

Housing Policy in Khartoum: Plot Subdivision for Increased Housing Supply for Low-income People

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Abstract: The article discusses plot size standards applied in the government sites-and-services projects in Khartoum and probes into the possible alternative ways of re-establishing solid grounds for those standards. The particular issue of plot size is a crucial factor in the whole housing policy as it directly affects the urban land use and consumption and extends its influence far into sustainability and affordability issues and the whole housing policy and supply process. The article, analysing the applied standards, argues that plot subdivision can substantially contribute to providing more access of housing to the low-income groups. Large plot sizes can be subdivided driven by the need to realize security of tenure, doubling the owner-occupier housing stock which is the base issue of self-help housing, increases housing finance, provides variety of housing choices and behind all it conforms to the legacy principles and some cultural attributes of the local community. The article underlined existence of a cumbersome regulatory system, subdivision procedures and development controls which need to be reformed.

Key words: Housing policy, urban land, Khartoum, plot size, regulatory framework.

1. Introduction

Housing policies in all countries focus on housing supply for all the people. Low-income groups need to be given more attention in the developing countries. Housing policies should be geared towards looking into every possible option to increase the housing supply for these groups who are the most affected ones. This research aims to examine the housing supply process for the low-income people in Khartoum, the capital city of Sudan, with particular emphasis on the land subdivision in the housing sites-and-services projects, which are regarded as a primary formal mode of housing provision. The research looks into the primary detailed factor of the plot sizes and their characteristics and standards that can be manipulated to fulfil the objective of sustainable housing supply for the low-income, applying a deductive research method.

2. Theoretical Background

Increased attention is given to shelter provision in the international human settlement development agenda. A series of international conferences on human settlements were held culminating in the last Habitat III conference in 2016 on housing, and sustainable development issued a “New Urban Agenda” document setting global standards for achieving sustainable development and guidelines for how cities could be built, managed and how the lives of the people could be improved. Within its sustainable development goals, it focused on making human settlements more inclusive, resilient, safe and sustainable. The document gave strong attention to providing adequate housing, increased supply of housing, adopt resilient housing policies, and sustainable housing options such as incremental housing and sustainable use and management of land.

The global evolution of housing policies has passed through different stages, from traditional self-help to the involvement of the international agencies such as

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the UN-habitat and the World Bank, who financed self-help projects, to its macro-economy and the use and development of national finance and capital markets to enabling strategies and finally to whole housing sector development [1]. Later, sustainable development came as a guiding paradigm in housing and settlement development that all should commit themselves to. Sustainability is strongly linked to better management and use of urban land. Sustainability is about using the resources including land for current needs without compromising the needs of the future generations.

Global settlement development policies conclude that governments in developing countries are advised not to become involved in direct provision of finished housing. Governments are encouraged to adopt vibrant strategies taking into consideration enabling housing markets to work. Housing markets involve markets inputs, viz., land, finance, labour, services and infrastructure, building materials and the regulatory framework. It also involves improving the performance of the market actors and developers [2].

3. The Housing Policy in Khartoum

The housing policy in Khartoum is mainly dependent on allocating housing plots as sites-and-services. The local government of Khartoum adopted a housing project in 1990 by which more than 1,200 housing plots were allotted within a period that extended over five years. The chosen method carries the characteristics of sites-and-services projects, though it is likely an open plot distribution process. No clear alternative housing supply policies were adopted afterwards. However, the supply of plots was relatively high that affected the housing market, allowing the government to break for quite an extended period, extending until to date, not supplying sites-and-services housing plots.

