KU LEUVEN

STARTER UNIT CONCEPT

Case-study Analysis of National Housing Corporation of Kenya Low Income Housing Projects

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We wish to dedicate this work to
Dr. Watson Lipwoni Khalwale Ingosi
who led by Deeds

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Chapter 1 INTRODUCTION

The Kenyan urban phenomenon, typical of most non-developed world urbanism, is one characterised by fast population[1] growth. This fast growth is often coupled with "superficial" physical boundary expansion[2] without the reciprocal urban infrastructure as well as other services. Housing[3] is one such services that is hardly catered for. The situation is most acute particularly for the lowly remunerated.

The Kenya Government acknowledges the value of housing as major contributor to the overall economic growth and development, ensuring a more prosperous population. No doubt, in key policy statements, she states:

'Decent housing within the reach of each income group is recognised by the Government as a major contributor to family and community health, and to the morale of the working population it leads to high productivity of labour and to reduced costs of public health, with the consequent important gains of economic performance. In addition to being a major element in living standards and the general welfare, housing accounts for a significant share of capital formation and thus contributes importantly to the national output and employment'.
[Erkelens, 1991,p.20]

The low income earners are immigrants from rural areas often engaged in informal commercial and light industrial activities(*Jua Kali*) and/or low remuneration jobs in the formal sector. Access to conventional housing is difficult for this marginalized majority. They resort to informal housing self-

[1] The Kenyan urban population has been growing at up to 7% p.a.[RoK, 1994a,p.41.] in the major cities particularly Nairobi and Mombasa. This is well above the national average of about 3.8%.[RoK, 1994a,p.41] Thus in addition to the natural growth, we have a substantial rural-urban migration, boundary expansions, and emergence of new markets as other factors attributable to this growth. [Erkelens 1991, p55].

[2] It is common for urban boundaries to be extended without immediate plans to provide services like roads, water, electricity or indeed acceptable housing. Further, effective planning control is often hampered by lack of manpower of sufficient know-how.

[3] Our definition of housing in this context is narrow; restricted to the product (rather than the process as advocated by. Turner[1976]) and closer to the building bye-laws of Kenya definition: *'a dwelling is defined as a part of a building lawfully used or constructed, adapted or designed to be used as a residence for one family and consisting of at least two rooms'*. In this work the following UN definition may suffice: *'a housing unit is defined as a separate and independent place of abode basically intended for habitation by one household, or one not intended for habitation but occupied as living quarters by a household'*.[Erkelens, 1991. pg. 22]

provision observable in settlements variously described as slums, squatter settlements, shanties.....

Formal interventions have been undertaken largely by the Government mainly through the National Housing Corporation[4] (NHC); a parastatal organisation (see Table 1.1)

However, the impact of these formal efforts is minimal given the magnitude of the housing problem[5]. This is particularly evident in major cities like Nairobi where up to 40%[Syagga and Malombe,1994] of the population live in informal settlements. In secondary towns upwards of 80%[Syagga and Malombe,1994] unplanned habitation is common. The seemingly dismal performance of formal housing interventions is because of the high costs of the inputs required in conventional approaches[6]. This as reflected in the high often unaffordable prices (to the poor) of the units.

One approach popular at National Housing Corporation is the Starter[7] Unit Concept, an intervention whereby a basic living unit (hereby referred to as 'starter') is erected and provided to the individual with a view of their progressively transforming it to a fuller unit in due course. The essential elements of a "starter" are a service "wet core" as well as living spaces of two (or lately one) rooms.

The Starter Unit Concept is a formal approach by the very fact of its initiation, but does revert to informality at the secondary stage of owner transformation. Thus the initiation and implementation are formal with professional inputs of design, finance, construction process, administration and management. This 'formality' however diminishes with the allocation exercise and almost completely peters out on completion of the loan repayment.

The secondary stage of owner control and virtual autonomy, calls into play 'informal' and unconventional processes common in unplanned settlements. Thus for instance, as regards the process;

[4] National Housing Corporation is a government parastatal institution established under the provisions of the Housing Act of 1953(Cap. 117 of The Laws of Kenya) and subsequently amended in 1967 and 1968. Her predecessor was called The Central Housing Board.Stren,1978]. NHC is thus charged with the responsibility of ensuring effective implementation of Government housing policies.[NHC, 1987]

[5] It is estimated that 60,000 units are to be provided annually between 1990 and the year 2,000 if housing need is to be satisfied in Kenyan Urban areas.[RoK,1991]

[6] Another position is the very definition of housing as the conventional types, whereby individual efforts are less recognised as solutions to housing; this despite the possible and unexplored merits of self-help and owner autonomy in informal settlements.

[7] We distinguish the starter unit from the 'core unit' where only the service core is provided.

'When people want to build in such a case they rely on a fundi or contractor, who doesn't need a proper drawing, or uses an old one. [Erkelens, 1991,p.40].

This work explores estate habitation as reflected in the early stages[8] of this informal character. Aspects of design and some cost consequences are also considered.. We also try to establish a link between this informality with the formal starter, whereby design , construction, and costing are undertaken by the conventional professional.

For purposes of this work, Starter Unit is defined as an approach by which the developer provides basic services and infrastructure, a wet-core of shower and toilet as well as one or two living rooms.

Formal housing refers to a professionally designed and executed project. In Kenya housing professionals include Architects, Quantity Surveyors, Engineers, Land Surveyors,..... Professionals could be in the public or private sector National Housing Corporation(NHC) is a public body charged with executing medium and low income housing.

Formal processes include; Design and Tender actions. Further, they are mostly subject to Development Control requirements stipulated in the Bye-laws and other legislation. Thus such development seeks Approval of architectural drawings among others. Very few private organisations engage in architectural aspects of Low Cost Housing. These include employers' institutions, Non-Governmental Organisations (NGOs)and Housing Co-operatives(e.g. NACHU[9]).

On the other hand informal housing is characterised by lack of legal control on development and use of non-conventional materials mainly recycled waste and/or organic based types. 'De-facto' ownership of the developments is possible but with little hope of legalisation. Development of these housing is normally through small scale builders who mainly employ local resources.

Box 1.1 Of Formal and Informal Housing

[8] Some of our case-studies are of projects undertaken in the last 5 years.

[9] NACHU refers to National Housing Co-operative Union, an umbrella organisation for housing Co-operatives.

year	NHC(1) houses total	S & S	MOWP W (2) housing	other public sources	other	total public	private (3)	total private	total production
1955						0	577	577	577
1956						0	830	830	830
1957						0	773	773	773
1958						0	636	636	636
1959						0	676	676	676
1960	665				665	665	562	1227	1227
1961	977				977	977	123	1100	1100
1962	1898		240		1898	2138	57	1955	2195
1963	272		242		512	514	86	598	600
1964	936		155		1178	1091	98	1276	1189
1965	890		327		1045	1217	44	1089	1261
1966	611		177		938	788	129	1067	917
1967	550		502		727	1052	258	985	1310
1968	1588	48	578		2090	2214	314	2404	2528
1969	1928	169	501		2506	2598	328	2834	2926
1970	2340	1465	982		2841	4767	470	3311	5237
1971	3445	2100	572		4407	6117	1426	5833	7543
1972	4598	96	1046		5170	5740	1832	7002	7572
1973	1190	84	565		2236	1839	1499	3735	3338
1974	1630	363	628		2195	2621	1451	3646	4072
1975	2196	1128	254	1068	2824	4646	1855	4679	6501
1976	1445	355	106	193	2767	2099	791	3558	2890
1977	1271	1077	359	257	1570	2964	742	2312	3706
1978	3942	2389	156	221	4558	6708	835	5393	7543
1979	6464	2454	482	481	6841	9881	2716	9557	12597
1980	4077	2719	471	206	5040	7473	2065	7105	9538
1981	2735	2550	49	443	3412	5777	1918	5330	7695
1982	2928	598	968	790	3420	5284	2083	5503	7367
1983	687	2048	457	552	2445	3744	981	3426	4725
1984	2398	882	626	116	3407	4022	646	4053	4668
1985	1009	276	467	184	1751	1936	578	2329	2514
1986	615	50	383	150	1266	1198	1078	2344	2276
1987	575	0	na	na	1108	575	1042	2150	1617
1988	229	0	0	0	na	229	1262	na	1491
*TOTAL	53285	20851	11273	4661	69794	90070	28457	97143	118527

1) National Housing Corpoaration and Central Housing Board
2) Minstry of Public Works
3) private covers towns only : Naiorobi, Mombasa, Kisumu, Nakuru, Eldoret, Kitale, Thika, Nyeri, Kakamega,Embu,and Meru
* upto 1987

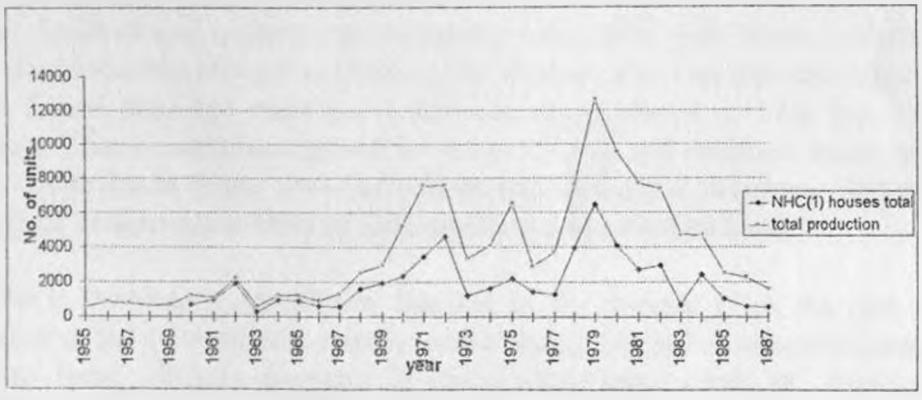

Table 1.1 Housing provision by the Formal sector in Kenya
source: Ernelens, 1991

1.10 THE PROBLEM

Over time, the National Housing Corporation(NHC) has implemented 'starter' unit projects in major urban settlements[10] particularly secondary cities. To curb costs, compromises are often made on the quality of the built-up area. Thus, only basic elements like walls, foundations, floors, roofs, and openings are provided. The general assumption and desired goal is that the intended owner will improve and extend the starter as per their resource and spatial priorities; but presumably according to a Type Plan provided by NHC.

Observations show the these changes do not always conform, however. In fact owner transformations could tend to contradict set typologies. Their perceived architectural propensities may not necessarily defy conventional professional logic, but may lead one to infer an underlying rationale that needs to be systematised. Our objective is to document and interpret these tendencies in set Kenyan contexts, with a view of improving SU designs.

The problem can also be viewed as one of a flawed design concept. Thus the professional is exposed by their inadequate understanding of the low income housing requirements and conceptual tendencies. But this is to assume that the owner tendencies are necessarily rational in the design sense; at least more so than the professional.

One would expect that a low income architectural concept should be cost sensitive one. It is true that aspects of cost are explored at one stage in the design of low income housing. But the divorce of the Architectural and the Quantity Surveying domains infers a time, if not spatial gap between the crucial aspects of cost and design. This manifests itself in solutions, cheap in aesthetics yet still out of reach by the poor majority.

A cost sensitive design concept has to necessarily respond to the form of the unit. This however is limited to incomplete units where only token provisions in the form of the SU are available to the allotted. For one can curb costs at the formal provision stage but is not entirely in control of what else may ensue. Thus economies achieved by virtue of scale and common action may be insufficient in future when individuals make unilateral decisions. But this is as far as form goes. What of time sensitive cost considerations?

Time is particularly sensitive in housing in SU designs given the cost of capital in the economically volatile environments where low income housing is an issue. Where increases in construction input costs are common, without commensurate income improvement, concepts ought to take

[10] Urban settlements in Kenya are defined as areas of human habitation of 2000 persons and above. Secondary cities may be defined as towns accommodating local district and/or provincial administrative centres. [RoK,1991,p 13.]

cognisance of the implications. This is hardly obvious given the images observed in NHC schemes.

Another factor that is hard to fathom but is equally important is the construction process. Whereas at the provision stage a formal contractor adhering to conventional contract requirements and provisions is charged with providing the units, at secondary stage the process is largely managed by the owner. This is fertile ground for a problem because the designs are geared towards a formal process and can hardly be expected to respond to the vissitudes of the individual. The inherent strengths of such an approach are twinned with possible fundamental inefficiencies.

The strengths include the capacity to personalise the design for own needs, and further to prioritise at each phase weighing competing demands against anticipated benefit and economic strengths. This is more easily achieved at the micro-scale and with a personalised construction process. The small scale however may harbour inefficiencies of economy of scale. Further, the informal 'contracts' may not cater for all aspects of control for mutual, client and contractor, redress (they more likely to be social arrangements between the parties). This may and often manifests itself in loss and poor quality products.

This work will attempt to investigate the above problems as manifest in SU housing design experiences in the NHC case-study projects.

1.20 HYPOTHESIS

Our basic hypothesis is, as implicit in the problem statement, is that these user preferences are among others a reflection of economic and hence cost considerations. Further SU designs fail to adequately address these issues from the perspective of the owner.

Given that immediate cost economy can be achieved through low specifications, medium and long term economy goes further to address issues of anticipated rental returns or other incomes; alternative construction processes, technology and materials; recurrent maintenance; different income supplementing spatial uses; cost of borrowed money among others. These are the preserve of the individual and their capacities and/or prefferences. A purely architectural approach without these longer term concerns is put to scrutiny in this work. Conversely we impute that these aspects which should not be divorced from architecture, and in fact should constitute part and parcel of the architectural brief in low income housing.

At a broader level, we look at institutional intervention in housing for the low income and query the respective roles of the professional where the

result contradicts his/her expectations. The hypothesis here is that design for this group imputes short and long term economic considerations as opposed to "pure" architecture. The age-old gap between architecture and users requirements is thus revisited.

Another way of looking at this is that of a feedback analysis for the professional. It is felt that most housing interventions hardly solicit responses from the users, with a view of improving the provision process. We feel that it is myopic on side of the architect as well as the institutions involved, as this is the only way of gauging their performance.

We deliberately isolate the Architect among the other professionals because we are of the opinion that he is ultimately responsible for the ensuing environment, in the process downplaying the role of the other actors. In Kenya, costing is left to the Building Economist and/or Quantity Surveyor[11]. Given that Low Income Housing has strong economic links, the architect has to take an increasing role in the economy of housing to avoid inevitable blame. His vantage position is that of being aware of other individual and societal concerns of culture and tradition; which are equally important and come in handy in determining priorities in shelter decisions. The architect thus ceases to be merely a space creator but takes responsibility of the costs and specifications. These roles are sadly but surely being reserved for the Quantity Surveyor; a scenario we opine is not desirable to the low income.

In responding to the set Type Plans contrary or at variance to the desired type, the users serve to re-educate the Architect about the desirable spatial and specification Standards. The Starter Unit Concept avails us a great opportunity to gauge provided standards against these user tendencies.

Conformity to Standards is often a prerogative of the Local Government and the developer (like NHC). The Starter Unit concept study is a measure of their effectiveness in controlling development. It is viewed as an interface between formal and informal intervention which can be exploited to the benefit of all; the dividends should be reflected in better shelter environments.

When dealing with opposing forces, flexibility and innovation is required. This is manifest at the planning and development control level as well as at the design stage. Foremost this calls for Starter Unit designs responsive to individual flexibility. Our hypothesis is that this is not manifest in SU projects implemented in Kenya. In fact NHC and the Local Governments go to great lengths to deter[12] any deviations and individual innovations.

[11] The term 'Quantity Surveyor' must be having historical semantic significance in its Anglophile origins but is hardly convincing to the client in terms of explaining aspects of costs of a building. On the other hand Building Economist seems more meaningful.

[12] Demolition and repossession of non-conforming instincts is the norm and threat.

A Tenant Purchase Agreement is the contract between the purchaser and the developer(NHC). It stipulates among others, that :

- the premises should be used for residential purposes only ;
- he/she should reside in the premises;
- she/he should not sell or assign part of the premises for five years;
- she/he should not sublet the for the five years; without the Corporation's written consent.

Box 1.2 Of Tenant Purchase Agreements

Institutional interventions should be gauged not merely by their success on one project but by their capacity to be replicated. This calls for economically sound principles at the feasibility study level. Thus at micro-level ,the purchaser should have the capacity to service the loan for two reasons. First, this would contribute to a global revolving housing fund for future interventions elsewhere. Second, this would eliminate conventional wisdom that social housing is a parasitic service. Subsidies in Social Rental[13] schemes is the order rather than the exception; this has significantly contributed to the malaise in low income housing funding. Poorly planned Tenant Purchase schemes would lead to 'Negative Equity'[14]; a situation which we fear may engulf SU projects. This study attempts to circumvent this undesirable possibility.

Our hypothesis is that SU should be a concept of ownership that accommodates and in fact stresses on income generation through a private rental (subletting) and alternative, commercial use. Planning for step-by-step development means a transformation budget being weighted against anticipated revenues from rent and these alternative uses.

A corollary of the foregoing scenario is that Low Income Housing is not just shelter but also a source of income for the owners. In addition to this the units should attract good re-sale value and also be re-mortgageable. As of now Tenant Purchase Agreements [NHC,1991] prohibit resale of the units before expiration of a 5-year consolidation period.

This study can be also be viewed as the role of informal design, construction and management activities in institutional project interventions, focusing on

[13] Social Rental schemes are here-by defined as publicly owned rental schemes as in Local Authority Housing and Government Staff Housing ; often with huge subsidies in interest on development finance repayments.(see a more detailed definition of rental concepts in Chapter 2)

[14] 'Negative Equity' is a concept by which formerly publicly owned housing are sold out on mortgage terms to individuals but cannot be sustained because the owners have difficulty repaying the mortgage and at the same time cannot sell them without incurring losses at below purchase value rates. This is not yet common in Kenya, however.[Zipfel,1994]

the SU. These activities' potential deserve a deeper investigation. We attempt to asses them and recommend the necessary design approaches as well as possible enabling policy re-formulations.

1.30 OBJECTIVES OF THE STUDY

The specific objectives of this study may be summed up as below:

- to collect available design and specification data on Starter Unit Concept projects in Kenya as proposed and implemented by NHC,
- to make an inventory of the level of development by the beneficiaries in the case-study schemes,
- to assess the success rate of the schemes by virtue of occupation or otherwise,
- to look at transformation choices and priorities made by the owners in design.
- to list the materials and technologies used in transforming the Starter Unit at building element level,
- to investigate the various uses of spaces within Starter Unit plots,
- to investigate the alternative uses various common spaces and facilities have been subjected to,
- to identify areas of possible design and policy reformation in institutional frameworks to create better Starter Units responsive to owner transformation,

1.40 METHODOLOGY

We used the following methods in this study. Namely;

- Fieldwork surveys, and
- Literature Review.

Fieldwork

For the fieldwork six projects were identified. They were located in four regional towns. The towns host regional administrative headquarters. Thus Kakamega is the district (of the same name) and provincial capital of Western Province, while the rest Bung'oma, Busia, and Vihiga are the district capitals for their respectively named districts. The schemes varied in scale from 30 to 212 units. All the schemes were visited and surveyed to varying depths. A general survey was carried out on all the units.

A further detailed physical survey of some sample units. This samples varied between 5% to 10% of the number of units in the development. They were selected more by virtue of availability of relevant persons at the time of the visit. Where possible free but guided interviews based on a prepared

checklist were conducted with some of the occupants and/or owners of these units Other interviews conducted were of other actors in housing like informal contractors and material suppliers. NHC and relevant Government officers offered their time for singularly fruitful discussions

Literature Review

Literature Review was focused on the position of SU concept and related concepts in mainly the Kenyan context. This diagonal reading is a précis of housing policy as it affects architectural concepts in Kenya from the advent of present day urbanism with colonisation through to independence. Not having accessed literature devoted to unadulterated design concept (here defined as 'abstraction of an idea' or 'notion') we looked more at general guiding policy aspects.

We attempt to draw linkages to design concepts from this reading as manifest in the products. The 'starter' as a reality is most evident in the USAID/Government of Kenya funded schemes, the umbrella under which most of the case-study schemes fall. But the concept of progressive development and ownership is hardly a preserve of these projects as will become evident in the readings discussed in Chapter Two.

Chapter 2
KENYAN HOUSING CONCEPTS

In this chapter, we situate the SU concept in the evolution of Kenyan low income housing concepts. In looking at low income housing concepts in Kenya, one is hard pressed to investigate and gauge their performance based on at least three considerations of *Functionality, Cost and Economic Criteria and Official Policy and Attitudes*.

We look at function and functionality given the uniqueness of the Kenyan African Urbanism; having developed into the present scenario more through extraneous forces[15] [Obudho,1992,p.96] than spontaneous natural growth experienced in most traditional western cities. Function refers to all perceived mandatory considerations of dwelling rendering it habitable. Thus a functional unit should conform to the basic household uses, environmental considerations, spatial requirements for a given household size, structural stability, cultural and societal demands, basic infrastructure services and ever increasingly important economic appropriation of dwelling. As will be shown these seemingly basic aspects have been and still are a subject of repeated redefinition for the low income.

The influence of cost considerations in low income shelter should be self evident given the poverty common denominator in the third world human settlement condition. Poverty of the individual is compounded by that of the state in its incapacity to provide social or cheap housing in the midst of other competing basic needs for the masses. The cost influence is not only the construction cost to the individual and the investor, but also anticipated economic returns from alternative use. This way a purely architectural concept evolves into a project for economic enhancement for the occupant; responding to a set income base and future returns. It could also mutate into loss incurring investment and/or non-disposable property attracting the term 'negative equity', if unchecked.

At policy level, we would wish to postulate that the above two considerations of function and cost should form the backbone of a policy; but this is hardly concurrent with the facts as witnessed in Kenya. Policies are often a product of local, national and international political interests in partial or total disregard to the sheer logic of functional and cost opportunities. This is manifest in prescriptive donor funded projects. Thus

[15] Obudho [1992, p.86]. He states: "*Urbanisation in Kenya is almost entirely a twentieth century phenomenon and is mainly a product of British colonisation.....One can therefore contend that the urban pattern which exists today predominantly reflects the development of British colonisation and trade rather than the traditional African population and agricultural patterns.*"

the source of funds may dictate what concepts are adopted for specific schemes. It is interesting to note that most popularly acclaimed policy interventions are not always new[16] [Pennant,1983] in their time but reflect more of the shift in emphasis by policy makers (who in turn may be subject to say donor conditions[17] or other exotic forces) than any innovative architectural ideas.

The SU, as indeed any other historical concept, is viewed as an architectural concept for low income housing in the Kenyan context responding to demands of function, economy and cost as well as policy biases.

It is suffices to note that aesthetics, to some the main domain of architecture, plays an insignificant role in low income housing. But is also true that a low income architectural aesthetic is evidently conspicuous (albeit for probably the wrong reasons!). The negative connotation of this aesthetic is more to do with the uniformity of form and barrenness of the structures in formal housing interventions. It is probably why informal individual approaches tend to be richer aesthetically as some transformations in SUC projects may illustrate.

In analysing the three aspects of functionality, economic and cost considerations and policy trends, cited above we will diagonally look at historical examples spanning most of contemporary Kenyan[18] urban history. A chronological approach is not obvious given the fact that decisions on policy and/or concept are less to do with lessons gathered from prior experiences but more to do with the cited other interests.

We try to isolate features which could form the basis for the SU schemes.

A word of caution: it is difficult to distinguish between the three aspects. Thus what is considered low income functionality is a product of economic considerations of the day which in turn were determined by policy; policy which in turn was product of contemporary perception of low income functionality,economicconstraints..!

[16] Thus Pennant[1983], cites Anthony O'connor, author of "*The African City*" that site and service schemes are a "*confirmation of a similar colonial pattern*"

[17] For instance IMF and World Bank emphasis on dollar return on aid in its Structural Adjustment Programmes may attract architectural solutions with economic return as the underlying concept, a factor not so obvious in prior projects. Historically new concepts are more a product of an influx of funds geared towards that kind of development. Thus we talk of 'World Bank upgrading schemes' , 'USAID tenant purchase schemes'.....

[18] The contemporary Kenyan state is a creation of the British imperial policy of the late 19th century. Political independence was gained in 1963.

2.1 LOW INCOME FUNCTIONALITY

Whereas basic human requirements of shelter are considered obvious, when dealing in detail with regard to low income housing in a Kenyan context (or indeed other similar non-developed World contexts) a clear definition is sometimes necessary.

The basic functional requirements in a Kenyan human settlement can be considered as sleeping and/or resting, cooking, eating, visitor meeting and entertainment, and service functions of sanitation, water supply and reticulation. These in turn may manifest themselves in form of rooms: bedrooms, kitchen, dining room, living room toilet and bathroom

What is unique is the interpretation of the specific needs as evident in provision of room space or otherwise. Further the aspects of privacy in a household and its members demand clarification. It is therefore essential that one defines the household; its structure and size. For Kenyan urban living , the household size has been a subject of unit typology and spatial re-definition.

For instance, the colonial government considered it illegal for African[19] families of man, spouse and offspring to live in the towns until the 1930s[20][Stren,1978]. This must have been extremely punitive for them given their extended family background. What was perceived and designed as African houses were essentially labour camps where male adult households would inhabit without the comfort and care of by their families; nuclear or extended. Thus the predominant typology is that of *dormitory blocks*. In reality only *bed spaces* were provided for this urban labour force.

Shihembetsa [1993, p. 263] observes that:
'The typology of houses in the African estates was characterised by single rooms laid out as dormitories. The Africans at that time were seen as temporary dwellers in the city. They came here to work and get money to pay taxes and then get back to their native homes. They were not allowed to bring their families along with them to the town. As a result the houses provided were bed spaces to be shared by two or three people depending on

[19]To the colonial Government low cost housing was an African *race* problem[Stren,1978]. In Independent Kenya it is a *class* hence largely an economic problem.
[20]According to Stren [1978,p.187], the colonial government's concern was the problem of control of the Africans. Thus they were considered a shifting and temporal population only in towns to provide cheap lowly paid labour. The majority were restricted to rural 'reserves'. In the late 1930s a ratio of six males to every woman is recorded in Nairobi. By keeping wages low they made it impossible for the Africans to afford any accommodation other than the bedspace often provided by the employer.

the size of the room. They were provided with communal services (water & toilets) located at a central point to serve a number of houses.'

Architecturally, this *bedspace* was essentially a *multi-function space* for the singular adult. What came to fruition later was that the families both, extended and nuclear, did come over to the city to join the male adult head with the inevitable consequence of congestion and the ensuing poor hygiene.

Whereas this was an inevitable result of a deliberate policy (by an insensitive government to some), some environments existing in the present day urban habitation parallel this scenario; but purely as a result of economic forces of poverty and want. The present day congestion in low income housing units particularly in Nairobi's social housing estates is intriguing if not understandable. It appears paradoxical that what was a deliberate attempt to restrict the household size in urban areas to a singular male *household size* was rejected as leading to congestion; but given a choice the same scenario of congestion resurfaces. Here, we witness the advent of policy and economic forces in determining low cost function.

A low income housing concept should thus recognise this reality of multiple use spaces as an inevitable sacrifice in the given circumstances.

The role of *cultural considerations* in determining functional requirements, whereby transitions, hierarchical relationships and privacy gradients prevail, seems to take secondary emphasis in low income dwellings. In the former colonial case through a deliberate policy while in the latter it is through hard economic choices. Some, of a sociological leaning, may argue that this re-definition of function contributes to the malaise that is often associated with low income living

Looking through colonial literature, there is growing recognition that more decent accommodation is desirable for the low income (means Africans) especially through the creation of the Central Housing Board in 1953. The dwelling is constantly being redefined. In its policy statements we cite [CHB, 1953, p.1];

'To achieve a contented urban population, which is the basis of a stable society, adequate housing must be provided, together with as many of the amenities associated with town life as possible. The problem, now, is not to provide just bed spaces-as was the practice thirty years ago - but well planned accommodation for the family unit. At the same time it is not sufficient merely to provide an adequate amount of housing; the basic requirements of high health standards must be studied and incorporated in the dwellings'.

Not only is low cost dwelling function being redefined, but also the transitory nature of the dweller is being replaced by a growing appreciation of more permanence in their stay in town. Thus in the same policy document is stated as [CHB, 1953, p.1];

...to encourage permanent urbanising of the African working classes which provide the labour force in all the main centres of the colony....

Further attempts are made to consider dwelling suitable for the family, given the limited income. These two considerations of Design and Cost are given prominence in the new concept [CHB, 1953, p.1];

The former must be of such a nature that it does not become obsolete in the course of a few years, and the later must pay due regard to he pocket of the man for whom it is intended. To this end the Central Housing Board is endeavouring to simplify standards of construction as much as possible.

It is clearer with regard to growth of the unit in response to growing needs [CHB, 1953, p.1];

Certain house designs are built to be, ultimately, family housing, but are retained, temporarily, on a single room basis until the need for family accommodation arises, when a simple structural alteration, such as unbricking a door, provides it.

This the one of the early evidences[21] of the SU concept. The Amalemba I typology (see Fig. 2.1, project drawings dated 1960) is one such example. Subsequently, NHC SU approaches, the subject of our case studies in this work, recognise the growth potential of dwelling units as a response to growing functional needs and economic priorities.

The essential infrastructure *services* for urban living include water, sanitation, roads and drainage. (We do not look into infrastructure in this work). For the low income this is often modified as communal water supply, pit latrines, open drains and upgradable infrastructure.. among others. It is expected these lowered standards are as good as can be afforded for the poor. Thus in a

[21] Reading Kenyan history, one notes increasing political and labour awareness in the 1950s. The African housing condition is among the grievances cited. The *Mau Mau* anti-colonial uprising leading to the emergency declaration in 1952 is the climax of these awareness. No doubt the Housing Ordinance comes into effect in 1953.[Stren,1978]. Also some Africans are incorporated to the cabinet; one of whom Musa Amalemba is minister for Housing.

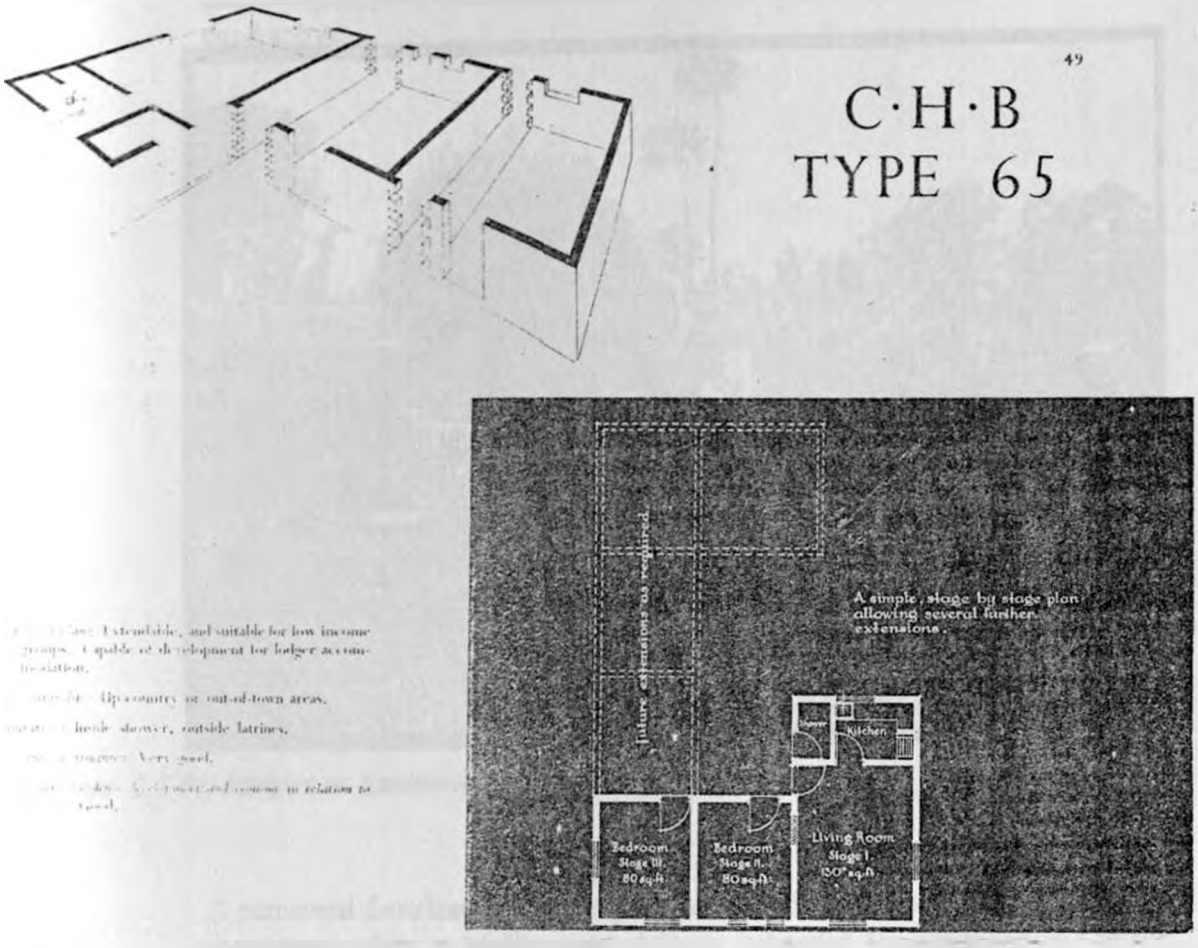

Fig. 2.1 Typical CHB starter unit source: Housing Government Printer, Nairobi

scheme as Amalemba I (one of our casestudy projects) pit latrines were provided. The advantage apart from costs is convenience of use by particularly the rural visitors who still find indoor toilets culturally inappropriate[22].

An additional advantage is the capacity to use the pits when water shortages occur, a common feature in all contemporary Kenyan urban settlements. When however they get filled up and no plans are made to empty them they become unsustainable and are a source of hygiene problems. The point that is evident here is that urban solutions without a culture of maintenance can be counter-productive, later assuming worse than desired character.

Some improvements in sanitation alternatives like the Ventilated Improved Pit[23] (VIP) latrines are possible with a view of curbing costs, whilst

[22] Discussions during the fieldwork with Elam Shikanga and Coun. Okureba in Amalemba I & II.

[23] An Finnish Non-Governmental Organisation (NGO),Kenafya, based in Kakamega has been trying to sell this VIP technology to the rural areas in Kakamega with no obvious success. We opine that this is

improving hygiene standards while at same time responding to the fears cited above.

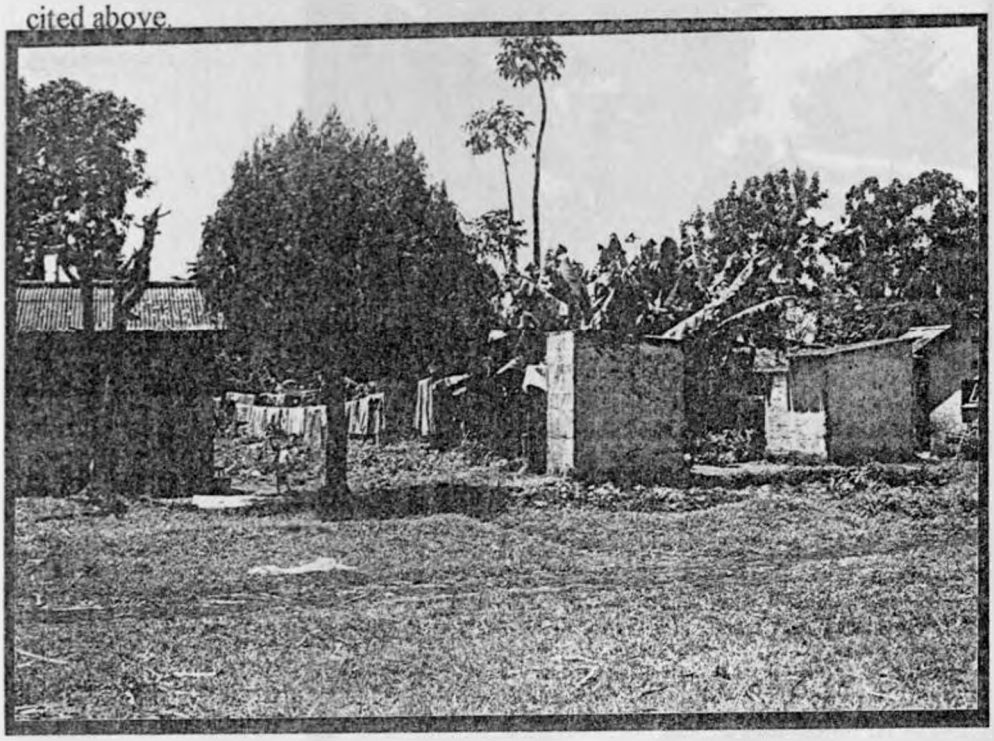

Photo 2.1 Pit latrines at Amalemba I

A perceived function like open space use is often assumed to accommodate recreation; while in reality most African urbanites (mis-)appropriate it for urban agriculture. It seems ties to rural agro-based living are not fully broken yet. It is common to witness livestock readily intermingling with urban dwellers in town estates. Cultivation of food crops is another common feature. (see Photo 2.2). It is possible that the open space function ought to be redefined.

