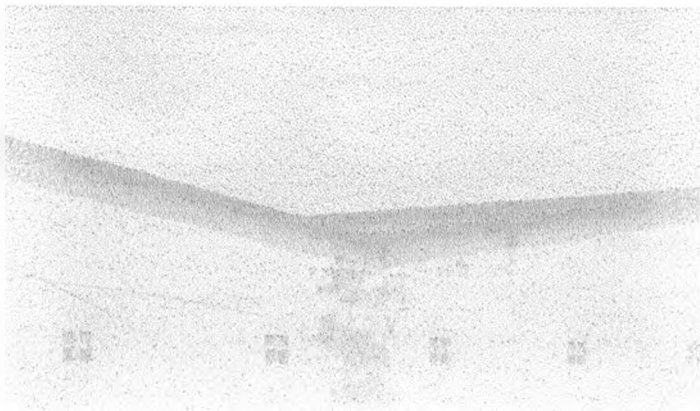


NATIONAL HOUSING CORPORATION PROGRAMMES: THE CASE OF KIBERA HOUSING SCHEMES.

**M.Arch. Thesis by:
MILIKAU EMMANUEL SONGORO**

B.Arch. (Hons), MAAK (GA)

B/63/7836/98.



October, 2001, Nairobi.

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DEDICATION

To Jeddy my wife,

and

Natasha my daughter,

in whom I pride.

11

NATIONAL HOUSING CORPORATION PROGRAMMES:

THE CASE OF KIBERA HOUSING SCHEMES.

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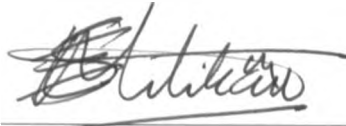
A thesis submitted in part fulfillment of the requirement for the degree of Master of Architecture, in Urban Design. Faculty of Architecture, Design and Development, University of Nairobi.

October, 2001.

DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.


Signed:



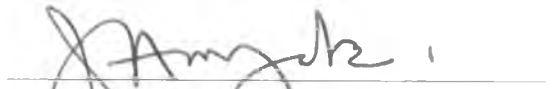
Milikau E.S. B63/7836/98.

This thesis has been submitted for examination with our approval as the university supervisors.

Signed:


Prof. Arch. Jerry Magutu (Supervisor).

Signed:


Arch. Tom J.C. Anyamba (Chairman,
Department of Architecture).

ACKNOWLEDGEMENTS

I acknowledge the many people who have accorded me assistance, guidance, support and inspiration during the time it has taken me to complete this Masters.

My supervisor, **Professor Arch. Jerry Magutu**, was very instrumental in the development of this work, by offering invaluable insights, guidance and sometimes simply by being patient. The **studio staff** at the department of architecture for their contributions. All **participants of the focus group interviews** deserve a mention. **Arch. D.M. Rimber**, MD, National Housing Corporation, **Arch. R.M. Sudi**, Chief Architect, National Housing Corporation and my **colleagues** at the National Housing Corporation for their support and enthusiasm. Special thanks to **Mr O. Otwaro** for his contribution in data collection, and to my **research assistants**.

Special gratitude to my friend **John Mwangi** for his concern and prayers, and to the **MIK** group, for their prayers.

Lastly, my **wife, Jeddy** for being there always, my daughter, **Natasha** for inspiring me, my **family** and **God Almighty** without whom I can do nothing.

ABSTRACT

The aim of this research was to explore if the designers' intentions were met in housing schemes done by the National Housing Corporation (NHC). The study basically used NHC housing schemes in Kibera as case studies for the housing evaluation (HE) exercise. The **mismatch** between the **designer intentions** and the **user needs** was thereby explored.

Through a literature review and empirical studies the author has tried to identify how widespread the use of Housing Evaluation is as a design tool in the housing industry in Kenya, with particular reference to NHC which is the government's implementing agency of housing policy. The receptiveness of the **producer-stakeholder** to the **user-stakeholder** input has been considered key in this work.

This research explores recent developments in housing evaluation and then proceeds to apply stakeholder analysis to the HE. It endeavors to **progress** work in the HE field by utilising the prescribed methodology.

The methodology chosen for the research was derived from the qualitative paradigm, with analysis being undertaken of **user** and **producer** stakeholders of existing housing projects done by NHC, in Kibera. It developed the proposed techniques by observing the interactions of the **users** and **producers** of the housing schemes in a detailed manner and clearly demonstrated that there is a **mismatch between the designer intentions and user needs**.

The study has shown how feasible a stakeholder analysis is, for NHC as a public housing institution, as it establishes a link between the designers and the users. This study, by observing the user and producer relationship in the housing industry in a detailed manner, has also identified areas for **further research**.

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CHAPTER

1

INTRODUCTION

What is wrong with modern housing estates? Everyone agrees that many of them are in serious trouble but there is no consensus as to the cause. Blame is cast in all directions - on planners, architects, housing authorities, developers, residents, children, cleaners, caretakers, the police, and other scapegoats - but these cross-currents can only flourish because there is no real factual evidence to sift out the true from the false.

(Coleman, A., 1985)

1.0 Background Information.

The design, construction and occupancy of the built environment is a complex problem involving a web of interacting social, economic, technical, functional and political systems (London, K 1997). The same can be said of the provision of dwelling units. Both constraints and opportunities for a solution are provided by these interacting systems. Different groups collectively act to design, construct, manage and make decisions to create and alter dwellings on behalf of others who occupy and use them. During the dwelling's life cycle, various groups of decision makers move in and out of it. And as Coleman (1985) notes, blame for problems in modern housing estates is cast on these groups and various other scapegoats.

Occupants of these dwellings and their various organisations undergo functional and cultural change (Markus, 1972). The life cycles of the dwellings are therefore dynamic both physically and organisationally.

The evaluation of the dwelling units therefore becomes a complex problem, posing questions of who evaluates what, when, and how. Key participants usually engage in a post rationalising exercise, often evaluating from the confines of their own 'world view'. But traditional approaches to housing evaluation are wanting in that they present solutions that are perceived in varying degrees.

Preiser (1989) states that the performance of a building is measured by a variety of groups including those using the building and those responsible for it. Architects, clients, contractors and occupants of houses are each key players in the dwelling's life cycle yet each views the building's success in different terms. These differing perceptions of performance by these key players are critical in **Housing Evaluation (HE)**.

'Judgements of building performance are made based on the extent to which the building is providing the "service" that they (users, owners, managers, etc) require of it' (Shibley, 1985). This 'service' is described by different groups from different viewpoints leaving those responsible for housing production with the dilemma of satisfying conflicting

requirements, assuming in the first instance that these requirements are readily identifiable.

The *post occupancy evaluation* (POE) emerged as a distinct area of research in the 1960's, in an attempt to measure systematically building performance and the extent to which the built environment did not satisfy requirements (Preiser et al 1988). Over the years, various techniques have been devised and implemented to try and capture the failures and successes and feedback the information to the decision makers. In these research the author has pursued these POE techniques, with specific reference to housing in Kenya, as a *Housing Evaluation* (HE).

The research relied heavily on a stakeholder analysis in developing an overall strategy for assessing the performance of the NHC housing units. POE research is undergoing a major shift (Zimring et al, 1988) which accepts that for greater effectiveness the POE model must consider the **entire building procurement cycle**. The author has adopted the same approach in developing the proposed HE study for NHC. The approach demands a comparison between the **expected performance** and the **actual performance** of the housing units, while capturing project objectives at the outset of a project (Leslie, 1985).

In Kenya, there has been little contribution to basic research made even though there have been a small number of applications in this area by government agencies like the National Housing Corporation and the Housing Department of the Ministry of Roads and Public Works. This research aims at an approach that offers a better understanding of housing (Zimring et al, 1989). The work has suggested that HE be incorporated into the building procurement process.

Housing **procurement** and **briefing** pose complex social situations the study of which is embedded in Sociology (Green, 1992). Varied participants from different organisational and cultural subsystems make decisions regarding housing from the confines of their own 'worldview', leading to lack of understanding. Client briefing therefore requires the integration of a number of these subsystems.

Before the development of the study progresses it would be desirable to look at the general housing environments within which Kenya and NHC fit in, if only to enhance the understanding of the housing situation.

The Global Scene.

This, in the author's view is well presented by the Habitat Agenda which was set out at the Second United Nations Conference on Human Settlements- Habitat II- held in Istanbul in June 1996. Its goals and principles are as follows:

- * Adequate Shelter for All.
- * Sustainable Human Settlements.
- * Decentralisation and Empowerment.
- * Partnership and Participation.
- * Gender Equality.
- * Financing Shelter and Human Settlements.
- * International Co-operation.
- * Assessing Progress.

Its Global Plan of Action set out two predominant themes namely:

- * Sustainable Human Settlements in an Urbanising World.
- * Adequate Shelter for All.

These themes are supported by the following campaigns:

- * Global Campaign for Good Urban Governance and
- * Global Campaign for Secure Tenure.

This Agenda which has been endorsed by governments the world over shows the scenario on the global scale. Whether sufficient progress is being made to implement this agenda is debatable. The many case studies presented in the Best Practices however show some brilliant strides made to achieve these aims the world over. The UNHCS (Habitat) also publishes the Local Leadership Initiative along with the Best Practises to encourage the achievement of the above goals, themes and campaigns.

The Local Scenario.

The initial thrust, especially after independence, was for the government and local authorities to provide rental housing to the many Africans who were poorly housed yet they

were moving to the urban areas in large numbers in search for work. In 1943 the first housing ordinance was set up in Kenya specifically to address this phenomenon. The following requirements came out of it:

- *the city council to provide housing especially for the low-income groups (Africans),
- *the establishment of the Central Housing Board and a special fund to make loans available to local authorities and
- *local authorities to provide housing at sub-economic rent and allow Africans to build villages in towns even with temporary materials.

This ordinance was the origin of public rental housing in Kenya's urban areas and culminated in the building of the Ziwani Estate in 1945 (Syagga, et al 2001). The Nairobi City Council (NCC) then became a major developer of rental units.

In 1953, the colonial government created the Central Housing Board (CHB) to be the principal medium through which the government could promote the development of housing. After independence, the Bloomberg and Abrams report (1965) led to the statement of the housing policy provided in Sessional Paper No. 5 of 1965/66, which emphasized basic standards of health, security and privacy. Here the government undertook to provide as a minimum, two habitable rooms and a toilet as opposed to the colonial provision of only one room. In 1966/7 the first comprehensive housing policy for Kenya was done. This sessional paper recommended the formation of the National Housing Corporation (NHC) to replace the CHB. NHC was mandated to continue the work of CHB but, in addition, it was given wider powers to:

- ***promote low-cost housing,**
- ***stimulate the building industry and**
- ***encourage housing research.**

NHC replaced the colonial Central Housing Board (CHB) which was to channel government funds to low income formal housing, mainly through the development and initiation of local authority housing programmes. The NHC was to be the GOK main agency through which public funds

would be channeled to local authorities for low cost housing (Gitau and MacOloo, 2000).

NHC is therefore a statutory body currently under the ministry of Roads and Public Works. It has a Board of Directors comprising of five members appointed by the minister from the private sector, and three public officers representing the relevant ministries of the government. The managing director is the chief executive of the corporation which has three departments each headed by a manager.

Since its establishment, NHC has provided to the low and medium income earners in Kenyan towns a cumulative total of 42,511 housing units valued at over KShs 2.6 billion (approximately USD 33 million). In recognition of the fact that 75% of Kenyans reside in rural areas, a programme aimed at improving rural housing was started in 1967 and over 8,100 Kenyans have benefited from it.

The mission of NHC is to play a leading role in the development and provision of decent and affordable shelter and related services in the country. To achieve this the corporation maintains a highly skilled workforce.

The efforts of NHC to realise this mission have however been hampered by a number of macro-economic difficulties, mainly high interest rates on both construction and long term finance, an unfavourable national economic performance and inflation.

Inspite of the great efforts that the government has put in encouraging the provision of housing to its citizens, the housing demand is far from being met, both by NHC and other public and private developers. The estimated shortfall of housing production in urban areas is 80,000 units per annum, and it has resulted in sprawling squatter settlements and informalism, in a bid to address it.

This gives a brief scenario of the government policy to provide housing to the urban populace. As mentioned before, the thrust was to provide housing to the Africans who were moving to the city in large numbers. The colonial policy had until this time been that of segregation, keeping African wages low and avoiding large scale housing.

1.1 Problem Statement.

This research develops housing evaluation techniques that consider stakeholders and their ideas on the important issues regarding a housing project and how they interact when discussing these ideas. This HE is seen as an **information tool**, but within the context of the housing procurement process and therefore a potential methodological strategy to improve it.

In Kenya it is true that only a small percentage of architects if any, use environment and behaviour research findings. Also true is the fact that research has not been translated into helpful information for decision making (Reizenstein, 1980). This work, it is hoped, will provide NHC important research to improve its future schemes, and give a basis for further research. The importance of the HE techniques in the building procurement process, it is hoped, will be an integral part of the NHC, being the foremost provider for housing for the nation.

As Zeisel (1989) indicated, it matters little the techniques used and what data is gathered if the data is not organised into information to be used. The effective management of evaluation findings is therefore key to the determination of their ultimate value and use (Leslie, 1985). Simply performing a well-conceived and structured HE study without its being beneficial to NHC and hence the country as a whole is not the intention of this study. The author is acutely aware of the fact that this in itself will not automatically produce housing that is responsive to occupant needs. Greater involvement of NHC and government agencies concerned with housing, better presentation of results and better targeting of information to the decision makers will be sought (Zimring et al, 1980).

Rapid changes in society make a solution of yesterday today's problem (Checkland, 1981). Therefore a 'strategic thinking process' (Eden and Radford, 1990) as opposed to a 'routine strategic analysis' is needed in the HE of dwellings in Kenya. This strategic thinking process is stressed in this study as integral to better housing schemes.

In going through all these, this research therefore endeavors to answer the following questions:

The receptiveness of key decision makers as opposed to the quality of HE's being undertaken is seen as a reason for the poor use of HE's (London, K 1997), in the housing industry. This is true for Kenya too.

The study addresses the mismatch between the designer-intentions and the user-needs.

- a). Have the designers' intentions been met in the housing schemes under study?
- b). What are the user reactions to the houses they occupy?
- c). How can the user reactions be incorporated in the designs and the housing procurement process?

The study's **hypothesis** is that there is a **mismatch between the designer-intentions and the user-needs**.

1.2 Aims and Objectives.

The purpose of this research is to explore the feasibility of further development of **housing evaluation (HE)** based on a **stakeholder analysis** to address the problem of HE effectiveness within the building **procurement process**. It aims at:

- * exploring if the designers' intentions were met in housing schemes by NHC in the Kibera area,
- * exploring the link between user-stakeholders and producer-stakeholders,
- * Progressing work in the HE field and
- * identifying areas for further research.

1.3 Scope and Limitations.

It should be noted that the data collected represented stakeholder groups associated with a **single building type** (i.e. **housing**), **situation** and **system**. Characteristics to the system are unique since it is derived from **public sector housing** rather than private, therefore other issues could feature more prominently in another system. Conceptually though, the HE techniques discussed accommodate unique characteristics within different project types.

Time and finances presented limitations to the amount of data that could be collected and the scope of the study. With these limited resources, what is presented in the following pages is what could be achieved.

1.4 Significance of Study.

Two main reasons make the proposed research significant:

- a). It lies at the core of the perceived problems within the housing industry, an industry that is significant to society as a whole.

c). There is a lack of research in the housing evaluation field.

This study clearly shows that housing is at the heart of architecture and urban design.

what century

findings

The Nairobi city population is expanding rapidly and is expected to hit the 3 million mark by the turn of the century up from 2.1 million in 1999! Implicit in this growth is the need for about 25,000 dwellings per year, and to achieve this, a housing construction rate **five times** the present formal one is needed. This means the housing gap is expected to widen at the century's turn and the informal sector will remain the dominant dwelling supplier to Nairobi city dwellers! The picture in other Kenyan towns, though better than that of Nairobi, reads almost the same.

Important to note also is the fact that most Nairobi families are low-income earners (average KShs 3,000/= p.m.) who cannot afford more than a room for housing, and the fact that land tenure is not secure to them, and most in Kenyan urban centres.

Councils have no housing policies and are therefore unable to respond coherently and creatively to the housing challenge. The councils show little flexibility in interpretation and application of building by-laws and in so doing have undermined the use of local materials and, consequently, the provision of housing.

The foregoing paints a grim picture of housing in the country, despite the existence of NHC and other players in the housing sector, and justifies the creation of an information network to help stakeholders in the **decision making process** so that better housing procurement can be achieved.

The **free flow of information** between participants because of the fragmentation in the industry has been a major obstacle to productivity and quality. Clients are highly dissatisfied. This therefore demands the development of a culture that is not only client focused but also non-adversarial between groups on projects. This HE study seeks this. It is recognised by the author that problems affecting housing performance originate in the inception phase. The likely participants in the housing project ought to be involved from the start. This study is therefore justified as it explores the **dynam-**

ics of such an approach.

The proposed research has far reaching implications for those responsible for the design, construction and management of housing projects, and those using the houses. The immediate environment of a housing project would include both

- ***Producers:** clients, financiers, architects, contractors, regulating authorities, and
- ***Users:** occupants, visitors, facility managers, owners, maintenance people and special interest groups.

This HE study has implications for organisations involved in the provision of housing, in the public sector and large private organisations. It further recognises the role of architects as providers of HE's to clients, and the fact that aside from the architect's traditional role as designer, he cannot isolate and neglect the **evaluation of houses-in-use (or user reaction)**.

1.5 Methodology.

Because of the exploratory nature of this research, the methodology adopted is mainly from **archival materials** augmented with **field empirical studies**. It is proposed that through observation, description and interpretation of stakeholders' reactions and interactions a 'rich picture' of the social, professional, technical, political and economic layers will be uncovered.

This study's methodology therefore considers two related but distinct issues:

- a). Implications of an innovative HE methodological framework based on a stakeholder analysis, and
- b). Research methodology and techniques that would allow further development in the HE field.

Data Collection and Analysis.

Methods within the qualitative research process that are available for collecting data for analysis, ranging from **interviews** (individual, group, focus, structured/nonstructured) to di-

rect **observation**, to the **analysis** of artifacts, documents, cultural records, to the use of **visual material** or personal experience (Denzin and Lincoln, 1994), were used.

One of the methods used in this study was the **focus group interview (FGI)**. The FGI has been used for exploratory purposes; the researcher may bring several persons together to test a methodological technique, to try out a definition of a research problem, or to identify key informants (Denzin and Lincoln, 1994). FGI's involving representatives of selected key stakeholder groups of housing done by NHC in selected case studies were carried out. The FGI's aimed at simulating preliminary briefing meetings based on stakeholder analysis related to housing design, by NHC.

Field observations of stakeholders taking part in a **naturally occurring 'stakeholder analysis'** were preferred for the development of the study.

Guiding questionnaires prepared by the author were used during the informal interviews.

The use of the **still camera** was a major data collection tool. This has been emphasized because NHC is yet to use this tool to its full potential.

It must be noted that there may be many urban design techniques that could provide the framework to develop this study, but this research is limited to housing projects, in particular those by the National Housing Corporation. It will benefit large corporate bodies and in particular government agencies like NHC, which have **repetitive bulding programs** (Leslie, 1985). This repetitive nature demands that more attention be paid to user reactions and hence the thrust of the study.

Evaluation, improvement, social responsibility and **accountability** expected of governments provides an environment to explore innovation.

Content and discourse analysis (Silverman, 1993) will be the methods used for analysis and interpretation.

Case Study Selection.

Given the enormous amount of housing NHC has undertaken, it was not possible to collect data from most of the schemes undertaken, leave alone the towns in which they have been done, and the different typologies. This was due to the limitations both time and financial resources. The case studies have been selected carefully to represent:

- a). The different housing types done by NHC,
- b). Different sizes of the schemes and
- c). Different times at which they have been done.

The author concentrated on schemes done in Nairobi, specifically the **Kibera area**. The following therefore are the proposed casestudies to aid in the development of the HE study:

1. Karanja Road Housing Scheme done in 1960 by the Central Housing Board (CHB).
2. Fort Jesus housing scheme. This was done in 1970 and consists of rooms with common wet areas.
3. Ayany housing scheme, consisting of bungalows done between 1977 and 1981.
4. Olympic housing scheme consists of bungalows done in 1969 and maisonnettes done in 1973.

The author briefly takes a look at the Nyayo Highrise scheme consisting of flats completed in 2000, just to give comparison of this scheme done after the above case studies.

1.6 Thesis Outline.

The schematic diagram below summarises the chapters in the thesis and the proposed time frames. While **chapter 1** is the **Introduction**, **chapter 2** forms the **Literature Review**. **Chapter 3** deals with the **Kibera Housing Schemes**, **chapter 4** the **Summary of Findings** and **chapter 5** the **Conclusions and Recommendations**.

After introducing the subject, the literature reviews the themes under study followed by the Kibera housing schemes case studies before an analysis and conclusion is done.

INTRODUCTION/
PROPOSAL
15th. June, 2001

Chapter One
Introduction

BACKGROUND
INFORMATION
15th. July, 2001

Chapter Two
Literature Review

FIELDWORK
August, 2001

Chapter Three
Kibera Housing Schemes

DATA ANALYSIS
September, 2001

Chapter Four
Data Analysis

CONCLUSIONS
September, 2001

Chapter Five
Conclusions and
Recommendations

Fig 1.1 Schematic diagram of thesis structure and time frame.
Author

1.7 Assumptions and Definitions.

Sample sizes for data collection in the various housing schemes were limited due to the short time available and because of financial constraints. Extrapolating conclusions from these into a wider population was therefore hard as these conclusions may not fit in other situations. The methodology developed for this research however is sound and may be used to analyse other systems in a similar manner. The study's intention is not testing but rather identifying and understanding issues surrounding the HE techniques and methodology.

It is therefore assumed that these sample sizes are representative of the populations from which they are extracted.

The following definitions will apply in this work:

* **Producers** will mean the clients, financiers, architects, contractors, regulating authorities,

* **Users** will refer to the occupants, visitors, facility managers, owners, maintenance personel and special intere-

Handwritten notes:
This could be an RS sample

st groups.

* **Stakeholders** generally refers any group of individuals who can affect, or are affected by, the achievement of the housing industry, especial as shaped by NHC.

* **A system** will mean an established, orderly way of building procurement.

* **Housing evaluation** refers to the post occupancy examination, judgement of the houses under study to find out if intended design intentions were fulfilled.

Control over the stakeholders, for instance their reliability to attend interviews will be a **limitation**.

It was **assumed** that any **random stakeholder sample** taken was **representative** of the particular geographical region and stakeholder groups selected.

In conclusion, Evans, M (1980) notes that housing forms by far the most common building type in the world. On the average, over half of all investment is made in construction and over one third of this investment in construction is devoted to housing. Put another way, over *15% of all savings in both developed and develpoing countries is invested in dwelling construction*. This makes it impossible to ignore the fact that housing needs very careful and conscious input at all stages by the professionals involved and the occupiers of the houses.

This study is therefore not only relevant but necessary to NHC as the foremost public housing body in this nation and to other building societies.

The Housing Evaluation study **provides solutions to real problems** in the housing sector.

In summary, the main purpose of this study will be to investigate the **feasibility** of the proposed **HE study while stressing stakeholder participation**, and consider the contribution of the study to existing ones especially within the housing sector. It will be tailored specifically for the National Housing Corporation's use in its quest for housing the nation.

CHAPTER

2

2.0 Introduction.

In this chapter, the literature related to the topic under study is addressed. Since you cannot talk about housing without mentioning human settlements, a brief look is taken at the beginnings of **human settlements** in East Africa and Kenya. This is followed by a look at the NHC **housing procurement** and the **housing evaluation (HE) concept** within this context. This is then followed by a review of the **traditional approach to housing evaluation** through definitions and trends and a summary of the shortcomings of existing approaches to housing evaluation methodology.

The author concentrates on **architectural design** and **urban planning** issues throughout the study.

2.1 Human Settlements in East Africa and Kenya.

In East Africa, civilization began along the coast. This was caused by trade leading to the necessity to put up support facilities like houses and lodgings.

Soon there was need to exploit the resources of the hinterland hence the eventual need to open up the interiors through the construction of the East African railwayline, roads and eventually other infrastructural services like electricity and telephone. This led to the development of urban centres at the coast and on the hinterland along these infrastructural amenities.

These urban centres began to have teeming populations with the **rural-urban migration** leading to the need to have organized **human activities** and **support systems**. Architects, planners and other related professionals were therefore required to help develop these support systems that included:

- *housing as a base for operation,
- *commercial centres as work places and
- *communal and cultural places for recreation.

Along with these there was need for infrastructure like:

- * roads,
- * electricity,
- * telephone,
- * water and sewerage and
- * garbage collection.

This has led to the mushrooming of urban centres like Mombasa, Nairobi, Nakuru and Kisumu.

2.1.1 Manifestations of Human Settlements in Kenya.

Like in other countries, these include:

- * Mushrooming of slums,
- * strained services like water and sewerage,
- * social malaise,
- * overcrowdedness,
- * rundown environments like garbage dumping and vegetation destruction,
- * urban sprawl - the rapid horizontal growth and
- * informal settlements.

2.1.2 Requisites for Human Settlements in Nairobi.

The foregoing is typical of Nairobi where the selected case studies are. The requisites for human settlements in Nairobi, just like any other city, include:

- * land: all activities take place on land,
- * housing which takes the giant share of the land,
- * infrastructural support,
- * financial and material resources,
- * human resources,
- * political will and
- * a supportive political framework.

Of all these, land is key as all human settlements take place on land. The activity dictates what kind of land will be required. For example housing for the poor should be near their work place and should consider other livelihood activities otherwise informalism sets in.

It is important to note that housing takes the lion share of the land resource hence its importance. Though this study does not examine the land policy, it points out the importance of a sound land policy that ensures equitable distribution of this resource, ensuring that especially the poor are housed.

The land policy in Kenya has the following general key points:

- *it is committed to **private ownership**,
- *the use and **control** of the land is left to the **local authorities** as far as urban land is concerned.
- ***disposition** of land is based on the **willing buyer willing seller** maxim.

Urban land is mostly on **leasehold** so that the government can control the land from time to time.

These has its disadvantages. Firstly, **private ownership** is a **capitalistic** approach which is the basis of market allocation of resources in Kenya. This state of events has led to profit driven developments which means that developments are rarely done for social considerations. Housing for the poor is therefore most unlikely to benefit from this state of events.

Secondly, local authorities control of urban land has a short-coming in that when suburbs develop on their own and do eventually merge with the urban centres, their developments are too far gone to be subject to the relevant council's control.

The third disadvantage is that there is no adequate personnel to police the increasing boundaries. This is typical in Nairobi where most suburbs have ran out of control.

Fourthly, there is a lot political interference in planning and allocation of land.

Lastly, when land disposition is left to a willing buyer willing seller, chances are that land meant for the poor will end up with the rich who can afford to buy it, hence random changes in use with their attendant problems. This is the scenario within which the National Housing Corporation operates leading to many complications in the provision of housing all over the country. The area under study, Kibera, is not exempt from this state of events.

A sound land policy will therefore a long way to ensure that housing is properly done and the shortfall catered for.

The gravity of the housing/shelter situation in Kenya may be exemplified by a few quantitative descriptions. At the time of the first comprehensive housing policy for Kenya 1966/67, the annual housing requirements were 7,600 units for urban areas. In the 1978-83 development plan period, urban housing needs rose from 160,000 to 290,000 units. In 1983 it was estimated that 85% of all urban households lived in slum and squatter settlements and only 30% of urban households had sufficient incomes to afford minimum cost conventional houses.

2.2 Nature of Housing Programmes in Kenya.

A literature review reveals that this nature can clearly be seen through the eyes of the National Housing Corporation (NHC) which was established under the Housing Act (Cap 117) of the Laws of Kenya, in 1965. NHC, whose motto is 'housing for the nation', was charged with among other duties, the responsibility of providing housing to Kenyans in several ways, some of which are listed below:

1. Tenant Purchase schemes,
2. Mortgage Housing Schemes,
3. Rental Housing Schemes,
4. Site and Service schemes,
5. Starter (or Core) Units,
6. Owner Build and
7. Urban Renewal (see notes on the left)

Under **Tenant Purchase**, a purchaser pays a deposit (10-20%) and subsequent monthly payments to NHC, while leaving in the house. The interest here is low (8-15% p.a.) For **Mortgage**, a 20% deposit has to be payed to a financier (e.g. HFCK), who will in turn pay NHC the full amount as the purchaser services the mortgage monthly, at market interest rates. **Rental** units are let and managed by NHC. Infrastructure is provided and plots sold off as serviced under the **Site and Service** schemes whereas a **Core Unit** is built and sold with the land for the purchaser to complete it under the **Starter Units**. **Rural housing** loans from NHC facilitate owners to build on their own. Schemes like Pumwani are meant to improve and upgrade slums under **Urban Renewals**.

Since its inception, NHC has until now churned out over 42,500 units at a cost of approximately KShs 2.6 billion. These units incorporate all the above house types and have been done in all the eight provinces in the country. Funding has been from varied sources including the World Bank, USAID, GOK and NHC's own funds. NHC has however not been able to meet the housing need, as by 1990, the rate of housing production (40,000 per year) fell short of the shelter needs by 33% (UNHCS, 1990). See notes opposite too.

To understand the potential of the **housing evaluation concept**, it should be seen within the context of this **housing situation**. Several models have been considered to illustrate the various phases of a housing project and this section briefly

by the year 2000, 112,000 housing units per year are required, whereas the production of housing in urban areas was only 20,000 to 30,000 units annually, giving a shortfall of over 80,000 or annum.

(Sessional Paper on Housing, 1997:3)

Nairobi's severe housing problem is particularly evident in the highly overcrowded informal settlements which accommodate about 55% of the city's population. The households in these areas have poor access to services such as safe water, sanitation and solid waste disposal. ... A major constraint to improvement here is a limited supply of serviced land, while another important feature is the extremely rapid growth of unserviced peri-urban settlements.

(Karanja, J.G., 1993)

considers three of these models to understand the broad framework of housing 'production'. The nature of the environment within which houses are designed in the country is then considered, and the critical relationship between briefing and the housing evaluation is discussed.

2.2.1 Nature of the Process.

'Successful Management of Design' (Gray et al, 1994) suggests that the process of design and construction is divided into four stages, common to all projects, based on key client requirements. They are:

- *the approval of the functional brief
- *the approval of the scheme design
- *the completion of the architectural design and the placing of contracts either with a single contractor or by separate packages.
- *the final acceptance and **handing over** of the completed project.

The conventional Plan of Work in the Architect's Handbook (RIBA, 1973) is another method of describing the process and it differs because it is more detailed and does not relate to management stages but is a mixture of tasks and products.