It is worthwhile to explore the performance of the housing supply and market at this stage. Four strategies were apparent. The first was selling the government

reserved lands illustrated as GR in the survey maps of the city, which constitutes around about 20% of the housing areas, but a minor percentage of this area was allocated as medium rise apartments. The second was to convert part of the agricultural land within the urban boundaries into residential land. After conversion, some of the plots are owed to the original owner of the property and the part goes to the government and publicly resold. The third was to subdivide some of the remaining lands under the Investment Act of 1996 to be sold for all uses including housing. The fourth was to regularise squatter housing areas which are extensively mushrooming around the city, under the tolerant government actions towards the public land invasions. The central motivating factor behind these strategies was apparently to increase the local government revenues from land sales, not adequately considering sustainability and the fact that land is a scarce and diminishing resource that must be rationally subdivided and used. These strategies increased the supply of housing plots. It was assumed that plot prices decrease accordingly, but the expectations depicted that plot prices were fuelled up by the high rates of inflation that dominates the economy of Sudan. People tended to buy plots for capital storage, to encounter the negative consequences of high rates of inflation that is continuously increasing. Observations show that the culture towards selling land is also changing. Plots tend to be kept not only for its capital value but also for its social value and only sold under high necessities by landlords, who are mostly high-income not in a pressing need for housing.

The sites-and-services plots distribution policy served primarily two purposes. The first is targeting the low-income people and the second is political patronage of the government which was newly taking over and were apparently in need of support to establish themselves as a recognised government. Some of the first group could not afford to develop their land causing plots to be sold and “hijacked” by high-income people. Their parcels were sold to meet

other expenditures on living necessities. Family houses and new squatter areas served as a refuge for such group further proliferating creation of informal settlements. The whole process did not adequately meet the needs of providing affordable housing for the poor and the low-income people. This necessitates exploring alternative approaches to increase the housing supply under the current circumstances.

The government housing project of 1990 was implemented in a hurry without careful and sufficient studies before putting the plan into action. Apparently, no careful or clear market study, socio-economic surveys, affordability, project costs analysis, land cost analysis, demand and supply analysis, demand for services, infrastructure and appropriate site selection studies were undertaken. Plot sizes were chosen by the rule of thumb, ignoring that plot size is a function of population served in the housing scheme. Reducing the plot size increases the number of households acquiring a piece of land and vice versa. The housing project incorporated a cumbersome procedure of land allocation and complex bureaucracy of sorting and short listing of the applicants. The process did not involve a careful assessment of the available and usable land for housing within the urban growth boundaries, which were not demarcated. The proper evaluation of the housing land helps planners to adopt appropriate and sustainable land use strategies which were not adequately considered.

4. Characteristics and Problems of the Sites-and-services Projects

The housing project of 1990 released a large number of housing plots for low-income people as an unprecedented housing plan. However, problems accompanied the housing plan can be summarised as follows.

4.1 Low Affordability of Homeowners and Lack of Finance

The households acquired plots take protracted

periods to complete the construction owing it to the lack of funding and inability to save enough money to build the houses. A large number of plots are still vacant since the commencement of the plan in 1990 due to those reasons and a large number of those who started building have not yet completed them. Houses are built through self-help and the homeowners incrementally develop their homes depending on the flow and availability of cash savings. Often homeowners start constructing one or more rooms and a toilet and move in and gradually complete construction. Construction is usually financed through windfall money, financial support of expatriate family members, and personal savings as ROSCAs (Rotating Savings and Credit Associations).

4.2 Lack of Community Facilities

Newly built districts lack the adequate level of services such as schools, health services and mosques. The project does not involve the provision of these services. People tend to use the services available in the surrounding old areas causing pressure on them and causing additional cost burden on the homeowners themselves. It is assumed that community facilities are incrementally provided concomitantly with the district development process, but this is not likely the case. They are often supplied through self-help initiatives by the people themselves at later stages.

4.3 Low Standards of Infrastructure

The project does not include the provision of the minimum level of water supply, sewage, drainage and electricity causing the delay of construction and the development of the whole district. Most households dig wells for water and build pit latrines at the early stages of construction to be able to move into the plot and start incremental construction. The neighbours sometimes share these facilities.

