Functions are read in room sizes or location. An example can be traced from a case of houses in informal settlements where a sleeping room is also used for cooking and welcoming visitors. If this room is called bedroom one is actually ignoring the fact that other activities are taking place inside the room.

Analysis of use of space both indoor and outdoor at plot level in the study of housing transformation is of great importance in understanding how both indoor and outdoor spaces are perceived and used.
3.14 Household

The concept household is rather complex and is not easy to define, especially in the African context. However, comprehending the phenomenon will assist in understanding house design in informal settlements and in the analysis of housing transformations.

Other authors have defined household taking into consideration variables like economy, cooking or eating together. Based on his study of Hausa Settlements in Northern Nigeria Schwerdtfeger defines household as:

A separate unit of domestic economy consisting of all persons who eat together from the same pot, dwell together in one part of the compound, and who contribute most of the time in kind and labour services (Schwerdtfeger, 1982:34).

Schlyter and Schlyter (1979) defines household as “a group of people who normally eat and live together”. However, Schlyter and Schlyter makes a modification by their contention that “sons and daughters with their families are always counted as part of the household if they lived in the same house, even if they lived and ate in separate rooms”. The reason was that the head of household included them in his household when he was interviewed. He/she regarded them as being under his authority. Other relatives and friends for instance, persons not paying rent, were counted as part of the household even if they were living and eating separately. Tenants were always regarded as separate households (Schlyter and Schlyter, 1979:35). The researchers further elaborates that taking into consideration the definition “A polygamist has one household if his wives eat and live together” but usually this was not the case. Trends showed that the wives had separate houses and the husband alternated his residence between them or he always lived with the youngest. In such circumstances, and according to Schlyter and Schlyter, they were counted as two households, one couple and one single woman. The later was counted as single women because practice showed that the first wife was often left without economic support from the husband and was thus in about the same situation as a divorced woman. They categorised household as follows:

1. Single man, children, grandchildren or
   Single man, children, relatives/friends or
   Single man, relatives and friends.
2. Single woman or second wife, children/grandchildren.
   Single woman and children, relatives/friends.
3. Husband and wife, children/grandchildren, relatives/friends.

Laslett (1974:30) divides households in different classes, namely: simple, extended and multiple family households. A simple family household refers to a ‘nucleus’ or elementary family. It consists of a married couple or married couple with their children or a widowed person with offspring. Extended family households refer to
all forms of domestic groups, which include two or more simple units connected by kinship or by marriage. In the Hanna Nassif context it seems useful to adopt Laslett definitions because there is a complex phenomenon like the one explained by him.

In the Tanzanian context in general there are different situations. For instance there are cases of monogamy where a husband, one wife and children with or without extended members of the family are living together. There are also cases of polygamous families where a man has more than one wife sometimes living under one roof and in other cases each woman is having her own house. However, they all consider their husbands as head of the household. There is yet a situation where a married woman after divorce returns to her parents with her children. There are also cases where some men live with their spouses and children, together with their parents but at the same time they are free in many ways.
4 RESEARCH METHODOLOGY

This chapter presents the processes used to carry out the research. The chapter also provides instruments used for selecting and analysing transformed houses. It provides methods used to capture the transformation processes, people's views in relation to modernisation, and observations on how indoor and outdoor space is used. Further, the chapter discusses how house types in the study area can be identified. An attempt is also made to discuss giving reasons for the selection of research methods and why they are considered suitable in this particular case.

4.1 The research design

The case study research strategy was used in conducting the study. Case study is defined by Yin (1994:23) as “an empirical inquiry that seeks to understand a contemporary phenomenon in its real life context, especially when the boundaries between phenomenon and context are not evidently clear and in which multiple sources of evidence are used.” Complementing Yin’s statement, Bell (1993:8) itemises case studies as explanatory, descriptive or exploratory. While researchers concern in an exploratory case study is seeking new ideas or insights on the phenomenon being studied, a descriptive case study deals with issues or events which have or are taking place. Explanatory case studies, however seeks to develop or unveil the cause-effect of the studied phenomena.

The main aim of this study is to find out how the housing transformation takes place in informal settlements. The study explores the factors influencing transformation and the implications of transformation activities ensuing spatial qualities. This work seeks to understand people’s attitudes to housing modernisation, how they use space, what house types are found in the research area as a result of housing transformation.

This has been carried out by studying one case of an informal settlement called Hanna Nassif in Dar es Salaam, Tanzania. In the informal settlements of Tanzania housing provisioning is organised by the residents without any government intervention. The same people carry out the activities of changing their houses.

The major themes in this study are housing, people, indoor and outdoor space and the interaction between them. This focus demands a direct encounter between the researcher and the residents. In this kind of research, an in-depth study is needed to understand peoples' values, interests and aspirations, in the process of housing transformation. Such a study calls for qualitative and quantitative approach. According to Gilham (2000:10) qualitative research focuses on what people tell you and what they do. Quantitative research is generally concerned with measurements and is characterised by a more structured and standardised data collection. Qualitative research views the individual or organisation in a holistic manner rather than reduced to isolated variables. The use of a quantitative approach was limited to a small scale. The Quantitative data provided this study...
with essential statistics, while qualitative data enriched the research discussion developing a better context for interpreting the results from statistical data.

For a detailed study of housing transformation, the actors in the process, their views on housing transformation, modernisation and the use of space are being examined. In examining the spatial qualities together with identification of house types, a single case study approach is used. Before commencement of the research, a pilot study was carried out. Results from the pilot study were used to improve the selection of houses for in-depth studies and improve upon questions which were addressed to the residents.

4.1.1 Choice and justification of research strategy

The selection of a research strategy is very important for it may affect the validity and reliability of data. Lerise (1996:198) points out that; “a properly selected research strategy has real life practical value”. Therefore, the choice of a method is determined by a number of factors, which include, the purpose of the study, the nature of the information required and the availability of resources. Understanding the process of transformation calls for an exploratory descriptive explanation of the phenomenon. The basic issue in this research is first to discuss the concept of housing transformation and make use of the definition in a real life context. In order to understand the process of transformation a systematic approach is needed to see what kinds of changes are taking place thus identifying the potentials and possible risks of the transformation process.

The selection of a case study strategy is justified by the nature of the research problem, objectives and research questions. The focus of is on the transformation of houses, process and outcomes. The appropriate questions are ‘how’ and ‘what’ is taking place in relation to housing transformation. The focus, therefore, is a combination of descriptive and exploratory accounts towards understanding the process, problems and outcomes of housing transformation. Housing transformation involves a chain of actions and actors. The analysis of the transformation and subsequent changes in the use of space and spatial qualities need to be examined in their real life context.

The analytical description of peoples values, interests and judgements is of significance in answering the “how” question. The houses as objects of the study are observed and analysed, judgements and interpretations made.

The case study strategy is significant in a study of this nature, since it brings to light the processes of housing transformation together with the actors in the real-life situation within their specific context of this study. The approach, however, has both weaknesses and strengths. One of its positive aspects is that it permits the researcher to concentrate on a specific issue and to identify various interactive processes at work. These processes may remain hidden in a large-scale survey but could be important to the success or failure of systems or organisation (Yin, 1994). Case studies may supplement information on a survey or are usually carried out as a freestanding exercise (Yin, 1994). However, they can be conducted before a survey, as a means of identifying key issues which merit further investigation.
Further the strategy is advantageous in comprehending a definite problem or situation deeply, particularly if cases rich in information are found. Complimenting the significance of the case study strategy Flyvbjerg argues that:

*Cases are important for a researcher’s own learning process. If researchers want to develop their skills to a high level, then concrete, context dependent experience is just as central for them as to professionals learning any other specific skills* (Flyvbjerg, 1995:7).

He further argues that “sometimes we simply have to keep our eyes open and look carefully at individual cases... not in the hope of proving anything but rather in the hope of learning something” (Flyvbjerg, 1995:8).

The case study research strategy is relevant in this study because housing transformation occurs in a ‘real life’ context. According to Yin (1994:3) “case studies allow an investigation to retain the holistic and meaningful characteristics of real-life events”. The unique strength of the case study is that it enables the researcher to deal with a variety of evidence, documents, observations and interviews.

The major concern about case studies is the fact that “they provide little basis for generalisation... and they take too long and they result in massive documents” (Yin, 1994:10). However, Yin points out that case studies like experiments are “generalisable to theoretical propositions and not on populations or universes” This means that the case study does not represent a sample, where the main goal is an analytical generalisation not a statistical generalisation.

Clear understanding of housing transformation helps in identifying issues, which can form a basis for understanding housing evolution in other informal settlements. The observed phenomenon in this study could be related to other settlements with similar conditions to the study area.

### 4.1.2 Selection of a case: Why Hanna Nassif?

Scholars like Patton (1987) and Flyvberg (1999) discuss decisive factors for the selection of a case study area. According to them the selection should take into account cases which are information rich. Information rich cases are those from which one can learn a lot about the issues that are in the study focus. Patton states that:

*Cases become particularly useful where one needs to understand some particular problem or situation in great depth, and where one can identify cases rich in information, rich in the sense that a great deal can be learned from a few exemplars of the phenomenon in question* (Patton, 1987).

In this study a case study area considered to be information rich is selected. Dar es Salaam is considered an appropriate area for this particular study because it is the largest urban agglomeration in Tanzania and is one of the rapidly urbanising cities in the country. Given its social-economic conditions more people are attracted to
reside in this city. The population is growing rapidly indicating that more and more people will be living in informal settlements where it is easier to get cheap accommodation. The pilot study done in 1999 by the author indicates that due to the high demand of rooms for renting there is addition of more rooms taking place. Another factor is that the landlords wish to maximise profit by having as many tenants as possible and, therefore, increase of rooms and other modifications are taking place.

The selection of Hanna Nassif as a case study area is motivated by the fact that it is an information rich because the phenomenon in focus of the study, that is transformation is highly manifested. Hanna Nassif is an important settlement for a detailed study because it is an extreme case taking in to account that it is one of the most densely populated neighbourhoods in the city of Dar es Salaam. A study conducted by the University College of Lands and Architectural Studies in 1998 showed that Hanna Nassif had 19,000 inhabitants. The population density was found to be approximately 390 persons per hectare. This is considered to be one of the densely developed settlements when compared to for example Mabibo area with 189 persons per hectare, Mikocheni A with 191 persons per hectare and Buguruni with 205 persons per hectare (Kironde and Rugaiganisa, 1995:15).

The settlement is located very close to the city centre (four kilometres) attracting more people to reside in this settlement. The Hanna Nassif upgrading project, especially the improvement of water channels drainage, has eliminated the problem of flooding during the rainy season. This has given people the opportunity of improving their houses as revealed by the increasing building activities in terms of extensions and alterations that are taking place. This is also one of the major motivations for selecting this area as a case study.

The selection of Hanna Nassif as a case study area was also motivated by the fact that there are a number of studies that have already been conducted in this area that can be used as a source of evidence in this research. These include studies by Kombe (1995) on formal and informal land management in Tanzania and by Kombe and Kreibich (2000) on informal land management in Tanzania. Although these studies do not cover the area of housing transformation, they deal with pertinent issues of land regularisation, servicing, and processes in land acquisition and subsequent development. It is envisaged that sufficient evidence in relation to understanding the transformation of houses would be obtained in the informal settlements of Dar es Salaam.

Besides the foregoing aspects, recent studies by Nguluma (1997) on the improvement of infrastructure in Hanna Nassif, a base line survey of Hanna Nassif (1998) by UCLAS and a study by the UCLAS students and Milano Polytechnic Institute of Architecture (Bersani and Bogoni, 2001) about living in developing countries, where Hanna Nassif was one of the areas studied qualifies Hanna Nassif as an area of study because of the information available. There are also aerial photographs of Hanna Nassif for the years 1975, 1982, 1987 and 1989. All this information clearly indicates Hanna Nassif as “information rich” settlement because one can learn a lot.
The 1998 base line study attests that the main use of land has remained residential for a long time. The land and building use pattern of the settlement has basically remained the same except for the commercial-residential category which has modestly increased. The study also indicates that there are substantial activities of building extensions, new buildings construction with replacement of the originally temporary residential structures and changes of building use. These changes make the settlement relatively more dynamic in terms of housing transformation and spatially consolidated compared to many other informal settlements in Dar es Salaam. The 1998 study indicated that tenant households constituted 70% of the total households, while 29% were house owners. About 70% of the tenant households were renting only one room, 22% had 2 rooms and 4% had three rooms and 4% rented four rooms. This indicates that in Hanna Nassif there are different tenure systems where one finds houses occupied by tenants only, owner occupied houses and owners and tenants sharing the same house. The multiple tenure character is likely to give answers as to why the transformation is taking place in the settlement.

The extent of housing development, improvement and changes observed in the settlement, has also been the force behind choosing Hanna Nassif as an area for the study.

The development in general has demonstrated characteristics which are described as an extreme/ deviant case. The improvement of settlement has been by using community initiatives and having a lot of donor funding being injected to the community projects. According to Patton:

...Cases that are rich in information because they are unusual or special in some way...or especially enlightening as outstanding successes or notable failures...lessons can be learned about the unusual conditions or extreme outcomes which are relevant to improving more typical programmes (Patton 1987:52).

Hanna Nassif is also an extreme case being one of the oldest informal settlements in Dar es Salaam with a long duration and intense experience of the transformation processes. This shows that one can learn a lot from activities which are taking place.

Understanding that housing transformations is one of the mechanisms of intervention by people themselves in housing development is realised, through house alterations like extension, alteration, demolition and replacement by better and durable houses. This study seeks to explore and analyse issues like space use and spatial qualities, separation of functions, privacy, health and comfort. Identification and classification of house type is also an important variable in this study since it constitutes one of the major results of housing transformation.

In carrying out this study the researcher seeks to understand the extent to which transformation is related to housing modernisation, while learning how housing transformation addresses the diversity of interests of house owners and their tenants.
Before selecting Hanna Nassif the researcher visited other informal settlements and made some observations. Areas visited included Buguruni Moto, Buguruni Mnyamani and Keko. These observations indicate that house production follows the same process as those observed in Hanna Nassif and many other informal settlements. Usually mafundi are used rather than contractors. Statistics reveal that approximately 90% of urban houses in Tanzania have been built by private individuals (Kyhn, 1984:45). When one looks at housing finance the general trend in Tanzania is that people are using their own savings and there is no housing bank. The above situation indicates that it may not make a big difference whether one is studying housing transformation in one or more informal settlements. It is likely that the results will be similar because of the same contextual factors. However, this is not to say that Hanna Nassif is a representative case of other informal settlements but what is found in Hanna Nassif could be similar to what could be found in other informal settlements, provided the context of other settlements are similar, since case and materials from the case are context dependent.

### 4.1.3 Quantitative and qualitative methods

Social science studies identify two principle approaches to research namely, qualitative and quantitative approaches (Nachmias and Nachmias, 1997; Patton, 1987; Denzin and Lincoln, 1994). Quantitative research is characterised by structured and standardised data collection through experiments and surveys (Nachmias and Nachmias, 1997). Quantitative methods use standards that fit various opinions and experiences into pre-determined response categories. The advantage of the quantitative approach is that it measures the reactions of a great many people to a limited set of questions, thus facilitating comparisons and statistical aggregation of the data (Patton, 1987: 9).

The qualitative research views individuals or organisations in a holistic manner rather than reduced to isolated variables and hypotheses. Qualitative data provide depth and details through direct quotation and careful description of programme, situations, events, people, interactions and observed behaviours. The detailed descriptions, direct quotations and case documents of qualitative methods are collected as an open-ended narrative, without attempting to fit programme activities or peoples’ experiences into pre-determined, standardised categories such as the response choices that constitute typical questionnaires or tests (Patton, 1987: 9-10).

Both quantitative and qualitative approaches are used to collect data in this study. In the qualitative approach open-ended questions are addressed. Kvale states that:

> The interview is qualitative if the emphasis is on the quality of descriptions, nuances and differences... To emphasize what happened, what did you do, what did you feel rather than immediately why did you do this. Is like using analogy with a medical doctor. He does not ask why you are sick, he asks you to describe the symptoms. When did you first feel that way? How did you...
experience it? What happened. He conducts observation and makes interpretations in the situation (Kvale, 1987).

The recorded cases narrate the process of housing development in the area and transformation in particular. Face to face interviews have been conducted. It has been important to ensure that the residents respond freely and openly. This is achieved by making sure that questions are put in a straightforward and clear manner with the residents given adequate time to narrate their experiences.

Observations and discussions were carried out including analysis of the literature and measurements of the houses. In the quantitative approach structured questionnaires are addressed.

It has been pointed out that greater confidence can be exhibited in research findings if the findings are derived from more than one method of investigation, consequently this work adopted both the qualitative and quantitative approaches.

4.2 How the research was conducted

A summary of the aspects and methods of investigation is given on figure 4.2. Yin (1994:78) states that “data collection for case studies rely on many sources of evidence like documentation, archival records, interviews, direct observation, participant observation and physical artefacts”. He further notes that there are other source of evidence like films, photographs and videotapes.

In this research, data collection is conducted in two phases. The first phase entails measurement of houses to document the size and extent of the transformed house and general reconnaissance of the house owners with the fieldwork conducted between September and December 2000.

The second phase of the fieldwork studies was carried out between August and October 2001 where the primary objective is to fill in the gaps not covered in the first phase. The main issue includes the social economic conditions of the residents, physical structures and spatial qualities and peoples views, with regard to housing transformation and the concept of house modernisation.

A total of 120 houses were selected for interviews in this phase. Specific issues that were addressed include household social background data, general information on transformation and how the space is used at plot and house level.

4.2.1 In-depth interviews

According to Yin (1994) one of the most important sources of case study information is the interview. He identifies three forms of interview, namely an open-ended interview, whereby one can ask the residents for the facts concerning their opinion about ongoing events. A focused interview is where a resident is interviewed for a short period of time during which interviews may remain open-ended and assume a conversational manner. A third type of interview demands more structured questions. Yin further states that;
Overall, interviews are essential source of case study evidence because most case studies are about human affairs. These human affairs should be reported and interpreted through the eyes of interviewees and well-informed respondents can provide important insights into situations (Yin 1994:85).

The principal aim of this study concerns the views of people on the issue of transformation, modernisation and how they use space. This interview method has been preferred rather than the distant administration of questionnaires. In-depth interviews were conducted in 21 houses in order to understand:

- How the transformation is taking place?
- Who are the actors in the transformation process?
- What do residents think about housing modernity and modernisation?
- How are the outdoor and indoor space used and what are their spatial qualities?

The criteria for selecting the houses for in-depth interviews based on a number of factors. The first factor is the houses, which are considered to be “modern”. These include houses constructed primarily with concrete blocks and roofed with corrugated iron sheets or tiles. Other criteria are whether the houses are located along the streets or within the inner part of the settlement. This is considered important to find out trends in transformation along the street and in the interior side of the settlement. Further, the selection is also based on tenure characteristics, whether the houses are for owner occupation, renting or both.

Open-ended questions have been raised so as to provide an opportunity for residents to elaborate their views on specific issues that were raised which also provides an opportunity for the interviewer to probe specific responses that are not as detailed as required. Cohen and Manion (1989) observe the advantages of open questions as:

- Allowing the interviewer to probe so that one may go into more detail
- Encouraging rapport.
- Allowing the interviewer to make an assessment of what the respondents really believe.
- Providing room for flexibility in terms of the format of interviews.
- Enabling the interviewer to test the limits of a respondent’s knowledge.

In-depth interviews were tape recorded to provide a sound base for the respondents’ answers while facilitating referencing and citation during report writing. A research assistant assisted in taking notes to complement what the main researcher has been writing. The main target for in-depth interviews are the heads of households interviewed to give their views on and describe the transformation process. In rented houses tenants have also been interviewed.
Informal discussions with members of the households have also been done to triangulate information gathered from plot and house measurements and interviews with the residents of Hanna Nassif, while the researcher listens to accounts of how the housing transformation process takes place.

The recorded cases narrate the process of housing development in the area and transformation in particular. Face to face interviews have been conducted. It has been important to ensure that the interviewees talk freely and openly. This has been achieved by making sure that the questions were put in a straightforward, clear and non-provocative way. The residents have also been given a lot of time to narrate their experiences.

4.2.2 Interview with key informants

Interviews with key informants helped in finding out the historical development of the Hanna Nassif settlement which included informants residents who have been living in the settlement since the early 1960s. They spoke of changes in land use in the settlement and housing development. Other key informants were mafundi, contractors, architects and planners. These were useful in giving information on the role of professionals in the transformation process. Key informants were considered knowledgeable to unveil information that led to further probing and questioning of the stated study aspects. Patton (1987:95) states that key informants are respondents who are knowledgeable and articulate, with deep insights that assist the researcher in understanding what is happening.

4.2.3 Observation

Activities of ongoing transformation during the period of the study have been observed with regard to house form, changes in facades, changes done in relation
to house location, for example if the house was located at the frontage of a street or at the back of a street. The researcher also observed if the transformation was interior, exterior, vertical or horizontal. Observations on the use of both indoor and outdoor space focused on domestic activities such as cooking, eating, washing dishes and clothes, bathing, socialising and small-scale business. These aspects are assumed as important in discussing issues of housing improvement related to the separation of functions, issues of promotion of indoor comfortable life in relation to health design and privacy.

The idea was to carry out observation anonymously without any previous explanation to the people who were being observed in order to avoid influencing people’s behaviour. However, it was not possible to carry out this exercise without the knowledge of the occupiers. This was because one had to spend a day in one house to observe all the activities taking place. If the occupants were not aware they would have been surprised to see a stranger. The exercise was to carry out a one-day observation in the selected houses. Since observation is time consuming and becomes difficult to manage a large sample, only ten houses were observed. The relevance being that it helps to corroborate responses from the interviews and other sources of evidence. Since the intention was to carry out physical observation and not participant observation, it was not easy to carry out the observation exercise continuously all day. This situation requires a time sampling schedule. It was, therefore, planned that the observation would take place from 0700hrs to 0900hrs, afternoon from 1200hrs to 1300hrs, and 1500hrs to 1800 hrs. The researcher carried out the observation by herself.

4.2.4 Document analysis

Another method used includes analysis of documents. According to Yin (1984:81) documentary information is likely to be relevant to most case study topics. In the case of the present study the researcher used minutes of the meetings, written reports, proposals and progress reports from the Hanna Nassif settlement.

4.2.5 Measurements

Measuring was another method employed where houses and plots have been measured and sketched (Plans, sections, plot size, outdoor space and indoor space). Spatial organisation and use of different rooms also documented, taking into account the way the house is furnished. The sketches show different types of housing transformation, the way outdoor spaces are designed and the relationship between outdoor and indoor space. A total of 21 houses, where in-depth interviews were conducted they were also measured indicating phases of transformation, especially extensions. The drawings and photographs provided a foundation for making an analysis of housing transformation. Ten groups of houses with a total of 100 houses were also measured and plans drawn, providing a basis for identifying and classifying house types in informal settlements.
4.2.6 Photographic registration

Photographs were also taken to document real life situations and spatial qualities. The photographs were taken systematically in different parts of the house, including all elevations, inside rooms, the way the space is used outdoors and the roof structures where it was possible.

4.2.7 Analysis of aerial photographs

Aerial photos of Hanna Nassif settlements from 1975, 1982, 1987 and 1988 were collected and analysed indicating housing development in the study area. The periodic photographs show changes which have taken place in individual buildings and the distribution of houses which are the physical products of housing transformations. Aerial photos provide a basis for establishing trends in housing densification processes in the settlement. In the aerial photos there are some details which could not be seen as clearly as human beings and vertical extensions.
## Aspects of Investigation

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<th>Aspects</th>
<th>Analysis of Scientific Literature</th>
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<th>Photographic Registration</th>
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**Figure 4.2:** Summary of research issues and methods used.

**Key:** ✗ indicating that the method is important.

✗ Indicating that the method is used to supplement other methods.
4.3 Reliability and validity

While reliability refers to the fact that if operations are repeated they may end in similar results, validity aims at establishing causal relationships, whereby certain conditions are shown to lead to other conditions (Yin, 1994:36). The goal of reliability is to minimise errors and biases in a study (Yin 1994:36). In order to make sure that the issue of reliability is taken into consideration a case study protocol was prepared. The protocol is a major tactic in addressing threats to the reliability of case study research. It is intended to guide the investigator in carrying out the case study. The protocol content includes the following, as advocated by Yin (1994):

- Case study project overview (research objectives, case study issues and relevant readings about the topic being investigated).
- Procedures for the field (credentials and access to the case study, general source of information).
- Case study questions (specific questions that the case study investigator must keep in mind in collecting data, potential source of information for answering each question).
- A guide for the case study report.

Besides the case study protocol, and in order to address the question of reliability and quality of data collected, only graduate research assistants from the University College of Lands and Architectural Studies were engaged. Prior to actual fieldwork assignments, training was conducted with the research assistants in order to develop a common understanding of research issues, objectives and methods. In training research assistants, all questions for interviews are scrutinized in order to have a common understanding and interpretation of all questions.

In order to ensure validity multiple sources of evidence are used. These include documentary sources, interviews, observation and aerial photographs. The significance of using multiple sources is to triangulate evidence and develop converging lines of arguments. With triangulation the potential problems of construct validity can be addressed because the multiple sources of evidence essentially provide multiple measures of the same phenomenon.

4.4 Generalisation

Usually most research demands the possibility of going beyond the specifics of a case at hand. Often the case study is criticised for the lack of rigorous techniques and the fact that the case study observation cannot be generalised. However, Yin (1994:38) states that the logic of a case study does not lie within statistical competition, an analogue between sample and generalisation is, therefore, wrong. In terms of general applicability, outputs from one case may only be transferred into other cases if the contexts that influence actions in those other cases are replicable. Lerise (1996:224) notes that the purpose of research is to produce
knowledge, which can become a basis for action and when the findings from the research become a ground for action it is said that it has been generalised. Lerise further argues that case study merit is based on details and the possibility that practitioners can relate it to their own situations and improve their practices. Researchers in epistemological research usually end up with solutions to a given problem but a case shows exactly what is done in a specific context. The capacity to show what is done and how is it done is the core strength of a case.

Is it possible to generalise from a single case study? This question was posed by Nnkya (1996:259) who contends that anybody doing a case study should expect this question from a positivist in social sciences, who holds that it is not possible to generalise from a single case. This indeed appears to be a concern of many researchers. The concern has been dealt with by proponents of case methods. These have argued and demonstrated that it is not only possible to generalise from a single case, but to falsify or verify scientific propositions through single cases.

Flyvbjerg states that re-known scientists have used single cases in developing scientific knowledge. For example, he argues that, Galileo’s rejection of Aristotle’s law of gravity was not based on observation “across a wide range” and the observations were not carried out in the same numbers (Flyvbjerg, 2001:74). Nnkya (1996) is also supporting this idea by noting that cases and experience were also critical in the development of physics by Newton, Einstein and Bohr.

Nnkya (1996:259) concurs with Bassey who advocates that in social phenomenon what is important is relatability, which means the extent to which an observed social phenomenon in a given context might inform similar situations in which the observed phenomenon is likely to occur.

This study did not use statistic representative samples. Therefore, results from the case study area are context specific and cannot be used as representative of other cases. However, the results can be used as a base for relatability with other cases where prevailing conditions are more or less the same as those found in the case study area. The main issue is that the results from this study can be related to other cases with similar conditions as those prevailing in the Hanna Nassif informal settlement.

4.5 **Methodological problems encountered**

During the course of this research some methodological problems were encountered. In some instances house owners refused to respond to the questions. In other instances some residents were willing to respond to interviews but declined to allow the researcher inside their houses. The following were identified as the main reasons behind these reactions.

- A number of studies have been carried out in the settlement thus some residents seemed to be tired of being interviewed.
- There has been a problem, where some people have been cheated and their houses sold without their knowledge. This makes some of the residents not to trust people who want information about their houses.
• It was also noted that people felt some kind of privacy interference, especially when they were asked for permission to go inside the house and analyse issues of spatial qualities.
• Since the settlement is informal several people have the feeling of insecurity on their property. Residents view researchers as government officials who might be planning to demolish their houses.
• It was further noted that some people have built their houses from funds whose sources are questionable. Some of the respondents thought that the researchers were actually coming from government anti-corruption bureau. Therefore they hesitated in responding to some of the questions especially those related to income and expenditure.

Other problems experienced are as follows:
• Some residents have the impression that researchers possess a lot of money. For example, there are some few incidences where I was asked to pay out money. One person said “Now that I have spent so much time responding to your questions, it will be a good idea if you pay for my time.” I explained to him that I was just a student and I did not have money but I remember one person insisted so much and I had to part with Tshs. 1000. (equivalent to 1 US$).
• There is also another incident where a resident agreed to talk to me and answer my questions. However, when responding, he gave very short responses like “yes”, “No” or “I do not know”. He did not want to elaborate on issues no matter how hard I tried to probe. There was a time when he said, “Why don’t you sit down and fill in the answers at home by yourself. I am sure you know the answers”. I explained to him why it was important to hear from the people but he seemed not to be convinced. To him the whole conversation seemed waste of time.
• In some houses where women respondents were at home, they were unable to participate unless they secured permission from their husbands, I noted that some women had no autonomy or say in their houses. It was hard for some women to feel free in discussing issues of housing when their husbands were not around. Apart from the fact that some women respondents knew about the process of transformation of their houses they were afraid to cooperate in the absence of their husbands.
• There was also lack of sense of responsibility on the part of the research assistants, although research assistants were trained on how to go about this particular study, two of them turned out to be untrustworthy. They were cheating in order to quickly finalise the exercise of measuring houses. When I

5 It is important to underscore one aspect in this case that the situation where people are desperate and with poor livelihood opportunities and insecure incomes, tend to be negative when bothered with interviews. They view researchers as people who take their time unnecessarily. They thus develop a negative attitude towards questions that explore their livelihood careers. This is an experience typical of informal settlements where poverty and income insecurity is pervasive.
crosschecked, I found obvious mistakes. After two days of research I had to look for other assistants which was quite disturbing because one loses time in training new assistants.

This chapter discusses the methodology and research strategy adopted in this study. Elaborated in particular are tools used for data collection, usefulness of qualitative and quantitative methods as well as validity, reliability and generalisation. The aspects of methodological problems encountered during the period of data collection have also been highlighted. In the preceding chapters, empirical results from the case study settlement are being discussed. This discussion has been structured in Chapter Five, Six, Seven, Eight and Nine.
5 TRANSFORMATION IN PRACTICE

In the preceding four chapters the general introduction to this thesis, the study context, the theoretical framework and the research design and methodology have been discussed. This chapter presents findings with respect to the processes of housing transformation. The issues addressed are how and why transformation is undertaken. Outcomes of the housing transformation as well as potentials and problems presented by the transformation processes are equally elucidated. Owners and tenants views form a basis for the understanding of peoples’ needs and desires in seeking to acquire modern houses through transformation.

5.1 Different types of housing transformation

This study has shown that residents in Hanna Nassif informal settlement, in quite varied circumstances, constantly change their houses in different ways. In most instances of transformations the initiative is taken by the owners, though tenants often have played an influential role. Of 120 houses studied 110 have been transformed in one way or another. Whereas 62 made extensions of rooms to the original structure, 23 made alterations to change room sizes, increase ceiling height, change doors and window size and repositioning. About 25 people demolished and replaced the mud and pole structures with concrete blocks.

Housing in Hanna Nassif has undergone the following forms of transformation:

- Horizontal transformation with rooms added to the original house.
- Demolition of existing houses and replacing them by new structures.
- Replacing mud and pole structures step by step.
- Building new concrete blocks structures beside old mud and pole houses.
- Interior transformations.
- Vertical extensions whereby rooms are added vertically to accommodate additional functions.

5.1.1 Horizontal extensions

This type of transformation take place in a situation where an owner initially builds a single storey house of one or more rooms later on adds extra rooms by extending the existing house horizontally. Usually this type of transformation is provided for from the very beginning, when a house is constructed. Extension works vary from limited activity of extending an existing room or rooms to adding a complete new dwelling unit to the existing one.

A horizontal transformer said that he had extended his house from four bedrooms to six bedrooms:
I found that my family was growing therefore I needed more rooms. I was also preparing myself for retirement, thus I found it a good idea to develop a few more rooms for renting out as a source of income after my retirement. I started by employing a fundi to make concrete blocks. When the fundi advised me that the blocks were enough for two rooms I started saving money for corrugated iron sheets. I bought one sheet, saved money, and bought another until I had an adequate number. Later I saved money for paying a fundi to carry out construction works, two rooms to start with (Interview with Mr. Mkopi, a house owner who has transformed his house from 4 rooms to six rooms.)

Emerging from the above observation extensions of rooms for renting out, can be regarded as source of income to house owners. Rooms for renting out generate investment especially for owners who are looking forward to retirement. It is equally a form of security for unemployed persons. Mobilisation of resources for transformation activities is done in a way that people do not save money and buy materials in lump sum. Instead they save materials bit by bit. This is considered a good strategy because materials are purchased when resources are available. Sometimes, with routine money saving, an unavoidable expenditure may deplete the savings thus disrupting the goal to transform the house.

Figure 5.1(a): An example of horizontally transformed house. The gate at the front elevation provides an entrance to the courtyard.
Figure 5.1(b): A courtyard space of which has been transformed horizontally. Note four doors where toilet and bathroom facilities are located. The courtyard is a central space for washing and drying clothes, a water tap and other outdoor activities.

