



UNIVERSITY OF NAIROBI
HOUSING RESEARCH AND DEVELOPMENT UNIT

P.O. BOX 30197 NAIROBI KENYA TELEPHONE 27441 EXT. 212 TELEGRAMS VARSITY

"THE KIBERA EXPERIMENTAL SELF-HELP SCHEME"

Explanatory notes on the planning of a
low-cost housing scheme in Nairobi.

These notes are prepared at the request of the National Environment Secretariat, The Office of the President. They are to be supplementary to "National Summary Report for HABITAT, The United Nations Conference on Human Settlements", which will be held in Vancouver in June this year.

author : Otto Kaszner, Research Fellow. (architect)
date : March 1976
typewriting: Alice Justin

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Housing Research and Development Unit, University of Nairobi
Director - K.B. Andersen, M.A.A.
P.O. Box 30197, Nairobi, Kenya tel. 27441 x 212

I N T R O D U C T I O N

It is evident in Kenya, as almost anywhere in the developing world that one of the major problems facing the Government is the insufficient provision of housing for the lower income groups which constitute the majority of the population in the rural and the urban areas. 1)

1) see reference
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It is quite as evident that this problem cannot be solved by limited public means alone and that consequently a new methodology must be found.

A pragmatic attitude found in many developing countries is to set standards, to build as much as the limited public funds permit and to leave the rest to the private sector.

This method introduces of course a larger element of uncertainty into the planning, but worse, it ignores the importance of incentives, guidelines and legalization for private initiative.

Especially the considerable efforts of the lowest income groups which are clearly visible around the urban areas and which find no way of materializing other than in the form of "squatt'ing", or as it is professionally termed "uncontrolled urban settlement".

Given security of tenure, a modest incentive and proper guidance, such as approved type plans and work manuals from the relevant authorities, this considerable potential could be channelled into more desirable, acceptable and legal housing.

It seems evident that the attention given need not necessarily be in terms of funds. It often appears that mere planning and above all a supporting policy lead to a considerable improvement.

The small scale African entrepreneurs, who need the encouragement of broad public recognition have already demonstrated their abilities and their technical and economic capacity seem not at all exhausted.

However, for any small developer in an urban area the problem seems to be serviced land rather than money. On the other hand, for any local authorities the problem seems to be money rather than land. In order to reach the maximum out-put of dwelling units, an integration of public and private economic and administrative efforts must be established.

Realising this, the understandable inability of public bodies to make an effective impact on the housing situation by conventional methods is now being resolved in Kenya by mobilizing the private potential in self-help schemes. The basic principle being that plots, serviced by public authorities are allocated to members of the scheme who are then responsible for erecting the super-structures.

In pursuing this realistic policy, whatever money is available in the public sector must, in the view of the HRDU, first go towards land acquisition and proper planning. The next phase must be the servicing of the acquired land and after that various forms of support for superstructures can be considered.

It is realized, in Kenya as elsewhere, that the cheapest forms of shelter at minimum standards of acceptability have already been discovered by the squatters themselves, in spite of the lack of public support.

It must at the same time be realized, however, that the lack of planning of these shelters in many cases makes future improvement of the structures and the environment difficult.

THE PROGRAMME

As a consequence of the considerations described above the Ministry of Housing and Social Services and the Housing Research and Development Unit of the University of Nairobi have suggested as the first priority a research programme to develop prototypical (self-help) dwellings for the lowest income groups.

Narrowing in on the climatic zone where the urban housing need is most urgent, the Kenya highland zone was chosen. This includes such major urban centres of Kenya as: Nairobi, Nakuru, Nyeri, Thika, Eldoret, etc.

It was realized that this exercise should not only include the aspects of physical planning, but organisational ones as well. The findings of the follow-up of this scheme will be taken into consideration, when setting up strategies for the implementation of official policy.

The premises set out in the foregoing text are based largely upon research findings which have been documented by the HRDU.

All site and service schemes in Kenya have been visited and analysed²⁾, the largest squatter area in Nairobi has been studied³⁾ and a range of the most important Government-sponsored housing schemes have formed the subject of a user-reaction survey⁴⁾

The climatic zones have been redefined with a specific relevance to low cost housing.⁵⁾ Functional aspects have been reconsidered and small scale experiments have been carried out on a range of building materials and components.

2), 3), 4), 5)
see references
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THE KIBERA EXPERIMENTAL SELF-HELP SCHEME

The planning of the scheme has been undertaken at the request of the Ministry of Housing and Social Services.

The Housing Research and Development Unit of the University of Nairobi is responsible for sketch design and co-ordination of the planning. The National Housing Corporation which is the executive body of the Ministry of Housing and Social Services is responsible for production of working drawings, site supervision and overall administration. A project planning committee has been established composed of representatives from the above mentioned bodies, the Nairobi City Council, the Ministry of Lands and Settlement and the local administration.

THE SITE, LOCATION AND CHARACTERISTICS

The site is located in Kibera, a peri-urban area 7 km. south-west of Nairobi City Centre. Parts of the area still possess semi-rural features: low density with open spaces between house-groups cultivated or used for grazing. Most development in the area is on unsurveyed plots varying from the so called "Swahili" type of houses in the middle of the area to structures of very modest standard along the fringes.

The area comprises a big market including some open-air workshops, a Muslim community centre in conjunction with the mosque, a primary school and a health clinic.

The existing public facilities are however insufficient to meet the present demand, therefore the draft for the Nairobi City Council Development Plan includes an additional primary school and a health centre/community centre.