4.4 Lack of Technical Assistance for Self-help Housing

People in the new housing projects build poor

quality self-help housing. They construct either by themselves or hire unskilled low-cost labour. They lack the adequate level of skills and training. Building materials used are mud, mud bricks and a mixture of mud and burnt red bricks, most as single-floor load-bearing walls construction. Roofs are mostly corrugated metal sheets, traditional jack-arch roof or concrete slab. People need technical assistance on best practice to improve the construction qualities and training on incremental development, awareness of building bylaws and planning regulations.

It could be concluded that the result was slow development of the low-income housing districts. Osman [3], found that 64% of new districts were vacant after ten years since the plan first initiated, for the new housing project, and 41%, 56.5% for the previous plans. Up-to-date figures show that 13.8% of Al-Azhari district, one of the new housing projects districts, is still vacant after twenty-five years [4]. However, the following period was characterised by higher speed of construction development due to the relative improvement of the economy following the settlement of civil, the peace agreement with South Sudan and exporting the discovered oil. After separation of South Sudan in 2011, the development of low-income district began to gradually decline because around 75% of the oil exports revenues went to South Sudan.

4.5 Plot Size Standards of the Housing Projects

Plot sizes standard is a direct and critical factor in determining the number of housing sites-and-services projects beneficiaries and rationalising the scarce urban land use. Minimizing the plot size increases the number of plots. Defining the appropriate plot size involves empirical assessment that takes into consideration a multiplicity of factors, such as household size, tenure, cultural aspects, environmental aspects, economic aspects related to affordability and technical issues relevant to building materials, labour skills, and incremental construction approach. Defining the appropriate plot size should be an intrinsic factor in the

housing policy. Large plot sizes exacerbated the urban sprawl, increased infrastructure costs, increased plot development costs, which is clearly observed in the city of Khartoum.

Zetter [5] argued that building and planning regulations and standards directly influence land utilisation. Technically, he assumes that plots with 1:2 and 2:5 frontage/depth ratios substantially reduce infrastructure provision costs, and that maximising plot coverage rationalises urban land use. He pointed out that district with 1:1:3 ratio, which he means 20% for roads, 20% for open spaces and services, and 60% for plots, is practically the best ratio [5]. It was found that only 50% of the urban housing land in Khartoum is allocated for plots, reflecting waste of valuable land. The ad-hoc adopted setbacks and plot coverage rules further aggravate the misuse of land. Regulations concerning resizing plots are not reviewed to stimulate plot development process and rationalise land use. More flexible controls are needed to use the urban housing land efficiently.

5. Chronology of Plot Size Standards in Khartoum

5.1 Pre-colonial Period (before 1898)

Before the colonial period, traditional housing types dominated all types of settlements where there were no official planning regulations regarding plot sizes or planning. Houses were built by the inhabitants themselves using local traditional techniques and local building materials, using mainly mud and thatch where the area was covered with forests and farmlands. Settlements were randomly developed. Plot sizes were very small and irregular. An excellent example of such native urban pattern is Omdurman City which was assigned by the Mahdist as a capital of Sudan.

5.2 Colonial Period (1898-1956)

With the fall of the Mahdists in 1898 and the advent of the colonial rule, Khartoum city was planned as the capital town, built on the European style. For the first

time in history, McLean prepared a master plan for Khartoum in the year 1912 [6]. He was a civil engineer who was appointed as a municipal engineer. The master plan zoned housing land into first second and third class based upon social and racial distinctions rather than land use planning rules [6]. The first class districts plots reached 1,500 m² and were uniquely assigned for Europeans, located on the river, well-built houses with trees gardens and irrigation system. Plot sizes varied accordingly, 800 m² for the first class, 600 m² for second class and 300-400 m² for the third class and 200 m² for the fourth class which was later added. The natives lived in 30 to 60 plot size houses in old Deims at the peripheries of the town in unplanned areas built with primitive and perishable materials. It was assumed that these sizes reflected the actual need of the low-income people at that time [7]. Arthur [8], pointed out that the previous old Deims before clearance was allocated as 50 m² (five metres by 10 metres), without sanitary systems or pit latrines. He argued that plot sizes were small that some families tended to obtain double plots. Later in 1937 plot sizes were increased to 200 m² as minimum lot size, to allow for pit latrines and sanitary facilities. The four-fold increase of the plot size remarkably improved the living conditions and public health. In early 1950's the old Deims were cleared and new planned ones replaced. Plots were 202.3 m² (12.78 by 15.83), and most houses were built with adobe or mud bricks. The new Deims plan was a monotonously and mechanically repeated cluster of 48 plots, composed of four blocks enclosing a private space, all in a strong-shaped grid pattern.

