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Low-cost housing projects in Khartoum with special focus on housing patterns[☆]

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Abstract

This paper summarises an M.Sc. (Physical Planning) field project carried out in 1997–98 on the planning of low-cost housing projects in Khartoum. The issue is one which calls for urgent rethinking. Planners seem inexplicably wedded to the rectilinear gridiron pattern in dealing with low-cost housing. The drawbacks of this approach, when the designs are regularly repeated without much revision and the executed projects never brought to completion, have become all too obvious after four decades of practice. The primary objective of this work is to assess this particular aspect while touching on some others which interact with it in the hope of eventually generating feedback to benefit future projects. © 2002 Elsevier Science Ltd. All rights reserved.

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1. Background

It is obvious that the much-standardised, repetitive patterns into which low-cost housing projects in Khartoum were indiscriminately fitted do not reflect deep planning thought. Since

[☆]This study was enriched by inputs from various professionals invited to participate in three jury sessions—in particular from Mr. Salah Mazari, Dr. Ahmed Mustafa Mohamed, Dr. Osman El-Kheir, Dr. Omer Siddig Osman and Architect Adlan El-Siddig El-Mahi. Besides writing the programme and co-ordinating the project, my role in this presentation is confined to summarising the text, stressing some issues that I felt, for some reason, were not adequately stressed in the original report and adding a section of footnotes. The issue is a crucial one and deserves to be brought to the attention of a wider readership.

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¹The views expressed in this paper are exclusively Professor Adil Mustafa Ahmad's.

their inception in the mid-1950s, they could hardly provide the variety of urban spaces or the healthful, supportive living environments aspired to by residents. They neither responded to the complex changes that have continued to transform urban society throughout that period nor benefited from the innovations in planning and servicing that have kept emerging.

While genuine efforts have doubtless been made by the housing authorities to study and analyse other aspects of the housing problem (as evidenced by a wealth of local writings, interviews and forums), little effort is observed in way of evaluation, feedback or upgrading of the designs. No significant progress in the design either through step-by-step evolution or innovative revolution can be detected in the four-decade journey. Astonishingly, the whole planning issue seems to be just taken for granted.

1.1. Objectives

Hence the objective of the present exercise was two-fold. First, it was to assess the performance of the projects with particular focus on the planning patterns adopted and the effect of the projects on the growth of the city as a whole. Secondly, it was to initiate a process of generating new forms from the variety of traditional settlements' patterns prevalent in the different provinces—forms likely to prove more responsive to residents' needs and aspirations.

These pages will address only the first issue since the time allowed was not enough to take the second to a satisfactory state.

1.2. The hypotheses

From the outset the dullness of the living environments in government housing was identified as a feature. This, admittedly, is partly due to the fact that none of the projects, not even the earliest, was ever brought to completion. The understanding was that the government had a commitment to provide the basic items and the residents were then to take over the completion and enrichment of their habitat through a process of incremental improvement; in reality, there were shortcomings on both counts. But apart from this, the problem evidently had more to do with some intrinsic *planning* aspects of the projects.

The exercise thus started with a set of hypotheses thrown up in the opening discussion session:

1. that the physical patterns adopted in these projects were invariably gridiron of simple shapes with no real evolution over more than four decades and minimum benefit from feedback;
2. that planners do not take the design of low-cost housing as seriously as they do First- and Second-class housing, where more attention has been devoted;²
3. that public participation has been overlooked at all stages of planning and implementation;
4. that whatever experimentations or innovations were introduced have not been followed up or developed to satisfaction;

²During the Anglo-Egyptian Condominium era, housing was classified as 'First', 'Second' and 'Third' class, a classification which was based on the duration of lease, plot size, building by-laws in force and minimum standards of building materials, infrastructure and services required. This classification system, strangely, is still being adopted.

5. that political expediency has sometimes forced planners hastily to turn up designs or mechanically repeat old ones without much effort in working them to maturity;
6. that the single-storey developments have contributed to the horizontal expansion and low densities prevalent in the city.

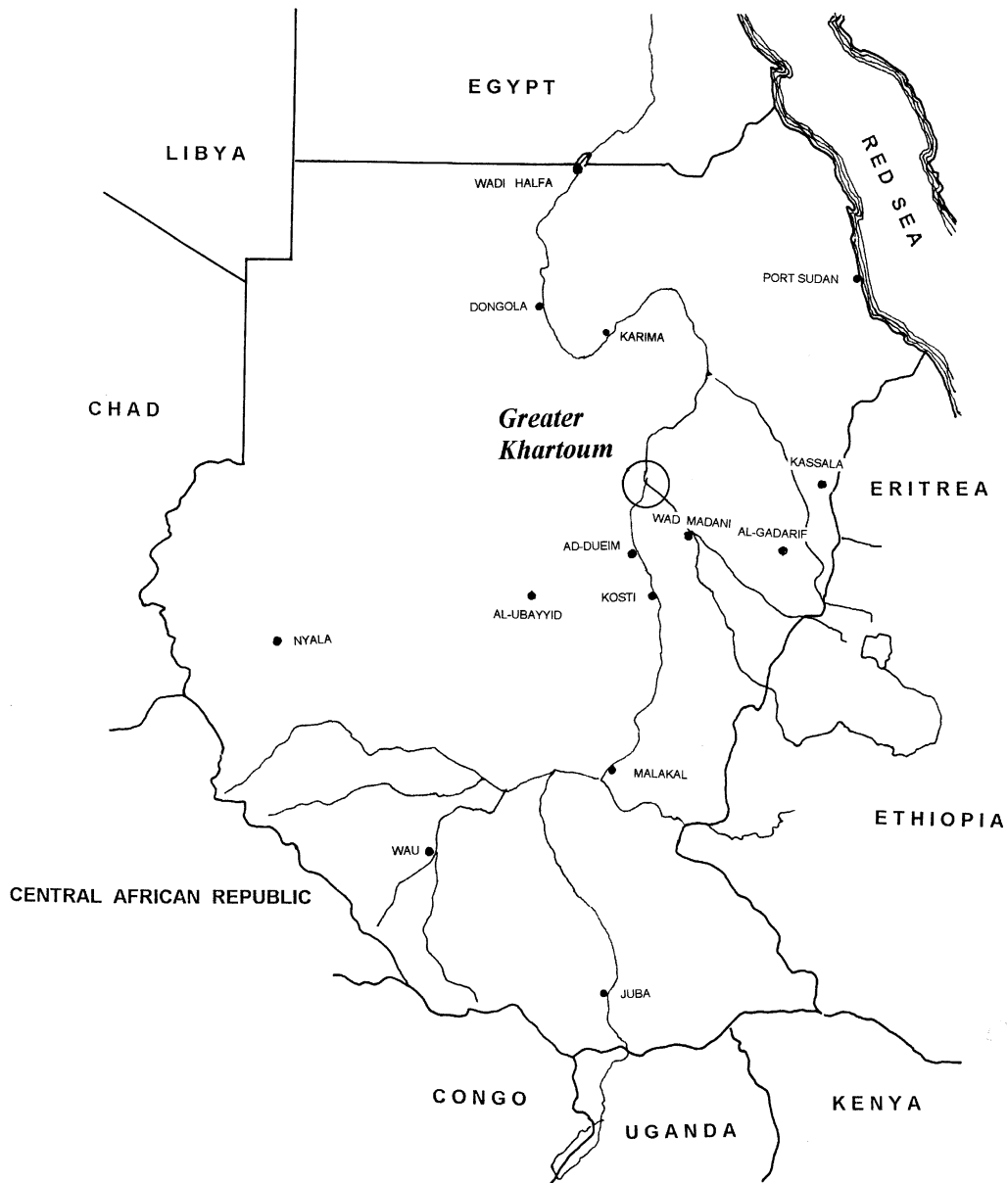


Fig. 1. Sudan and the location of Greater Khartoum.

