THE KIBERA SELF-HELP SCHEME

Plots size and plot use in an urban low cost housing scheme.

preliminary paper

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The Joint Advisory Board of the HRDU has approved a research activity listed thus:

DOCUMENTATION:
Plot size and Plot use in Low Cost Housing Schemes.
Phase 1: Nairobi Region.

The aim of this activity is to find the relations between different types of layouts and developments and the impact of the use of infrastructure and private plots. To reduce costs by balancing minimum layouts and infrastructures against the family and community development.

This paper does in no way pretend to be a complete analysis but aims at visualizing the first results and the method of analyzing the first of a series of schemes. It is for internal and limited circulation only.

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HRDU, April 1974
Jon Skakke
DIRECTOR
One project, the KIBERA SELF-HELP TENANT PURCHASE SCHEME, designed by the National Housing Corporation has been surveyed and analysed. The scheme consists of 210 dwelling units on 210 plots.

1. **THE HOUSES**

210 dwelling units - 144 house type Nr. 94/39/II  
- 66 house type Nr. 94/39/III

- 64 units Nr. 94/39/III - S.D. - plinth area 75 m²
- 2 units Nr. 94/39/III - Det. - plinth area 75 m²
- 140 units Nr. 94/39/II - Det. - plinth area 53 m²
- 4 units Nr. 94/39/II - S.D. - plinth area 53 m²

2. **THE PLOTS:**

Out of 210 plots, 201 plots are standard sized (96%):  
12.19 m x 21.34 m = 260 m²  
The remaining 9 plots are irregular shaped but rather the same size.

The total area of 120 plots = 54.600 m² (100% of bruto)  
The maximum area available for cultivation = 42.018 m² (77% of bruto)  
(bruto area - plinth area)  
The total area of private plots covered with double seal (house access)  
= 770 m²  
41.248 m²  
(75% of bruto)

3. **SURVEY RESULTS AND CALCULATIONS**

Total area available for cultivation: = 41.248 m² (75% of bruto)  
Total area which has been developed = 12.170 m² (22.5% of total)  
Part of the private plots available for cultivation - 12.170 : 41.248.  
= 29.078 m² (30% of net
Plot use:

Out of 210 plots
- 47 plots are unused (no cultivation) (22.5% of total nr. of plots)
- 9 plots are used for flowers only (26.5% of total nr. of plots)
- 56 plots are not used for crop cult. (73.5% of total nr. of plots)

154 plots are used for cultivation

Total area under cultivation - 12,170 m²
  flowers - 418 m²

Total area crop cultivation - 11,752 m²

- Average amount of crop cultivation / plot = 55.3 m² / plot
- Average amount of crop cultivation / plot on those plots which are used for cultiv. = 75.6 m² / plot

Cultivated area (m²) / plot and number of plots with a similar amount of cultivation (See Chart 2)

30% (29.4%) of the utilized plots cultivate less than 70 m²
60% (59.5%) of the utilized plots cultivate between 70 and 120 m²
10% (11.0%) of the utilized plots cultivate more than 120 m²
4. RELATIONS AND CROSS RELATIONS

1. Relation depth of frontgarden and use of frontgarden

In the project are 98 plots (47%) with an undeep frontgarden (4.5 m')
108 plots (51%) with a deep frontgarden (7.5 m')

The said 97 undeep frontgarden cultivated 523 m^2
- average 5.32 m^2/plot

108 deep frontgardens cultivation 576 m^2
- average 5.32 m^2/plot

12 undeep frontgardens were used for vegetables (289 m^2)
- average 24 m^2/plot

12 deep frontgardens were used for vegetables (390 m^2)
- average 32.5 m^2/plot

2. Relation depth of backgarden and use of backgarden

In the project are 96 plots (45.5%) with a deep backgarden (9.00 m')

In the project are 104 plots (50.0%) with an undeep backgarden (6.00 m')

104 undeep backgardens - developed 40.15 m^2 - av. 40 m^2/plot
96 deep backgardens - developed 60.12 m^2 - av. 63.5 m^2/plot

67 deep backgardens out of 96 were used (70%)
- av. 91.5 m^2/plot
(83% of area availabl

66 undeep backgardens out of 104 were used (63.4%)
- av. 63 m^2/plot
(85% of area availab
3a. Relation total amount of cultivated area on plots with an 
undep frontgarden (4.5 m) and consequently a deep 
backgarden (9.0 m')

6734 m² was cultivated on 96 plots - average 70.2 m²/plot.

3b. Relation total amount of cultivated area on plots with 
a deep frontgarden (7.5 m) and consequently an undeep 
backgarden (6.0 m')

4862 m² was cultivated on 108 plots - average 45 m²/plot.

4a. Relation semi-detached houses and the total amount of 
cultivated area.

4463 m² was cultivated on 68 plots with semi-detached 
houses: - average 65.7 m²/plot
On these plots are 180 m² available for cultivation -
36% used.

4b. Relation detached houses and the total amount of cul-
tivated area:

7607 m² was cultivated on 142 plots with detached 
houses: - average 53.6 m²/plot
On these plots are 200 m² available for cultivation -
26.8% used.