5.3 Post-independence Period (1956-1990)

The previous standards continued after independence in 1956 until 1965. A new housing plan

was initiated, where plot sizes were substantially increased to range from 300 to 360 m². Particular districts of Khartoum are Third Class Extension and Nasser districts. In 1959 a new master of Khartoum was prepared by the Greek planner Doxiadis. Although he proposed smaller standards for low-income groups, the plan significantly increased these standards. Table 1 shows the plot sizes recommended by Doxiadis Plan of 1959. Plot sizes for high and middle-income classes significantly conformed to Doxiadis standards, for example, in AlAmarat districts built in 1962. Generally, the housing projects of the 1980's aimed to reduce the plot size standards to maximise the number of beneficiaries and that the housing officials assumed that large lot sizes would cause urban sprawl. The plan aimed to reduce the plot sizes to range from 200 to 240 m². Never-the-less, these standards were not applied. 300 m² lot sizes were used in the next plans for low-income third class areas. Daak and Al-Mardhi [9], indicated that the housing policy defined 300 m² lot sizes for first and second class areas and 200 m² for third and fourth class areas which were later cancelled, being unsuitable and residents were socially often outcast. They indicated that housing areas were subdivided as 50% for plots, 35% for roads and open spaces and 15% for public services [9, 10]. Examining the housing standards of the low-cost housing projects in Greater Khartoum, it was found that the evolution of plot sizes does not show any tendency to either increase or decrease, but they are likely haphazard. In 12 projects plot sizes ranged between 180 and 300 m² [11].

In the following housing plans of 1968, plot sizes were again increased to the range between 360 and 460 for the low-income groups in the Sahafa district. They were reduced more in Arkawet district in mid-1970's

Table 1 Plot size standards of Doxiadis master plan (1959).

Income class	Corresponding housing class	Proposed plot size
High-income	First class	595-840
Middle-income	Second Class	315-592
Low-income	Third Class	135-252
Low-income	Fourth class	108-135

to approximately 360 m². The 1980's plans again reduced lot sizes back to 300-320 m² in Abu-Adam district. Never-the-less, Doxiadis standards for low-income groups were not strictly applied, but taken as a yardstick for all plans.

5.4 The Housing Plan of 1990 Onwards

This housing plan has distributed over 1,200 plots as mentioned earlier. Over 80% of the plots were allocated for low-income groups [12]. The project applied a lot size standard of 300 m² almost in the entire third class housing areas. Apparently, the reduction of the standards was caused by the need to maximise the number of beneficiary households of the long waiting lists in the housing plan that were continuously increasing due to rapid urbanisation and migration to Khartoum from all parts of Sudan. The method chosen to define the plot size is a rule of thumb. The allocation was not based on practical assessment of the land resources on which the need was to be empirically calculated for then and the future. In the year 2000, the sites-and-services project was suspended and no clear strategy was adopted alternatively, except publicly selling plots in auctions for local government revenues.