Figure 5.2(a): A plan before undergoing horizontal transformation. See plan 5.2(b) after horizontal transformation.

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Figure 5.2(b): A plan showing horizontal transformation. Five rooms were added to the plot and also one toilet and one bathroom increasing floor space from 116 to 184 square metres. The residents increased from 5 persons to 15 persons.

Figure 5.3: A house being transformed horizontally. Note the corners of the existing house where blocks are protruding to indicate provision for an extension.
The fact that housing transformations take place without any guidance from municipal officials, reveals that horizontal extension has led to houses becoming too close to each other with high plot coverage resulting in dark and unused alleys which become waste dumping spaces creating dirty and poor living environments. The proximity of the houses also causes problems of ventilation and inadequate light in the houses. Of 21 houses where in-depth interviews were carried, observation shows that in 15 houses air cannot circulate, for only those near the roads have adequate light and ventilation. Thus horizontal transformation has led into the maximisation of land use in order to add rooms for renting and owner occupation (Figure 5.4 b). The owners wish to maximise their profit while compromising spatial qualities. One of the owners had this to say:

We had an idea on how we wanted to extend our house. We needed to utilise the remaining part of our plot using the fencing wall as part of the building so that rafters and purlins could rest on the fencing wall. There was no partitioning in this extension...we wanted to rent out this extension to a person who was interested to run a nursery school. The space is also used as a meeting space for a group of Christians for fellowship run by the pastor who rents this house (Interview with Mr. Mustafa a retired military police officer, who is the house owner, renting out this house, he lives in the same settlement but in a different house).
Figure 5.4(a): A group of houses before transformation.

Figure 5.4(b): A group of houses after transformation.

Figure 5.4(a) and 5.4(b) Group of houses showing houses before and after transformation. In some houses the whole plot has been utilised after transformation.
In this case the extension creates space for services like a nursery school and Christian fellowship. However, the whole plot was utilised by this extension. People residing in this house have very little outdoor space (Figure 5.6, Phase II). The extension also blocks the rear rooms, depriving them of enough ventilation and light. The walls for the extension are utilised as a fencing wall with no openings provided, making the room far too hot for the children attending the nursery school before noon and adults attending fellowship in the evening. Artificial cooling, in this case ceiling fans have been provided to reduce the problem.

Lack of basic services in the community have force individuals to provide such services. Much as the Hanna Nassif settlement is considered upgraded, the government has not made any provisioning for nursery schools. Therefore, homes are used as areas for teaching children. The idea of a fellowship service within a residential house is not a good one. Believers are singing in loud voices disturbing people in the neighbouring families. With this extension completed the owner did not think about toilet facilities. The house has two toilets, for household members. One toilet is specifically for use in the master bedroom. There are about 20 children who are attending this nursery school aged between three and five years. They all use this other toilet. There are about 40 adults who attend the fellowship and use the same toilet. The toilet is over utilised thus creating potentially unhealthy conditions.

![Figure 5.5: Extended room used as a nursery school. The right side wall has no windows, which makes the room very hot. Ceiling fans are provided to cool the room.](image)
5.1.2 Demolition of existing houses and replacing them by new structures

Another type of house transformation in Hanna Nassif involves the demolition of existing structures and replacing them with new ones. Houses, which are being demolished, are mostly built of mud and pole. One way in which this transformation takes place is the construction of new walls of concrete blocks around an existing mud and poles structure. While new walls are being built, old structure walls are demolished and part of the new structure is roofed. The part of the old structure not yet affected houses the occupiers until the new structure is
roofed. Occupiers move into the built up part to allow demolition of the old structure. Partitioning of rooms is completed after roofing (Figure 5.7).

![Figure 5.7: Replacement of mud and pole structure. An example of a house undergoing transformation where a concrete block wall is built around mud and pole structure.](image)

Narrating the process of replacement of old structures with concrete structures one of the respondents said:

The improvement and transformation of my house started early in 1975. In this year I bought a small mud and pole structure roofed with palm tree leaves. I decided to demolish the house in order to build a modern urban Swahili house consisting of six rooms, a corridor between the rooms and the front veranda with a toilet and bathrooms at the backyard. Later, one of the rooms was converted into a sitting room where furniture like sofas, coffee table and television set are arranged. We have also permanently closed a door to one of the bedrooms which opened onto the corridor, and we have opened another door from the room that we converted into a sitting room. Our room is now accessed only through the sitting room and not from the corridor. Another room was converted into a kitchen. We do not have a storeroom so we store most of our household goods in the corridor. We also decided to construct another house at the backyard, which is not a Swahili house. The house has been completed but needs painting and furnishing. We intend to move in the new house and leave the old house to our children (Interview with Mrs. Mfikirwa, the house is owner occupied).
In this Swahili house one door accessing one of the rooms, was closed and another
door opening made through another room regarded as a sitting room by the house
owners. Due to a need for cooking space, which was not provided from the very
beginning when the house was constructed, one room was converted into a
kitchen. Reorganisation of space has been possible because the house is occupied
by only one household. The first house has six rooms. One room is used as a
sitting room and another one as a kitchen which has reduced sleeping space. Due
to the large number of family members, the house owner was motivated to build
another structure in phase three in order to increase indoor space (Figure 5.9). The
house is enclosed with a fencing wall except at the front elevation, where there is a
road of approximately three metres wide. The wall defines the plot boundary,
private and semi private space.

Figure 5.8: A room converted to a sitting room. Note the furniture arrangement for members of
the household and for visitors.
Building a new structure around the old one is a good strategy because the occupants are not easily displaced. However, the people living in the house, are subjected to danger in that the new wall weakens the original structure. The old wall can fall and endanger life of the inhabitants. The new walls might not be
strong enough because the precautions are not often taken into consideration during construction, to protect the old walls while digging the foundation of the new walls. These types of houses do not have a floor slab usually, encouraging moisture to penetrate through the floor and walls. Discontinuation of walls creates weakness at the wall joints, resulting in cracks. Some of the houses which were transformed in this way were noticed to have wall cracks.

With completion of the new structure the transformation would have led to the construction of a Swahili type house (Chapter Two). The Swahili house may be further transformed, where access to rooms through the corridor is blocked making accessibility only possible through another room. One of the rooms here was converted into a kitchen. Usually in Swahili house type cooking takes place in the corridor or in a room or in a kitchen located in the backyard. The transformation increased the size of the house which unlike extensions for renting out rooms, made more space for household members. Another house, which is not a Swahili house, was subsequently constructed on the same plot.

### 5.1.3 Replacing mud and pole structures step by step

Another type of transformation is that of replacing one room after another, whereby a room built of mud and poles is demolished, the walls being replaced by concrete blocks.

One of the transformers had the following to say:

> We bought a mud and pole structure in 1974. We were living in this house until 1990 when we started to demolish one room after another to allow the replacement of mud structure rooms with concrete blocks. The reason behind replacing the mud and wooden pole structure by concrete blocks was deterioration leading to leakage. Rooms used for sleeping were small while toilets were located outside the main house. We also urgently needed to own a modern house with enough space to accommodate all the family members. (Interview with mama Hadija, a house owner and a food vendor in Kivukoni).

The newly constructed structure is in good condition at least in appearance being superior compared to the mud and pole replaced structure. The inner and outer finishing of the house is good where walls are painted and the floor is of sand cement screed leading to better quality house compared to the original structure.

Since indoor space is considered an important part of the house by owners changes are often made to increase indoor space. However, by increasing indoor space outdoor space is proportionately decreased.
Figure 5.10: Replacing a mud and pole house step by step. Replacing one room after another whereby a room built of mud and poles is demolished, the walls being replaced by concrete blocks.

The strategy of replacing rooms step by step in the studied houses is working properly in that those occupying the house reside in the same house, while the work continues. The fact that the transformers have got meagre resources means that they cannot afford to demolish the whole structure and commence reconstruction afresh. This type of transformation gives people the opportunity to transform without too much stress on the availability of funds. The study shows that the transformers take the opportunity to change their houses and at the same time increase sizes of their rooms. One of the studied houses undergoing transformation was found to have two rooms of six square metres each, with room under construction being nine square meters.

5.1.4 Building new concrete blocks beside an old mud and pole structure

In this case those with large plots build one to three or more rooms using concrete blocks and then demolished their mud and wooden poles structure in use. The new structure is then extended to a larger unit as described by this developer:

I built my first house in 1973 and moved into it in the same year. The house had three rooms built of mud and wooden poles. After four years I decided to build a modern house on the same plot. My approach was first to save money for buying building materials. When I had enough money for at least putting up a structure of two rooms, I hired a fundi. I gave him ideas on how I wanted my house to be. The fundi started by constructing the foundation of the whole house. He then built two rooms. I saved some more money and after some years...
the fundi built two additional rooms. When the new house was completed, we moved in and demolished the mud and pole house (Interview with Mr. Mkopki who is selling vegetables in the market. His house is for both owner occupation and renting).

This type of transformation usually takes place in a larger plot, where it is possible to erect a new structure adjacent to the old one (Figure 5.11), which is normally extended step by step until the whole house is completed. More rooms might be extended for renting out with no increase of space for the owner’s household members, since the increase of space is for renting purposes.

In this transformation the transformers start constructing two or more rooms, continuing to add rooms in phases. The new structure is constructed independently from the existing structure, unlike in the two previously discussed kinds of transformation.

Figure 5.11: Construction of a new concrete structure adjacent to the old mud and pole house. The mud and pole structure will be demolished after the concrete block structure is finished. The owner of this house had a relatively large plot at the back of the old building where a new house could be built while living in the old one.
Figure 5.12: Construction of a concrete block structure in order to demolish a mud and pole structure later.

5.1.5 Interior transformation

Transformation of houses is not limited to structural changes of the outer part of the buildings only. Some changes are noted inside the house. Given the fact that in some other cases changes are done step by step, over a long period of time, the use of indoor space involves occupants shifting from one room to another. There are also situations where interior walls are demolished in order to increase the size of rooms. One of the interviewees commented that:
When we were living in a three rooms house, the two rooms were used for sleeping and storage. Cooking was in the middle room, similarly eating, receiving visitors and resting. After we had carried out extensions to more rooms, it became possible to accommodate some extra functions and change use of the rooms. For instance, one wall in the middle room was demolished so two rooms combined to make one big room, which was used for sleeping only. Another room used for cooking and storage and a kitchen area and store area were built. Eating is now taking place in the dining room, while the sitting room is located where we used to receive guests. (Interview with Ms. Amina who sells fruits and vegetables at home).

Interior transformation changes room sizes. For example, in the above quotation, the room increased in size by combining two rooms. Interior transformation also involves the extension of walls to achieve higher ceiling levels and the replacement of small windows with larger ones or demolition of partition walls to create bigger rooms. There are also other changes such as closing doors opening onto the corridor and creating a more convenient accessibility. One of the respondents narrated that:

The roof of my house was leaking. I decided to change the roofing sheets with new ones. In order to save cost, I decided to change the whole roof structure from hipped roof to gable roof. The change of roof structure also gave me an opportunity to increase the height of the room. The ceiling level was too low. Later, I also decided to change the size of the windows, which were too small with insufficient light; and too hot due to poor circulation of air. (Interview with Mr. Jumanne, a retired officer who used to work with the Tanzania railways corporation).

Following the above transformation of this house involved more than room extension, with changes of house elements such as window sizes, partitioning of walls, doors and roof structures. These changes are invariably made to suit the occupants’ change of life style and comfort. However, since the house is double banked with a corridor at the middle, efforts to transform windows size do not bring about significant improvement in cross ventilation. Consequently, the occupiers are obliged to use mechanical devices like ceiling and table fans.
5.1.6 Vertical extensions

In Hanna Nassif informal settlements there are very few two-storey houses. When this study was carried out there were only three and all of them were studied. One of them still under construction had the household members living downstairs with extension taking place vertically.

Vertical extension is another form of transformation, implemented in Hanna Nassif where there is no space left for horizontal extensions. Another motive for vertical extension is to facilitate cross ventilation. In order to understand how vertical extensions take place, one of the inhabitants who had made an extension to his house explained:
vertical extensions take place, one of the inhabitants who had made an extension to his house explained:

I started building one wing of my house which contained three rooms. I hired two mafundi to carry out the construction work. The rooms were inadequate from the start considering the size of my family. I could only manage to start with three rooms, which were vital if I had to avoid being a tenant. I wanted to live in my own house. Later I saved money and decided to extend first horizontally and later vertically. I added a sitting room, bedroom and kitchen to the existing three rooms. I decided to extend my master bedroom, toilet/bathroom and my office vertically. What forced me to extend vertically was the lack of outdoor space in my plot. I, however, got into trouble with some of my neighbours who opposed to the vertical extension and reported me to the City authorities who served me with a stop order at the plastering stage. I challenged the authorities that it was improper to order me to suspend construction works in view of the fact that there are no rules and regulations prohibiting the building of more than one storey building in informal settlements. Eventually I was allowed to proceed with construction on condition that I should roof the toilets of my four neighbours. The neighbours had earlier on complained that as their toilets were not roofed, if I resided in the two storey building I and my family would peep from the top while bathing and using the toilets below. Well, I agreed and gave my neighbours some money to buy roofing sheets for their toilets. Two of them roofed their toilets while the rest took the money but never roofed their toilets (Interview with Mr. O. Msangi, 45 years old, house owner).

It seems as if vertical transformations in Hanna Nassif may have the negative impact of infringing neighbours privacy. It is general knowledge that in this settlement the majority of pit latrines are not roofed. We can ask ourselves: “Why is it that most of the pit latrines in this informal settlement not roofed?” Is it that people cannot afford or is it that the residents do not consider it very important to roof the toilets?

The three vertical developers did not care whether they blocked ventilation and light from the neighbouring houses, but only wanted to fulfil their own needs, especially in seeking more space. However, not so many people have transformed their houses vertically, of 120 houses only 3 houses have been vertically transformed. Local mafundi are capable of constructing this kind of house, at least to two storey buildings.

In Hanna Nassif, for instance, many houses were transformed over the past ten years, since many people aspire to own houses to live in. All residents interviewed indicated the need to own a house. It is possible that the Government Housing Policy has contributed in influencing this preference. One of the policy statements clearly indicates, “It is the responsibility of each Tanzanian to build his/her own house” (Tanzania National Housing Policy, 2000:16). In urban areas it is difficult
for everyone to fulfil the desire of owning a house due to land shortage and affordability. In the circumstances, the transformation process means that by making extensions, the poor are able to provide housing for themselves, although it takes time to achieve their objective.

Developers in the informal settlements do not follow building regulations and the city council do not bother to enforce them. However as it appears, in case of complaints from the neighbours, the council intervenes to regulate development.

Figure 5.15(a): A vertically transformed house. The perforated fencing walls have been used to provide security without limiting cross ventilation.

Figure 5.15(b): Example of a vertical extension amidst low-rise houses. Side elevation of figure 5.15(a). Although vertical extension gives the owner the additional advantage of cross ventilation, the surrounding neighbours complained over the infringement of their privacy. To ensure constant comfort within the indoor environment, the owner of this house has installed a mechanical cooling device, an air conditioner for the upper rooms.
Figure 5.16: Horizontal and vertical transformations. The first phase consists of only three rooms, store, toilet, and bath with ample outdoor space. In phase two four more rooms were added plus a carport. Only limited space was left in the courtyard. In the third phase a master bedroom was added to the first floor. Population increase took place from three people in the first phase to eight people in the second and third phases.
Another vertical developer had this to say:

I decided to buy a plot to build this house because I was fed-up of living in rented premises. Being a man I wanted to own a house as it is a symbol of status. I could not find a vacant surveyed plot, so I decided to buy a mud and pole structure which I later demolished in order to secure space to build a house to suit my needs. I had limited resources to meet my desire to build the whole structure in a single phase. I approached a renowned fundi with some ideas in mind and explained to him what kind of house I wanted. I had no drawings but the fundi understood my verbal instructions. Construction materials such as cement and sand were purchased in small quantities. I hired another fundi to make concrete blocks enough for the foundation. I then halted the work to allow time to generate funds. As soon as I managed to raise some money to allow progress … by the time the foundation was ready I had no money left, so I had to halt the work again. The next stage I made blocks for one room. The fundi built one room after another until the whole structure was finished. I realised that there was still some space left in my plot but it was not enough for additional rooms, so I decided to extend vertically. I consulted a fundi, and instructed him on what I wanted to achieve. The extension started with the proper foundation and some columns. After some time the fundi constructed the slab. It also took some time to build the walls. I am now saving money for the roof. (Interview with Mr. Lyatuu, 48 years old working with the immigration office in the city. He is the house owner).

The house owner did not participate in the manual work. He acted as a client by providing building materials and hiring the fundi. This indicates that the transformation of existing houses is very similar to the process of house construction in the Dar es Salaam. Generally, in Dar es Salaam a house builder finds a fundi who carries out his tasks assisted by labourers. This case has shown that there is a possibility of extending houses vertically using a local fundi.

The limited outdoor space obliged the house owner to extend his house vertically, enabling the occupiers to have better access to cross ventilation compared to those in single-storey buildings. This type of development may also inhibit cross ventilation to the neighbours, depending on the wind direction. In Tanzania there are space standards for residential development within the urban areas, with guidelines for site planning, which requires developers to provide:

- An adequate amount of natural light and ventilation to all rooms and spaces.
- Privacy for each living unit and security.
- Easy and convenient access to the dwelling and circulation around them.
- Sufficient land for expansion.

The space standards recommend that the distance between two buildings front to front, across the street, a walk way or a common area should not be less than 2.5 metres times the height of the taller buildings. Due to the fact that housing development in this area is informally carried out, transformed houses do not take
this requirement into consideration. The distances between buildings are less than one metre wide whereas often the taller building is more than three metres high. This means that cross ventilation within the two storey houses and also those adjacent becomes greatly constrained.

One of the major problems which oblige people to construct their houses in informal settlements is the lack of surveyed plots. The demand for building plots per year is much higher than the number of plots surveyed during each respective period. (Chapter Two). Consequently, those failing to secure surveyed plots to develop houses resort to unsurveyed plots.

![Vertical transformation in progress. The courtyard belongs to another plot. This indicates that the houses are constructed very close to each other.](image)

**5.2 Underlying factors for transformation**

There are many factors motivating housing transformation. A combination of the economic, social-cultural and a great desire for modernisation are factors unveiled by the residents. 36% of the interviewed house owners stated that they transformed their houses due to the increase in the number of their household members whereas 20% of the interviewed residents attributed transformation to modernisation. Other reasons stated by residents include the desire for renting out or increased space for income generating activities.
Table 5.1: Factors that motivate the decision to carry out housing transformation

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Economic factors</td>
<td></td>
</tr>
<tr>
<td>• Renting</td>
<td>17%</td>
</tr>
<tr>
<td>• Space for income generating activities</td>
<td>8%</td>
</tr>
<tr>
<td>2. Social cultural reasons</td>
<td></td>
</tr>
<tr>
<td>• Increase in the number of household members</td>
<td>36%</td>
</tr>
<tr>
<td>• Space for the extended family</td>
<td>4%</td>
</tr>
<tr>
<td>• Privacy</td>
<td>7%</td>
</tr>
<tr>
<td>• Security</td>
<td>8%</td>
</tr>
<tr>
<td>3. Aspiration for modernisation</td>
<td>20%</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
</tr>
</tbody>
</table>

5.2.1 Economic reasons

The majority of people living in informal settlements are low-income earners. Results of this study show that among other reasons compelling residents to transform their houses is to generate income by extending rooms for renting out or rooms for carrying out commercial activities.

It is noted that apart from the addition of room, there are also extensions done to provide front verandas. Such extension is undertaken to provide space for home-based economic activities. Extension of houses located on main streets is often aimed at accommodating new demands including small businesses like shops, beauty and hair dressing salons, butchery, carpentry, and vegetable stalls.

Home-based economic activities are survival strategies for owners and tenants. Some of these new demands have negative effects upon the environment. For example, beauty and hair dressing salons contribute to environment deterioration when chemicals from washed hair are disposed of in drainage channels. Carpentry works are noisy and disturbing people living in the neighbourhood as no precautions are observed for soundproofing. Butchers dispose off dirty water into storm water drains, causing bad odours in the area.

In countries like Tanzania where informal economic activities play a significant contribution to household incomes, home-based activities are part of home life. Rooms extension provides space for income generating activities. Transformation leads to housing which accommodates informal economic activities such as shops, tailoring marts, salons, butchery, milling machines and the vending of cooked food.
Income from tenants

Many house owners in Hanna Nassif supplement their regular income through renting out rooms while others depend entirely on their income from rent. Of 120 people interviewed 17% transformed their houses to create additional rooms for tenants. Rent per month for a room is between Tshs. 8,000 to 10,000 (US$ 8 to 10) per month. The minimum wage for a government employee in Tanzania is Tshs. 30,000 (US$ 30). This implies that for a house owner with 3 rental rooms, he or she can easily receive Tshs. 30,000 equivalent to the minimum wage of a government employee. But some owners have more than 3 rental rooms indicating that the more the rooms, the more the income.

One of the respondents explained why they transformed their house:

We found that in our plot there was still ample space which could be utilised for additional rooms. We informed a fundi that we want a structure where each single room could be occupied by a single tenant. We also asked him to make estimates of building materials and other costs. The extension of the extra rooms was completed in one phase. The reason which made us make extension, was to earn income through renting out rooms. (Interview with Mr. Hussein, a small businessman, who owns another house in the settlement where he is living).

There are two forms of rental accommodation within the case study area. First, renting out one or more rooms to one or more tenants. Second, the renting out of the whole house to one tenant. One of the house owners remarked:

I made a lot of changes on the house like putting in a ceiling, creating two additional rooms, repainting the entire house and building a fence. I wanted to make the house look more attractive for tenants looking for a house... I do also have another house here in Hanna Nassif, which I rent out to make a living. The rental income supplements the small income from my modest business. The extensions I made to the house enabled me to secure reasonably good rent. (Interview with Mr. Hussein, a small businessman, who owns another house in the settlement where he is living).

Renting out rooms is a distinct economic activity taking place in residential houses. Other businesses carried out within residential premises include small groceries, tailoring marts and carpentry works.

Creating space for income generating activities

Availability of space for income generating activities is another motive for transforming housing units. Of 120 interviewees, 8% said they made extensions for the purpose of creating rooms for income generating activities. As already noted some houses are extended to create room for small shops, hair salons, pharmacy, tailoring, carpentry and even dispensaries (Figure 5.18). Both men and women are
engaged in these income-generating activities. A woman interviewee said that she prefers to carry out income generating activities around their residential premises to enable her take care of her children and domestic chores, as is evident in this case:

We first built a single room structure at the frontage of our plot. The intention was to occupy the unit while we develop a larger housing unit with the anticipation of using the small house for business. As soon as we shifted to the one room house, we commenced construction of the main house. We consulted a fundi on the type of house we wanted to build. The fundi came out with some ideas which we adopted. When construction of the larger house was completed, we moved in and used the small house as a shop. The shop is now a source of income to our family. I run this shop while my husband runs a larger shop in Ilala area. I like working here at home because I can take care of my children and at the same time do something to earn income (Interview with Mrs. Tesha who runs a shop at home).

In the light of the above, it is apparent that there is a relationship between housing and income generating activities. The importance of this link can be in the interaction between residential and income generating activities. Thus houses are not only used as shelter, but also as a source of income.

Figure 5.18: A residential house in which one room was added to be used as a shop. The shop is accessed through the front veranda.
5.2.2 Socio-cultural reasons

Social factors influence housing transformation such as increase in the number of household members. Others are space for extended family members, in search of privacy, protection and security.

Increase in household members

The need to accommodate increasing numbers of the household members is a major factor influencing housing transformation. Of 120 people interviewed 36% stated that they transformed their houses to take care of the increasing number of household members. One of the interviewees explained:
I used to live in a three bedroom house when I just got married. I was blessed with my first child. After some time I was blessed with another child. Our plan was to have six children. We discussed with my wife how we could accommodate an increased family size. We agreed the solution was to add few more rooms to the remaining space of our plot. (Interview with Mr. O. Msangi, 45 years old and a house owner).

Many people cannot acquire or develop sizeable houses for themselves to meet their immediate needs even if they need more space. Those who can afford to build houses, which are inadequate to meet social demands, struggle to bridge the gap by extending their houses step by step.

It is common knowledge in Tanzania that the practice in urban areas is that teenagers of 18 years and above continue to live with their parents until they are able to support themselves by renting a room or building their own houses. Sometimes they stay with their parents up to their late twenties or beyond, even after marriage. Thus, parents feel obliged to expand their houses for the sake of accommodating their adult sons and daughters. This denotes that parents in Tanzanian society living in urban areas can support even their older children. This might be due to the lack of enough houses to accommodate people in urban areas. Quite often government has not thought of how the accommodation problem for the younger generation should be solved.

**Space for an extended family**

The interview shows that one of the reasons leading to the transformation of the houses is to support relatives such as brothers, sisters and cousins. When such dependants finish school they migrate to urban centres to look for employment. Initially relatives require support while they prepare themselves for income generating activities. Those who increased space in order to accommodate extended families were 4% of 120 persons interviewed. One of the respondents stated:

> Two young brothers of mine completed secondary education three years ago. My father could not support them because he is a retired officer and he now lives in the village. I decided with my husband that they come to Dar es Salaam and stay with us. However, our house was small, thus to start with they had to use the sitting room until we were able to build a simple room at the backyard. We have been staying with the young men as members of the family. Both of them attend classes at a vocational training centre. (Interview with Rehema, 35 years old, who had to support her two brothers).

In Hanna Nassif, nuclear families comprising parents and children are rare. Of 120 interviewed residents 80% had relatives living with them. Some are grandchildren for, girls who happen to get children on early age usually leave their children to be raised by their grandparents while they rent a room somewhere else. Relatives were
found to share houses or rooms in order to support each other. However, when
the houses were being constructed no one thought of space for relatives.

Grown up children who carry out income generating activities or are employed
but are still living with their parents, do not pay rent directly. They assist their
parents for example in buying food once in a while, or paying some electricity bills.
Extended families are usually accommodated even if there is not enough sleeping
space. For example, when sleeping rooms are fully utilised, some household
members are forced to sleep in a room that is used as a sitting room. Therefore,
during the day the room is used for sitting and socialising but during the night it is
turned into a sleeping area. Having an extended family in the house increases
occupancy ratio. In this study, the type of extended families found were those
living under the same roof and sharing all the facilities with their hosts.

**Polygamy**

Some people still practise polygamy. Polygamous families often imply more
children and larger house space requirement. One of the respondents who got
married to a second wife thought that it was not proper to let both his wives live
under one roof. He was compelled to look for resources so that he could build an
additional house for his second wife. The man with two wives responded as
follows:

> Soon after I got married to a second wife I thought that it was not proper to let
> both of them live under the same roof. This feeling forced me to look for
> resources so that I could build another house for my second wife. I walked
> around the settlement to look for a plot. As I was interested in a plot that
> would not be far from my first house, I found a suitable plot and planned to
> build a three bedroom house. When it was completed my second wife and some
> of my children moved in. Later I started expanding it by making an extension
> for three other rooms and a sitting room. I kept on putting up one room after
> another until all three rooms were in place. Finishing was also done gradually,
> one room after the other. The reason, which made me extend this house, is that
> of increase in family size. I also wanted to have separate rooms for both boys
> and girls (Interview with Mr. Lada who is married to two wives. He
> has seven children, four boys and three girls).

As indicated above, the extension was built to accommodate an increase in family
size. This means that having more than one wife it is likely that one will have more
children. In this case the house owner preferred to separate sleeping rooms for
girls and boys as parents like to do so if resources and space allow. Boys and girls
have different needs so when sleeping rooms are separated they feel freer and
happier.
In search for privacy

Of 120 people interviewed 7% said they made alterations to their houses in order to improve or secure privacy. A lot of domestic activities take place outdoors like cooking, eating, washing dishes and washing clothes. Some of the respondents said they need security when performing certain functions. One of the respondents said:

We constructed a wall around the courtyard because we carry out most of our domestic chores there. We also use the space for eating. We do not want our neighbours to see what kind of food we cook. We also do not want people to see us while eating (Interview with mama Hadija who is a house owner and a food vendor in Kivukoni).

To ensure a feeling of privacy, in this case the house owner transformed her house by constructing a fence. She also mentioned that the fencing wall has other roles like that of security, and the definition of plot boundary.

Protection

Transformation of houses in Hanna Nassif is sometimes motivated by the urge to protect children, as reported by this female respondent:

The major change in our house is an extension to provide for kitchen and a shop. We also erected a fencing wall around our house and put up an entrance gate. The main reason for a gate is that we do not want our children to play with other children within the settlement because we fear bad influence from their peers who are known to have bad habits. We usually make sure that at all times the gate is closed and that entrance by neighbouring children is reserved (Interview with Mrs. Mnenuka, 30 years old and house owner).

Most parents like their children to behave well. They become protective especially when they think their children can learn bad behaviour from their friends or neighbours. This development is just an example of problems besetting Hanna Nassif informal settlements where a mix of residents from different social status settle in one area. The difference in earning capacities, educational and cultural background is a basis for concern by some parents to have their children secluded from other children in the settlement.

Security

Security is one of the factors leading to house transformation according to the respondents in Hanna Nassif. Provisioning of burglarproof doors and windows is becoming increasingly common in Hanna Nassif. Families construct fences around their houses to improve security. Of 120 interviews, 15 residents constructed a fencing wall around their houses. The height of the walls varies from two to three meters. One of the residents of Hanna Nassif commented thus:
We initially built a fence wall around our house using corrugated iron sheets. The level of security was very poor as assets stored at the backyard of the house often got stolen. We later resolved to build a concrete blocks fence and made a provision for a gate which is closed day and night. We are happy now as security has improved (Interview with Mr. H. Msangi who used to work as a technician at the Dar es Salaam Technical college).

Some fences have heights of up to three meters making it difficult to see the house within such enclosures. What is seen is only part of the roof for the main house. It is also common for the fence top to be decorated with pieces of broken glass to keep away intruders (Figure 5.20).

Figure 5.20: An example of a totally fenced house with a concrete block wall. It is impossible to see the elevations of the house.

A study conducted in 2000 in the city of Dar es Salaam under the “Safer Cities Project” found out that the most prevalent crime in Dar es Salaam is burglary. High levels of burglary are recorded by the victim survey with 43% of the victims reporting that their households had been burgled over the past five years. The second most common crime in the city is petty theft, with 32% of people being victimised. Vehicle theft and car hijacking rates were particularly low in Dar es Salaam, although theft of vehicle parts was prevalent.

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6 Safer Cities Dar es Salaam project is a project initiated by the UNCHS in cooperation with the International Centre for the Prevention of Crime (ICPC) in Montreal Canada. It was launched in August 1998 by the Dar es Salaam City Council. Its aim is to provide local authorities (cities, municipalities and towns) with technical support to develop sustainable ways of preventing violence and crime in the context of reducing or preventing the occurrence of crime or the fear of crime.
People living in new or established suburbs are at greater risk than those living elsewhere in the City. The report shows that generally people owning houses particularly those with high incomes are at higher risk. Robbery is likely to take place during the time when people are usually at home especially Fridays and Saturdays. The majority of cases occur between midnight and 0600 hours. Eighty percent of the people in Dar es Salaam use some form of protection against crime and violence where the most common type of protection is burglar proofing, followed by fences or walls and dogs. The devices used are fairly simple, however they enhance confidence among the people. People feel safe by having high fences, or walls, burglar-proofing, a security guard and a dog (Robertshaw, Louw, and Mtani, 2001:102).

Results from the referred survey are similar to the outcome of this study, especially on the issue of people feeling safe because of burglar-proof bars and fences. The issue to be raised here is whether burglar proof fences, gates and doors provide a lasting solution. What about safety in the event of fire, what about the visual appearance of the buildings?

Figure 5.21: Burglar proof bars fixed around the front veranda and all windows. In case of fire especially during the night when people are sleeping it will be difficult to get out of the house.

5.2.3 Aspiration to live in a “modern” house

A “Modern” house is discussed in this section as one of the motivations for housing transformation. However the issue of housing modernisation will be discussed in depth in Chapter Seven.

The majority of people we interviewed prefer not to live in mud and pole houses. According to the respondents in this study, these houses are built of
traditional materials and associated with poverty and hence low social status. Thus most people want to change their houses to concrete block structures. One house owner observed:

We bought a pole and mud structure in 1974. We lived in the house until 1990 when we decided to demolish it and build another structure by using concrete blocks. This new structure is what you see now. The motive behind demolishing the first structure and building a completely new one is because the pole and mud structure was deteriorating. Toilets were located outside the house and sleeping rooms were small. We had the urge to own a modern house, a house that suits an urban way of living. In the new house we made provision for a sitting room, dining room, kitchen, toilet and bathroom. We also provided for large windows to allow enough light and cross ventilation. We are happy that we now own a modern house (Interview with Mrs. Nampunda, who is a petty trader. The house is for owner occupation).

A “modern house” is viewed as one built with industrially produced building materials. It includes inbuilt toilets, separation of functions like sitting room, dining room, kitchen, toilet, and bathrooms. A functional aspect like cross ventilation was also mentioned.

Although modern houses are regarded as better houses according to Hanna Nassif residents compared to traditional houses, there is a need to understand what “better” houses mean. Better house according to the respondents of our questions refers to “durability”. People in informal settlements are convinced that industrially produced building materials are more durable than traditional building materials.