1.3. The setting

It is helpful to outline first a few features of Khartoum that are pertinent to the design and implementation of housing projects.

Three settlements—Khartoum (the colonial, administrative capital), Umm-Durman (the native city) and Khartoum North (the services and industrial centre)—together form Greater Khartoum (Figs. 1 and 2). They lie between latitudes $15^{\circ}10'$ and $15^{\circ}36'N$ in the semi-desert zone; this zone generally has a composite climate with a dominant (though interrupted) hot dry season, a brief (about three months) cool dry season and another brief (about two and a half months) rainy season.

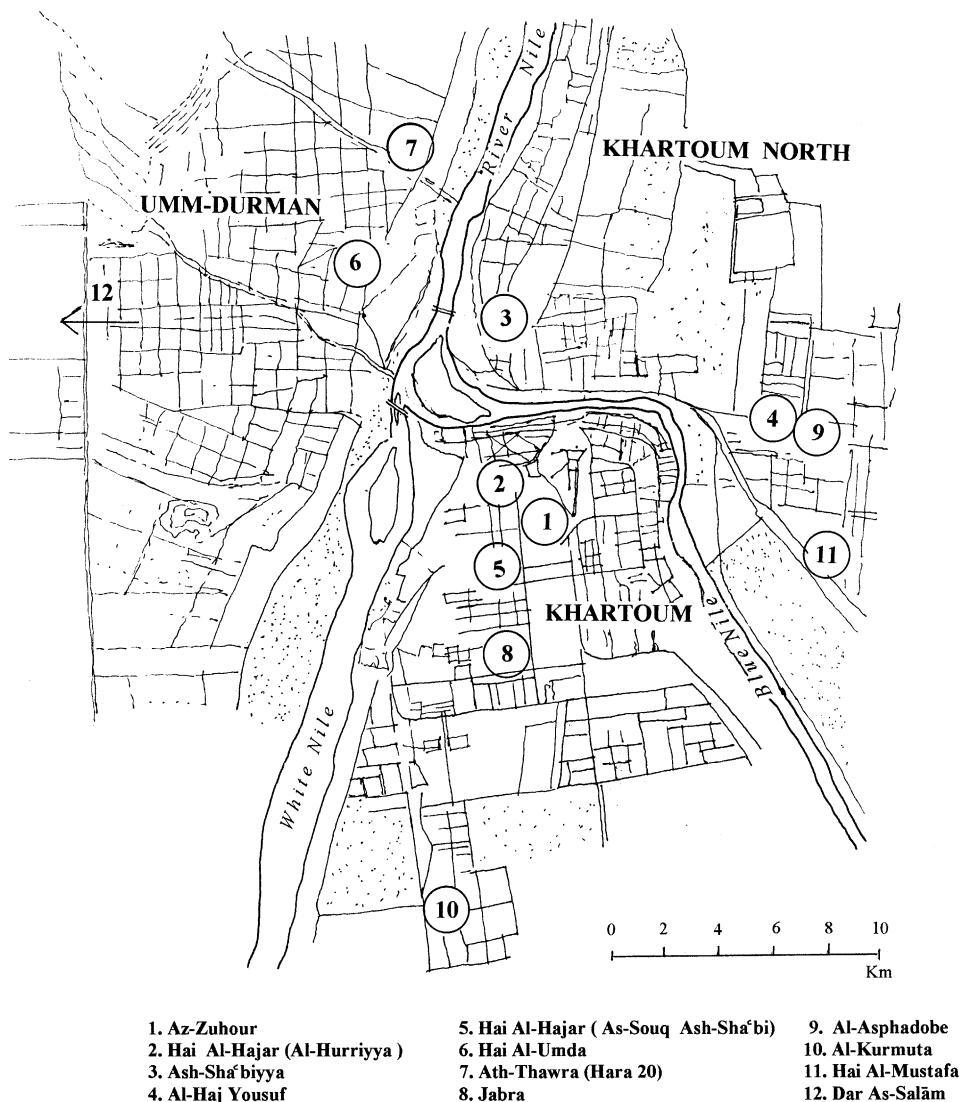


Fig. 2. The location of the projects in Greater Khartoum.

A remarkable difference exists in the nature of the soils: while Khartoum and Khartoum North have relatively fertile clayey soils, Umm-Durman has rocky and sandy soils. And while water can normally be found at the depths 8–14 m in the first two settlements, in Umm-Durman this depth varies from about 20 to almost 50 m as one moves westwards.

These two factors—nature of soil and depth at which underground water can be reached—account for the marked contrast in physical environments with Umm-Durman being bare and arid compared to the other two.³ Moreover, sinking wells for sewage disposal becomes more expensive because of the deeper aquifer and harder soil. But there is a positive side to this feature: erecting stable structures in Umm-Durman is cheaper than in the expansive agricultural soils of Khartoum and Khartoum North since foundations require neither great depths nor heavy reinforcement.

The region on the whole is flat except for the Umm-Durman area which is bounded by hills on the west and cut by natural watercourses that drain seasonal storm water eastwards to the Nile. This minimum of natural constraints offered by the near flatness is an advantage welcome to most designers; it gives them a free hand to experiment with layout and form and demands little compromise in issues like orientation or privacy except where neighbouring developments are concerned.

In this setting about 2.92 million people live according to the latest, 1993, census⁴ shared thus by the three settlements:

Umm-Durman	1.27 million
Khartoum	0.95 million
Khartoum North	0.70 million.

The total population of the country is officially estimated at 25.6 million and the mean annual growth rate (excluding the Southern States) at 3.14%. The average household size for urban Khartoum is 6.2 persons (for rural Khartoum it is 5.77 persons and for Khartoum State 6.12 persons).

2. The projects

Low-cost housing projects in the Sudan date back to 1954 i.e. to the transitional period to Independence, which dawned officially on 1 January 1956.⁵ That was before the advent of large-scale migration to towns and before anyone could reasonably talk about a housing *problem*. The government had aimed, through these projects, at providing its officials and workers with decent shelter against affordable monthly payments.⁶

³See, for example, Abu Sin and Davies (1991).

⁴See population census, 1993 (Government of the Sudan, Statistics Department, 1994).

⁵The Cairo Agreement of 12 February 1953 stated that Sudan should have the right to self-determination and that this should be preceded by a transitional period of self-rule not exceeding three years during which the Condominium rule should be liquidated. The first parliamentary elections took place in November–December 1953.

