



UNIVERSITY OF NAIROBI
HOUSING RESEARCH AND DEVELOPMENT UNIT

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

**HOUSE BUILDING IN SITE AND SERVICE SCHEMES:
some observations.**

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Author: M.S. Muller (research fellow)

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House building in site and service schemes: some observations.

1. Introduction

This paper sets out a few observations about house building, which can be made after having interviewed house-owners in two site and service schemes. The observations deal in particular with the cost of materials and of labour, with self-help and the use of skilled and unskilled labour and with the need among plottolders for information and advice. It is stressed here that the paper has a limited scope, containing insights, which reflect only the situation of the people who were interviewed. In each scheme about 10 houseowners were interviewed.

The two schemes, Huruma Estate in Nairobi and Langa Langa Phase II in Nakuru, which differ from each other in important respects, will first be described. One of the intriguing differences noted between the two groups of houseowners was that those in Huruma found it almost impossible to tell us exactly the amount of materials used, while those in Langa Langa could remember this very well. A possible explanation for this difference will be discussed in the last section of this paper. It centres on differences in income level and type of employment between the two groups of plottolders, and on the house design.

interviews: For various reasons the interviewed house owners are not
not representative of all house owners in these schemes. In
repre- Huruma Estate the majority of plottolders are organized
sentative in building groups, and are building houses for each
other. Since we were interested in knowing how individuals
manage to build alone, only those few people were
interviewed who are not members of building groups, i.e.
only 14 out of 307 plottolders.

In Langa Langa phase II different types of development have taken place: some house owners have built one double house on their plots; some built only one single house; and others completed both the single and double houses on their plots. A start was made with interviewing those people who had at least completed the single house. Although plottolders could remember the amount of materials used and their costs quite well, there was usually one item or other about which their memory failed. As a result, one aim of the project, i.e. to calculate the actual cost of the various building elements, was impossible to achieve. This was an important reason for discontinuing the interviews.

In addition, interviews were held with staff members of the National Christian Council of Kenya who have responsibility for supervising Huruma Estate; and with the Housing and Estate Officer of Nakuru.

The observations made about individual house building in the two schemes will be discussed together. Unless specific distinction is made between Langa Langa and Huruma, the observations refer to both schemes. Plans of the two schemes are attached to this paper.

2. Description of the schemes

2.1 Huruma Estate

history
of scheme

The history of Huruma Estate goes back to January 1970 when a squatter settlement not far from the city centre, called Kaburini, was burnt down. The people were "temporarily" moved to Mji wa Huruma near Karura Forest, where the Salvation Army runs a rehabilitation centre for the disabled. The former squatters stayed there for over two years. In May 1972 Nairobi City Council (N.C.C.) together with National Christian Council of Kenya (N.C.C.K.) started a site and service scheme to resettle ex-Kaburini people. Huruma Estate is located in Nairobi east, is adjacent to Mathare Resettlement Scheme and stretches from Huruma Site and Service Scheme (a National Housing Corporation project) to Kariobangi market on Outer Ring Road. There are 507 plots, of which 307 are on the north side of the road, reserved only for ex-Kaburini people. The 200 plots on the south side are mostly for ex-Kibera and ex-Mathare Valley people. On this side a certain number of wealthy businessmen and city politicians have also obtained plots. Because of their better financial position, they were able to develop their plots more quickly than the people who were genuinely to be resettled. Only ex-Kaburini people on the north side of the road were interviewed.

organi-
sation of
scheme

Huruma Estate is a joint venture between N.C.C. and N.C.C.K. The City Council is responsible for the technical aspects, i.e. building the wet core on individual plots as well as public toilets and showers on the oldest section of the scheme; for providing building plans and giving technical assistance with house construction. The N.C.C.K. is responsible for the administrative, financial and social aspects. The social aspects entail the formation and encouragement of building groups among plotters. Financial loans (Shs.7,500/-, interest free) are issued to individual

plottolders only when they are group members. Once the first 2 rooms of a house are completed, the owner starts repaying the loan at a rate of Shs.100/- per month to the building group. The group in turn repays this monthly amount to the NCKK. About 14 plottolders only have chosen not to belong to a group: they have built alone and therefore did not qualify for a loan from NCKK. Of those, 10 plottolders have been interviewed.

types of
houses

There are two types of houses in Huruma Estate. The first plan was withdrawn by the Council after it had been in use for about one year. This building consists of eight rooms. Residents use public toilets, showers and water taps. This plan featured back-to-back rooms and had a plot coverage of almost 75%. Moreover, the use of temporary materials, such as mud bricks was allowed. These three features were after all unacceptable to the Council. The new plan, introduced in 1975, consisted of four rooms around two sides of a plot, with toilet, shower and water on the same plot. Most house owners built unofficially another set of two rooms along the third side. All toilet/shower blocks were at the same time installed by the City Council, before any house building activities had started. The cost of building two rooms was Shs.7,500/- in 1975. The rent for one room with the use of public facilities was in January 1977 between Shs.100/- and Shs.150/-p.m. The rent for one room with use of facilities on the plot was between Shs.200/- and Shs.220/- p.m.

Some of the interviewed house owners had built according to the old plan, others had used the new plan. Since 1974 plottolders were allowed to live on their plots in temporary houses of wood or cardboard. Their presence on the plots facilitated and quickened house construction, according to the N.C.C.K., since the waste of time and money spent on transport, was eliminated.

employment Those interviewed were mainly self-employed: owners of
situation small shops in Huruma, or market traders; one was a taxi driver, but his car had broken down and he too had turned to trading. The income of all these people was below Shs.500/- p.m. All had lived in Nairobi between 10 and 20 years. Only one had land in the home village.