6. Plot Size Standards

Plot size standards vary from one country to another in the world's sites-and-services projects. For example in Latin America plot size was only 32 m², and 300 m² in Africa and the minimum lot size in Zimbabwe was 312.5 m². Research showed that such standards could be reduced down to range between 180 and 200 m². In Kenya, Egypt and India's plot sizes range between 120 and 150 m². In Zimbabwe, it was argued that the 50 m² lot size of a core housing project was not realistic [13]. Particular lot sizes of sites-and-services projects in India ranged between 25 and 35 m² and between 30 and 96 m² in the Philippines. Payne [14], argued that lot sizes in Africa are the largest in the world and they may be a reflection of socio-cultural factors. Dwelling sizes

were 22.2 m² in Dhaka, Bangladesh, 25-60 m² in Kumasi, Ghana, 44-56 m² on plots measuring 27-29 depth by 9-10 width in Harare, Zimbabwe and 29-46 m² in Helwan, Egypt [15]. It could be concluded that plot size standards in Khartoum are relatively high compared to many countries around the world and the urban sprawl of Khartoum needs to be countered. The urban fabric of the city requires consolidation, and the housing land utilisation also needs to be optimised concerning lowering the lot size standards.

The incorporation of plot subdivision as an essential part of the housing policy will contribute to increasing the housing supply for the low-income groups in many ways as follows.

6.1 Poverty Alleviation

Part of the plots can be resold by the landlord while keeping the remaining portion. Selling provides cash and assets that can help to improve the living standard of the household and therefore reduce the poverty incidence. The subdivided part can also be assigned for rent or establishing home-based enterprises within the plot allowing additional income for the household.

6.2 Realizing Security of Tenure

The illegally subdivided plots which are very common in housing areas cannot be formally resold because they are unofficially divided. Realizing legal security of tenure is one of the basic principles of the provision of adequate housing particularly in squatter areas. Plots legally acquired gain real market value, while the unofficially divided are often sold at lower costs.

6.3 Housing Finance and Affordability

The cost of the resold part can be used to finance completing or improving the remaining portion, by adding more rooms or services or generally improving the housing condition. Additional rooms can be built for rent. The cost of half of the plot in the new housing areas can finance building a traditionally built core

house in the other half. The resold one will be within the affordability of other low-income households.

6.4 Achievement of Sustainability

Plot subdivision conforms to sustainable development principles regarding best utilisation and rationalisation of urban land use. Increasing the residential density also conforms to sustainable development rules. Sustainable development is about meeting the needs of people to use the land and capital resources without compromising the ability of future generations to meet their own needs. Plot subdivision maximises the number of households served by the available infrastructure and increases the efficiency of the existing networks in the old residential districts.

6.5 Increased Housing Supply

More plots will be available in the housing real estate market targeting the middle and low-income people. More housing units will be available for rent and sale. The subdivision almost doubles owner-occupier tenures and doubles the housing stock at less cost.

6.6 Conformity with Legacy Apportionment Principles

In few years after allocation and after the original household head dies, the remaining members inherit the house and share its ownership. In Islamic communities, as the case of Khartoum, inheritance is subject to strict rules of rationing between the inheritors. Plot subdivision can, therefore, be easily tailored to the shares of the inheritors and conform to it. The unsettled legacy constrains the use, construction and improvement of the building. The official subdivision can realise security of tenure for all.

6.7 Provision of Varieties of Housing Sizes

Increased plot subdivision provides varieties of housing sizes. Instead of having typically allocated plot sizes, different plot sizes give more access to housing to the low-income groups.

6.8 Increased Owner-Occupier for Self-help Housing

Plot subdivision increases owner-occupiers who are key tenure type in self-help housing. People incrementally build their houses. Owner-occupiers spend part of their income in building and improving the house through self-help which is the primary mode of housing supply in Sudan. Other tenures such as rentals do not usually spend money on a house owned by someone else.

7. The Need for Plot Subdivision

Examples around the world have shown that, in principle, plots can be subdivided into smaller sizes, even extremely smaller than the current standards of Khartoum. Architects possess adequate capabilities to design these small plots, taking into consideration the environmental, social, cultural, economic and aesthetical factors that influence shaping the house. The traditional single storey house can be gradually converted into multi-storey buildings as it officially allowed in low-income areas and this will eventually increase the habitable floor space.