⁶All data have been obtained from the Ministry of Engineering Affairs and Housing, Khartoum.

Table 1
Low-cost housing projects in Greater Khartoum

1	Az-Zuhour	(Kht)
2	Hai Al-Hajar (Al-Hurriyya)	(Kht)
3	Ash-Sha ^c biyya	(Kht Nth)
4	Al-Haj Yousuf	(Kht Nth)
5	Hai Al-Hajar (As-Souq Ash-Sha ^c bi)	(Kht)
6	Hai Al-Umda	(Umm-D)
7	Ath-Thawra (Hara 20)	(Umm-D)
8	Jabra	(Kht)
9	Al-Asphadobe	(Kht Nth)
10	Al-Kurmata	(Kht)
11	Hai Al-Mustafa	(Kht Nth)
12	Dar As-Salām	(Umm-D)

2.1. History of the projects

In March of that year Hai Al-Hajar project was begun in Khartoum Town comprising 92 plots. This was soon followed, in 1956, by Al-Hurriyya project with 58 plots (Table 1) (see Photos 1 and 2).

Khartoum North witnessed such projects at Ash-Sha^cbiyya neighbour-hood in 1959 with 1000 plots, a relatively large number necessitated by the need for workers to reside near the industrial area. Al-Haj Yousuf project, 132 plots, followed in 1965.

In 1972 Hai Al-Hajar (As-Souq Ash-Sha^cbi) project materialised in Khartoum with 50 plots.

Attention was turned to Umm-Durman for the first time in 1973 with Hai Al-Umda project. Although Umm-Durman is the most populous city in the country (the only one to overpass the million mark in the latest census, 1993), it received this service almost two decades after Khartoum. One reason for this delay is that people prefer to live near their places of work and in Umm-Durman there are fewer places of work than in the other two settlements. Another is the pattern of freehold ownership of land prevalent in Umm-Durman which tends to reduce population mobility. Hai Al-Umda project was experimental; in it different styles of construction were used. It started with seven plots and ended with 45. In 1975 Ath-Thawra (Hara 20) project was implemented, with 123 plots.

In 1978 Jabra housing project materialised in Khartoum with 132 plots.

In 1980 a project in Al-Haj Yousuf was implemented with 32 plots. This project, called Al-Asphadobe, is of particular interest since it experimented with a new building material, as we shall see later (Section 2.9).

In 1992, projects of a larger scale were started—2200 plots in Al-Kurmata (Khartoum), 1011 plots in Dar As-Salām (Umm-Durman) and 850 plots in Al-Mustafa (Khartoum North). These projects have not been completed due to shortage of finance, high rates of inflation and mismanagement.

In all the 12 projects the planned number of houses, which have still remained unattained,⁷ is 5757.

2.2. The gridiron adopted

In virtually all the projects the rectilinear gridiron has been adopted as the housing pattern. Planner after planner for almost half a century has apparently seen no reason to change and only a few, fairly superficial variations on the theme have been attempted.⁸

One type shows the pattern at its simplest with all roads being through-arteries and the open spaces being surrounded by traffic on all sides. This can be seen in Ash-Sha^cbiyya (Fig. 3) project where all the services are centrally located. Dar As-Salām (Fig. 8) pattern also falls into this

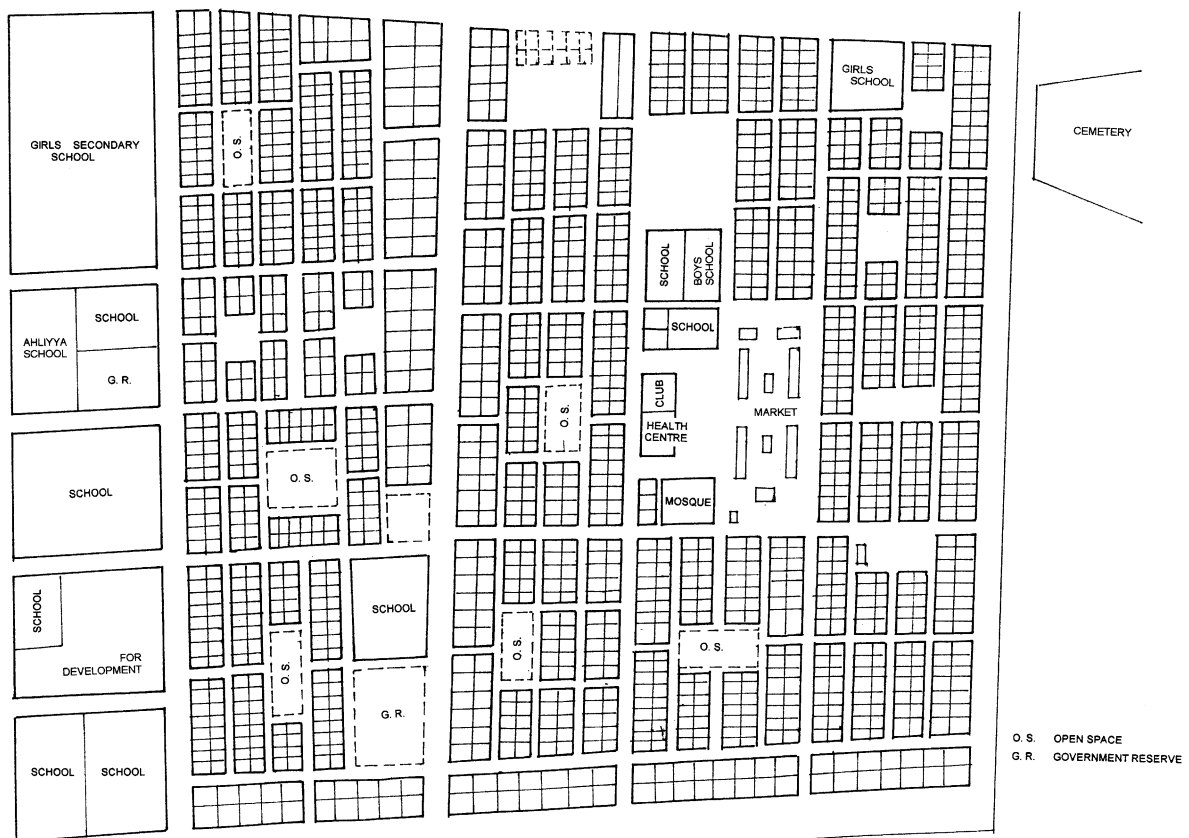


Fig. 3. Ash-Sha^cbiyya.

⁷ Some slight differences in figures appear in the different records.

⁸ No names of planners responsible for the designs appear on the plans which are usually full of spelling mistakes and contain no perspectives and minimum sections, details and specifications.