- * Inception
- * Feasibility
- * Outline Proposals
- * Scheme Design
- * Detail Design
- * Production Information
- * Bill of Quantities
- * Tender Action
- * Project Planning
- * Operations on Site
- * Completion

These two models have one thing in common: once the buildings/houses have been completed the consultants, contractors and subcontractors are no longer involved in the project. An alternative model by Law (1981) suggested that the sequence of phases of a building project, beginning with the brief, includes preliminary design, production, construction and evaluation. The flow diagram (figure 2.1 below)

demonstrates how evaluation is inextricably linked with the **briefing phase**, which is the **primary source of input** into the subsequent design phases. We must therefore accept that the **quality of the brief** will have a direct impact on the **quality of the designed product**.

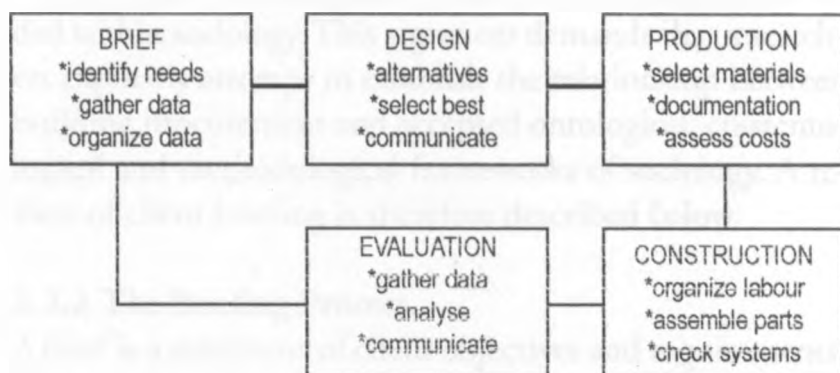


Figure 2.1 Building Process Flow Diagram

Figure from Law, 1981, *Evaluation of the Post Occupancy Performance of Buildings*, p8.

The three models described above only illustrate the process through defining various phases. It is however critical to consider the **nature** of the building procurement process.

A review of the literature provides evidence that the context in which buildings are designed and constructed can easily lead to buildings that are flawed in significant ways (Preiser, 1989). That this situation obtains is a result of the increasingly complex building industry. The housing industry is not exempt.

Change within the building and especially the housing industry, for example in volume, project size, materials, architectural design styles and concepts, is exacerbated by its *highly fragmented nature*, in which separate entities are involved in every phase (London, 1997). There are a lot of fragmentations (see quote opposite) from phase to phase and across consultants, contractors, suppliers, labour and client organisations, making **communication** among this large and assorted cast of players a difficult undertaking (Preiser, 1989). This makes the organisation of the project teams in both design and construction weak.

The foregoing therefore shows the importance of the initial phase of brief development, and the glaring fact that there is a lack of understanding or grasp of the complexity of this

'A process which involves so many people, connected by such a tenuous and opaque network of power relations and often working with such sophisticated and risky techniques, is bound to misfire from time to time'

(Prak, 1984 as cited by Preiser, 1988).

briefing process. Clearly this phase is critical as early decisions here have a major impact on the successive phases and the final project outcome.

Green (1992) suggests that the study of building procurement and the various phases including briefing be embedded within sociology. This argument demands that researchers explicitly attempt to establish the relationship between building procurement and accepted ontological, epistemological and methodological frameworks of sociology. A review of client briefing is therefore described below.

2.2.2 The Briefing Process.

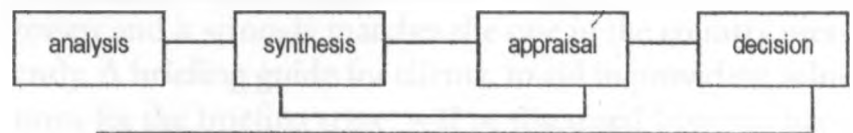
A brief is a statement of client objectives and requirements. Briefing therefore is the process whereby this information is passed onto the designer. Briefing is an ongoing process and though it takes place in the initial stages of the building procurement cycle, it is an ongoing iterative process.

Markus (1967) and Maver (1970) suggested an iterative process for the entire design phase, and is summarized in the figure below. It features three basic design phases including:

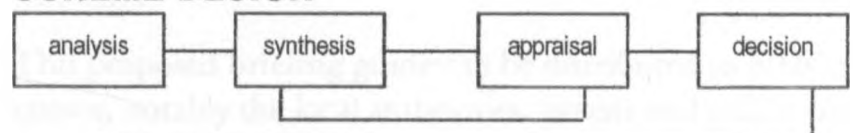
1. outline proposal
2. scheme design and
3. detailed design.

Within each of these phases there is a process, as shown.

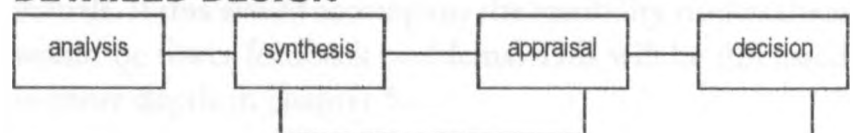
OUTLINE PROPOSAL



SCHEME DESIGN



DETAILED DESIGN



PRODUCTION INFORMATION

Figure 2.2 Markus and Maver Model of Architectural Design

Figure from Kelly et al, 1992, *The Briefing Process: A Review and Critique*, p7.

A shortcoming of this model however is the fact that feedback only occurs between synthesis and appraisal (evaluation steps) within each stage. There is no feedback between the stages themselves.

Building design is a problem solving process which cannot always be comprehensively stated at the outset of the project. The nature of building design and briefing is therefore complex and should be based on feedback at every stage. The different stakeholders in the whole building procurement cycle 'own' the various problems presented and have their own sets of agendas and solutions, which need to be captured constantly.

However further examination shows that in the US and Australia, briefing or programming has become a legitimate specialization for many architectural firms. Further indications from the literature review show that the common briefing problems generally encountered are:

1. Clients are often dissatisfied with the end product. Many problems can be traced to the briefing stage.
2. Clients vary. Many checklists/guides do not address this complexity.
3. Professionals in the construction industry believe that clients do not often provide adequate briefs.

The author concurs with these findings from the literature review and it strongly matches the case in the country presently. A **briefing guide** for clients, to aid in providing solutions for the briefing stage, will be discussed later, in chapter five.

This proposed **briefing guide** can be distributed to NHC's clients, notably the local authorities, private and public institutions seeking housing from NHC, and private individuals. If this would accompany the feasibility studies there would be fewer feedback problems. This will be discussed in more depth in chapter 5.

2.2.3 Client Organisations.

Green (1992) stressed the concept of organisational metaphors, summarized below, to aid in observing and underst-

anding organisations. This, the author considered a brilliant way of observing our own situation at home in Kenya.

1. Organisation as a **goal seeking machine** that works in harmony towards predetermined set objectives.
2. Organisations as **biological organisms** that continually adapt to their environment.
3. An organisation as a **brain** which can learn
4. An organisation as a **cultural identity** with shared beliefs and values.
5. Organizations as **political** entities.
6. An organisation as a **psychic prison** where creativity is stifled by the norm.
7. An organisation as an **instrument of domination** where the powerful lead and impose their will on others.
8. Finally, organisation as a **flux and transformation** where there is dynamism.

For NHC, more often than not, the client is an organisation such as the NSSF, NIIIF, Local Councils, the GOK, etc. It is therefore apt to consider the process of client briefing.

Green (1992), while analyzing the relationship between client organisational metaphors and the briefing process, reviewed how others categorized clients thus:

- *public and private sector clients or
- *continuing clients and one off clients,
- *clients can broadly be categorized by
 - project size,
 - sector (private or public) and
 - project interest (developer or owner occupied).

These typologies are widely accepted. They are also social systems and to gain insights a view from the outside looking in will always be limiting (London, 1997).

The relationship between the briefing process and the client decision makers is an area that is important to this study. Benner (1985) gives three contrasting approaches to briefing and these have been related to the organisational metaphors proposed by Green (1992).

The first approach relies on *expert intervention*, that is, an appointed person (designer) takes responsibility of the en-

ture process without consultation with building users. It assumes the client organisation's objectives are clearly defined and are static. The organisation therefore acts both as a **goal seeking machine** and as an **instrument of domination**, and the 'expert' will understand its objectives.

In the second approach, the *participatory* one, Bennet (1990) suggested that briefs are best produced by extensive collaboration between clients and designers over time, thereby assuming the fact that needs and objectives are dynamic and client values change. The **organic, cultural and political** organisational metaphors underlie this approach. In the author's view, participatory approaches are important especially for urban planning and community projects as it develops the relationship between the community, the users, the client and the designer.

As a third approach, Bennet (1990) shows how clients develop **standard briefs** that reflect **lessons learnt** from previous projects. Here designers also **suggest improvements**. This commitment to *progressive improvement* by learning from experience strongly reflects the **cybernetic metaphor**.

The author, while discussing the foregoing, is in favour of both the **participatory** and **progressive improvement** approaches to public housing projects like the ones undertaken by the National Housing Corporation. This will ensure a briefing process that has as little flaws as possible and a project that reflects the needs of the users and clients as much as possible. It is important to note however that the briefing process may vary according to the characteristics of the client and that it should be problem specific.

In summary therefore the briefing process should consider not only the characteristics of the client organisations but also those of the key stakeholders. The activities of briefing, designing, constructing, post occupancy evaluation and refurbishment are parts in an ongoing system within a large social environment.

2.3 Traditional Approaches to Housing Evaluation.

Though this study does not endeavour to give comprehen-

Cybernetic metaphor refers to the use of repetitive methods as a way of carrying out tasks. In reference to HE it shows a brief developed from past projects that can be used repetitively in all future projects with minor amendments.

sive listings of definitions, it is important to note the following:

- * sociological
- * rationalist approach
- * practitioner viewpoint and an
- * organisational approach.

2.3.1 Sociological Approach.

It was the general attitude in the 1960's within the built environment community especially the **academic researchers** reacting to designed environment failures of previous decades (Friedmann et al, 1978; Becker, 1989). The notable failures were a **mismatch between user response and designer intentions**. This led to Environmental Design Evaluation (EDR) which was considered to be '*an appraisal of the degree to which the designed setting satisfies and supports explicit and implicit human needs and values*' (Friedmann et al, 1978).

This definition captures the **sociological and psychological influences on environmental and architectural design**. The four factors that come out clearly in this approach are:

- *the setting,
- *the users,
- *the proximate environmental context and
- *the design activity.

These set out a scheme to organize knowledge of the situation, and are summarized in figure below.

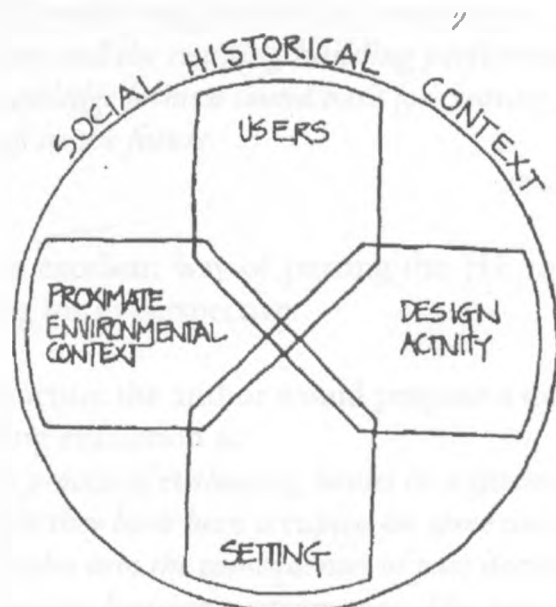


Fig 2.3 The structure for organising information in an evaluation.

While examining the case studies in the next chapter, the author will employ a methodology that takes into account the four factors that come out in this structure. This approach is important as it addresses the mismatch between the user response and the designer intentions.

In the past, post occupancy evaluations (POE's), have often been related to the Environmental Behavioural Research (EBR) field. They were then heavily influenced by sociology and psychology. But it is now more needful than ever before that POE's should be more and more incorporated into architectural and urban design processes for better design solutions. They, POE's and by extension HE's, should be influenced by architecture and urban planning.

2.3.2 Rationalist Approach.

This approach considers the link between the HE and decision making. It concentrates on the decision making that will use the information coming from an evaluation. The HE is therefore a decision making tool here.

2.3.3 The Practitioner Approach.

Similar to the rationalistic approach only this time the thrust was on 'quality'. A typical POE definition coming from this 'quality movement' was:

Post-Occupancy evaluation is the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time. POE's focus on building occupants and their needs, and thus they provide insights into the consequences of past decisions and the resulting building performance. This knowledge forms a sound basis for creating better buildings in the future.'

(Preisler et al, 1988)

This is an excellent way of putting the HE the author is advocating for in perspective.

At this juncture the author would propose a definition for the housing evaluation as:

the process of evaluating houses in a systematic manner after they have been occupied for some time, to provide insights into the consequences of past decisions and the resulting housing performance. This knowledge forms a sound basis for creating better buildings in future.

The rationalist approach was at its peak in the late 80's and it stressed the link between the POE and decision making. It is useful the HE under study in that it stresses evaluation of building performance after the buildings have been occupied for a while. This approach implies that with its own set of variables which should be considered when evaluating. It developed in the late 70's and early 80's.

The practitioner approach had the likes of Preiser as the major proponents in the late 80's and it was also dubbed the 'quality' movement of the Western world. Emphasis was placed on techniques and procedures there was focus on teh process and feedforward information.

Figure 2.4 below summarizes the elements of building performance.

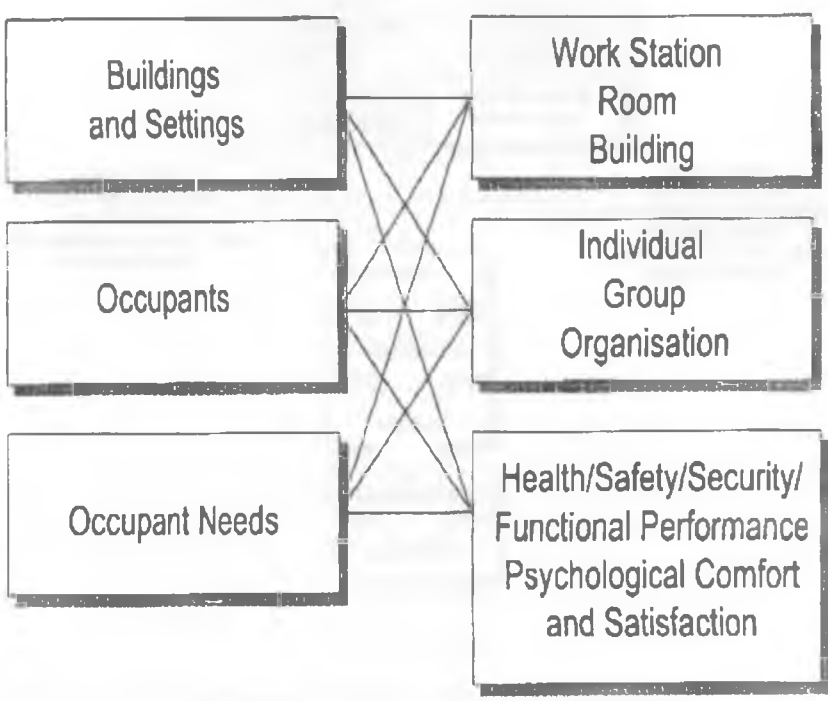


Fig 2.4 Elements of building performance. From Preiser, 1989, Building Evaluation, p2.

2.3.4 Organisational Approach.

The highlight in this approach is that buildings provide settings for the organisation's activities, reflect the organisational structures, express organisational images and support or inhibit the realisation of organisational goals but significantly they often represent the largest single physical asset.

This approach was stressed by the emergence of the 'facilities management movement' which recognised that it had a role to play as a decision making tool for organisations to manage their assets actively and carefully. (Preiser et al, 1988).

A relationship between the POE and building performance was put forward in the 80's. Figure 2.5 below illustrates this. It illustrates all stages right from the planning through to the occupancy stage, and it projects into the next building cycle.

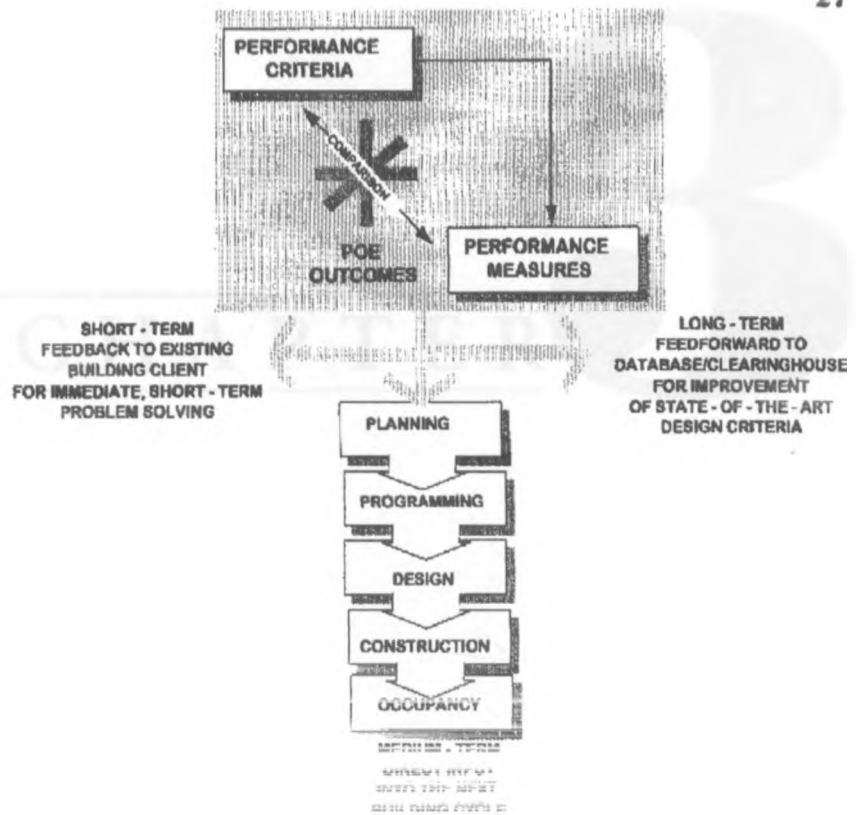


Fig 2.5 The Performance Concept in the Building Process.

From Preiser, 1989, *Building Evaluation*, p3.

Although stated as far back in 1989, the ideal of **incorporating the POE into the delivery process** there has been little evidence of this being achieved in the intervening years.

Many writers (Markus, 1972; Zeisel, 1981; Shibley, 1985; Green, 1992), stressed the interplay between the built environments that housed organizations, the sociology of the organizations themselves and the building procurement process.

These approaches are important in the development of a feasible HE process in this country and will be applied to the findings in chapter five as the conclusions and recommendations are discussed in detail. An application of some of them to our situation in this country and especially for NHC will be discussed.

CHAPTER

3

3.0 Introduction.

As explained earlier on, due to time and financial constraints, the author concentrated on Nairobi schemes and specifically the Kibera area housing schemes which consist of:

- *Karanja Road Housing Scheme (1960),
- *Fort Jesus Housing Scheme (1970),
- *Olympic Housing Scheme (1969 and 1973),
- *Ayany Housing Scheme (1977-1981) and

Case Study Analysis.

Before delving into the case studies, a review of case study analysis is desirable. Just like alluded to earlier, Urban Design is the thrust of this study and all analysis is looked at in the urban context. There are five themes of urban analysis namely:

1. Analysis of architectural types as units of theory and practice. Here the type is the focus of urban analysis.
2. Analysis of a variety of morphological structures within a settlement and of a variety of typologies that constitute those structures.
3. Analysis of the threefold contextuality within which architecture takes place - Physical context, Historical context and Cultural context. Here the analysis discovers the relative autonomy of architecture.
4. Analysis of settlement as 'Tissue'. Here the essential integrated character of the built environment is analysed.
5. Analysis of design as the process of typological transformation of existing types.

The case studies that follow use **tissue analysis** to analyse the housing schemes. Tissue analysis proceeds along two interrelated yet distinct lines:

- ***Spatial articulation** (built and open spaces) and
- ***inhabitation** (use or the appropriation) of it.

This analysis addresses the **discrepancies** between the **built environment and their actual use**. It studies the built environment at different **scale levels**, thereby relating a house to its larger context - the city, city sector, neighbourhood,

cluster then house. Tissue is the key word.

The Kibera Representative Environmental Study.

Generally the Kibera environment is:

- *largely formal with informality coming in over time,
- *built by the public sector (NHC),
- *of mixed social status. It has both the low-income and middle-income strata of society,
- *of Central position in relation to the CBD,
- *representative of both colonial and modern environments,
- *mixed in terms of religion though the earlier schemes were originally designed with the predominant Islamic religion at the time of construction and
- *architecturally homogenous in style.

Kibera area land was originally set aside to reward the World War Two soldiers. Over time, a variety of people have moved to Kibera area.

The Scale Levels.

The process of urban analysis of the housing schemes (dwelling environments) under study operates at different scale levels of the Nairobi city and concentrates on:

1. The **layouts** of the housing schemes majoring on zoning and functional specialisation versus integrated fabrics. Here issues articulation of public spaces, wasteful or intensive use of land, maintenance and security are addressed.
2. **Cluster** layouts especially as concerns opportunities for incremental developments, community and privacy.
3. **Dwelling typologies** where issues such as tenure, affordability, comfort, space use and technology are addressed.

Criteria for the Case Study Analysis.

The criteria described below were used on every scheme studied repetitively. The concept of type at various scale levels included the following criteria:

1. Settlement Type.

- *position within the urban fabric,

- *systems of access and circulation,
- *services,
- *levels of technologies of infrastructure,
- *articulation public and private spaces,
- *articulation of functions,
- *neighbourhood and cluster types,
- *land values and densities,
- *income categories and modes of tenure and
- *development opportunities.

2. Neighbourhood/Cluster Type.

- *access and position within settlement tissues.
- *systems of access and circulation,
- *levels of technologies of infrastructure,
- *public and private spaces,
- *articulation of functions,
- *plot configurations,
- *articulation of built and open spaces,
- *articulation of core and extension area,
- *building types,
- *land values and
- *income categories.

3. Dwelling Type.

- *plan organisation, space use, standards,
- *position in cluster, street, square,
- *implementation and management,
- *technology choices and building processes,
- *infrastructure and facilities,
- *costs and income brackets,
- *modes of tenure,
- *dwelling capacity and
- *development capacity - can it be extended, upgraded, transformed or increased?

3.0.1 General Approach.

The foregoing criteria aptly capture the factors in the sociological approach set out in chapter two namely:

- *the setting,
- *the users,
- *the proximate environmental context and
- *space use, planning and ordering principles.

This approach is borne in mind as the analysis unfolds and transformations and adaptabilities are also discussed.

3.0.2 Data Collection Methods.

To achieve these, data collection for all the case studies was done using four distinct methods in the evaluation of the houses namely:

1. **Interviews** carried out on the producer and user stakeholders using a guiding questionnaire.
2. **Observation** by the author.
3. **Photography**.
4. **Sketching**.

Prof. Wu Liangyong, presenting a paper at the 20th. UIA Beijing '99 Congress noted, "*This personal experience of the environment and the needs of the inhabitants must be accompanied by the technical ability to understand and solve the design problems*". The author bears in mind this dual responsibility as he discusses the case studies. Prof. Liangyong, W (1999) notes also that it is both irresponsible and foolish to ignore the torrent of social and cultural change as professionals. These too was borne in mind as the case studies were done.

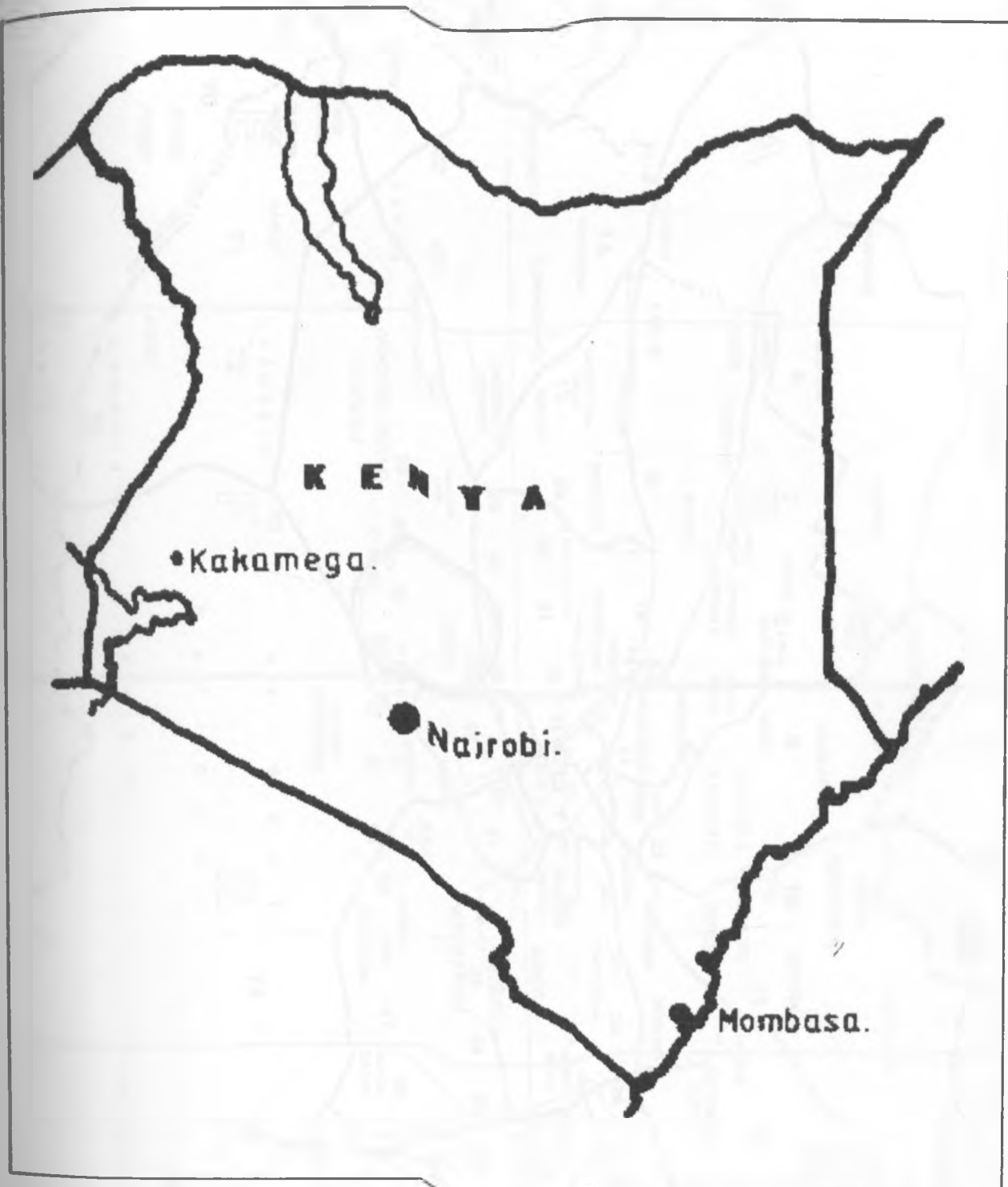
3.0.3 General Location.

The housing schemes under study are located in Nairobi, Kenya. This is shown in figure 3.1 on page 32. Nairobi is the capital city of Kenya.

Figure 3.1a on page 33 shows the Nairobi city plan and the location of Kibera in relation to other neighbourhoods. Kibera is very close to the CBD.

Figure 3.1b on page 34 shows a closeup of the Kibera area. This shows a development along the Kibera drive as the main circulation spine from which all other housing schemes develop. There is an interplay of open and built up spaces that define the urban tissue and the general feel is that of architectural homogeneity in the individual schemes. This homogeneity has however been interfered with by the mushrooming informalism.

The dwellings and dwelling groups are discussed in depth in the case studies.



The area of study is located in Nairobi, the capital city of Kenya.

Fig 3.1 Location of Nairobi, Kenya.

Author.

