Assessment of Efficiency and Sustainability of Housing Plan in Khartoum

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Abstract — This study aims to investigate the efficiency and adequacy of Sudan Housing Plan that aims to attain the goal of the provision of comfortable and affordable houses for those who get a low income. Two districts were chosen as a study area, Alazhari Block 3 and Alawda housing project located in the south of Khartoum. BK3 representing the sites and service brand, furthermore, Alawda represents core buildings (flats) type. Both areas have been monitored for 16 years (2004 - 2020) using satellite imageries, local services committee queries, and field surveying. The study showed that only 34% percent of the 678 parcels of BK3 was built up and only 3% of the buildings were occupied for 30 years, suffering the deficiency of basic services, while 100% of Alawda 1216 flats were built and occupied with full services in 3 years. This gives the credit of efficiency and adequacy to the core type on the site and services type.

Index Terms — Housing, Parcels, Flats, Core, Grants.

I. INTRODUCTION

The land is the source of all materials and wealth. Where we get everything that we use or value, whether it is food, clothing, fuel, shelter, metal, or precious stone [1].

The improvement of civilization and community growth is the first and most important objective of every human settlement policy. These policies must facilitate the rapid and continuous improvement of life’s quality for everyone, starting with the satisfaction of the basic needs of food, shelter, clean water, employment, health, education, training, social security without any discrimination as to race, color, sex, language, religion, ideology, national or social origin or a different principle, in a frame of freedom, dignity, and social justice [2].

Housing represents one of the most basic needs of mankind after food and clothing. As an integral part of human settlement that fulfills a basic need in which people live, it constitutes a critical component in the social and economic fabric of a nation, and the performance of the housing is often seen as a barometer for measuring the salubrity or ill health of a nation [3].

Housing is paramount to human existence and the character of its process of provision is the construction of a large number of residential buildings permanently with adequate physical infrastructure, and social services in planned decent, safe and sanitary neighborhood to meet the basic and special needs of a population [3].

Housing problems are global phenomenon due to rapid growth of population and high percentage of poverty among people, particularly in developing countries. The high demand for shelter is faced on the other hand by the failure of the governmental housing plans to bear these needs. The direct result of this deficiency is the wide spread of the informal settlements, which adds heavy burdens and challenges to sustainable urban planning. The success of housing projects depends mainly on the availability of affordable, accessible, legally secured, safe, physically adequate, socially accepted and provided by main services, lands, and buildings.

Referring to the facts above, the United Nations paid high attention to people’s need for affordable and comfortable housing, as a basic human right. Vancouver Declaration on Human Settlements (1976), adopted by the United Nations Conference on Human Settlements in 1976. Section I (8) and Chapter II (A.3) state, respectively: (Adequate shelter and services are a basic human right which places an obligation on governments to ensure their attainment by everyone, starting with direct assistance to the least advantaged through guided programs of self-help and community action. Governments should endeavor to remove all impediments hindering the attainment of these goals [2].

The provision of housing for the low-income has been a major problem in many countries and the developing world has been hard hit [4].

Public housing programs have been criticized for failing to provide quality, affordable, and adequate housing units to the target population in the highest developed countries [5].

In Khartoum there is a high demand for affordable houses, as a matter of the rapid increase of population, migration from rural to urban areas due to wars, natural disasters such as drought, and the need of people for basic services and good living levels. The failure of the government to attain the goal of sustainable and affordable housing projects, together with the high prices of houses in the private market and high rates of apartments’ rent, forces the citizens to build houses in informal settlements.

The issue of the informal settlement in Sudan started in the 1980s. This affair concerned large cities particularly in the capitals of the states. The most widely influenced cities were Khartoum north, Omdurman, and Khartoum, the capital of Sudan [6].

The existence of informal settlements extensions applies a heavy burden on the public services and generates social, economic, political and security issues to the government. To avoid the challenge of the spread of informal settlements, the government established policies and public housing programs.

The Sudanese housing policies encompass two main types of programs. The first one addresses the needs of all sectors of the population for the provision of plots through

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site and services schemes. The second type provides small built core units (Incremental housing) for the low-income groups [7].

A. Khartoum Housing Plan

The Extended Housing Plan in Sudan procedure has two stages. The first stage begins by filling the Housing Application Forms distributed by the Housing Plan Administration, Ministry of Physical planning, State of Khartoum. The Application forms are classified to three levels based on the income and occupation: first, second and third class. This research is concentrated on first class type only. The following certificates are the required documents to complete the application form for all levels:

- Basic identification certificate of the applicant.
- Residence certificate (at least 10 years in Khartoum approved by local authorities).
- Marriage certificate.
- Children's birth certificates.
- Parents identification certificates (if they are alive both or one of them).
- Other family members under his sponsorship certificate
- Income certificate (approved by the employer or local authorities).

A copy of each of these documents is attached to the application form. The application forms, after they are signed and sealed by municipality officers, are submitted to the Housing Project Administration. Referring to the attached documents each application is verified carefully in the presence of the applicant, marks are given to each attached document and the sum is the total marks of the applicant. The second stage begins after the completeness of all applications in stage one. The applications are arranged ascendingly referring to the applicant marks, priority is given to the application of the higher marks. The applicants are announced through public media to come in a predefined place and date to appear before the Housing Project Committee to draw the lot that determines the number of his parcel and block. There are two options: sites-and-services (an empty parcel of land) or in rare cases core housing as an alternative housing policy (built-up flats). The chosen parcel number is stated in the contract against the identification information of the applicant. After the applicant paid the predetermined fees, the contract is signed, sealed, and delivered to the Registration Office. The applicant can claim the ownership certificate from the Registration Office after verifying that he is the owner of the defined parcel. Finally, the owner must extract building permission from state buildings administration (for sites-and-services) to enable the demarcation of his parcel by State Survey Administration to begin building his house. In the case of the built-up units (core housing), flats are built by the government, provided by basic services, and hence distributed to the worthy applicants. This study aims to assess the efficiency and adequacy of each type to attain the goal of availing houses for the people in a short time, provided by basic services, and of an affordable cost. The study had investigated the development of each type for 15 years, Alazhari Block 3 had been chosen to represent the site-and-service type (empty parcels) and Alawda project to represent core buildings type (built flats). The chosen applicants have owned Block 3 parcels in 1990. All the stages for Alawda core housing had been carried out and the worthy applicants were determined in 2014. Occupation of the flats started in 2015 and ended in 2016. The location of the two districts is in the southern part of Khartoum State in Jabel Awlia locality.