2.2 Langa Langa Phase II

description of scheme Nakuru, which has been set aside for low-cost housing. It is adjacent to Langa Langa phase I. Both Langa Langa I and II have been planned and implemented by Nakuru Municipal Council with loan funds from the N.H.C.* Langa Langa II consists of 96 plots of 15 by 36 metres. The scheme is laid out in six rows of house type plots. The house plan is that of a conventional one-family unit of three rooms with internal toilet and shower. Each plot is large enough to accommodate three of such units, i.e. one single unit and two semi-detached units. All are built and owned by one plotholder. It was the intention of Nakuru Municipal Council that the plotholder would occupy the single unit, while renting out the two semi-detached units. In practice, however, most plotholders live elsewhere in Nakuru in cheaper accommodation. Each plot has its own septic tank to be installed by the plotholder once he starts building. Also the water connection to his private plot must be made by the plotholder. Plots were allocated in 1971. Title deeds were issued almost immediately with plot allocation, so as to enable plotholders to obtain commercial loans. The council did not make loans available.

employment situation Nine plotholders who had completed at least the single unit, were interviewed in this scheme. Most of the interviewed houseowners, were employed by large, institutional employers (Nakuru Municipal Council, East African Railways Corporation, Marshalls (EA) Ltd.,). Their incomes ranged from Shs.400/- to Shs.1,200/- p.m. Almost all of these houseowners were living in institutional housing or cheap rental accommodation elsewhere in town. The rent for a one family unit varied in January 1977 between Shs.350/- and Shs.400/- . Complaints were voiced by houseowners

N.H.C.* National Housing Corporation.

Table I : Characteristic features of Huruma Estate and Langa Langa Phase II.

	<u>Huruma</u>	<u>Langa Langa Phase II</u>
start of scheme	1972	1972
responsible organization	Nairobi City Council and National Christian Council of Kenya.	Nakuru Municipal Council
land use	residential/ commercial	residential
plot size	12 by 10.5 metres	app.15 by 36 metres
housetype	lodger-type single room accommodation	self-contained family unit, consisting of 3 rooms.
plot use	4, 6, or 8 single rooms	3 family units (each self-contained).
building costs	Shs.15,000/- to Shs.20,000/-	Shs.40,000/- to Shs.50,000/-
loans	Shs.7,500/- from NCCK* for construction of 2 rooms. Toilets, showers and roads built by NCC* free of charge.	No loan for house. loan of Shs.1,571/- for construction of roads and water mains by NMC*. Toilet and shower installed by owner.
ownership	majority are owner-occupiers.	majority are absentee owners.
employment	self-employed or unskilled-employed	skilled, clerical; employed.
income	less than Shs.500/- p.m.	Shs.400/- to Shs.1200/- p.m.

Note: * NCCK : National Christian Council of Kenya
 NCC : Nairobi City Council
 NMC : Nakuru Municipal Council

about the oversupply of this type of family-unit in Nakuru, leading to long vacancies and forcing the rents downwards.

2.3 Comparison of schemes

Langa Langa appearance house costs business The appearance of the two schemes, Langa Langa and Huruma, is totally different. Langa Langa is a quiet, clean well-maintained and orderly estate. The house types are conventional in the sense that several other housing schemes of Nakuru Municipal Council used the same type. The cost of building a single three-roomed house with all modern facilities like electricity, and running water inside the house, is between Shs.40,000/- and Shs.50,000/- in 1976/77. Outside Langa Langa, along the main road to town, Kanu Street, are properly licensed shops and workshops. No business may be carried out inside the scheme.

Huruma appearance business Huruma is a much more lively estate. There is a great variety of structures, even though all plottolders have to use the same type plans. Since the houses can be occupied as soon as the minimum of two rooms are complete, the structures can remain for a long time in different stages of completion. It may cost a plotowner, between Shs.15,000/- and Shs.20,000/- in 1977 to complete his house. There are still many temporary structures in the Estate, made of wood or cardboard, whose owners are waiting till either the building group or they themselves acquire the funds to build all the permanent houses. Several people have converted part of their houses into small shops or workshops, while also small eating places in temporary structures have sprung up. Permission from the Village Chairman is essential for opening any type of business.

3. Cost of building the houses

3.1 Building materials

cement and corr. iron The prices of cement and corrugated iron sheets are officially fixed. The only rebate possible is on transport costs. If large quantities are bought at a time, the agent may reduce the cost of transport or bring the material to the site free of charge. Those who buy small quantities have to look for their own means of transport, by bus, matatu (taxi) handcart or bike, depending on how much they want to spend.