The whole Kibera area is Government owned. The majority of the population belongs to the very low income groups, a large part of which is self-employed and the so-called "informal" economic sector plays an important role. The relative proximity of the City Centre and the Industrial Area makes Kibera an attractive residential area for the lower wage groups.

The site for this experimental self-help scheme is located in the western part of the Kibera area. Approximately 40 structures mainly of the Swahili type are found on site, on surveyed plots, the majority poorly constructed and maintained.

The planned development is in accordance with the overall planning of Kibera under preparation at the Ministry of Lands and Settlement.

which suggests development of different categories of housing in the area with an emphasis on housing for the lower income groups.

ORGANISATIONAL AND FINANCIAL PLANNING

The scheme is intended for the low income population of Kibera. The overall administration is the responsibility of the National Housing Corporation. It is a self-help scheme organized financially on tenant-purchase terms financed by the Ministry of Housing and Social Services through its executive body the National Housing Corporation.

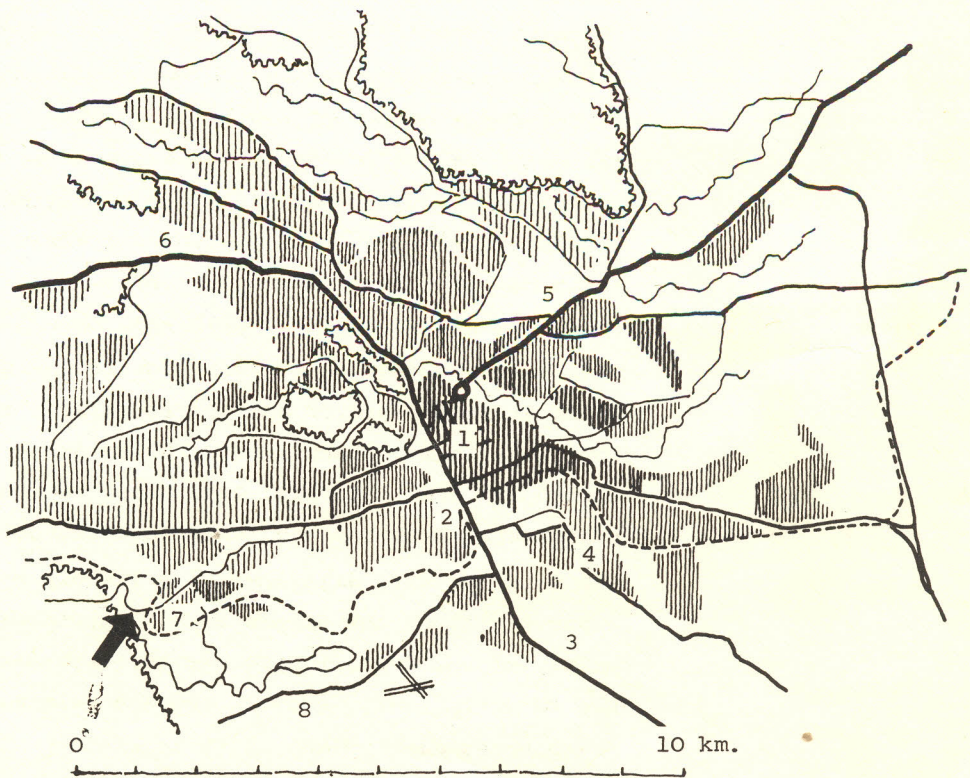
The plottolders will be encouraged to form "harambee" (self-help) groups in order to facilitate the construction work for the individual developer and reduce material costs through bulk purchasing. It should be mentioned in this context that people at present living in existing structures on the site, who will be resettled in the scheme, are in the process of setting up a building co-operative.

By forming such groups, the building instructors and supervisors assigned to the scheme by the National Housing Corporation will be more effectively utilized.