5. Relation plots along a public area and use of garden

3290 m² was cultivated on 38 plots along a public area - average 86.5 m²/plot.
6. **Relation orientation of the plot (backgarden) and amount of cultivation.**

<table>
<thead>
<tr>
<th>Orientation</th>
<th>Number of Gardens</th>
<th>Cultivated Area (m²)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>West</td>
<td>16</td>
<td>81.5</td>
<td>40.7%</td>
</tr>
<tr>
<td>S.West</td>
<td>10</td>
<td>79.6</td>
<td>39.0%</td>
</tr>
<tr>
<td>East</td>
<td>15</td>
<td>71.2</td>
<td>35.5%</td>
</tr>
<tr>
<td>W.S.West</td>
<td>10</td>
<td>66.1</td>
<td>33.0%</td>
</tr>
<tr>
<td>N.West</td>
<td>42</td>
<td>64.5</td>
<td>32.3%</td>
</tr>
<tr>
<td>E.S.East</td>
<td>12</td>
<td>63.8</td>
<td>31.8%</td>
</tr>
<tr>
<td>N.East</td>
<td>9</td>
<td>62.1</td>
<td>31.2%</td>
</tr>
<tr>
<td>W.N.West</td>
<td>12</td>
<td>55</td>
<td>27.5%</td>
</tr>
<tr>
<td>E.N.East</td>
<td>10</td>
<td>52.3</td>
<td>26.2%</td>
</tr>
<tr>
<td>S.S.East</td>
<td>19</td>
<td>50.8</td>
<td>25.4%</td>
</tr>
<tr>
<td>S.East</td>
<td>35</td>
<td>49.5</td>
<td>24.7%</td>
</tr>
<tr>
<td>N.N.West</td>
<td>19</td>
<td>45.2</td>
<td>22.6%</td>
</tr>
</tbody>
</table>

More than 35% cultivated: East/South-West/East

30%-35% cultivated: West-South-West/North-West/East-South-East/North-East

Less than 30%: West-North-West/East-North-East/S.S.E/S.E/N.N.W

West orientation of the garden gives highest amount of cultivation. Directly followed by South-West and East orientation.

(See CHART 4)
Fencing:
79 plots out of 210 are fenced = 37.5% (Slightly more than 1/3)
mashed or linked wire 16 plots
barbed wire 6 plots
cypres trees 21 plots
bamboo 27 plots
hedge 3 plots
bamboo + cypres 2 plots
wooden fence + cypres 1 plot
mashed wire + cypres 2 plots
preparing 1 plot

Total 79 plots

Relation 7 fencing and use of garden
The 79 plots cultivated (Flowers + Vegetables) in total 4716 m²
in average \[ \frac{4716}{79} = 56.8 \text{ m}^2 / \text{plot} \]

Relation 8: Type of fence and use of the garden

a) -Bamboo fence and use of garden:
The 27 bamboo fenced plots cultivated 1298 m²
\[ \frac{1298}{27} = 48.0 \text{ m}^2 \] (24%)

b) -Cypres fence and use of garden
The 21 cypres fenced plots cultivated 1119 m²
\[ \frac{1119}{21} = 53.3 \text{ m}^2 \] (25.2%)

c) -mashed, linked and barbed wire fenced plots and use of garden.
The 22 plots cultivated 1882 m²
\[ \frac{1882}{22} = 85.5 \text{ m}^2 \] (42.7%)
Relation 9: Fencing for security + visual privacy and use of garden

a) (Bamboo/barbed, mashed or linked wire + cypres/hedge)
The 35 plots cultivated 1671 m²

\[
\frac{1671}{35} = 48 \text{ m}^2/\text{plot} \quad (24\%)
\]

b) Fencing for visual privacy only and use of garden (cypres)
The 22 plots cultivated 1119 m² = 53.3 m²/plot (25.3%)

c) Fencing for security only and use of garden

(Mashed, linked and barbed wire)
The 22 plots cultivated 1882 m²/plot (42.7%)

General conclusions: from relation 8 and 9

- There is no obvious relation between fencing and use of garden for cultivation (vegetables) in this scheme.
- Fencing for privacy + security seems to lower the amount of cultivated area. These gardens are mainly for children's play area etc.
- Fencing for privacy only shows neither increase nor decrease in cultivation compared with the average amount.
- Fencing for security only (wire) seems to rise the amount of cultivated area.
ELEVATION

PLAN HOUSE TYPE 94/39/II

ELEVATION

PLAN HOUSE TYPE 94/39/III

scale 1:200
Standard plot I:
12.19 x 21.34 m
Undeep frontgarden
House type: S.D.
Plinth area 75 m²

Standard plot II:
12.19 x 21.34 m
Deep frontgarden
House type: S.D.
Plinth area 75 m²

Standard plot III:
12.19 x 21.34 m
Undeep frontgarden
House type: Detache
Plinth area 53 m²

Standard Plot IV:
12.19 x 21.34 m
Deep frontgarden
House type: Detache
Plinth area 53 m²