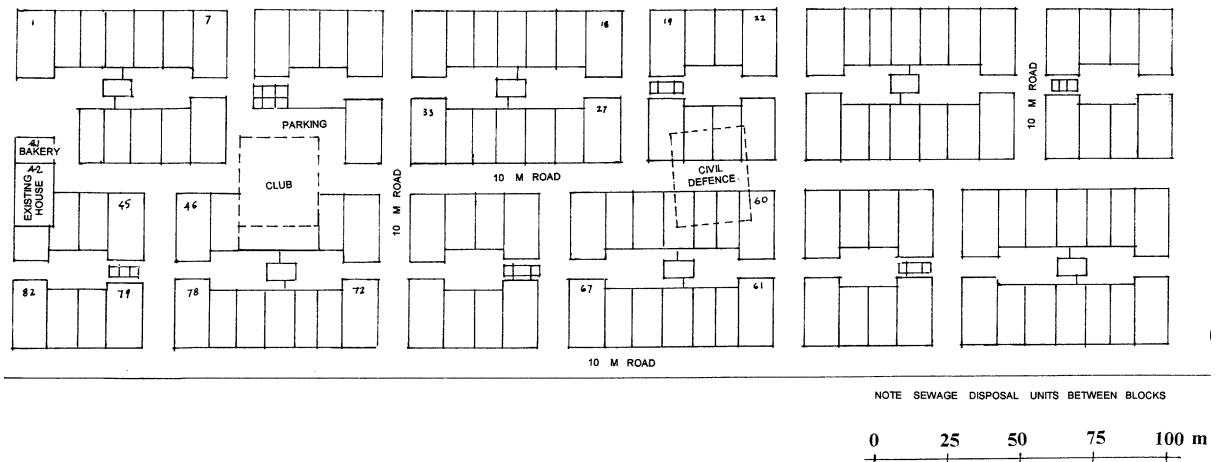


Fig. 4. Hai Al-Hajar (As-Souq Ash-Sha'bi).

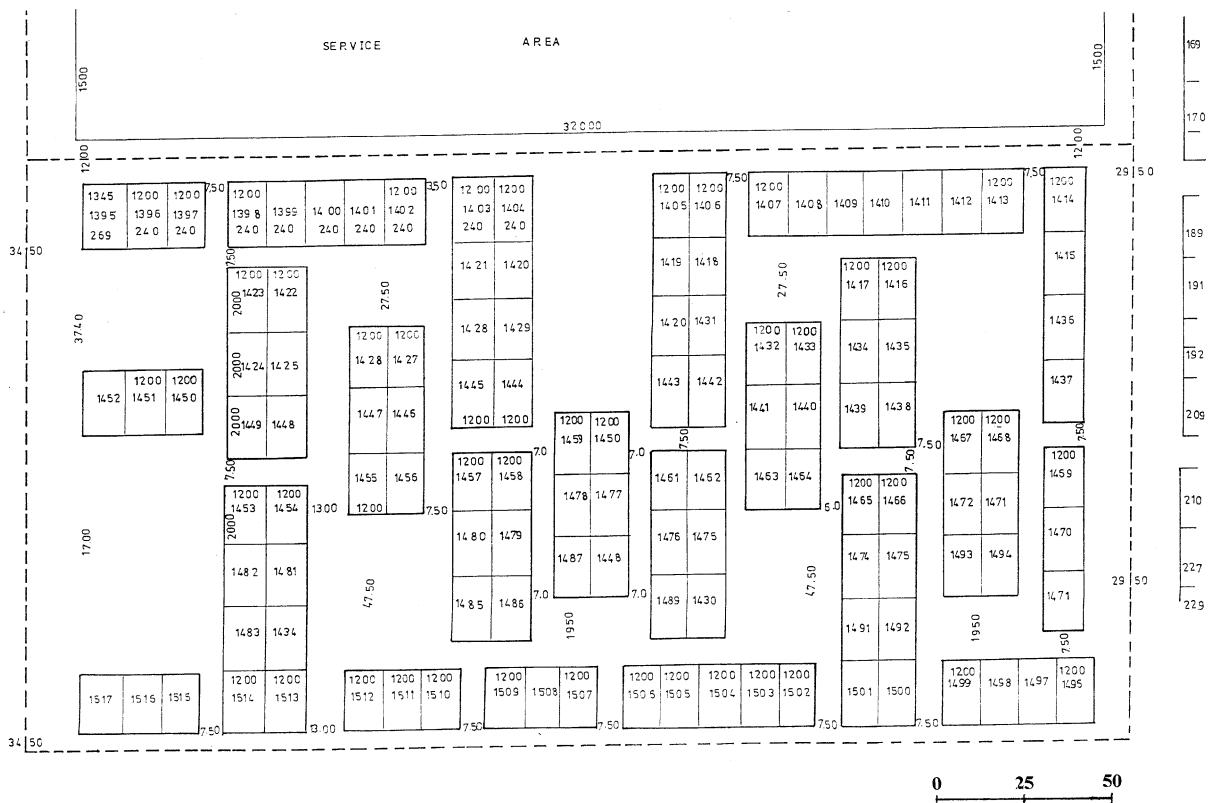


Fig. 5. Ath-Thawra.

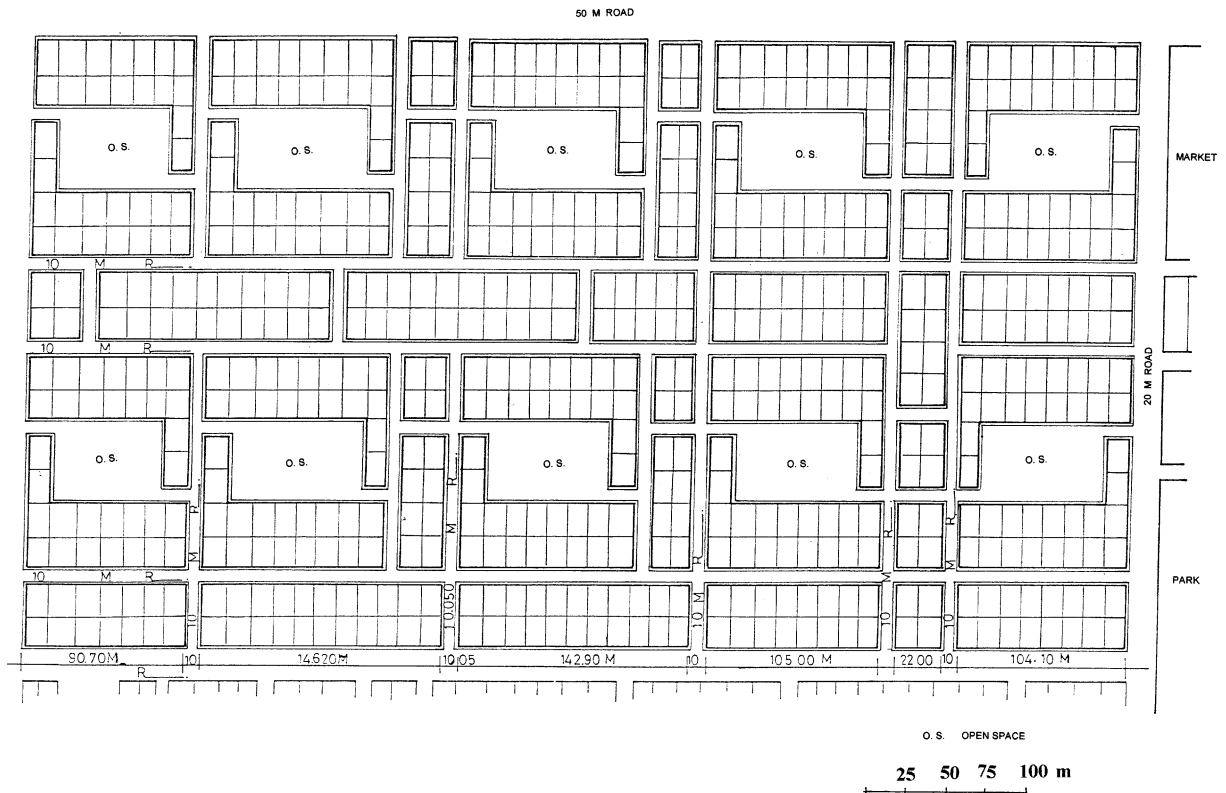


Fig. 6. Al-Kurmuta.