People’s admiration of concrete blocks as good “modern” materials could be said to be built on ignorance of how the materials perform, since not enough research is done in Tanzania to convince people of the positive aspects of local or traditional building materials. Most materials especially earth are used without being investigated as to whether they are good for a given geographical area. If the house deteriorates early people assume that all earth materials are not durable enough.
Figure 5.22 (a): An example of what is considered a modern house in Hanna Nassif. The house is constructed by using concrete blocks. Burglar proof bars have been extensively used as a means of ensuring security. Curved arches differentiate the house façade from many of the surrounding buildings.

Figure 5.22 (b): Another example of a modern house in Hanna Nassif. The house is characterised by concrete block for walls, tiles for roofing and relatively large windows and a fancy design.
Figure 5.23: An example of a traditional house in Hanna Nassif. Most of these houses are built of mud and pole walls and roofed with corrugated iron sheets. Small windows characterise the facades of these houses. Due to poor household economy and may be ignorance there have been no efforts to carry out maintenance. The outdoor space is used for cooking and selling cooked food.

5.3 Problems and opportunities inherent in housing transformation

5.3.1 Problems presented by housing transformation

Transformation is a process, which is also riddled with problems. The problems are: blockage of ventilation and light in the houses, decrease of outdoor space and the limited skill of the local mafundi for complicated transformations.

It was noted during the course of the research that in some cases transformation leads to the blockage of ventilation and natural light. In the hot and humid climate of Dar es Salaam such rooms are uncomfortable due to lack of ventilation. Introducing a transparent roofing sheet, which allows light, may solve the problem of light. However, the question of ventilation is difficult to solve.

The study shows that the number of household members in a unit invariably increased. Equally, the increase in the number of house occupants is bound to cause pressure on common facilities such as toilets and cooking areas.

While transformation increases the indoor space, outdoor space has been decreasing. Most people tend to utilise almost all the outdoor space, which makes it difficult to have outdoor living space as remarked by this respondent:

We have extended our house to the extent that we have no outdoor space left. This makes it difficult to carry out some of the household chores like washing.
Another drawback observed in the housing transformation process in Hanna Nassif is the limited capacity of mafundi to comprehend complicated construction works. As noted above the construction activity is guided by the fundi whose expertise is acquired on the job through learning by doing. As regards simple houses mafundi seems to have the technical skills to handle the construction activities. People seem to have confidence in mafundi. Much as mafundi rely on experience, field observations indicate a number of substandard workmanship like uneven plastering, roof-fixing problems (figure 6.4). The issues of mafundi will be discussed in detail in Chapter Six.

Of the houses studied not a single one was observed to have used traditional building materials on the extension. The “modern” materials are produced by using non-renewable resources that degrade the environment. Hence due to use of these materials transformation activity has been found ecologically unsound.

5.3.2 Opportunities

Transformation of houses is a house supply strategy. The transformation has given low-income people an opportunity to get access to affordable rooms for renting. Out of 120 houses studied 72 houses provided rooms for renting and 12 houses were rented as a whole unit.

Transformation of houses has made it possible for some people to differentiate their houses from others as a symbol of prosperity. After transformation some houses are well painted, with different roof styles and decorations at the front elevation. Some house owners incorporate their own creativity into their transformed houses.

According to some respondents house transformation has improved the social status of the owners in Hanna Nassif. By transforming their houses people feel that they have acquired “modern” houses. These houses make owners and tenants proud of their residences as confirmed below:

By changing my house I now feel like I am a really grown up. I can now stand in front of people and make a speech. When people pass by they point a finger at my house meaning that my house looks better than before (Interview with Mr. Mtoro, a retired officer for the Tanzania Railways Corporation).
Figure 5.24: An example of a decorated house in front elevation. The veranda dominates the front elevation. There is also a provision of a window with a sun breaker. Perforated veranda walls, knitted burglar bars, window sill and differentiated colours for the foundation wall and fascia for the veranda are some of the decorative elements of this house.

In the course of field study it was confirmed that house transformation leads to better houses than the original structure in Hanna Nassif. Owners and tenants expressed that they are happy to live in transformed houses. Transformation has made it possible for people to acquire more rooms through extensions and therefore, separate functions to a certain extent. A better house is regarded by the people in Hanna Nassif as one with large windows, which allow light and ventilation inside. Another indicator of a better house, according to the house owners is the one with a good floor finish, which renders the house easy to clean. Although it is only minority who have achieved this aspect, it is considered as a positive aspect of transformation.

In Hanna Nassif house transformation has increased indoor space for the household members especially those who are not renting rooms (Chapter Eight). Room extensions have also given house owners an opportunity to gain income through renting. This income has become one of the sources of funds for further transformations.

This chapter has been devoted to discussing issues related to transformation in practice especially how and what happened and the results of the process. In the following chapter, that is Chapter Six, actors in the transformation process are unveiled and their roles in the process examined.
6 ACTORS IN THE TRANSFORMATION PROCESS

This chapter presents the main actors in the housing transformation process in informal settlements. The fundi, a “self educated architect”, has been playing the role of a formally trained architect and engineer in the informal settlements. Other actors in the process are house owners and the few tenants who play the role of clients in the transformation process.

6.1 The role of the owner in the transformation process

The house owner is usually the manager of the whole process. He or she is the one who initiates the job while carrying out most of the preparations before construction. The role of the owner is to plan for the transformation process while the fundi plans for the execution of the work.

The house owners mobilise funds for housing transformation. This is in line with the general trend of housing development in Tanzania. Most households construct their houses from their own savings, from salaries, allowances, and other benefits or from business incomes, sale of assets (including land), income from assets rented out such as house rent, sale of goods and services, contributions from friends and relatives and inheritance. Sometimes arrangements may be made for the tenant to pay the cost of extension and the expenses are recovered from the rent. The study shows that some developers benefit from some input from relatives like grown up children and or boyfriends.

There is an informal saving and credit association known as “UPATU” in the Hanna Nassif settlement where by a group of say 5-10 people, organise themselves and each contributes a certain agreed amount of money per month. One month total contributions are then paid to one of the members. The following month to another member until all members of the group have received payment. Then the rotation is repeated. Some developers use this money for housing transformation activities.

It is evident from table 6.1 that salaries and income from small businesses constitute the major sources of incomes for housing transformation in Hanna Nassif. The study shows that 39% of the respondents transformed their houses by using savings from their salaries. 40% of the owners financed transformation of their houses from income earned from small businesses, while 11% received support from their children. 4% of the owners informed the author that they

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7 UPATU is a local arrangement whereby a limited number of individuals enter into verbal (sometimes written) agreement whereby the concerned parties contribute a certain amount of money and give it to one member on a monthly basis. It is a common arrangement for employees who earn monthly wages as a way of raising capital for a group member. The process circulates among members of the group and is in many a case a continuous undertaking.
received soft loans from their employers and 6% managed to get funds from informal savings and credit associations.

**Table 6.1: Sources of income for carrying out transformation activities**

<table>
<thead>
<tr>
<th>Source of finance</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>39%</td>
</tr>
<tr>
<td>Support from children</td>
<td>11%</td>
</tr>
<tr>
<td>Small business</td>
<td>40%</td>
</tr>
<tr>
<td>Mortgage</td>
<td>4%</td>
</tr>
<tr>
<td>Upatu</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>120</td>
</tr>
</tbody>
</table>

Building materials are a crucial input into the housing transformation process. Building materials can be grouped into two categories, namely, traditional materials which have been in use from generation to generation being locally available and modern materials which are industrially produced. The walling material, which is popular and used for housing extensions, are standard concrete blocks of 460mm x 230mm x 150mm. These are found ready made by small-scale entrepreneurs or manufactured on-site. The cement which is used in making these blocks is manufactured by the factory. Out of 120 people interviewed, 108 preferred to have concrete blocks manufactured on-site in order to ensure what they termed “quality”. The required standard quality proportion is one bag of cement (50 kg) to 25 blocks of the above mentioned sizes. However, in other cases small scale producers use one 50 kg. bag of cement to produce up to 32 blocks. Such poor qualities of blocks are inevitably weak. Concrete blocks are sometimes incorrectly cured due to water shortages and lack of or inadequate shade resulting in weak or low strength blocks.

Among the owners who transformed their houses, 72 out of 120 started with the collection and production of building materials. Those who were financially stronger preferred to buy already produced concrete blocks. However, those who were financially less able started the process by collecting sand, then buying one or more bags of cement, hiring a **fundí** to produce concrete blocks. Cement blocks may thus be produced in small numbers until the desired number is achieved. The majority of house developers also purchase corrugated iron sheets in small numbers until the targeted number is attained. Timber for the roof structure is purchased in a similar way. Although cement is basically extracted from natural materials, it is called “European Soil” (Udongo Ulaya). For many years Portland cement has been the only solution for most buildings in industrialised countries. The same has been exported to non-industrialised countries with little capacity to either consider or recognise that an alternative binder is not only a possibility but also often the more viable one.
Some owners play the role of *fundi*, as they possess building skills, thus participating fully in the whole process of transformation. In other cases tenants are also involved in the process of transformation. They enter into an agreement with the landlord to allow them to make needed changes or extend their houses. Such tenants usually hire a *fundi* and pay for the building materials and other construction costs and submit the expenditure list to the landlord. The tenant would then be deemed to have paid rent in advance for a certain period of time, that is, equivalent to the amount expended for construction.

### 6.2 The role of fundi in the transformation process

The direct actors in the housing transformation are *mfundi*, labourers and house owners (client) who are financiers as well. In other cases tenants are involved as clients. The 1991 informal sector survey came out with the characteristics of informal enterprises working in the construction industry. The major characteristics, which give the impression of the way a *fundi* operates are as follows:

- 90% of the customers in the informal construction sector are private individuals.
- Difficulties encountered when operating are unavailability of capital for equipment 28%, unavailability of credit 19% and non-payment of debts by customers 11%.
- 54% secure their raw materials from within the local areas, while 43% do not use raw materials. This latter fact means that the major input is labour, while other inputs are supplied by customers.
• 83% have no fixed location from which they operate.
• 95% serve their customers within their local areas.


It was observed in the present study that fundi operate in different ways. The first category is an independent fundi who is hired for a certain skill. If the fundi need assistance he may hire a labourer himself and it is his responsibility to pay him or her. The second category is the fundi with a group of skilled and unskilled labourers. In this category the fundi works together with skilled or semi-skilled labourers. The third category is a fundi with specialised jobs. He is usually specialised in one particular job, like roofing. When he gets a job of his speciality he collects a number of unskilled labourers to assist him to finish the job quickly.

The execution phase is done by both the owner and the fundi while the actual construction work is done by the fundi. Out of 120 interviews 118 respondents said that the construction activity was done by the fundi, while 2 said the owners who are mafundi themselves carried out the transformation activity. Finishing is also done by the fundi especially floor screed, plastering and painting. Most mafundi acquire skills and gain experience through working as labourers with experienced fundi before becoming an independent one. The way mafundi perform their job is that, they usually use their experience and therefore design and plan as they work. Usually the mafundi have basic equipment. If there is something missing it is the responsibility of the client to obtain it.

![Figure 6.2: Fundi at work. Fundi preparing mortar by mixing cement and sand for the purpose of joining concrete blocks.](image)
6.2.1 The role of fundi in design

Housing design is usually considered to be the role of an architect taking into consideration the requirements of his/her client. In this study it was noted that the role of architect is marginalized by the fundi. The fundi and house owners take care of the design for transformation. They start with some ideas from the owner, which are translated into a design. Sometimes the owner takes the fundi to an existing house in the neighbourhood, which he/she prefers. He then discusses its suitability and changes required. The fundi then build without any drawings. One fundi commented thus:

If a client approaches me to make an extension I usually listen to what he wants, such as number of rooms and their use. The first thing I do is to measure the total area for extension and advice my client about room sizes and number of rooms possible according to the available space. If an agreement is reached construction commences. I do not prepare drawings. (Interview with Mr. Mohamed, a fundi specialising in masonry work. He is a Form IV secondary school leaver).

A fundi also assists developers in the design stage by looking at the site and advising the client on the appropriate orientation of the building, number of rooms and sizes. Usually the design does not include much more than the size of the house, number of rooms and the type of house. If these aspects are agreed upon, the fundi has his standard solution for technical problems and details. As for plumbers, when they are offered a job to install pipes in a house, they first design a plumbing system and then discuss with their client the proposed action plan.

Table 6.2: Involvement of professionals in transformation activities

<table>
<thead>
<tr>
<th>Experts</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mafundi</td>
<td>99%</td>
</tr>
<tr>
<td>Civil engineers</td>
<td>-</td>
</tr>
<tr>
<td>Contractors</td>
<td>-</td>
</tr>
<tr>
<td>Architects</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
</tr>
</tbody>
</table>

Table 6.2 shows clearly that almost all transformation activities are mostly carried out by a fundi. Out of 120 interviews 119 indicated that transformation activities were done by a fundi. Only 1 of the respondents informed the researcher that he designed his house himself but hired a fundi to carry out construction work. He is an architect. There is no involvement of professional contractors or civil engineers.

Mafundi are involved in the design of the plan of the houses they build and they identify the place at which the extension is to take place. They normally advise the client on how they visualise the structure in the light of the available space for the intended extension. They even advise on the proper orientation of the house,
positions of doors and windows, on the room sizes depending on the available space and number of rooms needed by the client.

One fundi narrated the procedures he usually follows when a client approaches him for extension of rooms on an existing house:

We receive client requirements for extension such as the number of rooms and their uses. The first task is to measure the total area available for use. Then we advise the client about the room size and number of rooms according to the space available. If agreement is reached, construction works begin by making an estimation of building materials needed and labour charges. We then agree on the terms of payment, whether per day or piece of work. On few occasions we sign informal contract, otherwise our agreements are usually oral (Interview with a fundi, Mr. Adam whose speciality is masonry work).

Mafundi form a core of builders who participate fully in housing transformation in the process. Mafundi have played a big role in advising developers on how to build or make changes in their houses and also in producing building materials like concrete blocks and carrying out real construction work. Masons tend to become leaders in the building process and may affect the choice of other fundi like plumbers, carpenters and electricians. Masons also assist house owners in purchasing building materials where the owners cannot find time to purchase such materials themselves.

It was noted that in some large contracts, that is two-storey houses, which require reinforcements, contractors were not used; it was only a fundi who was involved.

6.2.2 Job availability and contracts for work

Mafundi were asked how they get jobs and also the procedure for carrying out building works. It was revealed that after living or working in one area for a number of years, a fundi becomes known and trusted. It was also learnt that if a fundi is well established in a given locality he or she would be approached by developers, but sometimes the fundi would walk around to solicit for assignments. One fundi commented, “When you are at the site you advertise yourself.” Relatives and friends of a fundi may also offer some work and or introduce them to other persons who intend to develop or transform their houses. The quality of a fundi’s work is an important part of his tool in trade. If one does a good job that is a ticket for another contract. One fundi commented, “Clients tell each other how good a job I normally do”. Some do verbal advertisement in the area, but the majority do nothing. They just wait until a client or other fundi who need assistance come to them and offer them some work.

Contracts may be oral or written. The nature of the contract depends on the extent of the work involved. In most cases, room extension and repairs are carried out on oral agreements. In cases where large construction works are involved, written contracts are common, with details of the work to be performed, terms of
payment and expected time of completion. The common arrangement noted during the course of carrying out this study are as follows: A discussion is made on the terms of the assignment. Later the client writes by his own hand that she/he has arrived at certain terms with the fundi. One copy of the document is kept by the fundi and another by the developer. Alternatively the fundi may prepare the description of the assignment and the terms agreed between the parties. The exchanged document becomes vital evidence in the event of any misunderstanding. Whether oral or written, the paramount aspects of the engagement are the trust between the fundi and the developer. One fundi commented that:

We are local fundi. There is no need of written contracts for minor works unless it is the construction of a full house.

One fundi observed that since he started his work as a mason he had never made any written contract for the works and that he has never been in a court for breach of any building contract. Much as a fundi and client might trust each other to the extent of having oral agreements, in other cases this could lead to delays of construction work. Some fundi turns out not to be trustworthy in finalising the construction activities. In such an instance a client would rely mostly on social pressure in the absence of a written contract. Figure 6.3 shows the processes of award of contract.

![Diagram](6.3: Processes of award of contract)

6.2.3 Payment arrangements

Payment to fundi is usually done as follows: The fundi are paid per piece of work, that is, after completing a given task as directed by the availability of funds from the owner. The fundi would then continue with another stage of the assignment when funds are available. For jobs that cannot be estimated on a piecework basis the fundi are paid per day. For measurable work they are paid per piece of work. In other cases fundi are paid for each concrete block they lay. Fundi have been paid in each definable step in the construction of a house for example, foundation, walling, roofing, fixing windows, doorframes and painting. In other contracts the agreement may be tied to the whole project. If it is an extension of two rooms, negotiations are made for the whole piece of work.

Labourers are usually paid per piece of work. Usually the price does not influence the quality of the work. The determination of the price is done after the fundi have made an estimation of the total work. The time required to finish the
work and the labour needed is estimated. The majority of the mafundi have good experience in making a good estimation considering the size of work and the location.

Generally, the relationship between fundi and client is good. However, misunderstandings are not uncommon. Delays are common on both sides. As for the house owner they are sometimes slow to pay mafundi and the latter sometimes fail to keep to agreed schedules. This causes misunderstandings. Mafundi raised the concern that the clients purchase building materials which are of low quality and in some instances clients do not pay regularly as agreed. The client usually purchases materials himself/herself because he/she can find the cheapest available materials, but this leads to a low quality end product. In other cases the fundi has to wait for several days before the client brings the materials. Delayed payment of the fundi usually causes delays in the execution of work, but the problem is sometimes that the owner cannot manage to secure the payments in time.

Table 6.3: Payment arrangements

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily payment</td>
<td>7%</td>
</tr>
<tr>
<td>Per piece of work</td>
<td>55%</td>
</tr>
<tr>
<td>The whole project</td>
<td>26%</td>
</tr>
<tr>
<td>Other agreements</td>
<td>8%</td>
</tr>
<tr>
<td>NA</td>
<td>4%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
</tr>
</tbody>
</table>

Table 6.3 indicates that most mafundi are paid per piece of work. Only 7% of the house transformers revealed that they pay the mafundi on daily basis. A substantial number of residents said that they paid the mafundi for the whole project, that is 26% of them but not in a lump sum. The fundi is paid at the beginning of work, then when he is half way and the remaining amount when the work has been finalised.

6.2.4 Arrangement for labour, working equipment and building materials

If the piece of work to be executed takes several days or weeks a fundi in most cases employs an assistant, even a fellow fundi to serve as a labourer. If the owner cannot afford to pay for the entire building works the fundi builds in phases.

Some mafundi make arrangements to hire labourers to assist them in mixing the sand/cement and carry blocks and other building materials. One fundi commented:

In most assignments I use labourers. When estimating construction costs for the assignment we take into consideration labour charges. (Interview with fundi Rashidi, his main speciality is masonry work).

Sophisticated or heavy equipment such as a concrete mixer are rarely used in the informal settlements. A fundi uses simple working equipment such as chipping
machine and painting brush, hammer, spade, spirit level, combination square and tape measure. Other equipment are used depending on the nature and extent of the work or job to be accomplished.

According to the fundi who practices in informal settlements, decisions on house transformation and improvement normally comes from the house owner. Sometimes ideas emanate from the tenants, although the landlord (owner) makes the final decision. One fundi noted that:

> In some cases tenants are the ones who influence the decision for change and improvements, as they advise landlords on the need for improvements or change. However the landlord is the one who has the final decision on whatever construction works are necessary or preferred (Interview with fundi Majid, specialised in mason, carpentry and steel fixing).

Some tenancy contracts allow tenants to make decisions on changes in rented houses within certain parameters. In such cases tenants meet the costs of the transformation or the desired change with an understanding that the cost will be realised through deductions from rentals due.

Mafundi face different problems in the transformation activities, problems related to working capital and capital for tools and equipment. They also have problems of technical and managerial skills taking into account that the majority of them acquired skills through on the job training. They also have uncertainty in their work because construction works are not regular and when available, others are just minor jobs with limited payment. Generally mafundi are involved in masonry work, carpentry, plumbing, painting, steel fixing, electrical works and concrete block making.

Most of the mafundi acquired primary education. Construction skills were obtained on job training at construction sites. Others obtained the skills while attending National Service Military Training Programme. Few of the mafundi attended vocational training. One of the mafundi narrated how he got his training by saying:

> I am a mason. My training was acquired on the job. I was working with an Indian construction company known as Babu Building Contractors from 1972 to 1985 in Dar es Salaam. I was first employed as a labourer to perform certain duties at the construction site such as assisting masons to mix cement and sand and also to carry cement blocks at sites. As a labourer I slowly observed how mafundi were working. At a later stage I was accepted to assist the mafundi in some minor masonry works, such as setting the rope to

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8 The National Service Military Training Programme was established in the early 1960s as a ground to groom primary school leavers to become soldiers and also train them in a number of skills such as masonry, carpentry, farming and animal husbandry. It was later extended to encompass graduates from secondary schools and colleges as a compulsory programme for military training.
straighten brick courses. After some time I managed to do other works involving plastering. Sometimes a fundi would assign me to piecemeal work while he was resting. I then applied for the post of a mason in the Company. I retired from the company in 1986 and since then I have been working on individual basis in the area of masonry... I have also been involved in other areas of construction activities such as roofing. So far I have roofed not less than seven houses and painted not less than six houses. My specialisation remains masonry (Interview with fundi Suleiman. His main speciality is masonry work and also carpentry specialising in roofing).

6.3 Quality of work

In the course of carrying out this study, it was observed that the workmanship of mafundi were generally poor. For example, most houses we surveyed had poor finishing which reflects that mafundi were not meticulous while doing the finishing. Obvious mistakes were noted on plastered walls in terms of surface levelling, window and door canopies.

There are also some situations where mafundi were cheating taking into account the ignorance of their clients in certain issues and the absence of close supervision. Sometimes when they are given for example cement for the case of plastering they do not use the proper ratios of mixing sand, cement and water. Instead they save the cement and sell it to other clients. This kind of cheating leads to poor final products. In other cases it was noted that there was a problem of constructing a roof in a proper way (Figure 6.4). Fixing of windows and doors was also a problem because in most cases door frames and windows are not properly aligned.

![Figure 6.4: Problem with the proper way of fixing a roof. In this case there is no wall plate and roof overhang is very small which could lead to the wall being affected by rain. The protruding blocks indicate that there will be an extension of rooms later.](image-url)
Mafundi use certain building techniques without having knowledge of why it has to be done in that particular way. For instance when some mafundi were asked why it is important to use prepared mortar within a short period of time; instead of replying that the mortar will lose strength they said that the mortar would harden. Surprisingly some thought that mortar could be crushed and re-used. This indicates that some of the mafundi do not know why exactly they are performing certain operations. Mafundi are also afraid to demolish part of a bad piece of work and carry out the work all over again. The main reason is that building materials are expensive.

Lack of technical skills is one of the reasons leading to poor quality work. One can speculate that the introduction of relatively new materials like cement is one of the reasons for poor quality work. These materials were introduced recently; the knowledge of using them is not so commonly spread as the knowledge of using traditional materials like mud and pole. The skills needed in traditional house building are easily available because they are inherited from past generations. Mafundi are hired only in specialised tasks such as roofing. This system does not take place in urban areas like Dar es Salaam. “Modern” materials and new technologies are adopted taking into account that most people regard technology from industrialised countries as superior to indigenous ways of building. In some instances mafundi lack knowledge on how to use the new materials in a proper way. Another reason is limited opportunities for mafundi to obtain access to formal training, which can lead to improving their skills. A skilled fundi always looks for better jobs and pay and usually strives to joins the formal construction industry. This limits the availability of skilled mafundi in informal settlements.
HOUISING MODERNISATION

This chapter presents findings on how people view modernisation and how the transformation of houses is linked to modernisation. Changes in terms of expansion, emergence of new house types, spatial relations and use of space characterise housing modernisation in the Hanna Nassif settlement. There is an increase in densities, and a rejection of traditional architectural ideals. The five major components discussed with respect to modernisation include building materials, separation of functions, comfort characteristics, rooms for renting and toilet facilities.

7.1 Building materials

In the Tanzanian context modernisation became obvious during the colonial era. The colonial administrative structures especially during the German period built “modern buildings” which were mainly public buildings. As people interacted more and more with the outside world more lessons were learnt and new building technology was imported from industrialised countries. Interaction between indigenous people and the outside world was facilitated through pictures, magazines and architects, whose training were secured in industrialised countries. At present, there are quite a good number of buildings in the country that can be considered modern.

One of the variables in the analysis of housing modernisation within the context of housing transformation in Hanna Nassif is the ongoing change in building materials. Residents transform houses from traditional to “modern” building materials as a strategy in modernising their houses. This can easily be physically ascertained in the study area and as confirmed from interviews with the residents of Hanna Nassif.

House owners and tenants were asked if transformation modernises their houses and what they think are the indicators of modern houses. “What is a modern house?” One of the respondent living in Hanna Nassif, quickly replied:

A modern house is the one which has facilities considered to be “modern” in the society meeting current needs. A house built with modern building material like concrete blocks, roofed with corrugated iron sheets or tiles, with cement, terrazzo or ceramic tiles floor finish. (Interview with Mr. O. Msangi, 45 years old, house owner).

Another interviewee explained that modernisation started in the 1920’s and 1930’s when corrugated iron sheets were introduced in the country. By this time, if a house was built of mud and pole but roofed with corrugated iron sheets, it was considered “modern” but if the house was roofed with thatch it was considered traditional. Later on lime was introduced so, if the house was painted with white lime, roofed with corrugated iron sheets it was considered even more modern.
This time the cash economy was weak, most people did not have cash. The few Tanzanians who were working in industries and agricultural estates earned salaries that enabled them to buy corrugated iron sheets.

Building materials seems to be a major indicator of modern houses. In all 21 in-depth interviews, the respondents mentioned building material as one of the indicators of a modern house. Traditional building materials commonly used in many parts of the country include mud and poles for walls and thatch, especially grass and palm tree leaves, for roofing. Common modern building materials are concrete blocks, corrugated iron sheets, mangalore clay tiles (This type of tile is largely imported from India. It is expensive but since it is made from burnt clay soil it has good thermal qualities) and concrete tiles for roofing. Most people feel that they have modern houses if constructed from a combination of the so-called modern building materials. One of the respondents observed that:

I used to own a mud and pole structure inherited from my parents in the early 80s. I decided to demolish the structure and replaced it with a concrete block house, roofed with corrugated iron sheets. When I moved into this house I felt great, as then I became an owner of a modern house. It is a status for me to own a modern house. I could clearly see that people in this community respect me more than when I used to own a mud and pole house. My new house is a better one (nyumba bora). There is a lot of improvement in comparison with the old house. I no longer need to repair the walls after the rainy season (Interview with Mr. Jumanne, a retired officer who used to work with the Tanzania Railways Corporation).

To this respondent modernisation means change of building materials. This development brings about a feeling of change in social status and respect from neighbours, whether in reality or imaginary. However the status aspect is in contradiction to climatic comfort, taking into consideration the type of building materials used.

A modern house in this context meant a house built of concrete blocks, cement screed floor and roofed with corrugated iron sheets. To this house owner issues like functional and cultural needs are not important. This tendency depicts the image of improved houses based on building materials, irrespective of indoor comfort characteristic requirements. Also the household economic capabilities to afford such materials, so the potential of local building materials has been ignored or neglected at the expense of “modern” materials. These materials seem to be inappropriate to local climatic and economic conditions, in addition to the fact that they are not easily affordable by poor households.

Concrete blocks and corrugated iron sheets are very moderate elements of housing modernization. Peoples’ perception of modernity might reflect colonial and commercial influence not necessarily in the way Vestbro identifies developmental aspects of classical modernism.
People have negative attitude towards use of traditional building materials. Both concrete blocks and corrugated iron sheets are expensive compared to traditional materials like sun-dried bricks. However, people still go for expensive materials because these materials are considered as symbol of modernity.

Why are traditional materials not popular as compared to “modern materials”? The present study shows that the preference is centred on the desire of household members to keep pace with “modernity”. Household members are desirous of transforming their mud and pole houses in order to build houses using concrete blocks even if they have very low income. A woman respondent had this to say:

I changed my initial house which was built of mud and poles to a concrete blocks unit on a step by step basis. I first purchased concrete blocks just adequate for only one room. I then saved money for paying a fundi for six months, then the construction of the first room with concrete blocks started. My income is very low so I could not afford to build all the rooms with concrete blocks at once. (Interview with Amina, 40 years old, a house owner who keeps poultry and cows and earns her income through selling eggs and milk).

Hanna Nassif residents give priority to the outer appearance of a house. 17 respondents out of 21 in-depth interviews said they were satisfied that their houses are modern because they are built of modern building materials. However, the remaining four people were of the opinion that building materials and other developmental aspects of house design like the separation of functions and health issues are important.

The fact that the Government of Tanzania is not giving any emphasis to the development of traditional building materials, people in the informal settlements are forced to use modern materials. The National Housing and Building Research Agency (NHBRA) in the country has done a number of research on how to improve local building materials such as sisal cement sheets and tiles, mud dried bricks and stabilised soil blocks. However, research dissemination is not accorded adequate attention. Research reports end up on the shelves and normally information does not reach people in need of the results. In the hot and humid weather like that of Dar es Salaam, the use of corrugated iron sheets is not suitable because they absorb heat, which is transmitted into the house. If there is no provisioning of ceiling board, then the house could be hot and uncomfortable to live in. Alternatives like “sisal cement fibre” roofing sheets or tiles are possible alternatives. The National Housing and Building Research Agency (NHBRA) did research on this type of materials and they proved to be good insulators and therefore poor conductors of heat. The materials are produced by using simple technology, they can also be produced on a small scale. There has been minimum dissemination of information on alternative roofing materials for people to be aware of new types of roofing materials.
7.2 Separation of functions

Separation of functions in a house allows for the smooth performance of activities to take place. In situations like Hanna Nassif where many households are accommodated in rented rooms, a house to them is a room. Within such a room all functions such as cooking, eating, sleeping and resting take place. This causes conflict in terms of space available. Cleanliness is also hampered because of mixed functions within limited space. A house with different spatial organisation is considered to have elements of modernity according to Hanna Nassif residents. To some interviewees however, separation is an important attribute of cleanliness within the house. One of the questions asked is; how important is the separation of activities in the house? One of the respondents said:

Separation of functions makes it possible to locate toilets, which could at times release bad odor, away from the living room and sleeping rooms. This makes it possible to live comfortably in the house (Interview with Amina who sells fruits and vegetables, tenant).

Out of 21 interviewees 11 prefer the kind of separation that creates strong links up to the kitchen, store, dining room, and sitting room. They also prefer a master bedroom which has an in-built toilet facility.

The dining room should be located near the kitchen, the sitting room next to the dining room. However, the toilet room should be placed a little bit far from the sitting room and kitchen but such that it can easily be accessed from other parts of the house (Interview with Mrs. Mfikirwa, a house owner).

Sanitation facilities are regarded important especially on separating toilets from other facilities so as to ensure that the sanitary conditions in the house is healthy. Other separations are related to functional qualities. For example, by separating the kitchen from the sitting or dining room it will be easy to cook and serve food especially if the type of stove used is charcoal and paraffin. These stoves produce fumes, therefore, they should be placed away from sleeping and resting rooms for health reasons.

It is often assumed that separation of activities is a reflection of an increased standard of living of which an increased number of dwelling spaces is an inherent part. It is nevertheless, not always true that the number of dwelling spaces increase with the standard of living. Similarly one cannot take for granted that differentiation of dwelling spaces is necessarily accompanied by a differentiation of activities. Household activities are not fixed to specific locations. One or more activities can take place at different places depending on factors like weather and time horizon.

Separation of men and women, children and their parents in the house is considered an important aspect by the respondents. Out of 21 interviewees 18 responded that they would like to have separate rooms for children and the
parents. Also between girls and boys as it ensures privacy and respect between different sexes and age groups. On this preference one respondent had this to comment:

To ensure a disciplined upbringing of the children, girls and boys should stay separated, even if rooms are small. Separation should be ensured notwithstanding constraint in space (Interview with Mr. Mustafa, a retired military police officer).

The strategies employed by people in the Hanna Nassif settlement in ensuring this separation between different age and sex groups include renting of rooms at nearby houses especially for boys. Also use of double-decker beds for children of same sex but different age groups. Room extension or separation, where a room is big enough, to ensure that different age and sex groups are separated. One of the respondents observed that:

An approach employed to ensure separation include separating a room by a curtain, renting a room for the boys in a nearby house and making an extension of the house to ensure comfortable accommodation of the entire family (Narration from Mr. Mkopi, who is a house owner, living in his house but also renting some rooms in a nearby house where his boys are accommodated).

Another respondent said:

When I got married we used to rent one room in a Swahili house. When I got my first child I started worrying of what is going to happen when I get a second and third child. I advised my husband that we have to do something. We looked for a plot to build a two-roomed house without success. There was an open space on the plot of the house we are renting. We approached the house owner with a request for permission to extend two rooms from his house on agreement that we should not pay rent until the cost of the extensions would be recovered. The landlord agreed so we extended two rooms as planned. We are now renting three rooms. The girl’s room is used for cooking and receiving visitors. Now I am satisfied because I have separate rooms for girls and boys (Interview with Mrs. Saidi who is a tenant).