It is increasingly important that one recognises, in addition the multi-use capacity cited above, the alternative uses the dwelling will be subject to. These alternative uses are often for economic returns, hence proliferation of shops, light industrial workshops, lodger accommodation, among others. Despite the reality few concepts recognise the need for types that accommodate this reality.

due to the non-tangible advantages in the rural low density areas. Here no real problem of sanitation is apparent. The VIP alternatives only aggravate the economic condition to the rural folk, by subjecting them to using materials which are subject to a money economy like PVC ventilation pipes, pre-cast reinforced concrete floor slab....[Kenya-Finland PHC-Kakamega] and [discussions in the field with Wilfred Shikumo of Kenafya].

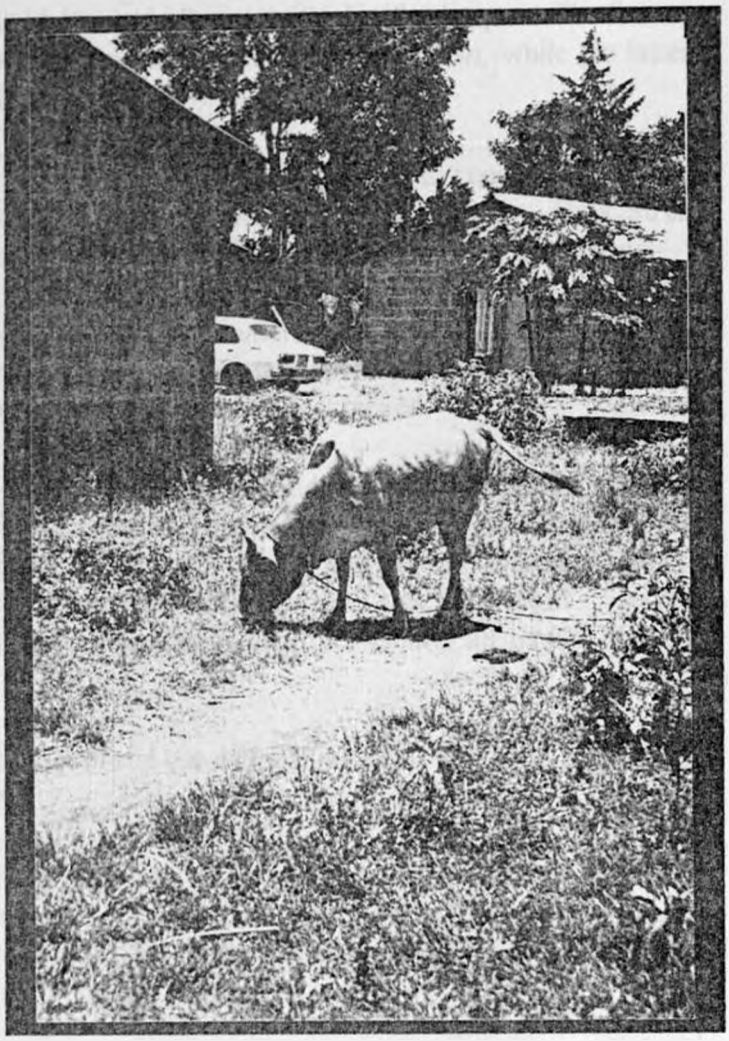

Photo 2.2 Busia open space use; cultivation and grazing ground

Redefinition of use in housing units is often a response to a given location within the layout i.e. responding to the street layout, location hence high value plots like corner plots and proximity to public and/or social function.

It is lamentable that NHC provides only for housing, ignoring /or giving low emphasis to related or supporting functions cited above. Thus an opportunity for a planned urban environment is denied, leaving room for the inevitable spontaneous sprouting of structures, unseemly to some, accommodating these functions. We posit that NHC scope should be broadened to cater for urban development *in toto* than just housing.

Climate as an aspect of function in low cost housing is equally important, given the variations in Kenyan climate. Further, low income housing should avoid high cost mechanical systems for control of indoor climate. Passive systems of thermal control are advocated. The clearest climatic distinction is

the lowland (coastal and lake area) climate to the highland types. The former often adopt a linear organisation to enable cross ventilation, while the latter adopt more compact forms.

The Swahili House is one typology of African housing to receive acceptance as suitable habitation in a Kenyan urban setting, Mombasa. Thus Stren [1978] cites some inherent advantages of the unit as evident in Mombasa;

•Environmental; through use of local materials of *boriti* (mangrove poles) and *udongo* (mud) for walls and *makuti* (palm leaves), as well as high ceiling height; a thermally comfortable environment is achieved.

•Social; because of the spatial organisation and layout of the rooms, services and the courtyard, privacy for the women, an important consideration for Muslim culture is assured. This also allows the extended family privacy through independence of the rooms. Further, this courtyard serves functional requirements of cooking and laundry washing; all female domain functions.

•Construction cost; because of the use of local materials and local artisanry it is relatively cheap to built.

•Economic returns; the organisation (independence) of the rooms around a corridor lends itself easily to room subletting without compromising privacy, ensuring rental returns. Further the frontal veranda, is easily convertible into a small scale shop for supplementary income.

'Not only does the design of Swahili house lent itself to lodgers, but the front of the house can easily be modified to accommodate a small shop. The small-scale trade that is part of the texture of life in Swahili neighbourhoods adds both to the profitability of the building for the landlord with a well located plot and the convenience of the householders and tenants.' [P.36].

•Adaptability to change; not only is the unit adaptable to the change of use as cited above but also technological innovations. Thus improvements for structural stability and longevity are possible and are made in respect of use of new materials like concrete blocks for walls and CGI sheeting for roofing. In summary the Swahili House is a design for owner-occupation, suboletting, commercial use, that is affordable and environmentally suited in its context.

Box 2.1 The Swahili House

Of climate and function one cannot afford but mention the traditional dwelling, where by employing local materials and layout techniques, an environmentally comfortable shelter is achieved. Similarly the Swahili (Box 2.1) [Stren,1978,p.36] house commonly found in almost all urban areas in the aptly called Majengo neighbourhoods is particularly responsive to thermal considerations

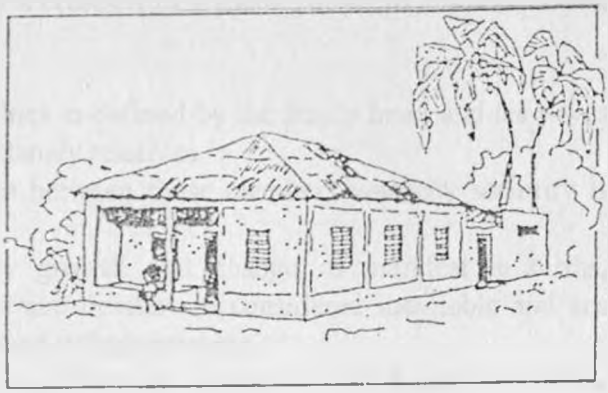

Fig. 2.2 Swahili Type House

Dwellings commonly found in squatter settlements are essentially products of economic want, uncertainty and fear of uprooting given the lack of tenurial security. It is therefore not easy to justify completely all the functional choices observable in these settlements. It is however possible to isolate some trends worthy of note and consideration for standard setting as regards minimum acceptable requirements and self-help tools.[Syagga and Malombe,1994] and [Erkelens,1991]

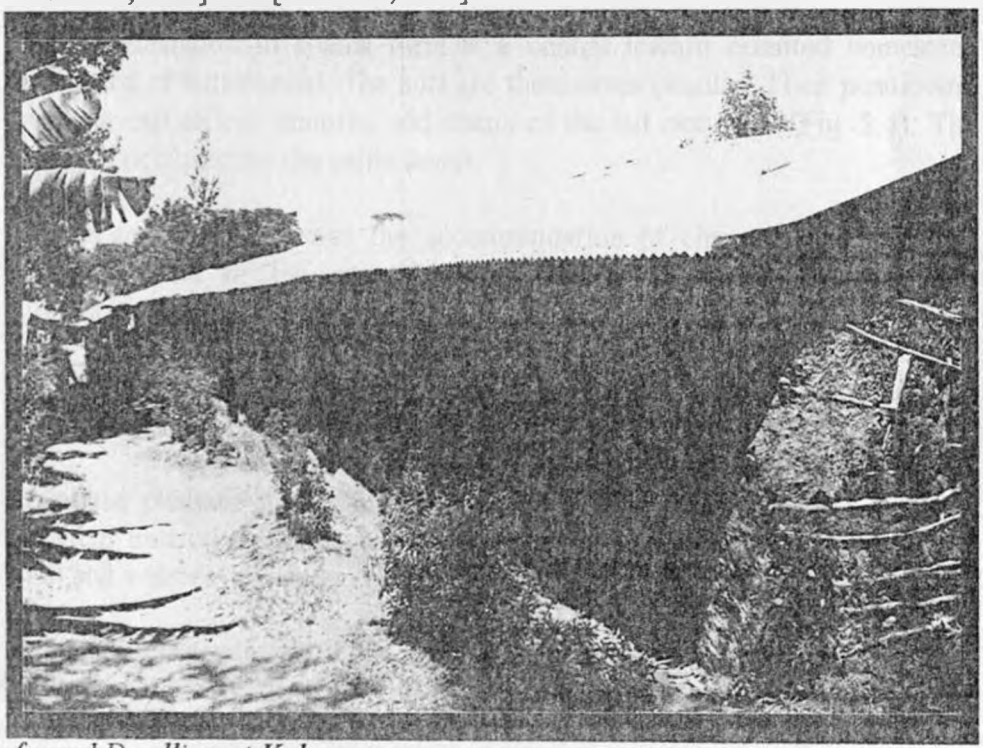

Photo 2.3 Informal Dwelling at Kakamega

The traditional dwelling typology (Box 2.2) in the rural context was governed by societal, environmental, economic, and technical functional forces.

A Luyia[24] dwelling is largely a creation of societal forces of the day. These include ;

1. Household Structure; which is defined by the family head and his wives and sons as well as extended family relatives.
2. Hierarchy of relationships between these members whereby seniority is by virtue of age.
3. The Life Cycle whereby growth and change as manifest in births, manhood initiation, marriage and deaths are considered inevitable and are part and parcel of the homestead or homemaking.
4. Gender relationships with women as owners of the house unit while males are the heads and guardians of the homestead.
5. Resource constraints, whereby organic and earth based resources are employed for dwelling construction and using local artisanry and techniques.
6. Protection of the economic base of the household; cattle. This is reflected in its central positioning in the homestead and surrounded by huts.
7. The Household Artefacts; which lend themselves to curvilinear forms of the hut may have functioning of the unit easier.

The manifestation in spatial form is a centric inward oriented homestead composed of huts (units). The huts are themselves circular. Their positioning in the layout reflect seniority and status of the hut occupant (Fig. 2.4). The centre is occupied by the cattle *boma*.

Crucial to the layout was the accommodation of change in response to changing roles in the homestead as adulthood (as signified by male circumcision), marriage and death.

The hut accommodates functions of cooking, sleeping, and visitor reception.(Fig. 2.3).

Given the pleasant climate one would hardly expect a more environmentally sensitive unit other than local use of environmentally sound materials like mud and wattle walls and grass thatched roofing.

Walled homesteads where the normal fence of euphorbia or thorns was replaced with a wall of clay was common in some parts of Buluyia as

[24] One of the three major Kenyan tribal groupings

protection against raiders from hostile neighbouring tribes Teso and Maasai. Outside the wall ran a ditch (*olukoba*) all round. Osogo[1965,p.70] cites Carl Peters, a German explorer on seeing Chief Sakwa in Wanga Mukulu:

'A wide ditch surrounds the walls of the palace, over which a dam leads to the gate. On entering the enclosure the stranger first comes upon a great open space , surrounded by the houses of the war garrison of the palace. From thence he comes to a second great space, which is surrounded in a wide circle, by the many houses of the Sultan. All these houses are full of hundreds of women, in whose midst he himself dwells.'

With the advent of new materials and technology, rectilinear artefacts, and changing household structures new forms are emerging. Thus a singular detached rectangular form with many rooms is common nowadays. The family is more nuclear and monogamous relationships are more common than otherwise. For materials, CGI sheeting is replacing the rarer thatching grass for the roofs.

Box 2.2 Traditional housing concept

- *The Luyia of Western Kenya*

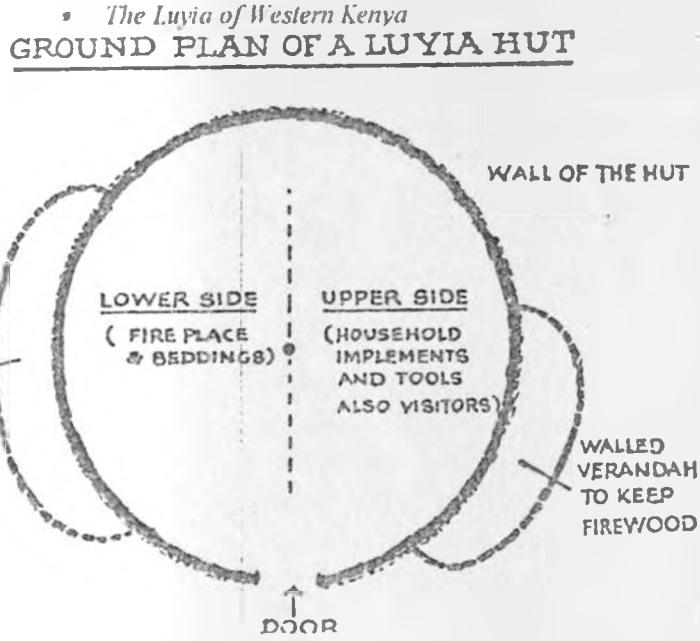

Figure 2.3 A traditional Luyia Hut
floor plan
source: The Baluyia, John Osogo,1965

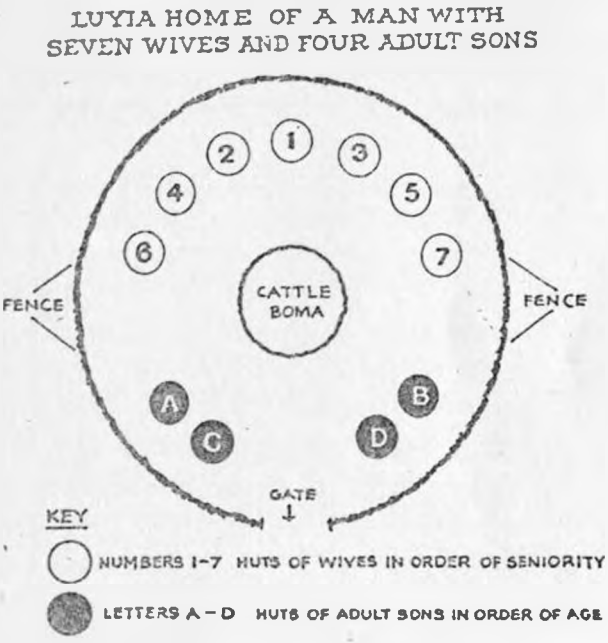

Fig. 2.4 A Luyia Homestead
notice the hierarchy of hut layout
source: The Baluyia,John Osogo,1965

In this section we have attempted to show that function and functional definition have influenced architectural concepts for low income housing in Kenyan society. This has traversed time and space; cutting across history

from the traditional settlement through the advent of contemporary urban dwelling to the present.

By function we have used the basic human activities of dwelling as well as performance of the unit as our definition. Societal forces were largely dominant in a traditional homestead in determining the concept. In the colonial urban dwelling controls and notions of the African a supplier of labour and not an urban dweller prevailed; resulting in the bedspace concept (this is further discussed under Policy in section 2.3).

Contemporary urban concept restrict function to the 'common' and the 'shared'. More recently the capacity of the function to evolve through growth as desired in the Starter unit could form the basis of design concepts. In this case cost may play a dominant role as the following section attempts to show.

2.2 COST AND ECONOMIC CONSIDERATIONS

The impact of cost and economic considerations on the evolution of housing concepts and the ensuing typologies in Kenya cannot be overemphasised. These considerations in low income housing ought to recognise (and one can add that they have occasionally recognised) the reality of:

- high *building costs* for conventional inputs,
- high cost *standards* and specification demanded in the urban settings,
- the low *incomes* of the intended dwellers and their influence over affordability,
- the cost of investment *capital* compounded with the lack of attraction of financiers towards this sector,
- the potential of macro-economic benefits of investment in this sector of local employment generation, local material development and production, local technology development,
- the potential of the micro-economic considerations of the individual with regard to the unit as an economic enhancement tool,
- the scarcity of suitable and affordable land.

We look some of these factors in the following sections.

2.21 Building Costs and Standards

Building costs in low income shelter consist of materials, the labour component and professional fees.

Conventional materials contribution to low income housing is significant in design concepts mainly because they constitute what is considered the urban standard as set in the relevant legislation. In effect a breach of these standards places the shelter so created in the category of unsuited urban housing, subject to demolition. This realisation places one in a vicious circle whereby the accompanying technology and 'software' ought to conform as well rendering the traditional skills inherited from the rural contexts largely inapplicable.

The cost implication is obvious and the distance between the beneficiaries and affordability, hence rent propensity,[25] increases. What is more is the sensitivity to macro-economic forces observable in a modern free market economy, as price decontrol, of these materials and the technologies.

[25] Rent Propensity is the proportion of income a household is prepared to devote to housing as used by Jorgensen [1982]

Efforts to adopt low costs technologies successful elsewhere like prefabrication have (largely justifiably) never been seriously investigated. For instance, of prefabrication Central Housing Board [p.36] states:

'Many experiments have been conducted from time to time in this colony in this connection, including various methods of prefabrication, which so far have proved disappointing, costs in most cases exceed those of present methods. Transport and breakage percentages are a contributory factor to these results.

'fundi'

It is fortunate that local artisanry (commonly called *fundi;* see photos 2.4,) has been adapting to some conventional technologies. The abundance of labour ought to make it less significant than other inputs. However conventional processes necessary in formal interventions may inflate costs.

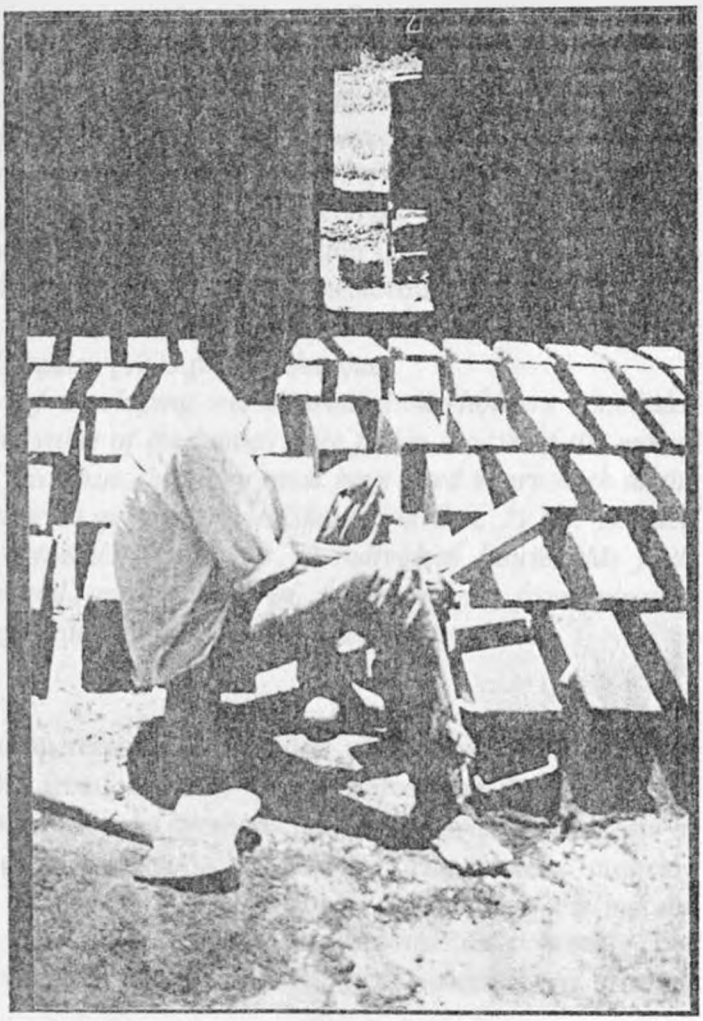

Photo 2.4 Block making by local 'fundi' at Bung'oma TP scheme

A common feature that has yet to reach its full potential is the informal contractor (*Jua Kali*[26]) His potential lies in the capacity to appropriate conventional technology to local conditions. In the process a hybrid technology[Verschure,1979], now increasingly common in informal settlements as well as self build environments like Site and Service schemes, Starter Units and rural areas. These processes are yet to be fully understood and hardly receive the necessary support. So far no attempt has been successful in incorporating them in conventional housing contracts and procedures.

Note that despite this axiom, the efficiency and tangible economic advantages of informal processes are not obvious, and are still to withstand the test of time. We are in fact only advocating their recognition and possible incorporation in the thinking of the professional and policy maker. It is only this way that endogenous technological development can be realised.

On labour, one cannot help but appreciate the potential of self help. The comments above on efficiency, recognition and regularisation of informal systems similarly apply to self-help construction. Own construction is however hard to come by [Syagga and Malombe,1994] as the opportunity cost is often high for the dwellers. What is becoming increasingly important is self-help management and self-help production [Erkelens,1991] This is particularly relevant in the SU projects at the transformation stage.

As Spence, Wells and Dudley [1993,p.13] point out:
'One extensive study of developing world urban householders concluded that in many cases the value of the homes were far in excess of the money they would have put into them that they must have used every trick in the informal building sector to get them built(Shankland Cox, 1977). The self management of the construction process by individual households finds parallel a in communal organisation of infrastructure from pirating electricity and digging drains for building and running a school'

fees
Another input in housing responsible for costs which have direct influence over concepts are the fees. Because of the percentage fee scales, the professional finds him/herself in an invidious position of lowering the costs of the units and in the process lowering his income. This position probably goes some way into explaining why only public organs take low income housing seriously. The private sector professional may pitiably but understandably have less motivation in taking up such a commission. The

[26] *Jua Kali* is the Swahili for 'hot sun' coined from the flames of the oxyacetylene gas used in welding workshops. We use term to refer to an informal organisation while the individual artisan is referred as *fundi*, Swahili for artisan.

Photo 2.5 Bricks at Busia Scheme

public sector concern constitutes a hidden subsidy (sometimes real as at Pumwani High-rise Apartments[Muturi,1992] & [PGCHS/UNCHS, 1993,p 272]). Professional fees in low cost housing based on conventional methods of calculation[27][RoK,CAP 525] whenever applied as in most NHC schemes .

2.22 Materials and Standards

Materials have been a subject of standards as controlled by the Bye-laws and other legislation. Considerable pioneering effort has been made in attempting to review these standards in independent Kenya [Agevi,1993a]. This coupled with research in Appropriate Technology[Agevi,1993b] have however not influenced construction costs significantly, yet.

More interestingly this has not influenced design concepts (or a search for alternative concepts). Reviewing standards and materials have mainly been towards replacing expensive and alien inputs (a significant and commendable attempt) in already set design constants. This has only added vocabulary in technology. Their local content and potential to increase domestic employment is desirable.

[27] CAP 525 of the Laws of Kenya governs Architects and Quantity Surveyors fees.

Standards and Appropriate Technology should necessarily influence design concepts. Thus for instance mass housing in the high-rise block was motivated by advancements in concrete technology and prefabrication of building elements; system building [Delrue,1982].

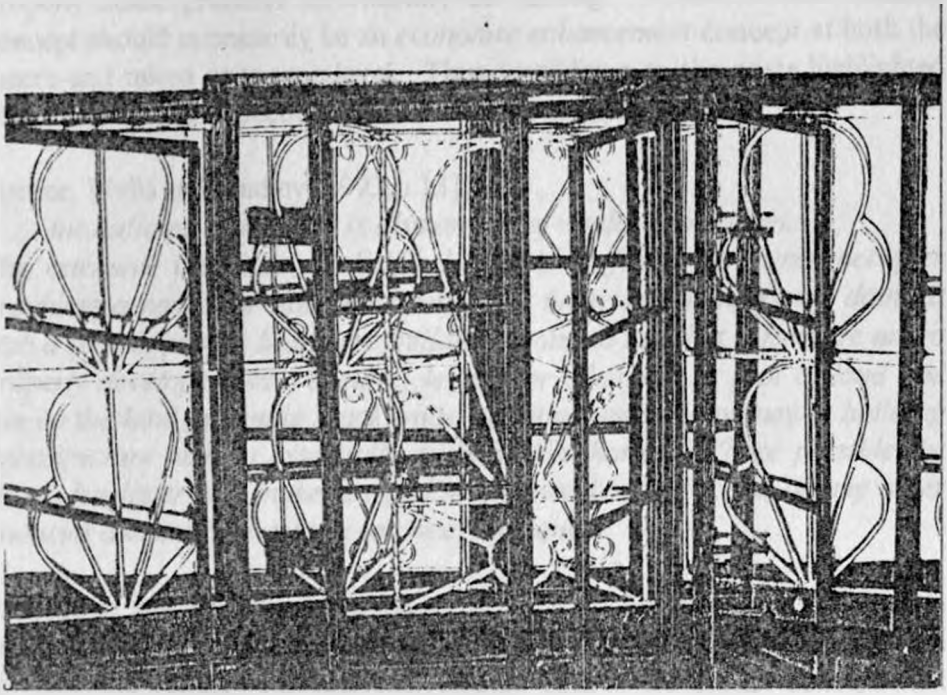

Photo 2.6 Typical metal-work products from a Jua Kali workshop.

Given the costly standards, the poor can hardly be expected to pay for conventional dwelling with their low *incomes*. Since architects' influence hardly goes beyond design and project implementation, one cannot blame them for doing nothing about incomes. However innovative design concepts promoting common and shared services, in the process lowering costs as in condominium [Tuts,1991]projects, and hence spreading costs are possible.

This should recognise broader aspects of the implementation process, and not just singular aspects. An example is the high and mid-rise apartments[28] blocks which were meant to curb costs through economy on land use. These have failed to fulfil targeted population groups since other factors like technology, construction process ...proved more significant than land in determining costs. The point is that concepts which spread out costs should be pursued and exploited in an effort to make low income earners afford housing.

[28] The example of Kibera High-rise estate where only middle income persons could afford units targeted for the poor.[PGCHS/UNCHS, 1993, p.279] & [Muturi,1992]

Economic Enhancement

Concepts that permit and encourage income generation by owners should be a pre-requisite to low income housing concepts. Here we refer to alternative use spaces cited elsewhere, for instance. The concept of self-help if managed properly could promote affordability of housing. A low income housing concept should necessarily be an *economic enhancement* concept at both the macro-and micro economic level. Thus in addition to the costs highlighted above one should expect returns and income generation.

Spence, Wells and Dudley [1993,p.13]:

'..... the building of housing is also an act of wealth generation. The extensive literature on Self-help tends to focus on owner occupier providing a house for him or herself. But many self-builders are doing it with a view to profit. Many are building rooms to rent but others are micro property developers who acquire, legally or otherwise, a plot of land and live on the land in simple shack while investing time and money in building infrastructure and an essentially middle class house. Where possible the micro-developer will make use of low interest housing loans or any other financial assistance available to owner-occupiers.'

Alternative use possible for a given unit should be exploited to generate additional income too. Often most estates are ill-provided with commercial services like shops, kindergartens, among others. A design concept that facilitates multiple uses, hence flexibility, is clearly suited.

As a result of non-consideration of these needs, we observe such services spontaneously distributed in most conventional schemes. The improvement of a given unit also adds equity to the unit making the possible resale[29] at a profit a desired goal. It also enhances the collateral value of the unit.

Of all the economic parameters at play, architects have a relatively higher impact on design. A study of design concepts for low cost housing is therefore a study of economical design. The danger of the economical design approach is the uniformity and barrenness of the aesthetic product. This goes some way in explaining the earlier cited low income housing aesthetic. The principle of the approach is to reduce the function to the common, the basic and therefore the cheapest, hopefully.

At planning level this economic aesthetic is evident in row plotting to facilitate efficient servicing. Thus common roads and back-to-back plotting. Units are combined in pairs or more to share walling and service pipes as much as possible. The roofs are devoid of any discernible form; shallow pitches and no ceilings.

[29] The shortage of housing in Kenya is such that few cases (if any)of '*negative equity*' [Zipfel,1994]have been reported, on mortgage or tenant purchase houses. If anything second mortgage loans are possible.

Finishing is poor or none, although some efforts are made to have the once in a while brightly coloured front door! It is safe to say that the architects' role is reduced to that of a damage control spectator, at least if we are look at his role as that of providing aesthetically pleasant form. This calls for redefining his role to more concretely include aspects of cost. It is safe to say that, when it comes to low income housing design the Quantity Surveyor is the one professional whose opinion holds sway in decision making, at design and planning stage.

It is correct to state that Technology ant Standards are inter-linked in a formal context. It is therefore common to relate the two as if they one cannot operate independent of the other. Thus Mabogunje, Hardoy and Misra [1978,p. 30] unerringly state that, technology is....

'....usually related to the economic level of developed countries and consequently may be unsuited to the economic capacity of the developing countries.'

But this is as far it goes for conventional Standards are hardly enforceable hence inapplicable to low income environments. Conventional standards are therefore only for the higher income groups in the formal sector, in this sense. Addressing affordable housing issues in the same light as standards is somewhat flawed. To associate AT non-adoption to prohibitive standards is hardly correct.

The impossibility of enforcement of conventional standards in informal settlements avails AT disseminators two opportunities;

- to introduce un-hindered these new technologies for informal acceptance and testing, this way a case of adoption would be stronger through performance in these tests,

- to gather information on informal standards for incorporation in prospective new appropriate standards. In revising conventional a normal starting point is the already existing ones. The process is normally on how to lower to appropriateness. A top-down approach. We opine that the approach should be the reverse, whereby standards gathered in the field, informal settlements are standardised, so to speak.

Box 2.3 Of Appropriate Technology and Standards in Kenya

2.23 Tenure and Financing Concepts

As will become clearer terms and conditions of finance and tenure influence the unit concepts immensely. Here we proceed to define the terms and show how they influence the designs in low and medium income housing. We try to compare the relative performance and potential as solutions to low income housing.

In all these we need to know the Cost of Capital and its influence over housing concepts. The *cost of capital* is composed of two aspects [Jorgensen, 1977, p. 54];

1. establishment and administration and,
2. debt servicing i.e. the interest and amortisation (capital redemption).

We define for broad categories under which we can gauge the performance of the differing concepts as regards applicability to the poor. These are;

- Target Group Focus (TGF), where we asses the relevance to the poor of the financial concept,
- Environmental Quality (EQ), where we look at the resultant *social* environment ,
- Housing Stock Reproduction (HSR), where asses the capacity of the concept to have a multiplier effect in terms of generating more housing stock for the poor,
- Local Resource Use (LRU), where we asses the potential of the approach to exploit local human and natural resource.

We do not attach any quantifiable weighting to these terms here but purely but give qualitative evaluation from our perspective.

Mortgage Schemes

Mortgage schemes refer to conditions where the allottee occupies a unit while periodically paying instalments towards the purchase price. In the meantime the title is kept by the loaning institution and reverts to him/her on completion of the loan.

The influence on design is as much tied to the terms of the mortgage contract as it is to the requirements of the targeted beneficiary. Since the house acts as collateral for the loan, basic requirements are high. For instance the unit has to be substantially complete complying with conventional standards. Moreover the terms are often harsh, for instance high, market rate interest rates, shorter repayment periods and higher deposits. Other impeding conditions are miscellaneous fees, legal fees and minimum amounts of balance in ones bank account....

The effect is to make these units by and large unaffordable to the poor majority; no doubt few talk of mortgage housing for the low income. Even though NACHU has experimented on Co-operative mortgage to be discussed shortly. NHC also has attempted 'low cost mortgage' schemes in Kajiado and Malindi. In the case of NHC, the 'low cost aspect' is normally in the 'starter' concept, otherwise the terms are never suited for the poor, and this is evident in the ownership and success of the said cases.[30] A mortgage scheme targeting the poor by Kenya Building Society at Koma Rock in Nairobi attempted to use Appropriate Technology material for roofing as away of making mortgage affordable [1993,pp.206-216][31]

This leads one to conclude mortgage housing is *not* target group focused; and that it is a concept to the convenience and expedience of the financier and developer in free market environment.

Understandably the environments in most of these schemes are good; in terms of estate community concern of security, cleanliness, noise...
Because of insistence of conformity to conventional standards, very small component of locally available and/or produced resource is employed in the construction of the units.

Further the process of construction is biased towards the conventional contractor to a large extent, diminishing or altogether eliminating the chances of the of the small contractor, or indeed the owner participating in shelter self provision. One can postulate that the mortgage concept is singularly unsuited as low income shelter solution in aspects of resource economy; both at micro-and macro-level. But that is, if we gauge from a social responsibility position as opposed to pure economic viability as target. Our position is that concepts that adopt cheap solutions, as in the SU could be made more efficient, enough to attract any mortgage financing.

The requirements of the financier include complete units; hindering any opportunity of the individual to exercise their own initiative to extend extra units. This is more so since one needs to conform to the set planning requirements lest the city authorities take offence and demolish the extra unit; a scenario harmful and understandably hated by the mortgagor.

Of course in reality most of these estates have extensions variously called 'guest wings', 'servants quarters'...(this is yet another aspect of the Kenyan middle class!). These are used as lettable units albeit informally. Still the point is that mortgage units do not expose themselves to housing stock

[30] This assessment based on our personal knowledge of the said projects and discussions with NHC project officers.

[31] It is possible that little success was achieved as Wells[1993,pp.206-216] reports that not much in terms of cost saving can be said to have been realised.

reproduction; legally at least. One can say that you provide *x* units and get *x* units in return after a lapse of time; not too satisfactory a condition....

In mortgage we see financial situation whereby an architectural concept is pre-determined, which in turn influences affordability and does little to guarantee a substantial increase in the housing stock in the long run.

Co-operative Mortgage

The problems highlighted above in respect of mortgage schemes rule out a vast proportion of the low income. The co-operative mortgage [NACHU,1988] attempts to circumvent these by adopting a group mortgage; hence group requirements. It is assumed that by a community taking responsibility of the mortgage requirements and repayments they will be more mortgageable.

In the process the individuals and their units do not matter to the lending agency; so long as the co-operative union as an entity is regular in repayments.

The task for the architect is that of an appropriate design concept that could reduce the burden of the loan to the individual. Few experiences are observable in Kenya. In the NACHU Kariobangi project [PGCHS, 1993, pp. 299-312] a condominium of three owners was adopted. The densities and limited open space on the plots made the environments not so pleasant. Further the lack of room and scope for expansion limits the potential for housing reproduction. But these are on specific comments on a solution. The effort to turn a financial concept into an architectural solution is worthwhile. There is evidently economy of resource use through shared and common facilities; mainly infrastructure and services.

Here is a case of financial conditions directly influencing architectural concepts. The success is mainly on the proper focusing of the income group. Because of the bureaucratic requirements and the chain of command, it is not easy to sell the units to another party as the co-operative manages the units directly.

Social Rental Schemes

We insist on using the term 'social rental' to distinguish it from any rental habitation *per se* which we advocate in the SU Concept. In this case we refer to government or publicly owned units often at subsidised rents. These are rents based on social or political interest; often well below market rents as well as economic rents.

The obvious result of subsidy [or cross-subsidy] is to reduce the funds available for any other development for the target group; hence keeping the supply low.[You,1993]

Further the absence of *de jure* ownership reduces the appetite to invest in the unit in form of expansion or maintenance. It is common to find up to 40% of the government housing stock deteriorated beyond rehabilitation. The resulting environments are often poor.

Viewed from this angle, *social rental*[32] schemes assume only a socially acceptability role. This is so because of their incapacity to evolve into an economically generative function. Often they are viewed as cheap housing for politically protected few [Jorgensen,1977,p.81]. The resulting environment is one of poorly maintained units.

Shihembetsa[1993,p.263]in reference the Nairobi neighbourhood units observes:
'It is noteworthy that these old estates have remained the same as they were built with notable deterioration of the structures and services due to poor m maintenance'

We are singularly not in favour of the above scenario and prefer an economic enhancement concept. Returns from subletting of units are encouraged not only as additional income but also as possible saving for extension, improvement and maintenance of the unit provided. This could in turn attract more rental return.

The provision process for social housing is often the formal one whereby the developer, a government department or parastatal employ conventional contractors and adopt conventional standards. This keeps away the higher potential of utilisation of local resource.

It has often been said that social housing schemes are a drain to the economy; this is more so in the Kenyan context. To justify any investment of this sort one requires to improve housing management in ensuring charging economic rents and regular maintenance.

In fact the government [RoK,1990,p.49.]seems to concur with this general opinion, and in fact encourages local authorities and other government

[32]By Social Rental we refer to government rental schemes common in most urban Kenya schemes often with subsidised rents. This should be distinguished from private rental units, encouraged in this in this discourse. Another related concept is that of *social mortgage* which we define to be the Tenant Purchase types; attracting social interest rates. The use of the term 'social' is borrowed from De Troyer's [1994 & seminars] 'social' interest concept.

departments to charge market rents and rates for letting and sale of public services and assets, including housing.