Table II : Cost of building materials
as paid by plotholders in Langa Langa II Nakuru

	<u>1972</u>	<u>1974</u>	<u>remarks</u>
cement	13.50	23.00	p. pkt. excl. transport
c.i. sheets	1.98*	3.68*	p.ft.Gauge 28;8/3" corr.
stone blocks	200.00	320.00 325.00	per lorry
crushed stones	150.00	180.00 200.00	per lorry
Sand	60.00	80.00 120.00	per lorry

Table III : Cost of building materials
as paid by plotholders in Huruma Esate in Nairobi

	<u>1972</u>	<u>1975</u>	<u>remarks</u>
Cement	14.00 18.00	25.40	p.pkt./excl. transport
c.i. sheets	1.96*	3.95*	p.ft.Gauge 28; 8/3" corr.
stone blocks	1.20 1.30	1.50 1.60	per block
crushed stones	40.00	50.00 60.00 80.00	per lorry
Sand	100.00 180.00	240.00 260.00	per lorry

* Information given by Mabati Ltd., information given by plotholders varied too much (different gauges, different sheet sizes) to be useful for comparative purposes.

stone, sand timber A somewhat greater variation in prices is possible with respect to stones, sand and timber. Businessmen bring these materials from nearby forests and quarries to their yards in town from where they sell to customers. The price range of a lorry load, which includes transport to site, has been agreed upon by the business men among themselves. The individual customer finds therefore that, although there is room for bargaining, the discount he can get does not vary much from one trader to another. It is interesting to note the great differences in prices of sand and crushed stones between Huruma and Langa Langa. They are due to the differences in distance between source of materials and building site. A stone quarry for example is very near Huruma, while sand has to be transported from Machakos District which is 55 KMS. away.

Joinery

The cost of windows and doors shows the greatest variation. First of all there is a greater range of suppliers, from traders in the centre of town selling factory-made products, to small workshops in markets which do not necessarily use first class materials and have lower labour costs. Further price variations are due to different circumstances, such as the customer may provide his own wood or glass (from a cheap source); the door frame or glass panels may or may not be included in the price, even if supplied by one trader; fixing of doors and windows may be either done by the fundi who made them or by those building the walls at no extra cost or by a specially employed fundi; windows or doors may be more easily given as a gift or at a very reduced price than any other building element.

cheaper materials

It was only the Huruma house owners who mentioned that they had sometimes gone to great lengths to get cheaper materials. Having less income than the Langa Langa owners, Huruma houseowners just had to be more resourceful to make their meagre funds stretch farther. One person mentioned he had collected discarded blocks by handcart from large building sites; another bought the remaining blocks at a low price from neighbours who either had finished building or who needed money urgently for other purposes. Lorry loads of sand or stones were sometimes shared by friends neither of whom could afford a whole lorry alone. Timber was sometimes cut and transported from Karura Forest by the house-owner himself.

Windows were sometimes kept closed by cardboard or wood until a proper window could be afforded. For this reason the N.C.C.K. is of the opinion that financial loans benefit the recipients more than materials loans. Since people are able to find cheap sources of materials, their funds can stretch farther. Of course, financial loans necessitate strict control and possibly inspection on site before a new loan instalment is issued. But similar control is needed with the stagewise issue of materials loans.

cost of
completing
"shell"

Since ordinary citizens are usually unaware of the complications of house building, many ploholders in Langa Langa II were surprised and disappointed to experience that the external shell of a house constitutes only a small part of the total building cost. They found that the cost of plumbing, wiring,, sanitation, kitchen sink, painting and making the connection to the water main formed more than two thirds of total cost. This is the case in Langa Langa II. In Huruma these internal cost are much less, due to the lower standards required and the construction of toilet and shower by Council. The point to stress here is not so much the relatively high cost of finishing the house, but rather that people were not informed about how much they would have to spend on the various parts of the house.

3.2.

Employment of labour

wages

If the labour cost element in total building cost were to be compared, a large variation within one scheme would be found. One obvious cause is the increase in wages over the years. Fundi's wages have, however, increased more between 1972 and 1975 than labourer's wages over the same period. In Langa Langa II fundi's wages were raised from Shs.15/- to Shs.25/- per day: while those of labourers were raised only from Shs.6/- to Shs.8/- per day. In Huruma fundi's wages are about the same as in Langa Langa, but the labourer's were higher, i.e. Shs.10/- in 1975. A second reason for variation is the employment of small contractors. For most of the construction a plot-holder acts as his own contractor: employing fundi and labourers per day or per week for as long as he has money to pay them. For certain tasks, however, a small contractor may be engaged who organizes and pays his own labourers. For an agreed sum a contractor may undertake to make the roof, to fix all windows and doors, to build or plaster one room,

contractors

or even to build the whole house with the materials bought by the plotholder.

Table IV : Labour per day as paid by ploholders in Langa Langa and Huruma. (KShs.)

	Langa Langa II		Huruma	
	<u>Fundi</u>	<u>Labourer</u>	<u>Fundi</u>	<u>Labourer</u>
1972	12.00	6.00	15.00	8.00
1974	25.00	8.00	-	-
1975	-	-	25.00 30.00	10.00

reasons
for lack of
self-help
work

Finally, there is the plotholder who engages a contractor to build the whole house. The contractor pays his own labour as well as purchases all the materials. This is the least frequent arrangement. Another reason for variation in labour cost lies in the manual self-help element. A few people admitted after insistent questioning that they themselves also had worked on the house. They had done so when they had some spare time and when easy jobs had to be performed. The few homeowners who did take part in construction, did so as labourers: carrying water, mixing cement or carrying blocks. All other work was invariably done by fundi and employed labourers. Lack of time was usually given as the reason for not engaging in more manual labour. Earning an income was considered of greater importance. And this makes sense for people earning very low incomes, such as the residents of Huruma. Economically it made more sense to earn at least Shs.10/- per day, rather than save Shs.8/- by doing manual labour and risking to disappoint regular customers at the same time. This argument is even more true for plotholders with higher incomes, such as those in Langa Langa. Consequently homeowners in Huruma did not report substantially more manual self-help than those in Langa Langa II, although they are in different income groups. It should be noted that the building groups in Huruma Estate do not engage in this form of self-help either. They employ and pay fundi's and labourers, even if they are members of a building group.