Transformation of houses in Hanna Nassif settlement leads into the provisioning of modern houses because there is an aspiration to separate functions. Even if it is not totally achieved the respondents show that they are aware of the importance of the separation of functions. They attempt to transform their houses to meet this goal. However, the extent to which functions have been separated should be taken into account. For instance, if there is limited space, the sitting room can be used for sleeping during the night. Receiving visitors could take place during the day.
Results from interviews within the settlement demonstrate that the residents are conscious of the need for separation of functions between businesses and residential. Business areas are associated with noise, pollution, danger of fire, wastewater, which are unsuitable for a residential area if the separation is not done properly. This also depends on the type of business. For example, in Hanna Nassif there were carpentry workshops and milling machines which generate a lot of noise and dust. These are unhealthy to people living nearby. There are also pubs where drinks are sold and music played for long hours. These businesses cause nuisance to the residents as reported by one respondent:

I feel disturbed by the commercial activities taking place in the neighbourhood. During nights it is hardly possible to sleep because of loud music from bars and customers who make a lot of noise (Interview with Mr. Nasib who is a house owner. His house is located adjacent to two bars).

Another respondent was concerned with the separation of residential areas and working areas. He commented that:

Separating working places from residential premises reduces risks such as fire outbreak and pollution from chemicals. The working environment and residential quarters should be separated. The separation of these two also ensures concentration as people can easily work without being disturbed with family matters (Interview with Mr. Hussein, a house owner).

Separation of functions has also a social benefit in the sense that when people work far from their homes, they cannot be interfered with by domestic matters. However, seven respondents out of 21 who responded to an in-depth interview, pointed out that if the two are put together people can work extra hours, as they will be closer to their homes thus enhance productivity.

To some respondents separation of functions in Hanna Nassif is linked with traditional ways of living and the position of men and women in the society. This is an anti modernist and cannot be treated as a developmental aspect. However it is worth mentioning in order to present the views of some residents on the raised issue. Quite often within many traditional societies, men and women do not eat together, a phenomenon which was reflected in Hanna Nassif and is implicitly an aspiration for more separated space for the function of eating. One woman informed the researcher as follows:

In the tribe I belong to men and women eat separately. So when we made extensions of our house we intended to have two distinct rooms for eating but due to lack of funds we managed to extend only two rooms for sleeping. Men are therefore eating in the sitting room and women in the backyard (Interview with Ms. Amina who sells fruits and vegetables).
The practice of women and men eating separately is a traditional one and respected in many tribes. There are historical reasons behind the practice. In polygamous societies where a man is married to more than one wife, the men receive special treatment from each woman. Women have to impress their husbands. Special food is prepared for the male parent, while the female parent and children eat different food. This preferential treatment could provide an explanation for separating eating space. Due to modernisation these habits are disappearing, especially in urban settings. In many households in urban areas men and women are eating together while only a few men who still wish to maintain the traditional ways of living eat separately from other household members.

Self-contained houses are directly related to the separation of functions. This is a house with differentiation in spatial organisation, where toilet and bathroom are located inside the main house. Understandably, a self-contained house has a sitting room, a dining room, bedrooms, toilet and bathroom (Figure 7.1). It may also have a guest room and a study room. Out of 21 people interviewed, 18 said they prefer a self-contained house. Issues of water shortage problems or of water connection to each plot are not given a serious consideration by residents when they construct or transform their houses to self-contained units. Few household members have managed to provide reservoir water tanks in their premises. Problems that might occur in the future have not been seriously taken into account. For example some houses are not accessible by car, making it difficult to empty filled up septic tanks. The main desire has been to own a self-contained house. These houses are considered to be modern as long as there is a provision for the separation of functions as explained by a 35 years old respondent:

I consider my house to be modern because it has different rooms for different functions. I also consider my house to be modern because it is a self-contained house, the bathroom and toilet are located within the main house (Interview with Mr. Mfinanga, house owner).

A self-contained house is preferred by Hanna Nassif residents because toilets and bathrooms are contained in the main house making it convenient to use such facilities both during day and night. In this type of house it is expected that a sitting room would be furnished with modern furniture like sofas, a coffee table which are well arranged. People value and admire the elements of a self-contained house relating to modernity. A sitting room is an area to welcome visitors and watch television. It is an area where the social status of the household can be depicted, as remarked by a female respondent:

I like my sitting room so much. I always keep this place neat and clean. I do not even want my children to sit on sofas or spend time at the sitting room. They make the area untidy. I usually arrange my sofas and coffee table in such a way that the area looks inviting. I want my visitors to know that I am a clean person and I know how to maintain the house. Sometimes when I want to recall some good memories I sit alone in the sitting room and this makes me feel...
very happy. I also display my television and music system in the sitting room to show my visitors that I am a modern person (Interview with Mrs. Msangi, a house wife).

Plan

Figure 7.1: A self-contained house. It has toilets and bathrooms within the main house, a kitchen, bedrooms and separate functions for sitting room and dining.

The sitting room is a reception room where visitors are received. A sitting room is where a display cupboard is placed to show glassware and other decorations.

Figure 7.2: Arrangement of furniture in a self-contained house in Hanna Nassif. Note the sofas, coffee table and television set.
The dining space is another important part of a self-contained house according to the respondents. Usually the common furniture here are dining table and chairs. To eat in a dining room is a feature which is linked to modernisation according to Hanna Nassif residents. Traditionally, especially on the coastal, meals were eaten while sitting on a floor mat. By sitting at a dining table means that each one will use her/his own plate, not like the practice in traditional way of eating, where one big plate is used by more than one person. Although some houses were found to have dining spaces, observation showed that some members of households are not using the spaces. A number of people prefer sharing food in one big plate (Figure 7.5). Some of the respondents said dining tables are used only when there are visitors in the house. This implies that even though houses are being transformed as a means of modernisation, people’s ways of living has not totally changed. There are traditional ways of living that are perpetuated despite modernisation of the houses.

Despite the fact that the span of the dining space in Figure 7.4 is small, hardly 2m, the owner of this house wanted it as part of a strategy to separate dining with other functions within the house. In the same figure there is a container under the basin to collect water leaking from a basin. This indicates that although people are aspiring to have modern equipment in the house the technology of fixing these gadgets is still lacking. This indicates the lack of skills by mafundi, in this particular situation a “plumber”, who learnt his work through on the job training.
A kitchen in a self-contained house is one of the dominating features where there are “modern” facilities like a kitchen sink, electric cooker, refrigerator and cupboards. Although these facilities are found in self-contained houses, the electric cooker is rarely used due to high cost of electricity. Charcoal and paraffin stoves are commonly used. Out of 120 interviewees 100 reported that they use both charcoal and paraffin stoves, 15 only said they use electricity and charcoal stoves and five use firewood.
As noted in the case of eating, one may conclude that the combined use of electric cookers and paraffin or charcoal stoves is a duality of modernity and tradition. The desire of people to use modern equipment in Hanna Nassif is hampered by the economic disability, in this case by the households’ limited capacity to afford electricity bills.

The front veranda is not a typical aspect of separation for it is usually a semi-private space. A veranda has an important functional aspect in a coastal weather. It allows breeze to pass through and is therefore a comfortable space to spend time, rather than inside the house. Although it originates from the Swahili house type and is therefore regarded as a traditional element, it is surviving modernization because of its important function.

Self-contained houses usually have well defined front elevations. The front elevations are defined by the front veranda, a prominent feature in the traditional Swahili house type. In the traditional Swahili houses the front veranda is simple and recessed to form part of the main house where the roof of the veranda is part of the main house supported by wooden poles. In self-contained houses the veranda can be part of the major house structure or with a separate roof for an extended veranda protruding from the main house. In many instances one finds that the main house is roofed with corrugated iron sheets or roofing tiles. Verandas are often roofed with a concrete slab. The concrete slab can have more than one function, it can be used as a roof and as a structure to support storage water tanks and a television satellite dish (Figure: 7.9). Special attention seems to be paid to the design of the entrance veranda where flowerpots are usually arranged. The front veranda could be regarded as traditional but still modern.
Figure 7.7: Veranda of traditional Swahili house type. Note that the veranda is part of the main house and the roof is supported by wooden poles.

Figure 7.8: Protruding veranda in front of the main house. Note the burglarproof bars with patterns which form part of the decorations at the front elevation. Although the house is roofed with corrugated iron sheets, the veranda is roofed with a concrete slab.
Figure 7.9: Protruding veranda supporting satellite dish and a water tank. The veranda is constructed with concrete slab making it easy to support water storage tank and a satellite dish.

Figure 7.10: A veranda which is semi-circular. Note that there is no concrete slab over this veranda, but an extension of the roof structure with part of the veranda open to the sky.
Figure 7.11: Protruding veranda enclosed with burglarproof bars. Note the wall decorations and flowers.

Figure 7.12: A veranda without burglarproof bars. Note that the concrete slab roof is supported by concrete columns which were neatly done to form arches.

7.3 Climatic comfort

Climatic comfort is considered important as a developmental aspect in house design. The issue is discussed in chapter three. Climatic comfort is also considered by the people of Hanna Nassif as one of the important factors in a modern house. Big windows, which allow adequate ventilation and light in the house, are considered to be elements of a modern house. One respondent said that:
I extended my house from four to six rooms. Later on I changed the size of windows because I realised they were small. I can now see a lot of difference on my house. There is more light in the rooms and also cross ventilation which makes the rooms cool to some extent, compared to when the house had small windows. These qualities enhance my idea of a modern house (Interview with Mr. Mkopi, who built a horizontal extension and later changed the size of the windows).

All 21 houses where in-depth interviews were administered have reasonably big windows to facilitate cross ventilation and adequate lighting. Even though big windows allow more light in to the house, it does not necessarily follow that the house will be cool. This is because houses have been constructed too close to each other blocking cross-ventilation. In the circumstances people are forced to use fans to bring down the room temperature. However, if houses had small windows the situation would be worse.

In a hot and humid climate like Dar es Salaam, indoor climate depends on the control of air movement and radiant heat. So it is not only big windows, which can contribute to making sure that indoor comfort is achieved. Other issues contributing to indoor comfort are light and well-insulated roofs, reflective surfaces and designs that ensure the penetration of cool air into the house. Trees surrounding the house contribute to indoor comfort.

Priority for improved outdoor space is considered secondary by the Hanna Nassif residents in relation to increase of indoor space. Outdoor spaces are used for extensions rather than leaving space for a green area. A good design not only considers the four walls of the house but also space around the building. This is not the case with what is happening in Hanna Nassif. Extensions lead into the maximum utilisation of plots and therefore high plot coverage, as discussed in Chapter Eight. Too little outdoor space is left in each plot, indicating the need to extend houses vertically in order to save outdoor space while at the same time increasing indoor space.

For full maximisation of ventilation, it is important not to have enclosure walls, or if enclosure walls like fencing walls are put in place, they should be perforated to obstruct vision but not air movement. Shade is also important for outdoor comfort. In Hanna Nassif there is the provisioning of overhangs and verandas, which provide shade. Much as shade from trees is important, in most of the transformed houses tree planting for shade has not been taken into account. Plantation of trees which can filter sunlight, reduce air temperature by evaporation and reduce glare have not been part of the housing transformation processes taking place in Hanna Nassif. Due to high plot coverage, outdoor space left for tree planting has remained minimal resulting in indoor discomfort despite the improvement of some of the housing elements.
Figure 7.13: A shade from the tree. This improves outdoor comfort. Activities like sitting and playing are carried out comfortably under a shaded tree.

7.4 Rooms for renting

One of the motives obliging the residents to transform their houses is that of making room extensions for renting out. Out of 120 interviewees, 20 responded that they made extensions for the purpose of creating rooms for renting out. Room renting should be viewed as an urban phenomenon. In rural areas where people live in traditional houses they do not commonly rent out rooms to other people. One of the respondents had this to say:

I have never seen anybody in my village renting out a room. Usually people occupy large parcels of land. Houses are built using locally available materials. So everyone can afford a house, but here in the city people rent out rooms. When I came to Dar es Salaam in 1980 I started living with my brother. After six months I had to find a room to rent near Kariakoo market where I sell fish with my brother. I managed to get a room here in Hanna Nassif. I like this place, it is located near Kariakoo. I do not have to board a bus.

(Interview with Mr. Abdala, 28 years old, who is renting a room in Hanna Nassif, a fish seller at Kariakoo market).

In rural areas when a young man wants to get married he is expected to build his own house by using traditionally available building materials with assistance from friends and relatives. Usually in rural areas there are no restrictions if one wants to construct a house. In urban areas funding is not easy to organise and also there is
scarcity of land, even where one has some funds. The alternative is to rent a rooms or a house.

7.5 Toilet facilities

Design for health and sanitary standards are considered important in classic modernism especially the developmental aspects of house design, discussed in Chapter Three.

Improved toilet facilities are also related to modern way of living depending on the type of toilet one has in Hanna Nassif. A clean toilet which is properly ventilated and easy to clean is considered modern as compared to the traditional pit latrine. When they were asked what type of toilet facility they prefer, out of 21 interviewees, 20 preferred a toilet which is located in the house rather than a pit latrine. Having a toilet facility contained in the house has the advantages of guaranteeing convenience of use especially during night. However, one of the noteworthy disadvantages of a toilet facility incorporated within the house is the bad odour during water shortages. They are equally not suitable for use by large families.

It is a good thing to have an in-built toilet facility, particularly where the regular flow of water is guaranteed, as it ensures security among family members after dark. I used to have a pit latrine but I did not like it because it was difficult to keep it clean. When I made an extension I also provided an Indian type flush toilet in the main house (Interview with Mr. Lada, 48 years old, a house owner).

One of the major problem facing residents of Hanna Nassif and indeed informal settlements at large is connection of clean water. Water supply is uncoordinated and unreliable. Water shortage is a common phenomenon due to water rationing in the city especially during the dry season. Therefore, water is fetched and stored in big containers from other areas within the city. What was observed is that for some of people who are not connected to water supply system but have a flush toilet system are forced to use water buckets to clean toilets after use.

Although most people prefer self-contained houses, as long as the distance from the main house to the toilet is not too far, it is not necessary to have a toilet in the house. What is important is for the toilet to be easily cleaned and well ventilated to reduce odour and the pit should have a lid to keep out flies. Out of 120 interviews 96 respondents use pit latrines while 23 use water closet toilets. Often pit latrines are in bad conditions not having ventilation pipes and are poorly designed for ease of cleanliness. There is a big possibility that they pollute ground water. The 23 residents who have water closet toilets have made provisions for septic tanks and soak away pits. In other cases there are only soak away pits. These might also contribute in polluting ground water due to the percolation of wastewater into the underground surfaces.
Figure 7.14: An example of a modernised toilet in Hanna Nassif settlement. Note that due to water shortage, flush water is in plastic buckets to facilitate flushing and cleanliness.

City health regulations advocates for each and every house to have a toilet. Out of 120 houses that were studied only one household admitted they use the neighbour's toilet.

Out of 120 residents interviewed 78 stated that they were dissatisfied, with the type of toilets they have. This indicates that despite the residents' desire to modernise toilets, they are yet to give the matter a priority.

Figure 7.15: Typical pit latrine found in Hanna Nassif settlement. Note that the floor slab has been raised above floor level so as to avoid overflowing of the pit especially during the rainy season when water table rises.
Location of toilets inside the main house is an innovation from the traditional practice, where toilets are located outside the house. Flush toilets require skills to fix the accessories making sure that the toilet is functioning well, as compared to the traditional pit latrine in which squatting slab can be built by most mafundi.

This chapter has presented issues of modern houses in relation to housing transformation as expressed by residents and as interpreted from observations made in the field study. The next chapter provides a discussion on use of space and density as variables of housing transformation.
8 USE OF SPACE AND DENSITY

In this chapter the use of space in houses in relation to the transformation taking place in the case study area is presented. The relationship between outdoor and indoor space after transformation is discussed and their spatial qualities are analysed. The issue of how people define their plot boundaries is discussed considering private, public and communal space with the positive and negative aspects considered.

The functions in relation to spatial requirements discussed are cooking, eating, storage, sleeping, personal hygiene, resting and receiving visitors.

8.1 Cooking

Cooking is an important activity due to its special requirement in house design which is located either indoors or outdoors. When taking place indoors, the place for cooking is in specially designed areas that is the kitchen. In houses occupied by both tenants and owners in Hanna Nassif cooking takes place mostly in the sitting room or along the corridor and sometimes in sleeping rooms. In many houses there is a provision for a separate small building ("banda") in the backyard specifically for the purpose. The study shows that there is an increase in the separation of functions, especially in owner occupied houses, as in some cases where a single household occupies the entire house. In houses occupied by more than one tenant, even if they have more than one room, multiple use of space is common. Owner occupied houses usually have provision for a kitchen space either inside the house or in a separate building as owners usually are better off financially compared to tenants renting rooms.

It was noted that before room extensions took place, 22% of the 120 interviewed persons used to cook in the courtyard, but after the extensions the number decreased to 8%. The majority of interviewees living in houses with more than one tenant, usually use the corridor space for cooking while the rest cook in their rooms. The interviews show that 60% of the 120 interviewed persons consider cooking as a private activity and do not want their neighbours to know what they are cooking.
Table 8.1: Cooking space before and after transformation

<table>
<thead>
<tr>
<th>Location</th>
<th>Before Transformation</th>
<th>After transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen outside</td>
<td>22%</td>
<td>23%</td>
</tr>
<tr>
<td>Kitchen inside</td>
<td>13%</td>
<td>20%</td>
</tr>
<tr>
<td>Corridor</td>
<td>11%</td>
<td>20%</td>
</tr>
<tr>
<td>Sitting room(^{11})</td>
<td>16%</td>
<td>20%</td>
</tr>
<tr>
<td>Sleeping rooms(^{12})</td>
<td>16%</td>
<td>9%</td>
</tr>
<tr>
<td>Courtyard open to sky</td>
<td>22%</td>
<td>8%</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
<td>120</td>
</tr>
</tbody>
</table>

Most people prepare their meals on charcoal stoves, at least 81% of those interviewed, with very few using firewood or electric stoves. After transformation however, the use of electric stoves increased from 4% to 10% among the residents.

Table 8.2: Types of stoves used

<table>
<thead>
<tr>
<th>Type of stove</th>
<th>Before transformation</th>
<th>After transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charcoal</td>
<td>81%</td>
<td>81%</td>
</tr>
<tr>
<td>Kerosene</td>
<td>12%</td>
<td>7%</td>
</tr>
<tr>
<td>Fuel wood</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Electricity</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
<td>120</td>
</tr>
</tbody>
</table>

When people were asked if they were satisfied with cooking space after transformation, 70% responded in the negative. 30% of the interviewees had no problems. A similar pattern was received from interviews concerning cooking space before house transformation, suggesting that transformation usually does not take sufficient care towards satisfying cooking space needs. It was observed that cooking inside a limited space is especially dangerous for children while inside high temperatures are uncomfortable for those preparing food indoors.

According to the people interviewed other problems experienced in relation to this lack of proper facilities are:

- Lack of proper kitchen resulting in unhygienic way of cooking.
- Cooking outside because of limited space inside becomes especially inconvenient during sunny and rainy days.

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\(^{10}\) Kitchen outside in the context of Hanna Nassif is defined as a small separate structure from the main house or well defined space which is roofed and is used particularly for cooking activity.

\(^{11}\) Sitting room is defined as a space used for sitting and welcoming visitors, usually with furniture like sofas, chairs and coffee table.

\(^{12}\) Sleeping room is defined as a room where by there are furniture like beds and the room is used for sleeping. If other activities are also taking place, like cooking and sitting, but as long as the room is used for sleeping is called sleeping room.
• Some of the houses provided with a well-defined kitchen, have no chimney to take smoke out of the room.
• Cooking indoors on a charcoal stove without cross ventilation poses serious health risks and environmental pollution. This was also observed by Nyström (1994).

Owners living in their own houses or tenant households occupying a whole house enjoy a better cooking space, hence better living conditions. Some residents increase the size of their kitchen, with extra cooking facilities outside the main building, where charcoal and kerosene are used. All people interviewed complained that using electricity is very expensive while some own electric cookers just as a status symbol. When asked why they were not using electric cookers an interviewee responded that:

Electricity is expensive. Thus it is more desirable to use the space at the backyard of the house to cook using charcoal, which is much cheaper.
(Interview with Mrs. Mnenuka, 40 years old, house owner owning an electric cooker).

Some residents have improved their cooking space by constructing a separate room as a kitchen in the backyard or in the main house. This is said to be an improvement because the same people used to cook in bedrooms or sitting rooms out of necessity. Some of them used to cook by using firewood outdoors. It needs to be pointed out here that although some interviewees were convinced that they had improved their cooking areas, a lot remained to be done to bring the kitchen area to an acceptable minimum standard, that is, reasonably healthy and hygienic. Amongst the residents it is common for cooking utensils to be kept on the floor, while the floor may not be clean, and sometimes wet because of lack of kitchen sinks. Buckets are used to store water.

In rented houses some household members have a communal kitchen space in the backyard. Cooking in communal areas provides women with an opportunity to converse while cooking, thus creating a social space. However, a space used by many people requires cooperation to maintain cleanliness.

In some transformations, involving extension of rooms, most cooking takes place outdoors. One of the respondents narrated that:

Before extending our house the cooking activity was done outside using firewood. Following extensions a cooking area is now provided. We use charcoal and sometimes kerosene paraffin stove instead of firewood.
(Interview with Mrs. Nampunda who is a petty trader. The house is owner occupied).

Another interviewee informed us that:

We used to cook using a kerosene stove. This was done in the main house corridor. But later we decided to build a small room for cooking in the backyard. We found that it was untidy to use charcoal stove in the main house.
while kerosene stove is suitable for cooking a small quantity of food. Since kerosene is also more expensive than charcoal we usually use charcoal (Interview with Mrs. Mnenuka).

The type of stove used sometimes determines by the space reserved for cooking. Household members are aware of the inconveniences of a charcoal stove inside the main house. Thus, often the best solution, according to the respondents, would be to have a charcoal or paraffin stove outside.

In accordance with Tanzanian Building Regulations (URT, 2000:28) every new residence containing more than one living room or a room for sleeping has to be provided with a suitable area for the preparation of food. The areas should also be provided with a facility for the installation of a suitable and proper means of cooking. Moreover, where such means burns solid fuel a chimney for the removal of smoke and fumes should be provided. The kitchen is also supposed to be provided with adequate facilities for washing food and cooking utensils. The floor is supposed to be of concrete, smooth surface or other suitable impermeable materials.

During the fieldwork no single kitchen or cooking space was found to have a chimney. A provision taking into account the use of charcoal and paraffin stoves which emit smoke and fumes is important given the type of fuel used by most residents. The quality of cooking is thus far below the standard required by the regulations. Much as these regulations are meant for formal settlements they are also important in informal settlements to improve people’s living standards.

Figure 8.1: Typical way of cooking using a charcoal stove in the backyard. Traditionally, the use of firewood is common. Note that other utensils are kept on the ground, where there is dust.
8.2 Eating

Eating also requires hygienic space, such as dining room where there would be a table and dining chairs. These are more common in owner occupied houses. Tables and dining chairs are rarely located in the kitchen or at in backyard. Most people in shared rented houses dine in their rooms or sometimes in the backyard.

Table 8.3: Space used for eating

<table>
<thead>
<tr>
<th>Space</th>
<th>Before transformation</th>
<th>After transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dining room</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Sleeping room</td>
<td>35%</td>
<td>27%</td>
</tr>
<tr>
<td>Backyard</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Sitting room</td>
<td>26%</td>
<td>23%</td>
</tr>
<tr>
<td>Corridor</td>
<td>13%</td>
<td>23%</td>
</tr>
<tr>
<td>Veranda</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
<td>120</td>
</tr>
</tbody>
</table>

Dining rooms are used by the male head of a household or visitors. Household members were often seen eating in rooms or backyard. Why are dining rooms with furniture rarely used? Research findings confirm that eating while sitting on a mat spread on the floor is the traditional Swahili way enjoying their meals. Although a lot of changes are taking place this eating practice is still common, especially in coastal areas.

Figure 8.2: Traditional way of eating. Eating taking place on a mat inspite of having dining tables and chairs.

13 Dining room in the context of this study is defined as a space in a house located for eating where there is provision of dinning table and chairs.
The use of a tray is still very common even today, being easier for many people to sit on a mat and eat than on a dining chair. Some space in the backyard for eating purposes have a soil floor where mats are usually spread but given the nature of the floor, dust cannot be avoided. Areas like these need a solid floor, which is easily washed thus reducing dust.

8.3 Sleeping arrangements

Sleeping space is important in house design taking into account health, safety and comfort. In the study area rooms are usually used for sleeping combined with other activities. For instance, other domestic activities may very well be either outdoors or indoors depending on the availability of space. In this context the definition of sleeping space by Larsson (1988:45) is adopted. For her, “sleeping space is the total floor area of all rooms used for sleeping (in beds or on the floor). There may be a sofa, a dining table, a stove or a kitchen-cabinet in the room but as long as somebody sleeps in it, I have called it a room for sleeping”.

This definition is regarded practical in the case of Tanzania because there are similarities of the kind of situation identified by Larsson in her study. Sleeping arrangements are analysed by comparing the size of sleeping areas and the number of people before and after transformation.

Figure 8.3: A bedroom. The room is small in size accommodating only one bed inspite of the fact that two beds could accommodate more household members. The interviewed person said this bed is shared by three persons.

Households interviewed revealed that all members sleep inside the house except in exceptionally hot weather periods when a number of persons sleep outside to enjoy fresh air or the breeze. Of 120 respondents, 61% said they were satisfied with sleeping arrangements after transformation. They said that before transformation
houses were small hence the inadequate sleeping space. Sleeping arrangements are arranged so that a husband and wife usually have their own room though sometimes they can share a room with children below school age, that is seven years old.

Although room extensions facilitate the increase of sleeping space, some of the rooms are small, less than nine square metres. This is contrary to the requirement of Tanzania Building Regulations (URT, 2000:7) which requires that, “Every room shall have a clear superficial floor area of not less than nine square metres.

The small rooms provide an indication that, although there is an increase of indoors space, some of these spaces are not of good quality. At least they do not meet the minimum requirement for sleeping space in conventional houses.

Most people use bedrooms for both sleeping and storage. Very few use bedrooms for resting during the daytime because they are hot during the day. Due to modern solutions of design like the use of corrugated iron roofing sheets which conducts heat directly into the house, people prefer to rest outside in the front verandas, or in the backyard or under shading trees.

8.4 Receiving guests and accommodation arrangement

Visitors are usually received in the sitting room, backyard, sleeping room, corridor, the front veranda or outside in front of the house, depending on the type of house and relationship.

Receiving visitors is considered important by the respondents, especially when space is needed to accommodate visitors staying overnight. A pertinent question that may be posed is: what happens when visitors are received while sleeping space is only enough for household members. For those persons whose houses have inadequate space it becomes difficult to accommodate this situation. Therefore, one of the reasons for house extensions and alterations is to find space for accommodating visitors who usually stay overnight.

Interviewees informed the researcher that visitors who come to stay overnight, even without prior information, they do not find it disturbing. According to them the idea of the extended family has to be accepted as a social responsibility as one person remarked that:

We have to accept our friends and relatives. Overcrowding for a few days is not a problem (Interview with Mr. Mkopi who is selling vegetables in a market. His house is for both owner occupation and renting).

Some people can tolerate overcrowding for a short period only. Other respondents said that visitors who come to stay overnight are a disturbance, especially when sleeping space is limited.

Normally visitors share rooms, even beds with children. Female visitors share rooms with girls and male visitors with the boys. In some cases children are asked to spend nights with their grand parents so that visitors can sleep in the children’s rooms. Some respondents said that sometimes children are asked to sleep on the
floor to allow visitors to sleep in the children’s beds. In a situation where sleeping space is not available at all, visitors may be sent to sleep at a neighbours’ house. Female visitors are given priority when it comes to sleeping arrangements. There are some cases where owners have a two roomed house. Then one room is used as a sitting room and the other room as a bedroom. In this type of house, if the visitor is a woman, the owner may let her sleep in the room used as a bedroom and he shifts to the sitting room. If the visitor is a man he may sleep in the sitting room. This shows great flexibility, which indicates that people are innovative with the use of scarce resources. However, it was noted that the respondents prefer to have separate guest room.

The issue of accommodating visitors often causes some disturbance to the host family. Similarly, health-wise, it may not be healthy to have several people congested in one room. Modernisation of houses should ideally take into account the provision of a special room for guests, but what matters is the availability of space and priority in relation to household members resources.

8.5 Storage

Space for storing household goods is important. Items stored, as revealed in this study, are cooking utensils, water, food and personal belongings. The issue is does the transformation provide space for storing household goods.

Personal belongings like clothes are stored in sleeping rooms. Some of the transformed houses have in-built wardrobes, others have movable wardrobes. Those who cannot afford wardrobes stores their clothes in suitcases or bags and put them under beds. When analysis was carried out on the drawings before and after transformation, there was an indication to that the wardrobes provision followed transformation. Thus the respondent considers the provision of this facility to be house modernisation ensuring better use of space.

Cooking utensils are usually stored in cupboards. Food storage in plastic containers, kitchen store, and kitchen cupboards while some household members revealed that they usually do not store food, purchasing what they consume on a day-to-day basis.

Drinking water is kept in plastic buckets, and refrigerators. Water for other uses is stored in big plastic containers and drums, sometimes located on the front verandas roof, which is usually a flat concrete slab.

46% of 120 respondents said they were satisfied with the storage arrangement while 54% said they were not. There are some bulky items that need storage space, for example bicycles, motorcycles, buckets, building materials like corrugated iron sheets either stored in the corridor or sometimes in rooms. Transformed houses may have storerooms, but often not enough to accommodate all the items. Bulky items are sometimes kept in the corridor or living rooms. Since corridors are used as access space it becomes inconvenient to store bulky items in the area. The sitting room becomes congested with furniture and bulky items mixed together, making movement difficult.
Although people are glad when they transform their houses into modern houses, yet the majority do not succeed in developing adequate space for storage.

### 8.6 Socialising and leisure

Socialisation is also an important aspect of housing which needs space. However it is not tied to a specific space area, can take place in many different spaces. Activities like sitting and talking, plaiting hair, playing cards and chess to mention but a few may take place at the front veranda. Also in sitting room and backyard or in the shades of trees or the house. Thus socialisation can take place indoors or outdoors. In owner occupied houses the room arrangement portrays a sitting room, dining, sleeping and kitchen areas. In these rooms sofas, coffee tables, stools, TV set, dining table and chairs are common features. As for men, usually socialising takes place in the sitting room or front veranda. Women usually socialise in the backyard or the front veranda. In rented houses, due to shortage of indoor space, usually socialising is in the backyard or outside under a tree or in the shade of the house. In rented houses it is usual to find a room crowded with a bed, a TV set, and a small table making it difficult to socialise in comfort.
Figure 8.5: Congested arrangement of furniture in rooms. There is very little space for circulation in the rooms.

In this type of house occupants socialise outdoors either in the backyard or on veranda. The outdoor space is not for socialisation only but also for other activities like cooking, washing dishes, washing clothes and drying. When discussing such issues a few questions arise such as: Can we say modernisation of houses leads to the shrinkage of outdoor space thereby affecting the quality of outdoor space? We cannot say the size only determine the quality but we should also look into the conditions pertaining to outdoor space. Most of which are left in their natural state making it difficult to keep them clean although sweeping is done from time to time. Usually when people want to sit and talk, rest, and plait hair they spread out a floor mat on the ground. Very few people have planted trees. As one of the respondents commented:

> It is good to have flowers and trees around the house because of the shade and fresh air. The area becomes a nice place to rest in the afternoon. This is what I aim for (Interview with Mr. Lyatuu who works with the immigration office and has a two-storey house).
People in informal settlements appreciate the beauty of green surroundings. Space for socializing in modern houses is related to space in a traditional Swahili house where the traditional setting was in a way that there was a seclusion of women from men. Women used the courtyard for receiving their visitors as a socialising area with men using the front veranda for coffee drinking and socialising. Changes are taking place, these days the front veranda can be used by women; and men can also be found sitting in the courtyard. It can be said that modernisation and the urban way of living brings about these changes.

### 8.7 Space for personal hygiene

Space for personal hygiene includes toilets and bathing facilities, which are usually found in a small separate building, in the backyard. Each house visited had these facilities. In some cases the toilet is also used for bathing purposes. Plastic containers are commonly used to carry bath water to the toilet. Some of the households have piped water connected to their plots while some do not.

Most of the toilets are pit-latrines, when a pit is full the house owner digs another within the plot. Houses accessible to a cesspit emptier, make arrangements for emptying of their pit latrines. This is expensive because one has to pay about US$ 50 for the service. Those who cannot afford to pay the service charge take advantage of the rainy seasons by making holes in their pit latrines and allow the sewerage to leak into open storm water drains.