Four definitions of rent will suffice;
1. *market rent* is rent charged in a free market economy as determined by demand and supply
2. *economic rent* is based on capital expenses and other management fees
3. *subsidised or sub-economic rents* have subsidies being the difference between market rents and the rents actually paid by the tenants.
4. *Controlled rents* are rents fixed through an act of parliament

Two other terms suffice;
- *pool housing* which are rental housing reserved for government departments
- *institutional housing* for various institutions like school and hospital staff

One can say that the latter descriptions are of staff housing hence rent subsidies constitute additional income for an often under-remunerated civil service.

Box 2.4 Types of Rent

Tenant Purchase Schemes

Tenant Purchase(TP) schemes are similar to the mortgage type described above save the following:
- the ownership title deed remains in the name of the developer until repayment of the long-term loan is complete when transfer transactions can be initiated,
- the conditions are softer, i.e. lower interest terms and repayment periods.

It is because of this soft terms that I would rather refer to the approach as *social mortgage*. This is often because the government which finances most TP schemes has a capacity to attract long-term loans on softer terms than most private would otherwise be able to.[Jorgensen,1977,p84].

The softer loan terms make these highly sought after units. The Starter Unit schemes in the casestudies fit in this category. This could serve as dual role as social housing and also be a generator of economic growth as we posit in this work. The concept is one of growth over time and decisions are in the hands of the owner; partially at the provision and totally at subsequent stages during owner transformation.

This is not say that that it has no inherent dangers. To the contrary, with these softer terms the final price of the units is often more affordable to the poor. Because the price is below the market rate sub-letting and speculative purchases set in. Further, where the units have a potential for expansion, the owner takes the liberty to extend the units given the meagre space often accorded and the need for additional income. This in itself is not bad per se

but some say that it is evidence of mis-targeted subsidies. we believe that with proper design and a sound self-funding concept one can still achieve a modicum of success.

The concept of the tenant purchasing his/her dwelling is infers a tenant being given responsibility over what is in reality not their property but with a promise of future ownership. One can say that the rents go towards off-setting the loan. Therefore it is a mid-way position between full ownership and rental type described above. The resulting architectural concept can thus be low cost but gives the dweller responsibility of control of the ensuing environment.

Clearly this calls for a design concept the accommodates transformation and multiple uses. The SU fits in this scheme. Due to this capacity to transform the environment cannot be controlled by the developer. On the other hand the owners do posses powers to re-create and the ensuing environment. The housing stock can predictably be increased as a response to user financial needs and capacity in an environment of effective housing demand. Control and deployment of locally abundant resource is possible; given the informal character of the ensuing transformations.

It is also possible to study and gauge appropriate standards for the said income groups through feedback and feedforward analyses. This is one of the objectives of this work.

Walk-up apartments

Tenant Purchase funds can also be deployed for complete units. A prime example of this is the walk-up apartments as at Kibera and Pumwani [PGCHS, 1993, pp. 269-274] & [Muturi,1992]. These were adopted to ease pressure on land in metropolitan Nairobi. It was also hoped that in the process this would curb costs.

The latter has hardly been achieved mainly because the technology for apartment development is necessarily high cost. Savings in land hardly figure in the selling price compared to say the costs attributable to the structural engineering basics. The completeness of the units render it impossible for the owner to participate in improvement of his/her own house.

Site and Service schemes

Financial terms for site and service schemes are identical to the tenant purchase terms described above. However the concept of only providing infrastructure (i.e. roads, water, drainage, and sewerage) and a service core (often toilet block otherwise no standing structure) yields somewhat different results.

The absence of a basic liveable space hampers the occupation of the plots by the low income often preferring to sell them to the rich, from the onset. The start-up capital for a basic unit often is unfathomable; most preferring to fall for the temptation of ready cash from the speculative purchaser. The secondary purchasers in turn develop the unit for rental income often from the very income group they bought from. (an example of Mathare North) [Tuts,1988].

The Site and Service approach as an concept deserving the energies of an architect, is debatable to some. What with only a virtually blank site as the resultant! But then one can say that it is an opportunity to redefine the scope of the profession. This should not be interpreted to mean venturing into the engineering domain but more to do with organisational mechanisms which encourage participation and co-operation between the dwellers and the professional. A sociological concept encouraging building communities rather than just buildings.

Two Concepts

Two other interventions of minimal conventional architectural consequence are *shelter upgrading* and the infant *house rehabilitation* projects.

Shelter upgrading involves intervention in an already settled area by providing infrastructure services only. The presumption is that the house condition is of less immediate consequence to the owners. Further, with improved services the value of the plots will be enhanced; making possible to improve the units. The few cases in Kenya can hardly be considered a success, mainly because of the apathy by the beneficiaries in comprehending the objectives of such approaches. Often we have loan repayment problems in such schemes.

House rehabilitation programmes involve provision of funds to individuals often in a housing co-operative society for purposes of themselves rehabilitating their house. The beneficiaries identify their priorities and present their costing to the consultants (in this case NACHU) before release of funds in instalments for the purpose. This is still infant and no meaningful assessment will be made in this work.

	TGF	EQ	HSR	LRU
MORTGAGE HOUSING	-	+	0	0
TP APARTMENT BLOCKS	+	0	0	0
SOCIAL RENTAL	+	0	0	0
SITE & SERVICE	+	0	+	+
SHELTER UPGRADING	+	0	+	0
HOUSE REHABILITATION	+	0	+	+
TP STARTER UNIT	+	0	+	+

TGF low income target group focus
EQ quality of environment
HSR housing stock reproduction
LRU local resource use

Table 2.1 Assessment Criteria for housing interventions

2.3 POLICIES AND OFFICIAL ATTITUDES

Influence of policy on low cost housing concepts

Policy can be seen as guidelines or as an operational framework for housing . The ministry responsible for housing is often responsible for setting these guidelines. In general one can say the pre-independence government largely ignored the African housing in the towns(at least at the earlier stages). We have also seen that later this attitude changed in the period just before independence. The framework created by this change of emphasis was largely passed over to the independence policy makers[33].

The independence government placed even greater emphasis[34] [Box 2.5]with the establishment of the National Housing Corporation in 1967 (through the Housing Amendment Bill, 1967) which was given a greater mandate than CHB ever had. Thus whereas, CHB could only offer loans and guidelines to the local authorities, NHC does initiate and implement projects. The NHC was and still is the executive arm [Ibanda,1976.p.9] of the government for implementing housing while the Ministry is the policy formulator. This explains why we think that policy is hardly responsive to evolving functional needs.

Thus the other arms of housing in Kenya; research wing at Housing and Building Research Institute(HABRI) formerly Housing Research and Development Unit(HRDU) and for finance Housing Finance Company of Kenya (HFCK) also suffer from this separation of this housing policy structure. Each champion their respective courses, without succeeding in a co-ordinated approach among themselves. Research at the reinvigorated Housing and Building Research Institute (HABRI), can hardly be deemed to be felt priorities at NHC or HFCK.

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[33] See Suren[1978.p.210]. We quote: '*By the 1950s, many of the elements of a national urban housing policy, that would persist until the present day had been established. In its broadest sense, the policy had stabilisation, the reduction of urban political grievances and labour efficiency as its chief goals. O achieve these objectives, the government to increased family housing, neighbourhood planning, economic rents, higher wage levels, improved social amenities, and residual controls over urban migration.*'

[34] We cite Ibanda[1978.p.9.]: '*It was in the post independence period that elaborate national planning began. During the same period the Government was determined to find solutions to its urban housing shortage. It was the urban housing pressure that prompted the Government to invite the United Nations experts to study of short and long-term housing needs, and to make recommendations on housing policies within the framework of Social and Economic Development Planning. The result was the Blomberg-Abrams Report published in May, 1965.*'

Some landmarks in the evolution of housing policy in post-independence Kenya [Ibanda,1978,pp.9-12]:

- the Bloomberg-Abrams Report prepared by United nations experts in 1965 recommended the establishment of a National Housing authority with more powers than the Central Housing Board to co-ordinate and initiate development by the local authorities
- in 1965/66 Sessional Paper No.5 is launched in which the government restates its position and commitment to decent housing
- NHC is established in 1967 as established as the executive arm of Government for *initiating and implementing* housing projects. This was part of the Bloomberg-Abrams Report
- further the Housing Research and Development Unit (HRDU) and Housing Finance Company of Kenya(HFCK) are established to compile background *information and research* on housing and to help in *financing* housing respectively
- in 1966-70 Development Plan low income urban housing was to dealt with through the *rental and home ownership* schemes. The government states its position against subsidies and encouraged development of Site and Service Schemes; where individuals would be encouraged to develop their own housing on surveyed sites serviced with roads, water, security lighting, sewage disposal and garbage removal
- 1970-74 Development Plan the Government undertook to assist local authorities in development of housing, encourage the improvement of designs through the emphasis on *local materials* and research on improvement of *building codes*
- 1974-78 Development Plan talks of the urban standard for housing of two rooms with a kitchen, water closet and shower. Further there is strong stand on unauthorised shelter in slums
- subsequent development plans show Government commitment to low income dwelling although no tangible programmes are initiated
- in the Sessional Paper No.1 of 1986 [RoK,1986,p.49] on Economic Management for Renewed Growth the emphasis is on investment with high yielding returns at less costs per beneficiary. There is increasing emphasis on the private sector playing a role in provision of public infrastructure.

Box 2.5 Some aspects of Government Policy on housing

While the HFCK is more in the mortgage business and can hardly be considered to be a full participator in low-cost housing provision[35].

One other valid way of rephrasing this section can be how policy biases have been unable to respond to evolving preferences of the low income users and hence housing concepts. This is not to say that policies have been unable to change but that they have been slow; to an extend that they are largely out of phase with the reality. One view would be as stated in the opening of this chapter: policies do not always respond to evolving functional and economic needs at the opportune moment. The following policy inclinations can generally be said to (have influenced) influence design concepts.
The said levels are:

- the official view on low income and native urbanity
- the enabling vs. provision dialectic
- tenurial system
- legislation and statutes

Urbanity

'the urban native'

As mentioned elsewhere the colonial administration in the initial stages was prone to relegate the African to rural living, and that urban living for them was transitory as opposed to that of permanence. The resultant concept in housing was the bedspace in the dormitory. In the same vein, it was perceived that the unit was to be let to him/her as opposed to ownership. The family was supposedly housed in the rural home. Thus we observe rental unit development of the bedspace nature. In essence these were labour camps, for the then emerging production, administrative and commercial centres.

Neighbourhood Unit

The reality of families coming over to visit their bread earners forces a policy shift to family living quarters. The emergence of the *Neighbourhood Unit Concept* in particularly Nairobi bears evidence of this policy shift. NUC were self sufficient neighbourhoods with the necessary social amenities like social halls, schools, shopping places, health facilities, ...in addition to housing. They were largely based on the Garden City of Ebenezer Howard [Hall, 1988] in England

[35] There are some exceptions of course. NHC's attempt to employ Appropriate Technology materials of Stabilised Soil Block (SSB) and Fibre Cement Roofing (FCR) tiles at Nyahururu TP scheme[Wells, 1993]is one example. Another is the HFCK's(by way of its subsidiary the Kenya Building Society, KBS) use of FCR tiles at Koma Rock [Wells, 1993]. Further HFCK has almost always been providing long term financing to NHC mortgage schemes. But the stringent terms mentioned in the discussion on mortgage housing have also always been applied rendering the units inapplicable for the poor. What is lacking is a co-ordinated low cost housing approach; in our opinion.

We still notice that the bias towards rental units as opposed to ownership. More so they thrive on heavy subsidies as rents are sub-economic This may have been justifiable at the time given the low salaries; then the official policy on employment.[Stren, 1978, p.187]

Serviced Site

A shift [Stren,1978, p.201] towards ownership can however be noted towards the end of the colonial government era. The *Serviced Site* [CHB, p.1]approach is one such manifestation of this policy.

The independent government's policy of free movement to the urban area ought to have accorded one an opportunity view the true African urbanity. This however was accompanied by adverse economic conditions and of such demographic proportions that the resultant environments can hardly be considered the truly African urbanity. As stated this majority due to the inadequate income and congestion. One can however observe traits of rural and cultural paraphernalia and lifestyle. It is also true that transformations of these traits have occurred and continue unabated.

urban agriculture

Common are the propensities for *urban agriculture* through cultivation or/and keeping of domestic animals in city quarters. The tragedy is the lack of well documented and comprehensive details of these common traits in African urban living. We posit that this is a basic requirement to understanding urban standards in African cities.

Another assumption of ownership is owner-occupation. This however does not truncate the rural links; in the form of ownership of property and home in the country. This is manifest in regular rural visits and to most final burial at the country home. No doubt most consider urban dwellings as mere *houses and not homes.* The reality of urban living to some is that of *an* abode and not *the* abode. This may have to be viewed more as a temporary transitional notion than a definition of African Urbanity.

Provision Process

By the *provision process* we refer to the restrictive formal interventions as opposed to the *laissez faire* processes in the unplanned settlements. More precisely we refer to the level and magnitude of intervention by the formal institution, whereby the owner's role in his shelter condition is evaluated. This calls to mind the dialectic of *enabling* versus *provision* of housing.

As has been elaborated elsewhere the colonial African was provided what was perceived as housing and until only later was he expected to contribute towards self-provision of own shelter (in serviced sites and core units). The latter presumed a concept of ownership of an unbuilt or partially built unit.

These later approaches carried over into and reinforced in independent Kenya, encouraged owner provision of shelter (site and service schemes, starter units...). It can also be stated that this also recognised the concept of owner-occupation, and /or subletting. Ownership of complete units was to come the in form of Tenant Purchase or Mortgage units. This also presumes owner-occupation.

In enabling strategies, the government aims to provide essential services; mainly trunk infrastructure, land, enabling legislation and financial systems, while the individual takes responsibility for micro-level decisions. This include plot infrastructure and building. It is hoped this way the multiplier effect of the input will be greater.

The site and service plots approximate to this approach. Upgrading schemes also fall in this category. The role of the architect and architectural concepts is diminished to that of a 'back seat driver' than project leader! It may suffice to add that there is need to have architects with strengths in sociological aspects of dealing with dwellers than mere architectural qualifications.

The Self-help concept in shelter provision is the cornerstone of this approach. Erkelens[1991] identifies three aspects of Self-help as;

- self-management
- self- production
- self- construction

However it is not obvious how these self-help concepts promote efficiency of resource use or otherwise. As will be seen in some SU owner solutions, not the most economical or indeed logical solutions are can be expected from the owners all the time.

Role of International Finance and Policy and Concepts

Conditions attached to *international finance* from bilateral agreements may not be divorced from what has already been discussed, only that they are set by the international financier adhering to their wishes, philosophies, ... these could be ideological, economic, political .....Further the funds could be channelled through a public agency, hence the government; an Non-Governmental Organisation (NGO), or a private agency.

Restrictive conditions affecting design concept could be the level of infrastructure/services vis-à-vis the built-up area, the number of rooms, the ceiling price of the unit, ... It also possible that the donor may insist on and in fact provide type plans. Some concepts emphasised and realised in Kenya are shown in Fig. 2.5.

Ideology

Although Kenya has been considered by many as a rightist, capitalist state, its housing policies can be classified as a mixture of both welfarist and free market attitudes. Thus, whereas social rental schemes evident in most urban areas in Kenya are more in tune with post-war housing[Power, 199..] instigated by the Leftist government in Britain, the more recent schemes emphasise sale and ownership encourage economic returns. The social schemes may considered more as socially desirable without necessarily being economically viable.

As can seen from examples in Kenya the social schemes are not replicable, acting more as a drain to the economy. Thus Jorgensen[1977,p.81] describes public housing as;

'identical ,minimum standard, ill maintained, overcrowded, loss producing units in the least attractive part of town'. This is so since they involve subsidies; funds which could be better directed to generate more housing for the needy. Limited resources contribute immensely to this scenario. It suffices that a well intended policy can be self-defeatist.

No doubt that emphasis is more towards economic viability and ownership in more recent policy trends; an ideological shift to the capitalist system. The IMF Structural Adjustment Programmes (SAP) embraced and currently being implemented by the Kenya Government emphasise such policy approaches. It is true that the majority of the very poor may loose out, but they at least they will be guaranteed future funding in housing,..... hopefully.

What ought to be done in order to embrace more poor people is to adopt design concepts that would enable them not only afford the unit but also generate income for funding another unit. This way both social desirability and economic viability are achieved.

A starter would be to sell the existing social housing stock to the tenants. With tenurial rights, it is possible for them to control, improve and generate income from their living environment; and possibly invest in more housing. In a way this will be a symbiosis of the socialist and capitalist approaches; desirable in the prevailing circumstances. Where *de jure* ownership is assured, as in Tenant Purchase schemes, however amenities are expected to be more. This is not necessarily at unit level, but also by the size of the plot. A large plot size accords the owner an opportunity to extend the existing and/or built a another unit.
It suffices therefore that, in character with the current ideological leanings, freehold and long lease ownership should be encouraged.

condominiums
One example of concepts based on community building principles is the condominium concept adopted in Umoja II[Tuts,1988]. The predominant concept was that the tenants pre-select themselves so as to form a socially acceptable entity. This way there could common action when need be causing less friction. Criteria for social acceptability could be common ethnicity, common employers, similar incomes..... The courtyard type condominium development with centrally placed services was the architectural manifestation of this approach. The same concept should suffice in co-operative housing developments; given the basis of the co-operative spirit. Thus in the co-operative Mortgage scheme at Kariobangi, we notice the condominium concept being adopted.

The apartment block possible as per the Sectional Properties Act can also be viewed as a sociological concept. Thus though the units are individually owned, there are amenities which will be commonly managed which call for a community[36].

Statutes

As stated, despite information to the contrary, the enforcement or otherwise of conventional standards through legislation and Building Codes has not greatly influenced low cost housing design concepts.(see Box 3.2).

Whereas the informal sector do not observe the laws hence setting new ones for themselves, the formal sector normally have a leeway, given their power and position in the decision making process. For the informal sector, it is assumed that because of their insecurity of tenure no effort should be made to conform any requirements any way

[36] The Act stipulates the formation of a corporation; a legal entity created and managed by the owners whose duties are to administer common amenities.

Formal institutions like NHC, NACHU and the local authorities have mostly had their way whenever necessary to change standards. Thus in condominium developments like at Kariobangi the lighting and open space standards are hardly fulfilled by NACHU. NHC's Kibera estate hardly went through the normal planning approval process, resulting in new densities and open space standards. In Nyahuru TP scheme SSB walling and FCR tiles were used on the roofs by NHC [Wells,199.., pp. 203-216]. These citations serve only to show that the powerful institutions could and do set new standards with the appropriate goodwill.

The Sectional Properties Act,1987

This is not say that statutes cannot influence design concepts, on the contrary they can and will increasingly do so. A case in mind is the enactment of the Sectional Properties Act,[GoK,1987] whereby flat ownership will now be possible. The view of apartments not as purely rental habitation may greatly influence the articulation of the units, the commonly owned and shared spaces among others. This call into place new management and administrative structures which in turn may influence architectural design concepts.

The apartment block however has inherent conceptual limitations and application to low income groups. This mainly because of the technology; which is mainly suited for the professional builders rendering owner building unfathomable.

Figure 2.5 summarises the relationship between policy, funding and house concept.

Fig 25

Framework of financial institutions and housing developments

SOURCE OF FUNDING	treasury																										
	foreign: Ford Foundation																										
	foreign: CDC																										
	foreign: WB																										
	USAID																										
	individual savings																										
	banks																										
	policies																										
	NACHU																										
DEVELOPER FINANCIER		G+L MOW		G+L MOLH			G+L MOLH L NHC			G+L MOLH L NHC L LA		NHC	LA	SH Coop	HFCK	Banks	Insurance co.	sav & loan building societies	private co (employers)	private (owner)		NACHU SH Coop	
		D		D		D(1) D(2)	D(2)	D(2)	F	D	D	D	D(2)	D	D	F	F(3)	F	F	D	D	D	D	
HOUSE TYPE/ FUND TYPE	mortgage																										
	tenant purchase																										
	S&S, Settlement Upgr.(4)																										
	Rental	institutional		pool				public			public								institutional	public							
	Sale																										
	house rehabilitation																										own house

LEGEND

D	developers
F	financiers
G	grant
L	loan
MOW	ministry of works
MOLH	ministry of lands and housing
CDC	commonwealth development corporation
WB	world bank
LA	local authority
NHC	national housing corporation
SH	self help
HFCK	housing finance company of Kenya

1) acts as project developer
2) can also act on behalf of small local authorities
3) long term loans to own employees for mortgages for customers; bridging finance for construction to be repaid in within 3 years
4) services brought within the existing area using the same funds as for S&S

source: Self-help building productivity; P.A. Erkelens 1991 & fieldwork

Chapter 3
CASE-STUDIES

3.1 GENERAL

3.11 Why fieldwork ?

Our inspiration emanates from John Turner's [1977] contention that people are most suited in providing their own shelter and therefore controlling basic shelter decisions for themselves. As such the professional's invidious position as provider is reduced to that of learning from the dwellers. The opportunity to attempt to understand user modifications to what has been provided is what the fieldwork was all about. However as stated elsewhere, other sources include literature and own experience.

Thus, the fieldwork constitutes the single most weighted methodology for this work . This for nothing but the sheer fact that we are investigating user response to what professionals have prescribed and dispensed. Further the core of our hypothesis is that conventional human settlement approaches are often at variance and even contradictory to what the potential beneficiaries perceive as their needs and requirements. It emerges that lessons acquired should attempt to bridge the gap between the providers and the intended beneficiaries.

The SU concept is a formal intervention in its initiation but adopts dweller, informal characteristics at the transformation stage. Through fieldwork, we gather knowledge of the dweller propensities so that in subsequent interventions we may assume the role of enablers than sheer providers. We also attempt, through discussions and interviews, to understand the breadth and depth of informalisation of otherwise formal interventions.

The uniqueness of a human settlement situation necessitates a targeted study achieved best in fieldwork. The variability of experience gained in different contexts is desirable for the constant re-education of the architect.

3.12 Limitations

Our essential limitation is also our inspiration. Having ,at one stage, played a role in the implementation of these projects, we were driven into formulating our hypothesis. But this also limits our scope. Thus most of the cases are of projects formulated and implemented in the ten years prior to the study. We try to circumvent this by studying other, older, historical SU interventions as will shortly be discussed.

Attempts and efforts were made to select projects representative of the National Housing Corporation projects[37]. Logistical constraints still assume a major role in letting this work assume a national character, however. Thus limited time meant we could only undertake detailed work on units where the occupants were available during the visit. Other investigations were less detailed.

Sources of data particularly for older cases were hard to get and where availed harder to authenticate. Other constraints meant that we could only restrict ourselves to the chosen geographical zone.

We limit our scope to architectural design and to a lesser extent cost sensitive aspects in our analyses. Other aspects of a cultural, ecological nature, etc. ...are important but are not emphasised in this work for practical reasons

3.13 Methodology

Table 3.1 summarises the various methodological approaches taken.

	general survey	detailed survey	TOTAL
Kakamega	202	10	212
Bung'oma	79	11	90
Busia	75	0	75
Vihiga	60	0	60
Amalemba I	54	2	56
Amalemba II	32	0	32
TOTAL	502	23	525
%	96%	4%	100%

general survey includes: global estate parameters, general unit survey on level of development, photographs.

detailed survey includes: unit details, measured drawings, interviews and discussions.

Table 3.1 Data Collection

[37] Here we refer to specifically the USAID financed Tenant Purchase housing schemes (Table 3.1) which adopted the starter unit concept. See also *Proposals and Recommendations for the review of the Development Loan Committee [USAID, 1974].* In this document it is proposed to loan to the Kenya Government US $5 million for housing to be implemented through NHC and specifically targets low income housing of at least two rooms ,a kitchen and wet core expandable in future.
It should be restated that NHC has implemented many other types of conceptual approaches as discussed in Chapter 2

The methodology employed in collecting data was mainly physical survey of owner transformations. For three of the schemes i.e. Kakamega, Bung'oma and Busia , all the units were covered. Selected clusters were the subject of investigations in the older Amalemba I & II Schemes. Only a global analysis was used in the case of Vihiga. Detailed analyses were used for the units in Bung'oma (12%) and Kakamega(5%). This involved more thorough survey of the unit and also the transformation aspects. Thus we looked at architectural merits and demerits of the options taken by the owners and their cost implications. In some cases NHC field staff were at hand on the sites and provided valuable assistance on owner transformation trends. In some cases interviews were possible.

Interviews were mainly with some tenants and owner-occupiers (where possible). Other actors like small scale contractors were also interviewed where deemed necessary. These were mainly guided interviews based on a checklist worked out beforehand (Appendix) but the responses have been structured to fit a comparative pattern whenever needed. Further it was possible to conduct interviews of some relevant policy actors[38] in the Kenya housing scene.

NHC provided most of the background data and documents of the SU and its extension concept as conceived and perceived. It proved impossible to get any cost data on the older schemes of Amalemba, even from NHC as well as the council. Only layout drawings were immediately available for the same. Relevant architectural drawings, Bills of Quantities and Cost Analysis data sheets were used during the survey for the projects at Kakamega, Bung'oma, Busia and Vihiga. The emphasis of methods and analyses vary between projects for reasons best understood when analysing the various criteria for choice of the respective schemes.

3.14 Choice Criteria

Our one-time[39] involvement in the implementation of most of the case-study schemes was our strongest motivation for the choices taken. This meant we already knew the various authorities first hand and hence easier access to useful data and information.

Since our subject is progressive design development over time, we thought that restricting ourselves to the four USAID schemes would hamper the extent of our findings as the schemes have not matured[40] enough. We thus selected two phases of Amalemba Housing Estate(I & II) which were

[38] Here we are grateful to NACHU, NHC, MOW, and Kakamega Municipal Council personnel.
[39] Between 1988 and 1993
[40] Here we refer to the five-year consolidation period stipulated in the TP Agreements[NHC, 1991]. in this period control of the is largely in the hands of NHC.

implemented by the Central Housing Board in the 1960s[41] to reduce this risk somewhat. This however only a precaution as we later found out that time was not a serious factor in the performance of the individual schemes. The context seemed more of the determining factor.

The USAID project was phased in terms of disbursement of funds in three "tracks", First, Second and Third Tracks. Our case-studies are a fair selection of this grouping. Kakamega TP falls within the first Track; while the Bung'oma, Busia and Vihiga fall in the third.
In terms of magnitude (see Table 3.11), Kakamega with 212 units is the second largest[42] in the USAID project. The rest are medium in scale (60-100 units). We chose Vihiga TP scheme despite the fact that it has only been recently (May, 1994) been completed for purposes of cost comparison; i.e. we use the contract costs for assessing recent trends in low income housing construction cost. The commonality of contexts of the case-study projects accords us an opportunity to create a continuity in discussing various aspects of the SU Concept.

3.15 Contexts

The fieldwork was carried out on six projects in four secondary towns in Western Kenya. They are major towns in the aptly named Western Province; [fig.3.1] an administrative entity in the country. This forms part of the Kenya -Uganda boundary; in fact Busia Town is a border town. This is significant in our subsequent evaluation of the performance of housing scheme located here. The province is largely inhabited by the Baluyia[43] tribe(see demographic data in Table...). The towns similarly are largely inhabited by the said tribe. It would be interesting to pursue how this ethnic bias manifests itself in the urban housing. It is beyond the scope of this work, however.

> Secondary towns in Kenya are best defined by their common function as district and /or provincial headquarters. Population figures are not useful in defining secondary towns as location of these towns is more often based on purely spatial criteria rather demography. A recent trend is to isolate principal towns as "growth centres" in high population areas and target hem for infrastructural improvements. These include Kakamega (one of our casestudy towns), Kisumu, Eldoret, Nakuru, Nyeri, and Mombasa ,and range in populations from 100,000 to 500,00 inhabitants. [RoK, 1993a]

Box 3.0 Of Secondary Towns

[41] The exact date of implementation was impossible to authenticate in the time available. The implementation drawings are dated 1960 and 1964 respectively.
[42] Meru TP scheme with 223 units is the largest USAID project.
[43] Baluyia is conglomeration of 18 Western Kenya Bantu speaking sub-tribes as defined by John Osogo[1965]

TRACK	SCHEME	NO. OF UNITS	APPROVED CEILING COST	COST PER UNIT	GROSS COST	MATERIALS ON LOAN	CONTRACT SUM	COMPLETION DATE	10% DEPOSIT	FEES	INTEREST
1ST	Homa Bay S&S	50		41,180.00	2,059,000.00		2,651,755.00	14.6.88	682,073.00	691,600.00	1,879,920.00
	Homa Bay material loan+remedial work	102		66,870.00	6,820,725.00	2,040,000.00	580,365.00	14.6.88			
	Kambu T.P.	60	72,200.00	72,280.00	4,047,680.00		3,330,440.00	24.9.87	407,768.00	510,768.00	542,560.00
	Kitui T.P.	30	65,000.00	70,985.00	2,128,950.00		1,315,445.00	4.1.88	212,895.00	814,920.00	783,130.00
	Kitui Serviced Plots	111		48,560.00	5,390,160.00	2,220,000.00	2,716,496.00	4.1.88	140,000.00		
	Kitui Demonstration House	1		140,000.00	140,000.00			4.1.88			
	Meru T.P.	223	65,000.00	59,660.00	13,304,180.00		6,577,423.00	20.3.87	1,330,418.00	1,433,480.00	765,020.00
	Meru Serviced Plots	4	30,000.00	26,060.00	104,240.00		4,489,914.00	20.3.87			
	Muranga T.P.	55	55,000.00	55,340.00	33,043,700.00		2,334,380.00	14.5.87	304,370.00	454,080.00	153,640.00
	Isiolo T.P.	83	76,960.00	76,460.00	4,849,060.00		6,705,720.00	19.1.90	484,906.00	772,620.00	841,540.00
	Isiolo Demonstation House	1		190,120.00	250.00			19.1.90			
	Isiolo Serviced Plots	61		31,600.00	2,289,640.00			19.1.90			
	Kakamega T.P.	212	60,733.00	60,733.00	12,875,396.00		9,080,118.00	11.4.90	1,287,540.00	913,240.00	1,167,560.00
	Machakos T.P.	55	63,500.00	65,120.00	3,581,600.00		3,324,880.00	31.3.90	358,160.00	445,280.00	291,300.00
	Machakos Serviced Plots.	25		32,500.00	812,500.00			31.3.90			
	NarvashaT.P.	75	55,000.00	55,000.00	4,125,000.00		33,250,600.00	30.11.89	412,500.00	503,060.00	313,548.00
2ND	NyahururuT.P. I	50	45,000.00	45,680.00	2,284,000.00		1,856,878.00	14.6.88	228,400.00	3,369,140.00	187,320.00
	Fully Serviced Plots	41		31,880.00	2,088,080.00			14.6.88			
	Nyahururu Semi-Serviced Plots	25		312,240.00				14.6.88			
	NyahururuT.P. II	40	65,000.00	65,000.00	2,600,000.00		2,622,083.00	14.3.90	260,000.00	271,260.00	341,760.00
	Nyahururu Serviced PLots	60		40,000.00	2,400,000.00			14.3.90			
	Siaya T.P.	150	50,140.00	50,140.00	7,521,300.00		5,594,028.00	12.10.89	752,100.00	931,600.00	442,000.00
3RD	EmbuT.P.	98	70,000.00	76,300.00	7,477,280.00		5,877,180.00	18.5.90	747,728.00	558,480.00	580,000.00
	Embu Demonstration House	1		293,420.00	263,340.00			18.5.90	263,340.00		
	Kerugoya T.P.	40	67,800.00	76,800.00	3,072,080.00		2,454,920.00	26.6.90	307,208.00	208,520.00	270,000.00
	Malindi T.P.	40	70,000.00	70,000.00	2,775,100.00		2,217,740.00	8.12.90	280,000.00	195,420.00	204,600.00
	BusiaT.P.	75	70,000.00	76,220.00	6,852,380.00		4,737,861.00	30.6.92	685,238.00	646,394.00	326,380.00
	Busia Demomnstration House?	1		250,000.00				30.6.92			
	Busia Special Unit.?	1		150,000.00				30.6.92			
	Busia Serviced Plots.?	25		35,500.00				30.6.92			
	Kapsabet T.P.	75	70,000.00	86,980.00	6,483,940.00		4,763,900.00	23.5.90	646,394.00	378,080.00	310,580.00
	Eldama RavineT.P.	25	67,000.00	68,200.00	1,971,400.00		1,374,779.00	21.3.90	170,950.00	155,040.00	126,460.00
	Eldama Ravine Demonstration House.	1		265,000.00				21.3.90			
	MaralalT.P.	50	70,000.00	78,300.00	3,686,820.00		2,615,543.00	not yet	368,186.00		
	Maralal Demonstation House	1		305,020.00				not yet			
	Maralal Serviced Plots	1		32,820.00				not yet			
	Bungoma T.P.	90	70,000.00	70,000.00	6,580,000.00		6,859,980.00	13.6.91	889,688.00		
	VihigaT.P.	60	70,000.00	70,000.00	3,500,000.00		4,497,800.00	20.5.94	420,000.00		
	Vihiga Serviced Plots?	10						20.5.94			
TOTALS		2088			118,577,251.00		93,885,263.00		11,414,302.00	9,698,580.00	952,788.00

note:curreny is Kenya Shillings
s&s=site&service
T.P.=tenant purchase

Table3.1:Report on U.S.A.I.D. funded projecxts; 1st,2nd, & 3rd tracks

source:NHC September, 1994.

The case-studies are situated in the administrative towns[44] named Kakamega, Bung'oma, Busia, and Vihiga of the four districts bearing the same names which constitute the major administrative-cum-political entities in the Western Province, of Kenya (map, Fig. 3.1). Kakamega doubles as the provincial capital as well. Vihiga was recently created from (Kakamega) and is yet to consolidate basic urban infrastructure; housing being a major component. Because of their administrative nature, the four towns tend to harbour colonies of civil service employees mainly of the middle and lower salary scales. This manifests itself in demand for cheap housing. Further, this means tenancies are high as opposed to owner-occupation since a good proportion of the civil servants originate from other parts of the country and their postings are not permanent anyway. This also means a larger proportion of non-locals. This could de-linking the ethnic equation somewhat from our analyses.

The absence large factories means the single largest employer is the Government. Otherwise small-scale manufacturing and commercial enterprises dominate the economy in the urban settings. Agriculture is the mainstay of the economy of the hinterland of these towns. Large portions of the agricultural activity in Kakamega, Busia and Vihiga is small-scale subsistence whereas Bung'oma is medium to large scale and commercially oriented. Busia is unique by virtue of its border location. A general assumption of a higher income profile of Busia is due to cross-border trade activities. This can further justify the transient nature of the dwelling inhabitants, and of varying and alien cultural backgrounds. The close proximity of Lake Victoria to Busia means higher intensity of trade in fish unlike the other three towns.

Thus the schemes are located in secondary towns of populations ranging from 20,000 to 100,000 inhabitants . They are free of large-scale factories as is the case in Webuye and Mumias[45]. They are largely dependant on the rich agricultural hinterland for economic cushioning.

The climate is another common denominator to all these towns. Minor variations exist at for instance Busia which because of its proximity to Lake Victoria has a higher general temperature . These differences do not constitute a major constraint to be of sufficient concern of architectural proposals by NHC as observable in the use of similar type plans in all the more recent schemes in the four towns.

[44] The other towns of significance in the province are Mumias and Webuye which are developed around major factories producing sugar and paper respectively. They have divisional administrative duties.
[45] Webuye's Panpaper Mills and Mumias' Sugar Factory are the leading factories in Western Province.