map of Nairobi

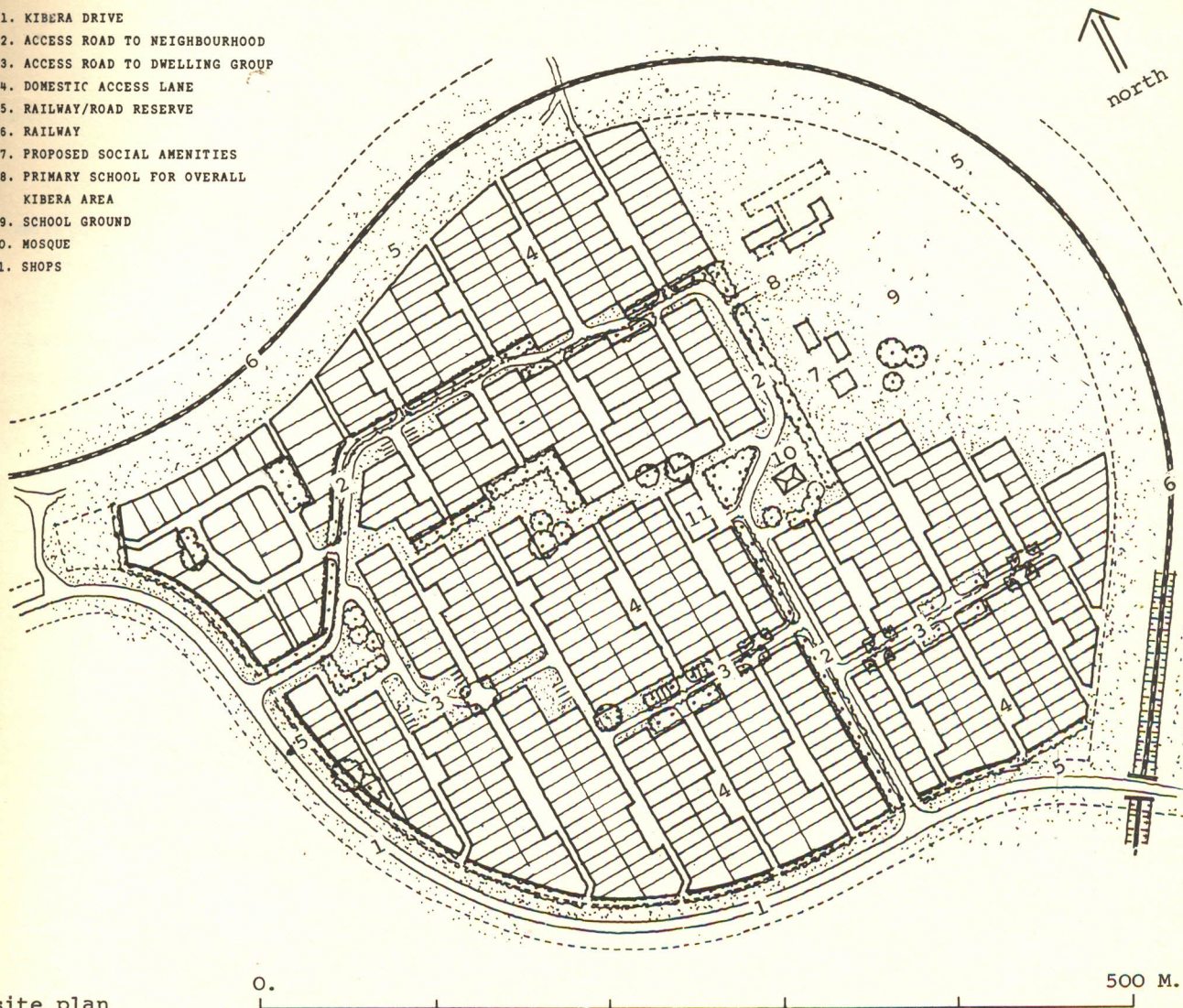
legend

1. City Centre
2. Uhuru Highway
3. Mombasa Road
4. Industrial Area
5. Murang'a Road
6. Wayaki Road (to Naivasha)
7. Kibera
8. Langata Road



PLANNING OF THE SITE

1. KIBERA DRIVE
2. ACCESS ROAD TO NEIGHBOURHOOD
3. ACCESS ROAD TO DWELLING GROUP
4. DOMESTIC ACCESS LANE
5. RAILWAY/ROAD RESERVE
6. RAILWAY
7. PROPOSED SOCIAL AMENITIES
8. PRIMARY SCHOOL FOR OVERALL KIBERA AREA
9. SCHOOL GROUND
10. MOSQUE
11. SHOPS



site plan

land use

The site comprises 17.5 ha of which approximately 14 ha only are available for development due to railway and road reserves. 2.5 ha are required by the Nairobi City Council for a primary school to serve the whole of Kibera area. The remaining 11.5 ha will roughly be used as follows:

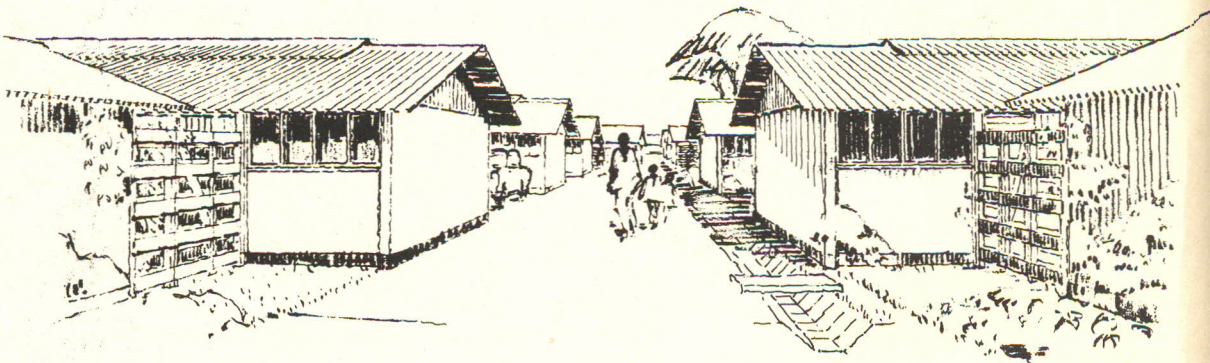
- roads: 20%
 - public facilities: 15%
 - residential development: 65%
- The scheme will comprise 520 plots.

site planning

All the infrastructure is planned to basic but improvable minimum standards. The planning is based on the requirements of modern sanitation and all-weather access roads for a low income residential area developed to a high density. The construction of infrastructure will be phased so that the occupants of the existing structures can be rehoused within the scheme.

roads

Pedestrian and vehicular traffic will be integrated in order to minimize the construction cost of roads and streetlighting. It is considered that there is no need for a separate traffic system as the rate of car ownership is estimated to be very low within the foreseeable future. However, the scheme is planned to exclude through traffic and in general, roads are designed for low-speed car traffic. The main loop through the scheme will be constructed in accordance with the Nairobi City Council standards i.e. surface of tarmac. All other roads as well as the group parking areas will be surfaced in murrum (compact soil of selected materials).



parking

Each individual plot will be reachable by car in accordance with Nairobi City Council requirements, for access of emergency vehicles. Approximately two thirds of the plots will have car parking spaces at the front on the road side, while the remaining ones will be served by parking areas close to the plots. For security reasons car owners prefer to be able to park on, or close to, the plot.