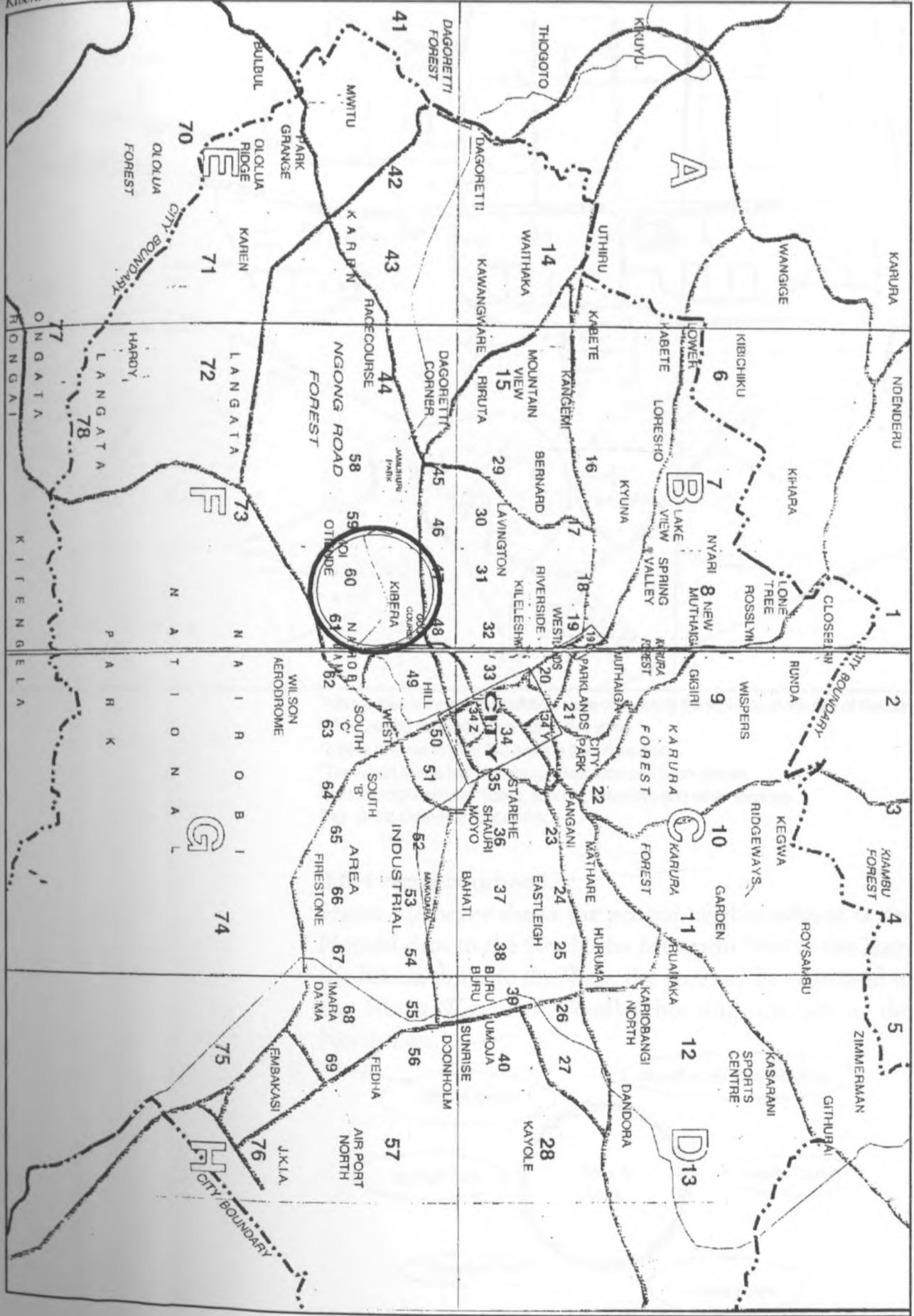
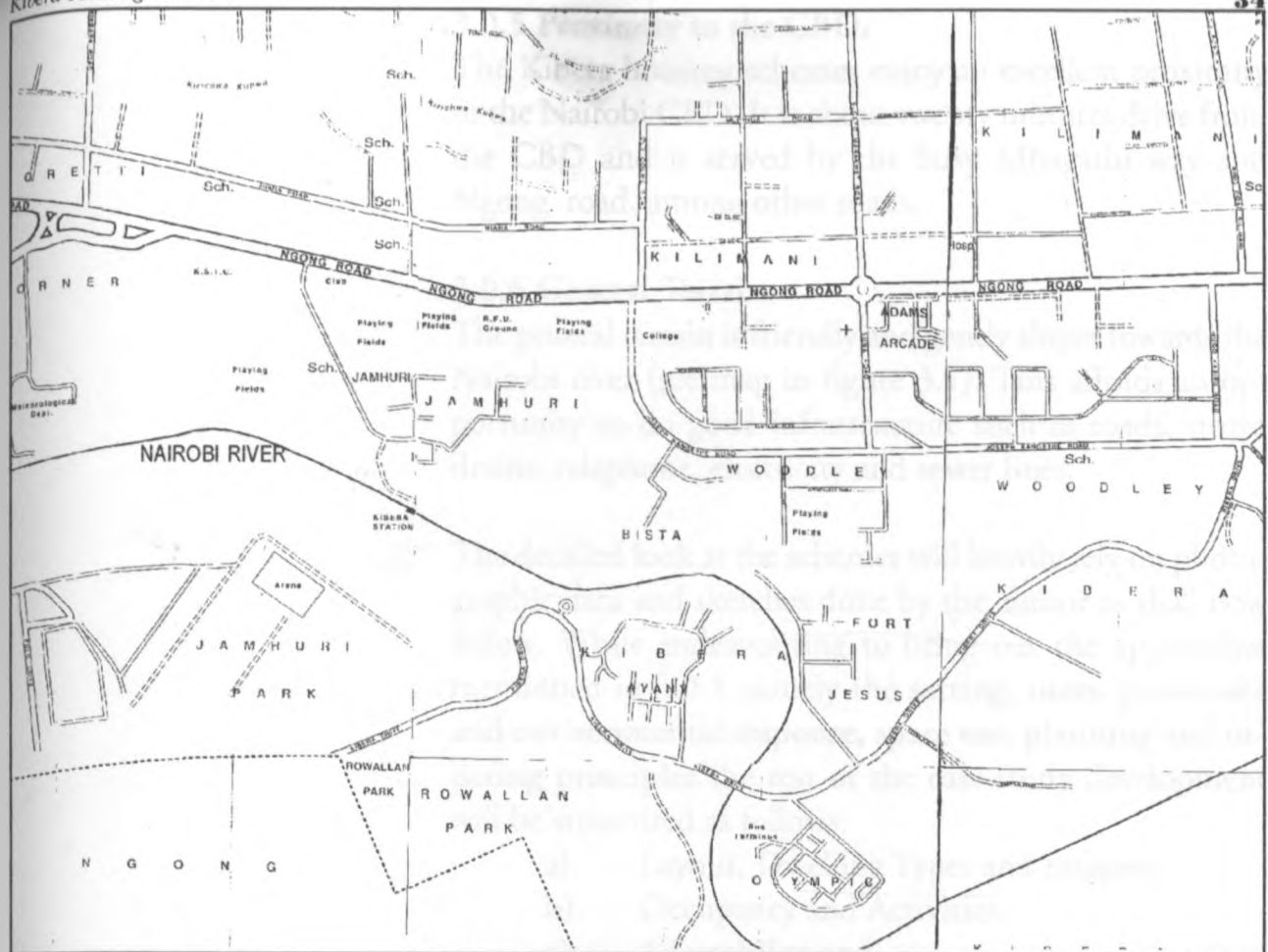


Fig 3.1a Kibera (circled) in relation to other areas in the city.

Author:



- *Kibera drive is the main circulation spine connecting the schemes to the rest of Nairobi.
- *The housing schemes grow out of this spine.
- *Kibera is close to the CBD making it a prime area.
- *The urban tissue has both formal built form and open spaces.
- *Infrastructure includes roads, schools, churches and other services.

Fig. 3.1b General Location.

Author.

3.0.4 Neighbourhood.

Figure 3.2 below shows the general neighbourhood as the Nairobi dam to the South, the Mbagathi Way to the East, the Kibera slums to the West, the Jamhuri show ground to the North-West and Woodley housing schemes to the North-East.

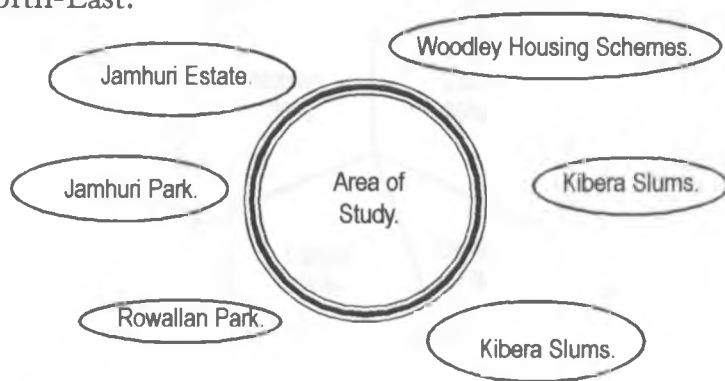


Fig. 3.2 Neighbourhood of the research area.

Author.

3.0.5 Proximity to the CBD.

The Kibera housing schemes enjoy an excellent proximity to the Nairobi CBD. It is about twenty minutes drive from the CBD and is served by the busy Mbagathi way and Ngong' road, among other roads.

3.0.6 General Terrain.

The general terrain is friendly and gently slopes towards the Nairobi river (see map in figure 3.1). This affords an opportunity to do good infrastructure such as roads, storm drains, telephone, electricity and sewer lines.

The detailed look at the schemes will heavily rely on photographic data and sketches done by the author as shall now follow. While endeavouring to bring out the approaches mentioned in 3.0.1 namely **the setting, users, proximate and environmental response, space use, planning and ordering principles** the rest of the case study development will be structured as follows:

- a). Layout, Dwelling Types and Imagery,
- b). Occupancy and Activities,
- c). Adaptability and
- d). Services, Infrastructure and Detailing.

3.1 Karanja Road Housing Scheme.

It should be noted that the Kibera area was initially allocated to the Nubian community after World War II as a settlement area. Though the Kibera area is now multi-tribal, it is dominated by this and a few other communities as shown in figure 3.3 below.

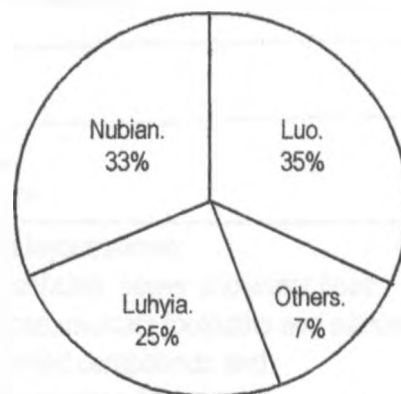
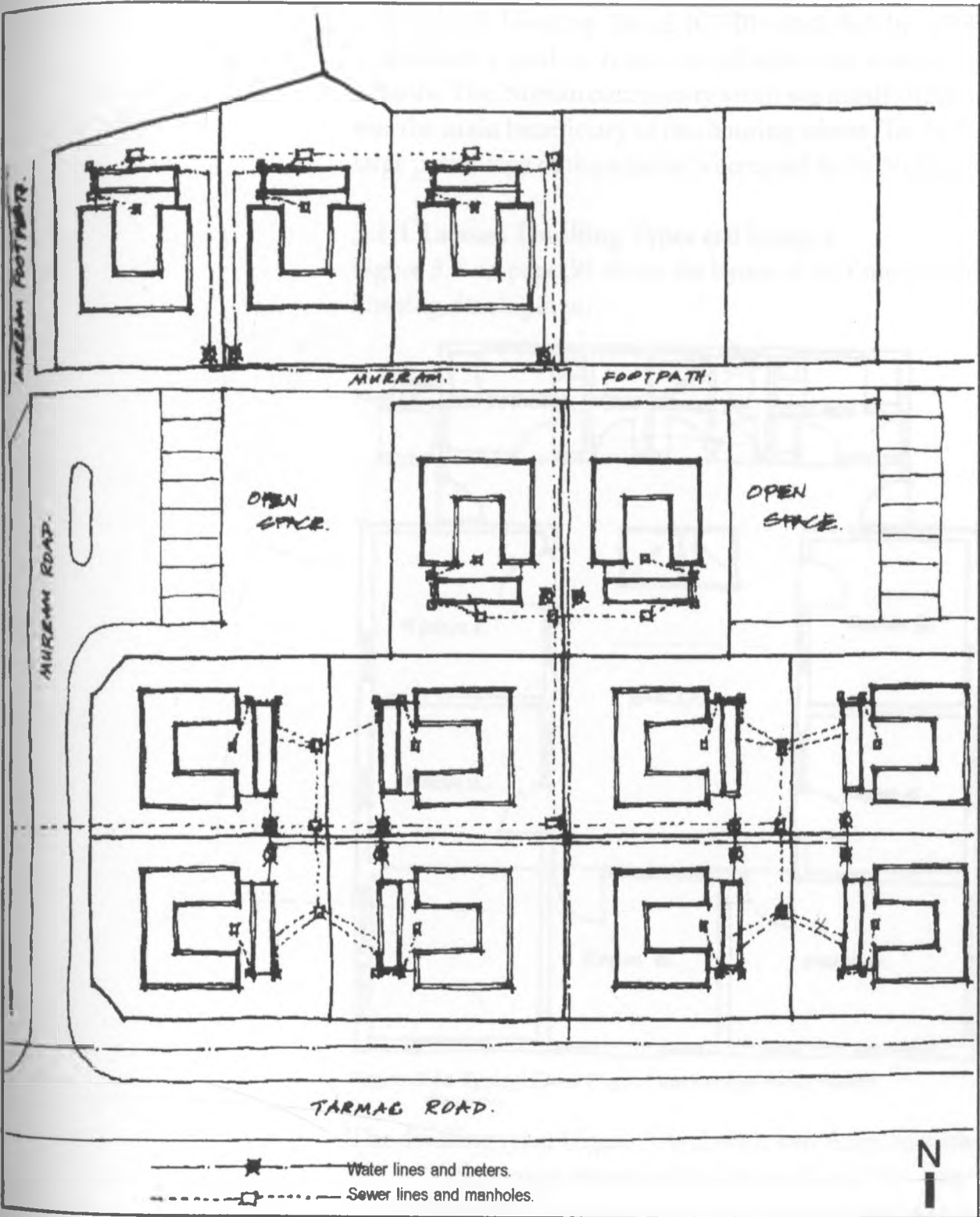


Fig. 3.3 Pie-chart showing ethnic representation in Kibera.

Author.



The Karanja Road layout shows:

- * shared manholes, sewer and water lines,
- * open spaces, murram footpaths and parkings,
- * closely parked compounds and
- * a very 'loose' urban tissue.

Fig 3.4 Layout of Karanja Road.

Author.

Though little documentation exists on this scheme, the author's findings indicate that it was borne out of the colonial Central Housing Board (CHB) which had by 1960 established a goal to house the Africans who worked in Nairobi. The Nubian community which was mainly muslim was the main beneficiary of this housing scheme. To date a large percentage of the scheme is occupied by the Nubians.

3.1.1 Layout, Dwelling Types and Imagery.

Figure 3.4 on page 30 shows the layout of the Karanja road housing development.

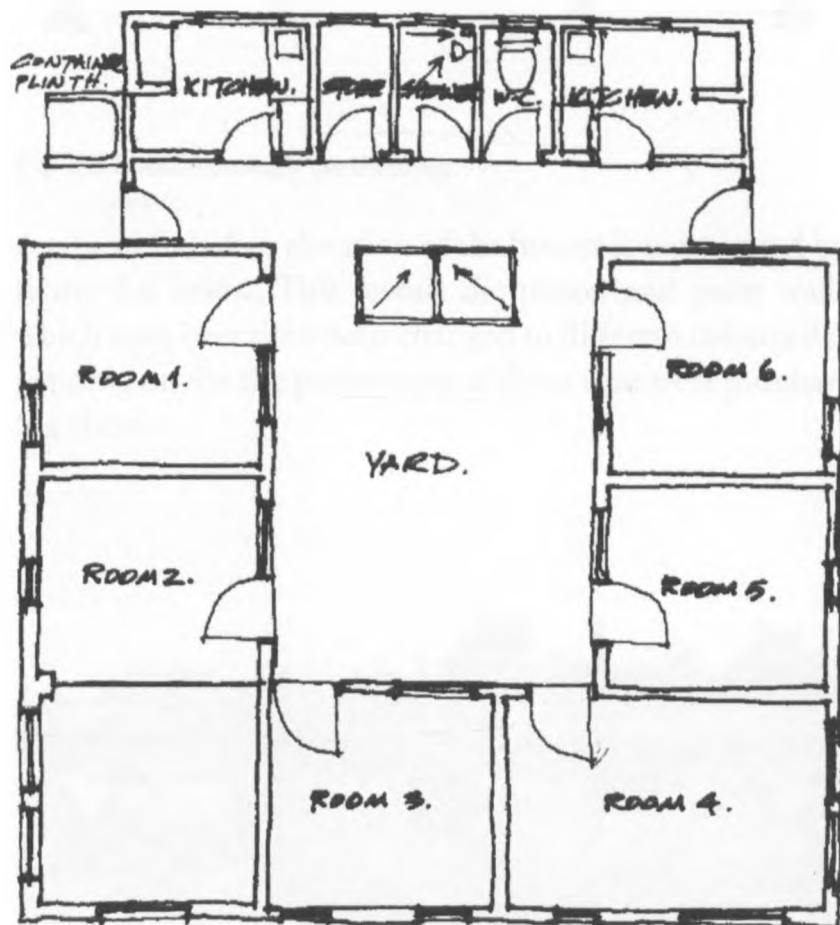


Figure 3.4a Typical Floor Plan of the Karanja Road Houses.
NHC/Author.

The dwelling types (figure 3.4a above), were designed with:

- *6No. rooms consisting of 4No. small and 2No. large.
- *A common courtyard reflects a communal culture.
- *Common w.c., shower, store and 2No. kitchens.
- *2No. entrances/exits and a common splash area.

The sizes of the rooms clearly indicate that families were not envisaged. In fact the colonialists' policy was that African workers' families should not be allowed in the cities!

Figure 3.5 shows the section through the dwelling type.

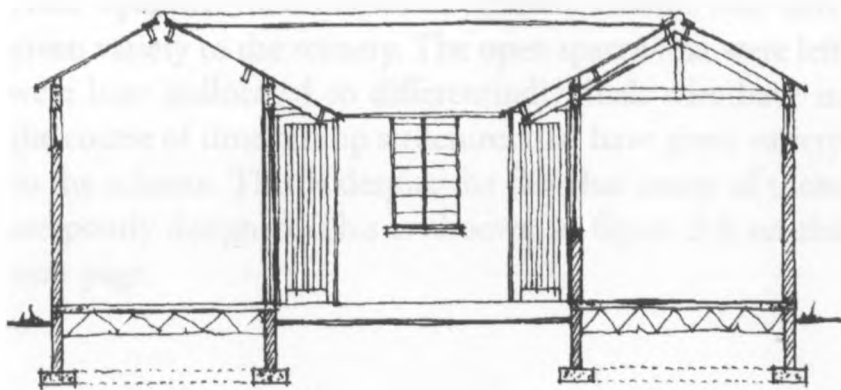


Fig. 3.5 Section through the dwelling.

Author.

A typical feel of an elevation of the houses is represented by figure 3.6 below. This reveals the plaster and paint walls which have over time been changed to different colours depending on the the preferences of those who were purchasing them.



Fig. 3.6 Typical View of the Houses.

Author.

The roofing materials used were asbestos sheets which are no longer being manufactured now. Note the metallic chimney flues and the metallic window seals. There was an attempt to fence off the block in the past but this did not work as evidenced by the fencing poles.

Figure 3.7 below shows the general **imagery** of Karaja Road housing scheme. This reveals a single house type repeated over the whole scheme. The different owners have over the years repainted their houses in different colours that have given variety to the scenery. The open spaces that were left were later reallocated to different individuals who have in the course of time put up structures that have given variety to the scheme. This is despite the fact that many of them are poorly designed. This is shown in figure 3.8 on the next page.



Fig 3.7 The Imagery of Karanja Road. This reveals a single house type that has been repeated all over the scheme. The blocks have been painted different colours, above, and note the murram roads within the blocks, below.

Author:



An upcoming highrise building in one of the designated open spaces. These structures flout the NCC by-laws with impunity. They do not respect their neighbourhoods either. Probably the designs being done should be done such that they do not encourage such developments to occur.



A structure that bares testimony to the disrespect for the NCC by-laws and the neighbourhood in general.

Fig 3.8 The Unplanned Structures in the Open Spaces.
Author.

3.1.2 Occupancy and Activities.

Karanja road is a bustle of activities including high rise buildings that accomodate shops, offices, workshops; kiosks for groceries and general stores.

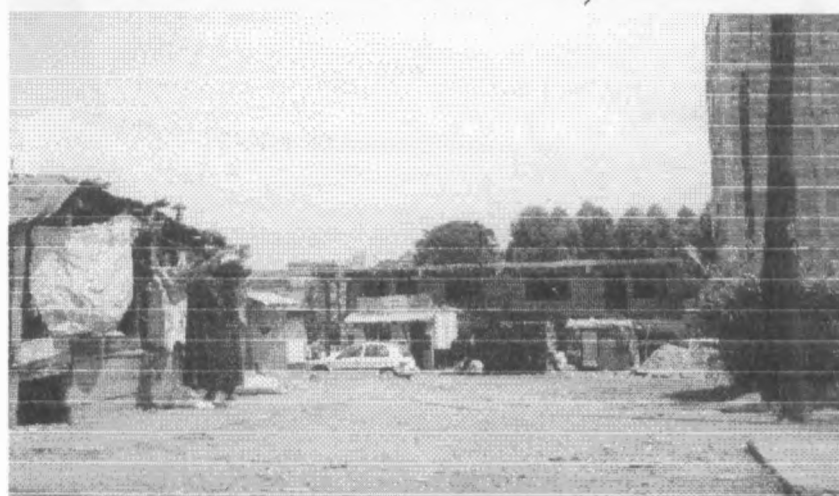


Fig 3.9 Activities on Karanja Road. These include public transport, top , meeting halls and residential flats, middle, and kiosks among other activities, above.

Author:

Karanja Road housing scheme was sold to the public on a Tenant Purchase scheme. Buyers would pay a 10% deposit after which they would service their loans with the Central Housing Board (CHB). Many of the occupants however have since been rented out. The trend is that families occupy single rooms and share the wet areas. However in some cases two or more rooms are taken up by families in which case they would have control over the spaces.

A greater percentage is occupied by tenants as opposed to the original buyers.

3.1.3 Adaptability.

The scheme has a positive side to it. One person who has purchased the house could choose to occupy the whole of it or sublet it to supplement their income, making it flexible in this sense.

The courtyard space can be adapted to several uses such as hanging clothes as seen later on, a playing ground for children and a meeting point for the different families. See figure 3.10 below.

The outer spaces within the blocks however are not adaptable to other uses like car parks since their dimensioning did not cater for this.

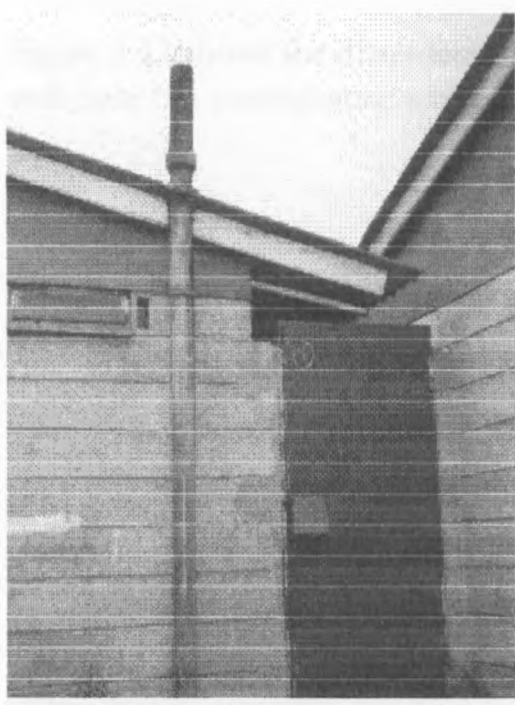


Fig 3.10 The Courtyard. This can be adopted to various uses. But it is also congested with clothlines and children playing.

Author:

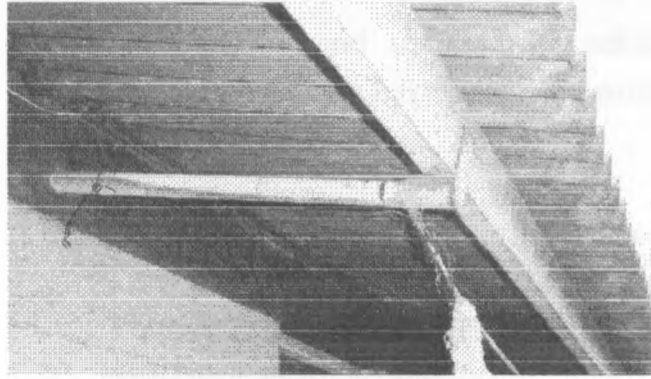
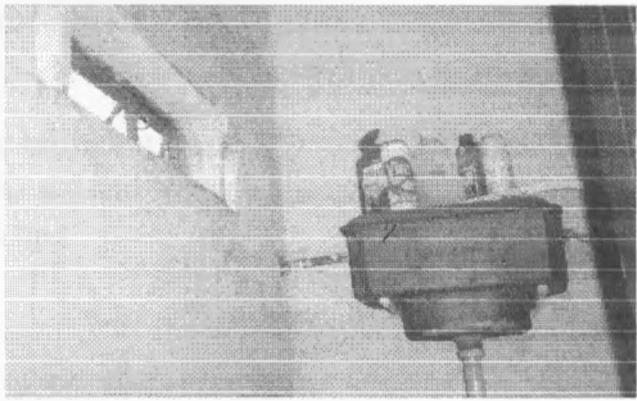
3.1.4 Services and Infrastructure and Detailing.

The detailing of the houses was well done and these details have lasted over the years. Details like metallic rafters, s.v.p.'s and cisterns which are rarely used are very longlasting, though they have their attendant problems like rust and difficult maintenance. Figure 3.11 shows these.



*Note the cast iron vent pipe.
*The roof on the left makes the entrance a nightmare during the rains.
*The steel door was put in by the residents to replace the original timber doors.

*Note the cast iron cistern.
*The permanent vents are adjacent to the high level windows and are completely open.
*The w.c.'s are communally maintained.



*Note the steel rafters.
*The clothe lines hang on these rafters.

Fig 3.11 Detailing.

Author.

Although services such as water, sewerage and electricity were initially well designed for, they have been overstretched as the initial numbers envisaged have been surpassed owing to two reasons:

- *Highrise buildings have increased densities and
- *There are more families per block than was intended.

Figure 3.12 shows the dilapidated roads. They were once well done but maintenance was thrown out of the window.



Fig 3.12 Roads that once were.

Author.

Street lighting exists but has not been maintained. Water and sewer lines exist and were planned for though they have been overstretched.

Some absent features in the whole scheme are schools and community facilities like social halls.

Those residents who end up acquiring vehicles or receive visitors with cars usually have problems with parking and security.

A few more revelations came from the interviews:

- a). The communal wet areas are hard to maintain.
 - b). Though it is secure within the courtyards, security without is relatively low.
 - c). There is no privacy within the blocks.
-

Figure 3.13 shows the layout of the typical cluster. The sewer system was economically done as it uses a minimal number of manholes and joins up to one system.

Open spaces were generously provided for. These are important as play areas and meeting points. They have unfortunately been located to other parties who have put up unplanned structures for commercial purposes.

The cluster reveals community life which was emphasised at the time of the scheme's design and which may have worked. Today however people have become individualistic leading to this kind of layout not being viable.

The provision of ground is however a positive thing especially for the low income earners, who need the ground for their activities more than the higher income earners.

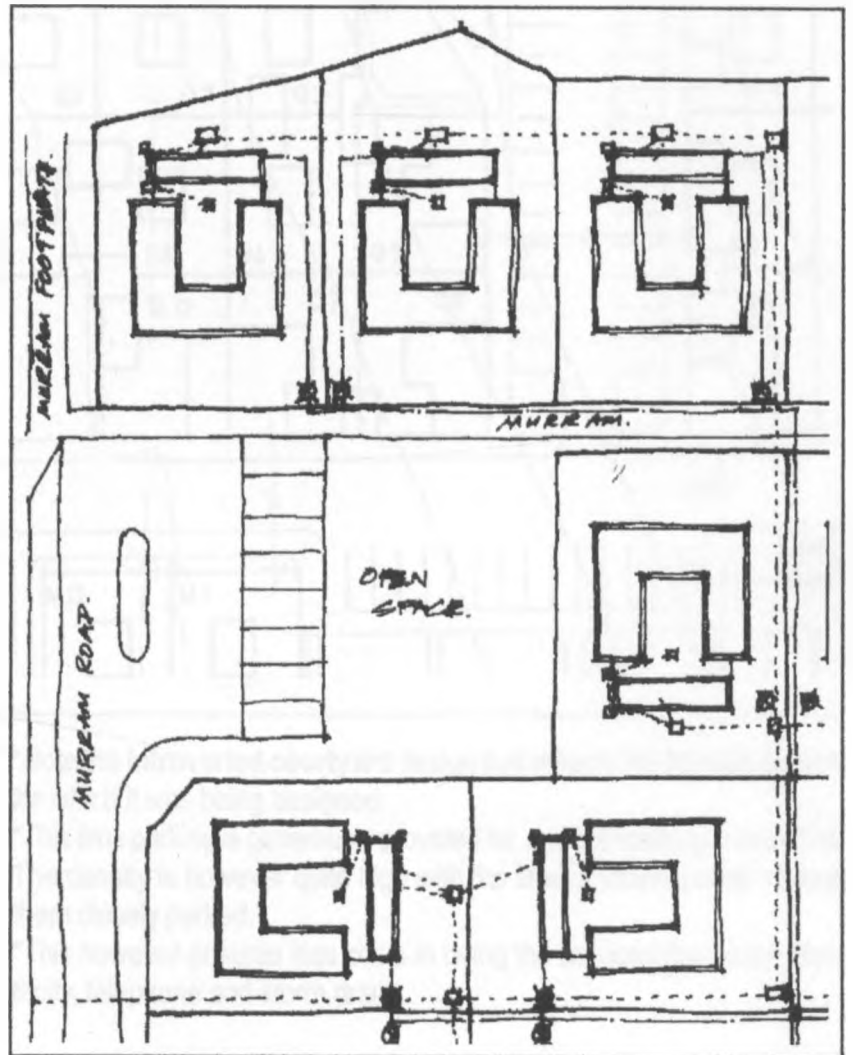


Fig 3.13 Cluster Layout.

NHC/Author.

3.2 Fort Jesus Housing Scheme.

This is the only NHC scheme in the Kibera area which was sold as a mortgage housing. The rest were on Tenant Purchase. This scheme was done in 1970. It is also organised around the courtyard like Karanja Road done by the CHB. Some of the lessons learnt from the concepts used in Karanja road, were factored into this scheme. It appears the thrust was to accommodate as many low income earners as possible within a small area. This will be discussed later. Figure 3.14 on page 40 shows the typical site layout.

3.2.1 Layout, Dwelling Type and Imagery.

Again the basic concept used here is the **courtyard** design. The difference this time is that there are openings between the rooms. At most, one could have six rooms consisting of:

- *four small ones and
- *two long ones.

The purchasers therefore had the option of closing off these walls and subletting the rooms to supplement their income. Figure 3.14a below shows a type layout plan. The courtyard, positioning of the rooms and wet areas can clearly be seen.