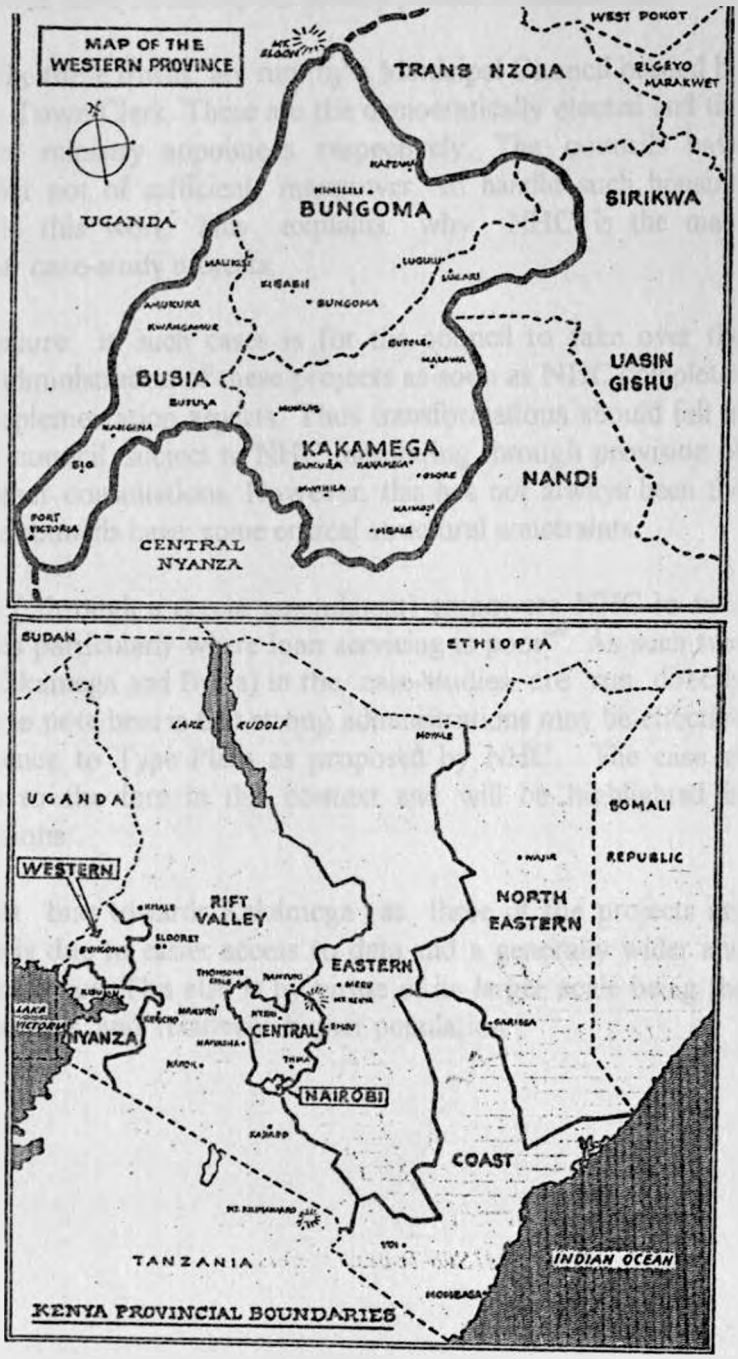


Fig. 3.1 Map of Kenya & Western Province

As for transport, there are relatively good road linkages between these towns and the neighbouring major towns like Kisumu, Eldoret and Kitale. Rail transport is only available from Eldoret through Bung'oma to Uganda. There is also an extension of the passenger line to Butere township in Kakamega district. All the towns have an airstrip for mainly private or charter use.

Administratively, the these towns are run by a Municipal Council headed by the Mayor and the Town Clerk. These are the democratically elected and the Local Government ministry appointees respectively. The councils have technical wings, but not of sufficient manpower to handle such housing projects studied in this work. This explains why NHC is the main consultant in all our case-study projects.

The normal procedure in such cases is for the council to take over the management and administration of these projects as soon as NHC completes the design and implementation aspects. Thus transformations should fall in the docket of the council, subject to NHC monitoring through provision of Type Plans and other consultations. However, this has not always been the case as often these councils have some critical structural constraints.

The Housing Act (through a recent amendment) empowers NHC to take over such schemes particularly where loan servicing is poor[46]. As such two of the schemes (Kakamega and Busia) in the case-studies are run directly by NHC. Suffice to note here is that strong administrations may be effective in ensuring adherence to Type Plans as proposed by NHC. The case of Bung'oma comes to the fore in this context and will be highlighted in subsequent discussions.

There is a slight bias towards Kakamega as three of the projects are located here. This is due to easier access to data and a generally wider and richer housing experience. This also is by virtue of its larger scale being the provincial headquarters and relatively higher population.

[46] This has been common in the last five years. thus for instance of the casestudy projects in post contract administration, only Bung'oma and Amalemba are run by the councils.

3.2 GLOBAL PROJECTS

3.21 Time and Implementation

We can for sure state when the USAID schemes were completed (see Table 3.1). This is harder for the historical projects however. Here we use the date of the available drawings. This way we at least know when the schemes were mooted. We then allow for one year as construction period. This was not considered a serious handicap to the work as will be shown.

It is also true that apart from Bung'oma none of the projects were completed in the stipulated time due to contractual problems and other extraneous causes. The direct implication on the SU is a more expensive unit and/or a smaller area. Box 3.1 gives a resume of the impact of time on SU costs as evident in our casestudies.

3.22 Size

See Table 3.1 & 3.2 for information on the number of units and costs of the casestudy schemes.

	NO. OF UNITS	GROSS COST(Ksh.)	DATE OF DRAWINGS	COMPLETION DATE
BUSIA	75		04/1988	06/1992
BUNG'OMA	90	6,580,000	12/1989	06/1991
VIHIGA	60	3,500,000	06/1992	05/1994
KAKAMEGA	212	12,875,396	04/1987	11/1990
AMALEMBA 1	32	not known	03/1960	-
AMALEMBA 2	54	not known	11/1964	-

Table 3.2 Casestudy Projects

It is often expected that a formal project intervention will conform to a streamlined system by which all parties in the delivery process will adhere to set and agreed rules. This is precede by a signed contract, in Kenya titled *AGREEMENT AND SCHEDULE OF CONDITIONS OF BUILDING CONTRACT* [RoK] experience in the casestudy schemes, as indeed in milliards of public sector schemes does not seem to corroborate this. The result is manifest in beyond budget projects leading to unaffordable units as in low cost housing.

A typical scenario is one where implementation of a scheme is commenced without a trouble free *site* , a guarantee of sufficient and regular finance, and without all and complete set of *contract documents.* This is often a source of disputes culminating into a larger proportion of avoidable soft costs. Another aggravating factor specifically influencing low cost sector is the *building*

contract itself which deletes the Fluctuation Clause leading to high loss absorbing tenders and/or non-completion of projects by single contractors.

Site

The cases of Busia and Vihiga schemes are clear examples of lack of clarity about the project site caused delays in implementation and added costs. For Busia it was a dispute with another public development project related to the Health Department. Vihiga's involved compensation of uprooted formerly rural inhabitants who were to give room to the newly created Municipal Authority. Protracted and tedious processes of identifying the parties and the monetary compensation was not resolved well into and beyond the contract period. No doubt two contractors were necessary to complete a mere 60 one-room starter units over 3 years in place of the stipulated forty weeks. In the process the unit costs nearly doubled.

Finance

Although the schemes donor financed internal bureaucratic mechanics make it difficult to pay for works completed in the stipulated 30 days. This leaves the contractor vulnerable to price fluctuations often to his disadvantage, given that no fluctuation of rates are permissible in the normal contract. Noncompletion of schemes is commonly the result. The Vihiga and Kakamega schemes are typical examples.

Contract Documents

It is normal to expect contract documents of Architectural Drawings ,Bills of Quantities e.t.c.., be ready before commencement of a contract. However with the absence of clarity of a site and finance this may be hampered, resulting in further delays and the associated costs.

As a result the contractors resort to claims and requests for time extensions. These take the form of damages due to loss of income in case of idle time, idle labour and idle machinery. Although the Fluctuation Clause is deleted from the contracts in case of idleness attributable to the employer, and given the recently introduced climate of decontrolled prices of building products, contractors seek compensation responsive to the scenario. Further in the event of determined contract and a new one is in place , new and higher rates are bound to prevail. A s stated only Bung'oma of the USAID casestudy schemes was immune from the above scenario.

Box 3:1 Of SU Time and Costs during Project Implementation

3.23 Site & Location

Figure 3.2 illustrates the various site layouts

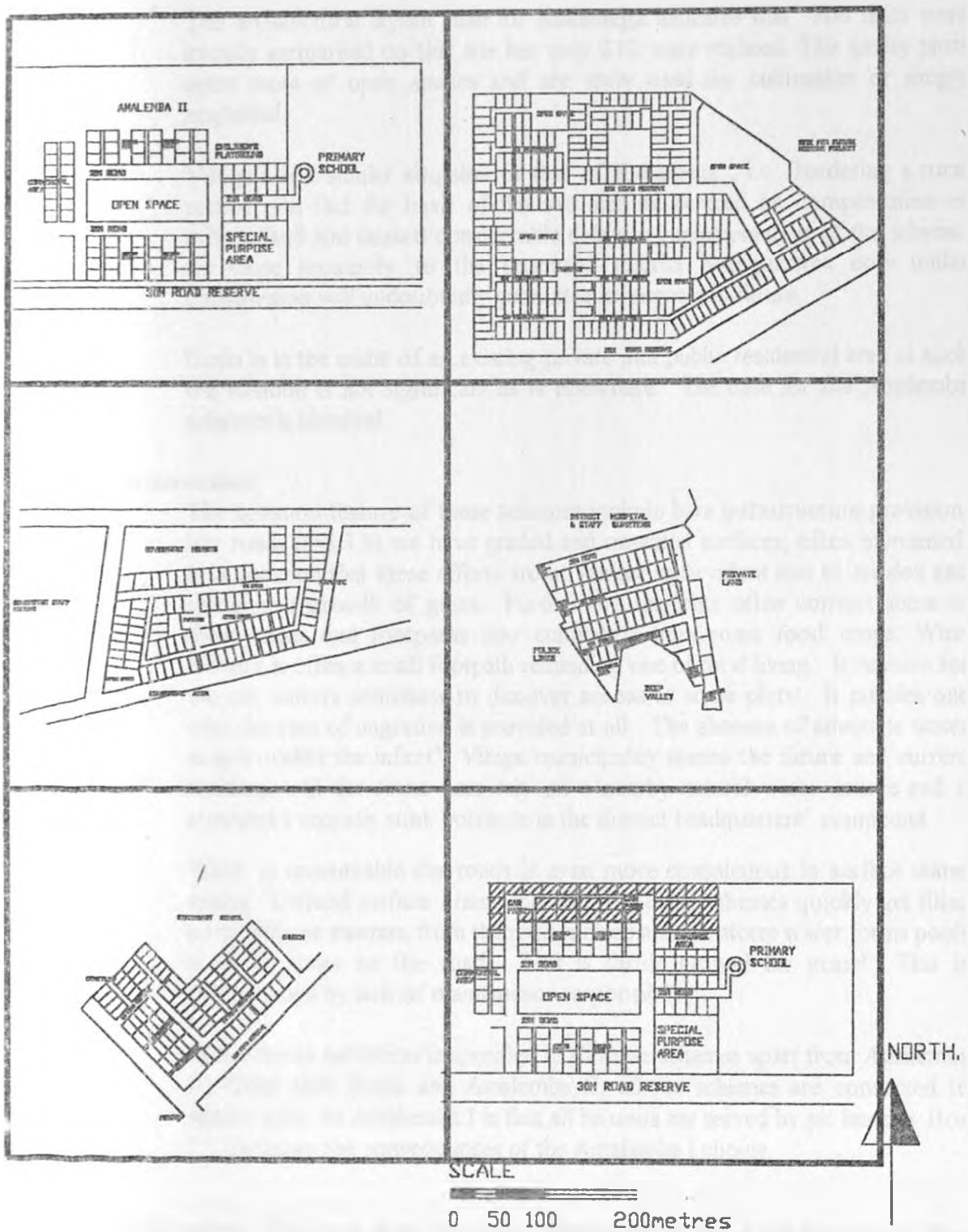
Salient features on each of the schemes are hereby explained.

The Kakamega TP scheme is significant because its peripheral location. Thus it forms the outer edge of the effective development control area of Kakamega town. This also coincides with the old Municipal boundaries. The site of about 1 Hectare is located at the periphery of a residential zone commonly called Amalemba[47]. It is also part of a one time airstrip. It is bordered by largely undeveloped public land (reserved for public housing and currently informally leased out to the individuals for cultivation) as well as private properties variously used for informal housing (see Photo 3.1) in addition to agriculture.

More significant is the fact that Kapsabet Road on its southern boundary forms edge of the effective Municipal Council *development control* zone. This location is thus the cutting edge between urban and rural areas. The main access is via Kapsabet Road; an often impassable earth road that links to the tarmac Kisumu-Kakamega Road. However the vast majority of the pedestrians use short-cuts through the former Airstrip land. These routes are not serviced with street lighting. Within the estate itself no lighting is provided either. The roads were murramed, although this is no longer evident when walking through the estate (due lack of maintenance the routes are overgrown with grass leaving out narrow footpaths ; a dire reminder of rural habitation). A large septic tank is used for [48]sewage disposal. Open earth drains are designed for surface water disposal. As in the case of roads these drains are not conspicuous to the visitor.

[47] Musa Amalemba is the name of the colonial Government minister for housing who hails from the district

[48] Kakamega has two oxidation ponds serving most of the town for trunk sewerage. This trunk sewers were however not sufficiently close for connection to this scheme.



AMALEMBA I	KAKAMEGA
BUSIA	VIHIGA
BUNGOMA	AMALEMBA II

Table 3.2 Casestudy Site Layouts

Fig. 5

The architectural layout plan for Kakamega indicates that 300 units were initially earmarked on this site but only 212 were realised. The empty plots seem more of open spaces and are aptly used for cultivation or simply neglected.

Vihiga's is a similar situation to that of Kakamega ; i.e. Bordering a rural setting. In fact the basis of the site dispute centred on compensation of private land and caused considerable delay in implementation of the scheme. Its close proximity to the proposed district headquarters now under construction will undoubtedly guarantee its success in future.

Busia is in the midst of an existing private and public residential area as such the location is not significant as is elsewhere. The case for the Amalemba schemes is identical.

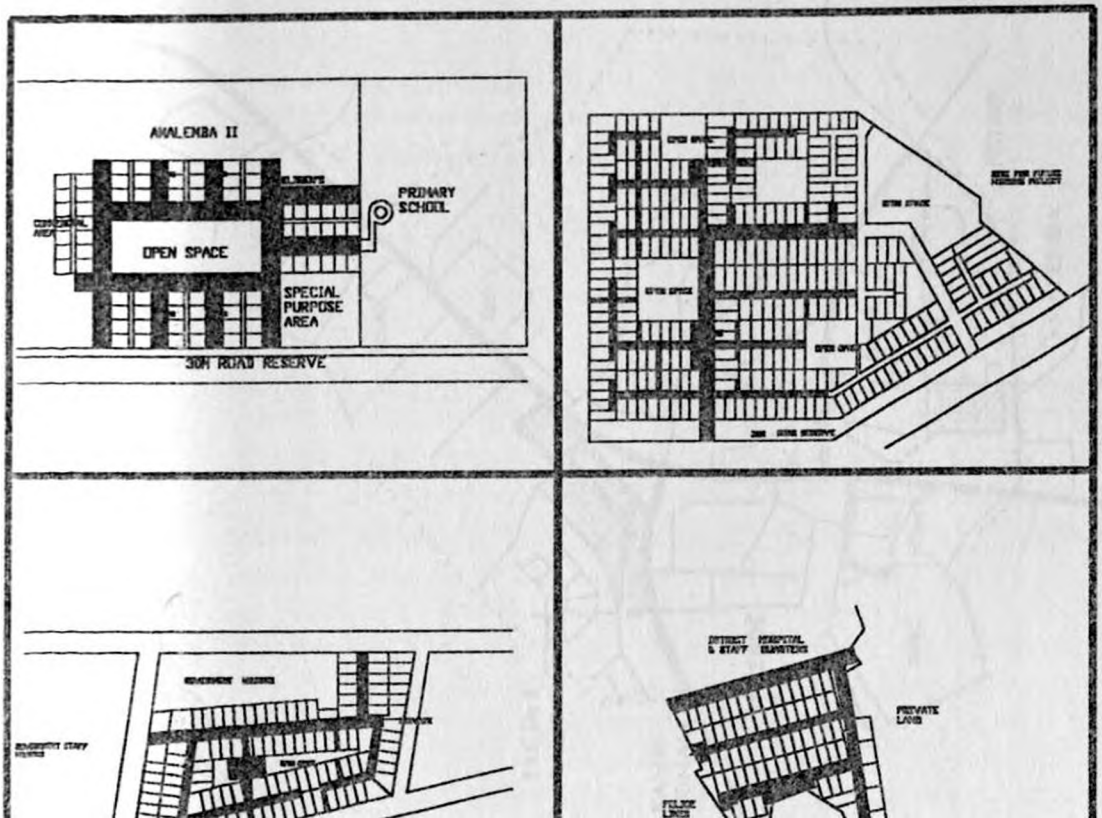
3.24 Infrastructure

The common feature of these schemes include bare infrastructure provision. For roads (Fig.3.3) we have graded and unsealed surfaces; often murramed. It is common that these efforts are no longer self-evident due to erosion and subsequent growth of grass. Further the residents often convert some of these roads and footpaths into cultivation area some food crops. What remains is often a small footpath reminding one of rural living. It remains for the car visitors somehow to discover access to some plots! It puzzles one why the item of ungraded is provided at all. The absence of adequate water supply within the infant[49] Vihiga municipality means the future and current residents will for some time rely on a nearby natural water source and if arranged a recently sunk borehole in the district headquarters' compound.

What is unworkable for roads is even more conspicuous in surface water drains. Unlined surface drains specified for these schemes quickly get filled up with loose murram from the road surface and the storm water forms pools at given spots on the road. This is fertile ground for grass! This is compounded by lack of maintenance responsibility.

Water-borne sanitation is specified in all these schemes apart from Amalemba I. Other than Busia and Amalemba II, all the schemes are connected to septic tanks. At Amalemba I in fact all he units are served by pit latrines. Box 3.2 discusses the consequences of the Amalemba I choice.

[49] the recently created Vihiga town at the time of the fieldwork did not have a Part Development Plan. However it is conglomeration of previous market, town and/or urban centres of Mudete, Chavakale, Mbale (our casestudy is located here), Majengo, and Vihiga (the District offices are located here). The main spatial link a 15-20km tarmac road. It is possible that parts of the corridor around the tarmac could form part of the new municipality.


AKALEMBA II
PRIMARY SCHOOL
OPEN SPACE
SPECIAL PURPOSE AREA
30M ROAD RESERVE
PRIVATE LANDS

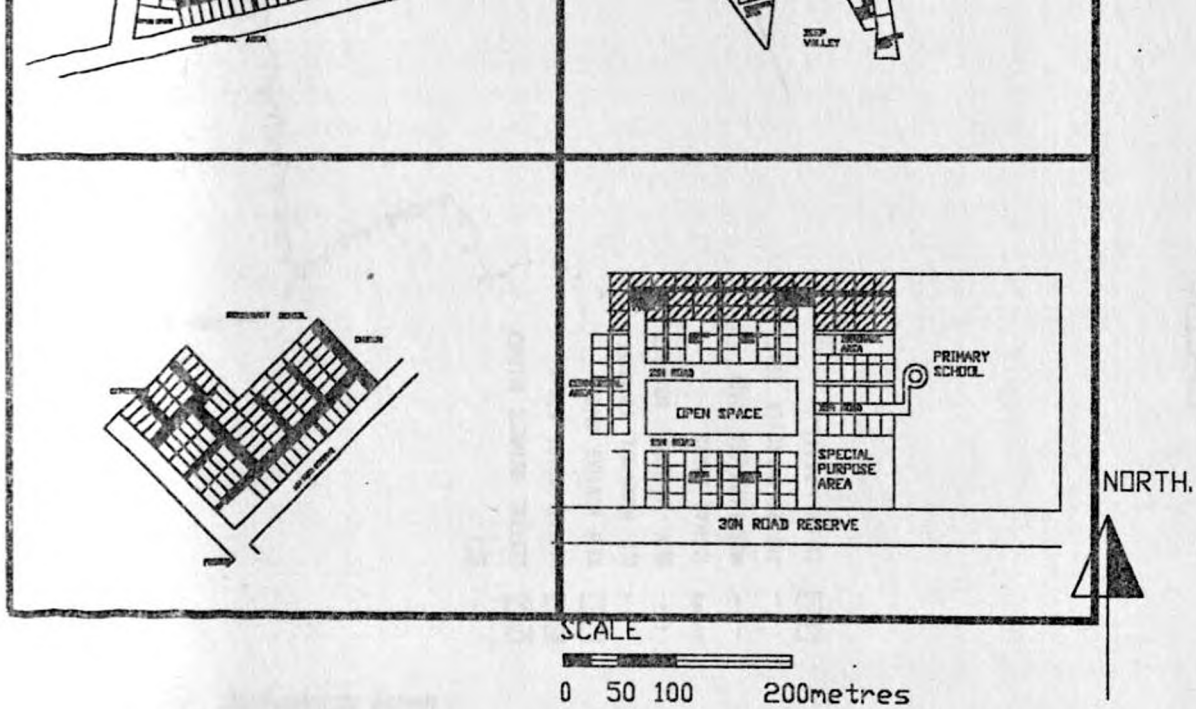


Fig. 3.4 Roads, Footpaths and Parking spaces.

AMALEMA I	KAKAMEGA
BUSIA	VIHIGA
BUNG'OMA	AMALEMA II

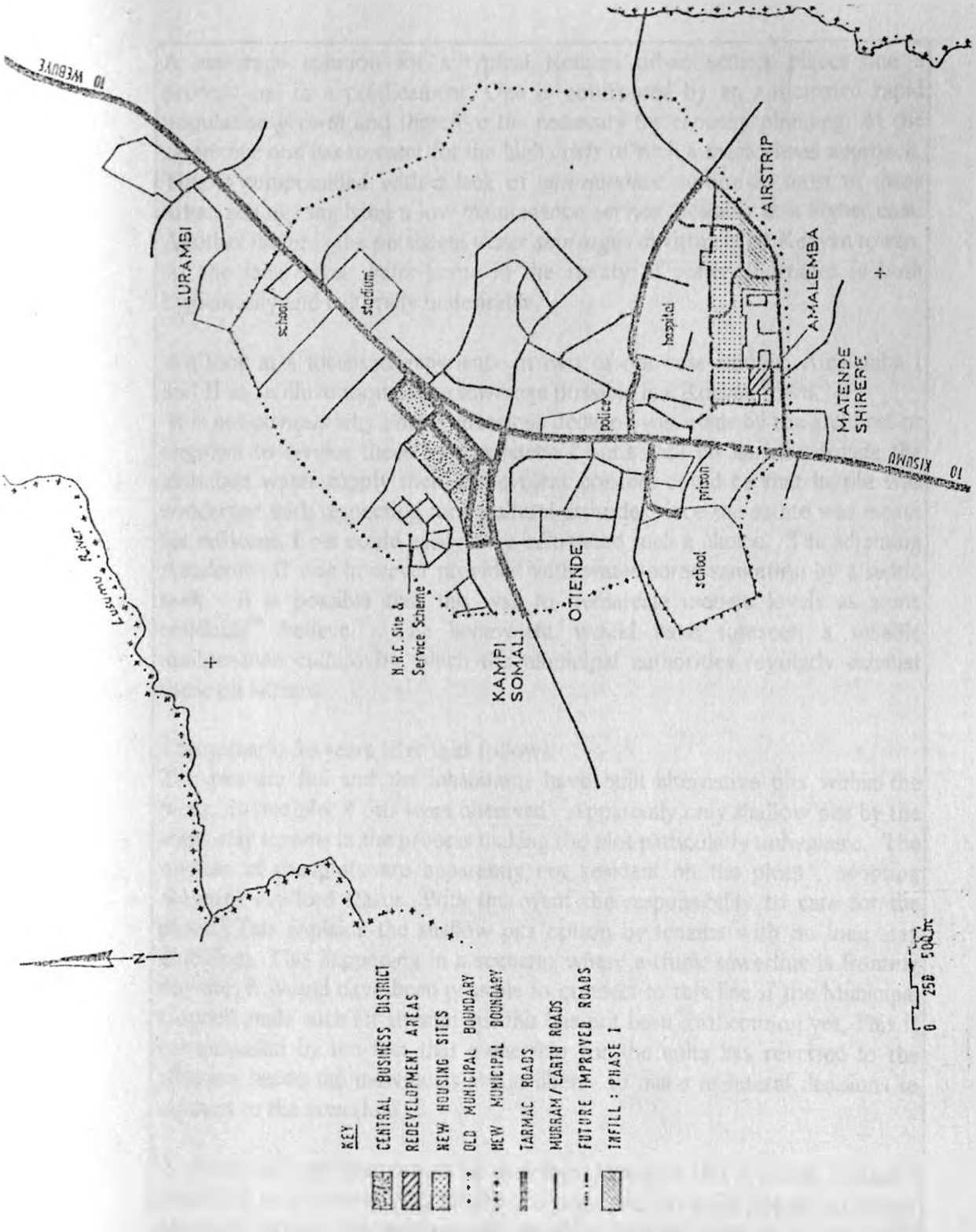


Figure 3.4 Kakamega Town Plan and project sites
source: ODA Study; six Towns in Kenya., 1982.

A sewerage solution for a typical Kenyan urban setting places one a professional in a predicament. One is confronted by an anticipated rapid population *growth* and therefore the necessity for capacity planning. At the same time one has to cater for the high *costs* of such a macro-level approach. This is compounded with a lack of *maintenance* culture in most of these urban settings implying a low maintenance service, possibly at a higher cost. Another factor is the persistent *water shortages* in virtually all Kenyan towns. At the local level water-borne in the reality of water shortages is both hygienically and culturally undesirable.

We look at a localised experience in two of our case-studies; Amalemba I and II as an illustration of the sewerage possible in a Kenyan town.
It is not obvious why , but a conscious decision was made by the architect or engineer to service these 54 Amalemba I units with pit latrines despite the abundant water supply then. Benevolent concern could be that he/she was concerned with respecting rural cultural attitudes since the estate was meant for Africans. Cost could easily have influenced such a choice. The adjoining Amalemba II was however provided with water-borne sanitation by a septic tank. It is possible that this was to demarcate income levels as some residents[50] believe. The benevolent would have foreseen a reliable maintenance culture by which the municipal authorities regularly exhaust these pit latrines.

The scenario 30 years later is as follows.
The pits are full and the inhabitants have built alternative pits within the plots. In one plot 4 pits were observed. Apparently only shallow pits by the short stay tenants in the process making the plot particularly unhygienic. The owners of the plots are apparently not resident on the plots , adopting absentee landlord status. With this went the responsibility to care for the plots This explains the shallow pits option by tenants with no long stay ambitions. This happening in a scenario where a trunk sewerline is fronting the site. It would have been possible to connect to this line if the Municipal Council made such an attempt but this has not been forthcoming yet. This is compounded by the fact that ownership for the units has reverted to the allottees hence the individuals are at liberty to make unilateral decisions to connect to the sewerline.

A communal approach would be desirable. However this is rather difficult[51] since it is only tenants who inhabit the units and naturally posses no longer plans of making the environment suitable. Isolated appeals to the NHC complaining about the poor sanitary conditions did yield any fruitful results

[50] Interview with Mr. Shikanga
[51] Interview with Councillor. Okureba

as NHC 's mandate ended with the conclusion of the loan. This concern is to discredit the pit latrine approach as the case for Amalemba II illustrates.

Here despite the provision of a water-borne sanitation , some of the inhabitants have unilaterally erected pit latrines. The reasons[52] cited included cultural attitudes to the toilet habit. But the main consideration was that of persistent water shortage. Thus with no water one can still benefit from the pit. It should be noted that these pit latrines are fairly recent occurrences in the scheme; maybe in direct response to the increasing water shortage problem.

The professional's approach could thus be many fold including :
1.take a cue from the Amalemba II tenants by adopting *either-or* solutions and thus foresee problems of water shortage and user biases.
2.take localised solutions at project level. Thus provide a local water source like a borehole and small scale oxidation ponds as in the Kakamega Site and Service Scheme.

An additional lesson from these schemes is that *sustainability* of some low cost and dubbed appropriate technology solutions should not be taken for granted. These approaches ought to be accompanied by relevant 'software'(knowhow) addressing issues of responsibility of the owner, tenant and community responsibility.

Box 3.3 The Sewage Disposal Dilemma at Amalemba

[52] interviews

3.25 Use of Public Open Spaces (Fig.3.5)

Open space use ;efficient or otherwise ,is a factor of the following possible design considerations:

- the size and dimensions; small or large,
- location in the estate context; central or peripheral,
- landscaping and landscaping elements; plain grass, trees...,
- definition; closed or open,
- maintenance ; responsibility,

The size of a Open Space within the estate should influence its utilisation by the residents. To define an optimum size or size range was rather difficult by virtue of our casestudies evidence alone. Without empirical evidence one postulate a large space to be subject to abuse and misuse; after all it appears as a "no-man's" land. However the giant open Amalemba Open Space seems relatively kempt and well utilised as a playground, for public meetings as well as a grazing ground for domestic animals! Preliminary conclusions would suggest that its size makes it harder for individuals inhabiting adjacent plots to (mis-)appropriate it.

Its location in the global estate serving the zone rather than a single estate seems to add value and justify its relative success. It is noteworthy that it the main zonal shopping centre is located at one of its edges. It is somewhat odd that this commercial area is some what subdued in terms of trade; people preferring to shop in smaller scale kiosks.... e.t.c. Another facility located here the giant high level water tank serving the adjacent estates. The space also strongly defined by a perimeter 15m. vehicular road. The relative level of this road is lower (0.5m.) than the space, making it act as some sort of barrier or buffer zone to the plots. In the Amalemba I concept of Open Spaces, a smaller children's play area was reserved at the edge.However in the subsequent Amalemba II this is converted to a drainage area. This is probably a reaction over the relative success of the giant open space.

It can be concluded from the above and the contrasting experience in the Kakamega T.P. scheme that peripheral location of the Open Spaces is counter-productive, exposing them to neglect and misuse.

The sole Bung'oma Open Space is unique in that despite its peripheral location ,it remains relatively kempt. But here is a case of only one small space fronting the access road. Even though the drainage area is located here no misuse has become of it. It is common in to justify peripheral location by virtue of keeping fronting infrastructure low; but this exposes the spaces to neglect and misuse.

The landscaping features of the spaces investigated are basic i.e. grass only , but this can exploited maximally by deliberately planting it, and of a suitable type (low vertical growth as at Buing'oma and Amalemba. Often the contractor is left to grade the space only.

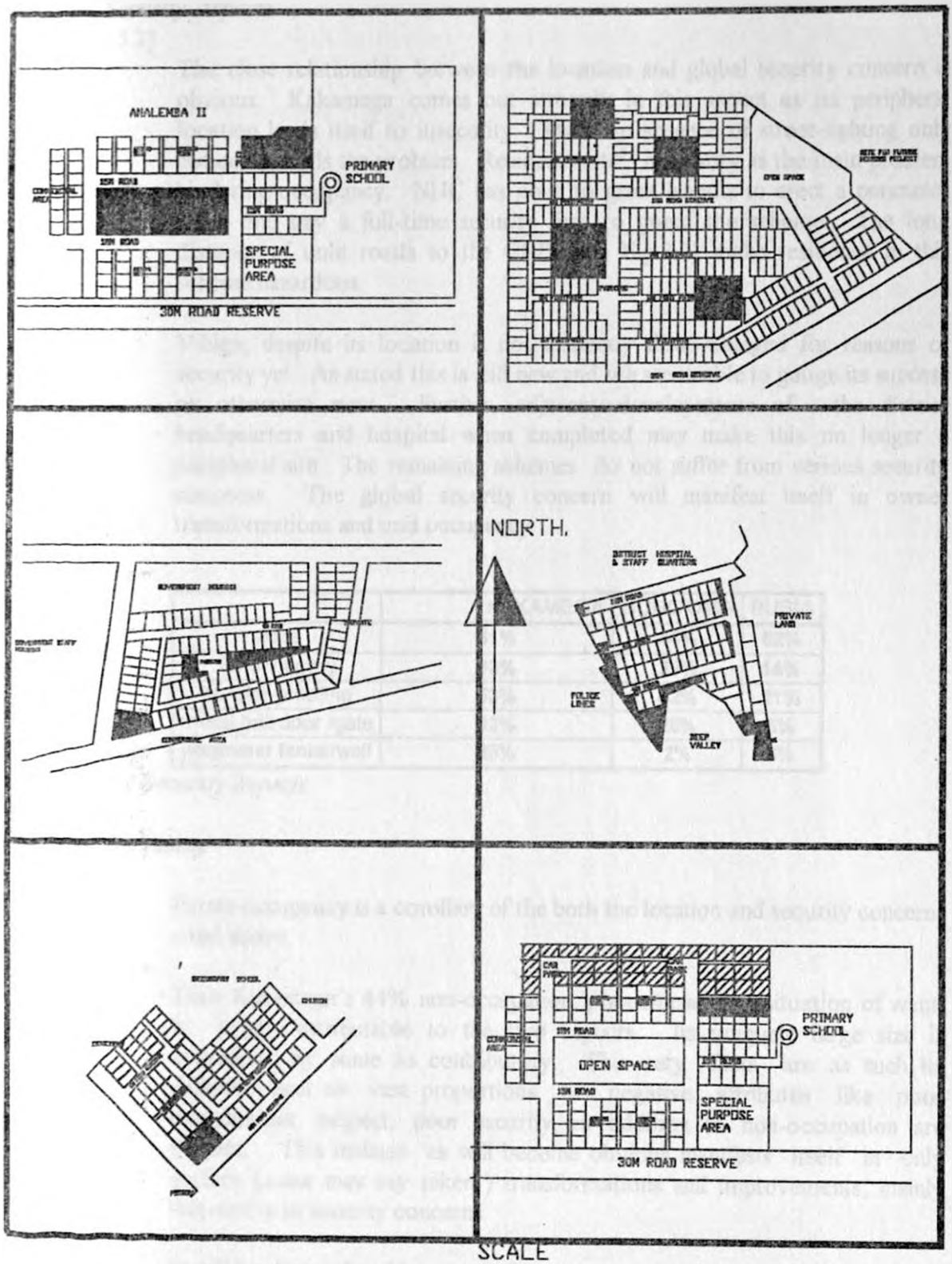
Contrasting responses to open spaces in both design and use are evident in the case-study schemes. As discussed Kakamega and Busia schemes have central placement of these spaces, Bung'oma and Vihiga treat them as peripheral spaces. The scale is also reduced in the later cases.

The two Amalemba schemes share in addition to the giant open space, a commercial centre and a Primary school. It is possible that the Neighbourhood Unit Concept[53] was applied here whereby communal facilities were to be provided for the estates. It is interesting to note that this has survived the times somewhat.

The Kakamega TP scheme is another story of open space use. Four medium scale open spaces remain unused or/and dis-used. Common practices include cultivation, garbage dumping, overgrown grass and unplanned foot paths criss-crossing the spaces. It is possible to learn something from the Amalemba schemes.

The design response at Busia, Bung'oma and Vihiga is that of avoidance of central placement and that of relegating them to left-over spaces. The later is reinforced by their treatment as drainage areas for location septic tanks as in the latter pair. Their sizes are relatively small . In Bung'oma one major reservation by the tenants on the scheme is the inadequacy of open spaces. We believe this is compounded by the smaller plots . Further, as will be shown more owners have developed their plots maximally rendering the short-term openness to disappear. Busia's centrally placed open space has largely been appropriated by abutting plots.

[53] Neighbourhood Unit Concept was adopted in most African workers housing, particularly in Nairobi whereby a neighbour hood was to self sufficient with commercial and social facilities. See. Shihembetsa, in *Report and Proceedings. Workshop on Housing* , PGCHS KU Leuven, 1993 p.263.



AMALEMA I	KAKAMEGA
BUSIA	VIHIGA
BUNGOMA	AMALEMA II

Fig. 3.5 Open spaces

3.26 Security Aspects

(Table 3.3)

The close relationship between the location and global security concern is obvious. Kakamega comes out strongly in this aspect as its peripheral location lends itself to insecurity. Thus the absence of street-lighting only but compounds the problem. Residents cite[54] insecurity as the main problem hindering occupancy. NHC has gone to great lengths to erect a perimeter fence and pay a full-time security firm to guard the scheme. The long distance of unlit roads to the CBD (see Fig.3.2) make residence in this scheme hazardous.

Vihiga, despite its location is not evidently disadvantaged for reasons of security yet. As stated this is still new and we are unable to gauge its success or otherwise now. Further, adjacent developments of the district headquarters and hospital when completed may make this no longer a peripheral site. The remaining schemes do not suffer from serious security concerns. The global security concern will manifest itself in owner transformations and unit occupancy.

	KAKAMEGA	BUNG'OMA	BUSIA
none	31%	46%	52%
ironmongery	38%	39%	14%
burglar-proofing	53%	42%	21%
metal grill door /gate	32%	20%	6%
perimeter fence/wall	29%	2%	8%

Table 3.3 Security Aspects

3.27 Occupancy

Estate occupancy is a corollary of the both the location and security concerns cited above.

Thus Kakamega's 44% non-occupation, phenomenal in a situation of want, is largely attributable to the two aspects. Its uniquely large size is considered by some as contributory. This very facts are as such its Achilles' heel as vast proportions of negative attributes like poor management, neglect, poor security, in addition to non-occupation are evident. This malaise as will become obvious manifests itself in only surface (some may say token) transformations and improvements; mainly responsive to security concerns.

It will be shown that this may conform to an economic rationale. Further, this should not obscure the fact that it is one scheme in the context of the

[54] interviews

case-studies where a variety (3 type plans) of typologies were provided. The resulting vocabulary of mutations is rich and will constitute the core of most subsequent analyses in this work.

Partial occupancy occurs where at least one sublettable is not occupied. The following observations suffice. Amalemba schemes were fully occupied by either owners or tenants. Any non-occupancy in Bung'oma was mainly by virtue of on-going extension works. As stated Vihiga is relatively new and no judgement is worthy of mention regarding its occupancy levels.

	BUNG'OMA	KAKAMEGA	BUSIA	AMALEMBA I	AMALEMBA II	VIHIGA
unoccupied	7%	44%	30%	0%	0%	97%
partially occupied	9%	5%	1%	0%	0%	0%
fully occupied	84%	51%	69%	100%	100%	3%

Table 3.1 Unit Occupancy

3.3 STARTER UNIT TRANSFORMATION

Transformation for our purposes will refer to efforts to improve ,change, and spatially extend the SU. this should be distinguished from normal maintenance. Table 3.5 summarises the frequency of transformations (for Kakamega, Bung'oma and Busia) as observed per scheme during the fieldwork. We distinguish spatial and aspatial aspects of transformation. The former involves area extension, whereas the latter concentrates on modifications and improvements on the starter provided.