category with all housing blocks having approximately the same size and orientation and hardly any character. So does Al-Mustafa (Fig. 7) project, though its open spaces come in different sizes.

In the second type, seen in Jabra, Ath-Thawra (Hara 20) (Fig. 5) and Al-Haj Yousuf, the continuity of the roads is interrupted by the housing blocks which alternate to create communal open spaces.

In the third type, seen in Al-Kurmuta (Fig. 6), the plots are arranged in L-shaped units every two of which face each other, mirrored, enclosing an open space with two access points diagonally located—an arrangement meant hopefully to discourage through-traffic.

The plots in the fourth case are arranged in U-shaped blocks grouped into twos to surround the open spaces; this is seen in Hai Al-Hajar (As-Souq Ash-Sha^cbi) (Fig. 4), Al-Asphadobe, Az-Zuhour Fattahat and Al-Hurriyya.

2.3. The gridiron assessed

The rectilinear gridiron pattern does have some points to recommend it. Its regular, rectangular forms, devoid of acute angles and redundant spaces, ensure maximum utilisation of land. With much ease and minimum compromise, the desired shapes and orientations of plots can be

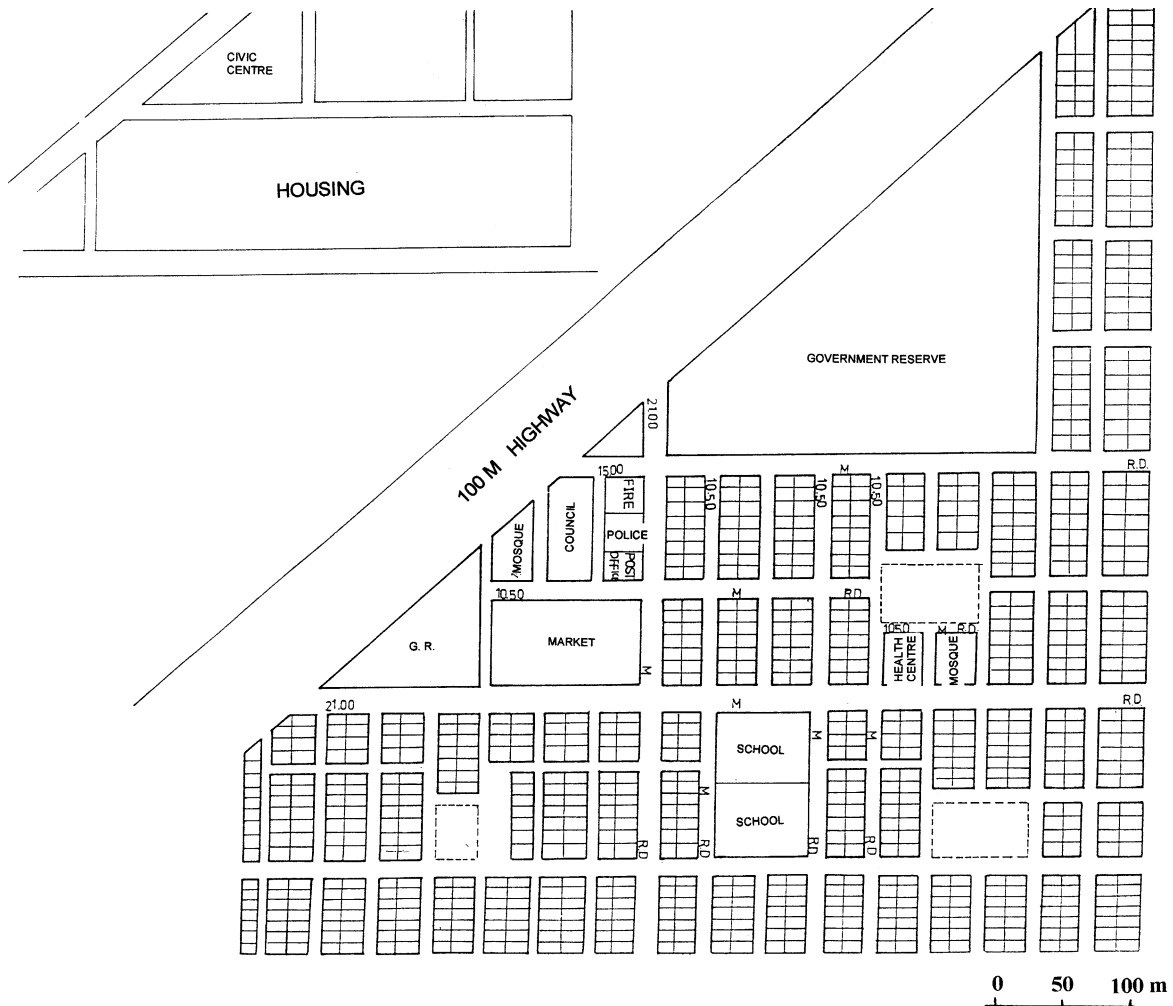


Fig. 7. Hai Al-Mustafa.

attained; with equal ease extension in any direction is possible. The simplicity of the patterns helps residents to form clear mental images of the place so that at any point one's location within a neighbourhood is seldom confused or lost. It also facilitates the design and execution of infrastructure items especially as a result of the uniformity where optimum gradients in underground works are concerned which make their provision and maintenance a more straightforward, hence cheaper, task.