Most of the pit-latrine floor finish is difficult to clean and most of them do smell. Similarly, many pit latrines are not roofed. Although the process of transformation has changed pit latrines, observation shows that the upper structure of a pit latrine is built of concrete blocks, but other aspects in relation to quality improvement are not taken into account. The Tanzanian Building Regulations stipulate that pit latrines shall be provided with a sufficient opening for light and ventilation near the ceiling as practicable and communicating directly with the external air. The floor of pit latrines must be of non-absorbent material, and a fall or inclination toward the entrance door (TBR, 2000: 63). Pit-latrines in informal settlements do not meet the regulatory requirement.
Few transformed houses have “modern” toilets and bathing facilities that include openings for light and ventilation pipes. The floor finish is of non-absorbent materials like tiles and cement screed. After transformation 20% of those interviewed changed their toilets to an eastern type of flush system. A few not connected to a water supply system have this type of toilet which they pour water into from plastic buckets to clean the facility. A few members of households who transformed their houses have also modernised toilets and bathrooms in such a way that they are easy to clean and more hygienic to use. Some have even taken the initiative to have large water tanks to maintain cleanliness during a water shortage. Some observations reveal that when one is trying to have a modern house, he/she is also trying to have a modern clean toilet.

Space for washing clothes is located outdoors in the backyard. Plastic containers like buckets and basins are used. There is no difference between spaces used for washing before or after transformation. No consideration is given to the improvement of space for washing clothes, unlike the space for washing dishes, where a special raised platform is utilised. Used water has no specific space to be directed to but most pour it on the ground or down the drainage water channels. During washing the space looks very untidy although the water poured on the ground reduces dust. There is a need of space for washing clothes for women expressed that they were not happy with the present arrangements preferring a raised platform for washing and a proper drainage system.
Figure 8.7: Raised platform for washing dishes. There is a water standpipe, but also plastic containers to store water because there is no guarantee of constant water supply on a day to day basis.

8.8 Plot demarcation

The housing transformations and modernisation processes taking place in informal settlements have led to an increase in the provisioning of distinct boundaries at plot level. There are instances where the houses have utilised all the space available, with the demarcation of plots indicated by only the house walls. Others have built fences, either by using permanent materials like concrete blocks or temporary materials like used roofing sheets, coconut tree leaves, drainage channels, and used tyres. There are some cases where people have planted trees or plants to indicate the plot boundaries. During this research it was noted that 50% of 120 interviewees could easily identify the boundaries of their plots without any demarcation marks.

The Hanna Nassif residents said that boundaries are largely related to plot demarcation and fending off intrusions and uninvited entrants. Although this is how they express it but it is difficult to prove.

Transformation of houses is seen in the increase in restricting entry either to plots or houses. The provisioning of demarcations, is a phenomenon which is increasing. In houses whereby there is provisioning of a fence and gate, it is not easy for anyone to go straight to the door without knocking at the gate or ringing a bell to be let in. The focus here is how the organisation of a house in the plot is
governed by territorial rules. The people of Hanna Nassif are expressing territory\(^{14}\) explicitly by building walls, providing gates, placing used tyres, planting trees and putting stones.

**Figure 8.8:** Demarcation of plot by used tyres. It does not prevent intrusion, but cars from entering the plot. This kind of demarcation marks semi-private space.

**Figure 8.9:** Demarcation of plot by planting hedges. This kind of demarcation provides greenery also.

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\(^{14}\) Territory refers to a unit of spatial control. While territory itself is neither public nor private, each territory contains spaces that are public, private or both.
The relationship existing between space on the opposite side of a gate can be seen as asymmetrical. It is easier for one to exit for example from a house into a street, but coming back, one is subjected to scrutiny at the gate or the door. It is not possible to enter without permission. If a visitor is someone not known to the members of the respective household he or she may be denied entry. For example in Hanna Nassif before a visitor enters a house he or she should say hodi (request to be allowed in the house). One will not enter the house until one of the household members replies karibu (meaning that you are welcome). The same applies where one is allowed to enter a house but not necessarily into the rooms. The decision to exclude or to shut the door to select whom should or should not be admitted is a territorial safeguard.

8.9 Communal, Private and public spaces

Most outdoor space found in residential areas within Hanna Nassif settlement are privately owned. However, the use of space is not restrictively private. With the exception of roads every piece of land belongs to someone. Due to the housing transformation process some residents have only very small outdoor space, while others do not have any outdoor space. The good thing about Hanna Nassif is that outdoor spaces can be shared with neighbours.

Usually there are no formal agreements regarding the use of outdoor space. Such usage is respected as a gesture of good neighbourliness. Only in a few cases do neighbours have some form of agreement. However, where one house owner does not have an outdoor space for washing, drying clothes or resting, while his/ her neighbour does not have access to the street, a mutual arrangement is made to allow each other to access space for the function he/ she needs.
There are cases where individuals do not allow their outdoor space to be used by their neighbours except when people require the space for a funeral or a wedding. Where a house is enclosed with a fence all the space within the enclosure is private. In rented houses co-tenants share, common spaces like corridor, front veranda and backyard. These could be said to be semi-private spaces because they are shared by several households of the house. Public spaces are those located along roads and sometimes school open spaces, which are accessible to everyone without restriction.

Distinction could be made clearly between space as a private one and the degree of privacy. The backyard without a fence has privacy to a certain extent, but the backyard with a fence is accorded a higher degree of privacy.

Public space is defined as space used by those who do not individually control it. In the case of an informal settlement like Hanna Nassif a clear public space is a street. If one leaves ones house by entering a street it is his or her right. There is always a public space where people can move in and out freely.

A territory can be claimed through the use of space. Some people occupy space temporarily and use these spaces as theirs. For example, one can put a table in a public street and start selling consumables and or other items. This is common in Hanna Nassif. There are some spaces where people sit in the evening, put tables and start selling consumables such as fried fish, fruits, coffee and other items. The following day they occupy the same space as if the space belongs to them, but it is actually a street, a public area. In Hanna Nassif those lacking outdoor space in their plots who wish to carry out income generating activities, claim territories at the side of the street close to their houses.

Figure 8.11 shows that a space is created for communal activities. This shared space could only be accessed by tenants, house owners and members of households. The space is controlled by members of the household who have the right to close the gate towards the street at set times. Members of the households living in private rooms determine the use of this space. This type of organisation allows the provision of more communal space between the domestic and public, which is the street in front of the house. Some families in Hanna Nassif settlement live in compounds behind a single gate maintaining a communal living space. Good communal space for multiple uses can compensate for lack of private space.
Figure 8.11: Courtyard used as a communal space. The courtyard is used by four households, one household in the main house and three households renting rooms in the extended part.

Before transformation, the space on Figure 5.2(a) (Chapter Five) could be regarded as private because the owners' household members only used it. After extending rooms for tenants, the tenants are now entitled to use the backyard space. This indicates that transformation can change the character of outdoor space. In this case leading people to control their space, and therefore, the establishment of what could be termed territory.

8.10 Density of plots and houses

The transformation of houses increases density. A study conducted by the University College of Lands and Architectural Studies in 1989 shows that in Hanna Nassif each piece of land is claimed and the built area contains 43 houses per hectare. The study shows that new developments are taking place in flood prone areas of the Msimbazi valley. The population density stands at approximately 390 persons per hectare. The study of housing transformation reveals that out of 21 houses studied in-depth, only 3 houses have more than 2 persons per habitable room.

Acioly and Davidson (1996:7) point out that the plot coverage give the dimensions of the most visible aspect of density in the amount of built up space. The study indicates that before house transformation, especially room extensions,
the majority of plots had low plot coverage (Figure 8.12). There is an extensive densification without development control, because the area is an informal settlement where rules and regulations to guide development are not followed. This has led to the area being built above the recommended plot coverage, given by the Tanzania Space Standards for Urban Residential areas (URT, 1978) which is 50%. The idea of 50% coverage is to have outdoor space for outdoor living, especially in Dar es Salaam where the hot and humid weather can be very uncomfortable. It is also intended for the purpose of adequate space between buildings to allow cross ventilation and light inside the houses. However, the disadvantage of the regulation is under utilisation of space especially when most of the houses are single storey.

![Plot Coverage Graph](image)

**Figure 8.12: Plot coverage before and after transformation.**

Figure 8.12 shows the percentage of plot coverage before and after transformation. Before transformation the minimum plot coverage was 7% and the maximum was 69%. After transformation the minimum plot coverage was 42% and maximum was 92%.

In residential areas many activities are taking place outdoors given the fact that temperatures in the houses are high due to the hot and humid weather of the coastal areas. Increasing plot coverage means diminishing outdoor space. It can be argued that excessive plot coverage has undermined the spatial qualities in the settlement. Despite the fact that the outdoor space was reduced, it was noted that the occupancy rate per square metre has not increased. The high plot coverage...
contributes to more indoor space for the majority of household members but not necessarily the improvement of indoor comfort. The high plot coverage deprives the residents of thermal comfort in their houses. Household members are obliged to pursue out outdoor activities like dishwashing, washing and drying clothes, socialising and resting within restricted space.

8.11 Increasing density and population

The transformation process has not increased average occupancy rates and overcrowding within rooms. There is an increase of space used for rooms at the expense of outdoor space. However, the increase of indoor space has reduced room occupancy rates, much as there is increase in the number of household members.

Rented houses are found to have higher occupancy rates compared to owner occupied houses. Despite the fact that the transformation under study is taking place in an informal settlement, it appears that the extensions and alterations have contributed to a decrease in occupancy levels per room as required by the standards in conventional houses.

It is clear that the extended rooms used for rental purposes in Hanna Nassif are responsible for the increase of occupancy rate and, therefore, population density. As there is limited control in the occupancy of accommodation in informal settlements, a room could be occupied by more people than the current levels given the rapid migration to urban centres. Similarly, cheap accommodation is found in rooms for renting in informal settlements, where many households sacrifice space to gain rental income.

Tanzania Space Standards (URT, 1978) recommends the rate of occupancy for residential urban areas to be 2 persons per habitable room that is, husband and wife, two adults of the same sex, 2 children below the age of twelve of either sex, the average family size being 4-6 persons.

This study has established that the minimum average household size before extension is 2 persons and the maximum household size before extension is 11 persons, while the average household size after extension is 4 and maximum household size after extension is 17 persons.

In the theory chapter, it was assumed that among reasons forcing people to transform their houses was lack of or inadequate accommodation to meet their space demands. Through extensions and alterations there is a considerable increase in house space especially for houses occupied by only one household. In all the houses studied the majority have increased house size. For example, one house was only 37 square metres but through extension the size of the house reached 118 square metres. In order to get a full picture of house expansion see Table 8.4 below.
Table 8.4: Increase in floor area

<table>
<thead>
<tr>
<th>House No.</th>
<th>Floor area of the original house sq.m.</th>
<th>Floor area of transformed house sq.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>127</td>
<td>127</td>
</tr>
<tr>
<td>2</td>
<td>73</td>
<td>82</td>
</tr>
<tr>
<td>3</td>
<td>124</td>
<td>148</td>
</tr>
<tr>
<td>4</td>
<td>37</td>
<td>102</td>
</tr>
<tr>
<td>5</td>
<td>39</td>
<td>149</td>
</tr>
<tr>
<td>6</td>
<td>41</td>
<td>131</td>
</tr>
<tr>
<td>7</td>
<td>74</td>
<td>128</td>
</tr>
<tr>
<td>8</td>
<td>116</td>
<td>188</td>
</tr>
<tr>
<td>9</td>
<td>122</td>
<td>163</td>
</tr>
<tr>
<td>10</td>
<td>125</td>
<td>177</td>
</tr>
<tr>
<td>11</td>
<td>93</td>
<td>160</td>
</tr>
<tr>
<td>12</td>
<td>33</td>
<td>133</td>
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<tr>
<td>13</td>
<td>121</td>
<td>165</td>
</tr>
<tr>
<td>14</td>
<td>82</td>
<td>107</td>
</tr>
<tr>
<td>15</td>
<td>37</td>
<td>118</td>
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<tr>
<td>16</td>
<td>97</td>
<td>106</td>
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<tr>
<td>17</td>
<td>136</td>
<td>136</td>
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<tr>
<td>18</td>
<td>18</td>
<td>98</td>
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<tr>
<td>19</td>
<td>84</td>
<td>191</td>
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<tr>
<td>20</td>
<td>157</td>
<td>157</td>
</tr>
<tr>
<td>21</td>
<td>49</td>
<td>154</td>
</tr>
</tbody>
</table>

There is a great variation of house sizes before and after transformation. Before transformation the smallest size was 18 square metres and the largest was 127 square metres. But after transformation the variation ranges from 82 square metres and 191 square metre. Thus transformation increases house space and at the same time introduces a great range of house varieties in terms of form and occupancy relationships. That is, houses with different designs and occupancy such as owner occupancy, rooms for renting out to several tenants and houses rented out as a whole unit.
In a case of the Hanna Nassif it was found out that the settlement is not for low-income people only but the middle-income group has fitted in well, much as the majority population is of low income. The transformation of houses has introduced houses for middle-income people. The history of the settlement shows that the original developers of the area were mainly low-income people and houses constructed at the early stage were of poor quality. The housing variety has led into a heterogeneous population. The increase in floor area often influences the increase in habitable space. Extra habitable\textsuperscript{15} space is created through the addition of new rooms.

This chapter has identified the use of space and their spatial qualities. Horizontal transformation characterizes housing development in Hanna Nassif where unguided transformation activities have led into poor spatial qualities. There is a high plot coverage due to room extensions especially for renting out. In the subsequent chapter the classification and analysis of different house types is carried out.

\textsuperscript{15} The Tanzania Space Standards for Urban Residential Areas define habitable space as a space used for living, relaxing, studying and for sleeping but not for cooking, washing, bathing, storing and other purposes.
9  HOUSE TYPES

The preceding chapter presented an analysis of space use and density in the case study settlement. One of the objectives of the present study is to identify and analyse changes that are taking place in informal settlements with a view to identifying and classifying existing and emerging house types. This chapter, therefore, provides a classification of different house types found in the study area. The built environment of urban informal settlements is a continuous transformation of different houses and space between them. The transformed houses may represent some values that actually bridge past and present lifestyles of the people.

9.1  Classification and analysis of house types

There are different criteria for classification of house types. For the purpose of this study Lawrence (1994) criteria for classification of house types were found to be useful (section 3.1.6). Through analysis of plans that were documented during the fieldwork it has been possible to classify house types using the two criteria. The first one is the spatial organisation of the floor plans and the second criterion is the number of floors. These criteria were proved useful by Lawrence (1994) who used them in classifying dwelling types in Fribourg, Geneva. By applying these criteria in the Hanna Nassif situation, the following house types have been discerned:

1. Rooms in line house type.
2. Urban Swahili house type.
3. Modified urban Swahili house type.
4. L-shaped house type.
5. U-shaped house type.
6. Two storey house type.
7. "Other" house type.

9.1.1  Rooms in line house type

This house type consists of rooms arranged in a line being single banked house consisting of two to four rooms. The room in line house type is not static for like other types it is also undergoing transformation. The formation of this house type is such that most household activities are taking place outdoors. Unlike other house types, the inter-phase between indoor and outdoor spaces is direct and not through corridors. This type of house usually lacks a front veranda. Observation has shown that this type of house has much better outdoor space as compared to other types in terms of ample space. The reason might be that the space left is intended for extension in the future. The house can be for owner occupation, rented and can accommodate both tenants and owners (Figure 9.1 and 9.2). One of its key advantages is that it facilitates cross ventilation.
Figure 9.1 and 9.2: Rooms in line house type. Entrance to each room is from outside. Unlike other house types which have verandas and corridors, the room in line house type has a direct access to the outdoor space.
The room in line house type plan is simple. In terms of design, the house is flexible for changes and expansion when the density is not high. In essence it is easy to extend additional rooms to the existing house. It is also cheap to construct given the nature of its plan. During the process of change a new house type can be developed by adding rooms from the end sides of the house or by changing it into a Swahili house type by adding rooms that face the present rooms. Overseeing the transformation of this house type could be a learning process to professionals in the fields of architecture and urban planning, on how incremental house construction is undertaken by residents. It could also contribute to the discussion of house types especially taking into consideration that new house types are emerging in informal settlements where professionals have not been involved in housing development. In the course of this research it was noted, that to a large extent, house owners themselves aided by mafundi drive the process of housing transformation.

In the room in line house type, tenants usually share utilities such as toilets and bathrooms that are located a bit separate from the main house. There is an organised system for taking responsibility in cleaning toilets, bathrooms and the shared outdoor space. As for this type of house there is no obvious division of spaces compared to the Swahili house type, where space division in terms of indoor, outdoor, private and communal areas are clearly defined. The only clear distinction of space is indoor and outdoor. It was learnt that this house type is constructed with the intention of future extension. Being relatively simple and cheap to build makes some house developers prefer this type of house. Once the house is habitable the owner starts saving money for buying materials and paying
the *fundi* to make the desired extensions. Since the roof types of many rooms in line house type is mono-pitch (Figure 9.3) it is easy to make extensions without disrupting the old part of the roof. Once the walls are built for the extended rooms, the roof is also easily extended.

As earlier observed, house transformation meets people’s needs for sleeping, eating, resting, and carrying out domestic activities that might otherwise be missing or inadequate. The room in line house type could be considered to fulfil two demands. One is owner occupation requirement whereby individuals struggle to develop their houses to avoid hassles or problems associated with renting rooms. Second is the fact that it fulfils the demands for rental accommodation, whereby house owners earn some income via renting rooms out, thus accommodating tenants.

9.1.2 Urban Swahili house type

The urban Swahili house type is described in section 2.3 of this thesis. The main features are central corridor from which all rooms are accessed. It also has a front veranda and a courtyard. Facilities like toilets and bathrooms are provided at the backyard. The division of space is clearly defined as indoor, outdoor, private and communal. This type of a house usually accommodates more than one household tenants and sometimes owners as well. Each tenant occupies one or more rooms together with his/her household members. Sometimes tenants share the house with the owner, sharing of both indoor and outdoor spaces. In this type of house, the use of both indoor and outdoor spaces are assumed to reflect how, and the extent to which interpersonal contact between individuals and group is encouraged or inhibited. There are some other Swahili house type which are used by only members of one household. Also due to the transformation process, there are some changes taking place, which places some houses to be at a border line and it is therefore difficult to say whether they are Swahili house type or not (Figure 7.1).
Figure 9.4: Typical layout of a Swahili house type. Each room is occupied by a tenant. The corridor is used for cooking and as a passage area. Toilet and bathrooms are located at the backyard. The front elevation is defined by the front veranda. The double-banked layout limits crossventilation.

Figure 9.5: Front facade of an urban Swahili house type. The front veranda is an important feature of this house. In most cases, the urban Swahili house type has a hipped roof.
The Swahili house type layout can be considered in terms of shared domestic services for cooking, washing (dishes and clothes), resting, bathing and toilet facilities. There is a different spatial relationship in this type of house, which leads to varying degrees of human interaction. Women using the backyard talk to each other while carrying out domestic chores. People living in this type of house often meet in the corridor. The layout of this house is to a certain extent disadvantageous in terms of comfort. The house is double banked and therefore it is not easy for it to have cross ventilation. There is also multiple use of space in that a room may be used for both cooking and sleeping. It was observed for instance that 30 interviewees out of 120 were cooking in their rooms. Cooking in rooms also meant for sleeping is detrimental to the health of the occupants since gas emissions from paraffin oil or charcoal stoves pollute the room making it uncomfortable to live in with limited fresh air.

Figure 9.6: Cooking taking place at the corridor in Swahili house type

The Swahili house is also flexible because the ground plan can be changed, taking into account limits set by the basic structure. These findings are similar to those made by Vestbro (1975: 34-35) in that the change of door positions or closing and having new openings, instigate the spatial organisation to be adapted to, for example, the family cycle of the occupants. The Swahili house type can be extended by the addition of new rooms directly to the main house or at the backyard. The Swahili type of house maximises the number of rooms for renting.
9.1.3 Modified Urban Swahili house type

A modified urban Swahili house type is either a combination of Swahili house type and room in line house type or a house with a spatial organisation that primarily contains either a backyard, front veranda, or a central corridor. If two out of five criteria (central corridor, front veranda, courtyard, toilet and bathroom located at the backyard and all rooms accessed from the corridor) of the Swahili house are fulfilled then the house is classified as modified Swahili type.

A modified Swahili house type can be of the original structure or may have resulted from a transformation process, in terms of extensions and alterations. A house can be subjected to changes depicting combined characteristics of a conventional Swahili house type with new additions. Like in other types, a modified urban Swahili house type accommodates tenants and owners. For houses which are occupied by tenants only or tenants and house owners, the sharing of some indoor and outdoor space is mutual. The sharing of space is similar to that obtained in Swahili house type.

A modified Swahili house type occupied only by the owner, usually the backyard space is enclosed by a fencing wall indicating that the use of space is private; and social interaction with the neighbours is limited. The backyard space is private compared to the house type for people renting rooms where the backyard space is rather communal in use. Where this house type is intended for renting, the underlying reason aired by interviewees owning such houses, is to provide as many rooms as possible in the space available. The communal spaces at the backyard are used for carrying out domestic chores, interaction between different tenants and relaxation. Notwithstanding the differences in house types studied, in the course of the field study it was observed that although transformed houses lead to new house types, there are some elements, which are not changing. The corridor is an important space provision because it is used for movement of persons and as access to the rooms. However, rooms may not be accessed through the corridor.
but from the outside. Another key part is the front veranda, although not all modified Swahili house type have a front veranda. This is considered important because it defines the front elevation of the house and is an area where visitors can be received and members of the family or tenants can socialise.

A modified urban Swahili house type in the area of this study is a result of transformation although others may be original. The disadvantage of this house type, especially when there is limited space is that extension of rooms has the tendency to increase indoor space and minimising outdoor space. Since the house is double banked with limited cross ventilation, further modifications especially in room extensions on the sides of the house make cross ventilation more problematic. However, the house type has the advantage of more rooms, therefore making rental accommodation more available to meet the increasing demands of rooms.

Figure 9.8: Layout of a modified Swahili house type. There is a corridor between the rooms but there is no front veranda or courtyard like that found in urban Swahili house type. Some rooms are occupied by the tenants and some by the owner.
Figure 9.9: A modified Swahili house after transformation. Note that there is an addition of other rooms on the plot. This is one house. All the rooms on the added part are used by the owner. By extending more rooms, the whole of the plot has been utilised, reducing the outdoor space.

9.1.4 L-shaped house type

This type of house consists of a line of rooms arranged in an L shape. It is a single banked house consisting of more than 2 rooms (Figure 9.10). The house provides a semi-secluded courtyard with the advantage that there is a higher possibility of enough cross ventilation and light in the house because it is easier for air to pass through. The L shaped house type has similar advantages as the room in line house type.
Figure 9.10: A plan of an L-shaped house type. All rooms are occupied by different tenants sharing the toilet combined bathroom. Other activities like washing clothes, drying clothes and cooking are takes place outdoors.

Figure 9.11: An L-shaped house after transformation. Note the additional room which is also rented out. Due to the increased number of inhabitants an additional toilet and bathroom is included as part of the transformation.

The courtyard layout created by the L-shaped house type shields the outdoor spaces from dusty winds. As in the case of the room in line house type, accessibility to rooms in L-shaped house type is direct from outside and not through a corridor. The L-shaped house type forms a semi-defined outdoor space, which can be used for activities such as washing, drying clothes, cooking and eating. Often this type of house is used for room renting. The entrance to the door is from semi-private area.
to a private area. This type of house is also simple to construct and flexible to extend on its sides. Its simplicity makes it possible for mafundi to carry out further extensions.

The facilities like the toilet and bathroom located separately from the house are also meant to be shared by all members of household renting the rooms. Toilets are either combined with the bathroom or separated.

9.1.5 U-shaped house type

This type of house consists of a line of rooms arranged in U-shape. It has many rooms with a courtyard between the rooms. Rooms are either occupied by both tenants and owners as in L-shaped houses. The entrance to the rooms is usually from the semi-private courtyard area to a private area, that is the rooms (Figure 9.12). In this type of house bathroom and toilets facilities are shared.

The U-shaped house type forms a courtyard, which is used for outdoor activities like washing dishes and clothes, drying clothes and hair plaiting. In the observed houses these courtyard are narrow, but they could be made wider. In this type of house the only space shared by different members of household is the courtyard and toilet unlike in urban Swahili house type where a corridor and the front veranda are also shared by other household members. Due to the narrow character of the courtyard, living quality in this space is rather poor, as a result of limited cross ventilation and too many openings of rooms facing this space.

![Figure 9.12: U-Shaped house type. Usually tenants and house owners share the house. In this case the toilet and bathroom are constructed with corrugated iron sheets as walling materials. The toilet is without roof cover.](image-url)
9.1.6 Two storey house type

This is another house type found in Hanna Nassif informal settlement. Two storey houses are rare in Hanna Nassif and other informal settlements. To build two storey houses requires more advanced building skills and are more expensive than the single storey houses. The study has shown that mafundi in Hanna Nassif can build this type of house. Out of 120 houses studied only three houses of two-storey house type were found. Out of the three houses one was constructed with a provision for vertical extension from the original design. The other two houses started as room in line house type. A horizontal transformation was completed first and later vertical extension. These houses were exclusively used for owner occupation. So they were occupied by one household only unlike in other types whereby multi-household occupation characterises housing tenure.

The advantage of this house is that first floor rooms are in good position to catch the wind especially in a densely populated area, where houses are too close to each other. The upper floor rooms are exposed to adequate sun lighting and views, since they emerge amidst low-rise single storey house types.

![Figure 9.13: A ground floor plan of a two-storey house type. Note that there is still an ample space remaining on the plot.](image)

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Figure 9.14: The first floor of a two-storey house type. Note a roof terrace where people can sit in the evening and enjoy cool breeze and views in all of the settlement directions. The upper floor has only one bedroom.

Figure 9.15: Two-storey house type. Roofing of the upper part of the floor was yet to be finalised. Tiles have been used as a roofing material. Coral stones have been used as a cladding to decorate the facades. Arches are used just to present a different visual appearance from the rest of the surrounding houses. It is an expression of the status of the house owner.
Fig 9.16(a & b): Two-storey house type which developed after horizontal and vertical extension. The original house was a room in line which gradually developed into a two-storey structure.

Fig 9.16(c & b): The first floor plan of a two-storey house type which was still under construction when this study was carried out and not yet occupied. The figure on 9.17(d) is the front elevation.
9.1.7 Other house types

These types of houses are either a combination of already defined types or with unique characteristics not defined in the preceding classifications. In the context of this study, other house types are either a combination of the Swahili house and room in line and other types with a different spatial organisation than the categories already defined.

The house in Figure 9.18 is usually used for owner occupation, or renting the whole unit to one household. The rooms are arranged in such a way that renting out rooms is not facilitated. The plan of rooms makes it difficult for cross ventilation to take place. Part of the plot is fenced with corrugated iron sheets. Household chores, such as washing and drying clothes, or doing the dishes, usually takes place in the backyard.
Figure 9.18: A floor plan showing one of the “other” house type. In this type of house there is no corridor. Toilet and bathrooms are contained in the house. The whole house is occupied by the house owner household members. Activities like washing clothes, dishes and drying clothes take place at the back of the house.

Figure 9.19: The floor plan of the “other” house type after transformation. An additional room was built and attached to it; it is a bathroom and toilet. The room is rented out.
The house in Figure 9.20 shows that the design is very compact. Corridors are too narrow to be shared by a large number of people. The outdoor space is also quite minimal, making it difficult for the house occupiers to carry out domestic chores.

The house types have advantages and disadvantages that differ from one layout to the other. Where house types are not totally enclosed with fencing, social contacts are encouraged. In the evening people sit in front of their houses chatting in social groups. All house types in this category have a link with the use of outdoor space. The relationship between indoor and outdoor space is linked making it possible for domestic chores to take place outdoors in the courtyard.

The changes that have been taking place in Hanna Nassif have led into different house types which might be a result of socio-cultural, economic, technical and functional issues.

However despite this attempt to classify house types in Hanna Nassif informal settlements, there are challenges particularly to the criteria used for making this classification. The basic criteria of the house layout do not capture all the variations in house types. What is common in all house types studied is the fact that construction work is without any formal design standards. This leads into many different kinds of houses that could not be explicitly classified. This points out the complexity of the whole exercise of classifying house types in informal settlements under the rapid dynamics of housing transformation. This calls for further research to develop other methods to classify houses so as to identify the unclassified house types. The above classification, advantages and disadvantages of the classified house types are summarised in table 9.1.
<table>
<thead>
<tr>
<th>House type</th>
<th>Physical/ layout characteristics</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room in line house type.</td>
<td>-Rooms aligned on one line. It is usually single banked and with mono-pitch roof type.</td>
<td>-Facilitates ventilation. -Flexible to changes (incremental). -Provides rooms for renting.</td>
<td>-Often a room in line house type is an intermediate stage towards a Swahili or “other” types of houses. -Expose users to indoor pollution due to use of charcoal and paraffin.</td>
<td></td>
</tr>
<tr>
<td>Urban Swahili house type.</td>
<td>Front veranda, a central corridor, all rooms accessed through the corridor; the corridor leads from front veranda to the courtyard.</td>
<td>-Allows for versatility in furnishing and functional use. -Flexible, the ground plan can be changed. -Elastic, can be extended by adding new room, at the main house or at the backyard.</td>
<td>-Does not facilitate cross ventilation. -This type of house constitutes the majority of house types in Dar es Salaam. -Expose users to indoor pollution due to use of charcoal and paraffin stoves for cooking.</td>
<td></td>
</tr>
<tr>
<td>Modified urban Swahili house type.</td>
<td>It has a corridor but modified entrances to rooms and sometimes without a veranda. - Fulfils 2 of the 5 criteria of Swahili type house.</td>
<td>-Provides room for renting and owner occupation. -Enhances social interactions among dwellers.</td>
<td>-Does not facilitate cross ventilation. -Creates more problems of ventilation by the addition of rooms to already the double-banked house.</td>
<td></td>
</tr>
</tbody>
</table>
### House type

<table>
<thead>
<tr>
<th>House type</th>
<th>Physical/ layout characteristics</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| L-shaped house types.       | Room in line forming L-shape with half enclosed outdoor space. | -Facilitates cross ventilation.  
- Creates semi enclosed outdoor space that is shielded from dust and wind.  
- Elastic, can be easily extended. | - Limited privacy.  
16 | Often L-shape is an intermediate stage in the transformation of a house to “other” house types. |
| U-shaped house type.        | - Room in line forming U-shape, with a defined courtyard. | - Flexible to changes.  
- Elastic, can be easily extended. | - Does not facilitate cross ventilation. | There are few houses of this type in Hanna Nassif.  
- Provides room for renting.  
- Narrow courtyard, difficult to use. |
| Two storey house type.      | - A house with two storey.    | - Facilitate cross ventilation.  
- Provides nice view at top floor. | - Does not provide rooms for renting.  
- Expensive. | There are very few houses of this type in Hanna Nassif settlement.  
- Potential to cope with densification. |
| Other house types.          | - Except for the two-storey house type “other” house types are a combination of characters from the five categories mentioned above. | - Varied layout provides a combined advantages indicated above. |  |  |

---

16 Privacy as applied here refers to limited space where private social activities can freely take place such as conversation, sleeping, dressing without interference from household members or strangers.
This chapter has presented a procedure to classify house types found in Hanna Nassif settlement. It is considered that the understanding of house types in this settlement provides knowledge for professionals on the existing and emerging house types in Hanna Nassif. This may inform them on how best to design and manage the built environment for future generations of urban dwellers. In the following chapter issues emerging from the analysis of empirical results are discussed.
10 DISCUSSION OF FINDINGS

The preceding four chapters presented findings of the study. This chapter provides a discussion on issues emerging from the research and a synthesis of the main findings. The themes discussed in this chapter include: transformation as a housing supply strategy in informal settlements; the role of actors in the transformation process; Whether transformation leads to appropriate house design; the contradiction between modern and traditional building materials; the relevance of house types classification theory; flexibility, participation and enabling theories for the transformation process; the rationale of housing adjustment theories and the issue of modernisation.

10.1 Transformation as a house supply strategy

In non-industrialised countries like Tanzania, where an organised system for house provisioning is lacking in both public and private sectors, a large portion of the urban population is left with a limited or no option but to live in informal settlements. In 1995, about 75% of the Tanzanian urban population lived in informal settlements. This represented about 60% of the urban housing stock. Most of these houses were constructed by the actors from the informal sector (G O T: 2000), mafundi being the main actors in the construction activities.

The diminishing government capacity to supply surveyed and serviced plots has left residents without any alternative, but to construct and transform houses in informal settlements. While the demand for surveyed plots in Dar es Salaam has been about 6,000 per year in the 1980s, the average supply was only 1,635 plots per year (Kombe, 1995:67). It is apparent, therefore, that with these shortages, both in the supply of housing and surveyed plots, housing transformation in informal settlements remains one of the major options of housing supply especially for the poor households.

Housing transformations that are taking place in Hanna Nassif settlement should be regarded as a natural response to housing demands, as well as to satisfy other needs created by the rapid urbanisation process.

Research findings on housing transformation in some parts of Africa show how different approaches are used to develop or change built structures in striving to meet increasing housing demands. The research done by Tipple (1991), Tipple (2000), Kellet et al (1993) and, Tarekegn (2000) indicate that transformation has lead to an increase in size and quality of houses. In Zimbabwe, for instance, the transformation studied used non-conventional building materials, identified as “shark” transformation. “The shacks-only transformers are householders who have made no other extension to the house than building one or more wooden sectional sheds which are normally rented out to separate households” (Tipple, 2000:296).