We assess transformations at three levels of analysis. Because the characteristics of the specific scheme influence individual propensity to improve or otherwise, we look at *project frequency* of transformations per se. The expected benefits from a specific transformation also influences the *nature* of transformation (spatial or otherwise) as discussed under the second level of analysis. Some SU *typologies* tend to attract more tendency to transform than otherwise. This, as will be shown, is a reflection of the containment capacity and completeness of the SU design.

The frequency of transformations *per se* is not necessarily related directly to the age of the project. Thus the older schemes have undergone maintenance and repairs but it could not be established that significant improvements deemable as transformations had been made. Amalemba I and II fall in this class. Vihiga is least transformed by virtue of its newness; this is also manifest also in occupancy levels.

Conventional logic dictate that recently implemented schemes should be less transformed as opposed to older ones. Our findings do not seem to conform. Thus the fact that Bung'oma is more transformed than Kakamega despite their similar age, points to other factors than purely passage of time. Not that time per se should provoke change, but the loan burden having been reduced coupled with increasing nominal incomes should free household funds for house development. Passage of time is also coupled with increasing construction costs and declines in real values of rents from the units.

The role of extraneous factors (hereby defined as factors not of a purely functional nature like security and location) is equally critical when determining the propensity to transform. These factors influence the rental attractiveness of the unit. Some tenants were evidently prepared to invest their own money in fixing security details to the units with a view of allaying rental charges and a cosier relationship with the owners in future. It is quite evident that in poor location schemes like Kakamega TP, occupation is a direct reflection on unit transformation in respect of these extraneous factors.

	BUSIA	BUNG'OMA	KAKAMEGA
neglected	23%	37%	34%
finishes	19%	47%	34%
burglar-proofing	19%	26%	53%
openings	15%	47%	38%
changed roof	0%	0%	6%
electrical wiring/conduiting	0%	100%	3%
changed use	0%	0%	3%
incomplete extension	9%	38%	8%
complete	16%	13%	2%

Table 3.6 Frequency of Transformations

Kakamega's frequency (of low spatial but high aspatial transformation) is attributable to the general malaise attributable to its poor security and hence location.

These same factors are also at play, but positively at Bung'oma TP (see discussion above on location). Its vantage location within the town guarantees security and propensity to spatially transform in anticipation of rental returns.

We are also stating that a desire to transform a given unit is actually related to the need to inhabit the unit as a tenant or owner occupation. Thus the level of " completeness" of the starter unit when provided will determine the degree of initial transformation (later referred to as inhabitation cost in chapter 4). This completeness factor is at two levels: first the basics of a habitable space like some level of finishes, locks and other aspects of security; secondly, is the spatial aspect. The former responds to the quality of what was provided in view of the environment i.e. the location, security ...e.t.c. The latter is more to do with functional requirements (quantity of what was provided) of the household size, privacy, and the basic use of the space.
More specific to our schemes, we note that the two Amalemba schemes were relatively well finished in addition to (seemingly) optimum two living rooms. No doubt the level of transformation is not as high as expected. (It is possible and probable that some minor aspects like changed locks have been done to most if not all Amalemba units, but we classified this more of a maintenance problem than a transformation concern, given the age of the schemes).

In Busia few transformations take place mainly because the workmanship and hence quality of the two rooms composing the starter was quite good. Busia's case is also peculiar in that as a border town it attracts mainly short stay cross-border traders as tenants. Further-more, most owners hardly

reside in the units (and possibly the town!). Thus although the frequency of transformation is high it is only superficial.

The case of Kakamega is that of atrocious workmanship necessitating a dire need for changes before habitation. For Bong'oma the single room provided was seemingly insufficient for the basic functional needs, this despite fair workmanship. Thus we note a higher frequency of spatial transformations at Bung'oma[55], at least for the first extra room than any of the other schemes.

			NO.	%
QUALITATIVE	66%	none	73	34%
		finishes	73	34%
		security aspects(Table 3...)	146	69%
		services(electrical conduiting)	7	3%
SPATIAL	9%	complete	4	2%
		incomplete	16	8%
OTHER	9%	changed roof	13	6%
		changed use	6	3%

Table 3.7 Frequency of Transformations at Kakamega.

It can thus be concluded that to curb expenditure on initial transformations, a well worked SU is desirable. Further, two living rooms seem to be optimum for "starters" so to speak. The basic service of a wet core (includes a water closet[WC] and a shower; independent or combined) are also desirable. Table 3.6 summarises starter provisions in our casestudy schemes.

	SPATIAL			SERVICES				FINISHES	
	ROOMS	STORE	KITCHEN	WC	SH	SH/WC	ELECT	PLASTER	PAINT
AMALEMBA I	2	0	1	0	1	0	0	1	1
AMALEMBA II	2	1	1	1	1	0	1	1	1
KAKAMEGA	2	0	0	0	0	1	0	0	0
BUNG'OMA	1	0	0	0	0	1	0	0	0
BUSIA	2	0	0	0	0	1	0	0	0
VIHIGA	1	0	0	0	0	1	0	0	0

Table 3.8 'starters'

[55] Bung'oma district has a per capita income higher by virtue of medium to large scale commercial farming (and a lower population density)unlike the rest of the province where small scale and mainly subsistence agriculture prevails. This could explain further why investment in spatial expansions are frequent.

Some other starter details like a low ceiling height as was provided in Kakamega instituted to curb costs often attract owner counter measures manifest in transformations. We therefore notice a higher frequency of raised ceiling heights in the scheme. We posit that such measures by the developer may not be economical in resource use as we will attempt to show in our cost models. Basically such transformations will cause delays in habitation (and thus lost income), inconvenience and a modification cost (i.e. what will have to done on the original structure to accommodate the new transformation; to elaborated later).

One transformation that invariably occurs is the changing of ironmongery details like locks. This is often a security concern since low cost locks often specified are hardly functional. It also possible that individuals have this propensity to personalise such details.

For internal finishes, most units seemed to be more concerned with rudimentary details like just an evenly finished surface than plaster and paint. In essence finishes should be basic and functional. Thus with good workmanship no attempts were apparent to plaster walls; most opting for a single coat of paint instead as in Busia. Where properly finished walls were provided as in Amalemba I, it was rather sad to observe neglect and a poor decorative and maintenance states.

Despite the fact that the external appearance of a house confers aesthetic, most tendencies were to let it serve purely functional value i.e. capacity to withstand weather and dirt. Very few attempts were made to paint walls externally. The regularity of roughcast plaster among the externally finished walls (coloured or otherwise) was however phenomenal. A possible explanation was the roughness which keeps maintenance costs low in addition to its possible aesthetic preference by the owners.

Spatial transformations are the expectation from a type plan. Often intricate details are available to the owner illustrating phased extension possibilities. The trend observable from the casestudy material shows a marked preference for the qualitative aspects as discussed above. As stated there is a common feature whereby a two roomed unit seems optimum as an independent entity functionally suitable and justifiable in terms of rental returns. Therefore, most schemes without this minimum size are at a disadvantage and are prone to spatial extension as a priority. The case of Bung'oma is self evident. It is also true that the extra room invariably conforms to the NHC Type phased development plan. This could be a credit to the design but we posit that it is more to do cost since often only two walls (this is in addition to the other building elements; but the wall constitutes a large proportion of the cost hence a major saving) remain to complete this room anyway.

The desire to extend is often curtailed by the prohibitive costs weighed against the non proportionate rental returns. Bung'oma's rather extensive tendency towards extensions is thus odd in view of dis-proportionately higher rents. It remains for one to conclude that the owners view the unit more of a capital investment than for immediate returns. Further it is possible the higher per capita district income in Bung'oma has a role to play.

The optimum and popular unit size of two rooms is clearly based on functional requirements of privacy for a small urban household. The typical household size in these estates is five composed of one or two adults and dependants; well below the provincial average of nine. In fact only one case was observed of a family of seven inhabiting the two rooms. Some single parent households were observed also. It was common that one parent with part of the family had his/her abode in the country while the rest were residing in the unit; at least for some of the time.

Typical space use was as follows: one room for sleeping and storage functions for the adults/parents, the second room was for visitors and eating as well as sleeping for the children at night. Cooking was performed in either of the rooms; and even outside occasionally. A typical complaint in the twin room unit was the absence of a kitchen, hence the high frequency of cooking area additions (see Typical transformation plans...Chapter 4)

The same tenants when confronted with the question of how much more they would pay for this extra space were however coy enough not to commit themselves to this extra expenditure. In a way this hampers the incentive to transform spatially. The twin room unit, based on evidence at hand, is still the most popular and appropriate habitation unit given the rents (as will be discussed) and use (please note the multi-purpose use capacity of the rooms).

Single room occupancies were less frequent. Bigger units were fetching lower rents per unit area, thus rendering them uneconomical. The issue of shared sanitary services between rental units was strangely uncommon in the more recent schemes; given the economy of doing so. It possible to conclude that these rental units seek independence of function of the different households.

Extensions seem more like attempts to create rental units than mere expansion of space for larger households. Its like the occupant has pre-determined his / her expenditure as well as space limits within which they adapt the functions. The twin room seems ideal but attempts at larger units have also been made.

Although commensurate returns may not be forthcoming, the enhancement of the property value is seemingly adequate satisfaction. This sort of investor simply sacrifices by spending on the unit without expecting proportionate rent. Often they accept the low paying tenant if anything but to stall deterioration that would be inevitable if the unit were uninhabited.

It is noteworthy that all extensions beyond the twin rooms hardly conform to the NHC Type Plans. However if a strong and effective planning control body exists, an attempt can be made. The case of Bung'oma fits in this category. The effective Municipal Engineer insisted on conformity to the Type Plans for all extensions, even if it was only for the appearance only; and that is what he got.

Thus when one visits the scheme the uniformity in appearance is striking if not deceptive. The interiors of most of these units are all varied to suit individual needs. The one unavoidable change he permitted on the appearance was the use of coloured (brown in colour to match the similarly coloured Asbestos sheets) corrugated galvanised iron sheets (C.G.I.) in place of technologically unsuited Asbestos sheeting (see Box3.2).

Underlying all these is the realisation that if transformed *appropriately* the units will be more habitable and hence attract rent and add value. Its true that the problems of affordable housing are acute in all the four towns, but *effective supply* is more than numbers. The quality in terms of given contextual economic parameters is as important.

Thus in contexts like Bung'oma where the essential global estate parameters as security and proximity to the CBD are fulfilled satisfactorily, the owner propensity is to transform is major, as reflected in extensions. Busia's malaise in respect of extensions is more attributable to absentee owners and hence landlordism; at least in the short term. In terms of return, superficial transformations are more attractive given that the input costs are minimal and immediate returns are assured.

In Kakamega for instance, the level of occupancy is a reflection of how much attention an individual has put into superficial aspects of security and finishes. There is a direct correlation between aspatial aspects of transformation and unit occupancy. It is also noted that where two units are occupied, one without, say burglar-proofing for windows and doors and /or finishes attracts less rent. In this case this was about 30%. Extensions also need these attributes in addition to space for marketability. Where extensions are evident, the magnitude and *rental entity* definition is important as already discussed. The magnitude of extensions can be viewed at the level of *floor area* and/or number of entities; here defined as *rental units* (room, multiple rooms or house).

At the level of area alone, the magnitude of transformation may not reflect increased rental value directly. Often large extensions are of complete houses intended for owner-occupation at a future date, at least. Thus they do not necessarily attract commercially equivalent rents.

In Bung'oma a 10 square metre room (with a shared wet core) attracts Kshs. 300 rent while in the same scheme a 3-bedroom (100 square metre) house attracts only Kshs. 1500, a 50% reduction in rent per unit floor area. This does not necessarily infer a recommended bias to the rental unit when considering extensions as the construction cost per unit area for the unit may be higher.

3.4 MATERIALS AND TECHNOLOGY FOR TRANSFORMATIONS

Choice of materials and the technology used in the case-study project transformations is marked more by conformity than deviance. This is hardly surprising given the formal origins of the settlements. And of course the units are still on loan and still subject to financier and developer restrictions and control. The local councils and NHC still reserve the right to repossess the units belonging to non-conforming allottees.

We believe this is not the entire justification, because the specifications for schemes are low anyway. Thus one can give credit to NHC in this case. It is indeed difficult to go lower in cost for most of the building elements. Yet this is still not completely correct given the following observations:

- The specifications used in transformations are often only an approximation of what ought to be. For instance when one talks of concrete blocks, it is expected that appropriate mixes of sand, coarse aggregate and cement are employed. In fact what is common is the use of sand blocks, without any coarse aggregate. The proportion of cement is often lower expected. These are all towards lowering costs.
- In the absence of a formal contract and contractor, the normal process of contraction is often by way of a labour arrangement with a *Fundi.* The implication is often that the developer has to do with compromise technology and quality. All this is to control losses that would otherwise be inevitable, where the contractor only sells labour. This is 'accepted' by the client given his /her incapacity to hire a professional architect and contractor thus subjecting themselves to their own lack of know-how. One can say that the products are never really conforming in essence. They are indeed only approximations to the formal requirements.

Where deviance is observed it is often logical as in the case of Bung'oma roofing(Box 3.2). Local availability of performing materials as fired brick walling, is another factor in changed specifications. It is possible for an organisation like NHC not to take cognisance of the traditional material and technological base of a given locality. This may be because the institutional strings associated to formal approaches. We will illustrate this with the case of fired brick in Kakamega (Box 3.3). Here we notice up to 40% brick walling in transformations.

Fired brick walling is a technology well understood by local artisanry. It was introduced there by missionary school and church builders with advent of Christianity. Further the soils are largely suitable (in varying degrees depending on location) for local brick making. The abundance of trees (and good climate for more to grow) makes it easy and cheap to produce them locally (even on site in a rural setting). Given the then recent hike in cement prices, most extensions resorted to brick use as a natural alternative.

The restriction the individual use of brick is the size (normally 100mm thick), which can hardly match that of block. This means use of more cement in mortar joints. In older missionary buildings especially for staff housing, they used mud in joints with a thin cement layer of cement at the exterior. This does not seem to be popular for not so obvious reasons A thicker brick (of 150mm.)is however now common and was commonly used during our visit. This calls for quality control to ensure a well burnt brick and one that has an even edge.

It is however difficult to control quality of these bricks. And often the losses one incurs because of poor quality bricks, though not documented to our knowledge, must be enormous. Some go ahead to plaster the brick walls to hide the brick wall and /or to deter water absorption through the uneven surface.

This quality dilemma is probably the reason why an organisational set-up like NHC or indeed a formal contractor may be ill at ease employing these local bricks in a formal scheme. The alternative is to use factory produced bricks which may be dearer than other conventional alternatives like concrete blocks and stone.

It is necessary that research into more fuel efficient local brick kilns should carried out to promote this now traditional technology and material. Further more quality control is needed as is normal for small scale production.

Box.3.4.Fired Brick Walling in Kakamega

	KAKAMEGA	BUNG'OMA	BUSIA
FOUNDATION	21	54	21
mass concrete	95%	94%	100%
r.c.concrete	5%	6%	0%
FLOOR	40	94	33
concrete slab	40%	56%	64%
screed finish	60%	44%	36%
INTERNAL WALL	19	49	21
concrete blocks	58%	98%	90%
fired bricks	42%	2%	10%
EXTERNAL WALL	20	53	20
concrete blocks	50%	98%	90%
building stone	10%	2%	0%
fired bricks	40%	0%	10%
INTERNAL FINISH	78	49	27
plaster	58%	98%	56%
paint	42%	2%	44%
EXTERNAL FINISH	35	32	10
plaster	54%	44%	50%
rough cast plaster	31%	38%	30%
coloured rough cast plaster	6%	6%	0%
paint	9%	13%	20%
INTERNAL DOORS	19	24	14
flush	32%	75%	93%
ledged & braced timber	68%	25%	7%
EXTERNAL DOORS	35	44	13
ledged & braced timber	37%	18%	0%
ledged , braced & framed timber	17%	50%	69%
metal casement (glazed)	46%	32%	31%
WINDOWS	110	47	10
timber framed with metal burglar-proofing	11%	9%	30%
metal casement with metal grill	89%	91%	70%
ROOF	18	46	15
plain g.c.i.	67%	0%	0%
coloured g.c.i.	22%	70%	0%
asbestos	11%	30%	100%

3. Transformation Materials for Building Elements

Table 3.8 summarises materials used in transformations in the three schemes at Kakamega, Bung'oma and Busia. Of Amalemba I & II the only changes from the original materials is in the following ways; all roofing finish is of CGI sheeting; contrary to asbestos used originally on the starter. As stated Vihiga had no transformations as at the time of the visit; due to its newness.

The use of informal materials like timber walling was not common on the main structures, for human habitation. Only one case was observed in Kakamega and even so it was used as a store rather an extra room. It is possible that it could be employed for cooking also. (This could not be ascertained by the respondent, who was unfortunately rather coy about letting us get more details!). One observation is that in the schemes such informal structures served more for domestic animals and as kiosks rather than human habitation. We therefore do not record them as transformations to the starter structure.

The following sections will highlight some features of these findings.

Foundations
It is evident that foundation materials are as inherited from the NHC types. Thus we notice mass concrete foundations in most part. Where we have reinforced concrete it is with a storey development as was the case in Bung'oma and Kakamega. We only conclude that no locally accepted alternative to foundations is available. This is strange given the abundance of rock which could easily serve the purpose. Further brick could be used in the foundations satisfactorily.

Floors
Similar to foundations, NHC materials are used abundantly. However most go further and finish the concrete with cement screed. A possibly cheaper non-conventional alternative to concrete slabs would be mere compacting easily available stone at a elevated level (to reduce the chances of water penetration in moments of heavy downpours of rain). A screed finish on top of this, would suffice. Some rural homesteads use this technology; and We opine that it could apply as a low cost alternative.

Walling
The only walling materials other than 'concrete' blocks are bricks and natural stone. The case bricks is discussed in Box 3.2 The use of stone is strange given the non-availability of the material in the case-study districts. On investigation we discovered that the persons involved made special arrangements to get the stone. It is conceivable that these were more

expensive solutions and that special circumstances[36] like cheap transport was arranged to make it worth the while.

It was evident that the use of SSB for walling was never considered as an alternative. Most respondents, builders and owners alike, confessed little or no knowledge of this as an appropriate alternative. It is conceivable that if NHC had used it in the starters, some awareness would have been imparted to the localities.

Finishing for the walls was also a common feature in the schemes. This in our opinion was mainly to cover bad workmanship and/or to compensate for poorly manufacture materials (like bricks in Box 3.2). The use of roughcast plaster as external finish (coloured or otherwise) seemed popular. It possibly because it has lower maintenance costs; requiring no paint. Painting was hardly common probably because of reasons of cost.

All the transformations used 200-300mm reinforced concrete ringbeams in the walls. This is understandable given that the region is sometimes subject to earth tremors. The ringbeam is the minimum precaution.
In Bung'oma the local Municipal Engineer insisted on using bricks mainly as partition walls.

Openings

The use of metal casement doors to the outside was probably because of their dual role as security doors in addition to the normal function. Further the possibility of glazing to let in light is an advantage. Similarly metal casement windows were not only popular for the extensions but also for the starters. Most seemed to replace the provided timber framed windows with the burglar-proofed metal casement types. These metal alternatives are a pointer to the emergence of the Jua Kali workshops which posses the capacity to assemble these components .

Roofs

CGI sheeting seems paramount in roofing finish choices. The experience with asbestos in Bung'oma is as in Box 3.3

> The choice of Asbestos sheeting for roofing in these low cost schemes was based on the lower rates as per the tenders. It is noteworthy that in their efforts to compete the ever popular CGI roofing sheets, Simbarite (the manufacturers) have developed thinner sheets in several colours at marketable rates. Thus if the unit area rates of the surface are considered the two materials are comparable. Further posses a thermal comfort capacity lacking in the GI sheets.

[36] Ownership of two of the units in Kakamega was traced to a powerful individual with possible access to subsidised transport and lowered rates in a neighbouring district

Their technological inappropriateness stems from the very serious health concerns and their non-conformity to low income shelter requirements discussed here. As for the health risk we cannot say much , but it is true that in Belgium where Internit (Simbarite's parent company is based), they have resorted to using synthetic fibres instead; for among others health reasons. Even so Asbestos was historically used for animal shelter and not human habitation..

Our major concern here is their use for low cost shelter. The case for Bung'oma is interesting for despite the low rates given by the contractors , the inhabitants have ignored this fact and changed to using the familiar CGI sheeting in their transformations. Of the reasons given , the strangest was lack of market *availability* of the material. One would expect the manufacturers to have addressed this issue beforehand. It is possible the local building material dealers could not afford to keep stocks of a material hardly extensively in the district obvious reasons.

The other reasons cited for the rejection of the material were related to the longer term *cost, handling* and other *software* aspects in addition to the accompanying *accessories*, and convenience of *transport*.

The thin (3mm) "Elgon" type sheets were particularly prone to breakage when subject to minor impact like balls (it is common in these environments to get kids playing a semblance of soccer in any available space close to the houses). The artisans were also to be extra careful in handling the sheets as the same would ensue. When transporting these sheets breakage were possible given the often potholed roads. It is possible over time the artisanry will find it easier to handle the sheets but the cost of the accompanying accessories for connection like the crook bolts, hook bolts ...will still have to be weighed against the easily handled roofing nails used in CGI sheeting. These accessories are often hard to find in the market and cost more too.

In low income environments a suitable material is one that easily finds alternative use when its original function has overtaken with time or general mishandling. Thus one finds use for old CGI sheeting as animal shelter for instance. Asbestos sheeting are singularly unsuited for this as broken sheets hardly have any residual value hence simply waste.
Given that the sheets perform well in thermal considerations(a factor hardly significant in the highland climate of our casestudies) the immediate and long term cost to the low income dwellers still has to be addressed. The dwellers need protection by organs like NHC as regards the health risk by simply not making it a choice in the first instance.

Box 3.6 Asbestos roofing sheets in Bung'oma TP

3.5CONCLUSIONS

IN THE GIVEN SECONDARY TOWN SETTINGS OF OUR CASE-STUDIES, WE ENCOUNTER HUMAN SETTLEMENT PROBLEMS ONE CAN SAY UNIQUELY SMALL TOWN.

THESE ARE TOWNS GRUDGINGLY ENDEAVOURING TO DISENGAGE THEMSELVES FROM THE RURAL ROOTS AND STILL STRONG LINKAGES.

THUS FOR INSTANCE WHAT CAN STATED AS A HOUSING PROBLEM DOES NOT NECESSARILY MANIFEST ITSELF IN TERMS OF UNIT OCCUPANCY IN FORMAL ESTATES OR RENT PROPENSITY IN THE CASE-STUDY PROJECTS.

INSTEAD WE HAVE STRONG TENDENCIES TOWARDS EXTRANEOUS FACTORS LIKE SECURITY, AVAILABILITY OF ON-PLOT SPACE FOR CULTIVATION OR OTHER URBAN AGRICULTURAL ACTIVTIES.

IT BECOMES APPARENT THE SPATIAL ABUNDANCE OR OTHERWISE WITHIN THE UNIT IS NOT PARAMOUNT; BUT ITS ATTENTION TO QUALITATIVE QUALITIES OF SECURITY AND GENERAL HABITABILITY ARE.

WITH THESE QUALIFICATIONS, IT COMES AS NO SURPRISE THAT SPATIAL TRANSFORMATIONS ARE HARDLY AN ISSUE.

GIVEN THIS SCENARIO ONE IS TO WONDER WHY THE PREOCCUPATION WITH THE RENTAL UNIT; WHEREBY A CLEARLY DEFINED SPATIAL UNIT IS BASIC TO CONSIDERATIONS OF TRANSFORMATION?

THE ANSWER IS INHERENT IN THE FORMAL NATURE OF THE SCHEMES: WHAT WITH LOANS TO PAY?

BY THE FORMAL ORIGINS OF THESE SCHEMES, WE ANTICIPATE MAJOR PRE-OCCUPATIONS WITH THE CAPACITY OF THE UNIT TO PAY FOR ITSELF.

THE ATTENTION IS FOCUSED IN DOING THE MINIMAL TO ATTRACT ENOUGH RENT FOR THE UNIT TO PAY FOR ITSELF. AS IT STANDS THE TENANTS ARE MORE INTERESTED IN THE AMENITY OF THE PLOT; FOR CULTIVATION AND OUTDOOR LIVING AMONG OTHERS. THE UNIT BEING RESERVED FOR ONLY THE BASIC HABITATION ACTIVITIES AND FUNCTIONS.

ANY ATTENTION TO EXPANSION, SPATIALLY IS RARE AND FOR THE RARELY ENCOUNTERED OWNER OCCUPATION; NOT FOR RETURNS.

OF THE QUALITATIVE TRANSFORMATIONS, SECURITY ASPECTS ARE PREDOMINANT. STRANGELY THIS LARGELY RESTRICTED TO THE UNIT ONLY , AND TO A LESSER EXTENT AT THE PLOT LEVEL. THIS IS UNIQUELY SMALL TOWN, WE POSIT. WHAT WITH 'FORTRESS'-LIKE WALLING IN BIGGER CITIES LIKE NAIROBI?

A FURTHER SATISFYING EXPLANATION COULD GO BACK TO THE RENTAL ASPECT; IT IS PROBABLY TOO EXPENSIVE TO JUSTIFY IN TERMS OF ANTICIPATED RENTAL RETURNS.

ONE WAY OF ATTEMPTING TO BALANCE COST OF TRANSFORMATION WITH RENT LIES IN CURBING EXPANSION COSTS. THIS IS BY MEANS OF LOWERED MATERIAL SPECIFICATIONS. WE HAVE SEEN HOW BY COMPROMISES IN TECHNOLOGY. SPECIFICATIONS AND PROCESS THE DEVELOPERS TRY TO KEEP COSTS AFFORDABLE.

IT IS POSSIBLE THAT THE SPECIFICATIONS AND STANDARDS PROVIDED BY NHC ARE AS LOW AS CAN BE; GIVEN THE FORMAL NATURE OF THE PROVISION PROCESS. THROUGH RATIONAL AND EXPERIMENTAL APPROACHES, THE OWNERS RESORT TO COMPROMISE TECHNOLOGY APPROXIMATING TO THE PROVISIONS IN THE 'STARTERS'.

THE COMPROMISE TECHNOLOGY IS IN RATIONALLY BASED; WHAT WITH ITS CAPACITY TO BE UPGRADED. THUS FOR INSTANCE SAND BLOCK WALLING EXPOSES THE WALLS TO WEAR AT THE CORNERS. THE SOLUTION IS TO UPGRADE THIS WALL WITH HIGHER QUALITY PLASTER OVER TIME. THE ECONOMIES OF THIS APPROACH MAY NOT BE OBVIOUS AS OF NOW, BUT IT MAKES SENSE N THE MEDIUM RUN TO THE OWNERS.

THE LESSON FROM TECHNOLOGICAL CHOICE IS ADAPTABILITY TO THE LOCAL RESOURCE BASE; CAPITAL, NATURAL AND TO GREATER EXTENT HUMAN. THAT THE LOCAL ARTISANRY SHOULD BE ABLE TO ADAPT TO THE DESIRED TECHNOLOGY IS PROBABLY OBVIOUS BUT WHAT MAY NOT BE SO OBVIOUS IS THE CAPACITY OF THE TECHNOLOGY TO ACCEPT THE INHERENT SHORTCOMINGS OF THIS PROBABLY NOT SO PROFICIENT LABOUR.

AS WAS THE CASE WITH ASBESTOS SHEETING IN BUNG'OMA A LOW COST FORMAL PROVISION IS NOT NECESSARILY CHEAP WHEN EXPOSED TO THE LIMITATIONS OF THE ARTISANS AS WELL AS OTHER LOW INCOME USE TENDENCIES.

THESE USE TENDENCIES INCLUDE THE RECYCLABLE CAPACITY OF THE MATERIAL; IN THE EVENT OF IT BEING DEEMED UNFIT FOR RESIDENTIAL USE.

IN THE DISCUSSION WE COULD EASILY LOOSE TOUCH WITH GROWTH; THE ESSENCE OF A 'STARTER' UNIT! IT IS APPARENT THAT GROWTH IS ONLY BUT A RESULT OF THE FACTORS OF RENTAL RETURNS AND ECONOMICAL TECHNOLOGICAL CHOICE FOR TRANSFORMATION. (SPATIAL EXPANSIONS ARE THE SUBJECT OF THE NEXT CHAPTER)

Chapter 4
TYPES AND TRANSFORMATIONS

In this chapter we investigate in more detail starter unit design and our findings as regards individual trends and considerations towards transformations.

4.1 GENERAL

Five unit types were used in our casestudy schemes; coded for this work; T0, T1, T2, T3, & T4. Table 4.1 shows the frequency of types in the casestudy schemes.

	T0	T1	T2	T3	T4	TOTAL
Kakamega	80	93	39	0	0	212
Bung'oma	58	32	0	0	0	90
Busia	0	75	0	0	0	75
Vihiga	60	0	0	0	0	60
Amalemba I	0	0	0	54	0	54
Amalemba II	0	0	0	0	32	32
TOTAL	198	200	39	54	32	523

Table 4.1 Frequency of House Types in the casestudy projects.

In the following pages we look at the type designs as provided, the proposed development and the observed transformations. We focus mainly on the Kakamega scheme; although additional information on Amalemba and Bung'oma are incorporated in less detail.

The general structure is as follows;

1. General description of design as implemented in the various schemes including project specific modifications where if any;
2. Original copies of Architectural plans as per NHC;
3. Proposed phasing in plan as well as three dimensional form;
4. Observed typical transformations, as well as some comments of some actors;
5. Conclusions.

4.2 TYPE TO

4.21 General Description

This type is one of the most frequently used (see table 4.1 above). Thus it is the only type used at Vihiga for instance. Figure 4.1 shows the Architectural plan and elevations.

It is also possesses potential for the most alternatives for sanctioned development; in the following ways;

- It can be *combined* into a unit starter, thus sharing two walls. This is significant when determining costs. The alternatives are detached and semi-detached units where no walls and only one wall is shared by neighbours; which spread out costs less. The four way combination is used at Vihiga and Kakamega (see Photo 4.1). The other cases have detached and the semi-detached options. It should be noted that this sharing is only significant as a cost measure at the formal provision stage. At the owner transformation stage this may not feature as the individuals may posses different priorities and capacities. Further they may not concur on the various options (or may simply be bad neighbours!). Further the legal position of party walls, (a wall separating two tenures) is often of a higher specification in terms of thickness for sound proofing and resistance to fire.

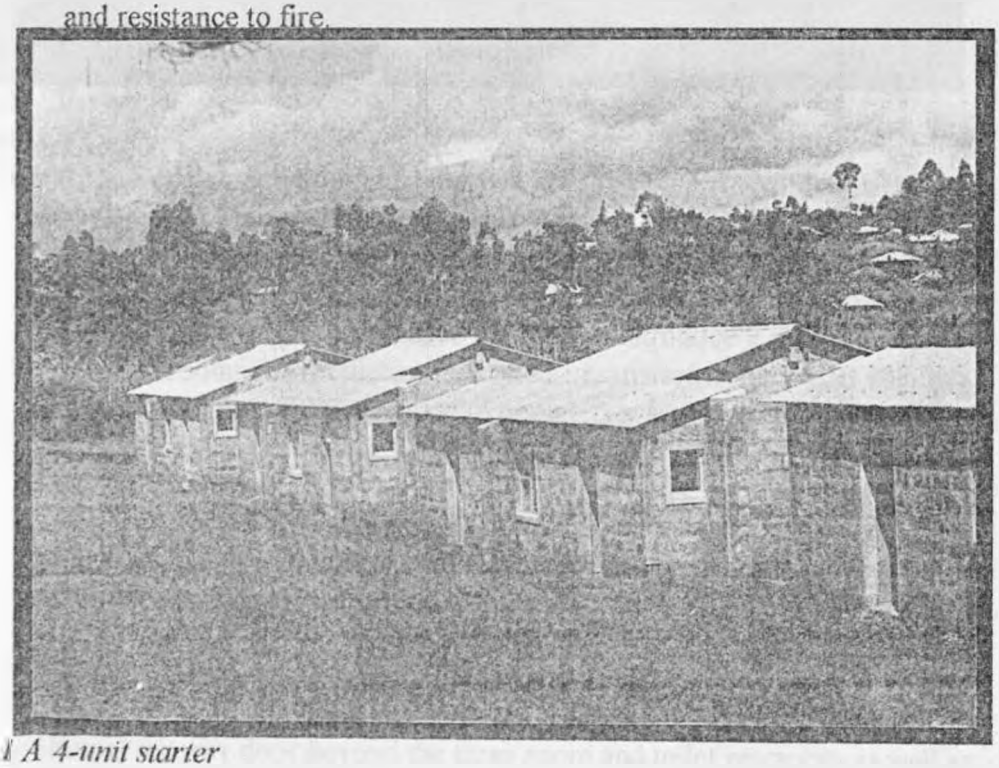


Photo 4.1 A 4-unit starter at Vihiga

- Unlike the other type plans, the *storey* option is given as an alternative for development (see Photo 4.2). In a way this envisions multiple tenancies. This storey option has not been exploited fully yet, presumably because the higher costs.

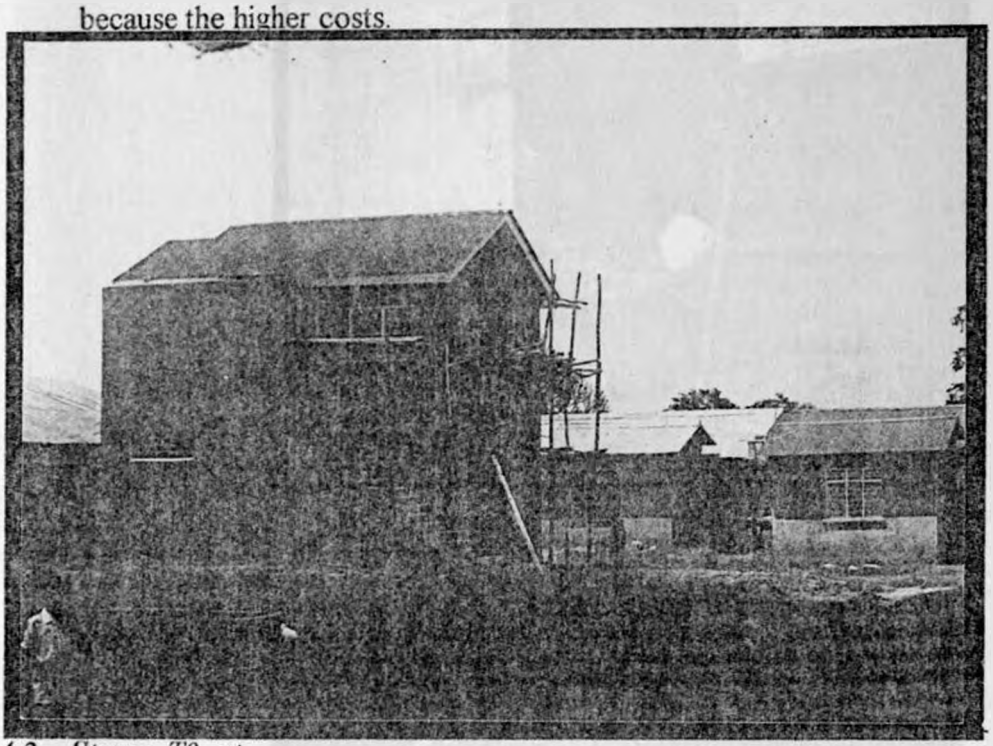


Photo 4.2 Storey T0 at Bung'oma

- Because of some yet unclear reasons at Bung'oma (may be an oversight on the side of the contractor, but it is repeated at Vihiga! (Photo 4.4), the roof of the starter slopes in the direction of the future extension (see, Photos 4.1 & 4.2). This renders the extension difficult (and/or costly) and inconvenient. This is so because one has to introduce a rainwater gutter between rooms, an inefficient and often unsatisfactory low cost solution. Most developments have tended to completely segregate this starter from subsequent developments, hence treating it as a completely independent unit. This works to the benefit of the rental unit approach, whereby a twin roomed unit is considered as adequate accommodation for most households. The subsequent development is thus treated as new rental unit disregarding attachment to the starter.

By far the most frequent transformation on this T0 type is not the spatial. Instead only entrance modifications are done (see photo 4.3). Thus an additional security door beyond the three room and toilet entrances as well as blocking of the space above the lintel is common.