The few plottolders who had chosen to employ a large-scale contractor had done so, because they were not able to supervise the workers themselves. The need for supervision was stressed by many people. There was suspicion that if left alone, those employed would not work hard enough, that they would steal material or use it wastefully. Because of this potential tension between employer and employee, some people thought it better not to employ friends who were fundi: it would kill friendship.

3.3. Expenditure and return

cost of
gradual
building

The sharp rise in building costs over the last few years has hit most severely the builder who has to build slowly, i.e. the builder who has to rely on monthly income from whatever source, for buying some materials and employing fundi for a short period. Budgeting, or the considered allocation of resources, can suddenly become a meaningless exercise when faced with unexpected price increases! Since wages increased less than building costs, less resources became available for house building. This slowed down the completion of houses, which in turn meant delays in getting incomes from houses. The plot owner with less resources is, therefore, hit twice: he has to pay more and has to wait longer for a return on investment, than the plotowner who has had the means to complete one or two buildings quickly at the same time of low building costs.

3.4. Technical advice.

examples
of advice

In both Huruma and Langa Langa II a site foreman was stationed on the scheme to help with essential tasks (e.g. setting out) and give technical advice whenever needed. This availability of technical advice was much appreciated. Houseowners in both schemes however, were obviously not the right persons to ask what types of advice had been particularly useful to them, because they were not present when the work was being done and the site foreman came to supervise. Those who did mention specific helpful assistance included reading of house plans, storing and using materials in efficient ways, and making cost estimates.

4. Income sources and building process

4.1. An extra source of funds

It appears from our observations that there is a relation between type of financial resources available to a plot-holder and the manner and speed with which the house

speed with which the house is built. The crucial link in this relation seems to be the existence of an extra source of funds apart from the main source of income from employment. This extra source can take two forms, i.e. (1) a regular, though small, additional source of income; or (2) the utilization of an available lump sum. The economic situation of the plotholder determines which type of extra source exists and in this respect the two schemes studied from a contrast.

4.2

Irregularity of income, buying and building

Huruma

The interviewed plotholders in Huruma Estate are all self-employed, small-scale traders with very low-incomes, estimated to be less than Shs.500/- per month. This income covers more or less the usual needs of the household. If savings exist, they have been accumulated with small amounts and are easily exhausted when emergencies such as illness occur. In the very low-income group savings can consequently not be relied upon to completely finance house building. If house building, which requires unusual expenses over a long time, is to succeed, an unusual source of income must be created.

types of
extra
funds

Several women in Huruma admitted having resorted to chang'aa brewing and selling to increase their regular incomes. Having completed their houses, they stopped the chang'aa business. One person turned to black market trading as a sideline. Yet another person obtained small "loans" from people promising each of them the same room as soon as it was ready. By receiving many deposits in this way the house owner could complete the house. He later returned some of the deposits. All the means mentioned were illegal, but they served the purpose of enabling the plotholders to obtain legal means of income. That is, the illegal means made it possible to build a house, which later provided the houseowner with a legal income from subletting. After completion of the first two rooms, the rent received from them was used towards completing the remaining ones. Obviously this was only the case if the houseowner did not live in these rooms himself. Huruma house owners had also sometimes obtained loans from friends or money lenders, (ranging between Shs.800/- to Shs.3,000/-).

irregular buying and building house type As the flow of income is irregular and small, so does the buying of materials and paying of fundis proceed in a piecemeal manner. For example, a few packets of cement or one lorry load of stones was bought one month, a few the next month, until enough material was collected to start a wall and finish a few courses. This type of process was made possibly by the Huruma house design consisting of two or three sets of two rooms which could be built independently from each other. A small investment could soon give a small return.

4.3. Predictability of income, buying and building

Langa Langa A different pattern was observed among the interviewed plotholders in Langa Langa II. Almost all were employed by large institution, earning between Shs.400/- and Shs.1,200/- p.m. And most of them lived in company housing with subsidised rents. All of these plotholders reported to have savings in the Bank. To get an extra source of funds for house building the plotholders in Langa Langa II did not turn to small scale, illegal business. Instead, they tried to obtain a large sum which would enable them to make substantial building progress without too much problems.

types of extra funds The extra sources mentioned included own savings (between Shs.6,000/- and Shs.12,000/-), sale of other property, loans from friends (between Shs.500/- and Shs.2,000/-) and a retirement benefit.

loans A special source of loans are the commercial banks. It was mentioned earlier that title deeds were issued to plotholders to enable them to get bank loans. In the first Langa Langa scheme many plotholders obtained loans large enough to construct a complete house. The security of their title deeds was enough. At the time of plot allocation in Langa Langa II lending policy of the banks had become more strict, i.e. few people could borrow large amounts on the strength of their title deeds alone. Loans were more often available for the internal finishing of the house only, whereby the already completed part of the house provided an additional form of security. It should be added that some people did not want bank loans because of the heavy repayment obligations.

insufficient savings and loans None of the large sums raised from extra sources sufficed for the whole house. People raised such sums at different stages of construction; and used them in different ways (i.e. to buy all materials for the whole house at once or to complete a certain part of the house by paying for materials as well as for labour). When such a lump sum was exhausted, people had to rely on their main regular source of income to do the rest. The building process slowed down.

house type With the larger funds available and the type of house to be built (a conventional one-family unit), the plottolders were both enabled and compelled to plan for the whole house, e.g. the number of blocks needed for all walls had to be calculated; all roof sheets had to be on site, before it made sense to start with the construction of a particular part of the house. This is in contrast to the building process in Huruma where it was sufficient to make calculations for needed materials for 2 rooms only. This difference in calculating, buying and construction practice was brought about by both the economic situation of the plotholder and the type of design. This in turn affected the houseowner's own knowledge about the building process.