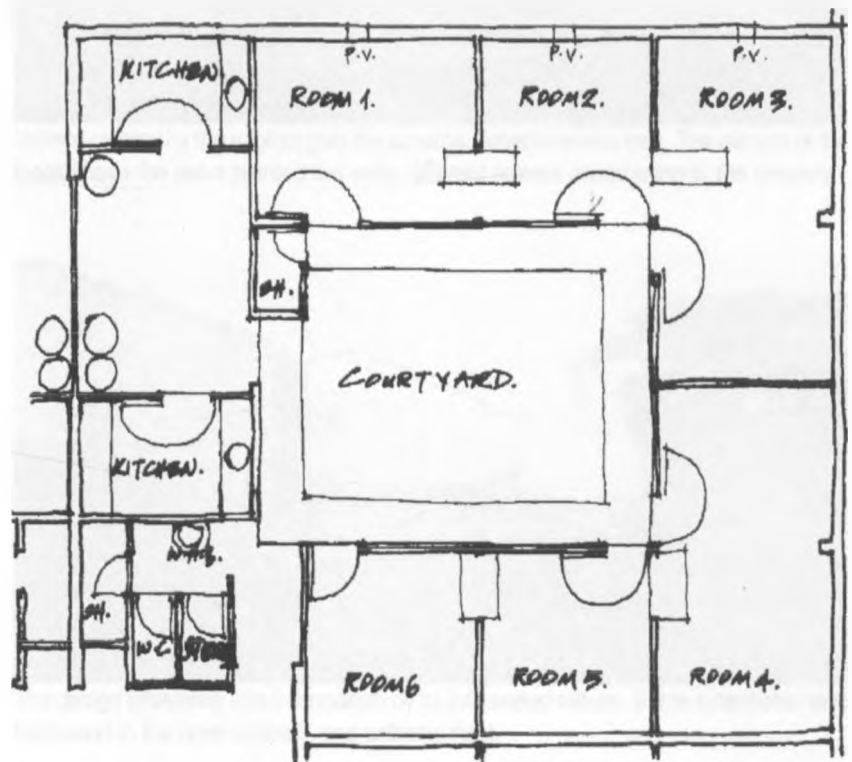
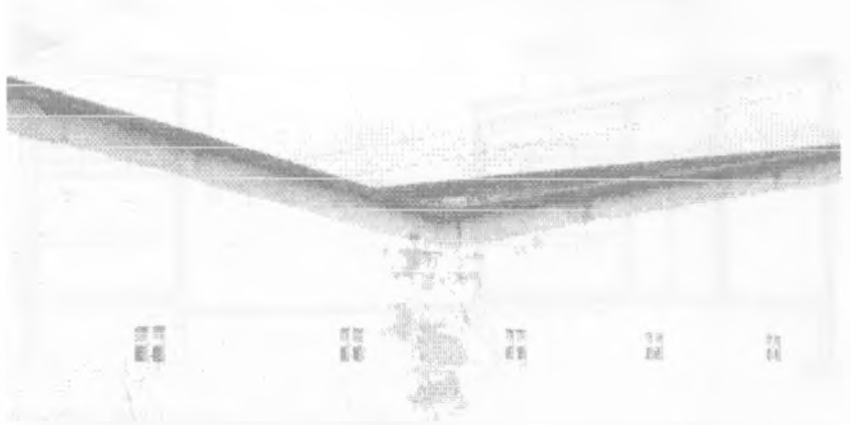


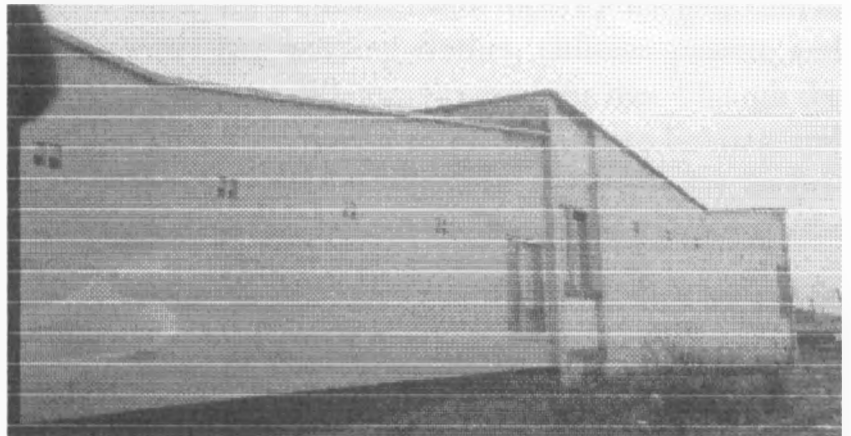
Fig 3.14a Type Layout Plan.

Author.

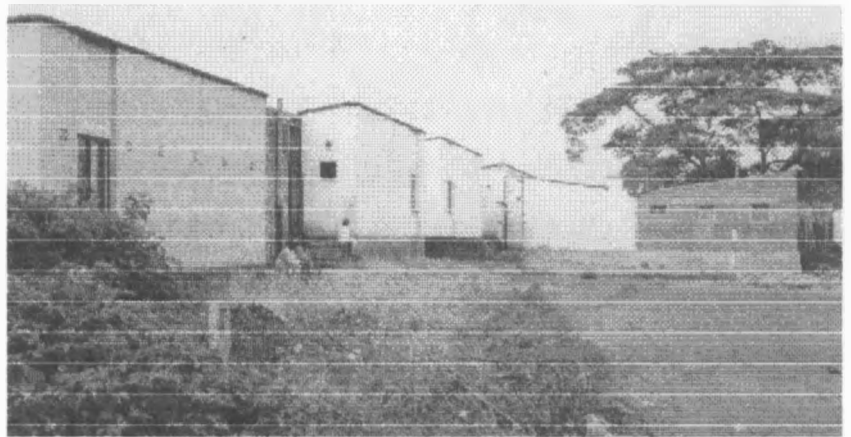
Figure 3.15 below shows the **imagery** of the Fort Jesus Scheme. The v-shaped roofs are imposing. Again the different colours of the paintwork stand out with the permanent vents on the outer walls clearly showing up.



Concrete louvre permanent vents on the exteriors effectively make the outside walls dead to informality which characterises other schemes discussed later.



Valleys created by the v-joints give the scheme a characteristic look. The owners of the blocks have the years painted the walls different colours contributing to the imagery.



The design effectively kills informality by its introverted nature. Some extensions have happened in the open spaces - see extreme right.

Fig 3.15 Imagery.

Author.

A section through the building reveals the detailing and this is shown in figure 3.16. Lean-to roofs drain into the courtyards. The rafters are exposed at the ends.

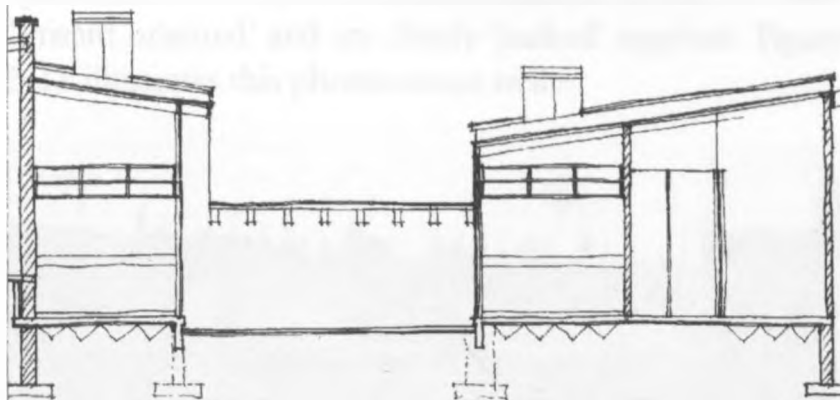


Fig 3.16 Section through building.

Author.

Some of these are made clearer at figure 3.17 below. Note that the courtyard is crowded with ropes for hanging clothes and activities like washing clothes, children playing and drying of cereals at different times of the day. Though the windows are large enough to give adequate lighting and ventilation, they curtains/blinds are drawn all day for privacy.

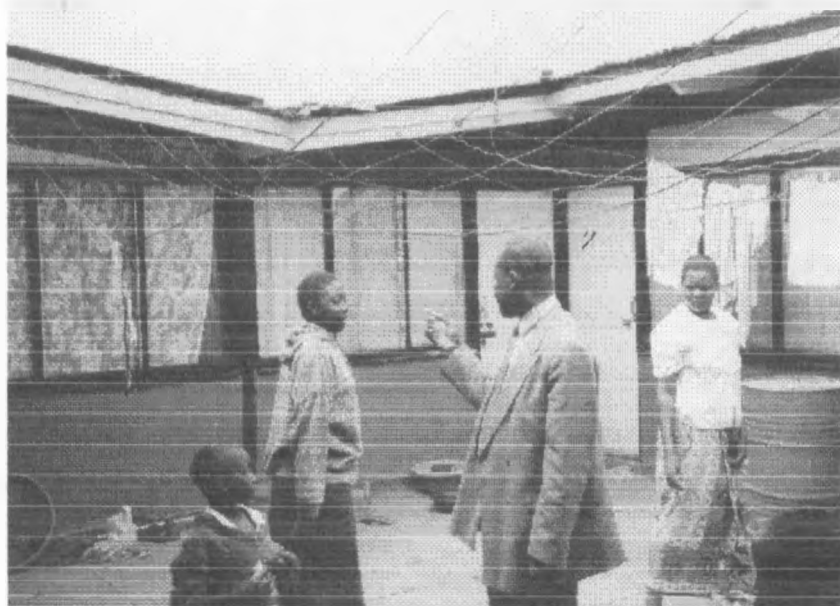


Fig 3.17 The Courtyard.

Author.

Life revolves around the courtyard as evidenced in figure 3.17 above. A random survey revealed that indeed many who purchased these buildings have ended up sealing the openings and letting them as many units.

3.2.2 Occupancy and Activities.

Diverse activities happen here as in any other thriving housing scheme. These however happen in the open parking space areas. This is due to the fact that the houses are more 'inward oriented' and are closely 'parked' together. Figure 3.17 illustrates this phenomenon well.

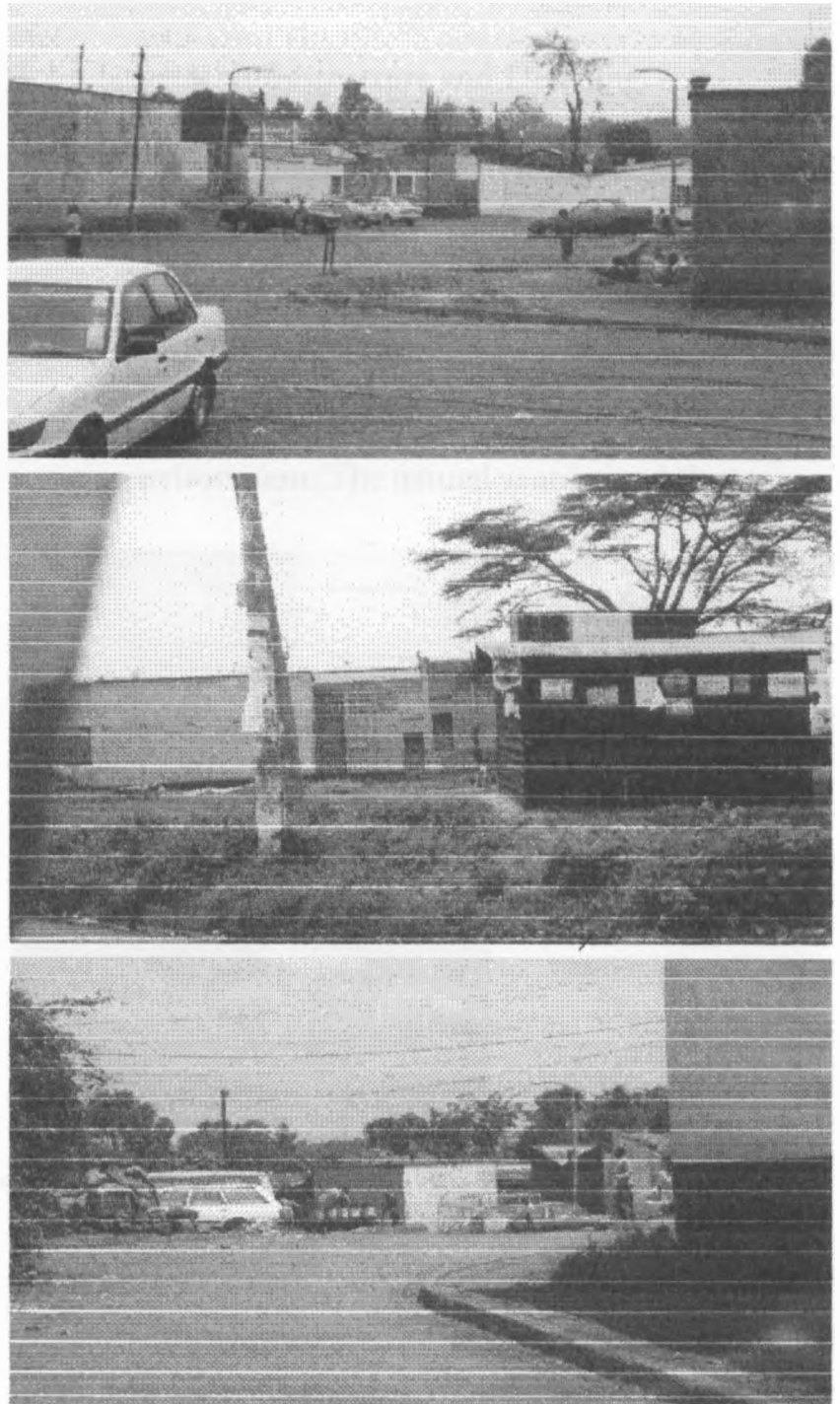


Fig 3.18 Activities. These include parking/playareas, top, advertising, middle, and charcoal selling above. The 'inward' orientation does not encourage informalism, which explains the absence of kiosks on the exteriors.

Author.

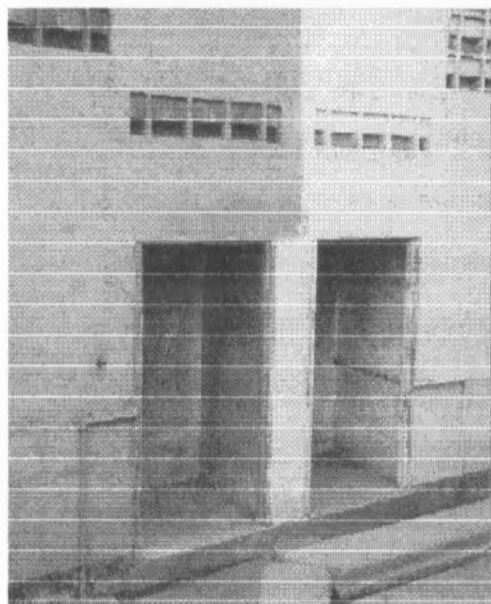
These activities include selling of charcoal, kerosene, groceries, butcheries and barbers.

The random survey indicated that the actual purchasers of these units do not live here. They have blocked off the openings and let off the rooms as individual dwellings. Some families however rent two or more rooms.

3.2.3 Services, Infrastructure and Detailing.

Further investigations revealed that:

- *It is hard to keep the shared facilities like the kitchens and bathrooms clean.
- *The kitchen and bathroom designs were better than those of Karanja road in that they were larger. Furthermore two per block were provided this time.
- *Dustbin cubicles (figure 3.19) have been provided for in the design indicating a clear response to the **environment**. The natural ventilation is better too.



*Niches have been created for dustbins showing a sensitivity to the environment.

*Concrete louvre blocks serve as permanent vents instead of windows, effectively reinforcing the 'inward' orientation.

Fig 3.19 Dustbin Cubicles and Natural Ventilation.

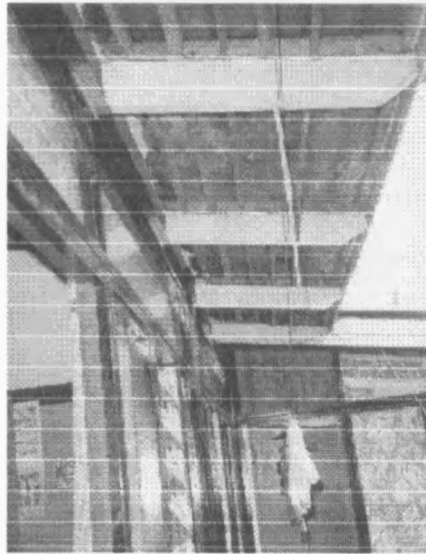
Author.

- *Larger windows in the courtyard area provide for more lighting.
- *As shown in figure 3.18, the roads are wider with more parking spaces provided for.

The scheme generally looks cleaner than Karanja road although it is denser

Figure 3.20 shows some of the details that were used. The roofing felt that was used ended up not being viable. The result is that all the roofs have been changed to g.c.i. sheets.

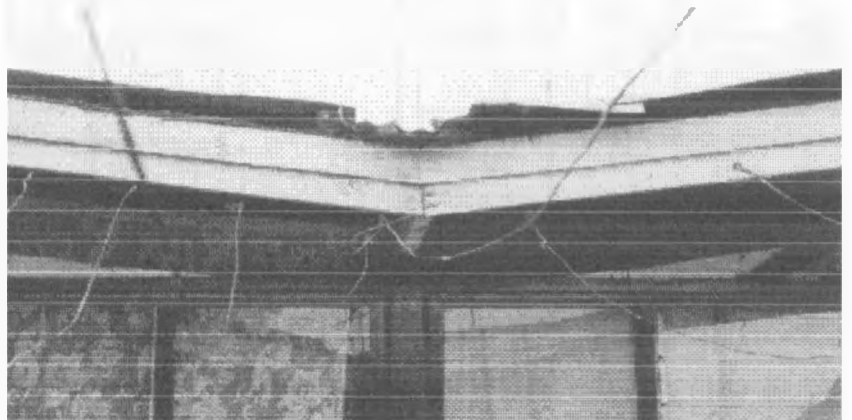
The v-joint has presented many leakages leading to expensive maintenance.



The original roofing felt material has long been replaced by gci sheets as it was not suitable for our type of weather. The many purlins used to hold the felt.



Leakages at the valleys are evident on the ceilings.



The v-shaped roofing joints have presented never ending leakages leading to high maintenance costs.

Fig 3.20 Faulty Detailing. Roof, top, v-joints, middle and above.

Author.

The metallic window seal has proved to be long lasting (figure 3.21). This is a detail which should be maintained in other low income housing schemes.

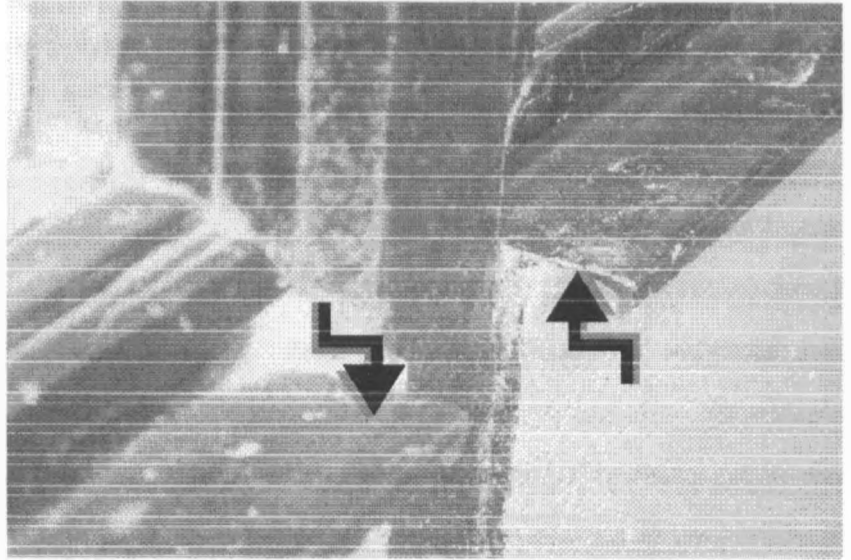


Fig 3.21 Metallic Window Seals, shown by the arrows.

Author.

The water and sewer services were done economically as shown on the layout in figure 3.22 below. Maintenance of drains is easy as they are centralised. The scheme is quite dense and shared party walls ensure minimal construction costs.

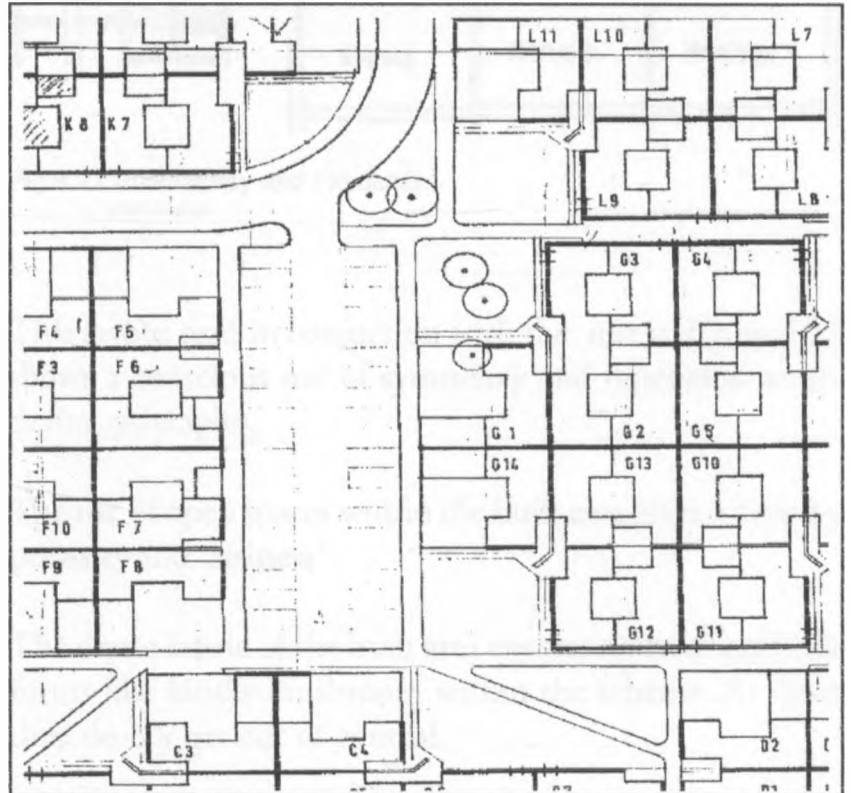


Fig 3.22 Layout for Fort Jesus shows minimised cost of construction due to shared party walls and services.

Author.

3.2.4 Adaptability.

The way the rooms are designed with openings (figure 3.23 below), makes it easy to adopt the rooms to different sized families and houses. One could opt for a small room or a large one or several or even all of them depending on the size of their family or their **affordability**, making the layout flexible. The owner could leave in some rooms and let out the rest to supplement income.

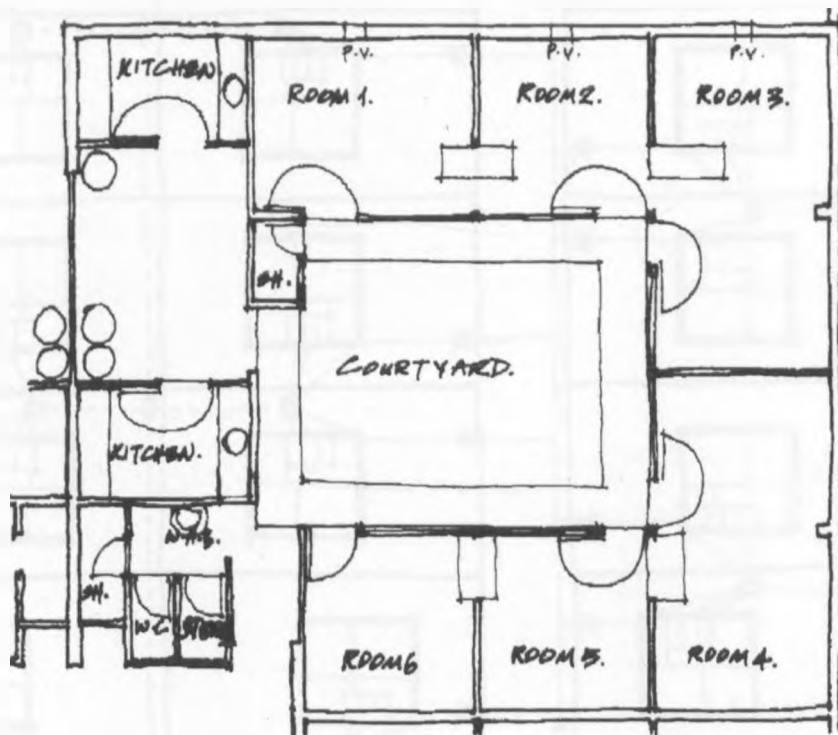


Fig 3.23 Adaptability and Flexibility.

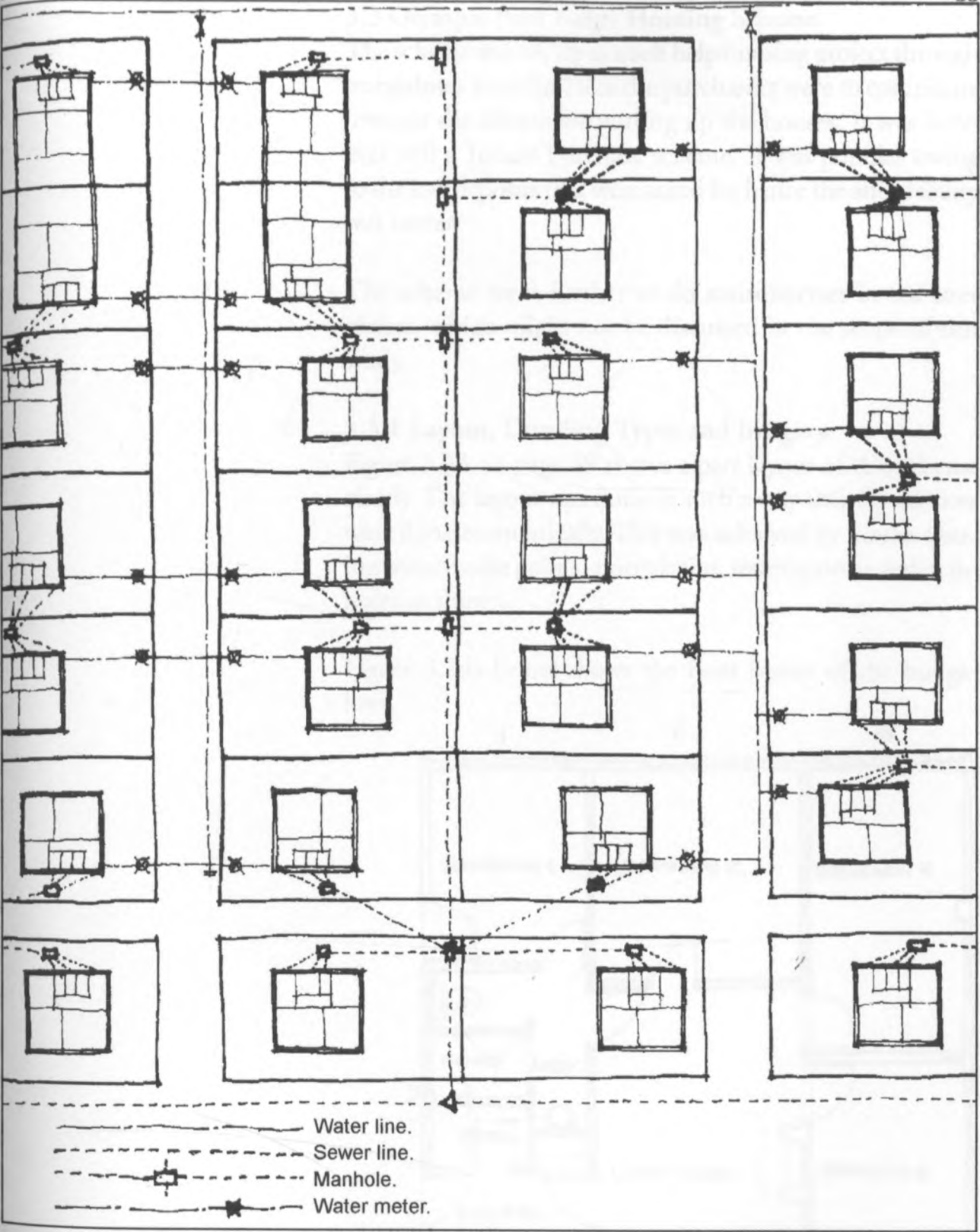
NIC/Author.

This layout read in conjunction with the one in figure 3.22 shows a conscious use of **symmetry** and **repetition** as ordering principles.

The use of open spaces within the built area gives it healthy **porosity** and 'airiness'.

The **dense fabric** of the built area ensures no informal built forms like kiosks mushroom within the scheme. At least they do not get out of control.

Again there is spread which is good for the low income earner whose activities are basically on the ground.



- *The layout minimises costs on water and sewer lines.
- *The compounds are large enough to accomodate parking.
- *There is room for future extension.
- *The planning allows for subletting.
- *It however allows for uncontrolled extensions due to the large compounds.

Fig 3.24 Part Layout of the Olympic Estate Bungalows (Self Help).

Author.

3.3 Olympic (Self Help) Housing Scheme.

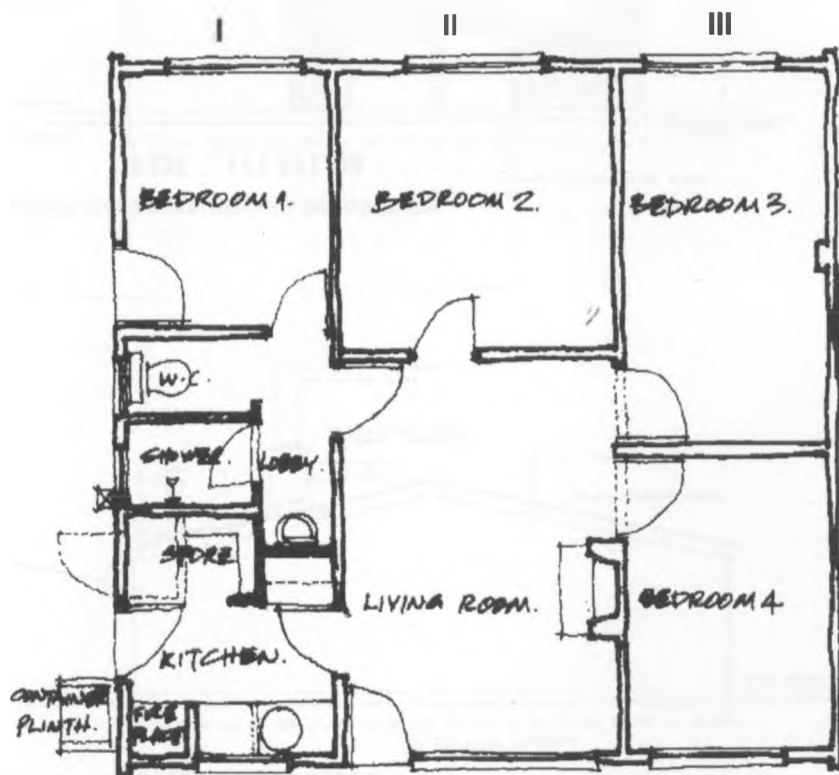
The scheme was set up as a self help housing project through bungalows initially. Here the purchasers were to contribute towards the labour for putting up the houses. It was however still a Tenant Purchase scheme. It was popular owing to the low deposits that were asked for hence the affordability was better.

The scheme went further to do maisonnettes in the later phases, which might not be discussed in the scope of this study.

3.3.1 Layout, Dwelling Types and Imagery.

Figure 3.23 on page 49 shows a part layout of this scheme clearly. The layout was done in such a way that the services were done economically. This was achieved by houses sharing water intake points, stormdrains, sewer systems and man-holes as shown.

Figure 3.24a below shows the floor layout of the bungalows.