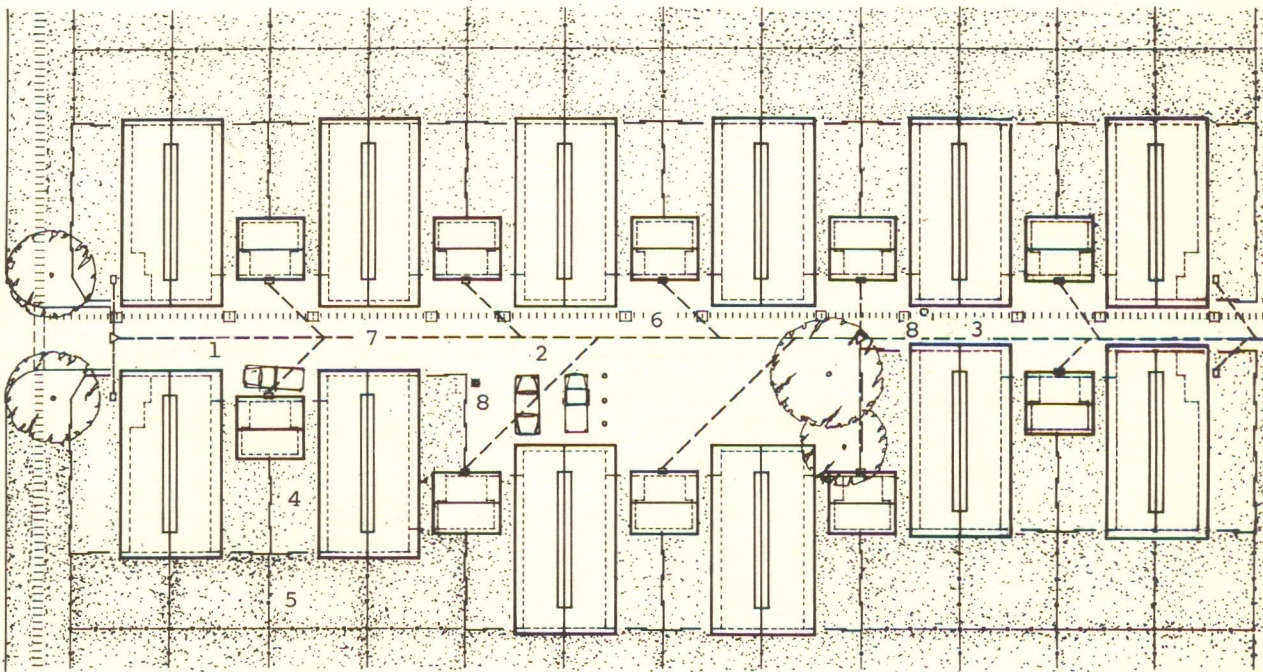
public open spaces

The planning of the scheme includes a centrally placed common where older children can play. Considering the low rate of car ownership which can be anticipated, parking areas can initially be used for playing purposes.

It is recommended that the sports ground of the Nairobi City Council primary school, which is to be built next to the scheme, should be open for older children and adults. Undevelopable land will be surveyed and allocated for cultivation to a number of plotholders.

shops and bars

A number of plots will be allocated for the erection of groceries, butcheries, eating houses and bars. The housetypes selected for the scheme are designed to be sufficiently flexible to be converted for such neighbourhood commercial enterprises.



lay-out of group
of houses

- | | |
|-------------------|-------------------|
| 1. access road | 5. private garden |
| 2. parking space | 6. open drain |
| 3. pedestrian way | 7. sewer line |
| 4. courtyard | 8. street light |

DESIGN OF THE HOUSES

The general design criteria adopted are:

- improvability by stages
- "legalization" of subletting and acceptance of a period of one room - one household occupancy
- number of standardized habitable rooms to be 3 - 4
- a simple configuration of the plot of narrow frontage
- a simple structural design based on a 2 m. module
- the positioning of the buildings on the plot so that the outside space is useable.

plot sizes

Plot sizes range from 110 - 160 m² giving a net density per ha of 45 plots corresponding to approximately 150 habitable rooms per net ha.

plot lay-out

The plots are planned to accommodate:

- 3 - 4 habitable rooms
- a toilet, shower and kitchen block
- a fenced out-door area adjacent to the house
- in most cases a small garden for cultivation.

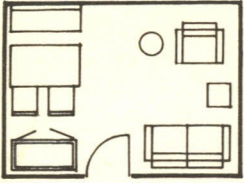
In accordance with the plot configuration the main structures (containing the habitable rooms) are placed at right angles to the roads.

Three housetypes have been designed for this scheme representing different principles of circulation between the rooms as well as the position of the toilet, shower and kitchen block.

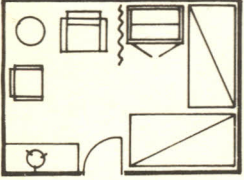
habitable rooms

In view of the expected high rate of occupancy it is desirable to place the toilet, shower and kitchen in a separate structure or alternatively at the end of the main structure. Such a lay-out will minimize inconvenience caused by smell and noise. Considering that subletting will take place, the rooms in the prevailing two housetypes will have external access from a properly fenced courtyard.