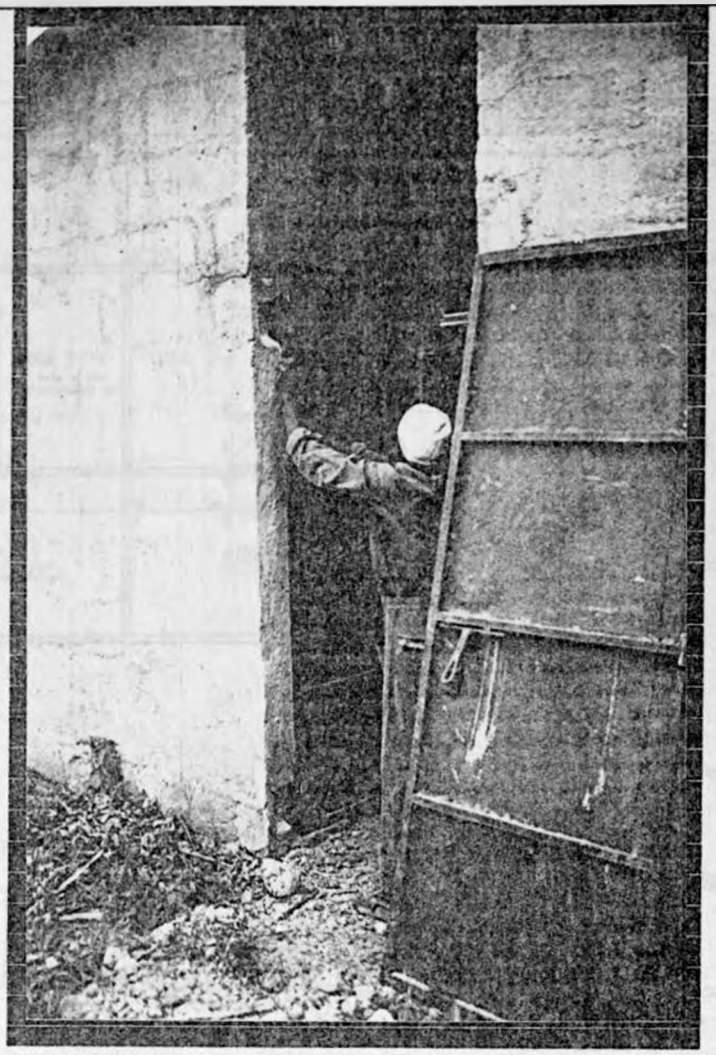


Photo 4.3 Kakamega

- *Entrance modifications*

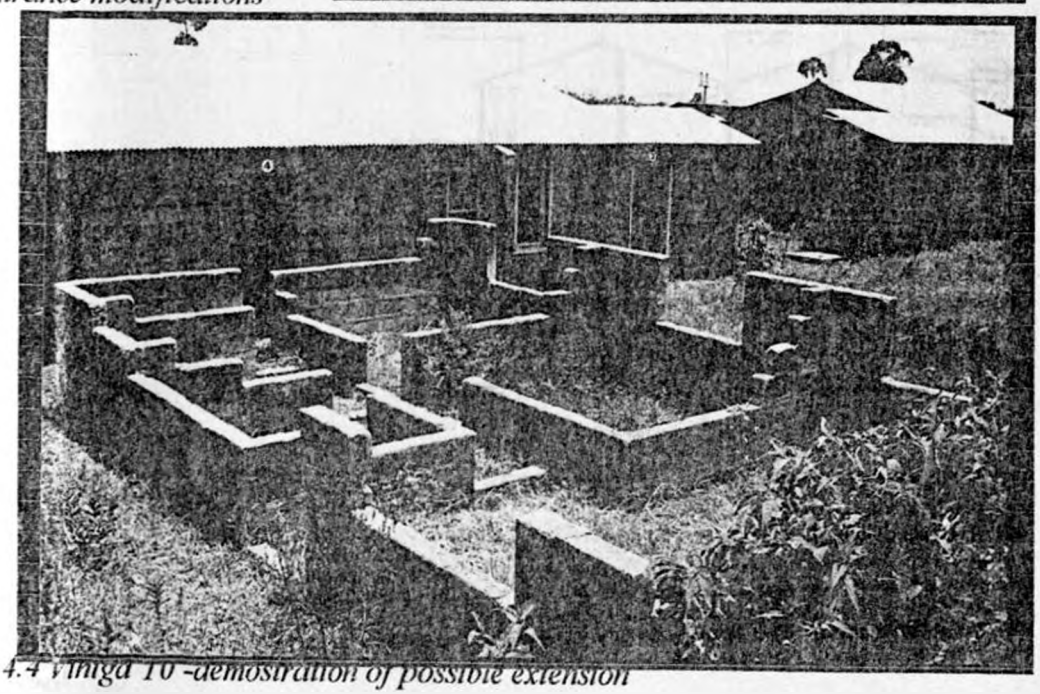


Photo 4.4 Vihiga 10 -demostration of possible extension

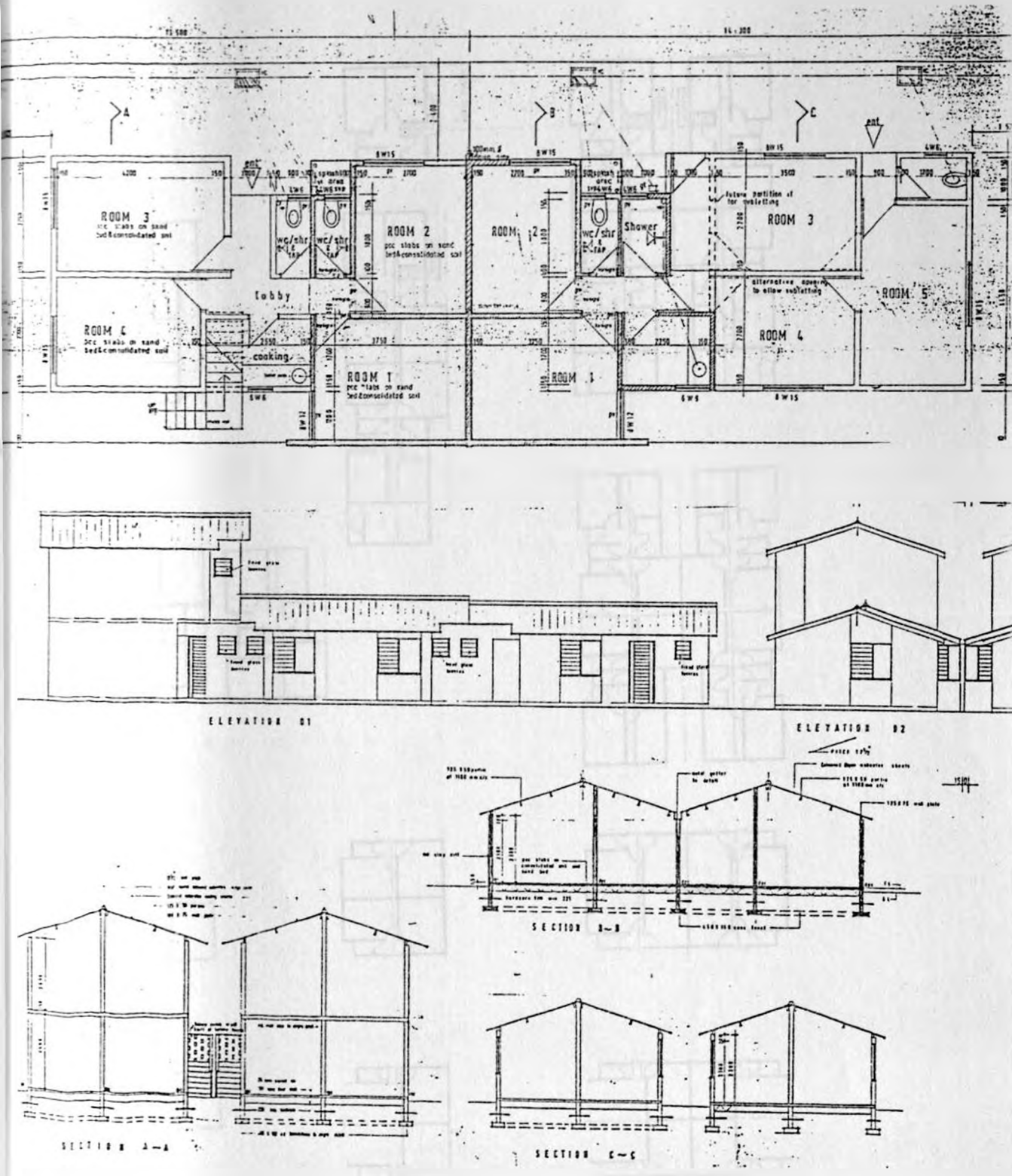


Fig.4.1 Architectural Drawings of type T0
Source; NHC,1994

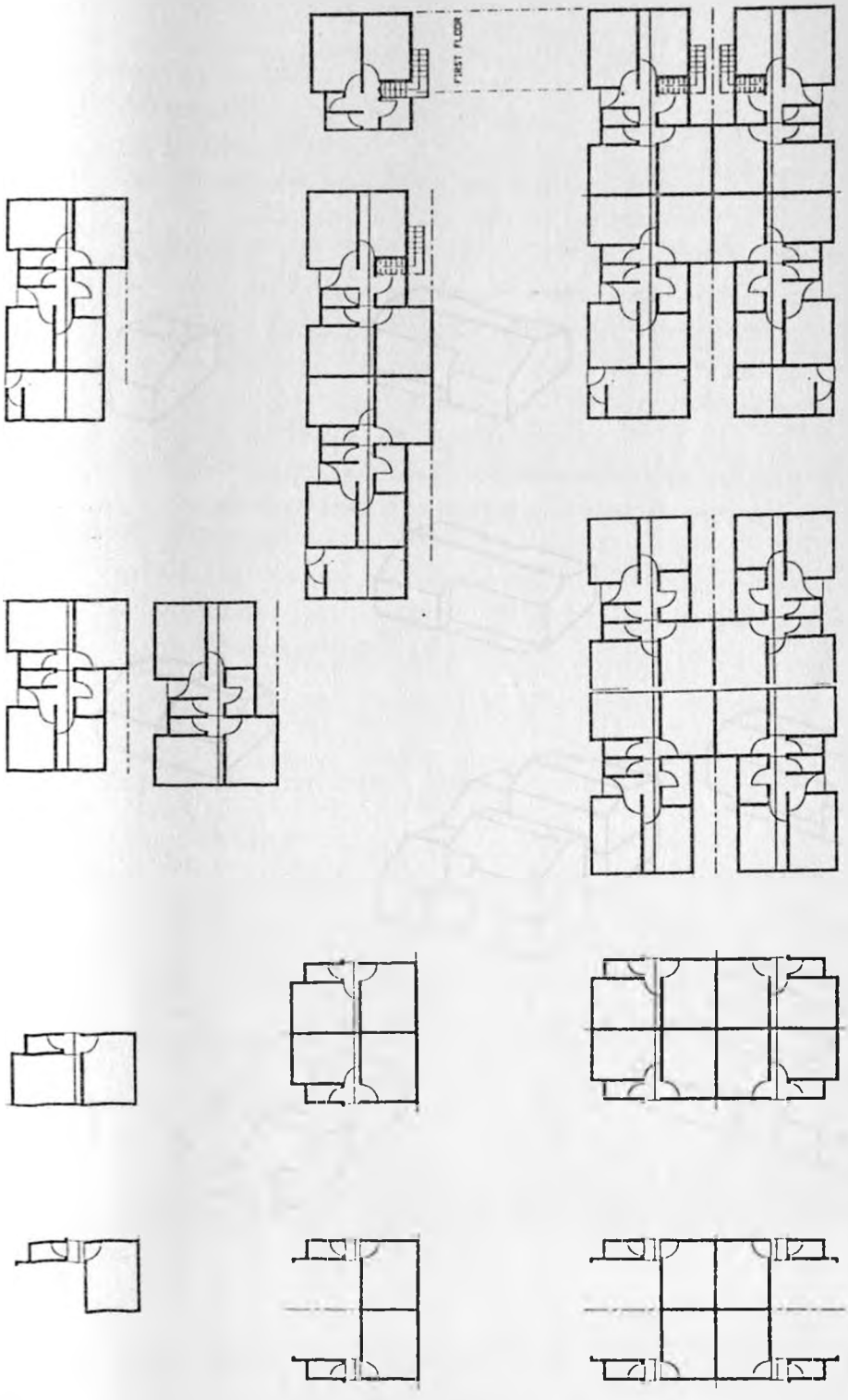


Fig. 4.2 Alternative 'starters' and Development: plans

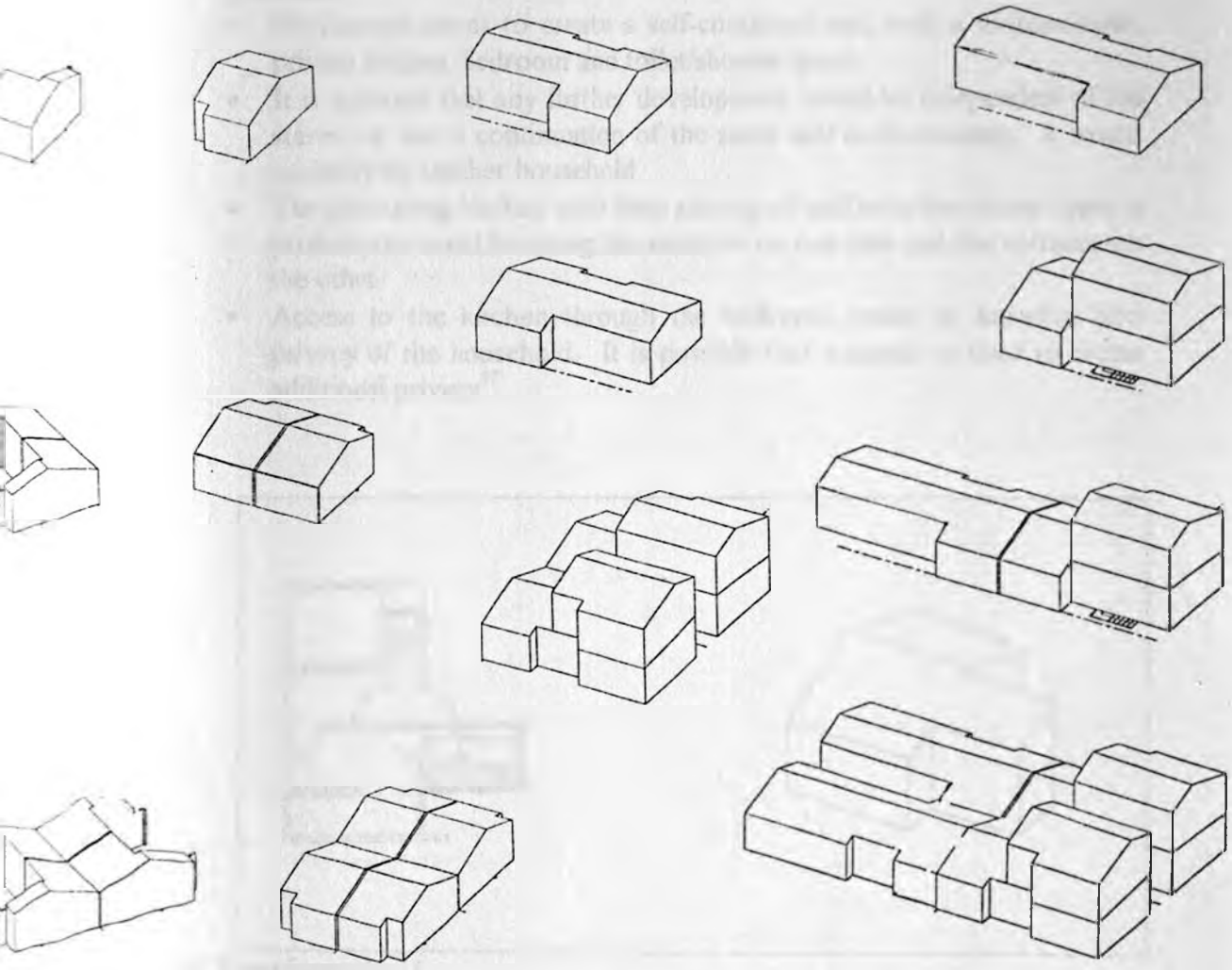


Fig.4.3 70 Volumetric studies of 'starters' and phasing

4.21 Some Typical T0 Transformations

Figure 4.4 & 4.5 and Photo 4.5 show some typical transformations as witnessed at Bung'oma and Kakamega.

Transformation 1 (Fig.4.5)

Type

- added kitchen
- relocated entrance door to room 2
- one main entrance door with the security door.

Comment

- the attempt seems to create a self-contained unit; with a visitors room, private kitchen, bedroom and toilet/shower space.
- It is apparent that any further development would be independent of the starter i.e. not a continuation of the same unit in functioning. It would probably be another household.
- The protruding kitchen with little sharing of wall with the starter room is probably to avoid blocking the window on one side and the entrance on the other.
- Access to the kitchen through the bedroom seems an intrusion into privacy of the household. It is possible that a curtain is used to create additional privacy[57].

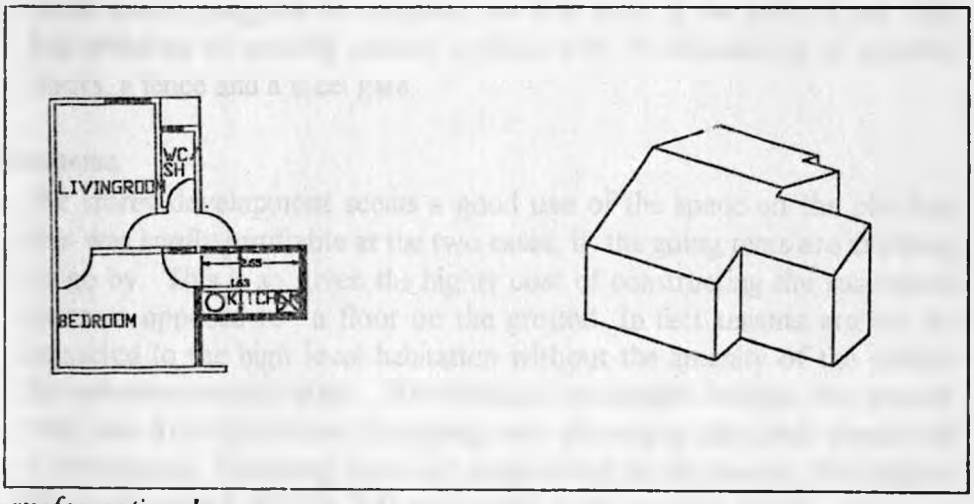


Fig. 4.4 T0 Transformation 1 at Kakamega

[57] We were not permitted to proceed to certain areas in the unit.

Transformation 2
(Fig.4.5 and Photo 4.5)

Type

- storey development
- close to the NHC type as proposed (see Figs.4.1, 4.2, 4.3)

1. in the Kakamega case (Fig.4.5) the principle of independent tenancies is respected
- the starter is self contained as a twin room rental unit;
- another two roomed unit with kitchen is built for another tenant but sharing the same entrance on the ground floor
- the upper floor is also a two roomed unit with a kitchen, store and shower and toilet. Cooking is done in one of the rooms
- the extension is in brick walling.

2. in the Bung'oma (Photo 4.5)case we have similarly independent units on the ground and the first floors but with marginally more amenities.
- thus we have a kitchenette on both the ground and the first floor
- the starter is left as provided (save for the standard completion of the incomplete room
- although the extension is in sand blocks, the exterior is applied with tyrolean (rough cast) plaster
- work was in progress to complete the first floor at the time of our visit but attention to security seemed evident with the installation of security doors, a fence and a steel gate.

Comments

- the storey development seems a good use of the space on the plot but this was hardly justifiable at the two cases; if the going rents are anything to go by. This is so given the higher cost of constructing the suspended floor as opposed to a floor on the ground. In fact tenants are not so attracted to the high level habitation without the amenity of the garden for subsistence cultivation. We witnessed one tenant moving to a ground only unit from the storied Kakamega unit above and she cited absence of a 'compound' (meaning space for cultivation) as the reason; this despite the similar rent (of Kshs.700 per month) being charged at both units.
- additionally the chronic water shortages are often more felt at first floors due to the higher pressures needed; a discouragement to occupation.
- the Bung'oma unit was, as most Bung'oma developments not so sensitive to rental returns; preferring to develop owner (or relative or friend) occupation.

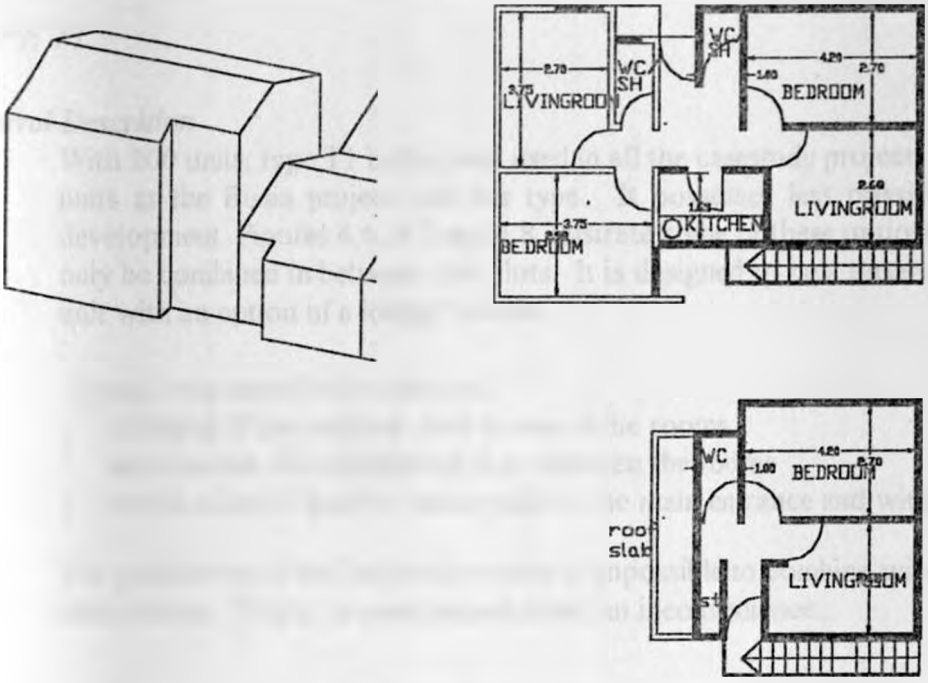


Fig.4.5 T0 storey transformation at Kakamega

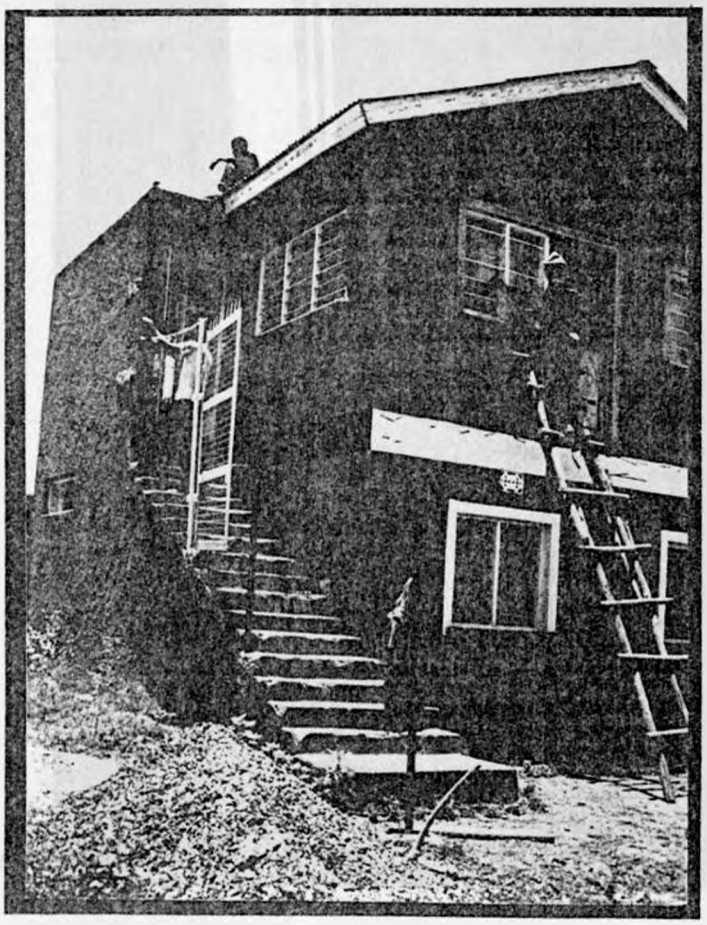


Photo 4.4 T0 storey type at Bung'oma

4.3 TYPE T1

4.31General Descrition

With 200 units, type T1 is the most used in all the casestudy projects. All the units at the Busia project use this type.. It possesses less possibilities of development. Figures 4.6, 4.7 and 4.8 illustrate some of these options. It can only be combined in between two plots. It is designed to be a three bedroom unit with an option of a lodger's room.

Typical responses to this unit are;

- blocking of the external door to one of the rooms
- introduction of a connecting door between the rooms
- introduction of security metal grille to the main entrance and windows.

The positioning of the bathroom makes it impossible to combine with the main rooms. This is, to most respondents, an inconvenience.