In the early stages of the development of Al-Azhari, one of the districts of the government housing plans, the plot size per person was found to be 61.5 m², which is high. In the same district the built-up area per person, was only six square metres. The total floor space per plot is 40 m², which means that the plot coverage is only 15%. However, this area gradually increases as a result of incremental development. This assumes that households were offered large plots while they cannot afford to build adequate space for them within the plot. If we believe that the current floor space fulfils the actual need of the family, this means that the remaining area is likely to be a surplus area that can be used for a variety of purposes including home-based enterprises. Such conditions support the idea of plot subdivision.

Theoretically, plots can be subdivided into smaller parcels in all the old housing areas. The process is informally operating but constrained by the strong and cumbersome regulatory system. The minimum

acceptable plot sizes can be empirically identified under the sociocultural, environmental and economical given data through serious research. Possible architectural solutions can be taken into consideration in the plot subdivision process. Accordingly, the 300 m² plot can be theoretically subdivided into two or three or four plots, assuming that a 75 m² plot can satisfactorily accommodate an average household. Similarly, the rule applies to larger plots of 400 m² or more in formal or informal housing areas. Practically, it would be somewhat challenging to subdivide plots in that way, as the outcome plots must have acceptable geometric shape and minimum frontage length. It was found that the minimum plot frontage should be six metres. These standards can be re-tested for Khartoum city case. Architects and urban planners possess the capabilities and can undertake the subdivision appropriately according to the viewpoints of the owners.

Houses in old districts of Khartoum are gradually converting into family houses as an inevitable evolutionary stage of sites-and-services projects. The first owner dies, the married sons and daughters still live in the same house with their wives and young children, because they cannot afford to live in a separate owned or a rented house. Family houses which have not yet been subdivided lack realisation of security of tenure and need to be divided according to the legacy shares. Owners are often reluctant to share maintenance and modifications costs and rarely agree to do that. Those married sons and daughters have two options. The first is that each married couples occupy rooms selectively and willingly and share the kitchens and bathrooms. This is in the case where there is a difficulty of physically splitting the house among them by building walls and building additional separate kitchens and bathrooms. This option adds a financial burden on the family members who are already low-income. Life quality, in this case, depends on how strong the social ties between the members and how

compliant they are with each other. The liveability in these cases is influenced by the lack of sufficient degree of privacy for each married couples and the existence of frequent clashes and conflicts between them. The second option is to illegally split the house into smaller independent units each with separate bathrooms and kitchens, and each occupied by a small family. Other problems involve construction and layout design problems and difficulties of family member's movements from one place to another. Houses are often unofficially subdivided by the small inheritor families but cannot be legally divided, because the legal subdivision rules do not conform to the desired way of the subdivision. Over 85% of the housing construction systems in low-income housing areas are load-bearing walls construction which can easily be subdivided, contrary to the concrete frame buildings which are difficult to split into separate independent units. The traditional low-income houses are rooms joined by verandas and open courtyards often used for night sleeping. It is usually cheap and easy to split.

Fig shows a case of a low-income house in south Khartoum before and after the informal subdivision. It was first lived by a family made up of a man, wife, four adult sons and two daughters in mid-1970. The house was incrementally built starting with two incomplete rooms, a kitchen, bathroom and a pit latrine, until it was consolidated in early 1990's as shown in the first plan. The second plan is recent one. The sons and daughters were married and the household head passed away. Two sons and a daughter acquired houses and lived separately. Other two married sons and a daughter stayed and informally split the house as shown in the second plan. The subdivision shows reasonable convenience of living by the smaller households but it cannot be legally done. The figure includes a space syntax analysis using gamma diagram, showing the distributedness of the first plan and less distributedness in the second plan.