On the negative side, the gridiron is alien to the country's indigenous organic settlements patterns (which has set as one of the objectives of the study the search for housing patterns based on traditional forms). It is repeatedly criticised for introducing an element of monotony through its rigid linearity and uniformity. All inner streets being potential through-arteries, the peace and

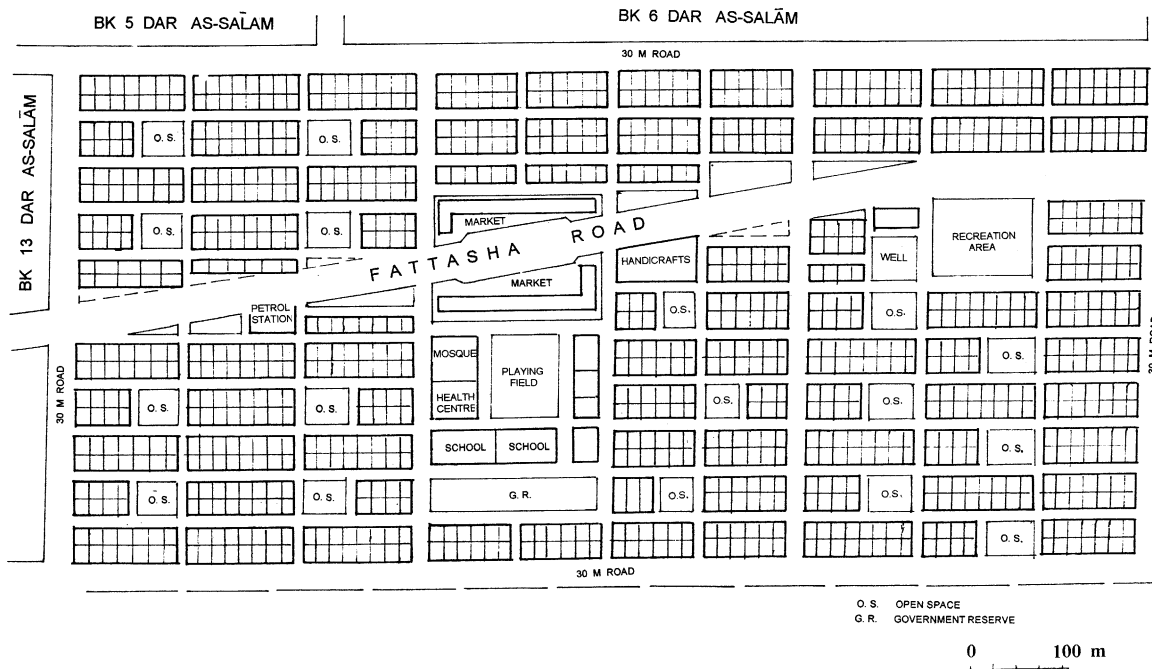


Fig. 8. Dar As-Salām.

tranquility within a neighbourhood are liable to be ruined by sudden diversions of outside traffic any time the even flow of this traffic is blocked. This will generate rises in air pollution and noise levels and will necessitate higher, hence more expensive, standards of road construction within the neighbourhood; it could also increase road accidents. The gridiron assumes flatness of the site; it can thus result in high costs of some engineering services such as storm-water drainage or sewage-disposal networks in cases where considerable slopes occur or physical obstacles are encountered. The cost of earth moving and filling can be disproportionately high.

Curvilinear organic patterns, on the other hand, raise practical difficulties in setting out and cannot ensure ideal orientation except to part of the plots but they offer valuable advantages on the foregoing issues. In particular, the curved roads and closed vistas provide the atmosphere of semi-privacy and intimacy favoured in residential areas as opposed to open-ended roads. They curb both the volume of motorist movement through the neighbourhood and its speed and, on the aesthetic plane, facilitate the creation of visually varied and stimulating spaces. They reduce the total length of roads and the number for crossings and require only certain roads to be built for heavy traffic.

The 'cluster' in residential development is yet another option that should be mentioned if only for completeness. It is a pattern of grouping plots closely around access courts with no direct access for the plots to adjoining major streets. The *cul-de-sac* plays an eminent role in the proper functioning of this pattern, and it is, in its local form, the *hara*, a fairly indigenous pattern ensuring high degrees of privacy and intimacy. Cluster patterns, however, are of limited use to us; they are suitable only for relatively small numbers of plots and tend to generate wasteful left-over

spaces. They are thus unsuitable when the attainment of reasonably high densities in an urban area is an objective.

Each of the two main patterns thus has its merits and drawbacks and there is nothing basically wrong in adopting one or the other. A proper hierarchy of open spaces and one of streets *can* be achieved and much practicality, beauty and interest can be infused into the gridiron plan. It is in the failure to exploit this potential and the excessive repetition and not in the choice of the approach *per se* that the planners' shortcomings are evident. The superficial variations that have been tried do not perceptibly enrich the environment or improve the performance.

It is pertinent to our argument that the latest projects show the gridiron at its crudest and could offer only the bleakest of environments. Dar-as-Salām plan (Fig. 8) does not even recognise the existence of the wide Fattasha road diagonally penetrating the settlement and makes no adjustment to accommodate, let alone utilise, it. At the very least the dirt road could have been diverted away from the built area if not utilised positively to create a lively peripheral market and service area, and thus the waste created by the wedge-shaped areas could have been avoided. Alternatively, the road could have been taken as the reference for the layout since a tilt of 15° or 20° from the E–W axis does not seriously affect heat gain or natural ventilation.

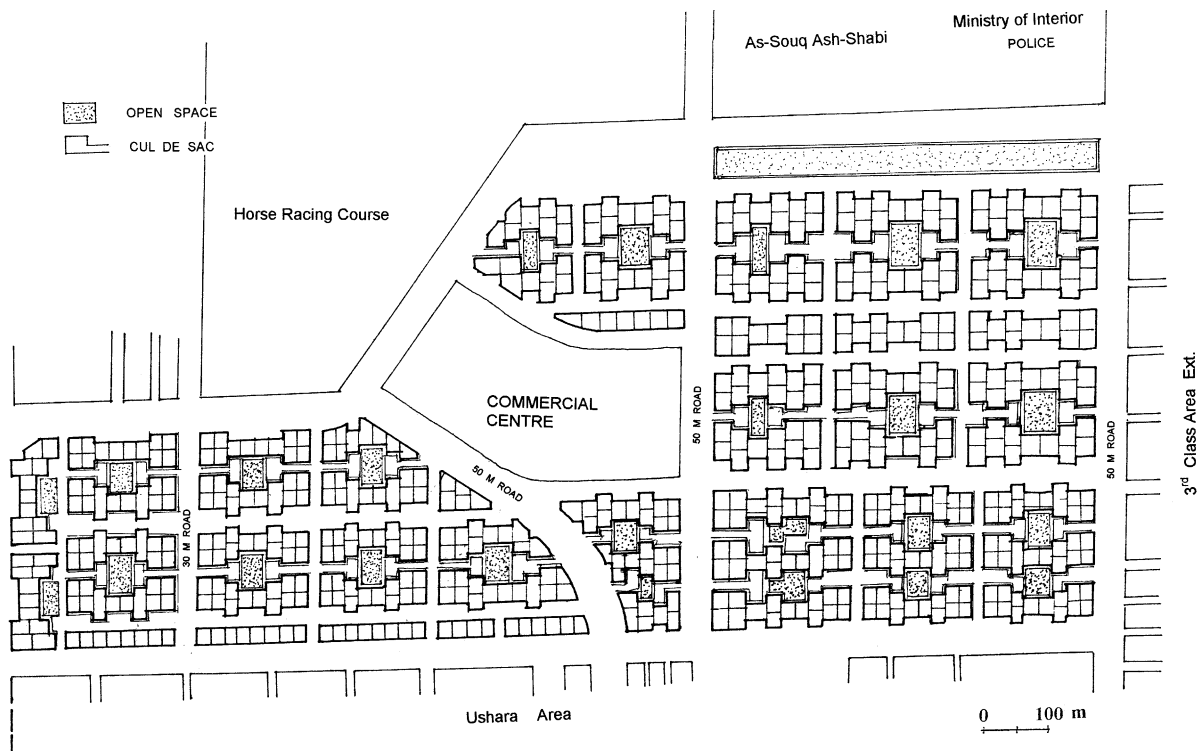


Fig. 9. Hai An-Nuzha. (1) Area of a plot 500–750 m². (2) Total no. of plots 619. In the design of First-Class housing projects more attention is devoted and more elaboration appears even while the pattern is again basically a gridiron. Source: Ministry of Engineering Affairs, Department of housing and Construction. Department of Surveying.