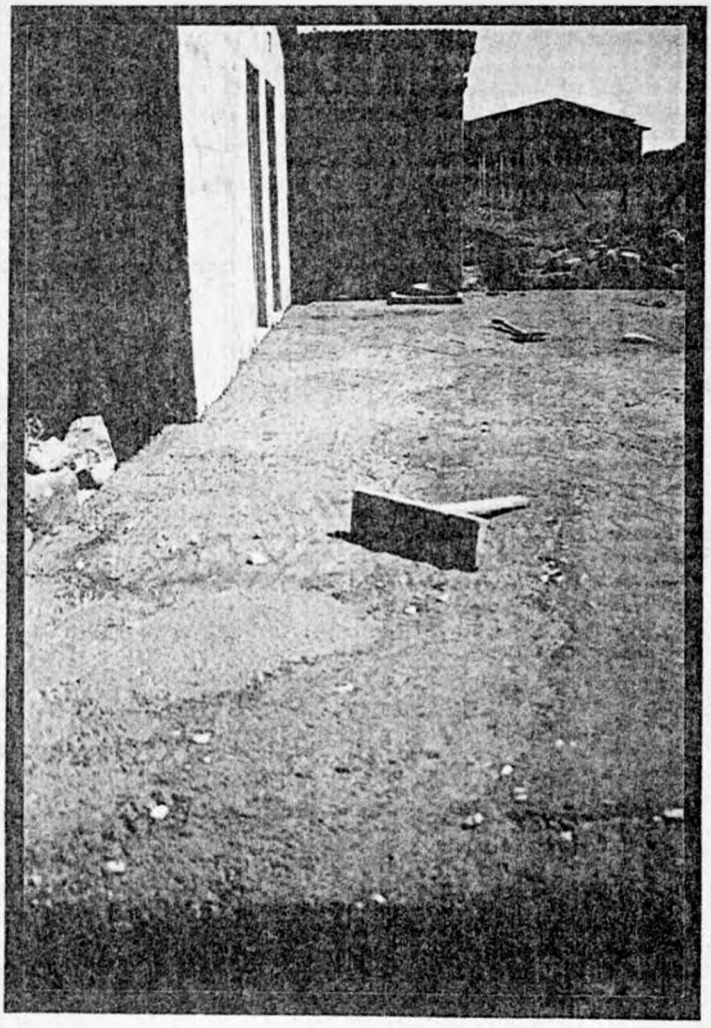


Photo. 4.5 T1 extension at floor slab level

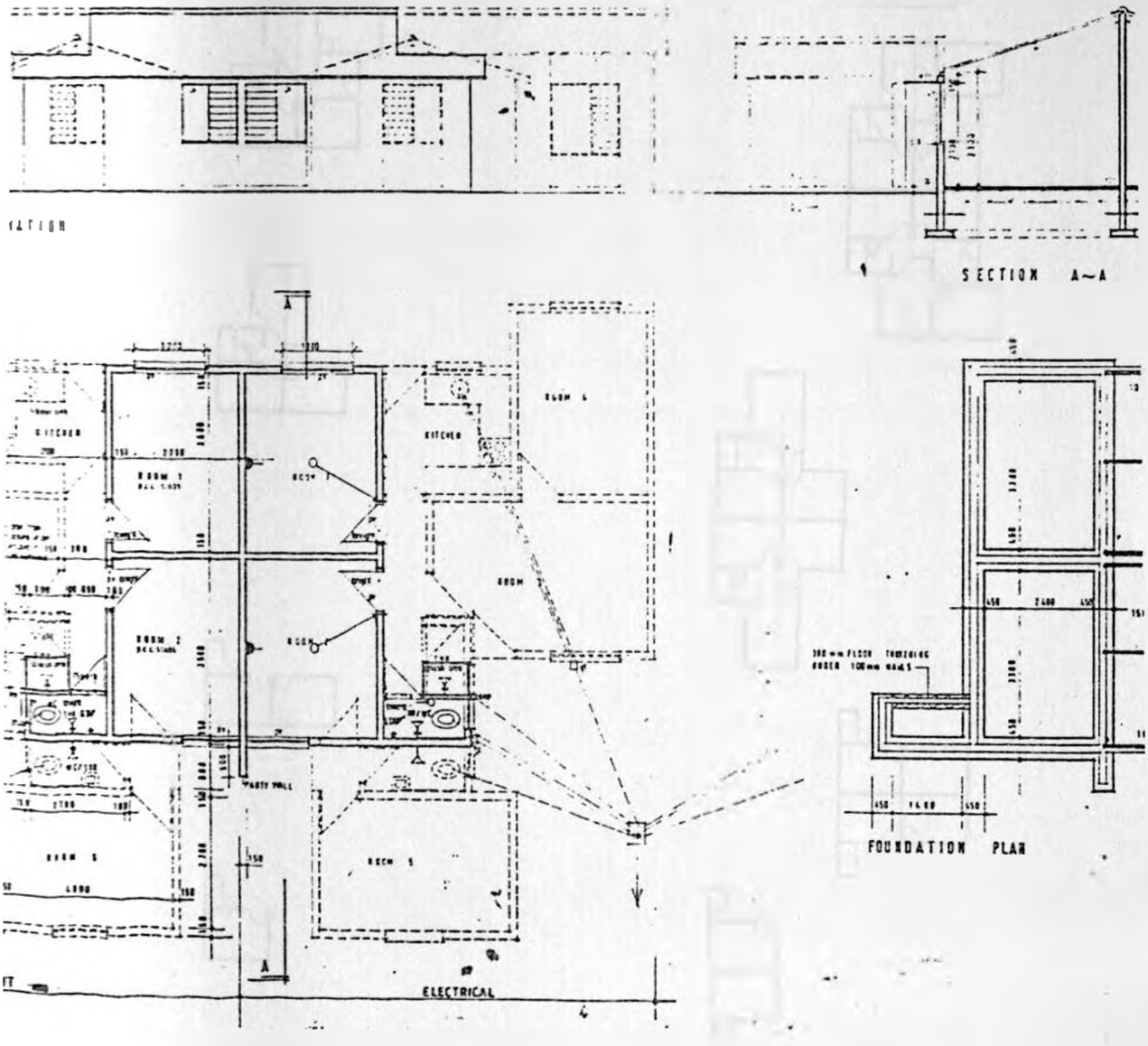


Fig 4.6 T1 Architectural Drawings
source: NHC

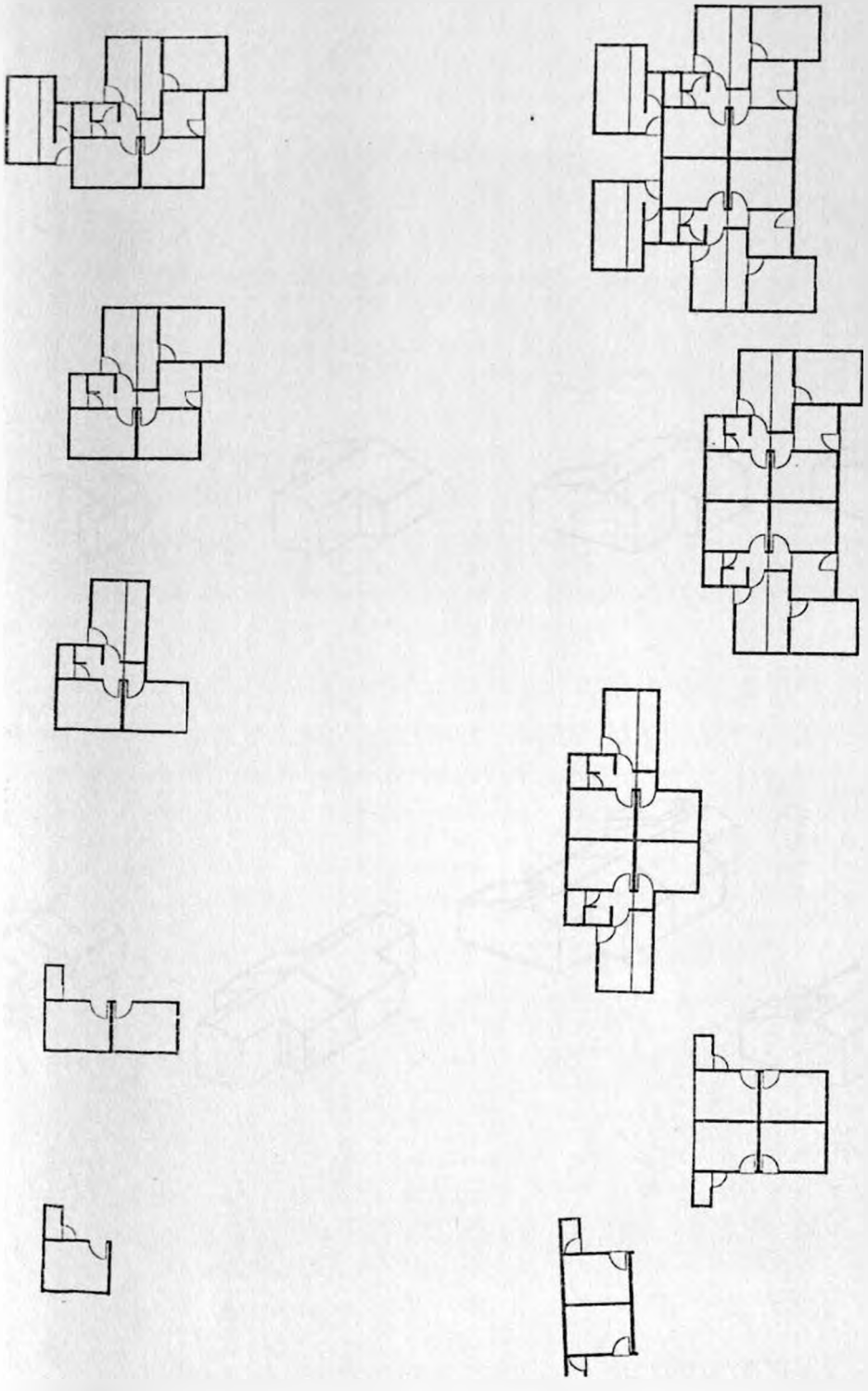


Fig.4.7 T1 Development Alternatives; plans

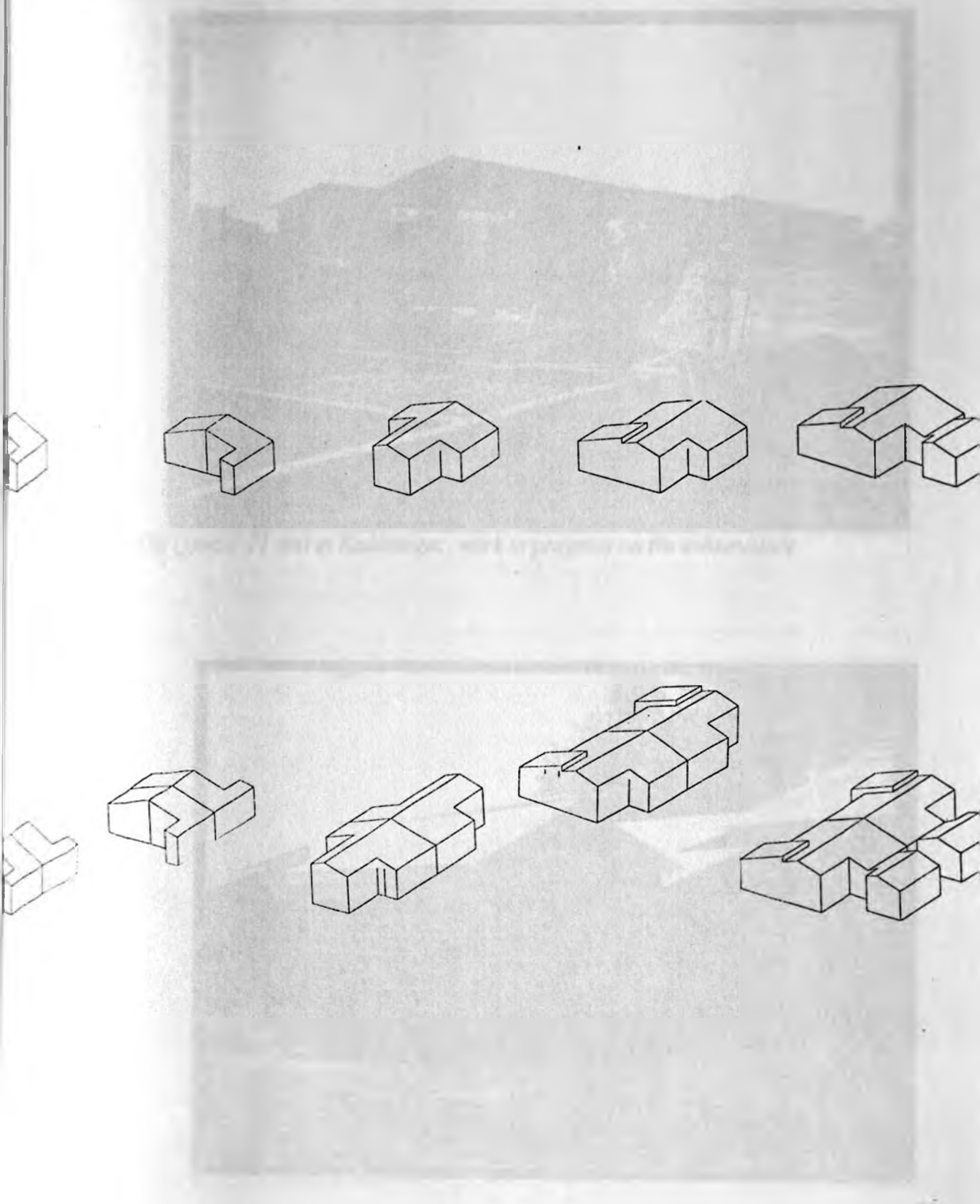


Fig 4.8 T1 Development Alternatives; volumetric studies

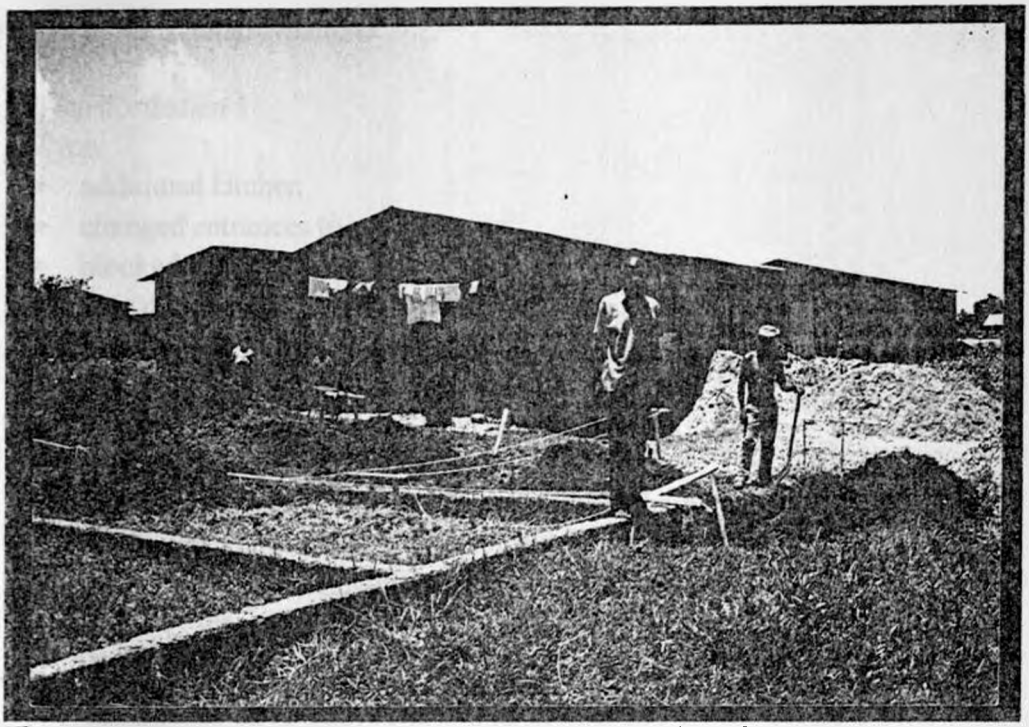


Photo 4.6 Typical T1 unit at Kakamega; work in progress on the substructure

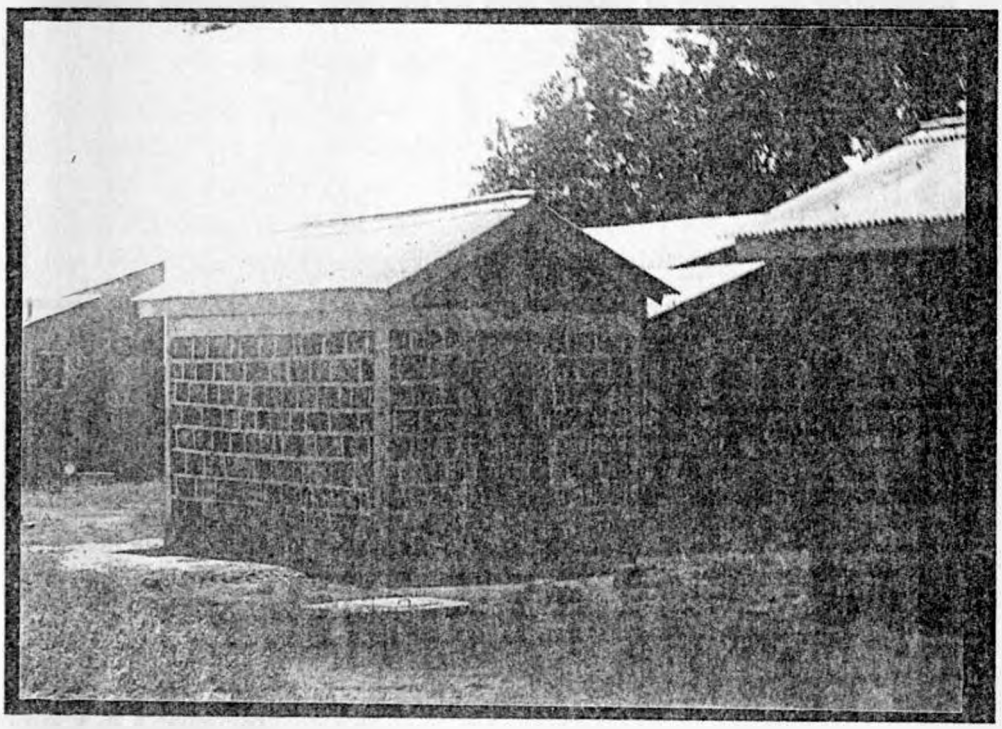


Photo. 4.7 Complete type T1 with lodger's Room at Bung'oma

4.31 Some Typical T1 Transformations

Transformation 1

Type

- additional kitchen
- changed entrances to rooms;
- blocked external door to room 2
- new door between room 1 and 2
- introduction of a chimney
- main entrance through the kitchen
- metal grille for security on main door.

Comments

- the space created between the kitchen and the bathroom defines a semi-closed/open courtyard suitable for outdoor cooking and living.
- there seems to a logical, hierarchical gradation of privacy and function from the newly defined court to living room and to finally to the private bedroom. This smooth is however interrupted by the passage through the kitchen space. When asked, the occupants of the unit did seem to mind this arrangement.
- the chimney does seem a huge convenience given smoke originating charcoal used for cooking.
- The walls for the extension are of brick but are plastered to deter moisture penetration, given the oft poor quality of local brick production.

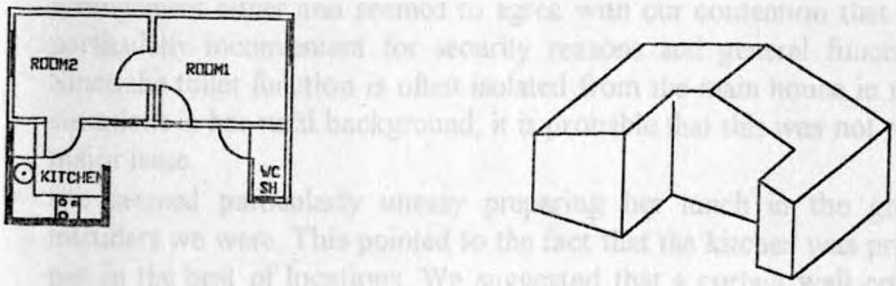


Fig.4.9
T1 Transformation 1 at Kakamega

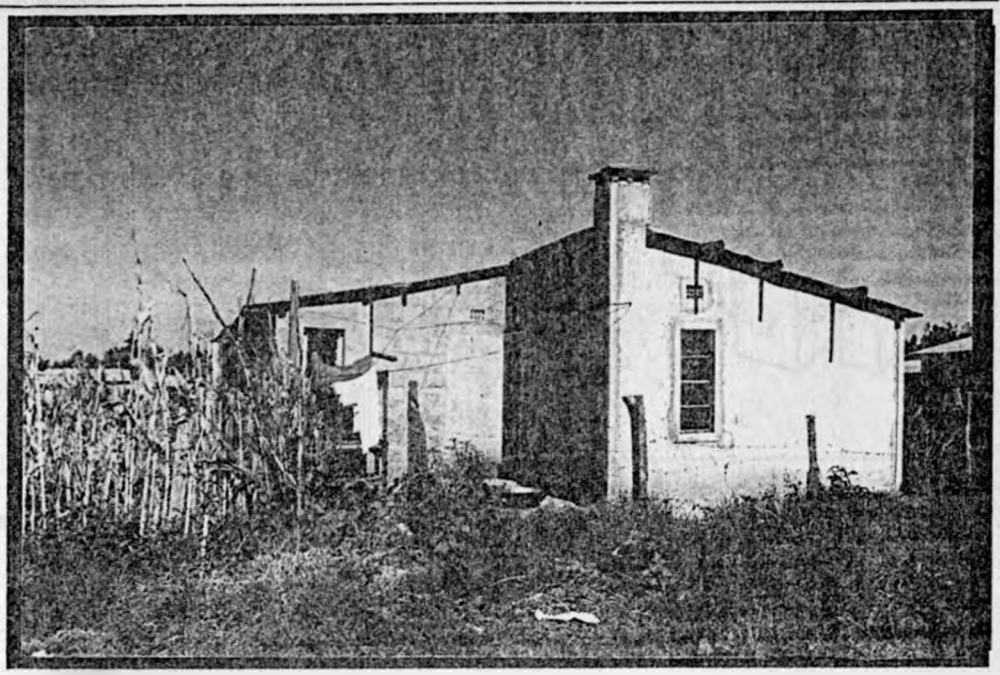


Photo.4.9
T1 Transformation 1 at Kakamega

Transformation 2 (Fig.4.10)

Features

- an additional space introduced to serve for cooking
- openings relocated
- main entrance through the kitchen space
- toilet isolated from the main unit

Comments

- the entrance past the kitchen seems acceptable in this type plan
- the toilet location seems rather inconvenient. When asked to comment the occupant who happened to the owner could not defend this arrangement either and seemed to agree with our contention that it was particularly inconvenient for security reasons and general functioning. Since the toilet function is often isolated from the main house in normal situations in her rural background, it is probable that this was not really a major issue.
- she seemed particularly uneasy preparing her lunch in the glare of intruders we were. This pointed to the fact that the kitchen was probably not in the best of locations. We suggested that a curtain wall could be introduced to isolate the cooking function from the entrance. Further that a connecting door between the bathroom and the entrance area could be more convenient. She seemed convinced.
- when asked about the design of the extension she seemed to pass it over to the *'fundi'* . Interestingly the *'fundis'* are party to major design decisions in these environments, sometimes to the detriment of the owners.

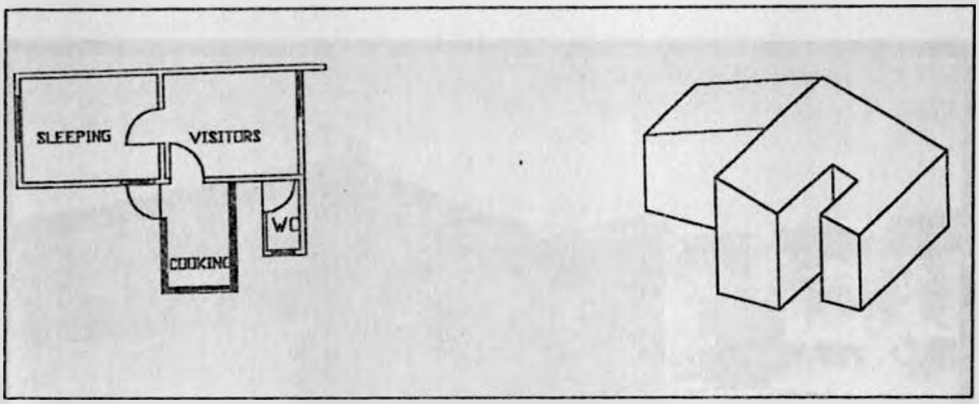


Fig.4.10
T1 Transformation 2

T1 Transformation 3 (Fig.4.11)

Features

- the original layout had been changed to accommodate two 1-bedroom units
- The original location of the toilet had been replaced with a kitchen for one unit
- the roof had been raised by two courses of brick
- because of its location, it was possible to have access from sides of the plot for access to the independent units
- walling for the extension was in brick

Comments

- at the time of our visit work was in progress on the extension (see Photos. 4.11 & 4.12)
- it looked a rather wasteful organisation in terms of positioning of walls and spaces
- the positioning of the toilet in between the original starter rooms was particularly inconvenient in aspects of ventilation, natural lighting and the cost
- the elevating of the roof was also an expensive effort given that most the original GCI sheets were not fully re-useable

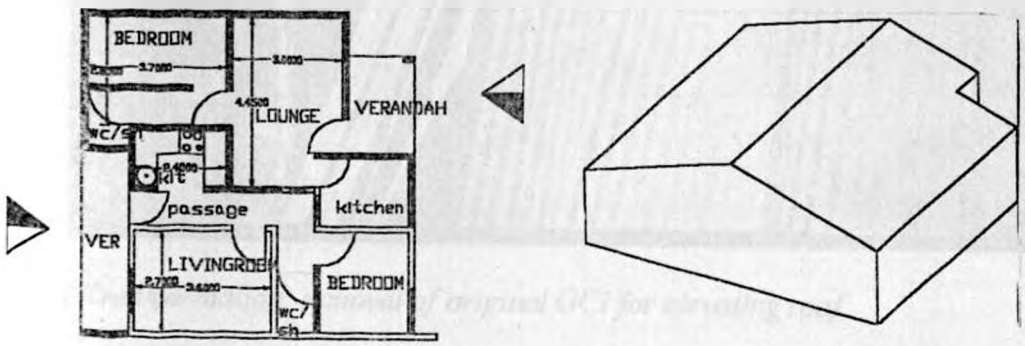


Fig. 4.11 T1 Transformation 3

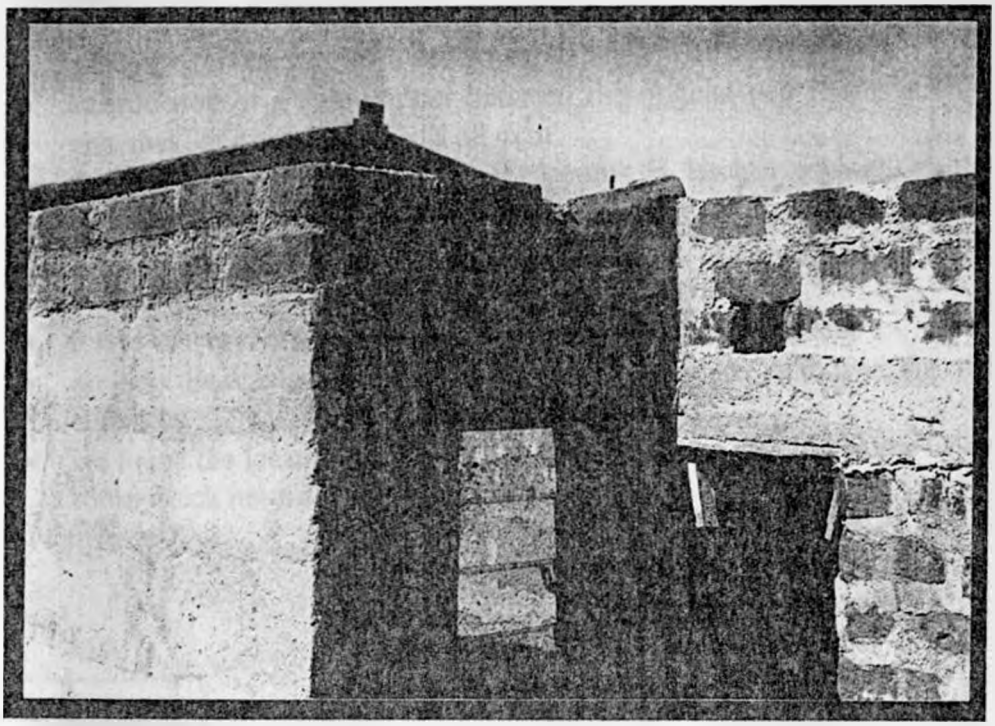


Photo. 4.10
T1 Transformation; additional wall courses for elevating roof

Photo 4.11 Transformation; removal of original GCI for elevating roof

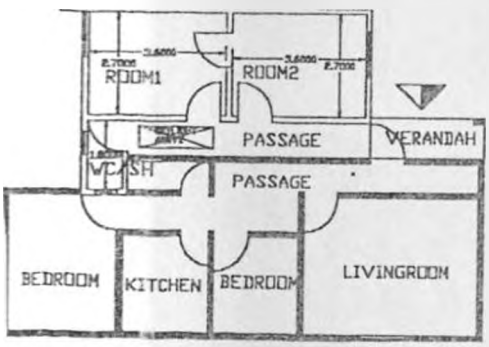
T1 Transformation 4 (Fig. 4.12)

Features

- a major effort to develop a new unit independent of the original
- introduction of a linking door between the original two rooms strange give that the external ones still all exist
- the new unit consists of two bedrooms, a kitchen as well as the bathroom

Comments

- the extension was to be inhabited by the time of our visit
- it was however unlikely to attract rents in proportion to its size
- no new materials, compared to the original, were employed for the extension
- we found the location of the kitchen inconvenient in relation to the living room which normally also serves as dining space



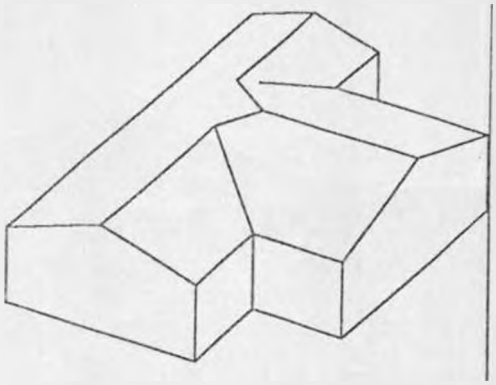


Fig. 4.12
T1 Transformation 4

Transformation 5 (Fig.4.13 and Photo 4.12)

Features

- changed main entrance door
- kitchen built
- linking door introduced between the two rooms
- door to one room blocked
- use of brick walling for the extension

Commends

- clear organisation of space and circulation
- the central placement of the door to room 2 makes its use not so efficient
- the positioning of the entrance door is particularly suited since the main street lies in its direction.

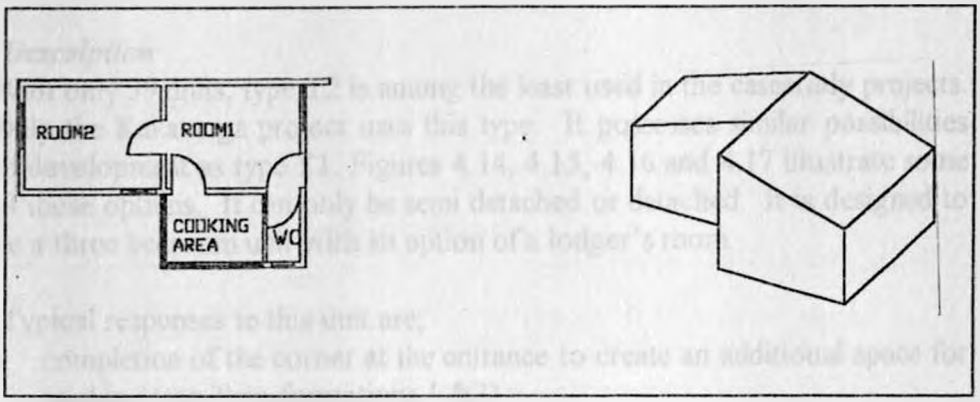


Fig.4.13 T1 Transformation 5

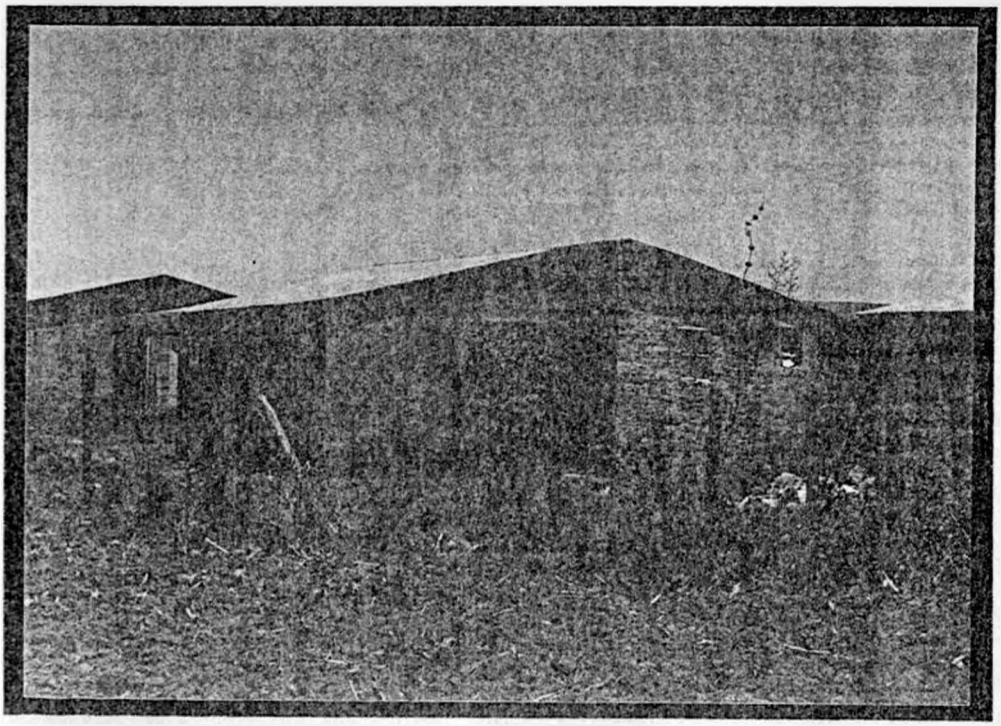


Photo.4.12 T1 Transformation 5

4.4 TYPE T2

4.41 General Description

With only 39 units, type T2 is among the least used in the casestudy projects. Only the Kakamega project uses this type. It possesses similar possibilities of development as type T1. Figures 4.14, 4.15, 4.16 and 4.17 illustrate some of these options. It can only be semi detached or detached. It is designed to be a three bedroom unit with an option of a lodger's room.

Typical responses to this unit are;

- completion of the corner at the entrance to create an additional space for cooking (see Transformations 1 &3)
- introduction of security metal grille to the main entrance and windows.

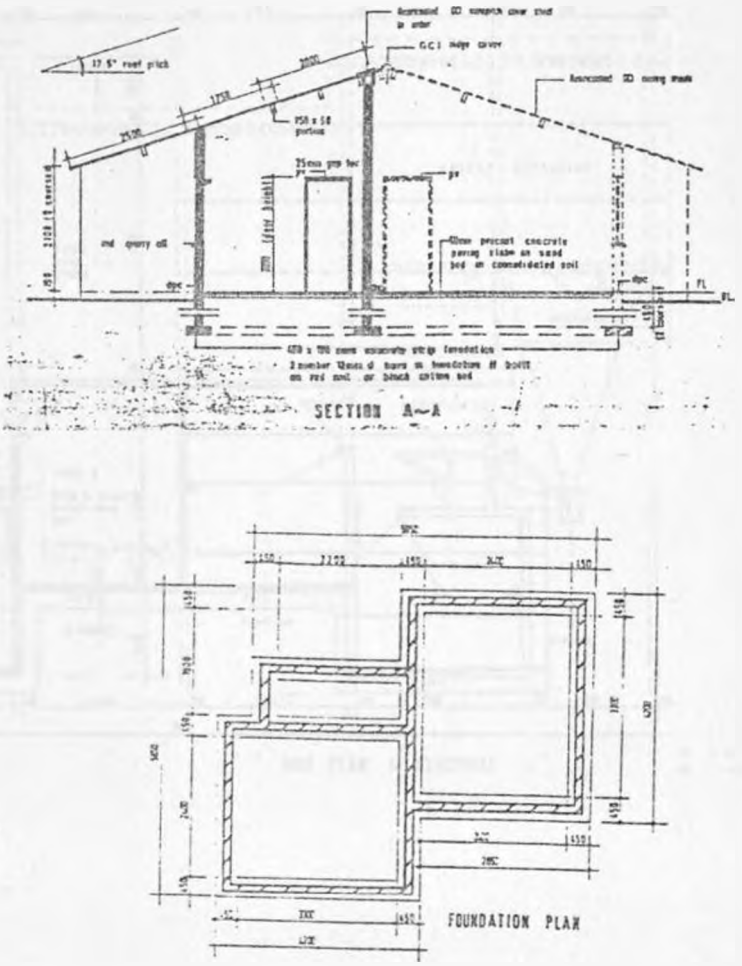
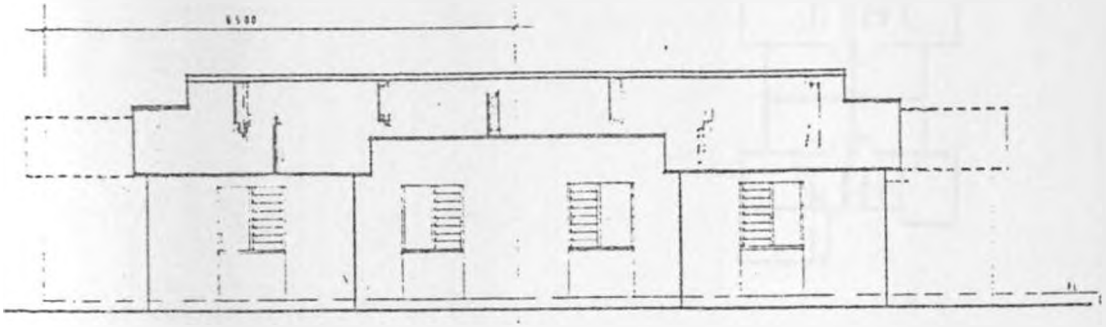
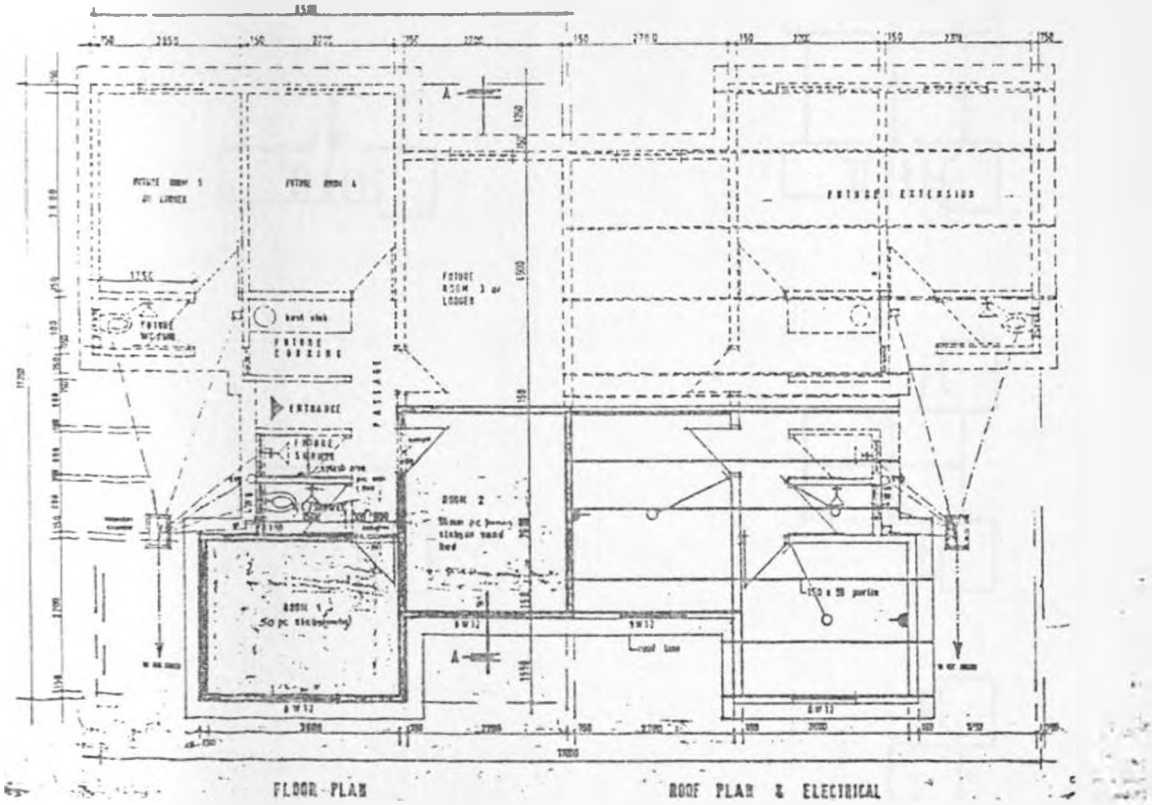