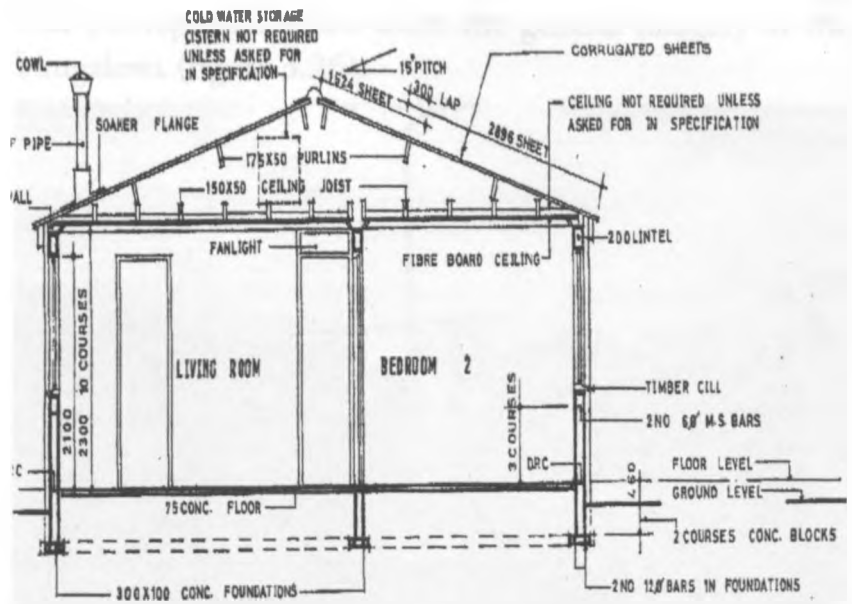


*Bedroom 1 could easily be sublet since it has a door opening to the outside.

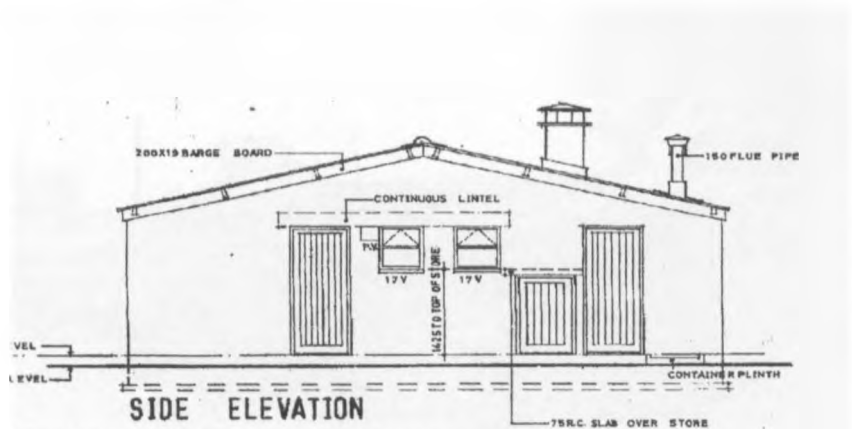
*Construction could be done in three stages: I, II and III, making affordable.

*The other rooms could also be sublet to supplement the owner's income.

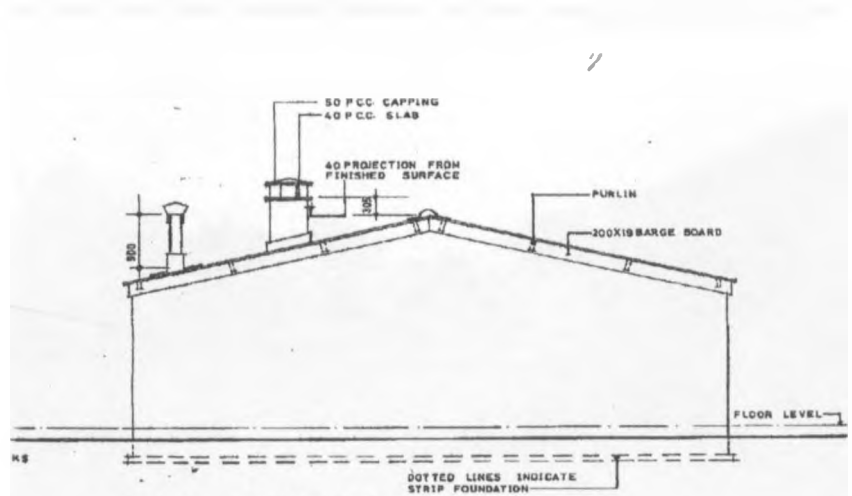
Fig 3.24a Typical Floor Layout.



Note the simple construction solution that enables it to be easily constructed making it a truly self-help programme.



Simple construction methods and materials.

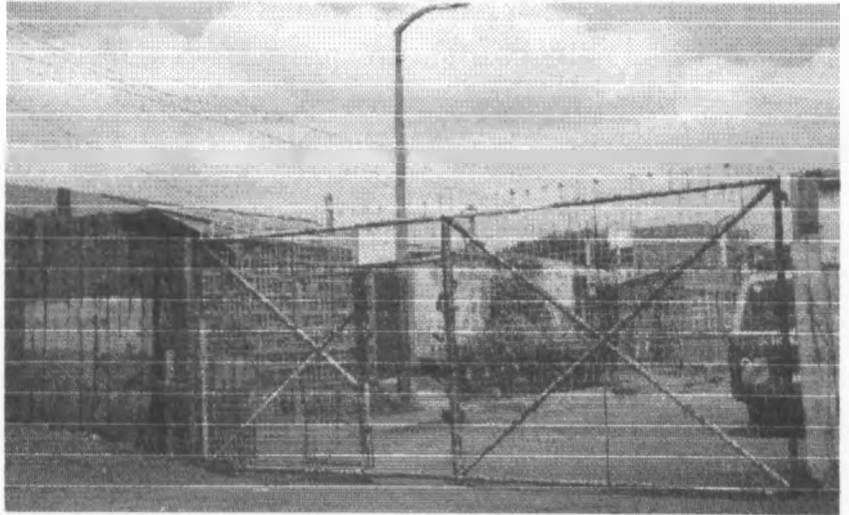


Simple facades.

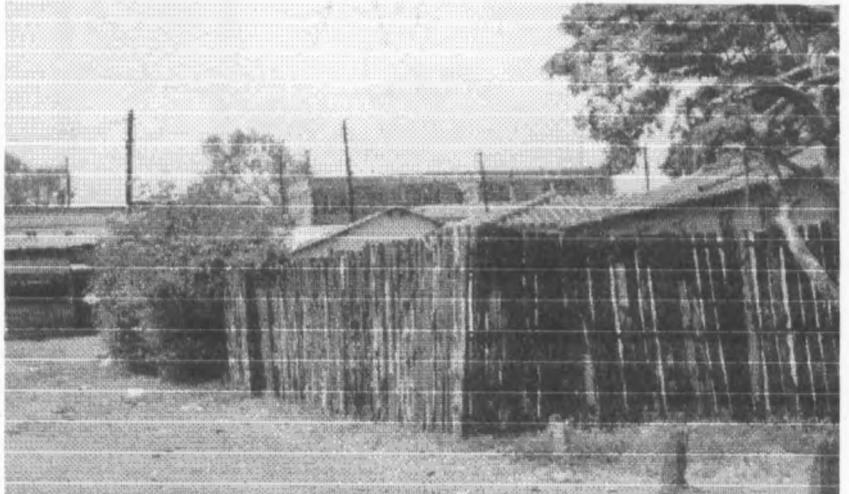
Fig 3.25 Section, top, Side Elevations, middle and above.

NHC/Author.

The photographs below show the general imagery of the bungalows (figure 3.26).



Stone fences around some of the houses. The gate has been constructed by the residents for organising security.



Wooden fences give a particular character. The houses are painted in different colours.



The general view from the roads.

Fig 3.26 Imagery. Gates for security organised by the residents, top, timber fencing, middle, and roads above.

Author.

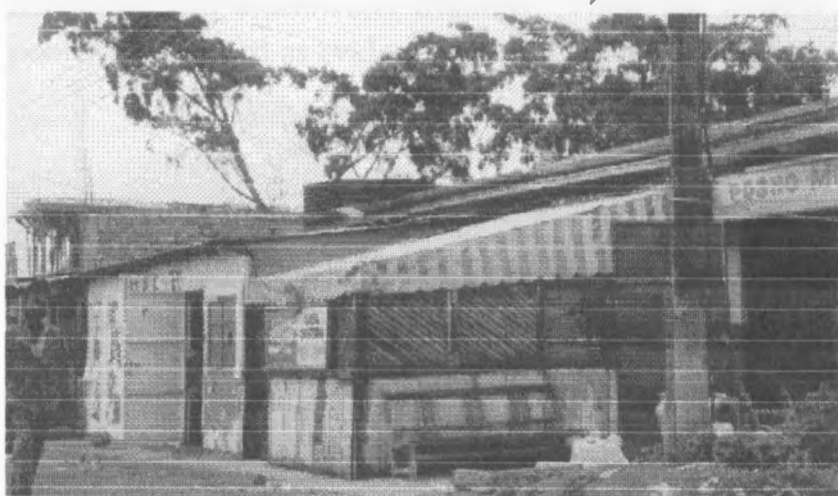
3.3.2 Occupancy and Activities.

Olympic Estate is largely occupied by the owners of the buildings, unlike Karanja road and Fort Jesus. They all participated in the construction of their houses hence the pride in occupying them. Many have however sublet bedroom 1 (figure 3.24a), to supplement their incomes. Some have gone ahead and constructed extensions on the compounds for rental purposes.

Figure 3.27 below shows some of the activities which take place on the scheme on Olympic housing estate. Note that here, unlike in Fort Jesus, the planning and design allows informalism to thrive.



Informalism has thrived in the form of kiosks, bureaux, barber and grocery shops.



Extensions to the original buildings, in the background.

Fig 3.27 Activities. Informalism, top, and extensions, above.

Author.

3.3.3 Adaptability.

Figures 3.24 and 3.24a show how the design for this self-help scheme was made to be adaptable to various circumstances. There are various possibilities:

- * The plan can be done in three phases or all at once.
- * bedroom 1 can be let by the owner to supplement income.
- * The store is both an internal and external one.
- * The compounds are large enough to accommodate extensions other than those designed for (see figure 3.28 below).

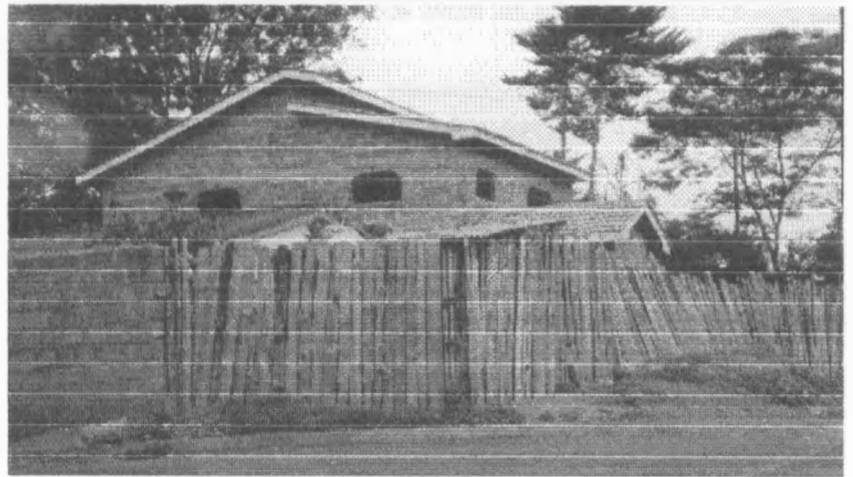


Fig 3.28 A New Extension.

Author.

3.3.4 Services, Infrastructure and Detailing.

Figure 3.29 below shows that thought was put into the provision of infrastructure like roads, streetlighting, electricity, telephone and stormwater drainage. These are however poorly maintained as evidenced in the photograph below.



Fig 3.29 Infrastructure - Dilapidated roads.

Author.

As shown in figure 3.30 below, there was more sensitivity in the provision of infrastructural services like this now famous primary school.



Fig 3.30 Olympic Primary School- More Infrastructure.

Author.

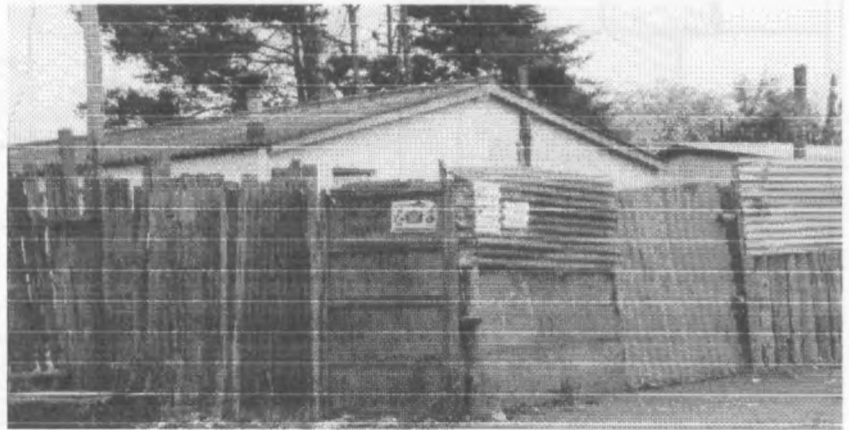


Fig 3.31 Notice the metallic chimney flues and the asbestos roofing.

Author.

Figure 3.31 above and figure 3.25 on page 51 show how the detailing has been kept as simple as possible. These details include:

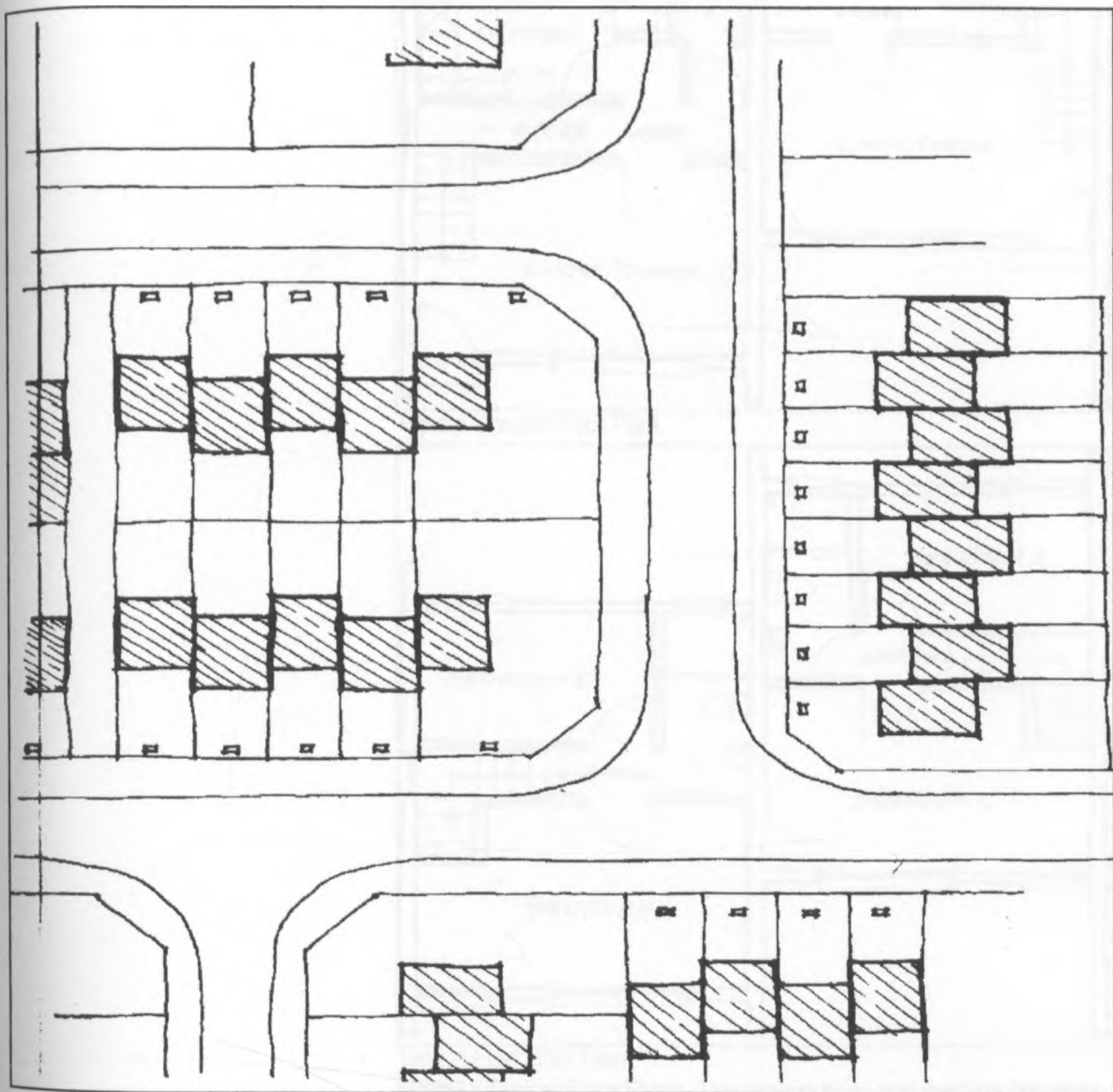
- * Corrugated roofs on purlins to save on timber for trussing.
- * The use of lintels instead of ringbeams.
- * Even the number of courses per wall are specified to ensure construction is within costs.
- * The use of metallic chimney flues instead of actual construction of the chimney.

The FGI's with the Olympic residents revealed the popularity of this flexible planning. However the following sentiments were also expressed:

- * The lettable bedroom(s) should be self-contained.
- * The kitchens should be larger.
- * Some sort of corridor was desirable to provide a privacy gradient for the rooms.

3.4 Olympic Estate Maisonnettes.

The Olympic Estate Maisonnettes were done after the bungalows and sold off on a Tenant Purchase basis, but were entirely done by NHC. Figure 3.32 below shows the layout of this scheme.

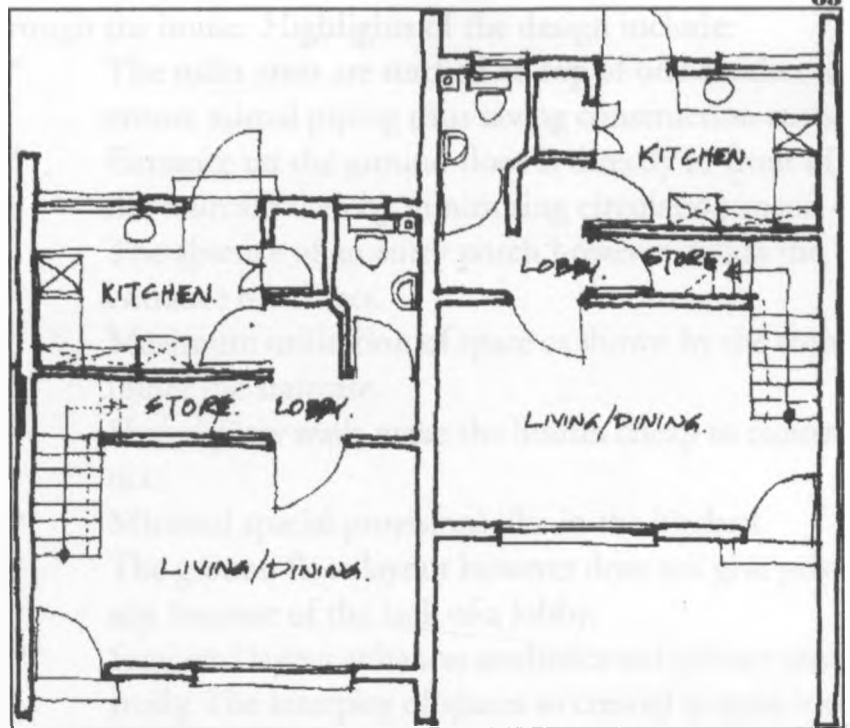


Note the following:

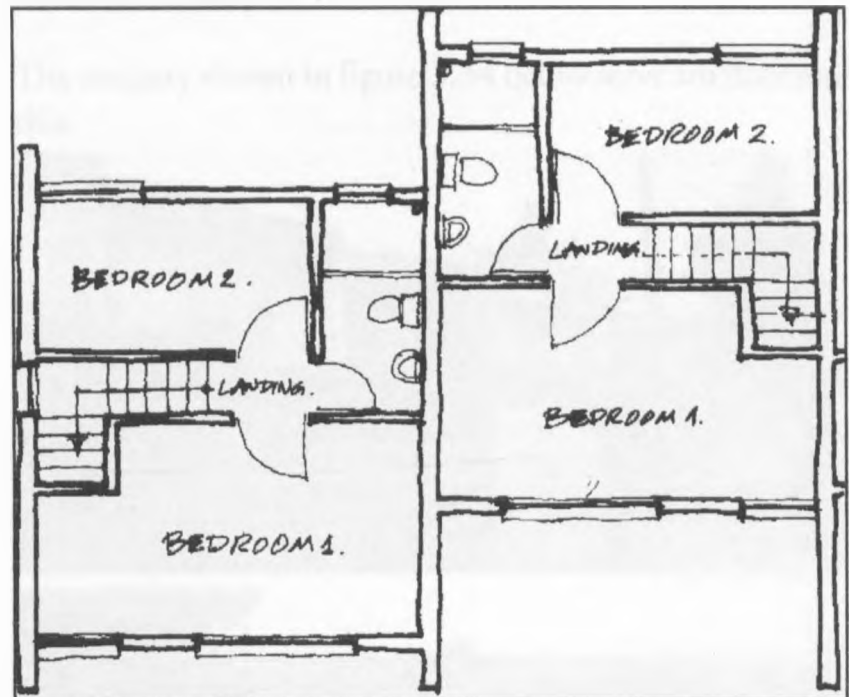
- * This time the plots are narrow to fit only the extent of the house from wall to wall. This effectively curbs the construction of unwanted extensions as is evident in other schemes.
- * Houses are staggered to improve imagery.
- * House units are well served with infrastructure like roads, storm drains, water, streetlighting and telephones.

Fig 3.32 Part Layout of the Olympic Estate Maisonnettes.

Author.



Typical Ground Floor Plan.



Typical First Floor Plan.

Fig 3.33 Typical Floor Plans. The ground floor, top, and the first floor, above.

Author.

3.4.1 Layout, Dwelling Types and Imagery.

Figure 3.32 on page 56 sheds light on the scheme's layout. Figure 3.33 above shows the typical floor plans of the maisonnettes.

From the ground floor layout, it is not desirable to put up extensions for subletting behind the units as there is no th-

rough the house. Highlights of the design include:

- * The toilet areas are stacked on top of one another to ensure minimal piping thus saving construction costs.
- * Entrance on the ground floor is directly in front of the staircase thereby minimising circulation space. The absence of an entry porch however makes the entrance too direct.
- * Maximum utilisation of space as shown by the store under the staircase.
- * Shared party walls make the houses cheap to construct.
- * Minimal spatial provisions like in the kitchen.
- * The ground floor layout however does not give privacy, because of the lack of a lobby.
- * Staggered layout enhances aesthetics and privacy externally. The interplay of spaces so created is quite interesting.

The imagery shown in figure 3.34 below serve to illustrate this.

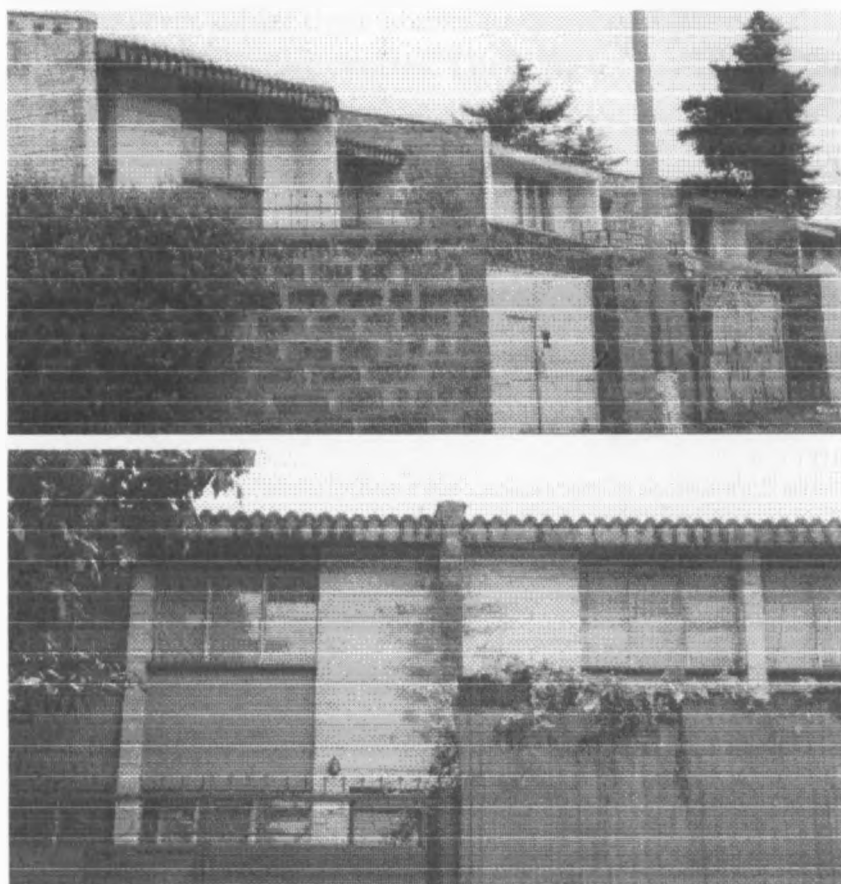


Fig 3.34 Imagery. Staggered layout gives an interesting interplay of external spaces, top, facade treatment adds to the aesthetics, above.

Author.

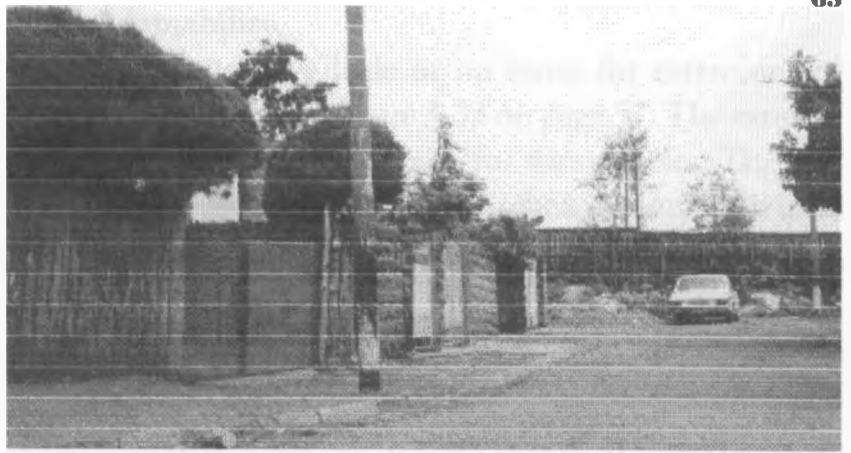


Fig 3.35 Imagery. Most of the residents have fenced their plots with stone and put different gates giving the estate a particular character. Note the tarmacked roads too. It looks modern.

Author.

The spaces within the estate are given character by the way the individual fencing has been done, as shown in figure 3.35 above.

3.4.2 Occupancy and Activities.

This scheme is largely occupied by the purchasers. A few have however sublet their houses or converted them to different use like daycare centres. There are few extensions for commercial use. This only happens on the corner plots which have larger plots and multiple access. This has therefore kept the original image of the scheme almost intact.

Figure 3.36 below shows some of the activities which take place at the entry points and at some of the open spaces on the scheme. They include kiosks for groceries, telephone bureaux, barber shops, salons and small places for video shows.



Fig 3.36 Activities that take place at the entry points to the estate.

Author.

3.4.3 Adaptability.

The floor plans leave little or no room for extensions or alterations, as shown in figure 3.33 on page 57. The external spaces can however be adopted for various uses. The rear spaces can be used as gardens, or kitchen yards or even used for construction of a servant quarter or third bedroom.

The space in front of the house could be landscaped to serve as aesthetical features in addition to being parking spaces. They could easily be used as extensions of the living rooms since the stone fencing provides security.

3.4.4 Services, Infrastructure and Detailing.

Further investigations revealed that infrastructural support was given consideration in this scheme. The spaces earmarked for a shopping centre and school were actually developed living little room for these spaces being used for other purposes. See figure 3.36 below.



Fig 3.36 Infrastructure. The shopping centre, top, and school, above were actually put up.

Author.

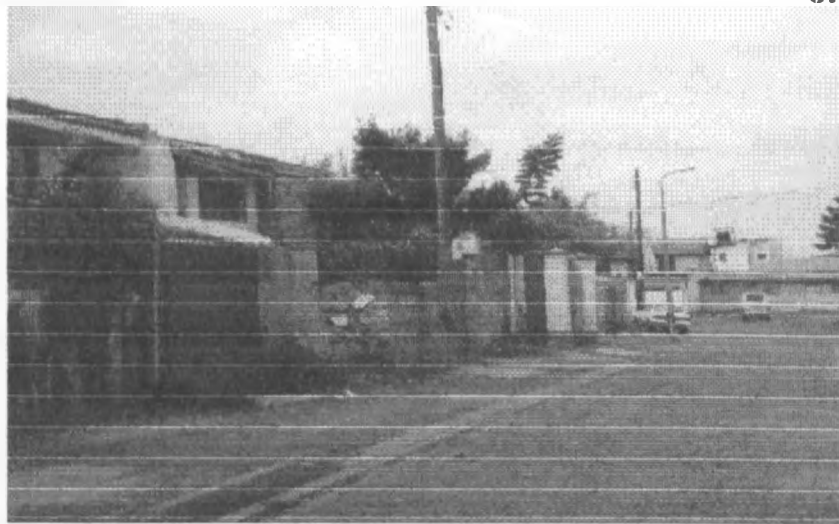


Fig 3.37 Defensible Space. The environment is such that it can easily be policed from within.

Author.

The layout of the estate enhances security because, as shown in figure 3.37, it can easily be policed from within.

The detailing enhances aesthetics as shown in figure 3.38 below. Notice the treatment of the fenestrations with recessing and different colours. The copings and staggered layouts too contribute to this.