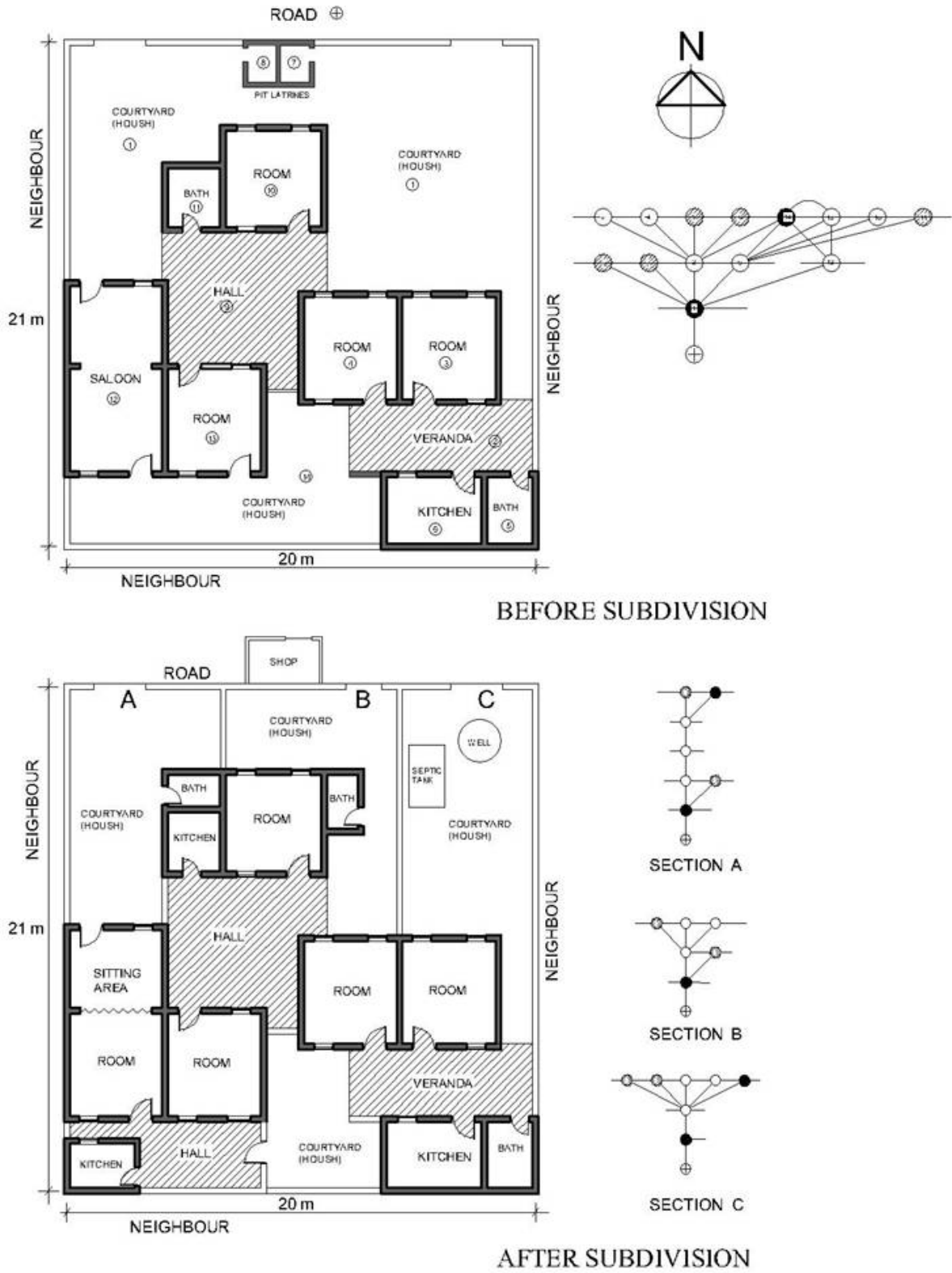


Fig. 1 A low-income house before and after subdivision.

8. The Legal Grounds of Plot Subdivision

The planning legislation in Sudan recognises and permits plot subdivision under specific conditions, based in “The Land Settlement and Registration Act of 1925”. The law is used in courts for settlement of land subdivision cases as a primary reference. The Act states that land can be divided if three conditions are fulfilled. First, the residual land should be a minimum of 400 m² in the first class areas, 300 m² in the second class areas, and 200 m² in the third class areas. Second, the plot frontage should be a minimum of 10 metres. Third, the frontage-depth ratio should be minimum 1:3.