The magnitude of transformation in Hanna Nassif is remarkable. Out of 120 studied houses a total of 110 have been transformed in one way or another. Different house types were changed ranging from small single storey houses and
large houses of single storey to two storey houses, thereby increasing the supply of dwelling spaces. These transformations have greatly increased the number of dwelling space both in terms of housing units as well as rooms for renting. For example, out of 21 houses that were studied in-depth, there were 93 rooms accommodating 100 people before transformation. After transformation, the number of rooms increased to 153, providing accommodation for 181 people. This is an increase of about 65% of the former housing stock and 81% of the population after transformation. These figures show that the kind of housing transformation processes taking place in Hanna Nassif play a significant role in the supply of houses to cater for the increasing city population. Although the selection of houses studies is biased towards those houses considered “modern”, the results are supported by the aerial photos, which shows the horizontal extensions in the whole of Hanna Nassif. The process of housing transformation is also found in other settlements in Dar es Salaam (Lupala, 2002).

Transformation of houses in Hanna Nassif provides rooms for rental accommodation. Many housing units studied were partly or wholly rented out. Out of 120 houses studied, 72 provided rental rooms while 12 were rented as a unit. Only 36 houses were totally owner occupied. This situation reflects the demand for rental accommodation and that the on-going transformation of houses is a strategy to meet that demand. The settlement is a prominent area because it is located closer to the city centre. Many low-income workers prefer to rent a room in this area because they can easily walk to their work places.

Further, out of 120 houses, 62 had been extended to provide additional rooms and 34 replaced mud and pole structures with concrete block structures. Transformation also includes alterations to consider privacy, thermal comfort, aesthetics, cooking places, bathrooms and toilets. Thus apart from the quantitative increase in terms of built spaces and rental rooms, housing transformation in informal settlements has also attempted to take in to consideration issues related to the quality of houses to some extent.

According to Tipple (1991), Kellet, et al (1993) and Tarekegn (2000) change in dwellings is related to the response of the existing housing needs taking into account economic and socio-cultural needs of the dwellers. Transformation of housing in the Hanna Nassif settlement is an indication of this response. Findings by Tipple (1991) and Tipple and Owusu (1994) further indicate that transformation activities improve the structure of the original building. This is because extensions are generally in a better condition compared to the original buildings. Findings from Hanna Nassif shows similar tendency. One of the major problems inhibiting the supply of housing in these settlements, however, is the rapid urbanisation taking place in poverty. The weak economic capabilities of many households in these settlements has limited their capacity to sufficiently provide as many houses as needed through the on-going transformation processes. Findings indicate that most Tanzanians especially the poor spend about 73% of their incomes in buying
food and clothing and that 51% live on one US Dollar per day (Lupala, 2001). A World Bank Report (1996: 407) notes that about half of the population in Tanzania is below the poverty line. It is apparent that despite the efforts of residents to transform their houses and increase housing supply, poverty remains one of the major obstacles in substantially increasing housing supply.

Another obstacle to the supply of housing has been the lack of housing financing systems in Tanzania. For example, the collapse of Tanzania Housing Bank (THB) in 1995 marked an end of peoples’ access to soft loans for housing. Further, the reduced housing supply by the National Housing Corporation (NHC) and the collapse of the program for Sites and Services and the abandonment of squatter upgrading projects in the mid-1980s, have had adverse effect in the supply of housing to the low-income people.

It is not surprising that housing transformations by poor households are being carried out step-by-step in Hanna Nassif. The similar tendency was noted in housing processes in George, Zambia, where members of households started to construct part of the structure, save money, purchase corrugated iron sheets and continue with extensions (Schlyter, 1984). In Hanna Nassif materials are being bought in small quantities depending on the availability of savings. Out of 120 interviewed residents only five persons secured soft loans from their employers. The remaining house owners used funds saved from their salaries, small-scale businesses and assistance from their employed children and or rent collections.

Lack of capital for transformation activities was noted by Tipple and Owusu (1995) in their study in Kumasi, Ghana. House owners have to finance the work and purchase of building materials from personal savings. There are no assurances of continuity during the construction period, as a result construction work faces interruptions, while waiting for the owner to mobilise funds.

The present study has shown that through housing transformation groups of low-income people have addressed their housing demands. Many households have responded to their shelter requirements by taking initiatives to invest their meagre resources in housing transformation. These have shown great potential in mitigating housing supply problems for the poor in terms of both quantity and quality.

In Hanna Nassif, housing transformations have been used as a means to housing supply. Housing transformations have been a means to an end for it has shown some positive aspects, which can be replicated, in other informal settlements. It is not the processes of transformations that are either a means or an end, which is important, but the identification of potentials and problems inherent

17 Although poverty is a relative and context specific concept, the Government Poverty Reduction Paper (2000:5) employs one US Dollar per day in real terms as a figure to facilitate comparison of poverty with other countries.

18 The Tanzania Housing Bank (THB) was a government institution which facilitated provision of soft loans to low and middle-income earners. Since its collapse in 1995, there has been no other institution that has been put in place to provide housing finance in Tanzania.
in the processes; whereby the actors, as a means have the capacity to carry out transformations as an end. Housing transformations should also be seen as an empowering process. Residents have empowered themselves and attempted to improve some health and comfort aspects also their social status in their living community. Through housing transformations people have managed to organise and address housing problems through labour intensive technology utilising low-income local craftsmen. Authorities must understand and recognise this supply strategy of the people in order to support and regulate it.

10.2 Role of actors in the transformation process

Three main actors involved in housing transformation processes in Hanna Nassif include house owners, *mafundi* and tenants. House owners are the ones responsible for the initiative and preparations for construction activities related to housing transformation. They are also the main financiers of the transformation processes. Construction activities are executed by *mafundi* with the assistance of labourers. Most household members did not contribute physically in carrying out construction activities. Out of 120 interviews, 115 responded that they did not contribute labour during the construction process. The respondents considered it better to engage a *firri*, while the house owners can continue with other activities to raise their income. However, the researcher observed that in many instances there were some members of respective households, who were idle and could assist the *firri* in place of labourers. This is different from Schlyter’s work in George, Lusaka. In their work they found that although the self-employed bricklayer did the brickwork, the house owners continued to do a lot of work. They did the digging, assisted the bricklayer as “mud boys” and laid the roofing with assistance from friends (Schlyter, 1984; Schlyter and Schlyter 1979).

10.2.1 The role of *mafundi*

*Mafundi* were found to operate in different modalities depending on the negotiated deals as per owners’ preference. For instance, they could be contracted for the whole work or on a piece meal basis. One of the systems is that the *firri* with his labourers are able to undertake a number of operations on the site like excavation, masonry work, roofing and plastering. In some cases, this type of *firri* may carry out the construction of a house from foundation to finishing. A *firri* acts as a foreman with a team of labourers who are semi-skilled and skilled.

The other modality involved, is employing a *firri* who possess specific skills to perform a limited job in his area of specialisation, for instance masonry, roofing, tiling or plumbing. In this type of work the *firri* often carries out the work with a limited number of unskilled labourers to assist in general activities. In such arrangements the house owner hires a different *firri* at the different stages of construction work. These approaches are usually not rigid. A *firri* can in principle operate in both modalities depending on the nature of the transformation process or construction work involved and agreements reached with the owner.
Although *mafundi* are not supported by any public or private institutions the fact is that semi-skilled and skilled *mafundi* contribute substantially to the provision of housing for the urban population. The cheap and simple technology used in housing transformation processes, whether by way of extensions or alterations, and the high demand for housing, increase the potential of *mafundi*. As indicated in Chapter Six, construction activities in transformation processes are being carried out by the *mafundi* and labourers. The positive aspects are not only the increase in housing supply but also the generation of employment. The income generated from employment in housing construction often spills over into more housing transformation.

*Mafundi* play a pivotal role in the entire informal housing transformation processes. They are flexible and swiftly able to adjust themselves to both the resource flow from the owners and the challenging working environment. For instance the occupiers' basic functions continue while transformation goes on.

*Mafundi* have proved their potential in facilitating housing transformation and, therefore, housing provisioning to the urban poor. The National Human Settlement Development Policy suggests that the mobilisation of resources in the informal construction sector, would enhance the government's initiatives in providing shelter to the increasing urban population. However, even though the National Human Settlements Development Policy (NHSDP, 2000) supports the role played by the informal sector in the provision of urban and rural housing, there are hardly any measures to enhance the role of *mafundi*. Besides, there are also no measures or strategies geared towards supporting the informal house construction sector to better perform its role. This is particularly required if one takes into account the challenges facing the informal housing construction sector, such as lack of support systems on credit financial facilities and training in the use and improvement of new construction materials.

### 10.2.2 The role of house owners and tenants

Although tenants are not the key actors in the transformation processes, in this study it was noted that in the case of rental housing, transformation and house changes were sometimes jointly determined by landlord and tenants. Tenants paid for the transformation costs and recouped the money spent by way of deduction from rent. Normally owners would allow tenants who have paid for construction costs a grace period, during which no rental charges are levied. Alternatively, a tenant would pay a smaller percentage of the rent, while the rest is accumulated so as to be invested by the tenant in the transformation process. In such cases the landlord discusses with his or their tenants the intention to introduce certain transformation. In some cases agreements are made between landlords and tenants, whereby tenants are free to determine the type of transformation required. Many a time landlords whose houses are transformed by tenants, benefit because they do not have financial resources to transform their houses in accordance with tenants' desires and expectations. Tipple (1991) notes that some tenants consider their rented houses as their permanent residence. They are ready to invest in extensions
and alterations without considering recouping their investment, primarily because the created room space is often sufficient to compensate them. In this regard if a tenant wants to effect some changes in a house he or she is allowed to realize the changes under mutual understanding and concessions. The dynamics observed in informal housing transformation, which among other positive aspects, seem not only to accommodate the interests of house owners in terms of enhanced value and income (rent) from the transformed houses, but also improve the well-being of the tenants even though ultimately they do not own the property.

10.2.3 The role of the government

Government has very little influence on the informal housing transformation process, due to the fact that many of the activities taking place in the informal settlement are not regulated by neither local or government. Government can, however, be regarded as an indirect actor in the whole process. Indirect in the sense that public utility agencies do provide basic services such as power and water supply but only on request and upon payment by individuals. Much as the issue of housing transformation is important, and informal settlements are recognised by government as an indispensable source of housing promotion, especially for the poor, government does not play any significant role in the observed processes of housing transformations in Hanna Nassif (further details in Chapter Eleven).

10.3 Does transformation lead to appropriate house design?

Taking the experience gained in Hanna Nassif, it is worth examining the house types with qualities that can be adopted for improved living in the future. Two major factors can guide the discussion in the adoption of better house types in terms of meeting the developmental demands in house design. These are health and comfort. It is a fact that urban areas are densifying as a result of socio-economic and spatial development, including the concentration of urban activities. More people prefer to live in cities than in rural areas. Therefore, the future designers of house types should take cognisance that most people in non-industrialised countries will be living in cities. This raises an important question regarding housing density. A compact layout is not only desirable but also more economic as compared to single storey sprawled housing that is often expensive particularly in terms of infrastructure provision. Thus a balance between compact layout and desirable spatial qualities ought to be made.

Since almost all transformations have been taking place horizontally, the resulting plot coverage has been relatively high. Out of 21 transformed houses, 10 houses had plot coverage exceeding 60%. This implies that outdoor spaces to facilitate cross-ventilation are dramatically reduced.

The climatic conditions in Dar es Salaam, which is hot and humid, is one of the factors that should also influence the appropriate house type. Temperatures are generally hot throughout the year with an annual mean maximum ranging from 26 to 33.5 degrees centigrade. The annual mean minimum is 16 to 25 degrees
centigrade. Highest temperatures are from January to March and minimum
temperatures are from June to September. The annual mean of humidity ranges
between 60% and 70%. In such climatic conditions, the basic requirements are
such that houses ought to maximise cross-ventilation. Large windows, big roof
overhangs and tree shading are particularly essential elements in house design.

The advantage is that the northeast monsoon winds together with the prevalent
sea breeze between December and March, which is the hottest period of the year,
provides air circulation that allows the human body to sweat and thus cool off.
Although monsoon winds produce a cooling effect to a certain extent, the
combination of high temperatures and high humidity causes permanent discomfort.
This situation calls for house types which can utilise winds to bring indoor comfort.

Most of the house types found in Hanna Nassif are not arranged so as to
achieve a comfortable thermal atmosphere in the house. It is not enough to
conclude that poverty and traditional techniques have led to the situation we see
todate. It is possible to say that “socio-cultural factors” such as the traditional way
of building, family systems and political reasons have overweighed material factors
such as climate.

Different house types were identified in this study namely, room in line, Swahili
house, L type, U type and two-storey house type. While the room in line house type
is single banked, it has more outdoor space in terms of air circulation and light as
compared to the other two types. It is also easy to undergo the transformation
because of its simple plan. The flexibility of this house could lead to any other type
if space is available for extension. In the room in line house type each household
has its own entrance, while latrine and cooking areas are often shared. The
disadvantage of this house type is that there is no clear division or separation
between private and communal space as it is in the Swahili house type. Climatically
the room aligned house type could be said to be most ideal for Dar es Salaam since
it allows air movement across the rooms as it is single banked. The fact that
poverty makes people stay in only one room may change with economic
development so as to allow more appropriate separation of functions.

The two-storey house type has the advantage of cross ventilation at the top or
upper floor and, therefore, it offers thermal comfort to some of its occupiers. Other house types such as L and U shape, have been discussed and considered
comfortable because albeit being single banked they are more appropriate for the
hot and humid climatic conditions common in coastal areas like Dar es Salaam.
The identification and classification of house types found in informal settlements
provide a useful ground to develop better designs, that are consistent or compatible
with the prevailing and emerging socio-economic conditions and life style of
residents in informal settlements. Densification makes it necessary to focus on both
qualities of house types and qualities of outdoor space.

The Swahili house is a more dominating type in Dar es Salaam. As indicated in
this thesis they provide cheap rental housing for the people living in the city. It is
flexible to changes, but the design is limited in terms of ensuring adequate cross-
ventilation.
There is also sharing of facilities like toilets and bathrooms by many households, which is not healthy especially in houses with high occupancy rate. Despite the shortcomings of the Swahili house type, it contributes to the provision of rooms for renting to a large number of urban dwellers. The same tendency towards room renting is observed in many other parts of the world. For instance in Botswana where Larsson carried out a study on housing transformation. She explains that:

Letting rooms is the result of urbanisation and illustrates the ongoing commercialisation of dwellings. Many poor people need the income from tenants for their survival in town, as such renting is often their only source of income (Larsson, 1990:130).

In Botswana having tenants rather than selling houses on the open market is the prime way in which low-income people commercialise and maintain their homes. In Hanna Nassif most low-income and middle-income earners owning houses secure income through letting rooms. Such houses are, therefore, an important source of income to the owners.

According to Rosenlund (1994) indoor temperatures in the Swahili house are about 3 degrees higher than outdoors even though all doors and windows were wide open. The measured radiant temperature from the roof in the living room was 35.6°C. He also found that a strong wind mainly affected the air movement in the central corridor. The room on the side hardly experienced any wind.

As discussed in Chapter, Two Vestbro (1975) did a thorough study of the Swahili house type. He found that this type of house was well suited to the people as it maximises the number of rooms for both rental and owner occupation. However, a lot of changes are taking place in response to modernisation and new urban life style, as a response to issues such as demand for privacy. Nevertheless as far as the layout of the house is concerned, it promotes contacts more than privacy.

The above researchers have pointed out the strength and weaknesses of the Swahili house type. Based on observations in this study, an alternative house type that may provide the quality of the Swahili house type and conversely tackle the identified weaknesses is desirable. This depends on dissemination of knowledge such as the one in this thesis into the informal settlements to individuals, officials and also government regulations of development in the settlements.

10.4 The contradiction between modern and traditional building materials

Most of the people interviewed express admiration for what they consider to be “modern” materials. They have developed a negative attitude towards the traditional building materials. Often the preference for modern building materials is associated with “durability” in the sense that traditional building materials are regarded as less “durable”. The majority of interviewees associate the local building materials with poor quality, and vulnerability to air borne and other diseases. The
interviewees mentioned that occupiers spend a lot of their invaluable resources in repairing or re-constructing houses built with traditional materials.

This research has shown that most people in Hanna Nassif prefer modern building materials like concrete blocks rather than earth or soil blocks. In some other countries earth materials are intensively used and have proved to be of good quality. For instance, Minke states that mud as a natural building material is superior to industrially produced building materials such as concrete. Newly developed advanced earth techniques demonstrate the value of earth not only in self-help construction, but also in industrialized construction (Minke, 2000:9).

Traditional materials have been used to construct buildings considered as modern houses. In these circumstances, the separation between traditional and modern could be contextual. This is because in certain environments or after certain treatment the same traditional material may acquire a different quality and value. Thus, change its product status from traditional to modern. The major problem with traditional materials is that they cannot be used directly in their natural way especially in dense urban areas. They require modifications or treatment to fit the modern era conditions (Minke, 2000:17). In Tanzania once popular traditional building materials have become neglected. These include among others, binders like lime and pozollana and clay soil for making burnt bricks. Architects and the building regulations neglect the use of such materials in preference to the more popular materials like concrete blocks. Most designs specify the use of modern materials, namely concrete blocks and corrugated iron sheets or tiles for walls and roofing respectively. It has become a common practice to use those materials when it comes to house extension. In informal settlements like Hanna Nassif some of the mud and pole houses, which were built a long time ago without much care or maintenance, have deteriorated to the extent that they look worn out and thus in poor condition. They are scorned "mbavu za mbwa", literally, meaning ribs of a malnourished and starving dog. This evokes negative notion of a house built with temporary materials. It implies that mud and pole houses are not appreciated. This attitude in turn makes people feel that traditional materials are not good and do not fit the urban context.

One of the impending roles of architects and engineers in the construction industry is to assess the potential of these materials and adapt them for use, particularly those which are suitable for the specific climatic conditions of the areas where they are available. The local materials are cheap. For example, making sun-dried blocks does not require heavy machines. If this technology is adopted in informal settlements, in the long run, construction including transformation of existing houses may become cheap. In countries like Mali the use of earth materials does not require complex equipment, or technological knowledge (Dethier, 1981:16).

It is not only in the study area where houses built with earth are undermined. Dethier (1981:10) observes that "prejudices have continued to flourish under many guises, condemning earth as poor, fragile, archaic and primitive". He further points out that from all over the world there is evidence that earth is a versatile building
material with many qualities to commend its use today. Although earth materials are highly susceptible to damage by water and moisture, various remedial measures have been developed. A good example is stabilised soil, whereby soil is mixed with small quantities of other materials and, therefore, its resistance and impermeability improved. According to Houben and Guillaud (1994) it is possible to considerably improve the characteristics of many types of soil by adding stabilizers to them, even though every variety of soil requires an appropriate stabilizer. In Tanzania, what is probably lacking is the desire and commitment to take advantage of the best traditional materials and the methods of their production in the light of modern expertise.

The prejudice against traditional materials, especially earth, cuts across societies, professionals inclusive. Very few architects and engineers support the use of sun-dried soil blocks or other earth materials. The reason being, at least partly, the nature of professional training received and the stigma on the design and use of natural building materials.

In poor countries like Tanzania it may be positive to pursue a successful awareness of the potential in the use of traditional building materials. Especially because there is increasing uncertainty of affordability by the majority of people. Also the environmental implications of excessive importation of “modern” building materials and/or technology. The late Julius Nyerere once remarked:

People refuse to build a house of burned bricks and tiles; they only insist on waiting for a tin roof and “European Soil” (cement). If we want to progress more rapidly in the future we must overcome at least some of these mental blocks.

To own or to live in a modern looking house is associated with modernity. This perception is reflected in Tanzanian government policies wherein the use of traditional materials is not given much emphasis. The National Human Settlements Development Policy (2000:40) states that:

Raw materials such as sand, cement blocks, burnt bricks, timber, roofing tiles and corrugated iron sheets, aggregate, cement are very essential in the construction of durable buildings. They should be available in large quantities and at an affordable price to encourage housing construction.

The Tanzanian government gives priority to the use of industrially produced building materials. Transformed houses in Hanna Nassif settlement could be regarded as a response by individuals to the forces of modernisation. They are an indication of how individuals aspire for better houses and contribute to the improvement of their living conditions.

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19 Extracted from a speech by the late President Mwalimu J. K. Nyerere, from the Tanzania Daily News of 20th October 1978.
It is seems that many people in non-industrialized countries are willing to embrace modern building materials at a cost, in terms of thermal comfort and high prices. However, among the urban poor, traditional building materials are often the main construction materials they start with many a time without technical support from either architects or other knowledgeable persons. This implies the need to re-examine the use of traditional building materials.

Fathy (1973) advises that the composition and properties of soil vary widely from place to place. It is essential that at any given site the soil to be used for brick making be carefully analysed. Expensive methods of stabilisation are unnecessary. It is clear that earth or mud is a good building material if appropriate technology is applied. The materials are also good for thermal comfort. Any surface exposed to direct sunshine, such as the ground or the walls heat up enormously during the day and loses its heat during the night. The comfort of people inside the building especially in hot and humid temperatures depends upon the thermal properties of the walls and roof. The best materials are those that do not conduct heat. Sun dried earth brick is one of the poor conductors of heat. Concrete houses prove too hot to live in during summer and too cold in winter (Fathy, 1973:48).

Traditional communities in the past resolved architectural problems in the construction of their houses without using any modern building materials. “Throughout the world there is a unique richness of design, technical ingenuity and subtle creativity” (Dethier, 1981:43). The earth materials are used beyond construction of residential houses. They are used for public houses like mosques, churches, and temples. These buildings give a reflection of the magnificence and complex structures of rural and urban characters. The structures are difficult to tell whether they are modern or traditional. Indeed there is a big contradiction between “modern” and “traditional”, as some traditional materials have been adopted to suit the technical and cultural needs of different urban and rural areas.

In contrast, there are people in industrialised countries discovering the qualities of materials like earth and thatching abundantly found in non-industrialised countries, with a view to adopting them to their context. In the United States for example, the use of adobe and rammed earth by integrating these construction techniques into national and regional standards has been officially recognised (Houben and Guillaud, 1994).

10.5 Security and housing transformation

One of the reasons for transformation mentioned by the Hanna Nassif residents is to increase security. They do so by provisioning of burglar bars around the doors and windows (Figure 5.21). They also provide fencing of concrete walls. Although house owners and/or tenants express satisfaction with what they consider to be improved security they would appear to harbour false confidence. Burglar proof bars and fences are said to increase crime rather than reduce it. This is because enclosures restrict neighbours and other people passing by not to take note of what is happening inside a house under seizure by burglars.
Security is a basic need in housing being a wide concept which demands a separate study of its own. The issue of security is well discussed as part of crime prevention of environmental design. Plessis (1999:33) is basing herself on studies of theoretical literature all over the world and specific studies on South African situation on crime patterns and crime prevention through environmental design to explore the link between the requirements for safer communities and those for more sustainable communities. The study reveals that safety and security are often considered by the poor as pressing needs.

Safety has become a demand and often the first priority of the urban poor worldwide, particularly in non-industrialised countries. According to Plessis, Crime is related to the low quality of environment, little scope for personal improvement and high poverty levels. Without improvement on these variables a community cannot free itself from crime.

The Habitat II Agenda takes into consideration safety and security. According to the Agenda, factors which undermine safety and lead to crime are poverty, inequality, family stress, unemployment, and absence of educational and vocational opportunities. Other related factors are lack of ownership, overcrowding, lack of recreational opportunities and the social stigma associated with a particular neighbourhood. Plessis (1999:35) points out that “faced with physical and social marginalisation and therefore with little opportunity for self-improvement many poor people turn to crime both as a survival mechanism and an enter-perennial opportunity.”

Lack of employment and economic hardship in informal settlements equally forces people to get engaged in crime. Individuals who can afford to take preventive measures find themselves implementing basic crime prevention like “target hardening” especially burglar bars and locks. Nevertheless burglar bars have a lot of disadvantage. In case of fire there is little opportunity to escape. It seems as if people do not see the negative aspects of putting bugler bars in all windows and doors as long as they believe they are keeping at bay intruders. There is a need to increase consciousness about importance of environmental design through crime prevention. Bistrup (1991) discusses a case study based on reports from the Danish Development Board on a housing experiment to prevent crime. She states that it is important that the households area constitute a clearly defined unit of reasonable size, a neighbourhood. She further states that:

> the design of a neighbourhood should promote the tenants’ sense of responsibility for the neighbourhood and the design should encourage cooperation and spontaneous contacts. Carefully designing the houses, entrances and public and semi-public areas . . . if the tenants feel that the neighbourhood belongs to them they may achieve a sense that they have the right to control what happens in the neighbourhood (Bistrup 1991:47).

Plessis (1999:35) points out that strong communal ties and feeling of ownership lead people to intervene in criminal incidents due to the fact that people have
invested time and money. This could be a well supported idea because where people know each other there is a tendency for unity against criminals.

The issue of territoriality is seen as one of the key principles of crime prevention through environmental design. Clear demarcation between public, semi public and private space create “defensible space”. These are the spaces, which could be controlled by people. Plessis states that:

> Clear delineation of boundaries between public, semi public and private space create “defensible space” – spaces of which people have control and some degree of responsibility, spaces without clear ownership quickly become desolate and increase of fear of crime even if they do not become sites of conflict. It also encourages improvements to and better maintenance of the built environment resulting in a better quality of environment (Plessis, 1999:36).

Different principles for safer cities are discussed by Plessis (1999) as a crime prevention measure. One of them is the mixed land use. This is said to increase the hours of use and therefore having people around the area most of the time, making the area safer. Another principle is equal distribution of population and facilities because overcrowding leads to social discontent, crime and overuse of resources.

It would seem logical to argue that to achieve crime prevention through environmental design, economic activities and community facilities should be brought to the areas where the poor are living. A range of housing options in each neighbourhood to accommodate all classes of people is also of great importance. This will encourage the creation of stronger and more diverse communities and the poor will be brought closer to employment opportunities. The idea is to bring the relatively rich closer to the people with an interest in keeping their neighbourhood safe (Plessis 1999:39).

Improvement of the quality of life, of both the natural and the built environment is another principle for crime prevention through environmental design. Areas with inferior housing and a low quality environment create a negative image that leads to fear of crime. It is suggested by Plessis (1999:39) that the problems leading to decay could be solved well in advance during the design phase, by making sure that the materials they specify and workmanship are of high quality that do not require expensive maintenance. These factors seem to be relevant to Hanna Nassif and more general to Dar es Salaam. The challenge is how to achieve them in the existing informal settlements. Poverty alleviation strategies may contribute in reducing crime. The whole issue of security needs further research.

### 10.6 House types classification theory

Type as an analytical tool is one of the theoretical ideas that have been discussed in this work as a method for analysing and classifying house types. The typological analysis of residential buildings carried out by Lawrence (1994), preceded studies of the relationship between the functions ascribed to spaces and their relative position
Lawrence gives five criteria for the classification of house types (see Chapter Three). His criteria for classification provide a base on which different house types have been classified in this study. In the present study, the classificatory criteria of the number of rooms, layout, spatial organisation and number of floors plays an important role in classifying house types. Application of these variables were carried out with some modification. Lawrence used spatial organisation of the floor plan in relation to the means of access from the public realm of the street to the private realm of each dwelling. This criterion was employed in the present study although the public realm in this context is not well defined by streets. In many sections of the informal settlements like Hanna Nassif the indoor-outdoor interface is defined by indoor and semi-public open spaces and footpaths, providing accessibility to individual dwelling units. This should be considered as a modification of Lawrence’s application of this criterion, whereby streets have been considered as the major domains of the public realm.

Another classification criterion is that of the socio-economic variable related to income and social status as in working class or middle class. This criterion again is less relevant in informal settlements. Further the situation of middle class residents in Hanna Nassif is poorer, than the working class in Europe where Lawrence employed his classification. This situation limits further the use of this criterion in Hanna Nassif. For example, one finds middle class people renting a room next to the low-income earner. There is no clear demarcation between houses for low income and middle-income people. As noted in the empirical study chapters, two storey houses were built adjacent to old single storey houses that were predominantly occupied by poor households. It is this mixed character of socio-economic conditions that renders the criterion on socio-economic status to be of limited usefulness in classifying house types in Hanna Nassif.

The criterion of building materials for instance timber framed, brick or stone walled was also used by Lawrence. This criterion is less relevant in the context of Hanna Nassif where most houses are constructed with concrete blocks. For example, while about 90% of the houses in Hanna Nassif have been constructed with concrete block walls, the remaining 10% constitute houses constructed of mud and pole walls. Through the process of housing transformation mud and pole houses are continuously being replaced with concrete blocks. It can, therefore, be assumed that in future all houses will be constructed with concrete blocks despite the fact that same materials have been considered not appropriate for the weather conditions of Dar es Salaam.

According to Lawrence the stylistic criterion accounts for the professional knowledge of architect and builder, which is frequently recorded in pattern books. While this criterion could be useful for the classification of house types in industrialised countries, it is less relevant to non-industrialised countries, especially in informal settlements. The houses in these settlements are constructed under
dictates of poverty. The kind of facades like classical, neo-gothic criteria are less relevant in classifying house types in this context. Given the conditions prevailing in informal settlements a total adoption of the theoretical premise put forward by Lawrence becomes limited in classifying house types for the Hanna Nassif settlement.

10.7 Flexibility, participation and enabling theories for the transformation process

In the 1970s John Turner’s ideas had a considerable impact on the conception of informal settlements. Subsequently the strategies for improving housing by the United Nations, the World Bank and aids organisations adopted Turner’s ideas. For Turner the inner city shanty town was viewed as ones of despairs, while the peripheral ones were seen as a result of people’s own efforts (Turner and Fichter, 1972). They anticipated that the peripheral informal settlements would develop in middle and working class areas. Hanna Nassif informal settlement is only four kilometres from the city centre. It is considered as one of the informal settlements within the city settlement comprises of low and middle-income classes of people. Both categories are involved in the process of transformation producing housing to meet their needs.

Like John Turner also John Habraken examined housing problems, taking into account flexibility, participation and enabling as important parameters of design and planning practice. The overall approach of Habraken is different from the conventional approach to housing supply. According to Habraken user participation is considered important because the production of buildings can be made more efficient and more dynamic (Habraken, 1983). He calls for flexible designs from architects which allow for change and incremental growth. Hanna Nassif residents may be viewed as agents in the housing process where construction activities must be understood as part of the process. Although Habraken calls for flexible designs from architects, Hanna Nassif residents have managed to construct houses which are flexible enough to carry out extensions and alterations.

Turner’s advice is that governments, NGOs and building industries should enable people to plan, construct and manage their own houses at an affordable cost if they are to realise their housing needs (Turner, 1982). Turner calls upon governments and professionals to support in the action of people. In order to address housing problems, both Turner’s and Habraken’s approach are considered important. Turner’s approach includes government and public authorities complying with the social demands of communities regarding housing and their freedom to build. Habraken’s approach is in the context of design and practice as a process that builds capacities through the organisation of sites and buildings. His idea of people’s participation is partly focused on flexible designs, which are easy to transform when making extensions and adjustments. The present study supports this idea where residents of Hanna Nassif are participating in housing processes.
They commence with the construction of small structures and extend them to relatively larger ones with new forms, as and when resources allow.

As highlighted in Chapter One, the Global Strategy for shelter is that of enabling. This means that government should reconsider housing production and take a step further to enable potential suppliers of housing. The result of the present study has shown that the transformation process has led into an increased supply of housing but the government has not enabled the process. According to Tipple, Israel is the only country he knows which has encouraged transformations. Thus in Israel the government recognised the potential of the transformation process by its people. The Ministry of Housing of Israel allowed and encouraged transformation in public housing by the people themselves. They supported transformation by “providing small loans for interior functional changes or replacement of damaged sewage and water pipes, and larger loans for extensions. The loans changed to keep pace with the rampant inflation at time” (Tipple, 2000:127).

The distinction to be made here is that, it was easier to enable transformation processes taking place in Israeli because the activities were conducted in formal settlements. Although informal settlements like Hanna Nassif has been accepted by the government and have been upgraded with drainage channels, the housing transformation processes are yet to be facilitated and adequately supported by the government and NGOs.

In order to enable the transformation processes, there is a need to underscore the driving force behind transformations and the obstacles facing the ongoing processes. This study has analysed the reasons for which households transform their houses and the problems they face. The study has also shown how transformations increase housing supply, given the present housing shortage in the country. This is a reason for encouraging the government to enable the processes.

The Global Plan of Action states that “the government should support private sector initiatives in providing bridging loans to builders at a reasonable interest rate” (UNCHS, 1996). The residents of informal settlements who transform their houses could be more efficient if they have access to credit. They could use their existing houses as collateral. This could enhance the transformation stages towards the provision of housing which would reduce the burden of construction costs. The time spent in the transformation process could as well be shortened if skills and affordable building technologies were provided.