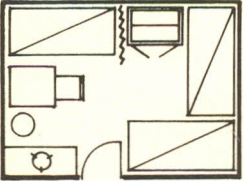
The habitable area can be divided into 3 or 4 rooms of 15, 12 or 9 m². Thus the habitable rooms are larger than is commonly found in low cost housing schemes as it is assumed that each room will have to accommodate one household at least initially. The design of each room is based on a module related to the size of bedspaces, and their performance under conditions of maximum utilization.



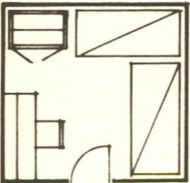
room, 3 x 4 m., furnished as a living room (conventional situation)



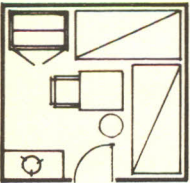
room, 3 x 4 m., furnished as a combined living and bed room



room, 3 x 4 m., furnished for a 3 person household under conditions of maximum utilization



room, 3 x 3 m., furnished as a bed room for 2 persons



room, 3 x 3 m., furnished for a 2 person household under conditions of maximum utilization

outdoor private area

The usefulness of a well fenced outdoor area of an appropriate size, adjacent to the rooms, can not be over estimated when dealing with low-cost housing. The importance of such an area being well protected is clear from user-reaction surveys which repeatedly have shown that physical security of the surroundings is of great concern to low income groups.

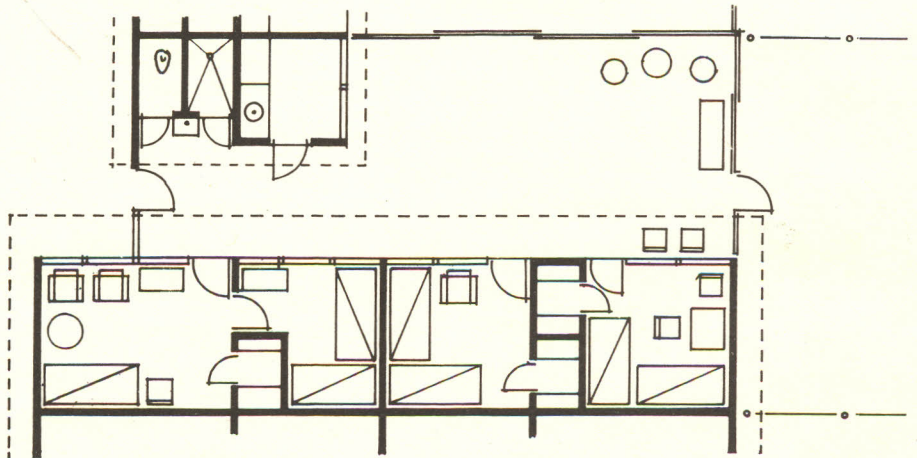
climatic design determinants

As the scheme is located within the highland climatic zone the following climatic requirements have been considered in the design:
--- all dwelling units are placed on an east-west axis in accordance with the prevailing wind direction and the sun's movement. This orientation will ensure that the courtyards, from where the habitable rooms receive their fresh air are well ventilated.

--- proper roof overhangs are provided in order to reduce direct insolation and rain damage to outside walls.

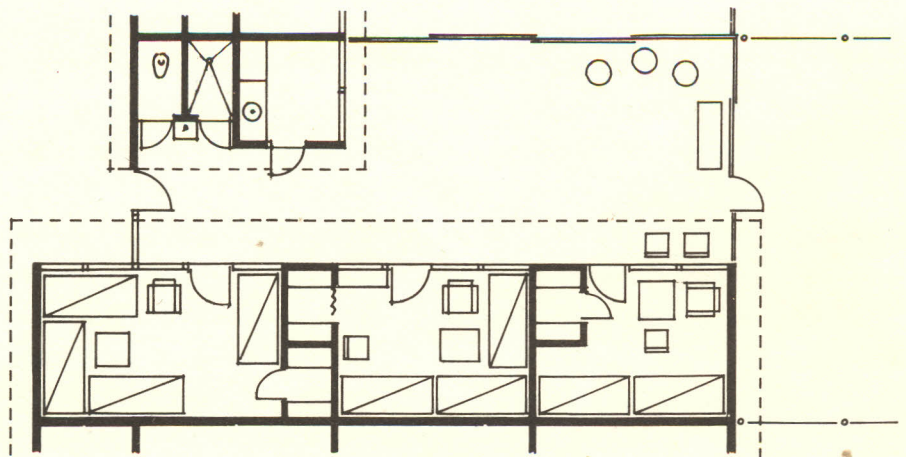
Furthermore as ceiling boards can hardly be afforded during the initial phase of occupancy, people will be encouraged to use alternative materials of local origin such as papyrus mats. By doing so internal thermal discomfort can be reduced in cases where corrugated iron sheets are applied as a roofing material. Whitewash of external wall surfaces will be encouraged in order to reduce absorption of heat. Also by planting trees near the houses the shading effect will reduce internal thermal discomfort.

Below are shown suggestions for subdivision of the habitable area following various situations of occupancy.