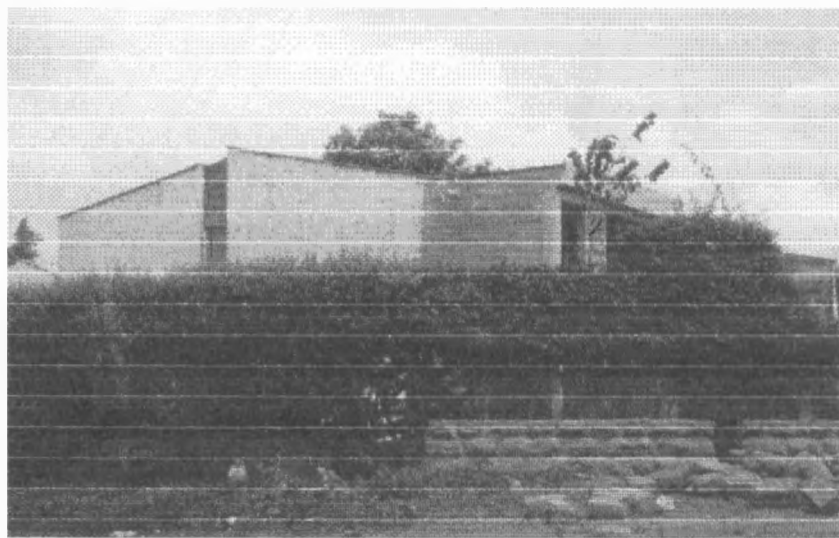


Fig 3.38 Detailing.

Author.

Further examination of the detailing (figures 3.33 and 3.34) reveals the wet areas especially the kitchens were well done making them easy to work in. The rendering on the walls externally also contributed to the aesthetics. The large windows allow sufficient lighting.

3.5 Ayany Housing Scheme.

This consisted of starter units. Here the purchaser would buy a core unit consisting of the wet areas and one room. A further two rooms could then be done in future when the buyer was able to. The Entire scheme was sold off on Tenant Purchase terms. The scheme was done between 1977 and 1981. A part layout is shown on page 68 in figure 3.39.

3.5.1 Layout, Dwelling Type, Imagery.

Figure 3.39a below shows the typical floor plan.

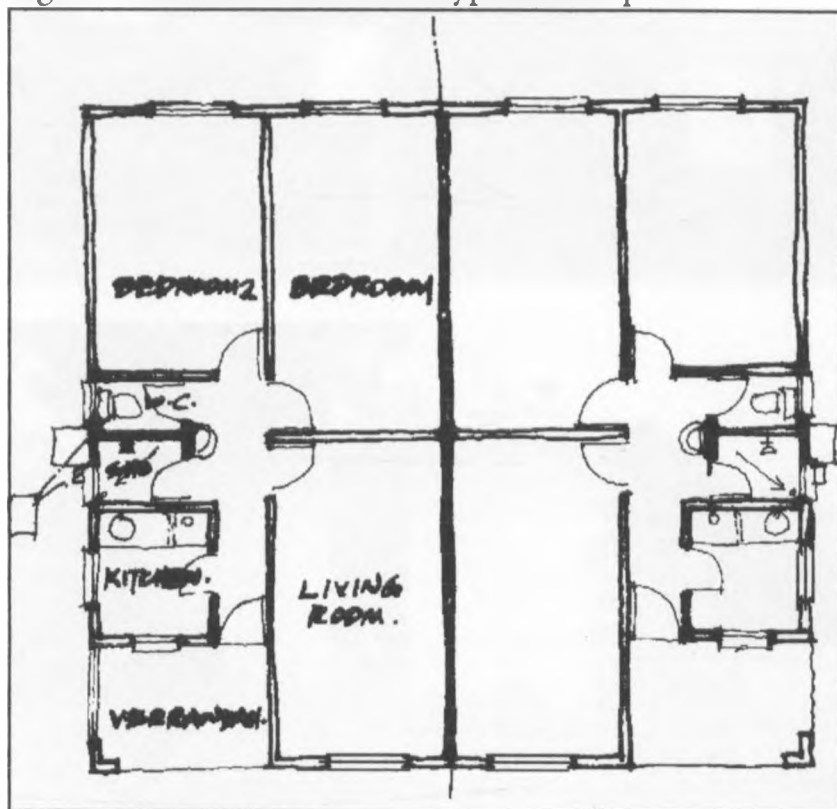


Fig. 3.39a Typical Floor Layout.

Author.

The w.c., bathroom and one room would be built by NHC and a plan of the possible extension given to the purchaser who would in turn put up two more rooms to achieve a two bedroomed self contained house with a verrandah at the end of the day.

The other option was to put up the living room and wet core leaving the other two to the purchaser.

This method of housing has proved very affordable to the many lower-middle income earners.

Figure 3.40 on page 64 shows a typical core unit in the

Ayany area J on the top photograph. The middle and bottom photographs show a core unit and one that has been completed by the purchaser respectively.

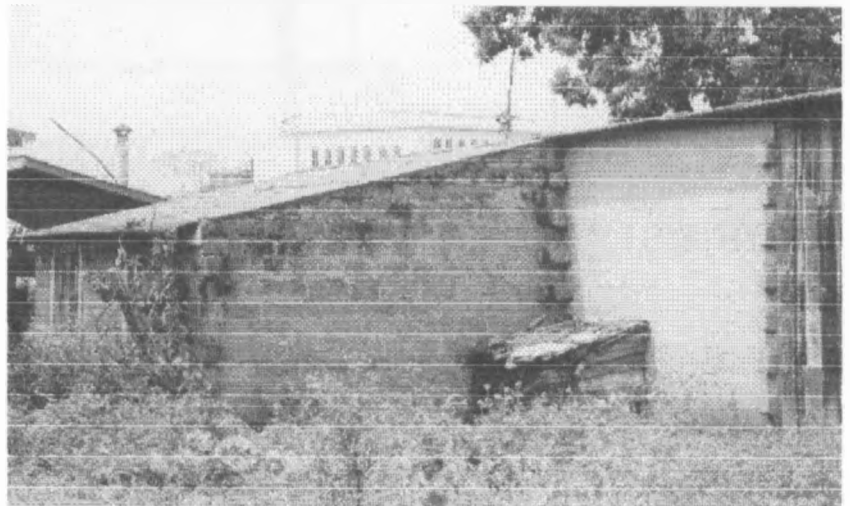
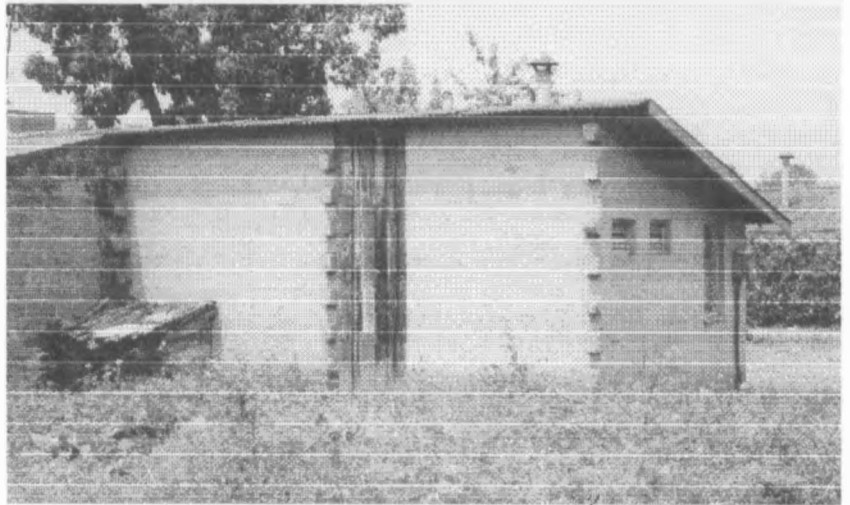
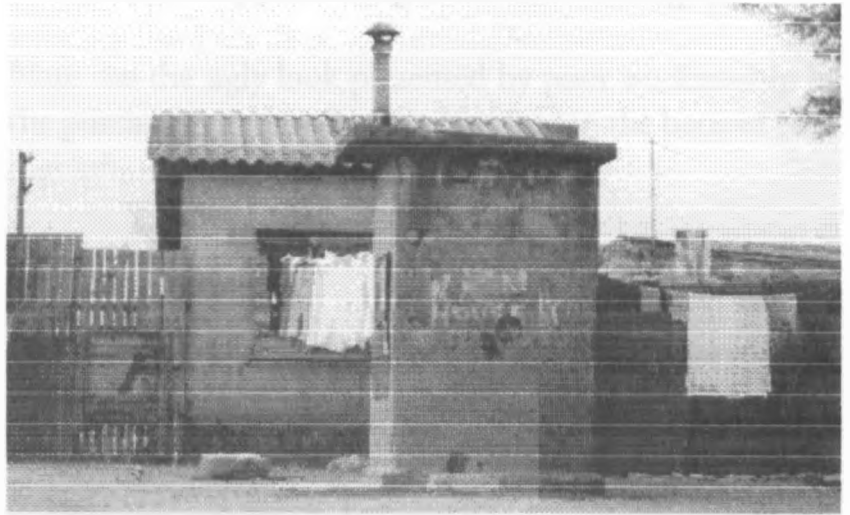


Fig. 3.40 Core Unit in Area J of Ayany, top, another type of core units, middle, and a house completed by the owner, above.

Author.

Figure 3.41 below shows the imagery presented by the Ayany scheme in general. The asbestos roofs are conspicuous. The walls have plaster and paint and the chimneys are metallic flues giving the houses a character of their own. Notice how the use of Kie-apple fencing enhances the imagery.

Note too the ugly look presented by poor workmanship by the purchasers as they do the extensions in the bottom photograph.

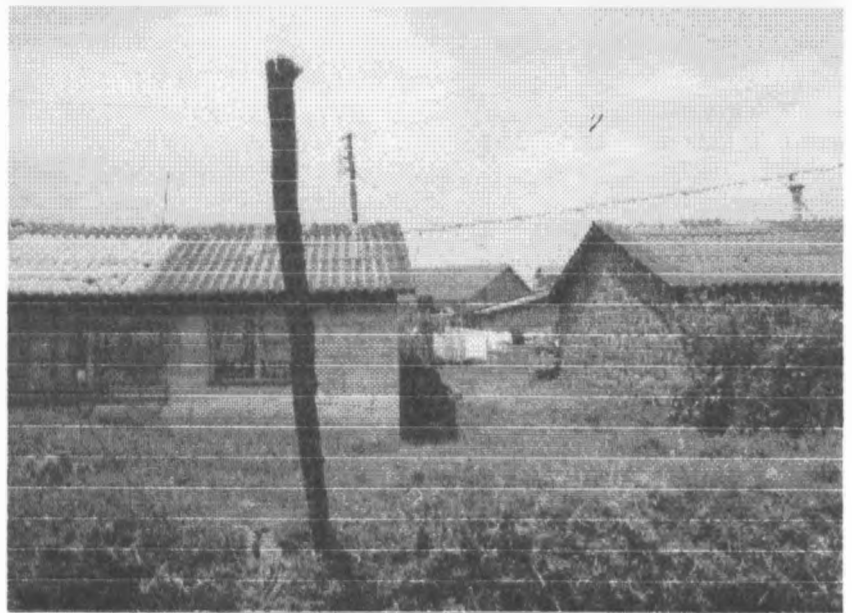
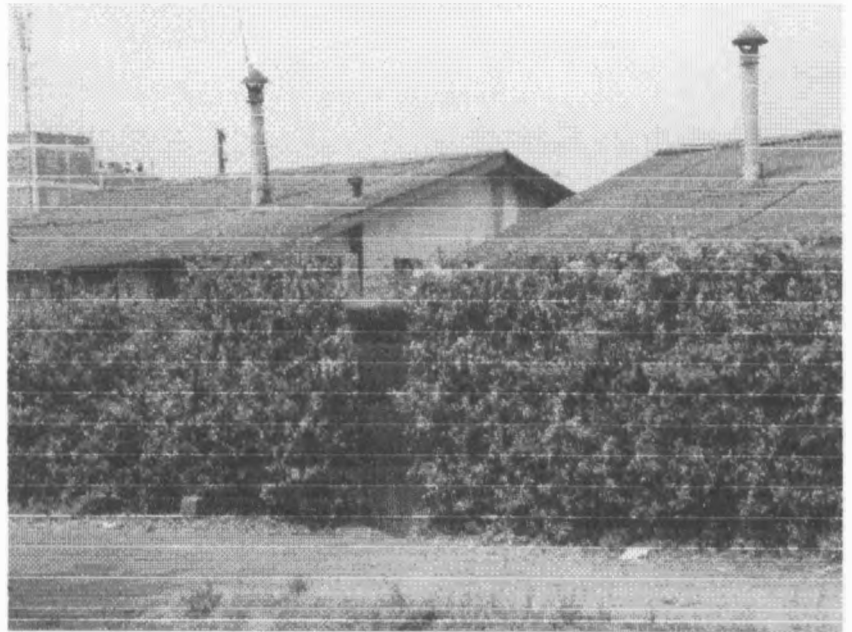


Figure 3.41 The Imagery of Ayany Estate. Asbestos roofs and metallic chimneys, top, finishing by purchasers does not match that of the original units done by NHC, above.

Author.

3.5.2 Occupancy and Activities.

Many kiosks and other informal businesses have mushroomed along the streets of the estate. They include general shops, groceries, barbers, cobblers, salons, cafeterias and communication bureaus as evidenced in figure 3.42 below.



Fig. 3.42 Activities.

Author.

Here a larger percentage of the purchasers actually leave in the houses. They have over time put up extensions behind the main houses that they let to supplement their incomes. Many of these extensions have ended up being larger than the original houses! Some have even gone highrise.

The dominating trend therefore is the owners of the houses live in the main houses whereas the extensions are let out. A few landlords have however let their main houses.

3.5.3 Adaptability.

The layout already discussed in figure 3.39a shows a floor plan that can be adapted to be:

- *A three roomed house or
- *A two roomed house or
- *A one roomed house.

The compound also offers the opportunity to do an extension behind it making it flexible.

The scheme was therefore designed to cater for a wide spectrum of income earners.

3.5.4 Services, Infrastructure and Detailing.

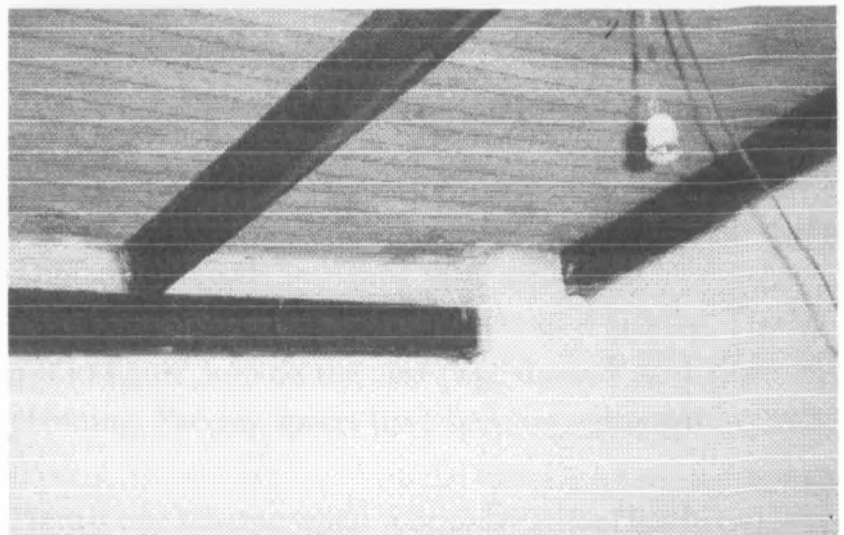
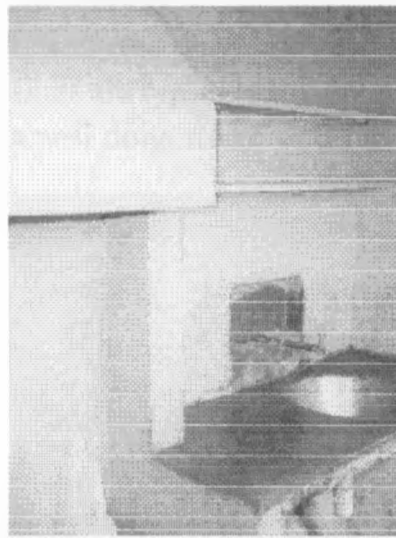


Fig 3.43 Detailing. Clockwise from top, Metallic chimney hood, w.h.b. outside the wet area and exposed roof structure showing the asbestos roofing and wiring.

Author.

Figure 3.43 on the previous page shows some of the details used at Ayany. They are briefly discussed below.

The metallic hood and chimney works well, and so does the round stainless steel sink mounted on an r.c. worktop. The surface piping in the bathroom has attendant problems of rust though they are easier to maintain that way.

The asbestos roof however has maintenance problems since asbestos easily cracks and is no longer being manufactured. Though the absence of a ceiling makes the units cheaper to construct and hence more affordable, they make the house look 'cheap' and lower the aesthetics.

All services are provided for namely: water, storm drains, sewer, electricity and telephone. The mushrooming extensions are however stratching these. Figure 3.44 below shows a well done storm drain in area J.



Fig 3.44 Storm Drains.

Author.

Though the roads in Ayany were well done, maintenance by the city council as in other schemes is lacking. The layout in figure 3.45 on the next page shows well thought out planning. Parking spaces have been incorporated.

Here is one scheme where a primary school has been incorporated in line with the council by-laws. Figure 3.46 shows this, on the next page. Here we see a church too on one of the open spaces that was allocated to it.

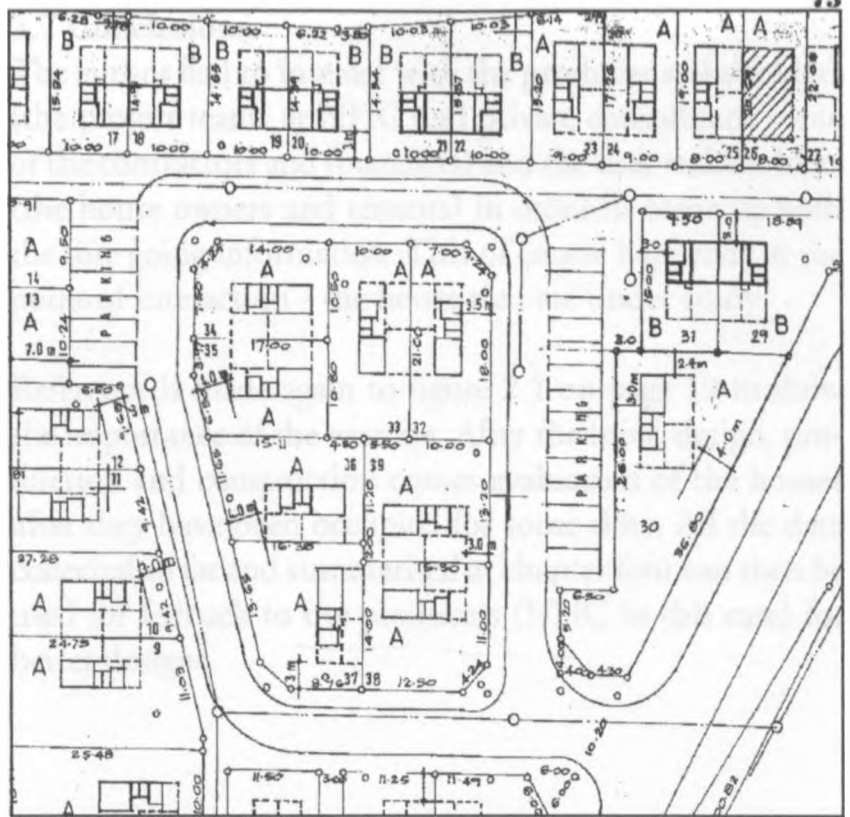


Fig 3.45 Storm drains, sewer lines, waterlines, telephone and electrical services all go along the tarmac road.

NHC/Author.

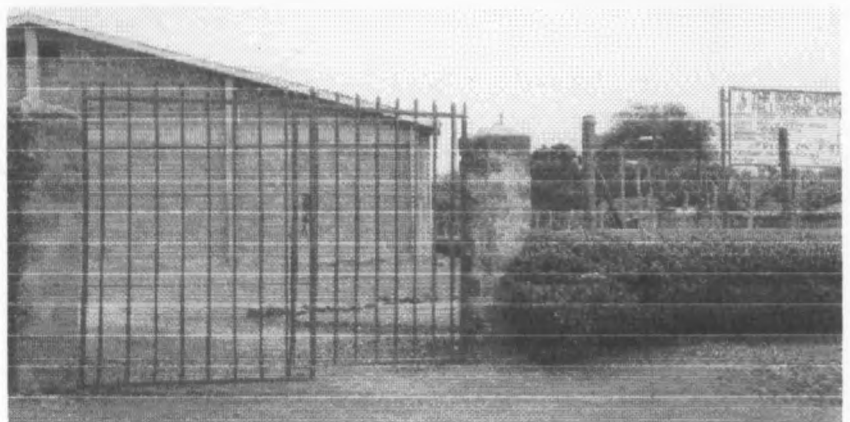
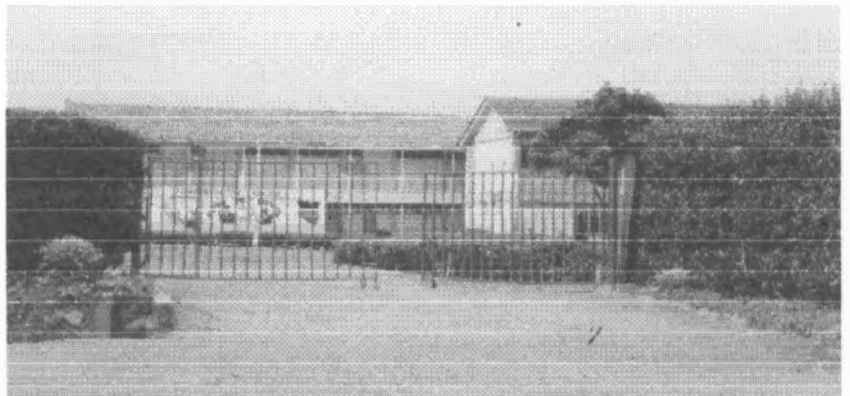


Fig 3.46 Other infrastructural services - School, top, and Church, above. These are welcome services for a comprehensive housing scheme. They also serve to prevent unwanted constructions in the open spaces.

Author.

3.7 Conclusions.

The author had to interact with the **producer stakeholders** (the project teams at NHC and private consultants, some of the contractors and financiers) and the **user stakeholders** (the house owners and tenants) in order to come up with the fore going information. This of course happened at the point of interaction - the house that are under study.

Reference is made again to figure 2.1 on page 19 to show the importance of the exercise. After the brief, design, production and construction comes **evaluation** of the houses after they have been occupied for some time. All the data collected so far and summarised at chapter four can then be used for feedback to the producers (NHC in this case) for better designs.

CHAPTER

4

4.0 Introduction.

As already stated in chapter three, the data collected was aimed at arriving at an evaluation that will link the **producer** and **user** stakeholders in the housing industry for NHC. This information will be useful in addressing the **mismatch** between the **designer-intentions** and the **user-needs or reactions**, as stated earlier.

The author concentrates on **architectural design** and **urban planning** issues, and summarises the findings below. This summary takes into account the different **scale levels** and the criteria set out at the beginning of chapter three is borne in mind as the twin issues of **spatial articulation** and its **inhabitation** are focused on.

4.1 Designer Intentions and User Reactions.

Four case studies done by NHC in the Kibera area were studied and the designer intentions and user reactions can be summarised in the four categories namely:

- a). Karanja Road Housing Scheme.
- b). Fort Jesus Housing Scheme.
- c). Olympic Housing Scheme.
- d). Ayany Housing Schemes.

These designer intentions have been extracted from the designers both within and without NHC, and from the author's deductions. The user reactions are from the FGI's and the author's data collection previously described. They are as follows.

a). Karanja Road Housing Scheme.

Refer to figure 3.4 on page 36 and figure 4.1 on page 78. Designer intentions can be summarised as follows:

1. Settlement Level.

- * To settle the Nubian community especially after World War II provide living quarters for workers with the Kibera drive being the main circulation spine.
 - * Access roads done in tarmac but internal roads and open spaces/parkings done in murram.
 - * Neighbourhoods were 'open' and the dwellings were generally interspersed with open spaces for recreation.
-

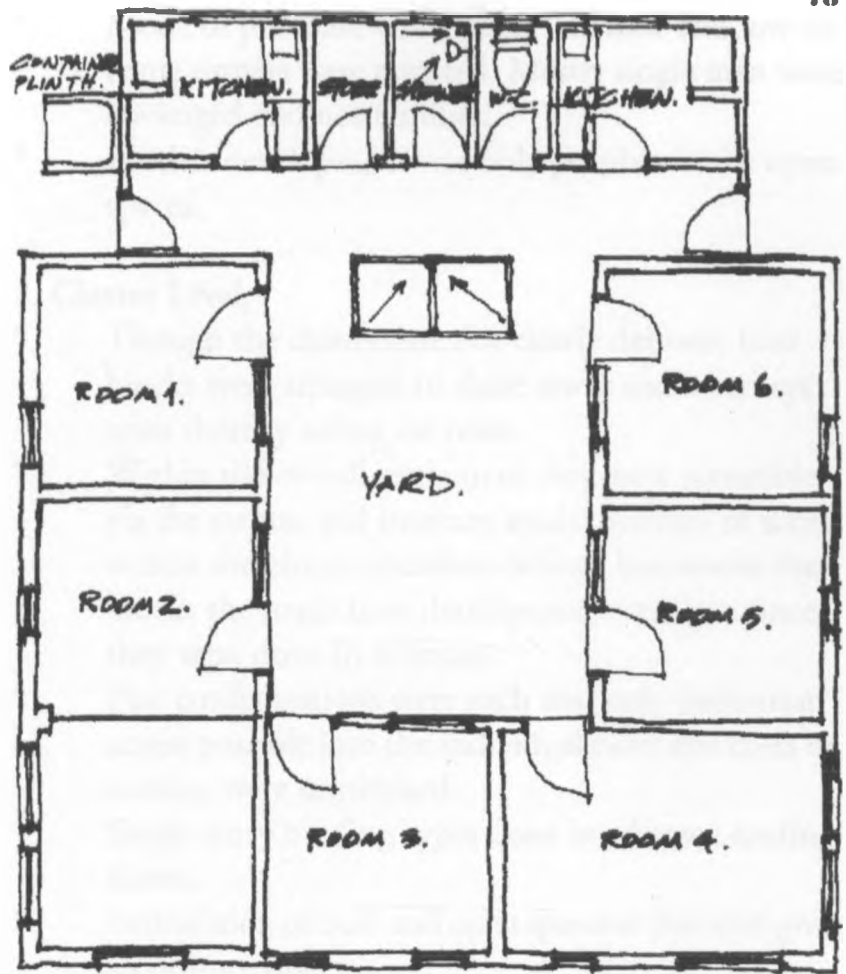


Figure 4.1 Typical Floor Plan of the Karanja Road Houses.
NHC/Author.



Figure 4.2 The Karanja Road Courtyard.
Author.

- * Mode of purchase was Tenant Purchase and low-income earners were targeted. Mostly single men were envisaged and not families.
- * Further development was only possible in the open spaces.

2. Cluster Level.

- * Though the clusters are not clearly defined, four blocks were arranged to share sewer and water systems thereby saving on costs.
- * Within the overall settlement they were accessible via the tarmac and murrum roads. Systems of access within the blocks therefore defined but nearer the blocks the roads have deteriorated over time since they were done in murrum.
- * Plot configurations were such that only pedestrian access possible into the individual plots and costs on services were minimised.
- * Single story building types done in asbestos roofing sheets.
- * Articulation of built and open spaces at this level gives a porous tissue.
- * Functionally, most of the development is dedicated to residential use.

3. Dwelling Level.

- * The courtyard principle used with the single rooms articulated around the courtyards, to capture the community life envisaged and the Islamic religion predominant at the time of design.
 - * Single rooms with shared wet areas were done to discourage the build up of African families and to house the men who worked in the industries.
 - * Part of a large number of blocks in the cluster and settlement level making densities high. Refer appendix 3.
 - * Stone walls, plaster and paint finishes, steel rafters, cast iron s.v.p.'s and cisterns.
 - * Tenant Purchase with the view that the owner could sublet the individual units.
 - * At unit and block level, no further extensions or developments envisaged. Despite this, provision made for further development in the open spaces.
-

Refer to figure 4.2 on page 78. The user reactions could be summarised as follows:

- * The concept of subletting is welcome.
- * The courtyard ensures security especially for children.
- * The rooms should however be self contained to help contain the problem of toilets that are not well kept.
- * The courtyard is crowded. There should be provision for cloth lines and maybe fewer rooms.
- * Common kitchens do not work. They are only used for such things as dish washing as actual cooking takes place in the rooms. A kitchenette in each room could be the answer.
- * One entry point is more desirable for effective policing of the courtyard by the occupants.
- * Level of finishes for roads in the estate (murrum) not popular. Facilities like schools, nurseries needed.

b). Fort Jesus Housing Scheme.

Figure 3.14 on page 46, figure 4.3 below and figure 4.4 on page 81 refer as this scheme's findings are summarised. The designer intentions can be summarised as follows:

1. Settlement Level.

- * Within the urban fabric, scheme positioned adjacent

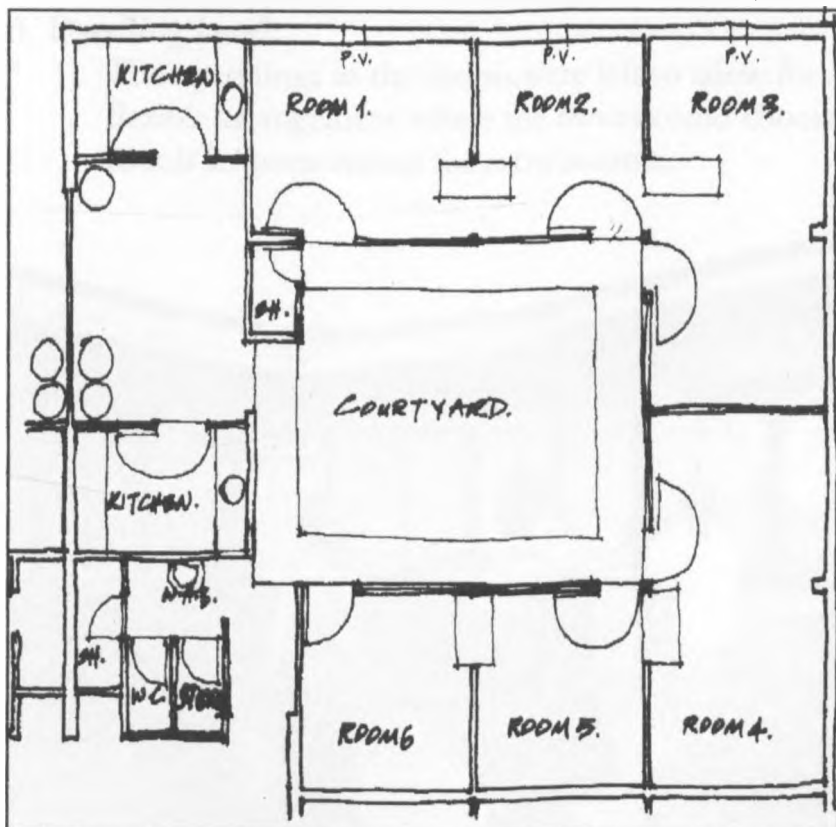


Figure 4.3 Typical Floor Plan for the Fort Jesus Houses.