Conclusions

What is the value of these observations which are based on a small number of interviews? The answer is that it is certain that the described variations in labour, manual self-help and financing of house building exist. It is less certain, however, how widespread these variations are and under which circumstances they occur. The following conclusions can be drawn from this paper.

residence during construction. - When plotholders are allowed to live on their plots in temporary structures during the period of house construction, this speeds up the construction process. No time, energy or money is wasted in travelling.

lodger type house - The lodger-type house is very suitable, because
1. there is a great demand for one-room accommodation, and 2. it can allow, if properly conceived, gradual construction and soon offer small returns. (It should be noted that the National Housing Corporation has based the house designs for the present site and service scheme programme on this lodger house-type principle).

cost of
gradual
building

- The plotholder who is compelled by his personal economic circumstances to build gradually, has to spend relatively more on his house than the better-off plotholder. This is so because the former does not receive the advantages associated with buying large quantities and has to absorb the full impact of inflation.

financial
loans

- Financial loans may be more advantageous for the plotholder than materials loans, provided he is able to get greater value for the same money through his own efforts. Stagewise issue of such loans could be linked to the stages of building inspection.

manual
self-help

- Manual self-help in building one's own house does not occur frequently. If it occurs, the houseowner works as a labourer, not as fundi, if he is not one by profession.

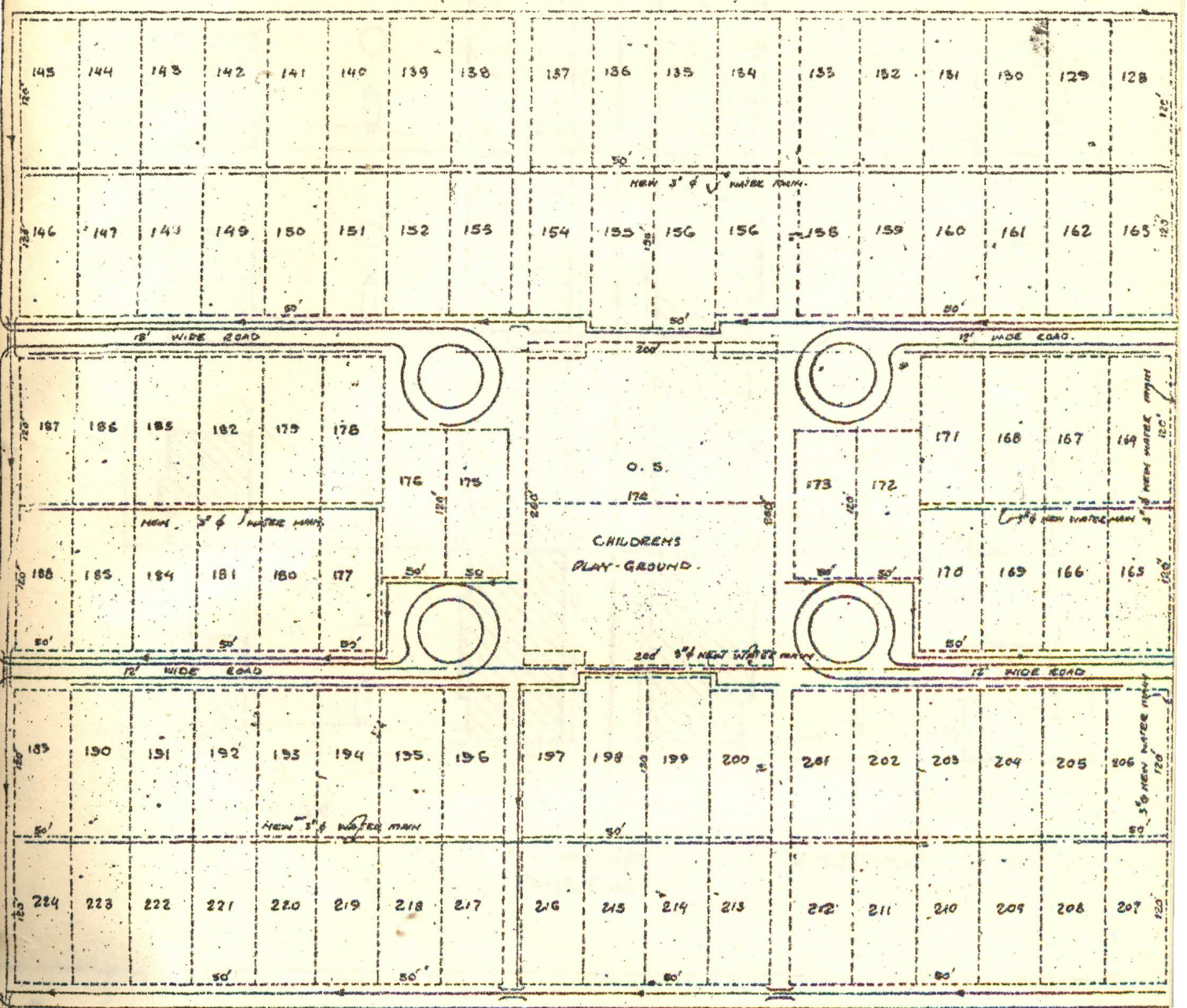
advice






- Information and advisory services are badly needed. At least two types of information are needed to be given at different times and to different people.
1. Information to plotholders e.g. about the financial implications of house building; and about efficient ways of organizing the building process in terms of timing and funds. 2. Technical advice to construction workers e.g. about properties of various materials and construction techniques.