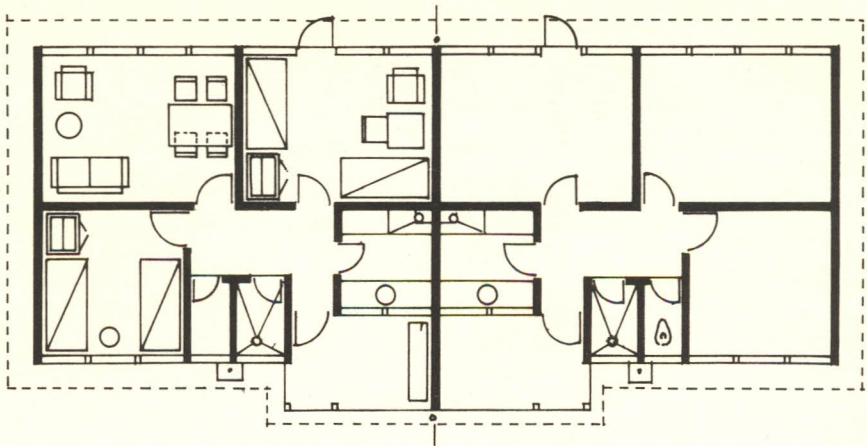
housetype A

occupied by an owner household and two minor subtenant households.



housetype A

occupied by an owner household and two subtenant households.



housetype C

occupied by an owner household and one minor subtenant household.

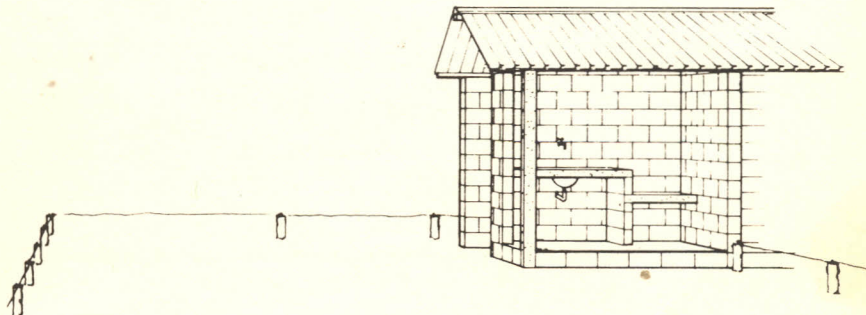
CONSTRUCTION ON SITE

Construction of infrastructure i.e. construction of roads, sewers, open drains, water supply and street-lighting will be undertaken by a contracting firm.

The plottolders will have to undertake the construction of a substantial part of their houses either as individual developers or as members of a building cooperative and harambee group. This self-help approach to construction should not be interpreted too narrowly: it ranges from the plottolder manufacturing building blocks and erecting the structures personally to the plottolder hiring labourers, purchasing materials and supervising the construction work.

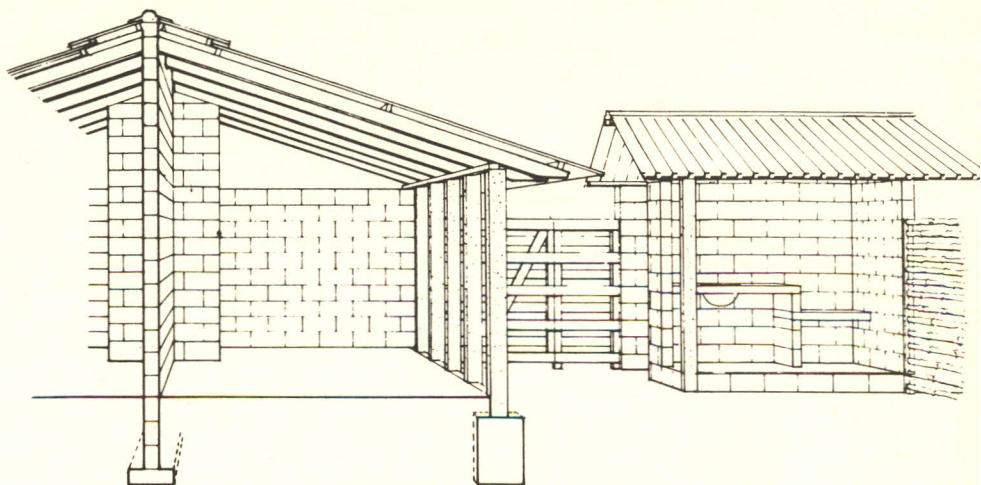
In order to guide the developers during the construction period building supervisors and instructors will be assigned to the scheme and a number of demonstration houses will be erected.

Examples of various stages of development on the plot are shown below.



housetype A

Plot initially provided with a contractor-built kitchen, shower and toilet.



housetype A

Plot, initially provided with a contractor-built shower and toilet plus main walls and a roof covering the habitable area.

MATERIALS AND CONSTRUCTION METHODS

All structural parts of the building will be properly erected of permanent materials. This means that foundation strips and load bearing walls or columns will be made of stone, bricks, concrete blocks or concrete.

Floors could be constructed of rammed earth initially, for possible replacement by concrete screed.

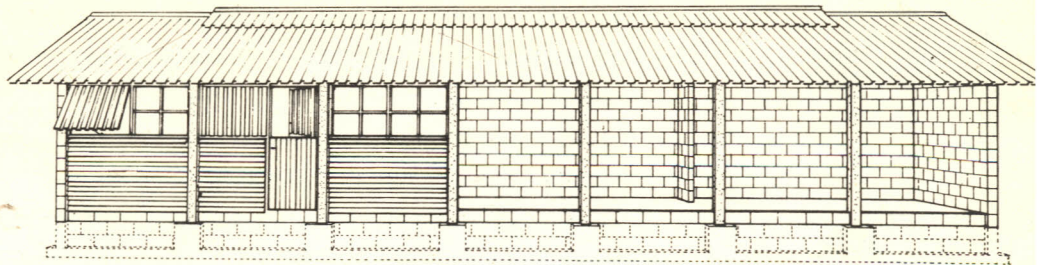
Wall infills and partition walls could be of temporary materials such as mud-and-wattle or low grade timber boards during an initial period for possible later replacement by permanent materials.