Author.

- * Kibera drive main system of circulation with all other roads within the estate radiating from it. Services like electricity, telephone, sewer and water mains follow this system.
- * The roads all done in tarmac within and without the estate this time around.
- * Low income earners targeted and this time a mortgage housing scheme.
- * Generally forms a very dense urban tissue with with a mixture of open and built up space both within and without the courtyards. Articulation of private and public spaces clearly done.

2. Cluster Level.

- * Many blocks sharing walls and around open spaces which allow for parking, playing areas and porosity.
- * Single storey building types with felt roofing initially, plaster and paint to the walling, gives the general imagery.
- * Circulation around the blocks both vehicular and pedestrian.
- * plot configurations give a dense feeling.

3. Dwelling Level.

- * The openings in the rooms were left to allow for a flexible arrangement where the owner could choose to sub let some rooms for extra income.

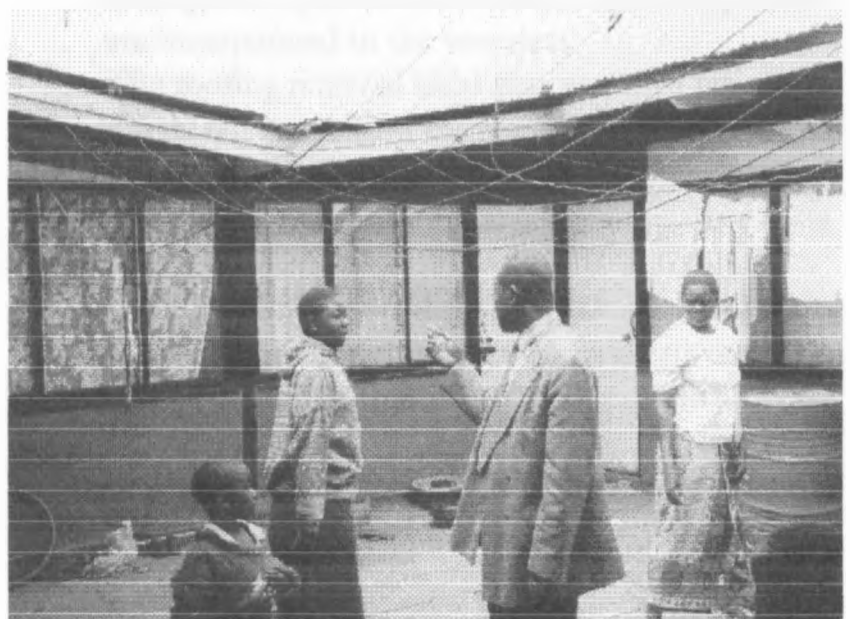


Fig 4.4 The Crowded Courtyard of Fort Jesus.

Author.

- * The wet areas were now located such that they were 'hidden', for privacy.
- * The courtyard was given a completely introverted nature to reflect the Islamic community for whom it was being designed.
- * Large windows provided for more lighting and ventilation, a lesson learnt from Karanja Road.
- * More showers and w.c.'s per court also a lesson learnt from Karanja Road.
- * Provision of dustbin cubicles to keep the waste outside as opposed to inside for hygiene.
- * Minimal construction costs due to shared walls and services.
- * Largely concrete permanent vents on external walls to make it 'introverted' in nature to kill informalism around the blocks.
- * V-shaped valleys to give character to the blocks.

User reactions are as detailed below:

- * The concept of allowing the owners/tenants to be able to sublet rooms is popular. The fact that walls have opennings to allow for someone to use the whole block should the need arise is also popular.
 - * Privacy for the wet areas is more appreciated here though the kitchens are not use for cooking just like in Karanja road.
 - * The courtyard is crowded and full of clothlines. The users prefer a provision for cloth lines and splash areas incorporated in the wet areas.
 - * The roofing material (felt) that was used was not durable or suitable for the Nairobi weather. A lot has had to be replaced.
 - * The roof if ever leaking making maintenance costs high.
 - * It is a good thing that there is no informalism around the blocks. However, those who own cars or are visited by motorists find it hard to keep watch over their vehicles.
 - * It is better to have especially the large rooms self-contained. This allows for subletting without fear of sharing the toilet facilities. Kitchennetes too are to be preferred to the communal kitchens, as all cooking takes place in the houses anyway.
-

- * The fact that there is one entry/exit point is good for security reasons.
- * Metallic window seals were a good idea as they have lasted long. But the windows have had to be burglar proofed.

c). Ayany Estate.

This was a scheme where starter units were used and the purchasers would complete them according to plans given by NHC. Figure 3.39 on page 68 and figure 4.5 below refer. Design intentions were as follows:

1. Settlement Level.

- * A more porous feeling unlike the schemes previously discussed. Again the Kibera drive is the main giver of circulation and with vehicular and pedestrian circulation radiating from it, as well as linking it to the other schemes and the city.
- * Tarmac roads, telephone, electricity, sewer and water mains along the roads.
- * Larger open spaces and provision for other infrastructural support like school and community facility.
- * Low to middle income groups targeted.

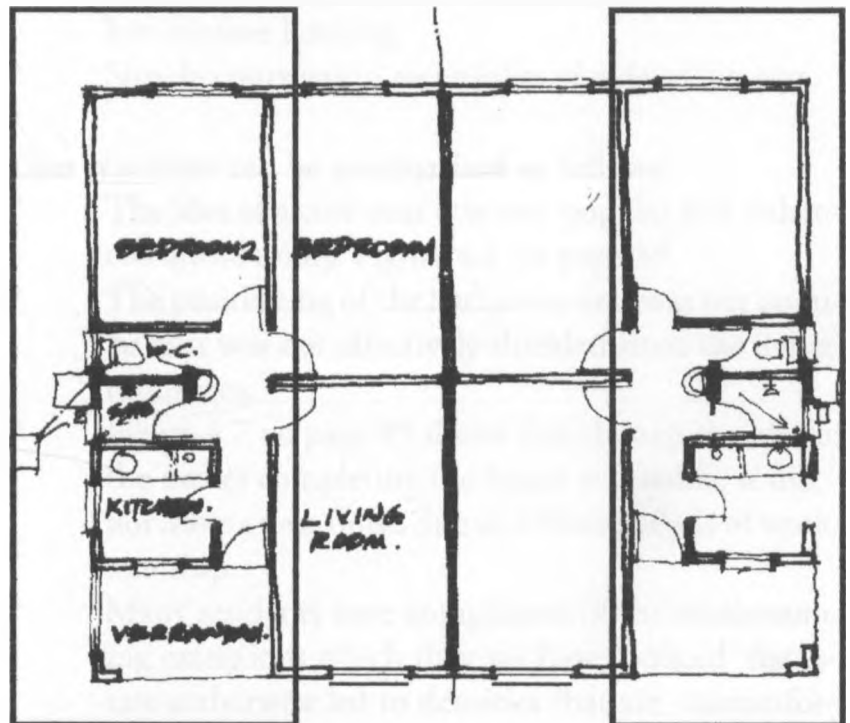


Fig. 4.5 Typical Completed Floor Plan in Ayany Estate. The area in the box would first be done then the completion would come later, by the owner.

- * Mixture of functions - residential, school, community facility and nurseries.

2. Cluster Level.

- * Systems of access clearly defined in the road network.
- * Plot configurations such that vehicular traffic is accessible to every plot.
- * Public and private spaces done consciously to achieve a comprehensive housing scheme. This articulation gives a porous urban tissue.
- * Single storey building types in own compounds have led to individual fencing giving a particular character.
- * Open spaces were left for playing grounds and parking. This left the scheme with a good porous feel.

3. Dwelling Type.

- * The kitchen, w.c., shower and bedroom were done by NHC and the purchaser would do two more rooms. The plots provided were however large enough to provide for other extensions.
- * The construction was simple to allow for affordability. Simple chimney flues, round sinks in r.c. worktops, separate w.c. and shower compartments in line with low income housing.
- * Simple construction techniques and detailing sort.

User reactions can be summarised as follows:

- * The idea of a core unit was very popular as it enhanced affordability. Figure 4.6 on page 85.
 - * The positioning of the bathroom area was not popular as it was not effectively shielded from the living room area.
 - * Figure 4.7 on page 85 shows that though the idea of the owner completing the house was noble, it did not leave a neat finish due to differing levels of workmanship.
 - * Many residents have complained of the mushrooming extensions which they say have 'defaced' the estate otherwise led to densities that are uncomfortable. These transformations are not welcome though they are income generating projects to those who do them.
-

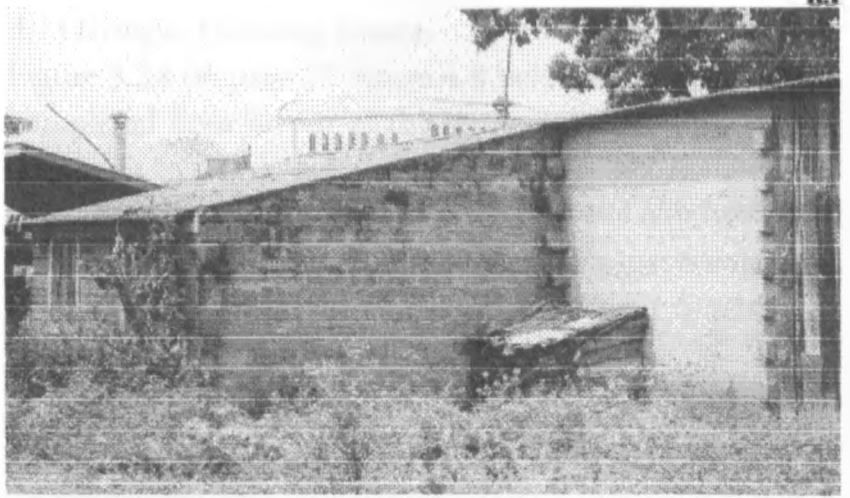


Fig. 4.6 A Core and Completed Unit.

Author.

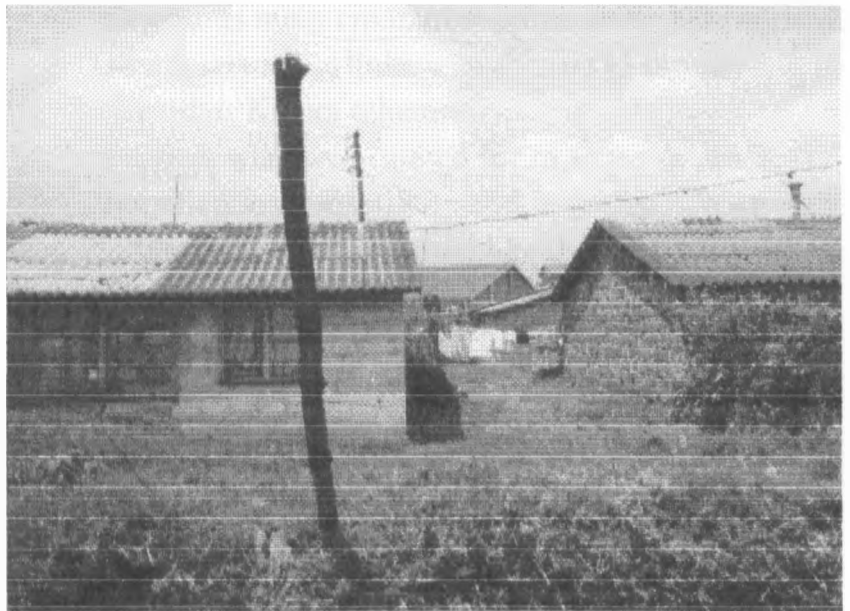


Fig 4.7 The structures done by the purchasers seldom marched the NHC standards.

Author.

- * Users decried the construction of flats which were not only ugly, they also intruded on privacy.
- * Any Primary School was a good idea but maybe more schools or nurseries should have been provided.
- * The roof detail is ugly according to most users as the rafters and asbestos roofs are exposed.
- * Kitchens should have been more generous.
- * User reaction indicates that some sort of fencing should be provided to avoid the different types of fencing being done.
- * There was a desire for better organised clusters to provide for privacy and security.

d). Olympic Housing Estate.

Figure 3.24 on page 55 figure 4.8 below shows the Typical completed floor layout of this project that was interesting because it was a **self-help** housing scheme. The owners were required to contribute to the labour, especially unskilled. NHC would provide skilled labour and supervision. This made the deposits required for downpayment much lower thereby enhancing affordability.

Notable designer intentions are as follows:

1. Settlement Level.

- * The scheme is well positioned within the urban fabric and its main circulation spine is the Kibera drive which serves as a linkage to the rest of the city and to the other Kibera schemes.
- * Services were well catered for in terms of roads, water, telephone, electricity and sewerage. Other infrastructural amenities like the Olympic primary school in place, with the articulation of built and unbuilt forming a porous urban tissue.
- * Densities not as high as in the Fort Jesus and Karanja road schemes.
- * Low and middle income categories targeted.

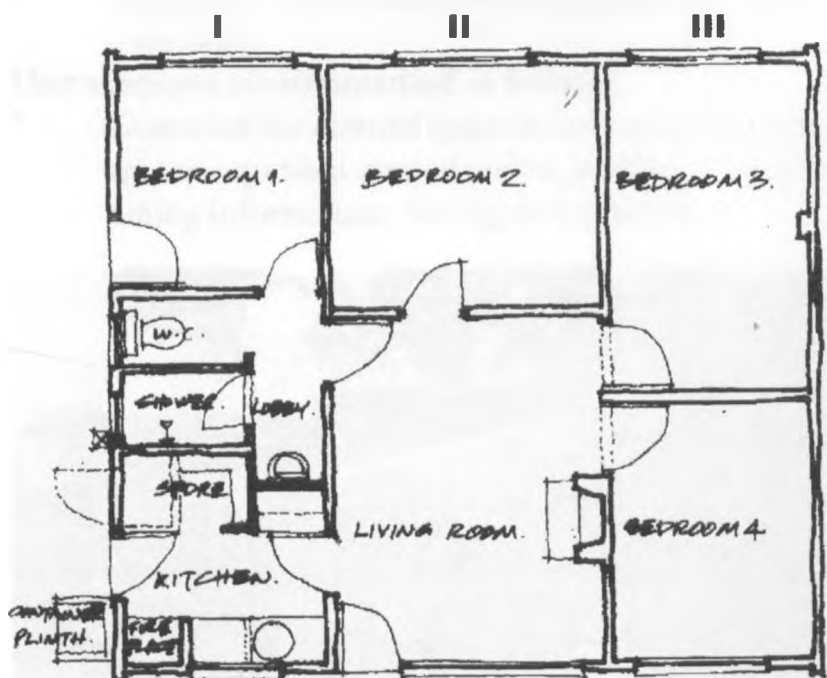


Fig 4.8 Typical Floor Plan. Could be done in three phases.

NHC/Author.

2. Cluter Level.

- * Olympic used a inear arrangement with no conspicous clusters. The units however arranged such that they can share services to lower construction costs.
- * Roads done in tarmac and the external parking spaces well done though not maintained.
- * Articulation of residential and communal funtions well spelt out with buiding types all single storey origi nally.
- * Plot configurations such that they are accessible by vehicles and pedestrians.
- * Simple construction technologies employed this be ing a self help scheme.

3. Dwelling Type.

- * NHC did the wet areas, two bedrooms and the livi- ng room, with the help of the owner. The other two bedrooms could be done later as per the plan.
- * Bedroom 1 was such that it could be sublet hence the provision of an external door.
- * There was provision for doing two more more bed- rooms.
- * The store had both internal and external storage, and there was a container plinth for dusbins outside the kitchen.
- * Simple detailing was used to facilitate the use of un- skilled labour under supervision.
- * Shared sewer and water lines to minimise infrastruc- tural costs.

User reactions are summarised as follows:

- * Control of the external spaces is not easy as the houses are not organised around courts, leading to mushro- oming informalism. See figure 4.9 below.



Fig 4.9 Uncontrolled External Spaces.

Author.

- * The mushrooming uncontrolled extentions have lowered the aethetical value. See figure 4.10.

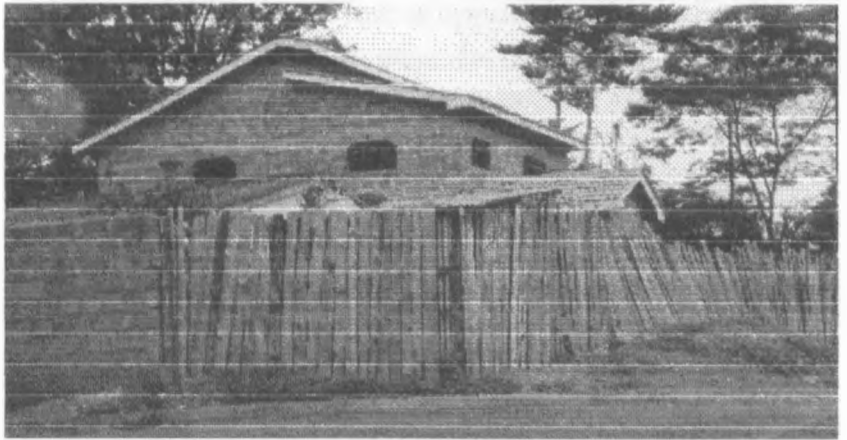


Fig 4.10 Uncontrolled Extentions.

Author.

- * The roads are in a deplorable state at some points, although this can be blamed on the Council for not maintaining the after taking them over.
- * Most owners feel that the letable bedroom should have been self contained to facilitate privacy.
- * The living room chimney is misplaced.
- * In terms of affordability, the self-help measures taken were laudable.
- * Residents are generally happy with the provision of a primary school and shopping centre which are missing in most of the earlier schemes.
- * Most decried the size of the kitchen.

Some of these issues were addressed in the construction of the Olympic Maisonnettes where plots were provided just for the houses and necessities. Here too the houses were organised in courts making surveillance easy. Figure 4.11.



Fig 4.11 Olympic Maisonnettes.

Author.

Olympic Maisonnettes.

Refer to figure 3.32 on page 62, figure 3.33 on page 63 and figure 4.12 below. Here as opposed to the earlier Olympic scheme, maisonnettes were developed and it was a Tenant Purchase scheme.

1. Settlement Level.

- * Linkage to the city and other schemes provided by the Kibera drive, which articulates the main circulation spine, that also supports the services.
- * Space articulation gives a very formal look that is broken by the staggered houses. A healthy mix of public and private space giving a porous urban tissue and a balanced articulation of functions.
- * Provision of other infrastructural support like shopping centre and school.

2. Cluster Level.

- * Well done tarmac roads and services. Plot configurations ensure that transformations are minimised at



Fig 3.36 Infrastructure. The shopping centre, top, and school, above were actually put up.

Author.

- * Here for once the cluster layout considers a system where the residents can organise their spaces into more organised and managed units.
- * The maisonnettes present different scenic views which is a welcome deviation from the previous schemes under study.
- * Articulation of public and private space, and functions evidently more considered.
- * Middle income category targeted.
- * Open spaces built up thereby minimising transformations.

3. Dwelling Type.

- * Use of interesting fenestration treatment to create aesthetic facades.
- * Compact internal space articulation making land use intensive and thereby lowering construction costs and enhancing saleability.
- * Standard building processes and detailing.
- * Greater dwelling capacity.
- * Shopping centre serves the residents to ensure a comprehensive housing scheme.

User reactions included:

- * A liking for the plot configuration that ensures no transformations in terms of extensions.
 - * The location of the shopping centre in the middle of the estate not popular due to the fact that it brings in many 'intruders'. Many preferred for it to be at the entrance to sieve out non residents.
 - * The room sizing a little small and lack of an entry porch and/or verandah was a glaring omission.
 - * Aesthetics of the scheme were lauded as appropriate.
 - * Intensive land use lauded.
 - * Most residents preferred a courtyard layout at cluster level to provide outdoor spaces that can easily be watched and managed by the residents.
 - * Larger families expressed a desire for three bedroomed units and/or designs that could be altered to accommodate an extra room.
 - * A self contained master bedroom was a preference for yet another group.
-

4.2 Conclusions.

The foregoing gives the scenario of the designer intentions vis-a-vis the user reactions. It must be noted that the National Housing Corporation (NHC) and the then Central Housing Board (CHB), always had mechanisms in place to do feasibility studies before commencing projects. The approach was generally practitioner and sociological in nature. NHC even used to have sociologists on its staff. Some projects had the benefit of a user reaction analysis. This has however died over the years leading to a severe mismatch between the designer intentions and the users. In short, between the **producer** and **user stakeholders**.

At this point the author would like to emphasize that the thrust, as mentioned earlier, is to address this mismatch between the designer-intentions and user reactions by creating a body of knowledge through this housing evaluation which then acts as a **link** between these groups, for better and more effective future designs.

CHAPTER

5

5.0 Introduction.

At this juncture the author would like to revisit the definition for the **housing evaluation** which was stated as:

the process of evaluating houses in a systematic manner after they have been occupied for some time, to provide insights into the consequences of past decisions and the resulting housing performance. This knowledge forms a sound basis for creating better buildings in future.

This definition can be broken down into the following four parts:

1. **Evaluation** of houses in a systematic manner after they have been **occupied for some time**.
2. Provision of insights into **consequences of past decisions**.
3. The resultant **housing performance** and
4. Creating thereby a body of knowledge that forms a **sound basis for creating better buildings** in future.

In order to address the mismatch earlier alluded to, one has to go through the stages stated above, as has been done in the case studies at chapter three.

As already shown in figure 2.1 on page 18, the evaluation basically aims at:

- *gathering data,
- *analysing it and
- *communicating it.

All this so as to **feedback** those who make **briefs** for new projects in NHC. By this a **link** is established between the producer stake holder and the user stakeholder. This link is the key to addressing the mismatch between the designer intentions and the users reactions.

These techniques work for other building types and organisations too. They are therefore recommended for other projects although here they apply to the housing situation and only as done by NHC.

5.1 Conclusions and Recommendations.

The following quote aptly gives a conclusion the way we view users:

If you ask me what it takes to be a member of a party exploring the continent called design, you'll get a description of the strange creatures one encounters on the way and the strange geographies one has to feel at home: a story about the hostile regions of regulatory processes, the frightening herds of other peoples's values, the shifting sands of time, the weird animal called change, and finally, the unknown tribes of users...

(John Habraken, "Notes of a Traveler")

Consider this one too:

A healthy growing society will always have a housing problem. If I ever met a society that claimed to have solved all its housing problems, I would look at it with great suspicion and conclude that it must be in a worrying state of decline.

(Otto Koenigsberger, "Intentions of Housing Policy Alternatives")

Although it is not possible to solve all our housing problems, we can contribute by making our nation and city a better habitat. Partly in learning from our mistakes and making better decisions for the future generations.

The author hereby prescribes the following conclusions and recommendations for NHC and any other agency or private individuals involved in housing. These are derived from the foregoing case studies, from archival materials and from best practices.

1. A **participatory** and **all inclusive** design process must be strived for all the time for better results. As Jefferson, T (1820) stated: *I know of no safe depository of the ultimate powers of society, but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion.* NHC must involve those it is designing for right from the word go through established mechanisms for better results. The sociological and practioner approaches earlier described would do well.
-

2. **Enablement.** This is giving power to or making adequate or proficient the people being designed for. It is not about philanthropy but empowering the user. This makes design more relevant and the end result is a scheme that meets user needs. *Participation without enablement is like trying to drive a car without fuel.* The enablement should be clear in building programmes, on sites, in buildings, in systems of management and most importantly, in financing.

3. **Defensible Space.** As Newman, O (1973) puts it, it is a model for residential environments which inhibits crime by creating the physical expression of a social fabric that **defends itself**. There are a lot of modifications in NHC schemes after the purchasers have taken over the buildings indicating little or no thought given for security and surveillance. This can be done by establishing territoriality in:
 - * Site Planning.
 - * Street Design.
 - * The individual units.

This gives the capacity of physical design to provide surveillance opportunities for residents and their agents. Figure 5.1 below and 5.2 on page 79 illustrate this.

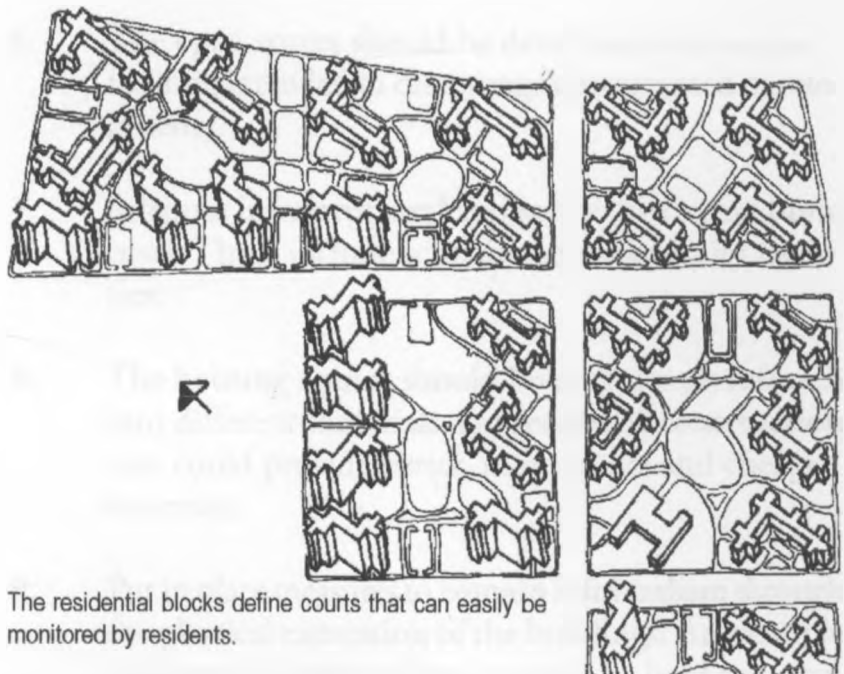
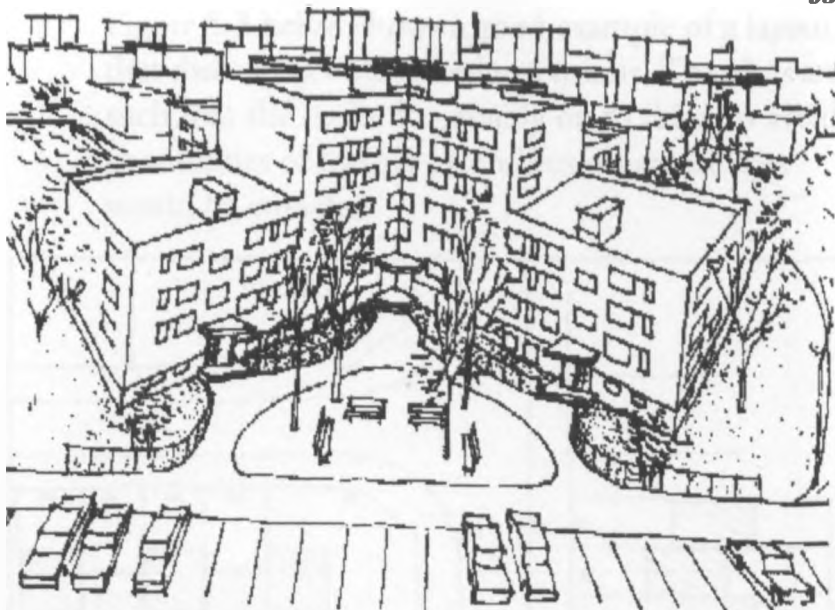


Fig 5.1 Defensible Residential Space.

From *Defensible Space* by Oscar Newman.



Here the building dispositions create triangular buffer areas which are used for play, sitting and parking. The areas are easily observed from the streets and from the windows of the flats. Entry from the street must be through this triangle.

Fig 5.2 Defensible Residential Space.

From *Defensible Space* by Oscar Newman.

4. **Sustainability.** Especially as far as the environment is concerned. Garbage collection, sewage disposal, imagery are all themes to be looked at critically in the designs.
5. NHC should be encouraged, as a feedback from this HE to provide small and adequate plots that **discourage extensions.**
6. The open spaces should be developed with actual facilities intended to **discourage unwarranted developments.**
7. Adequate **infrastructural support** to be factored into costs. These include schools and community facilities.
8. The housing agency should invest more on **research** into different **materials** and **modes of construction** that could provide better, more secure and cheaper materials.
9. Put in place measures to **contain informalism** through the physical expression of the buildings. An example is figure 5.2 above where it would be hard to carry out activities that the residents do not approve of.

Figure 5.3 below shows a good example of a layout that discourages unwanted extensions. The plots are such that the house fits exactly on to them to avoid possibilities of further extensions otherwise they would be crowded.

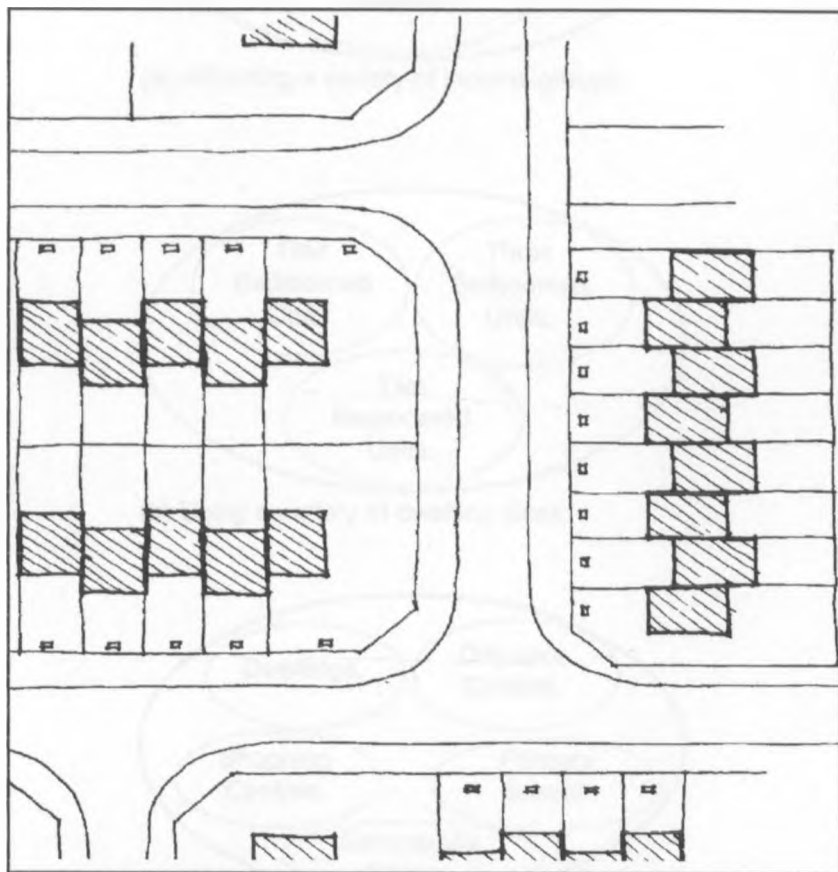
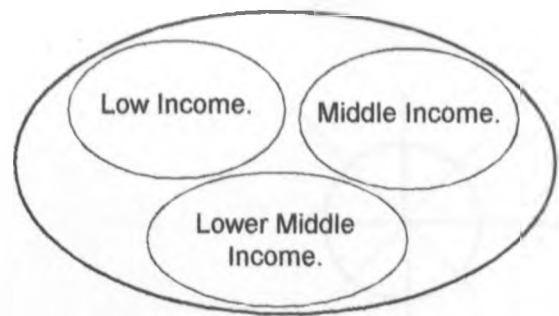


Fig 5.3 A layout that discourages unwanted extensions.