The theories of Turner, Habraken and Hamdi on flexibility, participation and enabling are considered important in housing transformation. This thesis has shown that in Tanzania there is lack of government intervention in the whole process of transformation. The result of this has been rampant uncontrolled housing transformations which undermine the spatial quality of the settlement to some extent due to high densification processes, absence of enabling strategies from the government, and high rate of urbanisation that takes place under the dictates of poverty.
10.8 The rationale of housing adjustment theories, improve or move

One of the theoretical premises that have been reviewed in this study is that related to housing adjustment, “improve or move”. The main argument put forward by Tipple (2000) and Seek (1983), has been the importance of understanding how and why home improvement takes place. Seek defines home improvement as additions, alterations or renovation of dwellings. This definition makes the theory relevant to the study of transformation in Hanna Nassif, because the main issue is to understand housing transformation process taking into account extensions and alterations.

Seek (1983) recounts two major arguments. One is that additions and alterations to dwellings are undertaken largely to meet demands for more and better housing. It is not to make good features of the dwelling which have become defective as a result of ageing and wear and tear. The second is that many house owners tend to stay in the same house for a long time and modify it as their housing demands change over their life cycle. Not all households intending to transform their houses have alternatives of either extending, making alterations and moving. In the case of Hanna Nassif a majority household members prefer to extend and make alterations rather than moving because of their limited resources. Moving means either going to rent another house in another settlement or buying a plot in another settlement. It may be argued that the location of the settlement is important, when discussing the issue of improve or move. Hanna Nassif settlement has proved to have many potentials. It is situated very close to the city centre. Therefore, it is easier for residents to just walk to the city centre for their livelihood strategies, access to schools, shops and hospitals. This contributes to the fact that a majority of residents prefer to either extend or make alterations to their houses to meet their needs, rather than move.

In his study, in Australia, Seek (1983) found that most people had constructed the first house as a stepping-stone towards ownership of a better house. As the housing requirements during the earlier life cycle phases were more modest and less pressing most of them were prepared to live in a house with fewer facilities and move only when their housing needs increase as their families grow and as their financial circumstances improved. This observation is contrary to what is happening in Hanna Nassif. Some of the reasons given as to why people change their houses in terms of extensions and alterations are that of increase in household members and also when they are better off financially.

It can be argued that the theories of housing adjustments, may be applicable differently in the industrialised countries as compared to non-industrialised countries. In non-industrialised countries, especially in informal settlements, freedom of choice in terms of moving is limited as compared to industrialised countries where there are many choices especially for the rich people. The choice of extending and alterations is considered much more reasonable for Hanna Nassif residents, because construction activities take place when resources allow, but
moving means that one would be required to have enough funds to purchase or rent a better house.

Although financial costs may be considered as a hindrance to move, it may be argued that there is a reluctance to leave familiar surroundings and residents have been accustomed to. Over the years household members develop social ties which are binding and considered valuable to them. The closer the links to friends and relatives are established, the fewer are the possibilities for moving to other neighbourhoods.

It is from this established neighbourly relationship that even after their social-economic conditions have improved residents prefer to make extensions and alterations rather than move. This kind of housing processes has implications for a policy of encouraging transformations so that the low-income household can be able to meet their housing needs. Another important issue is that achieving housing which meets the needs of the people through extensions and alterations is generally the choice of low-income people. This enable them to meet demands for more housing units and to accommodate more household members (Seek, 1983).

10.9 Transformation for modernisation

The discussion on the concepts of modernity, modernisation and modernism are based on the works of Berman (1982), Giddens (1990), Burgess (1985) and Tran Hoai Anh (1999). The concept of modernity is defined in different ways. Giddens (1990:1) refers to modernity as a “mode of social life or organisation emerged in Europe about the 17th century”. In this case he discusses the concept of modernity in relation to a specific historical period in Europe. Berman (1982:15) refers to modernity as the “experience of being modern”. He further states that, “to be modern is to find ourselves in an environment that promises us power, adventure, joy, growth and transformation of ourselves and the world” (Berman 1982:15).

Modernity and modernisation are concepts that are related to each other. However, if one is to make a distinction between the modernity refers to “conditions” or “experience” of modern societies while modernisation gives an emphasis to the process that leads to modern societies (Tran Hoai Anh 1999:41). The concept of modernism is much related to the modern architecture of industrialised countries. “Modernism in the third world is considered as based on the values and ethos of the west, and a break with traditional values and culture” (Tran Hoai Anh 1999: 69). The main argument which is put forward by Tran Hoai Anh is that modernity cannot be considered as only a western phenomenon and that modernisation can take place in different forms.

In Sweden the modernism took the form of functionalism. One of the important parts of modernism in Sweden was the belief that building design could contribute substantially to a new man. However, the main limitation of these theoretical bases in the analysis of housing in informal settlements is the different perceptions of modernity, modernisation and modernism in different context of
industrialised and non-industrialised country like Tanzania, especially in the informal settlement.

These theories are vague and contradictory as some researchers considers modernity as part of the entire process of social development while others views it as mere experience in the development process. In Chapter Three the author attempted to sort out those variables which are most relevant to the research problem. In this case, the developmental aspects of house design entrenched in modernism were to suit this study with reference to non-industrialised countries like Tanzania, and particularly in an informal settlement. These developmental aspects were used in Scandinavian countries especially in Sweden in the 1930s and they contributed to housing improvement. During this time Sweden faced housing problems and also the mass migration of people from rural areas to the larger cities. Overcrowding of people in cities forced governments to address housing problems. Modernism became a leading doctrine in housing and town planning as part of the welfare policy of the Social Democratic party in 1932-1976 (Vestbro, 2000). Sweden developed a Swedish housing model, a state policy to support the construction of high quality housing for every Swede. A series of housing programs took place under the million homes programme ten years of construction 1966-1975 when 100,000 new homes were built each year.

Although Tanzania today is facing housing problems more or less like those faced by Sweden in 1930s it is unlikely that it will solve its problems in such a period as Sweden did. First of all Sweden is an industrialised country with a much more powerful and stable economy as compared to that of Tanzania. The Government of Sweden has also given a high priority to its housing policies for building a welfare state, which is matched with planned implementation. In the case of Tanzania the government is trying to cope with housing problems, but most of its commitments are put into policies, while real implementation has been at a minimum due to poor resources allocation. The economic inability has lead to an informal housing market. The inability on the part of the Tanzanian government to cope with the housing problems can be explained in a historical perspective.

In the 1930s Sweden was already industrialised while Tanzania was a British colony whose economy was agricultural; with virtually no industries. In view of the underdeveloped state of the economy indigenous Tanzanians then had very low income and the state of housing was equally poor and backward. Tanzania today is more developed than it was in 1930s. However, it is still non-industrialised as compared to Sweden in the 1930s–1950s. It is apparent that due to industrialisation and hence mechanisation of agriculture Sweden has had a higher socio-economic growth in the decades 1930s–1950s as compared to Tanzania in 2000s. Usually an industrialised economy creates a tendency of rapid change from poverty to wealth. It is equally important to note that an industrial economy has the power to generate huge capital base and wealthy classes of people as the ownership of most means of production is private including industries, commerce, banks and financial institutions. This is not the case in non-industrialised countries.
where most of the people are poor, the levels of income are low due to poor capital base hence no wealthy classes, but merely individuals.

It may further be observed that the state of an economy has a strong influence on political institutions. Thus in poor non-industrialised countries like Tanzania the state and its institutions are fairly inefficient as noted in the failure to address straightforward housing problems facing the informal settlement. The state is poor due to its poor economic base. It has limited resources for planning, which in turn leads to non-functioning market. It is also an open secret that state institutions are corrupt with weak checks and balance leading to poor accountability and further inefficiency in the performance of the very institutions. The situation is different in industrialized countries like Sweden where strong economic base and democracy, powerful checks and balances like news media, opposition parties and non-governmental institutions have led to the building of a strong and fairly efficient state, and its institutions.

The above stated differences in the state of the economy of industrialised countries versus non-industrialised countries like Tanzania breeds different strengths in professionalism. The argument put forward here is that while in non-industrialised countries a majority of professionals in the housing sector struggle to make ends meet in industrialised countries professionals enjoy high levels of income. Naturally intensive debate on housing form and planning for the poor plus taking professional responsibilities have not only been possible but consistent. This is barely possible in non-industrialised countries and largely in academic circles for non-industrialised countries like Tanzania.

The challenge which is facing Tanzania is a rapid urbanisation as a consequence of the inherent demographic process viz. natural growth and immigration. The country has to cope with widespread poverty while the economic performance is growing at a slow pace. Any attempt to copy Northern models of managing rapid urbanisation has been hindered by the new phenomenon, urbanisation in poverty. In a poor country like Tanzania the public sector has failed to provide adequate urban planning support because the high rate of urbanisation has outgrown the management, financial capacities of the country. Owing to a poor national economic performance, the rapid population growth has not been matched with the growth of a housing delivery system. Thus the rapid urban growth rate has brought enormous stress on the ability of the government to cope with demands for housing, which has led into an inadequate institutional capacity to manage housing problems. There is also government reluctance or inability to implement its policy. On the other hand it is slackness in formulating viable and workable housing policies. This explains the reason behind many people seeking to develop housing in informal settlements.

Despite the weaknesses in the socio-economic and political system of Tanzania pointed out above, over the past ten years Tanzania has undergone rapid social, economic and political changes. The centrally planned economy is being transformed into a market-led economy, which has gone hand in hand with the political changes. The socialist oriented one-party political system has been
transformed into multi-party political system. Planned social amenities are being taken over by the private, civic societies and grass root communities.

The role of professionals in the field of human settlements development ought to be transformed to reflect these changes. Before the 1990s a centralised top-down planning approach, that was perpetrated by the centrally planned economy of the 1960s and 1970s, dominated for example the planning professional. Planning for informal settlements was therefore considered much more of a technical undertaking. Recent development observes involvement of communities under participatory approaches, which is a positive undertaking. Tanzanian professionals need to be engaged in a debate directed at addressing issues of house form and house designs suitable for the poor, to stimulate the discussion about “reworking the vernacular” in order to come out with affordable and modern house types with a Tanzanian identity.

In the light of the foregoing, it is clear that modernity, modernisation, and modernism have different pre-conditions in Tanzania as compared to the Scandinavian countries. However, some elements relevant in the latter countries can be considered relevant for informal settlements in Tanzania as per the results of the study presented in the findings chapter.

With this brief introduction in this section the following discussion is based on aspects considered as modernisation by the Hanna Nassif residents as revealed during the course of carrying out this study.

10.9.1 What is a modern house

One of the issues studied is whether transformation of houses has led to modern houses. What does modern houses mean in the informal settlements? Empirical investigations from Hanna Nassif show that residents have attempted to modernise their houses in terms of the use of “modern” building materials. The term modernisation as perceived by many residents of Hanna Nassif means houses constructed with concrete blocks and corrugated iron sheets as compared to houses constructed with mud and poles. Therefore the houses are modern in the context of Hanna Nassif. Such houses when compared with say apartment blocks in Dar es Salaam in high-income areas built from other sophisticated materials like glass and steel, Hanna Nassif houses could be considered less modern.

Larsson (1992:132) states that “housing modernisation generally denotes the process whereby traditional housing is being replaced by modern housing”. In the present study it is established that modern materials are being used to replace traditional materials. It may however, be argued that the materials change factor is not enough to make a house modern. As Larsson puts it “tradition and modern housing do not necessarily constitute a dichotomy”. The housing transformation cannot be considered as a one-way procedure, that is replacing only traditional elements.

The study further showed that despite the transformations taking place, there are still some elements of the traditional Swahili type house. As discussed in the previous chapters, the veranda and corridor are elements which are still dominant
in houses even after transformation. One wonders why these elements are not disappearing. Does it mean that they have such special functions that are indispensable even today? The traditional elements, which are fast disappearing include traditional building materials. As already noted, houses built of traditional materials are invariably replaced with "modern" materials. To have a house that is considered modern yet retaining some traditional elements has been observed by Tran Hoai Anh (1999) in a different context.

Housing modernisation through transformation not only takes into account changes from traditional materials like mud and pole to "modern" materials such as concrete blocks and corrugated iron sheets, but also such other changes like spatial organisation. Some houses can be regarded as modern in terms of materials used but maintain traditional features because of their layout. A typical example is the layout of the Swahili house type. Although some Swahili houses are considered modern by the Hanna Nassif people because of the use of concrete blocks, corrugated iron sheets and decorations, the layout is still traditional. For instance the use of space in a Swahili house sometimes change, rooms may be converted for use into a kitchen, a sitting room or a dining room or to make a provision for inbuilt toilets. Nevertheless the layout still remains traditional, where the main features are the front veranda, corridor from where all the rooms are accessed and a communal backyard.

One of the problems inherent in modernism is the emphasis on the use of industrially produced and non-renewable building materials. It has been indicated in the present study that the transformation of houses in informal settlements use such materials. Concrete blocks and corrugated iron sheets are extensively used in the transformation of houses. These types of materials use non-renewable energy for both production and transportation. Insensitivity in the use of materials is detrimental to the environment for it does not take in to account the principles of sustainable development. The principles are found in Agenda 21 of the Rio Conference of 1992. Modernism solutions need to be applied taking into account local environmental conditions. For example, in order for sustainability to prevail it is important to take into account the use of renewable materials and avoid materials that consume a lot of energy during production. Traditional building materials abundantly found in non-industrialised countries include adobe and rammed earth. Due to the colonial influence and modernism, houses constructed of these materials are considered as temporary and inferior structures.

10.9.2 Rooms for renting

One of the features depicting housing modernisation in Hanna Nassif is the increase of rooms for rent which is an urban phenomenon related to modernisation. Larsson (1990:129) states that room for tenants is a departure from traditional ways of living. In her study of Botswana, Larsson notes that room to let in traditional dwellings was rather hypothetic. Both men and women remained with their parents until such time when they got married. Larsson relates the question of rooms for rent to urbanisation forces, which in turn have created a
higher demand of rooms for rent. This is also true of the case in Hanna Nassif where residents rent out rooms in houses, which were initially meant for members of the immediate family only. High rates of urbanisation in Tanzania, especially people moving from rural to urban centres creates the demand for rooms for renting. In rural Tanzania people do not rent out rooms or houses. However, due to modernisation forces which are also penetrating into rural areas one can assume that in the near future, in rural areas, people will also rent out rooms. The argument here is, changes are not taking place in urban areas only. There are some rural areas which are experiencing drastic changes in housing.

Renting out rooms is one of the key sources for house owners to supplement their incomes. Some of the house owners have used the income from room renting to develop their own houses, including extension or alterations. Rooms housing tenants, assist house owners to gain income which can be utilised further for housing development. Room renting is a direct outcome of urbanisation and commercialisation of houses in the same way as observed in Botswana (Larsson, 1990). Modernisation has in reality increased the value of a house not only from usage point of view but also as an income-generating venture. Room renting also contributes to the housing stock in the settlement, thereby ameliorating the problem of housing shortage.

10.9.3 Sanitary facilities

Another aspect worth noting is the relationship between increased indoor space resulting from transformation in relation to services such as toilets and bathrooms. Often transformation of houses in terms of room addition for renting has contributed to the reduction or worsened conditions of services such as toilets and bathrooms. Often room extension for renting in Hanna Nassif does not take into consideration the demand for services such as toilets and bathrooms consistent with the increase in number of users. For example, a toilet meant for a single household of say five persons is used by many households, sometimes by over ten people. Out of 120 houses which were studied in Hanna Nassif, 110 had transformed their houses either through extensions or alterations. However out of these, only two houses provided for extra toilets in which one toilet was being used by owners’ household and the remaining one by the rest of tenants. It is also noted that the aspiration of living in modern houses has led residents of Hanna Nassif to fix water closet toilets in their houses without taking into account the problem of water shortage. Although some of the residents have installed reservoir water tanks, a majority of the residents have not. During the course of carrying out this research it was noticed that some people with water closet toilets used buckets of water to clean the toilets. This is rather a cumbersome exercise. These types of toilets were fixed on houses for owner occupation or rented as a whole unit. The majority of Hanna Nassif residents use pit latrines. Out of 120 houses studied 80% use pit latrines. These latrines are often not roofed. The surfaces are not easy to clean and some are very near to the houses leading to a bad odour and the spread of flies. This means that as much as transformations have led to the modernisation of
houses, owners have failed to take into account health issues in relation to toilet facilities. In reality much priority has been paid to the living space but the attendant services are not taken into account.

Although there are extensions of rooms specifically those used for cooking, the quality of these spaces are generally poor. As for the kitchen there is often no provision area for keeping utensils, so they are often kept on the floor. The use of charcoal and kerosene stoves is most common, while all the houses studied did not have provision for a chimney to suck out smoke. According to Larsson (1988:92) indoor cooking can be a health hazard because of long-term consequences of air pollution and the risks of getting burnt. Air pollution from open fires, especially when placed indoors, has been recognised as a major hazard in less developed countries, especially for women, who look after the fire and cook the food (Hardoy and Satterthwaite, 1987: 225-227). Generally, there is lack of proper kitchens resulting into unhygienic cooking space. There is also congestion due to many people using a limited space. In those areas where there is a limited space in the house, cooking is done outdoors without shade, so it is inconvenient especially during rainy and sunny hours. This is contradictory to classical modernism especially the developmental aspect of house design where health designs are considered important. Improvement of the kitchen is considered an important design task (Nystrom, 1994).

10.9.4 Separation of functions

Apart from the use of certain building materials the residents of Hanna Nassif identify modernity with clear separation of functions. It was observed that houses for owner occupation tend to have more functional separation than those for renting. Functions such as kitchen, bedroom, sitting room, store, toilet and bathroom. Such houses depict the social status of the owner in the sense that in most cases, people who occupy such houses are economically well-off and thus socially better than those who live in rented premises.

Few of the houses studied showed some distinct separation of functions. For instance, extensions were made to create rooms for sleeping, dining, cooking, sitting and resting, toilets and bathing facilities. These houses exhibited spatial organisation with a separation of activities taking place in different areas of a house, whereas the original structures were often small and had only a few rooms characterised by the multiple use of space. The separation of functions led to better functional qualities of space and is hereby considered to be one of developmental aspects of house design. However, the issue that emerges from the separation of functions is the question of mixed functions in rented rooms. Many tenant households were observed renting one or two rooms, while the household size were in some instances as large as eight members. Cooking, sitting, storage of food were noted to be accommodated within a limited number of rented rooms.

Early modernists were for separation of functions but also minimum use of space. The intention is to use space efficiently. Therefore, if functional separation goes too far it could be regarded as an obstacle to development (Correa, 1985;
Larsson, 1990). For instance, provision for communal spaces for multiple uses may be regarded as efficient use of scarce resources.

Mixed uses particularly in rented rooms provide a challenge to the perception of housing modernisation purely based on the separation of functions. The argument here is that modernisation has to be perceived as a process rather than an end in itself. Residents of Hanna Nassif may exaggerate the issue of separation of functions. They stated that a house with separation of functions is considered modern. Most of the interviewees prefer most activities to be separated. This could be linked to colonial influence. There are some functions which could be combined without bringing about conflict of functions for instance dining and sitting room or cooking and dining.

Increase in more space is considered modernisation by Hanna Nassif residents because they can put modern equipment. It was observed that some residents have modern equipments like TV, refrigerators, sofas, dining table and dining chairs. All these equipment are associated with modernisation.

The transformed houses illustrate that modernisation brings about change in the interaction between individuals and society. Individuals who own modern houses consider themselves to be socially superior in comparison to tenants in rented accommodation. They consider themselves as “modern” because they live in modern houses. They also regard themselves as having fulfilled their aspirations and dreams to own modern houses.

The views of Tran Hoai Anh (1999:226) could be related to what has transpired in Hanna Nassif although her study was conducted in a different context in terms of culture and class of people. Her study focuses on houses of middle class people. She observes that modernisation brings about the dialectics of change in the relationship between the individual and society. The houses also exhibit that social
changes and modernisation have a significant impact on people’s views, their vision for the future, their notion about self-identity and awareness and their conception of how to be modern. It was noted in Hanna Nassif that people with good houses command respect among residents within the community. This is not a unique feature limited to the study area. In many parts of Tanzania, even in the rural areas, general knowledge shows that living in a better or a relatively high quality house is considered not only modern but also socially and economically sound.

10.9.5 Spatial qualities

An interesting phenomenon emerging from housing that has undergone transformation is the reduction of outdoor space. In the course of this research it has been noted that in many transformed houses there is an increase in floor area ratio following the transformation process (Chapter Eight). Horizontal densification results in limited space between buildings. The space is important for cross-ventilation, light, green areas and nice views which are considered important in the theories of modernism, especially in the developmental aspects of house design. Outdoor space are of paramount importance for people living in informal settlements and more specifically in the hot and humid coastal climates like that of the Dar es Salaam. It is often more comfortable to carry out domestic activities outdoors, or to rest under cool shade in the outdoor space. Most households have been deprived of this option because of the extensions which in turn have given rise to limited space for outdoor activities.

Maximum plot utilisation through horizontal transformation has become manifest to the detriment of spatial qualities. Another issue that may be levelled against housing transformation observed in Hanna Nassif, is that changes do take place without observing rules and regulations regarding housing development. Issues like setbacks, building lines and plot coverage have not been considered. This has led to the blockage of free air movement for ventilation and adequate light, thus increasing thermal discomfort and the creation of minute spaces between buildings that cannot be utilised. In many areas these spaces become rubbish-dumping areas and in some cases the space is so small making it difficult for people to pass through and clean the areas.

Throughout this thesis it has been noted that housing transformation does not involve only extensions of the larger building element or sections. There are also changes within the house such as increase in window sizes, room sizes, repositioning of windows and doors. This is done in order to increase comfort in the house in terms of more light and cross ventilation. However due to the fact that the houses are very close to each other and distances between buildings are also very limited, the situation makes it difficult for the residents to achieve comfort. Instead they resort to mechanical devices like fans which are energy consuming. This is contrary to developmental principles of house design, which advocate for health, access to daylight and other functional qualities (Vestbro, Nawangwe and Sanya, 2002). The developmental principles of house design have in Sweden, been translated into practice thereby improving living standards. Such
qualities, if advocated and gradually adopted in non-industrialised countries would bring about positive changes needed for all communities concerned.

![Narrow alleys](image)

**Figure 10.2: Narrow alleys.** When two houses are close to each other create dark spaces which cannot be used for any meaningful outdoor activity they end up to accumulating rubbish that cannot be easily cleaned. Transformation activities have led to this kind of a situation.

Residents are modernising their houses to increase indoor space without much consideration for outdoor space. It is worthwhile to note here that fencing walls are associated with security. However to Hanna Nassif residents they are also signs of modernisation. Most of these fences are high sometimes up to three metres. Some of them are not provided with ventilation holes so they obstruct air circulation and view. This is a contradictory phenomenon because as much as the people say they have changed their windows in order to get cross ventilation, at the same time they have provided fencing walls which restrict air movement in and out of their compounds.

Houses should be designed for protecting people from adverse climatic effects. As far as house design determines the degree of human comfort which may be considered as a developmental aspect. Classical modernism gave high consideration to design related to room differentiation, control of temperature and noise insulation (Krantz, 1990; Vestbro, 2000). The theory could be applied in Hanna Nassif even in a limited way because the area is not regulated to encourage community development.

Correa (1995) points out that urban living involves much more than just the use of houses. The house or a room is regarded as only one element in the whole
system of spaces that people need. Since in Hanna Nassif outdoor space is reduced due to horizontal densification of houses, there are very little communal spaces left for outdoor activities. Backyards to houses are usually important for carrying out domestic chores like cooking, eating, washing and resting, but due to transformation activities these spaces may later on be covered with buildings which will create an environment that may negate spatial qualities.

Figure 10.3: Provisioning of a fencing wall and a gate which restricts air movement and view. The fencing wall is well decorated with daccing

A study conducted by Jessen et al (1999) on the use and function of open spaces in Hanna Nassif revealed that people are attracted to use these spaces. They are used as recreational areas especially when there is shade from trees. The study also shows that although life in Hanna Nassif may be of a lower standard compared to many formal settlements, it is still of high quality in terms of social interaction and living conditions among the people. They further observe that even though some spaces were not effectively used, they play an important role in mediating the built and un-built parts of the settlement, that is, some spaces were centres of communication and socialisation. It is important that these functional spaces are not displaced by ongoing transformation activities and desire by the residents to modernise their houses.

10.9.6 Potential for multi-storey houses

One of the results of horizontal transformation is the single storey houses that dominate the Hanna Nassif settlement. This type of house leads to increased density resulting in problems of spatial quality especially the reduction of outdoor space. Reasons behind this kind of development are poor economic conditions of the residents. There is also lack of guidance from the professionals on how best the
residents of Hanna Nassif can utilise their plots while at the same time gaining both indoor and outdoor space. The solutions to this problem could be vertical transformation, at least up to two storey houses. Such action means it will be possible to achieve wider streets, more green spaces and better outdoor qualities in backyards at the same time increase of indoor space. Functions like bedrooms could be situated upstairs where it is likely to experience more air circulation. Functions like kitchens and living rooms could be located downstairs. This action will also reduce the sprawling of the city and also reduce the cost of providing infrastructure. In the present study mafundi were able to carry out vertical transformation up to two storeys. It is likely that pressure on the availability of land will lead to more two storey houses. Correa gives recommendations within the Indian context on the importance of having multi-storey house types, which can be developed with owners earning capacity that require shorter construction periods. He also recommends the use of renewable building materials leading into efficiency in terms of land use (Correa, 1985). Although the Indian context is different from that of Tanzania, what is important in this discussion is the similarity of house types that may address the problem of optimal density while taking care of the spatial qualities. This shows that even in informal settlements two storey house types can be achieved at the same time maintain spatial qualities. So it is reasonable to consider the applicability of two storey houses within the context of informal settlements in Dar es Salaam. However, if many two storey houses will be built next to each other the benefit of cross ventilation will be reduced. There will be a need to look into solutions of solving ventilation problem.

Houses of four storeys or more are expensive to construct and to maintain and need a rent subsidy so as to make them accessible and affordable to low-income groups (Jelineck, 1992). Only the government and wealthy individuals are capable of providing such solutions. Most house builders in the informal sector cannot afford vertical extensions to four storeys apartments because of high construction costs, capital outlay and even technological prerequisites. Most mafundi cannot undertake construction of such houses unsupervised by engineers since they do not possess the requisite know-how. This is an area where government support to enable residents to transform their houses vertically in partnership with other actors in the construction industry would be necessary.

The foregoing discussions elucidate the major findings of study. In the next chapter, the policy issues and recommendations for further studies are being presented.
11 RECOMMENDATIONS

In a situation where the public housing provision system has more or less collapsed, housing demand particularly for the poor is seen as one of the major forces that activates and sustains housing transformations in informal settlements. There seems to be little or no alternative to meet housing demands for low-income people besides the informal development sector. In the circumstances, it is likely that the process of transformation will continue beyond the foreseeable future. Need for a positive response to maintain the potentials and deal with the shortcomings of housing transformation is of significance. Transformation potentials have to be explored in other existing settlements. Future upgrading of informal settlements should take into account the potential of transformation during the design stage.

Kombe and Kreibich (2000), Kombe (1995) and Kironde (1994) have observed that the government of Tanzania has neglected informal housing development. Politicians and civil servants perceive or assume that informal settlements are a transition likely to end once there is improvement in the economy. This is a major factor that inhibits meaningful supportive policy changes (Kombe and Kreibich, 2000:167).

Recognising the role that the informal sector has so far contributed in housing the majority of Tanzanians, and taking into account the strength of informal housing and its deficiencies and considering the ongoing transformations of housing, a number of policy issues are outlined in the following sections. The thrust of the policy recommendations is to support housing transformations in informal settlements so as to make it more efficient and commensurate with the needs and demands of a modern society. The major policy area concerns the need for a change in the role among the key actors namely the government, the private sector, non-governmental organisations and the financing sector.

11.1 The role of the Government

The 1988 global strategy for shelter for the year 2000 promotes the latest shift in policy focus and advocates the enabling approach and partnership. The enabling approach, mainly developed in theory, has seen the new role of government shifting from that of providing to that of supporting. Lack of government intervention has lead to unguided housing development in the rapidly growing urban areas including Dar es Salaam. “There is need for political will, support and appropriate legislation. The state ought to appreciate strategic economic interests of supporting and making the informal settlements more efficient” (Kombe and Kreibich, 2000). The enabling role by the government to support the urban dwellers in the whole issue of housing provisioning, including regulating the ongoing transformation, technical and financial support is considered central.
Inadequate resources, especially finance, inappropriate policies and lack of institutional capacities have contributed to unguided housing transformations in informal settlements and overall poor quality housing environments particularly within the informal housing sector. There is a need, therefore, for policy review to direct and enhance strategic deployment of the limited public resources available like finance, technical and manpower resources to support housing transformation and the formalisation of informal settlements. Harmonisation of informal and formal housing is an essential and important policy area, which requires mandatory government support. The government should define a proper balance of powers and roles between the key actors, public, private and popular sector including organised local committees and NGOs in housing and development.

The role of the government in overseeing housing development in the informal housing development is minimal. It is necessary for the government to act and clarify its role in relation to housing development in the informal settlements, to take a clear position and to determine its capacities. The government should recognize its limitation and implement its policies. Only then can informal housing benefit from government assistance.

Developers seem to enjoy the freedom to carry out transformation activities without even giving consideration to neighbouring houses in terms of spatial qualities like air passage, privacy and traffic circulation. It is important on the part of the government to guide developments taking place, so as to make sure that house transformation activities are taking place within reasonable, affordable and acceptable standards and norms.

Tarekegn (2000:38) points out that the nature and scale of transformation activities in low-income housing in developing countries has remained generally untouched by planning authorities. Nevertheless, as it has been shown in this study unregulated transformation in informal settlements is anticipated to increase. This unguided development will necessitate re-development in the future. It is thus imperative to find out the potentials and problems of housing transformations in different social and geographical contexts. By doing so it will be easier to build knowledge of the transformation process taking place in various settlements and find timely solutions.

11.2 The private sector

The housing transformation, which is taking place in informal settlements, is largely done by the “informal private sector”. For instance, it is individual persons who search for land to build houses and carry out transformations.

Most of the houses in urban areas in Tanzania have been built by private actors. The private sector is playing a leading role in promoting housing both in formal and informal areas. Two different actors are involved in house construction process, client (owner) who mobilise resources (materials and cash), and mafundi carry out the construction works. The construction process is organised and managed by the owners. In future private actors are likely to play even better roles,
unlike in the 60s and 70s when the Arusha declaration\textsuperscript{20} restrained private initiatives. Trade liberalisation, economic and political reforms instituted in the 1980s advocate for private sector participation in the socio-economic sectors most of which were centralised between 1967-1992. A need arise for policy makers to be candid about the capacity of the private sector in the informal settlements, particularly the capacity to further engage in housing development. This calls for policy makers to accept and adopt housing policy measures that may develop existing skills and experiences.

11.3 Community Based Organisations

Community Based Organisations (CBOs)\textsuperscript{21} have proved to be active social actors. For years they have played a leading role in mobilising local resources like skills, materials and even financial resources. The CBOs are among the key actors in informal settlements which have assisted in bringing about social and economic improvements although they are few and most of them weak. In recognition of their roles and potentiality, CBOs have to be supported so that they may continue to play a leading role in promoting community welfare in informal settlements. CBOs have the potential to execute the following functions:

- To play an active role in enforcing land development control tasks so as to minimise or reduce problems associated with transformation processes being undertaken by private house promoters.
- To advise and train housing developers to acquire the best methods and skills for carrying out transformation and improvement of their houses.
- Improving community facilities and services. This may be achieved through acting as a pressure group in matters related to community welfare.
- To play an active role as negotiators so as to secure land for basic community facilities and services and coordinate the various actors involved.
- To mobilise financial and technical resources from within and outside the settlement.

11.4 Financial institutions

This study shows that transformation activities are carried out by using personal savings. In view of the fact that the capacity of this source is small, finance for transformation activities is one of the major obstacles. There is a need to review, seek support from financial institutions such as, the National Micro-Finance Bank, National Social Security Funds and other saving schemes to provide loans to builders in the informal areas. A major problem which has to be addressed is the

\textsuperscript{20} The Arusha declaration is a government policy which was adopted in 1967 whereby the means of production (land, labour and capital) and investments were put under government ownership.

\textsuperscript{21} Community Based Organisations (CBO) are grassroot organisations within a limited geographic area with the main goal of serving interests of the immediate community.
lack of security of tenure by informal sector house developers, as most residents do not have land titles. A need to regularise informal settlements and grant house owners with some kind of land title is important.

The possibility to enhance micro-credit schemes is another important area which as noted in Hanna Nassif, has proved effective in improving households' socio-economic welfare, leading to better housing.

11.5 Building materials

As discussed earlier “modern” building materials are preferred more than traditional, even though traditional building materials consist of many qualities including suitability to climatic conditions and easy maintenance. There is a need to promote the use and production of local building materials and raise awareness of the potentiality of local building materials. Although traditional materials are regarded to have short life span, there are known options to improve on their quality. A tendency among most people is to build houses by using modern materials available in the market. This encourages the importation of materials which are expensive. This tendency hampers the development of a local/ traditional building materials industry.

“Modern” building materials are often expensive. They are also standardised and the technology to use them is readily available. Universities, vocational training centres and technical colleges teach on how to use “modern” materials. There has also been a failure on the part of research institutions, which deal with the promotion of local building materials to disseminate information through demonstration or pilot projects of local materials to promote their penetration into everyday housing and building practice.