External openings could be filled-in with second-hand windows and doors from existing structures on site as a temporary measure for later upgrading.

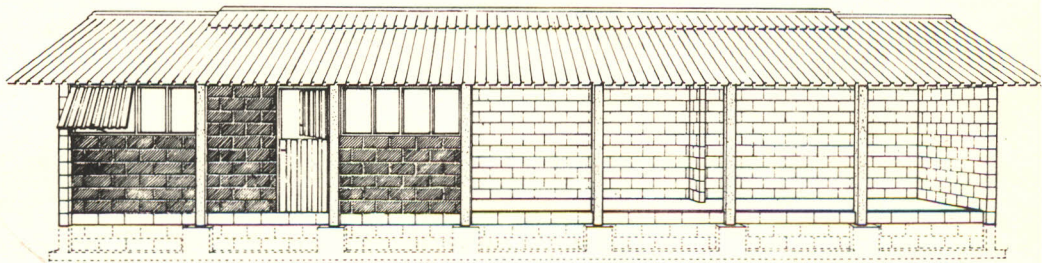
Windows and doors of a very simplified construction will be shown in the demonstration houses with all connections nailed, glazed parts fixed, openable parts provided by shutters.

The roof is clad with 26 s.w.g. corrugated galvanised iron trough sheeting on a light timber supporting construction.

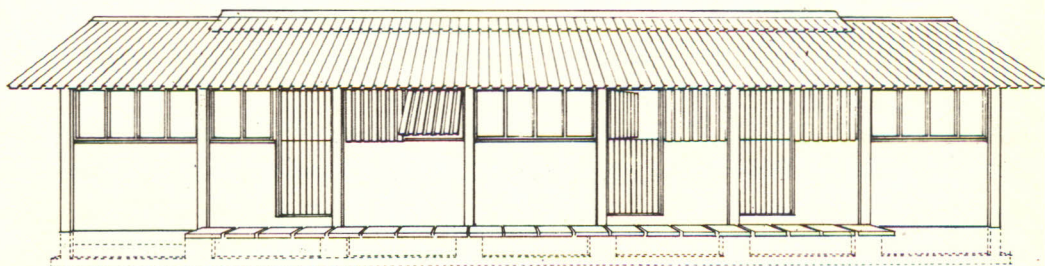
wall infill of
timber boards



wall infill of
soil blocks



wall infill of
concrete blocks,
back-washed in a
cement/lime mortar



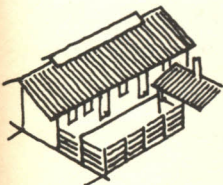
FINANCING.

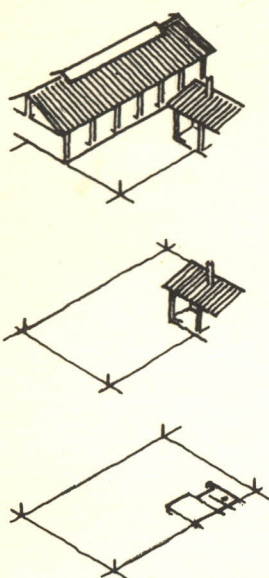
The cost of construction of the infrastructure, the contractor-built part of the houses and material loans for completion of the houses will be recovered over 20 years at 6.5% interest.

A deposit of 5% of the gross costs will be payable.

The gross costs of plots developed by the contractor to various stages including cost of construction of the infrastructure are as follows:

- a) demonstration houses comprising 3-4 habitable rooms plus toilet, shower and kitchen block (completed by contractor), gross cost KShs. 31,800/- (\$4000)





- b) toilet, shower and kitchen block and a roof covering the habitable rooms including party and gable walls (completed by contractor),
gross cost including a material loan for completion of the entire house Kshs. 22,000/- (\$2650)
- c) toilet, shower and kitchen block (completed by contractor),
gross cost including material loan for completion of the entire house KShs. 16,000/- (\$1940)
- d) concrete slab for toilet, shower and kitchen block (completed by contractor),
Gross cost including a materials loan for completion of the entire house KShs. 14500/- (\$1750)

Referring to b), c) and d) it should be noted that costs can be reduced by KShs.1800/- by initially leaving out floor screeds and using materials such as mud bricks and timber off cuts for wall infilling and partition walls. Cost of construction of the infrastructure amounts to KShs.4800/- (\$580) per plot. Professional fees, supervision, interest on construction finance, contingencies amount in average to 20% of the above gross costs. The costs given are approximate and based on 1975 prices.