In reality, there are thousands of plots granted to the applicants according to site-and-service type, these plots suffer the lack of basic services and high cost of building construction. Previous facts are the direct justification for these plots to be unbuilt for a long span of time. The total number of the flats granted to the applicants according to core housing type is very few and this type is rarely implemented and take long time to be repeated in the same manner depending on the availability of required fund.

II. MATERIAL AND METHODS

A. Study Area

Alazhari block 3 and Alawda Housing projects are part of Jabel Awlia Locality, State of Khartoum, East of Alsalama and North of Suba Alaradi, between latitudes (15° 29’ 15’’ N and 15° 30’ 45’’ N) and longitudes (32° 36’ 15’’ E and 32° 37’ 31’’ E). The distance between the two districts is 2 kilometers apart.

B. Data

- Satellite imageries downloaded from Google earth for years (2004 to 2020).
- Data Collected from Services Committees of the two districts.
- Field surveying in the study area.

![Fig. 1. Starting of a building in Alawda core housing project (2012).](image)
Table 1 below contains data collected for the first-class two types of housing, Alazhari block3 for site and services type and Alawda for core buildings type:

| Item                                | Alazhari Block3 Sites and Services Project | Alawda Core Project |
|-------------------------------------|--------------------------------------------|---------------------|
| Type of Ownership                   | Leasehold (public grant)                   | Leasehold (public grant) |
| Total Area (meter²)                 | 600000                                     | 100000              |
| Number of Units (plot/flat)         | 668                                        | 1216                |
| Starting Date                       | 1990                                       | 2012                |
| Building Duration Date              | 1990 - Now                                  | 2012 - 2015         |
| Building duration period (years)    | 30+                                         | 3                   |
| Percentage of Built Units (2020)    | 34%                                        | 100%                |
| Occupation percentage (2020)        | 10%                                        | 100%                |
| Services (2020)                     | Water, Electricity, Mosques                | Water, Electricity, Mosques, Primary Education, Public, Sewerage, Drainage, Internal Roads (interlock), Security |
| Payment Facilities                  | Once (in advance)                          | 20% in advance + 100 monthly rates |
The worthy applicants of the flats in Alawda were determined and announced in 2014. The worthy applicants of parcels in Alazhari block3 received their parcels ownership in 1990.

The buildings in Alawda started in 2012 and finished in 2015 (figure 1.2), provided by basic services (table1)

In block 3 in 2004, only 5 owners started building their houses (figure 5) (after 14 years of ownership) in the absence of all public services (water and electricity services started in 2009) and the high cost of buildings material.

Research revealed that building materials were the most important factor in the process of house projects. Generally, it is very difficult to construct a permanent structure with affordable and sustainable building materials [7].

Failure of owners building their parcels and the need for shelter force some owners to sell their parcels and use the gained money in buying houses in informal settlement areas.

The total area of Alawda project is 100000 square meters occupied by 1216 beneficiaries and the total area of Alazhari block 3 is 600000 square meters (6 times of Alawda area) owned by 668 beneficiaries (0.55% of Alawda) (Fig. 3 to 6 and Table 1).

In 2020, only 225 parcels of Alazhari block 3 were built up out of 668 (figure 6 and table 1). 100% of Alawda flats had been occupied since 2016 provided by basic services. Only 30% of Alazhari block 3 houses had been occupied up to 2020 provided by water and electricity public services in unstable manner (Table1).

Regarding the objectives of the government housing policies in the provision of affordable houses for those who get a low-income and the mitigation of the extension of informal settlements, sites-and-service housing type does not attain these goals due to the high cost of building materials and deficiency of basic services. This type occupies wide areas of land and their wide horizontal extension slows the provision of basic services, which lengthens the span of time for owners to build their houses. The core buildings type has the advantages of a short span of time for building the flats with the provision of basic services, accommodation of two times the number of owners of sites and services in about 1/6 of the land area of sites and services and with a very short time for the occupation of the owners with low cost distributed for a comfortable long time. Although core type has the credit to satisfy the goal of adequacy, but still it is far away from satisfying the goal of the provision of houses for a considerable number of low-income applicants. The two types do not satisfy sustainability goal, which direct the low-income individual to informal settlements.

### III. RESULTS AND DISCUSSIONS

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Table 1: Data of housing types.

| Housing Type | Number of Homes | Percentage |
|--------------|-----------------|------------|
| Core Building | 1000 | 50 |
| Core Services | 1500 | 75 |
| Total | 2500 | 100 |

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### IV. CONCLUSION

Professional Experience: STAFF MEMBER (now associate professor), Sudan University of Science and Technology, College of Engineering, School of Surveying, 1991-present. SURVEYOR, Sudan Survey Department, 1984-1988 (2 years relief without without payment), SURVEYOR, Saudi Arabia- Almedina Almunawara Manyclopedia, 1986-1989. CONSULTANT for survey works for study and design of Dongola-Arjeg – Sudan express road (365 km) – Daehan Consultant Company (South Korea), 2010.

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