income
sources

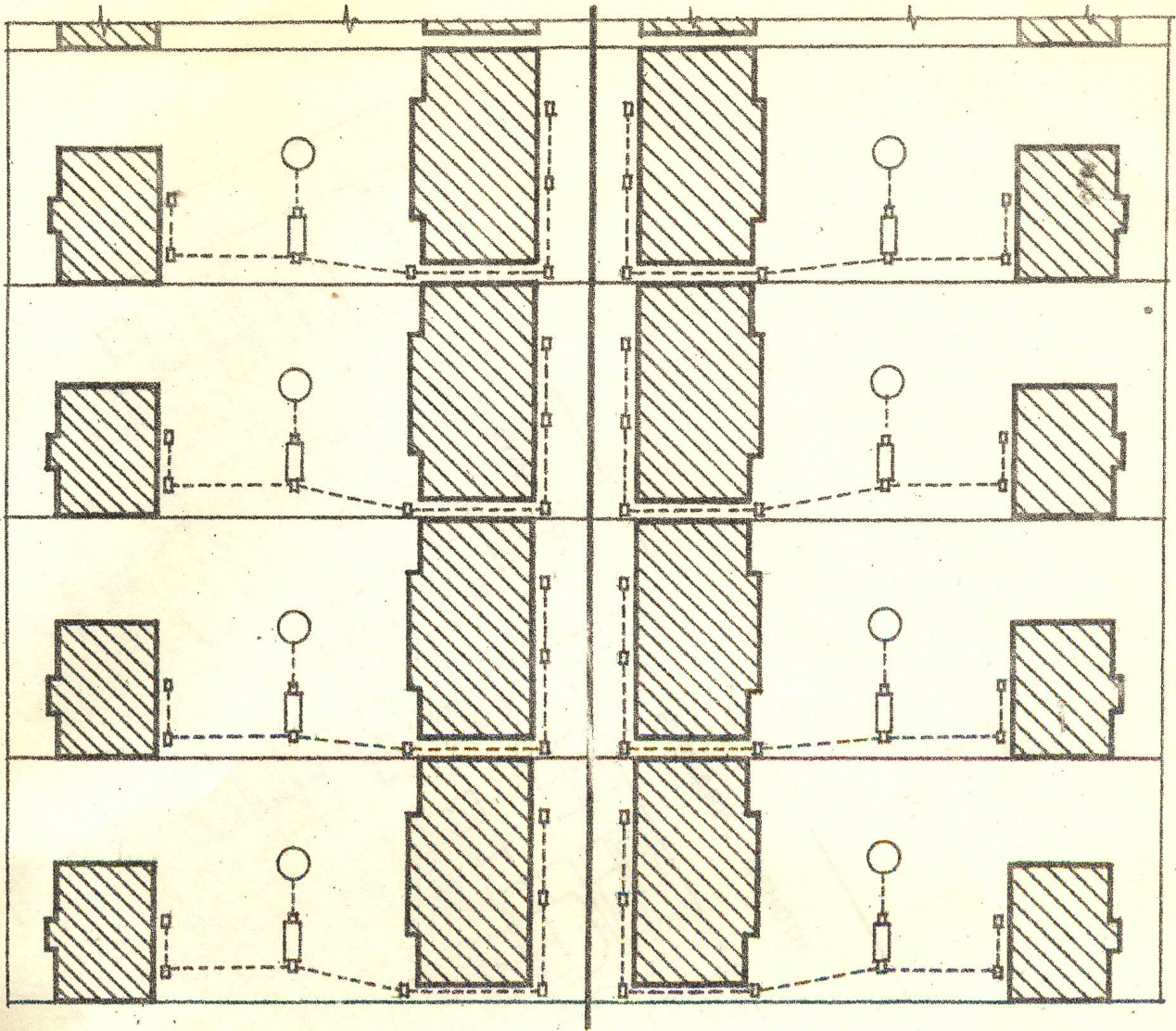
- Income level as well as access to additional sources of funds influence the speed and type of building process.