monthly repayments

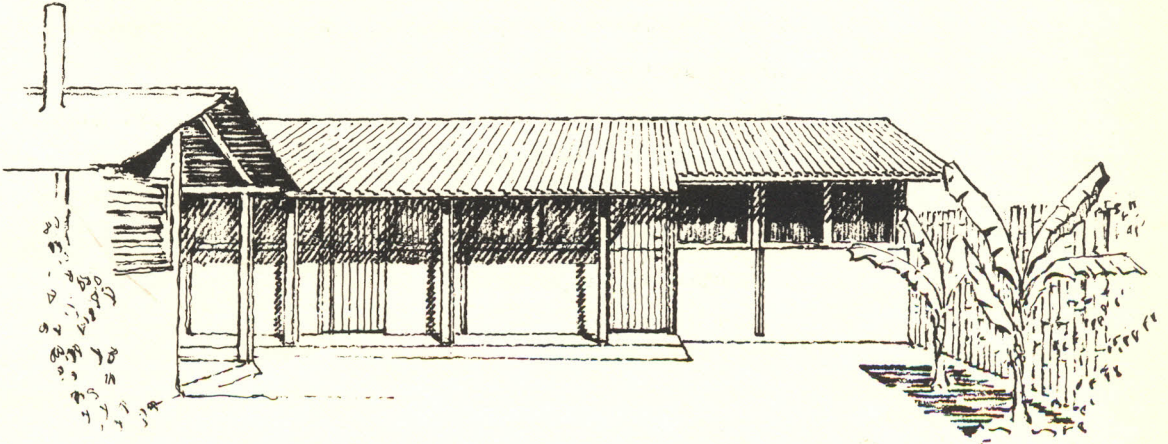
Monthly instalments including loan redemption rates, administration fees etc. will vary from KShs. 160/- (\$20) referring to c) to KShs. 300/- (\$37) referring to a). It is realised that the affordable rent for urban low-income groups is approx. 20% of their monthly income. The income brackets of the target population have been fixed at KShs. 300/- to KShs. 800/- per month. Taking this into account less than 20% can afford the cheapest version of the plot unit.

However as the majority of the future plotholders will most likely obtain additional income from subletting one or two rooms during an initial period, they will be able to enter the scheme. Furthermore a period of grace of 6 months will be granted the plotholders in order to ease their initial financial burden.

Taking the situation of the income group of KShs. 300/- per month as an example, the affordable monthly rent of 20% amounts to KShs. 60/-. Supposing this income group is opting for the cheapest version of plots the monthly deficit will be KShs. 100/- The plotholder will then have to sublet to 2 rooms for KShs. 50/- each to make up the balance. However considering that the market rent for one habitable room within this category of housing is well above KShs. 50/- the problem can be solved.

ARCHITECTURAL ASPECTS

Public low cost housing schemes are often criticised by the occupants for being monotonous and in general of a low environmental quality. The monotony often derives from a too rigid lay-out pattern repeatedly applied over a large area. By placing the houses in groups, by planting trees to show the hierarchy of roads and by careful landscaping, signs of identification in the environment have been established and the risk of monotony reduced.



Roofs are an important architectural feature of low cost structures, especially, when they, as is often the case in Kenya, are placed in an undulating landscape. The roof is therefore designed to be a unifying and dominating feature of the structures. It should also be mentioned that this allows an aesthetically more relaxed and varied use of wall infill materials and colours.

C O N C L U S I O N S

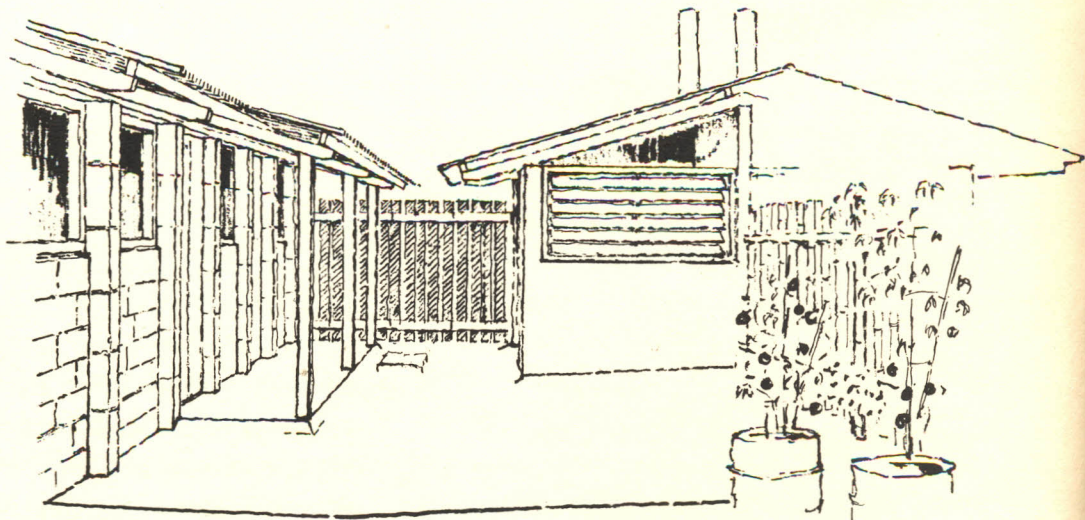
As previously mentioned, the aim of the scheme is to gain background information on which to establish new basic, but improvable, minimum standards in order to match the affordability of the urban low income groups, who otherwise have no alternative but to live in uncontrolled housing. It has been a fundamental requirement of the planners from the clients that this scheme, being the first large site-and-service scheme based on the self-help idea, should be designed in a way as to ensure an appearance during the development phase which is acceptable to the public. Furthermore, being an urban scheme, it has been conditional that it be planned for the modern type of sanitation on the plot.

Although these criteria are appreciated, they have an impact on the initial construction costs, which makes it difficult for the lowest income groups i.e. the income groups below KShs. 300/- per month which make up 30 - 40% of the urban population to enter such a site-and-service scheme.

The scheme should thus be seen as one possible solution to the urban housing problem, rather than the solution.

Other ways to meet the urban housing problems are still to be tried in other experimental projects, such as experimental urban site schemes and experimental improvement schemes for spontaneous urban settlements.

The planning of such experimental projects should aim at striking a balance between the actual demand for housing by the low income groups and the available resources, in the form of public or private finances, local materials, vocational skills, and planning and administrative potential.



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1. INTRODUCTION on page 1 and 2 is based on:
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