2.4. Plot sizes and orientations

An examination of plot sizes in these projects shows them to range between 180 and 300 m². In Hai Al-Hajar projects (Az-Zuhour, Al-Hurriyya and As-Souq Ash-Sha^cbi) there are two plot sizes: 200 and 220 m². In Ash-Sha^cbiyya plot sizes range between 240 and 300 m² while in Hai Al-Umda they are 190–240 m². In Ath-Thawra, Jabra and Al-Haj Yousuf the size is 240 m² and in Al-Kurmuta 265 m². The minimum plot size in the projects is 180 m² in Al-Asphadobe project while the maximum, 300 m², appears in Al-Mustafa and Dar As-Salām (Fig. 9).

Relating plot sizes to dates, one can discern no correlation—there is no clear tendency either towards increasing or reducing plot sizes but rather more or less haphazard swings. This can be taken as evidence that the issue of optimum space requirements has not been handled in a serious way and the few existing theoretical studies have not been consulted and thus no feedback has accrued.⁹ It is also an outcome of old designs being mechanically readopted without revision in new projects usually to meet (irrelevant) deadlines.

The norm in plot shapes is the rectangle along a N–S axis with the house built along an E–W axis thus avoiding the direct sun from the east and west, capturing the breeze and creating two external courts: a front one for males and guests and a back one for females and family.

2.5. Roads and open spaces

Roads in the projects vary in width between 6 and 30 m and are not guided by any recognisable standard. In Ath-Thawra (Hara 20), for example, road widths range from 6 to 7, 7.50, 12 and 13 following no clear logic. They are more consistent in the smaller projects such as Hai Al-Hajar (As-Souq Ash-Sha^cbi). Surrounding streets are usually 30 m.

Public open spaces, similarly, do not seem to be dictated by standards, patterns or prescribed percentages of overall areas. They can appear as a large number of small squares as in Dar As-Salām or a small number of larger squares and their percentage of the total area varies considerably. While variety is certainly desirable in a residential area, what appears here is too casual to appeal as a positive feature. To make matters worse, kindergartens, bakeries and primary schools have been erected on some of the areas designated as ‘open spaces’.

2.6. Densities

In dealing with housing densities one fact has to be kept in mind: the majority of the projects (9 out of 12) are devoid of areas for social services—they are located near residential areas whose social and infrastructure services are to be shared with them. This renders figures for housing densities inadequate for direct comparison between the neighbourhoods under study and the established residential areas. Owing to this absence of service areas the density for any of these projects will appear higher than it would be for a typical self-contained neighbourhood with an equal number of households.

⁹The three studies mentioned are: Fawzi (1954) (see also Mahmoud, 1974; Doxiadis Associates, 1959 and Elias, 1979).

The gross densities of the three complete projects—Ash-Sha^cbiyya, Dar As-Salām and Hai Al-Mustafa—are 117, 149 and 161 persons per hectare respectively (Figs. 3, 8 and 7).

No reliable figures are available for housing densities in Khartoum. An estimate by Doxiadis and Mustafa¹⁰ in 1991 gives a range of 50–150 persons per hectare for Third-Class areas with an average of 130 persons per hectare. If we adopt these estimates we shall find no significant deviation of the projects from comparable residential areas elsewhere in the city.

It would be misleading to argue that adding residential areas without services to established ones is a way of increasing densities or seeking better utilisation of services since they are to share the existing services which are themselves insufficient, usually.

The projects therefore are seen merely to augment sprawl—one of the negative features of the city.

2.7. *The impact of sewage-disposal systems*

The problem that impinges strongly on the functioning of the design and has remained inadequately solved is that of sewage disposal. In low-cost housing it constitutes one of the most expensive items and a most sensitive one in its nature, an item that tolerates very little compromise in design standard and no phasing in its provision.

Pit latrines have been used for the majority (72%) of the *planned* plots (it must be kept in mind that the latest projects are still unfinished). They are the most inefficient considering the damage they deliver on the site particularly when relatively closely spaced.¹¹ They are potential health hazards (breeding flies, generating odours, etc) activated above all during flood times, which have become more frequent lately, especially for the neighbourhoods along the Nile. The possible contamination of ground water also has to be considered in certain soils and with certain depths of aquifers since most of the water supply of the city comes from artesian wells. Adopting pit latrines leads to wasting part of the plot area since allowance has to be made for a second latrine to be dug in case the first one is filled up. Moreover, they deprive us of a valuable resource, human excreta, which can be processed and utilised. Pit latrines are endured solely on grounds of affordability.

The system of buckets collected manually every evening, which had been the norm in Colonial Khartoum, appeared for some time in the Hurriyya Project (of 1956, comprising 1% of the total number of houses); it was then officially banned in the whole city in the late 1960s having been repeatedly denounced as odious and degrading.

The septic tank/soakaway well system has been used for the remainder (i.e. about 27%) of the households. It is of special relevance to this study since it gives rise to the situation in which interaction with the planning pattern comes into play. In four of the seven projects where the system has been used it was sought to reduce costs by providing one network to serve a group of houses—one septic tank to serve 2–4 houses and one soakaway well to serve 6–12 houses. The wells, tanks and most of the manholes are located in the communal open spaces onto which the houses open.

¹⁰ See Doxiadis and Mustafa (1991).

¹¹ This problem was felt when 'Ishash Al-Fallāta' neighbourhoods were cleared and the location replanned as upgraded residential areas.

Now, residents normally keep their homes tidy but tend to be less scrupulous about what lies away from their boundary. They are understandably reluctant to pay for renewing or maintaining the ‘public’ parts of the sewer network which they justifiably regard as the responsibility of the government—no different from the maintenance of water supply networks, power substations or garbage bins. In many cases, therefore, the manhole covers were cracked or missing which sent a signal that the ‘anaerobic’ system had ceased to function properly, dust accumulation inside it was in progress and the exposed holes were now physical as well as health hazards. This of course is not so much an undermining of the concept of sharing expensive infrastructure items as a criticism of the inability to develop the design to a level where it does not bring in its wake adverse side effects to the residents—in this case ill health and the impoverishment and degradation of public open spaces.