KANU STREET

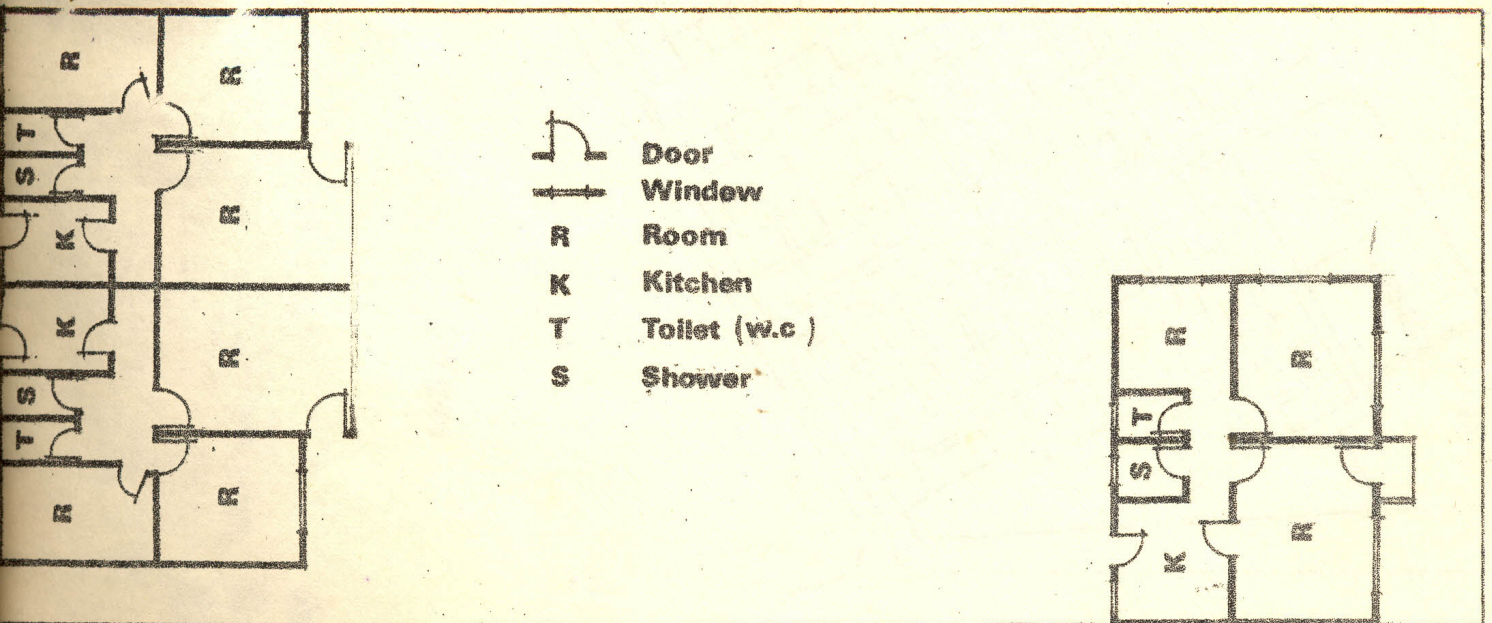
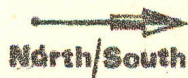


-  earth Drain
-  15" ϕ culverts with headwalls
-  12" ϕ " under footpaths with headwalls
-  12" ϕ plot sanitation
-  9" ϕ