The planning legislation also identified a minimum of 25 m² to register the area for individuals in the case of shared equity. The Land Registration Department identifies the apportionments for each person in the case of shared equity settlements, based on the inheritance rules or the desired ratios by the shareholders. Astonishingly, shareholders with less than 25 m² will, therefore, forcibly sell their shares or alienate them to another shareholder. Based on the *sharia* laws, other shareholders have the right of pre-emption, which means the right to possess or acquire by forced purchase another property, even if it was sold to someone other than a shareholder.

The Civil Dealings Act of 1984, has identified conditions for registration of flats and floors in apartments or condos. The minimum area eligible for formal registration is 120 m². This area does not simply work, because the majority of available flats are greatly below this size. It is assumed that units be registered as they were originally designed and approved, be small or large. Investors will be enforced to design their apartments with minimum 120 m² flats or more. Such conditions exclude low-income people from the housing market because large units are not affordable to them.

It is essential to differentiate between the minimum area for subdivision and the minimum area for registration. The first is 200 m² in third class housing

areas and the second is 25 m². The first is a condition for practically dividing the plot and the second is a condition for ownership and registration. Their non-conformity is a basic constraint of subdivision. The previously mentioned three conditions of plot subdivision are difficult to achieve in reality, and they are also constraining the process. Moreover, such conditions restrict realisation of the security of tenure which is a critical issue in the provision for adequate housing and a key question in housing supply policies. Apparently, there is a pressing need to reform the planning legislation for more flexibility and realism that can enhance plot subdivision with contentment that subdivision is a decisive factor for increasing the housing supply. It is clear that these legislations are not adequately and periodically updated. An Act that has been originated during the colonial period in 1925 still operates without substantial changes after more than 90 years and with its original attributes.

Staying for prolonged periods in shared ownership disadvantages the shareholders regarding financial losses and mostly building conditions deteriorate because they often refuse to spend for maintenance and up keeping. The law did not define a specific period for staying in shared ownership, unlike, for example, the Egyptian law which states a maximum of five years to remain in a shared ownership [16]. It is unclear what the bases for those conditions are. If they were based on the traditional building types, they are continuously changing, and new methods of construction are taking place. If they were based on the old traditional housing types, the plot size standards proved to be much lower in old Deims which reached 50 m². Even in fourth class districts, the plot was only 100 m².

The planning controls focused on the subdividing the plot but ignored the availability of a buildings structures on the plot, and whether those structures could also be split with the plot while minimising the costs and keeping the building. The cases will undoubtedly be treated appropriately if the courts employ and consult qualified architects and urban

planners and structural engineers because they will be capable of undertaking the tasks properly giving better results for the division process.

9. Conclusions

Although the government housing schemes have successfully supplied a large number of housing plots for the low-income people, some drawbacks have accompanied the process including appropriate standardisation of plot sizes. It was discussed that many advantages have resulted from plot size standards in the government site-and-services projects of Khartoum. Plot subdivision can be a rational solution to the dilemma of the irrational plot sizes adopted in those housing schemes. It can substantially contribute to poverty alleviation, realise security of tenure, contribute to housing finance and affordability of the low-income, and realise sustainable development measures. It also conforms to the principles of Islamic inheritance rules and conforms to the inheritor's shares and enables them to acquire and use their shares legally. Plot subdivision increases housing supply as a strategic aim of most housing policies. At the city level, the new housing districts lack necessary community facilities and infrastructure. Hence plot subdivision can reduce the urban sprawl, raise the efficiency of the infrastructure and public services and economise housing land use.

The research revealed the existence of cumbersome regulatory constraints that impede plot subdivision. The regulatory conditions for plot subdivision can hardly be realised or practically applied. So they need to be revised and reformed with an aim to increase the supply of plots. The research depicted that plot size standards can be substantially decreased without compromising the actual household needs and therefore contribute to increasing shelter provision for the low-income groups.

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