There is thus a need for training institutions, local authorities and private sector organisations such as contractors and producers of building materials to play a leading role in promoting the use of local building materials. This could be achieved through continued experimentation and evaluation of their performance. The government has to provide an enabling environment to facilitate the achievement of desired results through training and research.

Developing a local building materials industry is considered important. So far the establishment of this type of industry in Tanzania has not been successful due to the absence of interaction among the available technical resources, institutional mechanisms and user knowledge. There is also a need to assess the available construction technologies with a view to incorporating local materials and suggesting areas of improvement for better performance. This could facilitate better accessibility to improved local building materials.

In order to ensure promotion of local building materials there is a need to take into account the following:

- A clear policy on the promotion of locally available and use of naturally occurring materials.
• To create awareness and educate Tanzanians on the importance of traditional building materials as compared to the so-called “modern” materials.
• The locally manufactured materials should be standardised especially those developed from small-scale industries that use locally available natural resources.
• A proper way of disseminating research information to the public in general should be put in place.

What has to be improved is the role of government in the entire process of housing transformation. The “laisse affaire” attitude on the part of government implies expansion of informal settlement is taking place without a regulatory framework.

The government should play a positive role as “enabler” to support developers to undertake extensions and alterations taking into consideration standards which can guarantee improved environmental quality.

It is anticipated that many people in informal settlements will continue to transform their houses in order to fulfil their socio-economic desires. It is, therefore, recommended that in order to achieve a balanced development of housing in informal settlements the following should be pursued:

• To provide affordable, flexible and realistic standards to guide housing development in informal settlements. The regulations should be related to what people can afford taking into account materials and skills available and construction methods that are cheaper and familiar. Future regulations should reflect local conditions and be responsive to local needs including the economic capacities of the people.

• To evaluate the possibility and viability for the use of locally available resources for construction vis a vis imports. The intention here should be to assess the available construction technologies with a view to incorporating local materials and methodologies for better performance. This may facilitate the determination of simplified methods and improved building materials suitable to the environment and weather conditions.

• Capacity building strategies are equally important. In this regard it is important to train mafundi to acquire sound technical knowledge and skills in construction works, and managing housing development through tailor-made courses for the mafundi who are engaged in transformation activities, so that they can learn/acquire new techniques through advanced technology in the building industry.

11.6 House types for coastal climate

Single banked houses are appropriate for the coastal climate because they facilitate maximum cross ventilation. In order to optimise cross ventilation, the long walls ought to face the prevailing wind direction.

The location of bedrooms and living rooms should also be taken into consideration. The kitchen, toilet and bathrooms should be located on the west
part of the building to act as a protection against the hot sun on the living and sleeping rooms.

House types that can be extended vertically rather than horizontally are considered suitable. This will invariably provide option for more outdoor space. Such houses could be well achieved through housing transformation where developers are supported and guided to start with a small unit and later transform the house gradually. To achieve this, partnership between the private sector, government and individual developers is inevitable. Although a majority of residents in informal settlements are not used to living in more than a one storey house, it is anticipated that they will appreciate these houses and change their life styles in order to live harmoniously in new house types.

Figure 11.1(a): A single banked house. Note that it is possible for the wind to pass through to maximise ventilation. Figure 11.1(b) Blockage of wind. The figure shows that the inner walls block the wind making it difficult for cross ventilation to take place.

Figure 11.2 (a): Orientation of houses. Note that houses ought to be oriented with long walls facing the NE prevailing winds to enable maximum intake of wind. Figure 11.2 (b) Poor orientation of a house to block flow of wind.
In Tanzania most households build low-rise single storey houses. The result of this are, interalia, sprawl of the city and therefore it becomes expensive to make provision of infrastructure in terms of roads, water connections and electricity together with maintenance and uneconomic use of land. As elucidated in Chapter Eight, transformations through extensions, alterations and replacing mud and pole structures has led to different house types. Some of these house types like room aligned, L type and U type are considered appropriate in terms of climatic factors. However, if we are to address problems associated with city sprawl then there is a need to take into account how the prevailing transformation activities are taking place. Through technical and financial support it is possible to guide developers to carry out vertical transformations. This strategy leads to the creation of outdoor space, reducing the plot coverage so as to improve the quality of outdoors spaces.

These ideas may be considered too ambitious to be achieved within a short term. However, since we are dealing with built up parts of the city, they are worth taking into consideration in order to address the issue of the low-rise character of the transformation of houses.

11.7 What can professionals learn from the study?

As already noted, presently the contribution of professionals such as architects, planners and engineers in housing development in informal settlements is very little or negligible. The study shows that the key actors are mafundi who design, advise and carry out construction works. Most of the architects and planners are trained by the government in order to serve the society. It is sad to see that their expertise is not utilised in the informal settlements where a majority of urban dwellers including the poor live.

A large number of low-income earners live in informal settlements, they transform their houses in terms of making extensions and alterations. Often this is done without involving or seeking professional advice. The absence of professional input leads to excessive high housing density, over-utilisation of plots leading to the
deterioration of living conditions within some of the transformed houses. This problem is, among others, an indication that professionals like architects and planners do not contribute much in the area of informal housing development.

It is necessary that professionals play an active role in supporting housing construction and transformation taking place particularly in low-income informal settlements. They should take into account the availability of basic needs for housing, like finance and technology, in terms of building materials and specialised skills. There is, for instance, the need for flexible designs, which could be altered and extended to suit the needs of low-income earners. Architects and planners should also learn to “work with” the people and not only to “work for” the people. That is, they should interact with the local fundi as one of a strategies to solve pertinent socio-economic, physical and environmental problems in informal settlements.

Architects and planners need to appreciate that even low-income earners in informal settlements require technical support to realise modern houses. The professionals ought to endeavour to use their skills in assisting housing developers realise their objectives to evolve modern housing, taking into consideration the climatic conditions pertaining to the location of houses and the developers’ socio-economic factors. Further, architects and planners should note that there is a need to build local capacity in terms of organisational, financial, managerial and technical support of the people in the informal settlements in order to assist them positively deal with emerging housing problems.

Architects should learn from countries where traditional building materials have been put in use, the importance and potential of local building materials especially earth. It is assumed that if houses built of earth materials popular in countries like Mali, Algeria and Egypt, are built in Tanzania, people would appreciate the structures and hence the building materials can be popularised for wider use.

One of the key issues with regard to the role of professionals is whether architects and planners would be in a position to participate in capturing their clients’ imaginations. This may be in terms of preference, given the nature of their training and professional attitude in which planning and designing concepts are gauged on formal settlements. The architect should bring to the site compatibility, experience, and share these with clients and give advice where necessary. To put into practice lessons drawn elsewhere, professionals will require personal commitment, new skills and understanding as well as appreciate the social, cultural, economic, political and physical dynamics of informal development processes.

11.8 Recommendations for further research

This study has identified a number of issues that could not be exhaustively addressed or investigated due to the scope of the study. Emerging issues that would require further research consistent with the above discussed transformation processes, include the following:
11.8.1 Security

It has been established that one of the reasons underlying transformations is improvement of security. Many house developers have tried to improve security in their homes by making provision of burglars proof bars, concrete walls and gates. Whether these provisions are effective or not and in what other ways should improvement for security be provided through planning and design in informal settlements, is an area for further research. It will also be of advantage for housing developers to find out the pros and cons of the security methods in use. Experience from international research on the issue of security should be applied in the case of Dar es Salaam.

11.8.2 Privacy

Privacy is one of the fundamental issues valued by most households interviewed. It is understood that privacy differs from one cultural background to another. Privacy proved to be a multi-faceted issue, which forms part of a culture. There is a need for in-depth study in relation to privacy especially taking into consideration changes resulting from urbanisation in poverty.

11.8.3 Income generating activities

As observed earlier in this work, informal economic activities form a major source of income for most of the people interviewed. Income from petty trading is used to transform houses in order to generate further income within the houses, through room renting. An important issue for further investigation is, to what extent are activities at house level making it necessary for owners or occupiers to change the use and structure of their houses. It will be interesting to find out the magnitude, the potential and problems associated with housing transformations as a means to widen the scope of income generating activities. Future design and planning of low-income people could take into consideration rental accommodation needs as a source of income for house owners; but also addressing the needs of housing demands for the poor in informal settlements. Some interesting studies have been carried out in other countries (Sinai, 1998; Kellet and Tipple 1997). There is a need for this kind of research to be carried out in Tanzania.

11.8.4 Training for mafundi

As already observed mafundi possess certain capabilities to carry out an acceptable standard of construction works. However, there are some pertinent concerns on the quality of work produced by mafundi. It is recommended that further research be conducted to find out the nature and level of training and re-training for mafundi necessary to meet the needs of new technology. This is considered important so that they can play a more positive role in housing transformation in informal settlements.
11.8.5 Public and private spaces

The issue of public and private space in informal settlements is important because the study has shown that in the process of housing transformation, developers utilise an available space to increase indoor space to the detriment of outdoor space. There is, therefore, a need to study and come up with a layout to define public and private space in informal settlements. This could be done in a participatory manner and be approved by both the affected people themselves and local government. The study should come up with an approved regularization plan defining public and private spaces. The plans should then be used for development control.
REFERENCES


Bersani, E. and Bogoni, B. (2001): Living in Developing Countries: Dar es Salaam Tre Lune, Edizion, Mantova.


Kabwogi, C.M. (1997): The Implementation and Impact of Rent Control in Tanzania, Ph.D. Thesis, Department of Town and Regional Planning, University of Sheffield.


Lawrence, R. (1987): Housing, Dwellings and Homes. Design Theory Research and Practice, John Willey & Sons Ltd.


APPENDIX 1:
QUESTIONNAIRES OF A FIELD STUDY ON TRANSFORMATION OF HOUSES IN DAR ES SALAAM-
PHASE ONE

1 Information on house occupants
(a) The house is:  -Owner occupied
                  -Owner and Tenants
                  -Tenants only

(b). Owner's name:………………………………………………………………………………
Person interviewed:………………………………………………………………………………
House no: …………………………………………………………………………………
Sex:………………………………………………………………………………
Date:………………………………………………………………………………
Education:………………………………………………………………………………
No. of persons in the household living together:…………………………………………
No. of persons living in the house:…………………………………………………………
Indicate adults their sex and ages:…………………………………………………………
Indicate children and their sex and ages:………………………………………………

General questions
1.1 When did you start living in this house?
1.2 Where did you live before?
1.3 Are you the first one to live in this place?
1.4 When was this house constructed? Who built it?

2 Questions about alterations and extensions
2.1 Have you changed walls, doors, windows, ceiling, roofing materials or number of rooms in this house since you occupied it? If yes, what did you change and when were the changes made?
2.2 What prompted you to make changes?
2.3 Did create any extensions e.g. addition rooms?
2.4 Have you modified the use of space such as kitchens, sleeping rooms etc?
2.5 Have you modified interior walls so as to change room sizes? If yes give reasons
2.6 What other modifications have you done in your house?

3 Questions about alterations and extensions at plot level
3.1 Are you planning to construct more buildings/rooms on this plot?
3.2 If yes, what are they for (rent, own residential use, shop, others (specify)

4 Questions about process of transformation at both house level and plot level
4.1 What reasons prompted you to carry out transformation?
4.2 How did you carry out the changes?
4.3 Who were the actors in the whole process of transformation? (architects, contractors, mafundi, local leaders, etc.)
4.4 How was the transformation financed?
4.5 Did you hire any fundi?
4.6 What are the payment arrangements?
4.7 What are the advantages of transformations?
4.8 What are the disadvantages of transformations?

5 Questions about use of different spaces

5.1 Cooking and eating
   5.1.1 Where do you usually prepare your meals after transformation? Is there a separate space for cooking only?
   5.1.2 Where did you prepare your meals before transformation (outside or inside)? Give reasons.
   5.1.3 What type of cooking stove are you using after transformation?
   5.1.4 What type of cooking stove did you use before transformation?
   5.1.5 Where do you prepare food before cooking?
   5.1.6 Where did you prepare food before cooking before transformation?
   5.1.7 Are you satisfied with the cooking arrangements?
   5.1.8 Where do you wash dishes?
   5.1.9 Where did you wash dishes before transformation?
   5.1.10 Are you satisfied with cooking arrangements after transformation?
   5.1.11 Were you satisfied with cooking arrangements before transformation?
   5.1.12 Is there enough space for preparing and cooking?
   5.1.13 Was the place for preparing and cooking enough before transformation?
   5.1.14 If not, what problems do you experience or did you experience in food preparation and cooking in terms of use of space?
   5.1.15 Where do you and your family eat meals mostly (indoors, outdoors)?
   5.1.16 Where did you and your family eat mostly before transformation?

5.2 Storage of Household goods
   5.2.1 Where do you keep your cooking utensils?
   5.2.2 Where did you keep your cooking utensils before transformation?
   5.2.3 Where do you store food (rice, beans, sugar, maize flour etc.)?
   5.2.4 Where did you store food (rice, beans sugar, maize flour etc.) before transformation?
   5.2.5 Where do you store water?
   5.2.6 Where did you store water before transformation?
   5.2.7 Where do you keep your clothes?
   5.2.8 Where did you keep your clothes before transformation?
   5.2.9 Are you satisfied with storage arrangements? If not, what problems are you facing?
   5.2.10 Were you satisfied with storage arrangements before transformation? If not, what problems did you face?

5.3 Sleeping arrangements
   5.3.1 Where do different members of the household sleep (indoors, outdoors)? Are these areas used separate from other functions like cooking, eating, storage?
   5.3.2 Where did different members of family sleep before transformation?
5.3.3 Are you satisfied with sleeping arrangements for your family?
5.3.4 Were you satisfied with sleeping arrangement for your family?
5.3.5 Where do you usually rest at midday?
5.3.6 Where did you rest at midday before transformation?

5.4 Hygiene
5.4.1 Where do you have a bath?
5.4.2 Where do you wash face, hands and feet?
5.4.3 Are you satisfied with personal hygiene arrangements?
5.4.4 What kind of toilet are you using?
5.4.5 Where is the toilet located? If outside, how far is it from the main house?
5.4.6 Are you satisfied with the type of toilet and bathing area you have?

6 Questions about use of space at plot level
6.1 What land do you consider belongs to you?
6.2 How is the plot demarcated?
6.3 How is the outdoor space defined and used over time?
6.4 Is there any agreement between neighbours in the use of private space?
6.5 How do you determine boundaries of private, semi-private and communal space?
6.6 Do your children have space for playing?
6.7 Did your children have space for playing before transformation?

7 Use of space for income generating activities inside the house and outside the buildings.
7.1 Do you have any small business done at home (inside the houses or within the plot)?
7.2 What kind of business is that?
7.3 Are you in any way having difficulties to work at home? Give reasons.
7.4 Do you grow vegetables near the house?
7.5 Do you keep poultry and animals? If yes, where do you keep them?

8 Visitors
8.1 Where do you usually receive visitors?
8.2 When visitors come to stay overnight, how do you arrange for their sleeping area?
8.3 Do you think you can receive visitors in your dwelling in a manner you consider appropriate?

9 Evaluative questions
9.1 What do you like most in this house?
9.2 What do you consider being poor in this house?
9.3 What improvements do you think are urgent?
9.4 How many people lived in this house before you made any changes?
9.5 How many people are living in this house now?
APPENDIX 1B:
RESEARCH QUESTIONNAIRE ON HOUSING TRANSFORMATION IN HANNA NASSIF SETTLEMENT, DAR ES SALAAM.

Information on House occupants

<table>
<thead>
<tr>
<th>House owner</th>
<th>Tenants</th>
<th>House owner and tenants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of research assistant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of house owner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of head of household</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plot number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of persons in the household living together</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of persons living in the house</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicate adults, sex and ages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicate children and their sex and ages</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General questions

1. When did you start living in this house?
   1. 1960-1969
   2. 1970-1979
   3. 1980-1989
   4. 1990-1999
   5. 2000

2. Where did you live before?
   1. In town
   2. In village

3. Are you the first one to live in this place?
   1. Yes
   2. No

4. When was this house constructed? Who built it?
   1. In the 1970s
   2. In the 1980s
   3. In the 1990s
   4. Year 2000
5. How much did the construction of the house cost (Tshs)?

Questions about alterations and extensions

6. What is the best choice for you, to make extensions or alterations or to move out and find accommodation in another settlement
   1. Making extensions or alterations
   2. To move

7. Have you changed walls, doors, windows, ceiling roofing materials or the number of rooms in this house since you occupied it? If yes, what is it and when were the changes made?
   1. Yes
   2. No
   If no why not? ……………………………………………………………………………………

If yes, what changes have been made?
   1. room extension
   2. Change of doors
   3. Change of windows
   4. Change of ceiling, roof
   5. Any other item, please itemise
   6. Demolition of the house and reconstruction
   When was the transformation carried out… ……………………………………

8. What are the reasons which made you decide to transform your house?
   1. Increase of family members
   2. To improve the house
   3. The desire to have a modern house
   4. Any other reason, please itemise.

9. Did you do any extension e.g. addition room?
   1. Yes
   2. No

10. Have you modified use of space such as kitchens, sleeping rooms or any other space?
    1. Yes
    2. No
    If yes what are the reasons for the changes… ……………………………………

11. Have you modified interior walls so as to change room sizes?
    1. Yes
    2. No
    If yes give reasons… ………………………………………………………………………

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12. What materials did you use for roofing
   1. Corrugated Iron sheets
   2. Mangalore tiles
   3. Concrete tiles
   4. Thatch
   5. Others (specify)…………………………………………………

13. What materials did you use for extending walls
   1. Concrete blocks
   2. Mud and pole
   3. Others (specify)

14. What other modifications have you done in your house?
   ………………………………………………………………………………………………………
   ……………………………………………..…………………………………………………………

Questions about alterations and extensions at plot level
15. Do you have any plans to construct another house or make additional rooms on this plot?
   1. Yes
   2. No
   If yes, what are they for (rent, own residential use, shop, Others (specify)………………………….…………….

Questions about process of transformation at both house level and plot level
16. What were the sources of money you utilised to transform your house
   1. Salary
   2. Received from children
   3. Business
   4. Mortgage
   5. Any other source, please mention……………………………………………………

17. Who were the actors in the whole process of transformation?
   1. Fundi
   2. Civil engineer
   3. Contractor
   4. Architect

18. If by fundi what were the payments terms?
   1. Daily pay
   2. For specific piece of work
   3. For the entire job
   4. Any other arrangement……………………………………………………………

19. Do you think by transforming your house you have modernised it?
   1. Yes
   2. No
20. What is your conception of a modern house

21. Would you think a modern house is necessarily better or appropriate?
   1. Yes
   2. No
   Please give reasons... .................................................................

Questions about use of different spaces

Cooking and eating

22. Where did you prepare your meals before transformation (outside or inside)? Give reasons
   1. Cooking space outside the house
   2. Cooking space inside the house
   3. At the sitting room
   4. In the veranda
   5. In the courtyard
   6. Reasons... .................................................................................

23. Where do you usually prepare your meals after transformation?
   1. Cooking space outside the house
   2. Cooking space inside the house
   3. At the sitting room
   4. In the veranda
   5. In the courtyard

24. What type of cooking equipment are you using after transformation?
   1. Charcoal stove
   2. Electric cooker
   3. Kerosene stove
   4. Firewood
   5. Gas cooker

25. What type of cooking equipment did you use before transformation?
   1. Charcoal stove
   2. Electric cooker
   3. Kerosene stove
   4. Firewood
   5. Gas cooker

26. Are you satisfied with the cooking arrangements?
   1. Yes
   2. No
   If you are not satisfied what are the reasons?... .........................
27. Where do you wash dishes?
   1. Washing basin fitted in the kitchen
   2. Concrete platform outside the house
   3. On the floor
   Any other place, please mention... ............................................................

28. Where did you wash dishes before transformation?
   1. Washing basin fitted in the kitchen
   2. Concrete platform outside the house
   3. On the floor
   Any other place, please mention... ............................................................

29. Where do you and your family eat meals mostly?
   1. In the veranda
   2. At the courtyard
   3. In the dinning room
   4. In the sitting room
   5. In a sleeping room
   6. In the corridor
   Other place, please mention... ............................................................

30. Where did you and your family eat mostly before transformation?
   1. In the veranda
   2. At the courtyard
   3. In the dinning room
   4. In the sitting room
   5. In a sleeping room

Storage of Household goods

31. Where do you keep your cooking utensils?
   1. In the utensils cupboard
   2. In the plastic container
   3. Under bed
   Other place please mention... ............................................................

32. Where did you keep your cooking utensils before transformation?
   1. In the utensils cupboard
   2. In the plastic container
   3. Under bed
   Other place please mention... ............................................................

33. Where do you store food (rice, beans, sugar, maize flour etc.)?
   1. Store
   2. In plastic containers
   3. In tin containers
   Other places, please mention... ............................................................

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34. Where did you store food (rice, beans sugar, maize flour etc.) before transformation?
   1. Store
   2. In plastic containers
   3. In tin containers
   Other places, please mention

35. Where do you preserve water?
   1. In refrigerator
   2. In water clay pot
   3. In tin containers
   4. In plastic containers

36. Where did you store water before transformation?
   1. In refrigerator
   2. In water clay pot
   3. In tin containers
   4. In plastic containers

37. Where do you store clothes?
   1. In wardrobe
   2. In suitcases
   3. In plastic bags
   Other places, please mention

38. Where did you store clothes before transformation?
   1. In wardrobe
   2. In suitcases
   3. In plastic bags
   Other places, please mention

39. Are you satisfied with storage arrangements? If not what problems are you facing?
   1. Yes
   2. No
   If no what problems do you encounter?

40. Were you satisfied with storage arrangements before transformation?
   1. Yes
   2. No
   If not what problems did you encounter?

**Sleeping arrangements**

41. Where do different members of the household sleep
   1. In sleeping rooms
   2. In the corridor
   3. In the sitting room
   4. In rooms at the backyard
   Other places, please explain
42. Where did different members of family sleep before transformation?
   1. In sleeping rooms
   2. In the corridor
   3. In the sitting room
   4. In rooms at the backyard
   Other places please explain……………………………………………. 

43. Are you satisfied with sleeping arrangements for your family?
   1. Yes
   2. No
   If no what are the reasons……………………………………………… 

44. Were you satisfied with sleeping arrangement for your family?
   1. Yes
   2. No
   If no what were the reasons?…………………………………………. 

45. Where do you usually rest at midday?
   1. In the veranda
   2. At the sitting room
   3. At the backyard
   4. In sleeping rooms
   5. At the corridor
   6. Outside under shade

46. Where did you rest at midday before transformation?
   1. In the veranda
   2. At the sitting room
   3. At the backyard
   4. In sleeping rooms
   5. At the corridor
   6. Outside under shade

Hygiene

47. In which space does the family have a bath?
   1. In the bathroom outside the main house
   2. In the toilet room outside the house
   3. In the bathroom located in the main house
   4. In the toilet room located in the main house
   Other place, please mention…………………………………………… 

48. Where do you wash your face, hands and feet?
   1. Outside at the courtyard
   2. In the bathroom
   Other place, please mention…………………………………………… 

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Questions about use of space at plot level

53. How is the plot demarcated?
   1. Fencing wall
   2. Wooden poles fence
   3. Iron sheets fence
   4. Stones
   Any other item……………………………………………………………………..

54. Do the children have space for playing?
   1. Yes
   2. No

55. Did your children have space for playing before transformation?
   1. Yes
   2. No

56. Do the children have a specific place for their homework?
   1. Yes
   2. No
   If no where do they study…………………………………………………………..
Use of space for income generating activities inside the house and outside the buildings.

57. Do you have any small business at home (inside the houses or within) the plot)? If yes which one?
   1. Frying pancakes
   2. Shop
   3. Coffee/tea shop
   4. Vegetable garden
   5. Any other business

58. Are you in any way having difficulties to work at home? Give reasons
   1. Yes
   2. No

59. Do you keep poultry and animals?
   1. Yes
   2. No
   If yes where do you keep them? .................................................................

Visitors

60. Where do you usually receive visitors?
   1. At the backyard
   2. In sleeping rooms
   3. In the corridor
   4. At the sitting room

61. When visitors come to stay overnight, how do you arrange for their sleeping area?
   ......................................................................................................................

62. When guests spend a night with your family do you face any inconveniences?
   1. Yes
   2. No
   If yes what are the inconveniences?.........................................................
APPENDIX 2:
QUESTIONNAIRES, FIELD STUDY- PHASE 2

1. Information on house occupants
   1.1 House no…….. Date of interview: ………
   1.2 The house is
      - Owner occupied
      - Owner and Tenants
      - Tenants only
   1.3 Owner’s name: ……………………………………………………………………………………………………
   1.4 Person interviewed …………………………………………………………………………………………………
   1.5 Sex: …………………………………………………………………………………………………………………
   1.6 Education: ……………………………………………………………………………………………………………
   1.7 Occupation: …………………………………………………………………………………………………………..
   1.8 No. of persons in the household living together: ……………………………………………………………
   1.9 No. of people living in the house: ……………………………………………………………………………
   1.10 Indicate adults and their sex and ages: ……………………………………………………………………………
   1.11 Indicate children and their sex and ages: ……………………………………………………………………………

2. Ideas about urban life style
   2.1. When a male family member gets married, does he move out of the house or continue living with his wife in the parent’s house?

   2.2 Is there a situation where males and females sharing a room? In which circumstances?

   2.3 What are the advantages and disadvantages of cooking by using charcoal stoves?
      Advantages…
      Disadvantages…

      2.3.1 What are the advantages and disadvantages of cooking using paraffin stoves?
         Advantages
         Disadvantages.

      2.3.2 What are the advantages and disadvantages of cooking using wood fuel?
         Advantages…..
         Disadvantages…

      2.3.3 What are the advantages and disadvantages of cooking using electric cooker?
         Advantages…..
         Disadvantages…..
2.4 When you consider life in the village where people are assisting each other, do you think here in the city people are helping each other or are more individualistic? Please give reasons.

2.5 When one is moving to a city like Dar es Salaam, does it mean that the life style is also changing? What are the good and bad aspects of these changes?

2.6 Where do you carry out your daily activities for earning a living?

2.7 Could you please tell me your daily schedule from the time you wake up to the time you go to bed.

<table>
<thead>
<tr>
<th>Time</th>
<th>Type and place of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>04-05</td>
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<td>05-06</td>
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<td>06-07</td>
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<td>22-23</td>
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<td>23-24</td>
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</tbody>
</table>

**Type of activities**

- cooking
- eating
- sleeping
- washing-personal
- washing-laundry
- ironing
- at work
- studying
- sleeping
- relaxing
- going to the market
- gardening
- others-specify.
2.8 What is your monthly income?

What is your daily, or weekly or monthly expenditure?

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
<th>Expenditure per day</th>
<th>Expenditure per week</th>
<th>Expenditure per month</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Food</td>
<td></td>
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<tr>
<td>2 Energy</td>
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<td>- electricity</td>
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<td>4 Water</td>
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<td>5 Transport for the members of the household</td>
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<tr>
<td>6 House rent</td>
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<tr>
<td>7 School fees</td>
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<td>8 Taxes</td>
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<td>10 Socializing</td>
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<td>- cinema</td>
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<tr>
<td>- dancing</td>
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<tr>
<td>- eating out in a restaurant</td>
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<tr>
<td>- Others (mention)</td>
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<td>11 Contributions</td>
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<td>- weddings</td>
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<td>- funerals</td>
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<tr>
<td>- support to extended family</td>
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<td>- parents</td>
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<tr>
<td>- others (mention)</td>
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</tbody>
</table>
3. **Ideas about modernity**

3.1 If you think of a house considered modern, which features do you think of?
3.2 Do you think that by having a modern house one is improving ones living conditions? In which way?
3.3 What do you consider to be the difference between a traditional and a modern house?
3.4 Should houses provide for nuclear or extended family living? Which aspects are important for the two ways of living?
3.5 Is nuclear family living more modern?
3.6 How important is the separation of activities in the house?
3.7 How do you see the issue of having toilets inside the house, (What we call self-contained houses). What are the positive and negative aspects of this situation?
3.8 What should be separated? Kitchen from living room, toilet from kitchen and living, bedroom from living room, workplace from residential quarters?
3.9 How important is the separation of men and women, children and parents, boys and girls in the house? Which measures should be taken to achieve separation (if desired)?
3.10 What changes do you see which are considered as modern but which you do not consider improvements?
3.11 What does it mean to be a modern person?
3.12 What are the most important aspects of house improvement?

4. **Building rules and regulations**

4.1 Are you aware of existing rules or regulations guiding people during housing construction and transformation?
4.2 If yes, do you think these rules are taken into consideration by the transformers?
4.3 Do you think it is important to have such rules and regulations?
4.4 Do you have any local rules which guide development in this settlement?
APPENDIX 3:
CHECKLIST OF QUESTIONS FOR FUNDI

Name of the interviewer…………………………………………………………………………………………

Name of Fundi……………………………………………………………………………………………………

Age………………………………………………………………………………………………………………

Education…………………………………………………………………………………………………………

1. What kind of jobs do you usually perform (masonry, carpentry, plumbing, electrical etc.)?

2. How did you get your expertise?

3. How do you find jobs?

4. During the course of carrying out your job, how is the agreement reached between you and your client. Do you have any form of written contract on how to perform your work and terms of payment?

5. Have you ever worked with any construction company? If yes, what kind of jobs did you carry out.

6. How do you understand a Swahili house? Can you describe how it is?

7. What is a modern house? Can you give criteria for a modern house?

8. Are you personally involved in the construction of modern houses?

9. Why do you think people are transforming their houses by extension and alterations?

10. Who are involved in the construction of houses in Hanna Nassif? Is it only mafundi or contractors?

11. How are you involved in the design of houses?

12. Do you work with labourers or do you use labour from the family members?

13. What kind of equipment do you use for your work?

14. Normally, who is purchasing the building materials like cement, sand etc? Is it you or the house owner or how is the whole arrangement of purchasing building materials?

15. In the whole issue of housing transformation, who makes decision on what to be changed?
APPENDIX 4:
KEY INFORMANTS INTERVIEW FORM (PLANNERS, ARCHITECTS AND CONTRACTORS)

Interviewee:………………………………………..…….…..
Title/ Designation:………………………………………..……..
Date:……………………………………………………...

1. What are the roles of planners and architects in housing development in informal settlements?

2. What are the roles of mafundi in housing development in informal settlements?

3. What are the relationship between mafundi and architects/planners in housing development in informal settlements in practice?

4. It seems mafundi have taken the role of architects in housing development in informal settlements. What is your opinion? What is your observation on the quality of work produced by mafundi?

5. Are there any local rules and regulations guiding development in informal settlements? If any, please, give examples.

6. What approach do you use to regulate housing development in informal settlements?

7. It seems that people in informal settlements are transforming their houses through extensions and alterations. Do you see this as a potential or threat? Please, give reasons.

8. In your opinion, what should be the future role of architects, planners and mafundi in housing and general settlement development in informal settlements?
APPENDIX 5:
REGISTRATION FORM NO.1. HOUSE TYPE CHARACTERISTICS

House Type:…………………………………….………………..
Name of Research Assistant:………………………………..……
Date:……………………………………………………………..

Instructions:
1. Draw a house plan and indicate spatial-organisation, measure the dimension of a plan and at least one section to show the height and number of rooms and use.
2. Draw a site plan and try to document all details found in the plot e.g. plants, annex houses, toilets, water taps etc. Put the dimension of the plot.
3. Indicate the distance from the house being studied to the nearby houses and put the dimension.
4. Indicate any changes that have taken place for example extension, alteration or any kind of transformation.
5. Draw furniture arrangements in the plan and its dimensions.
6. Take photographs of each house studied to document spatial qualities.

<table>
<thead>
<tr>
<th>No.</th>
<th>Swahili House type</th>
<th>1 storey house type</th>
<th>2 storey house type</th>
<th>Residential / commercial</th>
<th>Single detached house</th>
<th>Multiple occupation house type</th>
<th>Others (specify)</th>
<th>wall</th>
<th>windows</th>
<th>doors</th>
<th>Roof</th>
<th>Floor</th>
<th>House size</th>
<th>Plot size</th>
</tr>
</thead>
</table>

AS =Asbestos, RT = Roofing tiles, CI = Corrugated Iron Sheets, C = Concrete, CS = Cement screed, FL = Floor tiles, OT = Others(specify)
APPENDIX 6:
REGISTRATION FORM-OBSERVATION ON USE OF SPACE

House no. or name of the house owner: …………………………………………………………………………………
Name of the observer: ……………………………………………………………………………………………………………
Date: ……………………………………………………………………………………………………………………………

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>SETTINGS</th>
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<tbody>
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<td></td>
<td>Back Yard</td>
</tr>
<tr>
<td>Eating</td>
<td></td>
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<tr>
<td>Cooking</td>
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<td>Sleeping</td>
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<tr>
<td>Bathing</td>
<td></td>
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<tr>
<td>Washing Clothes</td>
<td></td>
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<tr>
<td>Washing dishes</td>
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<tr>
<td>Socialising (e.g. playing chess)</td>
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<tr>
<td>Income generating activities</td>
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<tr>
<td>Receiving visitors</td>
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<tr>
<td>Hair plaiting</td>
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<tr>
<td>Resting</td>
<td></td>
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<tr>
<td>Others (specify)</td>
<td></td>
</tr>
</tbody>
</table>

Symbols to be used in relation to time frame when the observation will take place includes:

- 0700-0900hrs
- 1200-1400hrs
- 1600-1800hrs
- All day