SITE PLAN
LANGA LANGA PHASE II

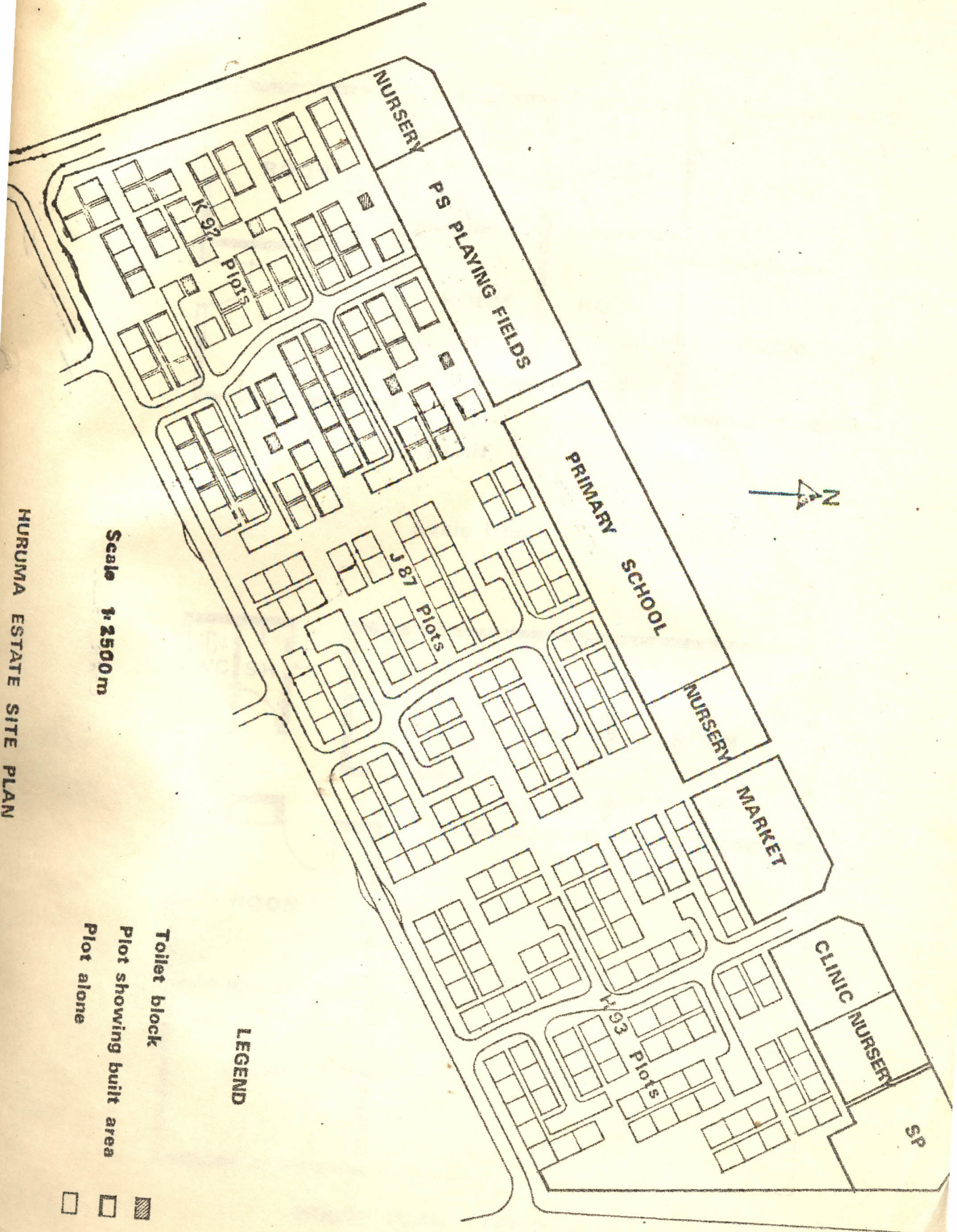


SITE PLAN



LANGA LANGA PHASE II

LEVEL DIAG



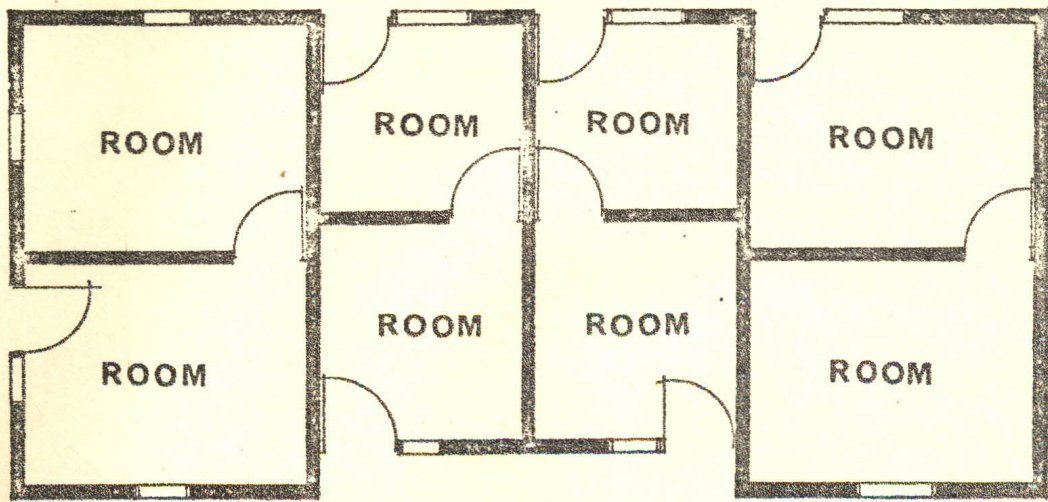
Scale 1:2500m

HURUMA ESTATE SITE PLAN

LEGEND

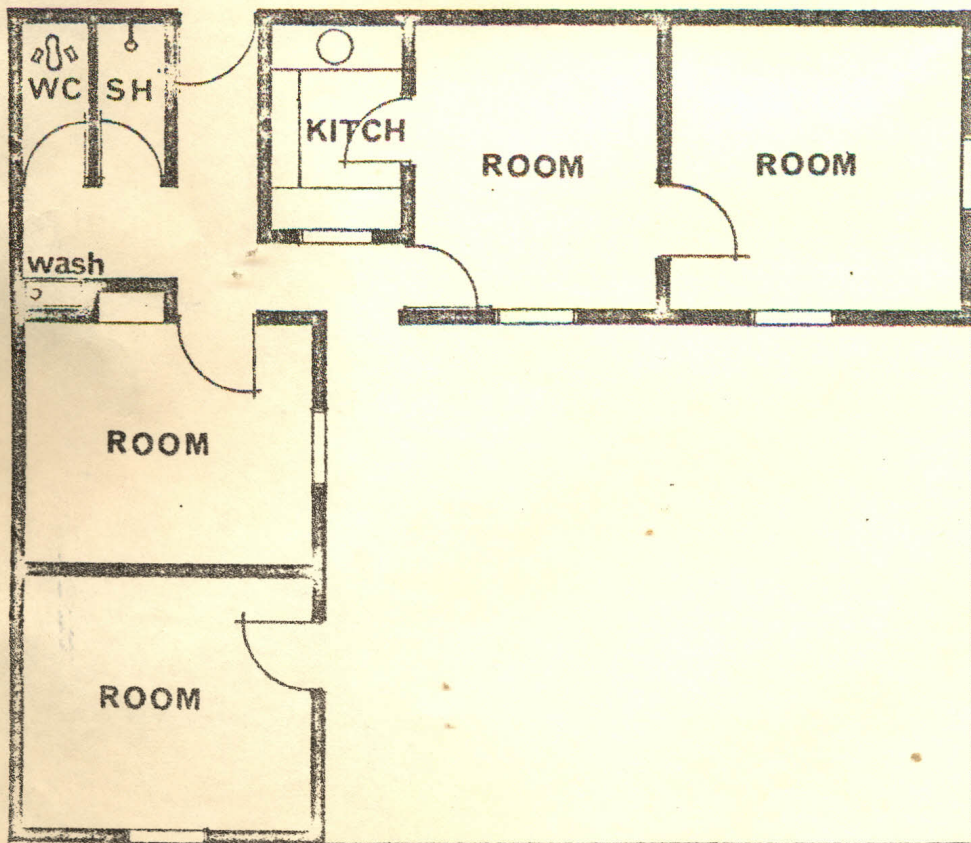
- Toilet block
- Plot showing built area
- Plot alone

HURUMA ESTATE TYPE PLANS



HOUSE PLAN TYPE 1

Scale 1:100



HOUSE PLAN TYPE 2