2.8. Landscaping public spaces

Closely related to this side effect and curiously for an inhospitable climate like Khartoum’s, none of the designers has taken the landscaping of public open spaces as part of the design challenge; in fact, they go no further than marking them on the plans as ‘O.S.’ or ‘Green Areas’. A landscaped (even a crudely landscaped) area would offer some shade, reduce heat, dust and glare and absorb or drain off rainwater. One would have expected at least one fairly prominent square in each project to be completed as a demonstration model in the hope of spurring residents to follow suit, especially as this is an operation that can conveniently be phased over a number of years. In the very rare instances where some such treatment has appeared in reality, it was invariably the initiative, efforts and finance of the residents that had created it.¹² And particularly where the noisome presence of shared drains and wells is a planned feature of the project, public spaces are all but deserted.

In impoverishing or merely neglecting public spaces, the resultant harm does not lie solely at the health/environmental/aesthetic planes but equally perceptibly at the social/recreational ones: the tendency to deprive a neighbourhood of its potential meeting spots and play areas. Socialising is particularly vital to this category of families brought to live together for the first time, identify with each other and hopefully set the premises for coherent communities to come.

2.9. Positive features

Although no serious attempts either to elaborate further the layouts or turn to alternative approaches are sensed, some projects can still be commended for experimenting at a small scale in other fields. In Hai Al-Hajar (As-Souq Ash-Sha^cbi) project the architect worked towards creating a distinct architectural character.¹³ While sticking to the old planning layout, partly due to site

¹² My own experience in Burri (Khartoum) while attempting with the community to implement a landscape design for a bare open space within a residential area and introduce a few activities was that residents in a subtle way aborted the project. The reason, I learned later, was that they preferred a quiet square in the evening to a lively one that would disturb the peace of the neighbourhood and ‘attract urchins and idle folks’.

¹³ The project was designed by Architect Sharaf El-Din Bushara born c. 1940, a Nubian from Wadi Halfa much influenced by old Nubian forms.



Photo 1. Shared sewage disposal systems further devitalise public open spaces. Note the attempts by residents to extend their living spaces outwards on the street and protect their greenery from goats.



Photo 2. A view of Hai Al-Hajar (As-Souq Ash-Sha^cbi) housing showing the designer's attempt to reduce construction costs and create character through the use of brick vaults.

constraints, he introduced internal and semi-enclosed courtyards and designed his roofs in the form of vaults. Both these features are uncommon in the city and have made the neighbourhood stand out among the traditional cubic forms prevalent in the region. In Al-Kurmuta, character was sought also in some houses through the design of semi-circular brick arches.

In the ‘Asphadobe’ project a new building material was tried consisting of mud stabilised with asphalt. This improved the strength, moisture resistance and general appearance of the brick. The weakness that popped up later was that of the external rendering flaking off, under swings of temperature and humidity, owing to its incompatibility with the wall mix.¹⁴

We have already discussed the efforts to cut the costs of sewage disposal systems through sharing manholes, septic tanks and soakaway wells whose reduction in number, also, automatically reduced damage to the land.

In all cases, however, the experimentation terminated there with no follow-up or refinement in subsequent designs.

2.10. The opinions of residents

In an opinion survey carried out intermittently throughout the study period, residents expressed dissatisfaction on several issues.

Criticism focused first of all on the small sizes of the plots. These were declared inadequate for many households especially when we take into consideration the complex interfamily relationships which increase households above the original family size, stepped-up migration to towns and the minimum acceptable level of privacy between neighbouring households especially with the high gender awareness prevalent in society. The inadequacy or absence of services and the need to share with adjoining neighbourhoods have added to their dissatisfaction.

Residents lamented the vulnerability of the construction process to inflation and mismanagement which result in long delays or in an inability to finish construction thus forcing them to complete their houses themselves and further stretch their budgets.

The high rates of escalation also meant that the declared method of payment could not meet the construction expenses. Residents were unable and unwilling to increase payments as demanded by the housing authorities. Hence disputes and court cases appeared lately for the first time in the history of the projects.

They complained also about the location of the projects—some seen as too far away from city and employment centres.

3. Conclusions

The survey of drawings, executed projects and experts’ and residents’ opinions has established that the hypotheses which prompted the launch of this exercise were undoubtedly realistic. The following conclusions were reached—confirmed, rather.

¹⁴The project was undertaken by the Ministry of Public Works (now liquidated) and supervised by Architect Dr. Abdel Halim Awad.

The planning cycle lacked continuity as no feedback from the executed projects and no upgrading of the design were sought, hence the tedious repetition and the accumulation of errors. No reliable system has been laid to ensure a convincing evolution.

It emerged from interviews and discussions that very little account has been taken of the variation of social factors pertaining to the Sudanese urban family throughout this long stretch of time. No steps were taken to reflect the changing needs of these communities in design—let alone probe the special needs of disadvantaged groups : women, children, the elderly, etc.

It also emerged that the overwhelming consideration was to minimise initial costs while ignoring the high running and maintenance costs that follow or the inconvenience to residents—as in the resort to pit latrines or sharing of septic tanks.

Far from being viewed as partners, beneficiaries were given no active role to play in shaping their habitats (apart from filing complaints); planning proceeded totally inside government departments. The accusations often repeated that planners were insulated and beneficiaries isolated are by no means unfounded.

Despite the availability of a variety of planning patterns, the simple gridiron was the one invariably adopted for low-income groups; this has enhanced the cheerless profile of the extensions of the city. The gridiron naturally has much potential if given the chance to mature fully. But in practice the projects have remained visibly stunted; none of them, even today, has materialised as hoped. Planners clearly do not take the design of low-cost housing as seriously as they do First- and Second-Class housing; perhaps they do not believe that efforts to try different patterns and much elaboration are warranted or expected for low-income communities.¹⁵

The low housing density of this type of development is a contributing factor to sprawl which is seen as one of the maladies of Khartoum adding to the general waste and inefficiency of the city—longer travel, more expensive infrastructure, depletion of the hinterland, sense of isolation, etc.

There is a positive aspect in the latest three projects—these are designed as fairly integrated neighbourhoods with ample social services unlike the others which rely on the services of neighbouring communities who normally are themselves underserved. Moreover, some positive features have been introduced in some projects pertaining to new building materials and forms, services and architectural character. However, planners rarely show any enthusiasm towards pursuing features credited to previous colleagues and seeking to advance and elaborate them, especially in the absence of a system requiring them to.

Political pressure has played a role in hurriedly turning up some projects hence the persistent repetition of old designs towards which misgivings had been clearly expressed by residents. This has worked towards shaking the credibility of government authorities in dealing with citizens' problems. But while this political pressure is undoubtedly real and calls for investigation, it in no way excuses the planners who should be working continually on the innovation and refinement of their designs.

The total number of houses produced by the system in over four decades is so limited related to the total housing demand that the system cannot be relied on to ameliorate the housing crisis.

¹⁵ Compare these with two projects designed during the late Condominium era on the curvilinear pattern: Hai Al-Matar and Al-Mugran. For details see Ahmad (1992).

To conclude, the problems have been admirably presented by all parties approached. It remains for a coming administration to embark on building a sustainable system more forward-looking and more sympathetic to residents' aspirations.

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