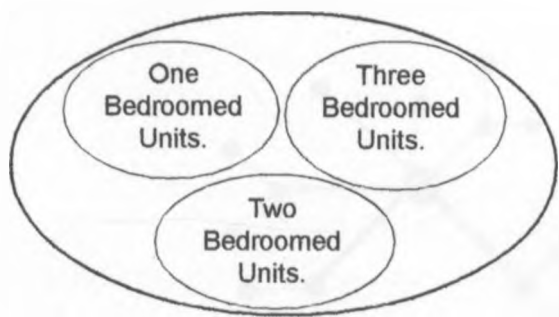
Author.

10. There is need for NHC to establish **user reaction mechanism** for all its schemes and develop a **data base** of appropriate **responses** for its technical team.
11. The design of **comprehensive** housing schemes should be aimed at. Figure 5.4 on page 92 serves to illustrate this point clearly. The scheme can be comprehensive in four ways:
 - * Having a variety of income earners,
 - * Utilising a variety of income sizes,
 - * Interdependence and
 - * Having a variety of building types.

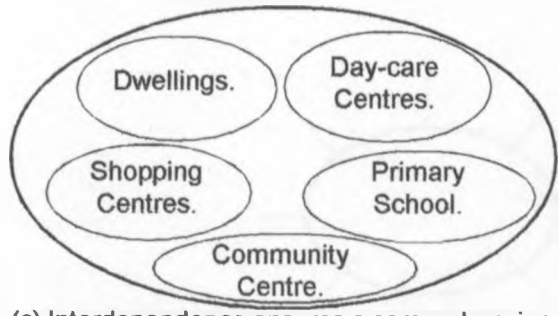
This ensures a self sustaining entity.



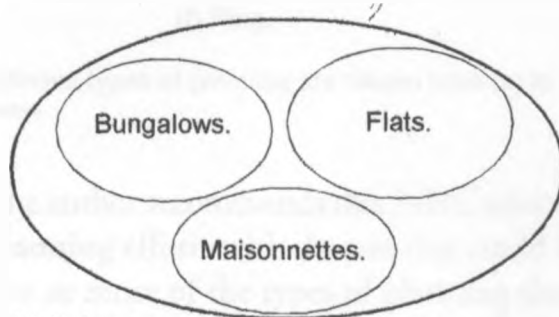
(a) Attracting a variety of income groups.



(b) Using a variety of dwelling sizes.



(c) Interdependence ensures a comprehensive scheme.



(d) Using a variety of building types.

Fig 5.4 A comprehensive housing scheme. Four ways of achieving it are shown from (a) to (d).
Author:

12. The use of different types of planning as suggested by Spreiregen (1965) could be used. These are illustrated at figure 5.5 on page 93.

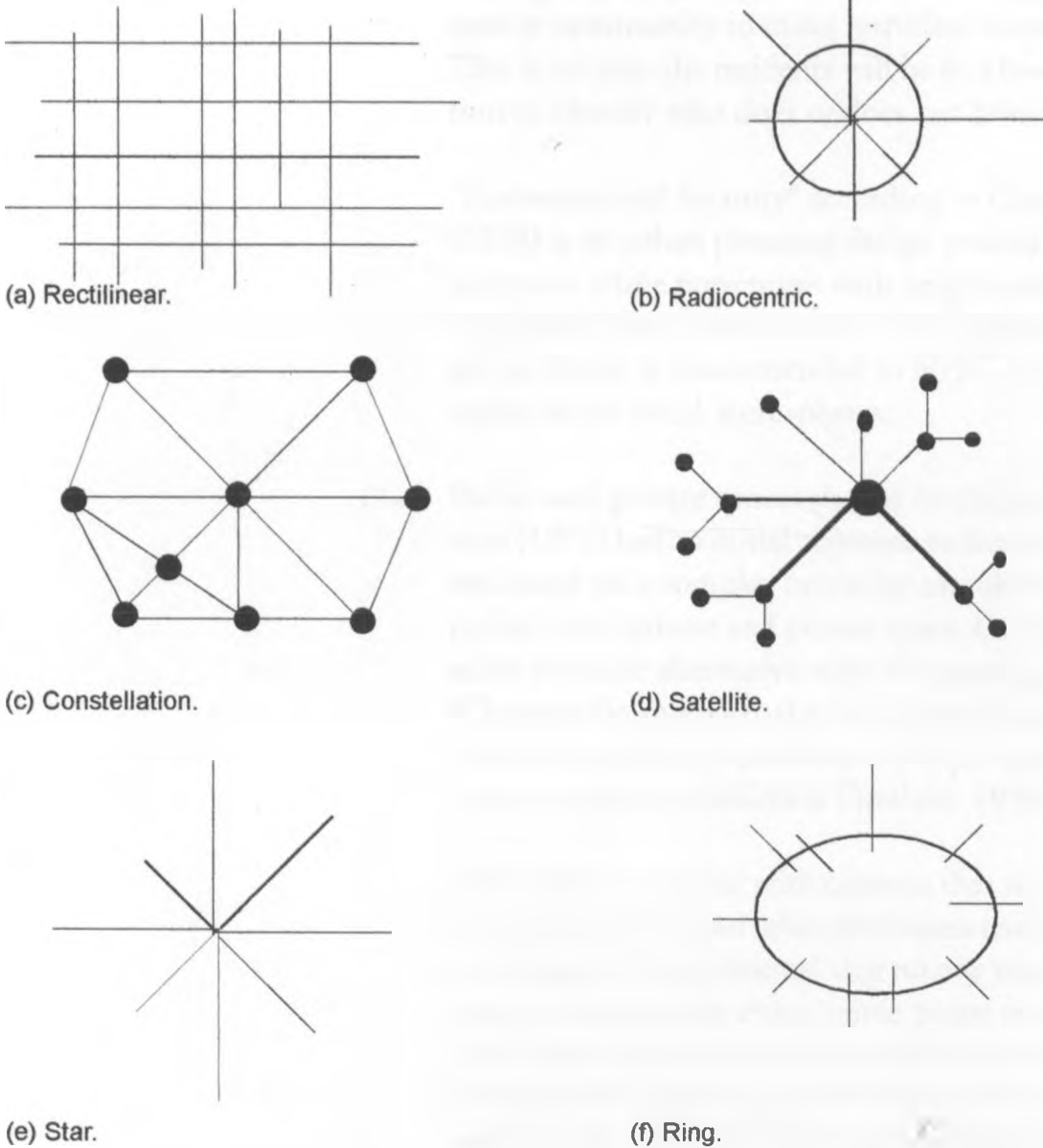


Fig 5.5 Different types of planning are shown from (a) to (f).
Author.

The author recommends that NHC adopts **conscious planning** efforts with themes that could be based on one or more of the types of planning shown above. This ensures order and more controlled developments.

13. **Neighbourhood design.** Stollard (1991) notes that the majority of researchers and practitioners favour the concept of **territoriality**, that is, the idea that people identify with, watch over and protect their own particular neighbourhood. The author concurs and

strongly recommends that NHC adopts the practise of designing layouts that foster a sense of **neighbourliness or community** to make intruders conspicuous. This is because the residents will be in a better position to identify who does or does not belong.

“Environmental Security” according to Gardiner (1978) is an urban planning design process which integrates crime prevention with neighbourhood design and urban development. This **holistic** approach to design is recommended to NHC, if only to realise better social atmospheres.

14. **Public and private spaces** should be distinct. Newman (1972) had an initial approach to security which was based on a complex heirarchy of public, semi-public, semi-private and private space. Other approaches advocate alternative ways of organising space. Whatever the approach, the importance for strict differentiation between public and private space is a matter of general consensus (Stollard, 1991).

The author has noted with concern that many layouts done by NHC and other developers tend to make public space “urban deserts” that no one uses or cares about, making them either crime prone or open for “grabbing” and therefore alternative and unwanted development. These spaces should be made more neighbourly, and should have visual **links** to the dwellings around them.

15. Organising dwellings in small **clusters** with their own manageable ‘owned’ spaces creates small identifiable neighbourhood units with limited public access. This ensures environments which encourage natural surveillance and self policing, as illustrated in figure 5.6 on page 95. These courts should however make entry to the dwellings more difficult for intruders and provide security for private areas, and safer car parks. Figure 5.7 on page 95 illustrates this.

All large schemes should therefore be organised into small clusters.

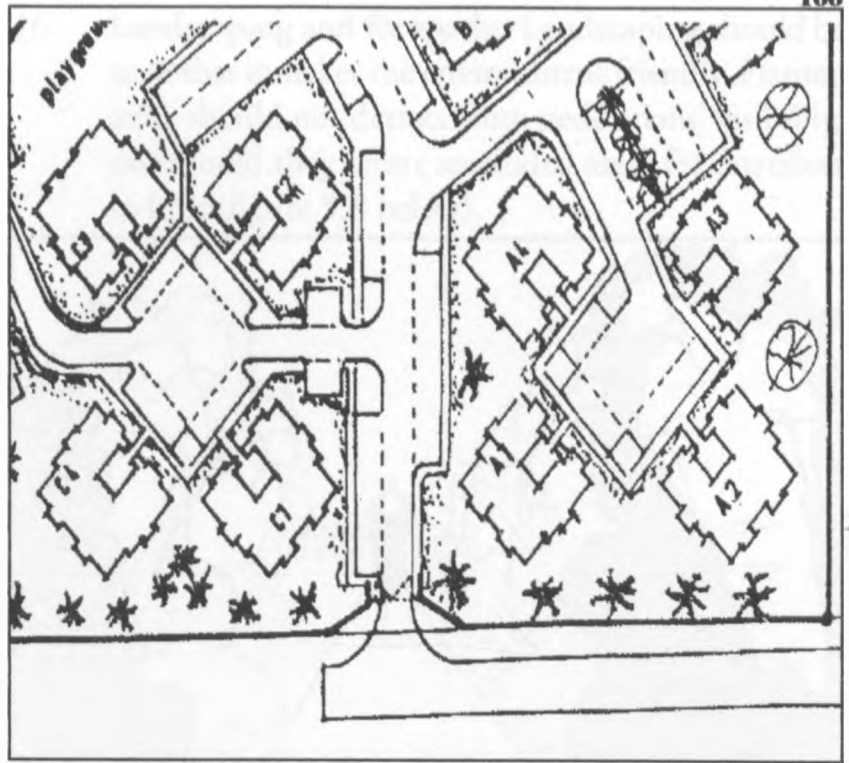


Fig 5.6 Cluster layouts encourage neighbourliness.
From NIC.

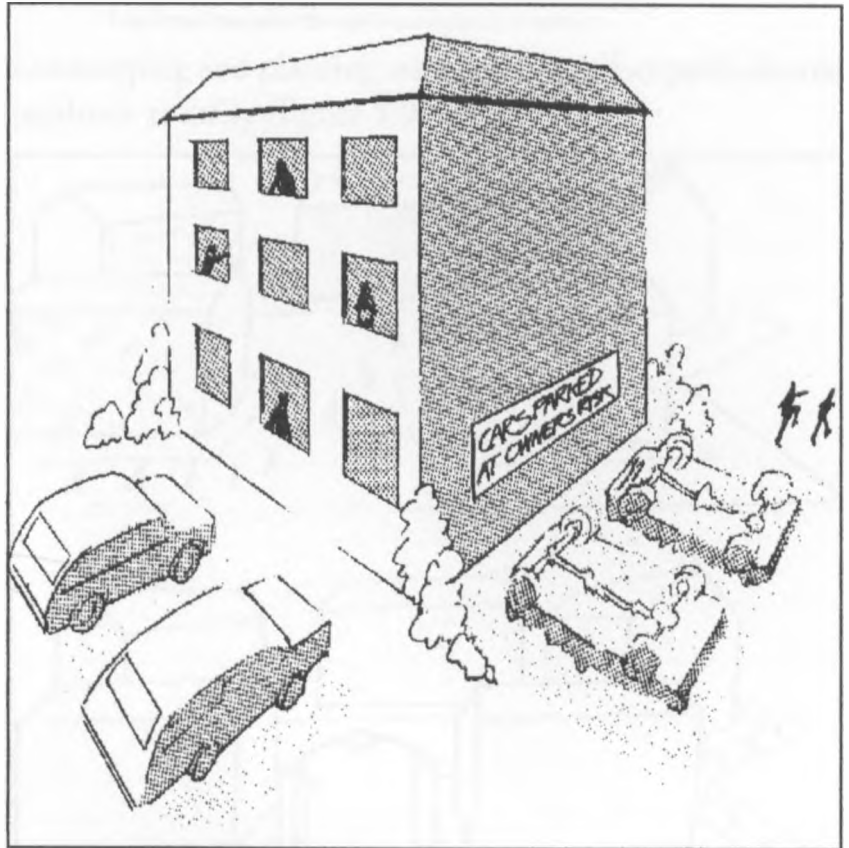


Fig 5.7 Natural security for parking lots.
From Crime Prevention Through Urban Design by P. Stollard.

16. **Landscaping and footpaths.** Landscaping should be such that it makes the environment friendly. Planted areas should not detract from pedestrians' visibility, nor should they create secluded areas for intruders to lurk (figure 5.8 below).

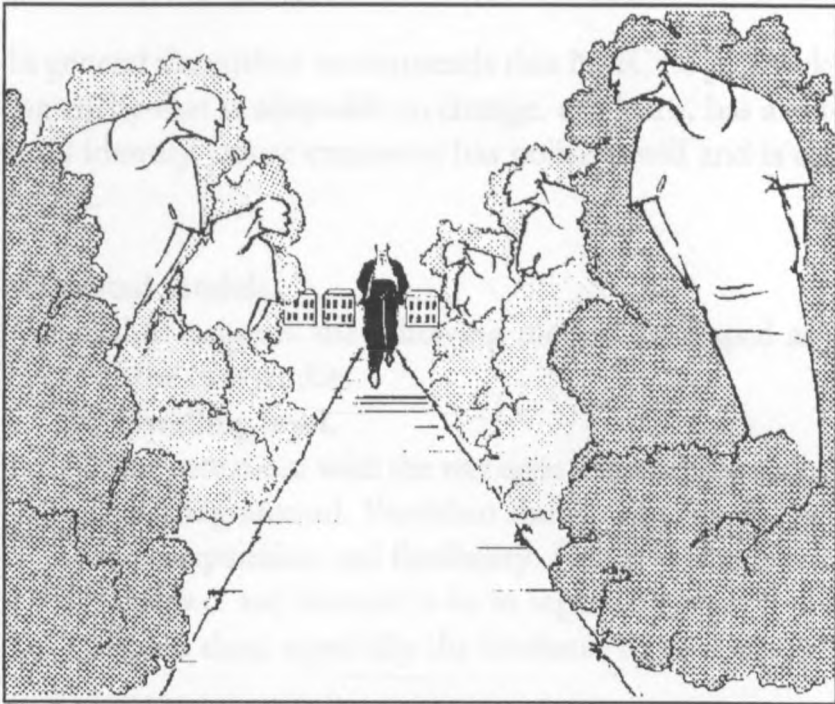


Fig 5.8 Landscaping should not create secluded areas.
From Crime Prevention Through Urban Design by P. Stollard.

Landscaping and planting associated with footpaths should reinforce security (figure 5.9 below).

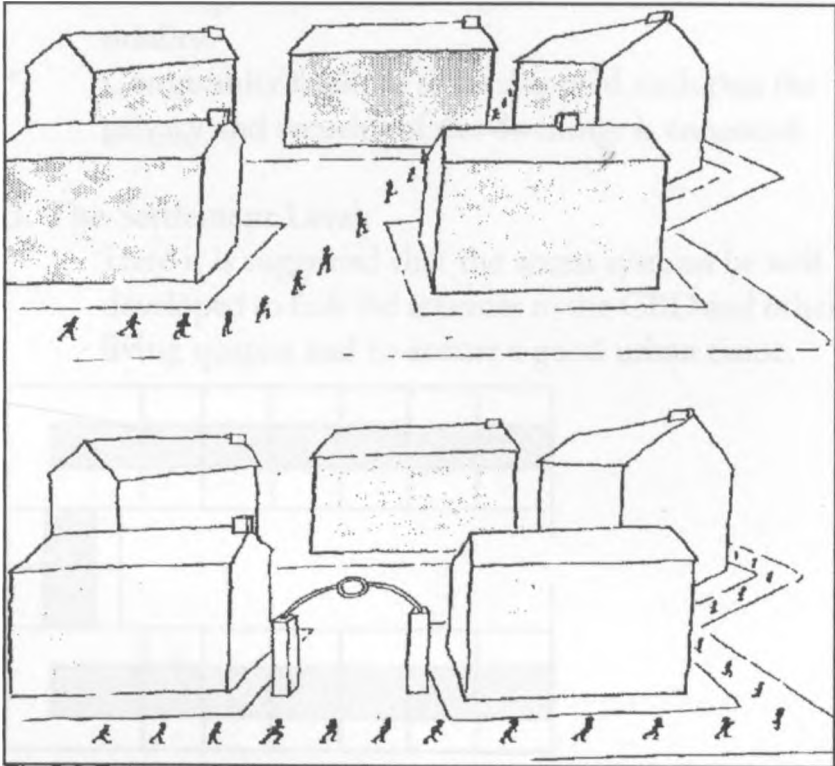


Fig 5.9 Entrance features reinforce a sense of privacy.
From Crime Prevention Through Urban Design by P. Stollard.

Appropriate selection of plant material is important in any scheme and though financial provisions for landscaping are meagre if not non-existent, NHC should incorporate these in the schemes from the onset.

In general the author recommends that NHC be goal-seeking entity that is adaptable to change, can learn, has a cultural identity, house creativity, has political will and is dynamic.

Suggested models.

The author suggests the following models developed as a result of the case studies.

1. The Dwelling level.

- * The core room with the wet areas and sleeping rooms radiating around. Provision should be made for **future expansion and flexibility**. Figure 5.10 refers.
- * The w.c. and shower to be in separate rooms.
- * Room sizes, especially the kitchens, to be larger.

2. The Cluster Level.

- * Here, plot configurations must ensure that there are **no transformations**, figure 5.11, and that the dwellings form **defensible space**. This enhances **territoriality**.
- * Community facilities to be disposed such that the privacy and security of the dwellings is enhanced.

3. The Settlement Level.

- * Here it is suggested that the access systems be well developed to link the schemes to the CBD and other living quarters and to ensure a good urban tissue.

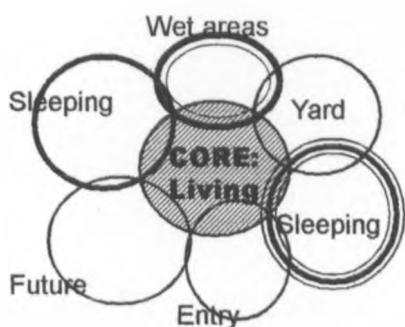


Fig 5.10 The Dwelling Level.
Author.

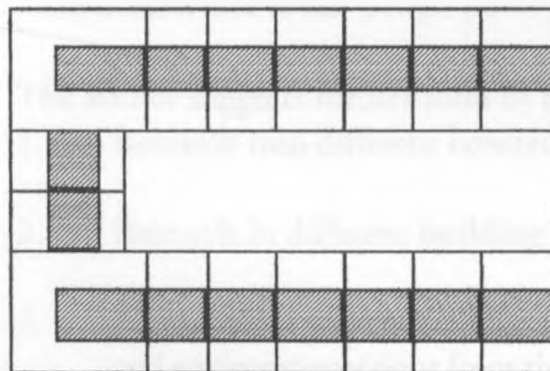


Fig 5.11 A suggested cluster that ensure territoriality.
Author.

5.2 Suggestions for Further Research.

Established in Cap 117 of the Laws of Kenya section 10 (a) is the Corporation's mandate to undertake and encourage research and experiment in housing and related matters, and undertake and encourage the collection and dissemination of information concerning housing and related matters. Section 10 (c) of the same authorises the corporation to undertake and encourage the provision of training in furtherance of the Housing Act and provide training for its members of staff.

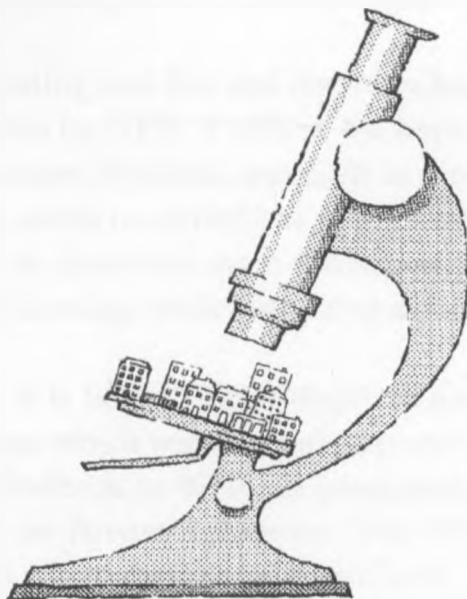


Fig 5.10 Research.

From *Crime Prevention Through Urban Design* by P. Stollard.

It is in this light that the author, examines the situation in Kenya, through the 'eyes of NHC', since it is the chief government agency through which government and other funding for housing is channeled. It is important to note too that the author has also developed the whole study from an architectural and urban design point of view.

The author suggests further areas of research as follows:

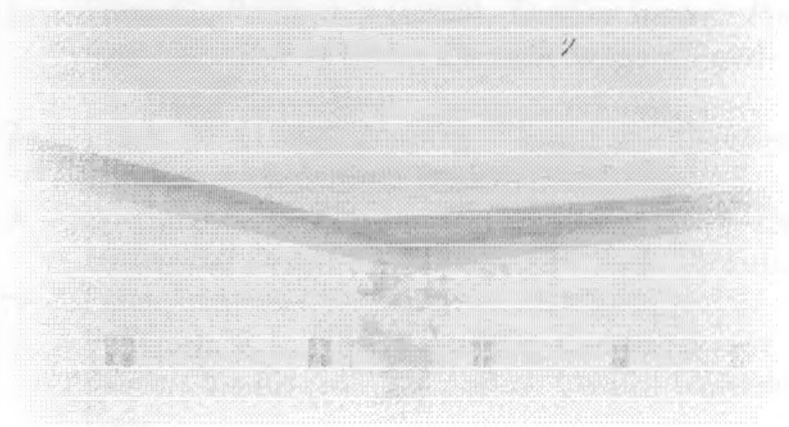
1. Research into different **construction techniques**.
 2. Research in different **building materials**.
 3. Research into ways of creating **safer housing schemes** and environments right from the layout to the individual house design.
-

4. **Develop Enablement and Participation.**
5. Establish a **briefing guide** for its projects and clients.
6. Policy issues relating to **self-help** housing programmes should be thoroughly studied by NHC being the government arm through which housing policy for the public sector is implemented. As Rodell and Skinner (1983) correctly note, conventional housing has miserably failed to reach the low-income families and it reached a point it cannot be ignored anymore.
7. **Upgrading and Site and Service** schemes should be revisited by NHC if only in the hope to house the poor more. Research, especially in form of user reactions, needs to be carried out extensively on these schemes to determine more efficient ways of production of housing, while enhancing **affordability**.

With these, it is hoped proper **response mechanisms** can be put in place which will establish appropriate ways of **information feedback** to NHC as **producers**, leaving satisfied **users** in future schemes. The NHC housing programmes would thereby be streamlined.

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APPENDICES

Appendix 1 - Guided Questionnaire.

The following is a sample of the guided questionnaire used on a random sample of the families from the four estates of the research area. The questions were not necessarily asked in the order in which they appear, neither was it necessary to ask all of them per family. Only the heads of the households were interviewed, and a total of one hundred families were interviewed at random, that is an average of twenty five per estate. The data was then analysed and summarised by the author.

Kindly answer the following questions.

1. What is your occupation?

2. What is your marital status?

3. How many dependants do you have?

4. What is the relationship of your dependants to you?
Please state whether wife, husband, children, relatives, friends, etc.

5. Do you own the house you live in?

6. If not, how much rent do you pay monthly?

7. Why did you opt to stay this Estate?

8. What in your view are the advantages and disadvantages of living in the xxxx xxxxx Estate?

9. What do you like about the design of the individual house you are staying in?
-
10. What do you dislike about its design?
-
11. What do you think about the general layout of the estate?
-
12. If you had the opportunity to give an input into the individual and overall design of the estate, what would you suggest?
-
13. What means of transport do you use to work and back? (State whether public, or your own car, etc.)
-
14. Do you have any other comments you would wish to make as a contribution, not only towards improving this estate, but to give guidelines for improving the design of future ones? If so, please list them briefly.
-
-

Thank you for your contribution, not only to my studies, but to the development of better settlement schemes also.

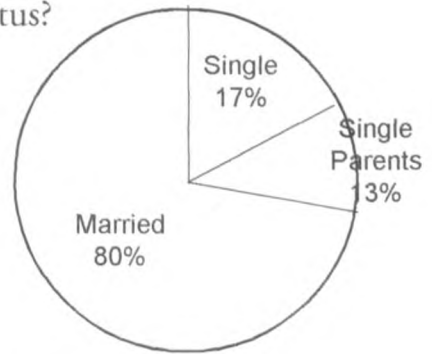
Appendix 2 - Questionnaire Analysis.

the following is a general analysis of the guided questionnaire the author used on randomly selected samples of residents of the schemes under study. The responses have been summarised in pie-chart form for convenience of interpretation.

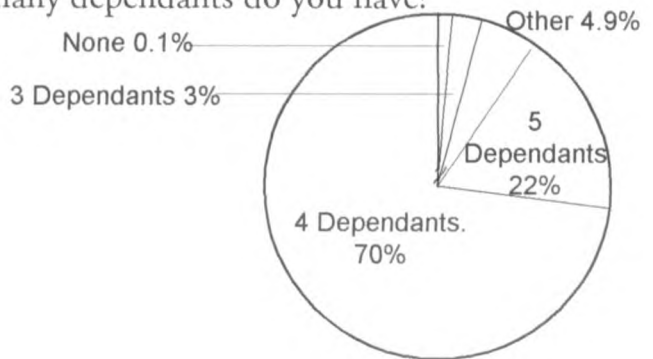
Q. What is your occupation?



Q. What is your marital status?



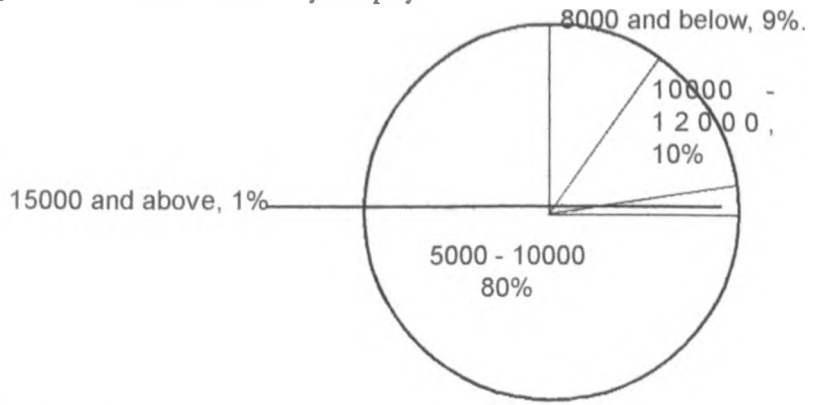
Q. How many dependants do you have?



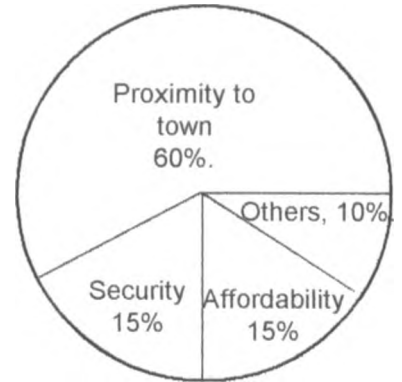
Q. Do you own the house you live in?



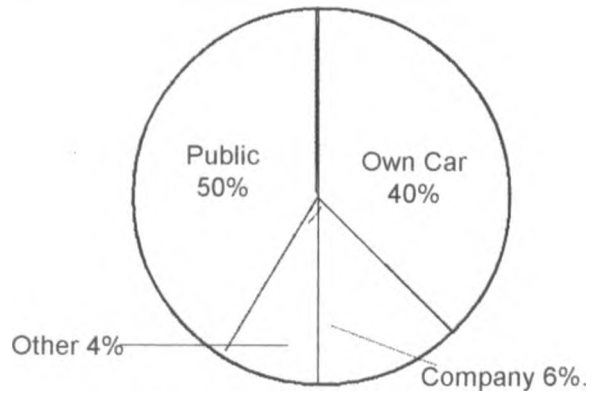
Q. How much rent do you pay?



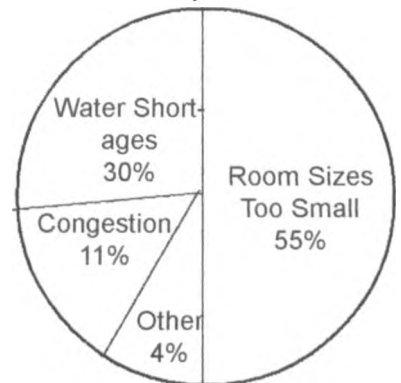
Q. Why did you opt to stay in the estate?



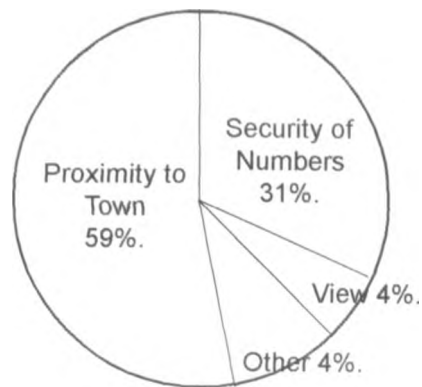
Q. What means of transport do you use to work and back?



Q. What do you dislike about the flat you live in?



Q. What do you like about the house you are staying in?



2