Fig. 14 T2 Section and Foundation Plan
source; NHC, 1994



ELEVATION 001



FLOOR PLAN ROOF PLAN & ELECTRICAL

Fig.4.15 T2 Architectural Drawings
source: NHC

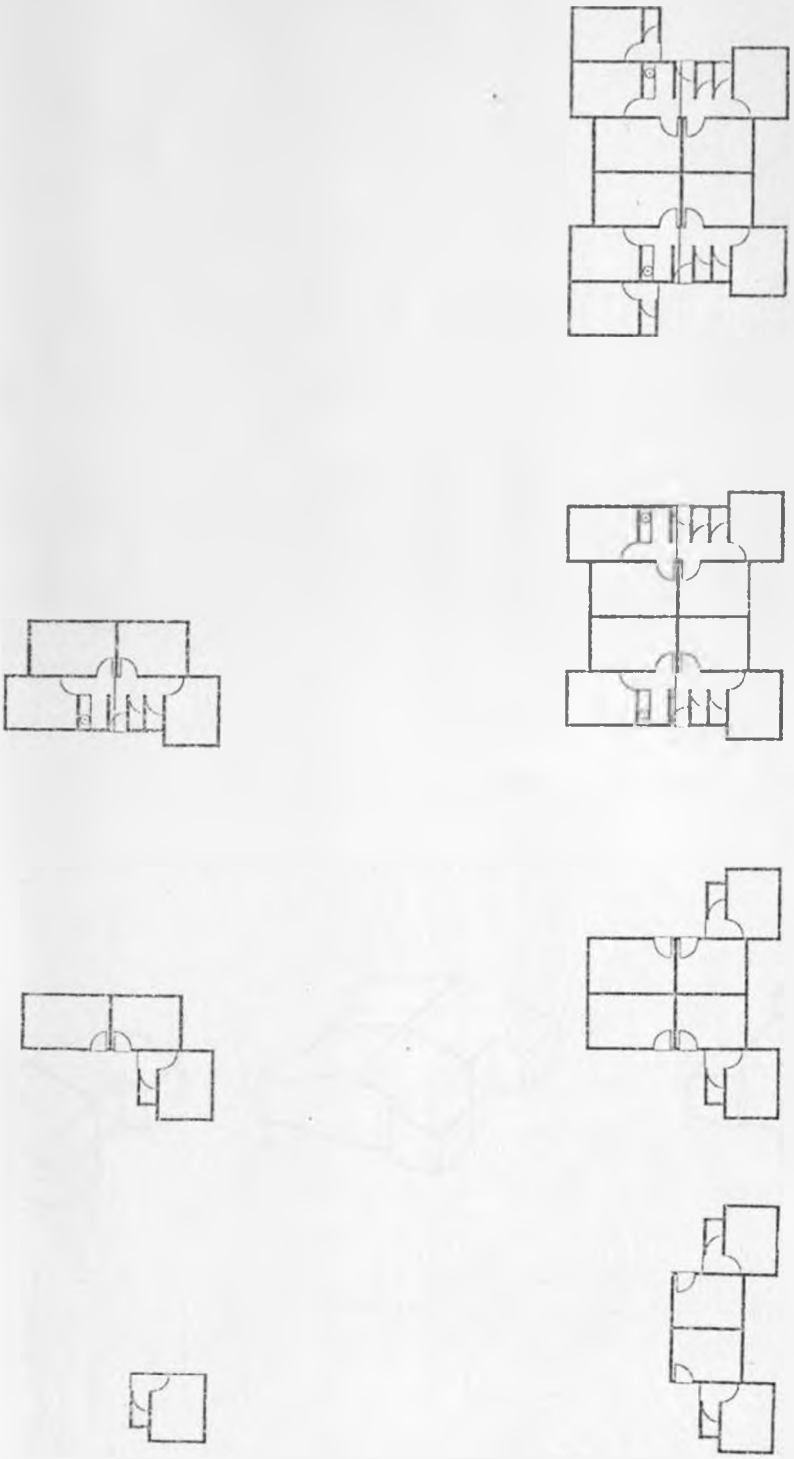


Fig.4.16 T2 Development Alternatives; plans

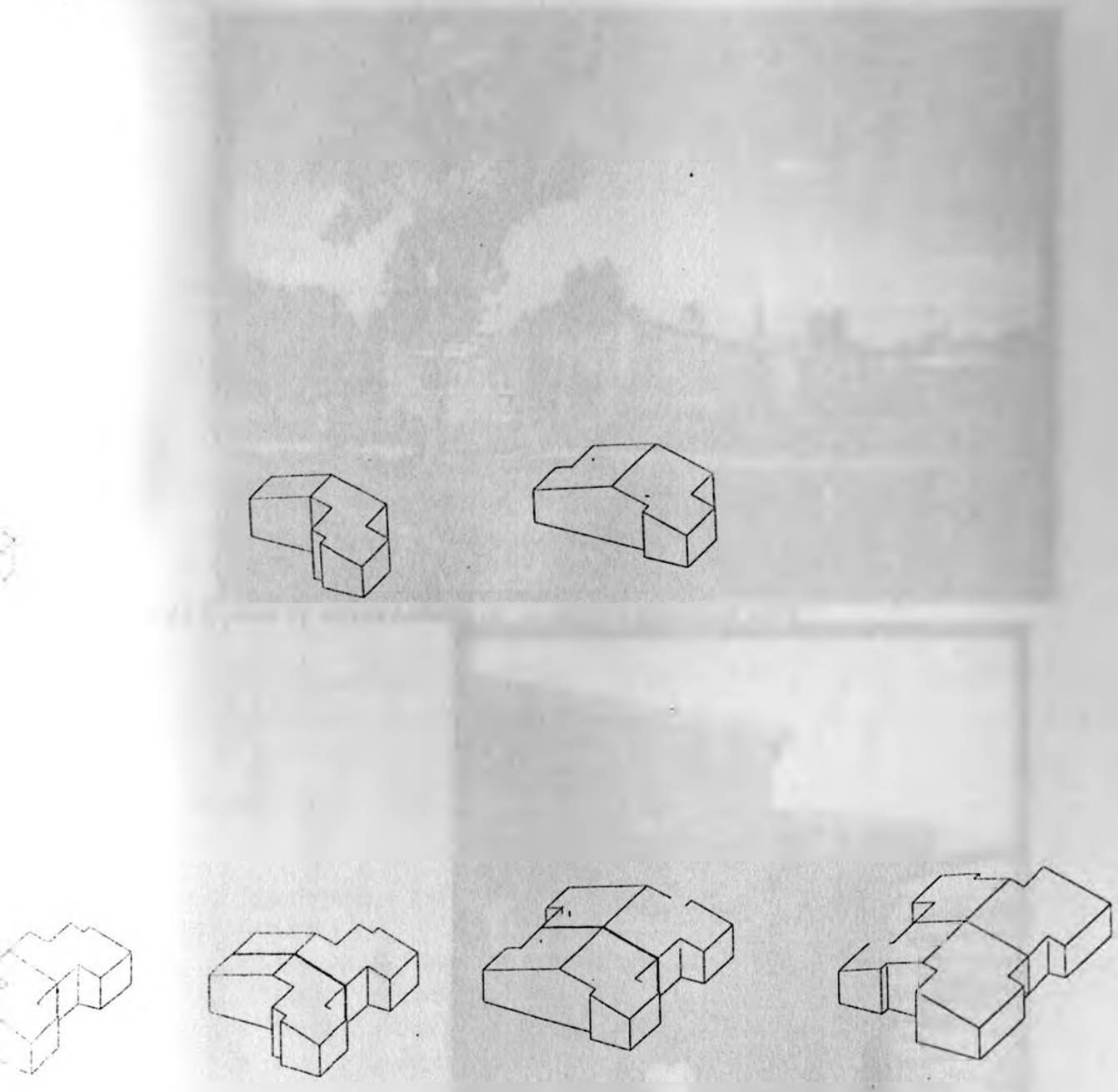


Fig. 4.17 T2 Development Alternatives; volumetric studies

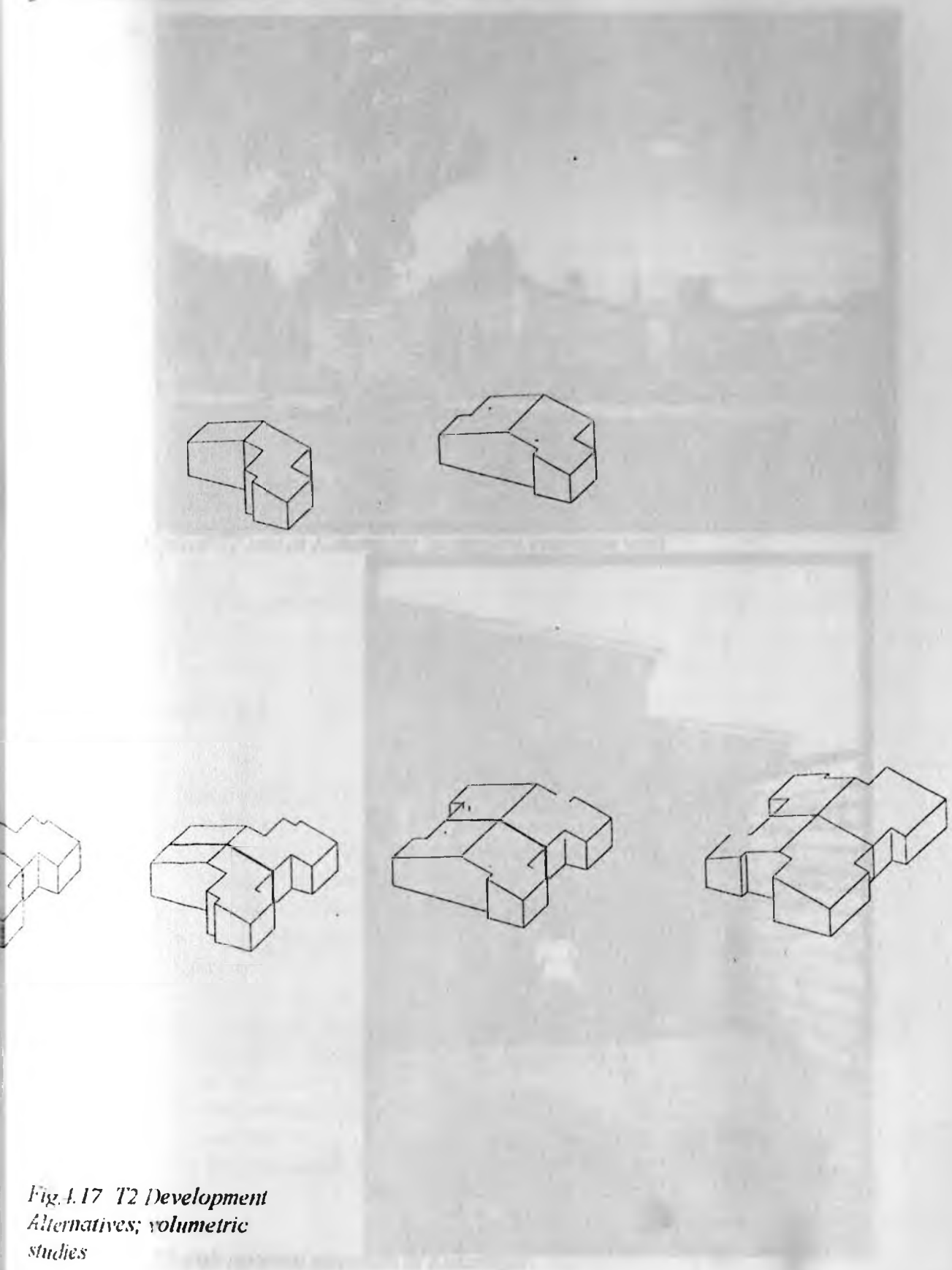


Fig. 4.17 T2 Development Alternatives; volumetric studies

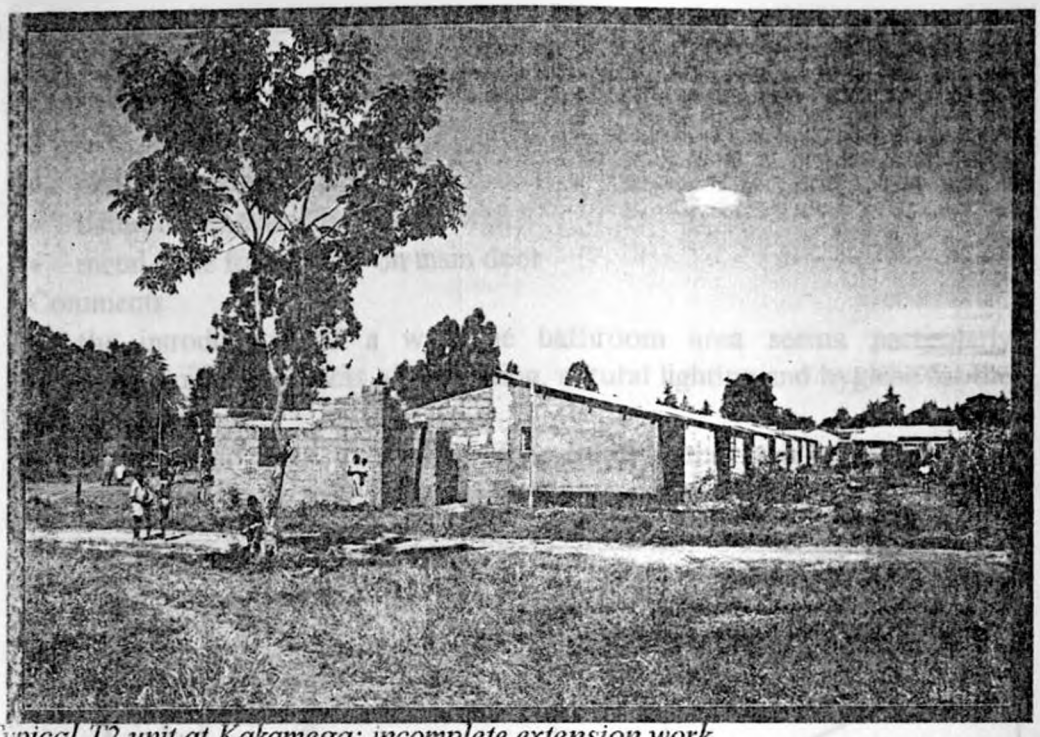


Photo 4.13 Typical T2 unit at Kakamega; incomplete extension work

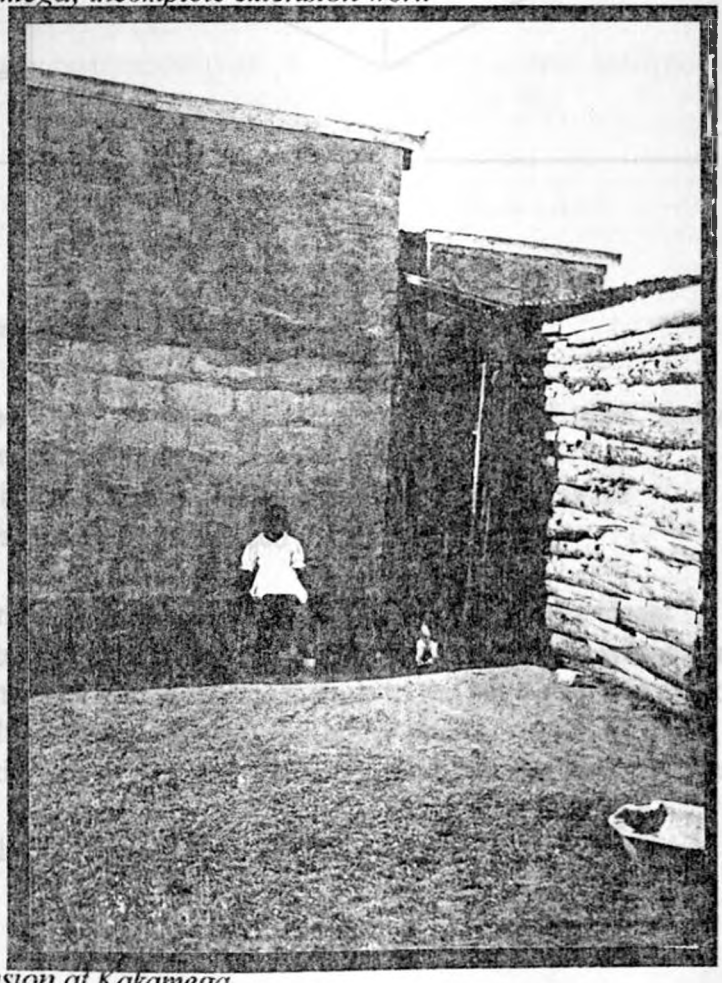


Photo. 4.14 T2 with informal extension at Kakamega

4.42 Some Typical T2 Developments

Transformation 1 (Fig. 4.18)

Type

- additional cooking area
- bathroom enclosed by kitchen wall
- metal grille for security on main door

Comments

- the introduction of a wall the bathroom area seems particularly inconvenient in aspects of ventilation, natural lighting and hygiene for the occupants
- we gathered from the NHC representative that this extension was earmarked for demolition due to the above reasons

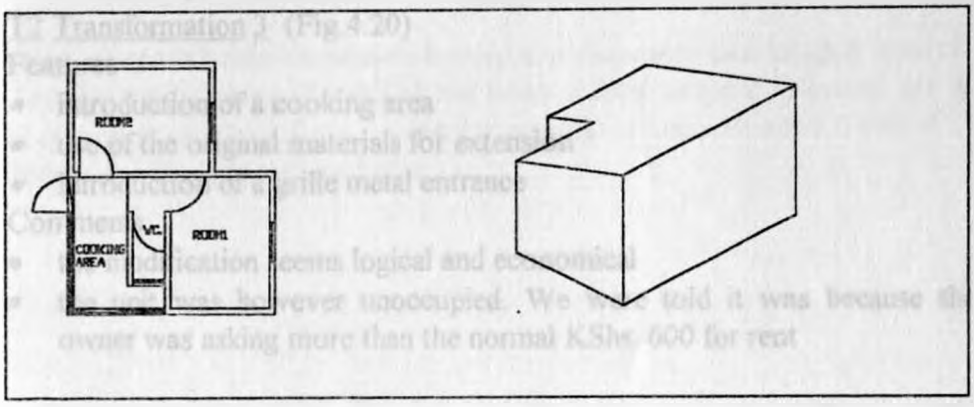


Fig.4.18
T2 Transformation 1 at Kakamega

Transformation 2 (Fig.4.19)

Features

- a complete 1-bedroom unit with independent shower and toilet, and a kitchen have been introduced
- the original unit has also been extended by adding a shower space
- metal grille doors have been introduced for the entrances

Comments

- the new unit seemed to function satisfactorily according to the tenant
- we thought the bedroom at the entrance was particularly inconvenient in relation to the entrance. But then it was close to the bathroom and toilet; a convenience. It seemed particularly suited for a guest room.
- the backyard exit was convenient for privacy in relation to the other neighbour
- the original unit lacked a kitchen; an inconvenience

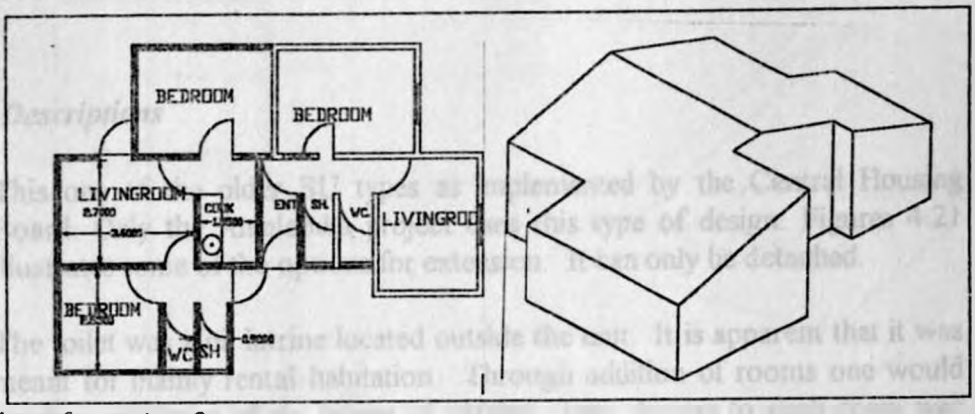


Fig.4.19 T2 Transformation 2

T2 Transformation 3 (Fig.4.20)

Features

- introduction of a cooking area
- use of the original materials for extension
- introduction of a grille metal entrance

Comments

- the modification seems logical and economical
- the unit was however unoccupied. We were told it was because the owner was asking more than the normal KShs. 600 for rent

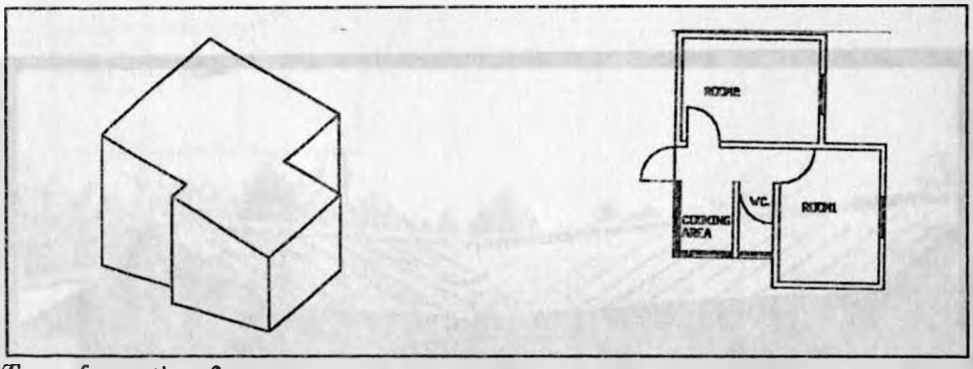


Fig. 4.20 T2 Transformation 3

4.5 TYPE T3

4.51 General Descriptions

This one of the older SU types as implemented by the Central Housing Board. Only the Amalemba project uses this type of design. Figures 4.21 illustrates some of the options for extension. It can only be detached.

The toilet was a pit latrine located outside the unit. It is apparent that it was meant for mainly rental habitation. Through addition of rooms one would reach a maximum of six rooms of varying sizes. Access to each room was from the outside. At full development one have courtyard space joining the rooms. Photo 4.16 shows such a courtyard.

Most units are hardly developed beyond the two-room plus kitchen 'starter'. This is strange given the age of the units. Some original 'starters' are as shown in Photo 4.15. Few unplanned evolutions were recorded. Photo 4.17 shows a self-contained evolution.

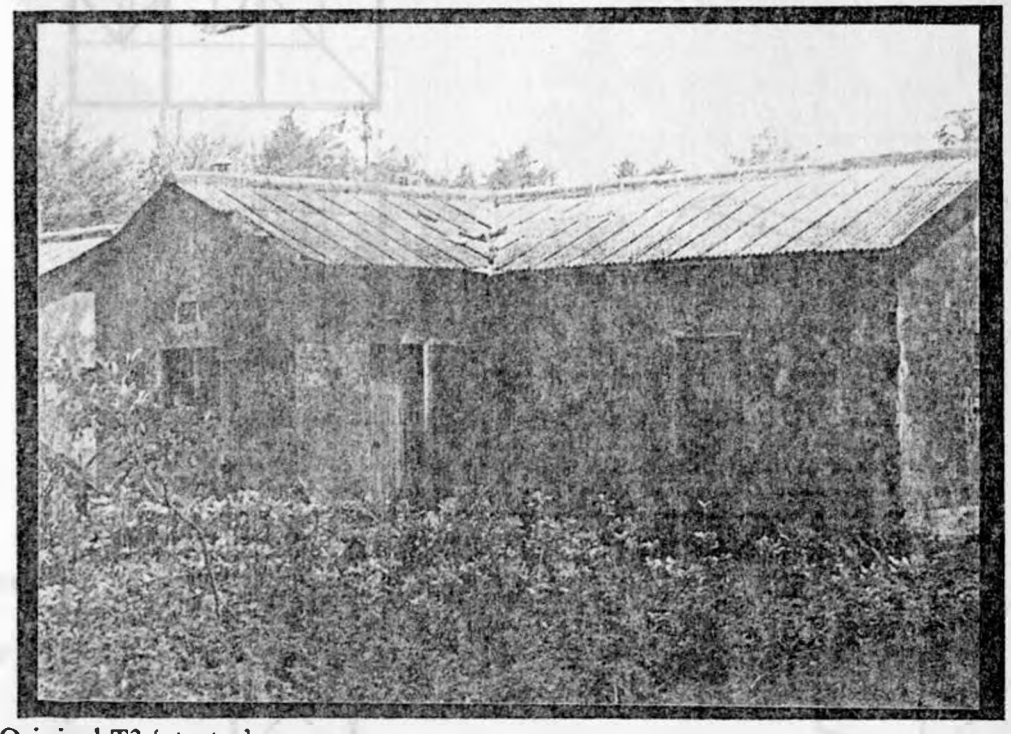


Photo 4.15 Original T3 'starter'

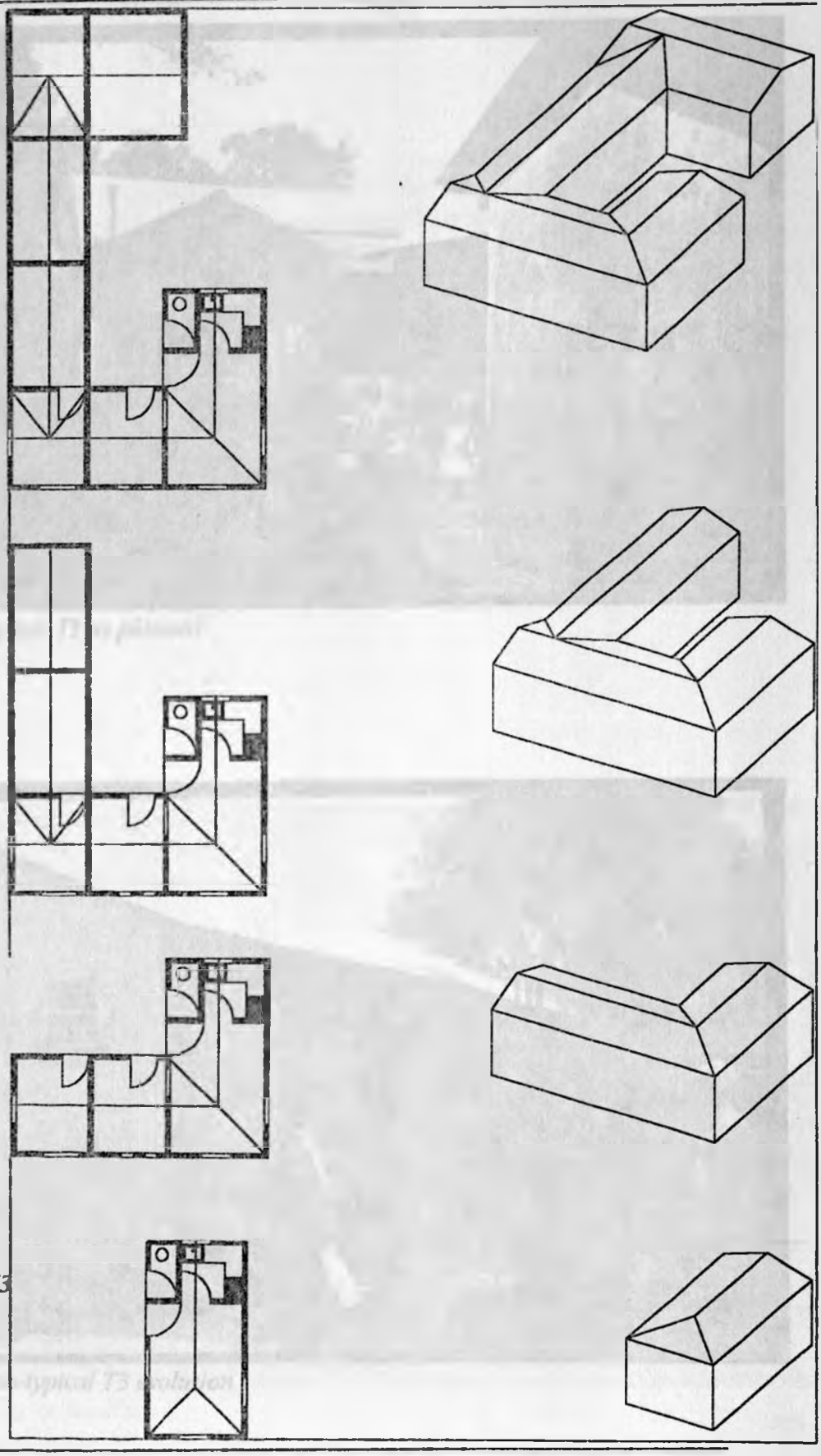


Fig. 4.21 Type T3 Planned development possibilities

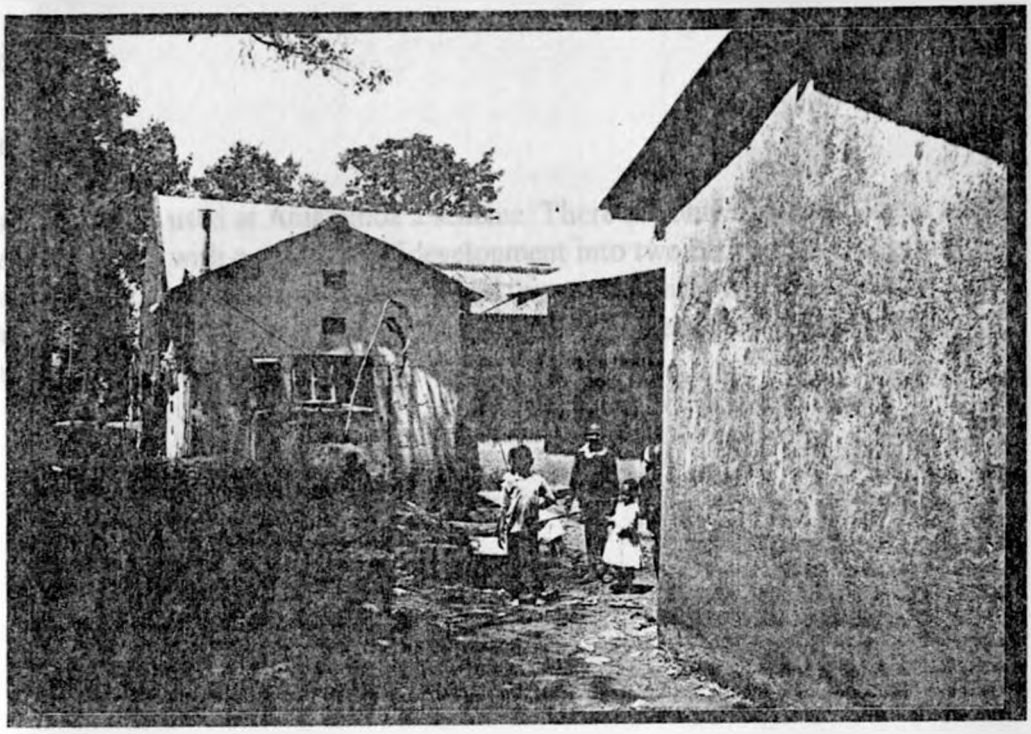


Photo 4.16 Complete T3 as planned

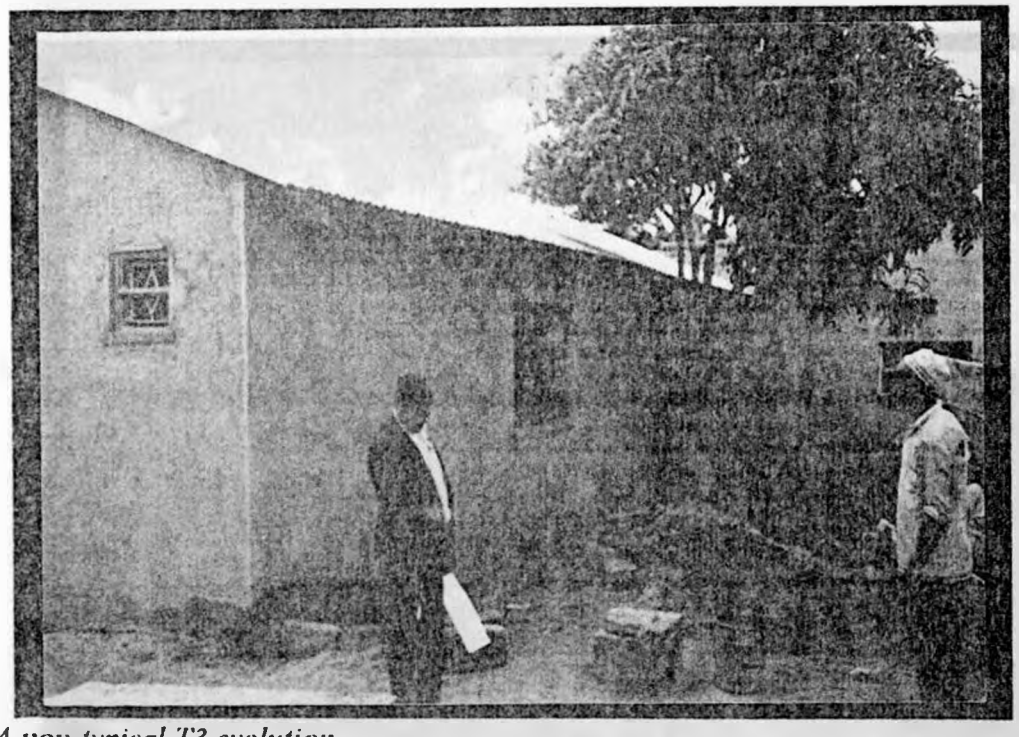


Photo 4.17 A non-typical T3 evolution

4.6 TYPE T4

4.61 General Decription

This type is only used at Amalemba 2 scheme. There are only 32 units. These are 1-bedroom units with a potential of development into two bedrooms. Out of the total only two were observed to have taken this opportunity.(see Photo 4.18). None of the units had developed anything contrary to the provided development plan. Photo 4.21 shows the original 'starter'.

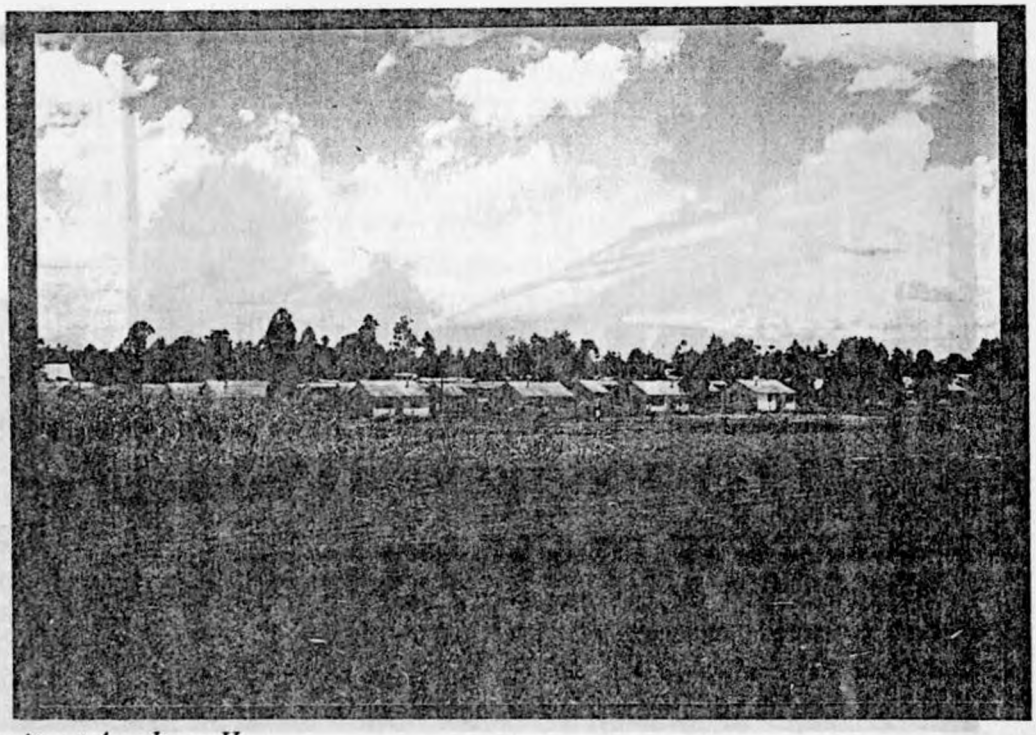


Fig. 4.18 T4 units at Amalema II

Photo 4.19 Original T4

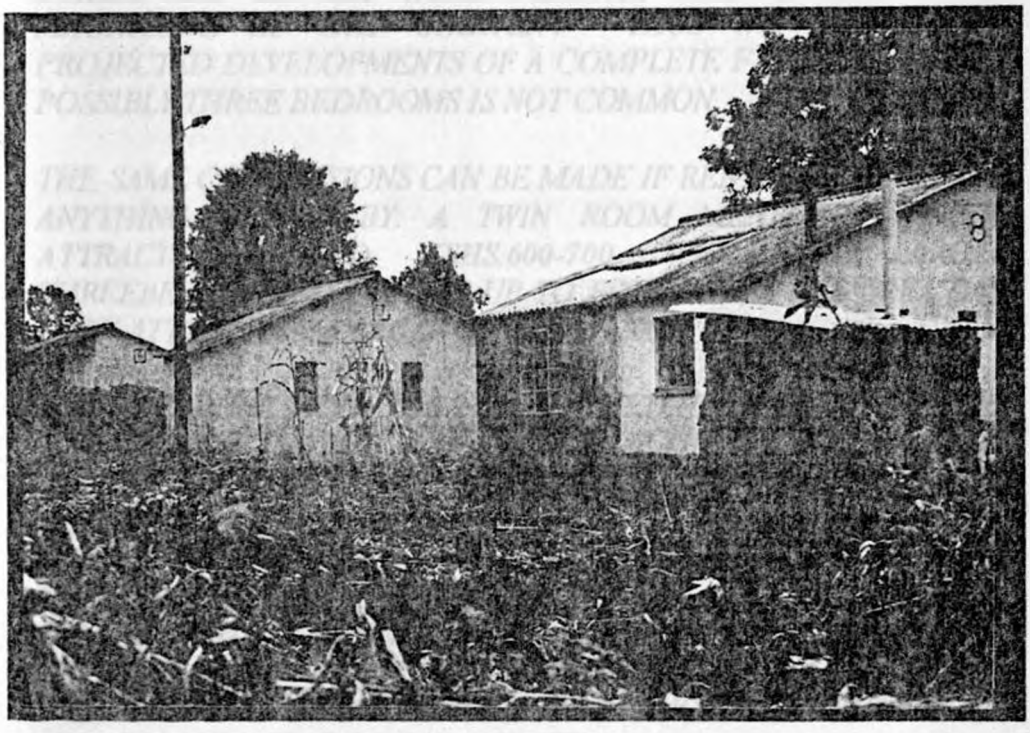


Photo 4.20 Extended T4

4.6 CONCLUSIONS: TYPES AND TRANSFORMATIONS

*FROM THE **TYPES AND TRANSFORMATIONS** DISCUSSED IN THIS SECTION ONE CAN MAKE THE FOLLOWING REMARKS AND CONCLUSIONS:*

THE TWO ROOMED UNITS PROVIDED IN MOST OF THE CASE-STUDY PROJECTS ARE LARGELY POPULAR AND ACCEPTED AS THE BASIC MINIMUM HABITATION FOR THE INCOME GROUPS DISCUSSED.

IT IS THEREFORE IN ORDER TO FOR N.H.C. TO DESIGN SIMILAR UNITS FOR THE CASE-STUDY TOWNS.

HOWEVER THE ABSENCE OF A KITCHEN SEEMS TO BE A BASIC SHORTCOMING OF THE TYPES

IT IS APPARENT THAT MOST RESPONDENTS WISH TO HAVE A SELF-CONTAINED TWO-ROOMED UNIT ; I.E. WITH A SEPARATE KITCHEN AND BATHROOM. MOST TRANSFORMATIONS SEEM TO AIM FOR THIS.

TRANSFORMATIONS BEYOND THE FIRST TWO ROOMED UNIT DOCUMENTED IN THIS SECTION ALSO ATTEMPT TO ADD A UNIT WHICH CAN BE LET INDEPENDENTLY AND OF THE SAME MAGNITUDE AS THE 'STARTER'. THUS WE STATE THAT PROJECTED DEVELOPMENTS OF A COMPLETE FAMILY HOUSE OF POSSIBLY THREE BEDROOMS IS NOT COMMON.

THE SAME CONCLUSIONS CAN BE MADE IF RENTAL RETURNS ARE ANYTHING TO GO BY. A TWIN ROOM MENTIONED ABOVE ATTRACTS AROUND KSHS.600-700 WHILE A LARGER THREEBEDROOMED UNIT OF UP TO FOUR TIMES THE AREA CAN ONLY ATTRACT A MAXIMUM OF KSHS. 1200.

WHERE LARGER THAN THE TWO-ROOMED RENTAL UNIT OCCURS IT PROBABLE THAT IT IS OCCUPIED BY THE OWNER WHO MAY VALUE THE CONVENIENCE OF THE BIGGER HOUSE RATHER THAN THE RENT THAT IT WOULD ATTRACT.

THE PREDOMINANT APPROACH IS THAT OF SELF CONTAINMENT OF THE TWIN ROOM UNIT RATHER ADDITION OF EXTRA ROOMS. THUS WE CAN CONCLUDE THAT WHAT IS DESIRED IS A DESIGN THAT WOULD NOT ENCOURAGE TOO MUCH EXPENDITURE ON THE IMPROVEMENT OF THE 'STARTER'.

ONE WAY OF ACHIEVING THIS WOULD BE THROUGH PROVISION OF A KITCHEN OR SIMPLY A COOKING SPACE THAT IS DISTNCT ENOUGH FROM THE THE BASIC SPACES OF SLEEPING AND LIVING ROOM.

THE CONCEPT OF GROWTH SHOULD BE SEEN AS ADDITION OF RENTAL UNITS RATHER THAN EXTENTION OF THE BASIC UNIT. THE IMPLICATION IS THAT WHEN DESIGNING FOR GROWTH WE SHOULD ATTEMPT TO ARTICULATE DIFFERENT RENTAL UNITS RATHER THAN ROOMS TO THE MAIN CORE AS IS THE CASE IN THE NHC TYPE PLANS.

*THE DEFINATION OF A **RENTAL UNIT** IN SPATIAL TERMS FROM THESE FINDINGS SHOULD GENERALLY FOLLOW THE FOLLOWING GUDELINES:*

1. *TWO ROOMS OF MORE OR LESS MULTI-FUNCTIONAL NATURE. A POSSIBLE AREA OF SUCH ROOMS WOULD BE 12 M2. MINIMUM.*

   A FURTHER CLEARER DISTINCTION CAN BE MADE BETWEEN THE ROOMS; ONE DESIGNED FOR VISITOR USE FOR THE MOST PART.

   THIS WOULD SERVE EATING FUNCTIONS AND DAYTIME ACTIVITIES. BUT IN THE EVENING ONE SHOULD NOT RULE OUT ITS USE AS A SLEEPING AREA BY INTRODUCTION OF A MATTRESS AND/OR A SMALL BED FOR OLDER CHILDREN AND/OR VISITORS.

   IT WOULD ALSO SERVE AS A KITCHEN UNLESS PROVIDED FOR OTHERWISE.

   THE SECOND ROOM'S FUNCTION IS THAT OF PRIVACY AND SLEEPING FOR THE PARENTS.

   SMALLER CHILDREN AND BABIES COULD ALSO SLEEP HERE.

2. *A KITCHEN OR COOKING SPACE OF LESSER AREA, DEPENDING ON THE DESIGN.*

   OVER DESIGNING FOR THE KITCHEN COULD BE COUNTER-PRODUCTIVE AS FEW CONSIDER IT AN ADITIONAL SPACE BUT PART OF THE BASIC ENTITY.

THE IMPLICATION IS THAT THEY MAY NOT BE WILLING TO PAY EXTRA FOR IT.

IN FACT AN APTLY DESIGNED AND DESIGNATED PORTION OF ONE OF THE MAIN ROOMS IN (I. ABOVE) WOULD SUFFICE.

3. *A BATHROOM UNIT. IT WAS APPARENT THAT NONE DEEMED IT PARTICULARLY INCONVENIENT TO HAVE A COMBINED WATER CLOSET AND SHOWER UNIT.*

THUS THE LOW LEVEL EASTERN TYPE W.C. COMBINED WITH TOWERING SHOWER IN CLOSE PROXIMITY ARE SOMEWHAT ACCEPTABLE TO MANY RESPONDENTS.

THE THE LOCATION OF THE BATHROOM DOOR SO AS TO OPEN OUTSIDE RATHER INSIDE ONE OF THE ROOMS (FOR MORE SELF-CONTAINMENT) WAS NOT A SEIROUS BOTHER TO MANY ALSO.

IT IS POSSIBLE THAT THE CHRONIC WATER DISAPPEARANCES MAKE THE TOILETS A HAZARD AT TIMES. AN OUT OF THE WAY TOILET IS THUS CONVENIENT, VIEWED FROM THIS ANGLE.

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