

**INTERNATIONAL JOURNAL OF
INNOVATIVE RESEARCH AND KNOWLEDGE**

ISSN-2213-1356

www.ijirk.com

**UNDERSTANDING THE SOCIO-ECONOMIC ASPECTS OF
SLUM DWELLER: A case of Korogocho slum in Nairobi, Kenya**

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Abstract

Urbanization and industrialization in Africa has led to rapid population growth within cities as a result of rural-urban migration. Kenya, just like most African countries has a high urban population growth rate of 6-7% per annum yet the production of affordable housing by the government does not match the population growth rate thus leading to housing deficit. Kenya, through Article 43(part b) of the Constitution (2010) establishes the right of every person to access adequate housing and reasonable standards of sanitation which is not the case as over 60% of the urban population still lives in the informal housing. This paper seeks to understand the slum dwellers wholesomely, by investigating the slum demographics, livelihood, health, security and social parameters as well as the forces behind space use. Korogocho slum was chosen for case study where 59 households were selected and qualitative data was collected using interviews, survey questionnaires and observations. The information collected was analysed using qualitative analysis techniques. The study revealed that the space use in the slum set up is informed not only by the demographics but also, social, livelihood, security and health parameters and that indeed there exist innovative ways of use of the space. The study recommends that upgrading projects are best done in situ, by improving the economic prospects and social empowerment of the dwellers, creating safe and healthy environments.

Keywords: *slum dweller, socio-economic fabric, space economy.*

INTRODUCTION

Urbanization and industrialization is responsible for population growth due to migration and in-migration. Globally, it is estimated that by 2025, almost 60% of the population will live in towns and cities with African countries having the fastest urbanized cities since independence (UN-Habitat, 2012). African cities have grown in size due to rural– urban migration while their urban services and infrastructure has remained the same leading to mismatch between economic and urban growth. Globalization has resulted to one billion people living in urban areas to dwell in slums without adequate shelter. Like most African countries, the urban population growth rate in Kenya is 6-7% per annum and the production of affordable housing by the government does not match the population growth rate thus leading to housing deficit (Government of Kenya, 2010).

In the UN-Habitat's Sustainable Development Goals (SDGs) 2015, goal 11, priority target was to ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums by 2030 (Government of Kenya, 2010). Kenya, through Article 43 (b) of the Constitution has established the right of every person to accessible and adequate housing and to reasonable standards of sanitation (Government of Kenya, 2010). This had not been the case as most urban dwellers were still living in slums which are crowded and unhygienic, since the Government had failed to provide enough affordable social housing, as recognized by Kenya's Vision 2030. Proper response to affordable social housing must entail understanding the context of existing livelihood of slum dwellers, their social organization and space economy. However, Kenyan Slum Upgrading Program (KENSUP) was not fully responsive to the issues of low cost housing by being totally oblivious of the socio-economic structure of the slum dwellers in their recent slum upgrading projects. This was manifested by not having integrative housing development that considered socio-economic fabric, social organization and space economy of slum dweller. In addition, some other reasons were that the initiatives tend to focus on large scale projects instead of zooming into a particular group, thus failing to understand the social, economic and physical needs of many different groups within the slums.

This study seeks to investigate the existing slum demographics, livelihood, social and physical environment influence on the slum dwellers space use. A clear understanding of the slum dweller's setting, socio-economic status, wants or priority of needs of different slum stakeholders and governments. Understanding this would lead to slum upgrading proposal that would be integrative, economically viable and socially accepted by the slum dwellers.

FACTORS AFFECTING SLUM/HUMAN BUILT ENVIRONMENT

According to Rapoport (1969), buildings and emergence of settlements are as a result of the man; his nature, aspirations, social organization, world view, way of life, social and physiological needs, individual and group needs, economic resources, attitude to nature, personality fashions, physical needs and building technologies available. The interaction between these elements and nature; physical aspects, such as climate, site, materials and structural laws results into house forms. As houses being the direct expression of changing values, images, perceptions, and way of life, it becomes very necessary to understand the new perspective of the factors affecting house forms. Studies have been done and building prototypes developed in Kenya for KENSUP (Kenya Slum Upgrading Program) which are oblivious of how the slum dweller normally come up with their shacks, their priorities, the reason behind their site selections, and the building technologies used. This study attempts to discern the forces behind the slum built forms, trying to relate their way of life, priorities, means of livelihood and

social organization influence on their space use. This section focuses on evaluation of other scholars theories on the underlying concepts on human form emergences especially among the peasant societies.

In past people were more concern about holistic orientations, were highly responsive to site, climate, topography for physical comfort and peaceful microclimate within the house. Today man have advance in technology that he can overcome several of these factors according to his need and desire.

Today choices are excessive which has given rise to new factors affecting the house form, which in the end seems to dominate our traditional values and cultural ideas. Phenomenal urban growth has put man into a very unprecedented environmental situation, to the extent that he is unable to relate himself with his habitat. However, one can argue that modern symbols related to house are as strong as those of the past and still take precedence over physical aspect. Modern man may still have his own myths and the form of house, while very different in their specifications, may be motivations or priorities, which are not completely different from those of the past, and still primarily be sociocultural (Rapoport, 1969, p.133). Ideally, houses according to Vitruvius orders should be structurally sound shelters (*finitas*), accommodate human needs (*utilitas*) and they should be beautiful like Venus (*venistas*) where beautiful is again a varying shared societal image.

The following theories as summarized have been brought forward and supported by other scholars as primarily influencing house forms and they are discussed below.

Basic needs concepts

The common basic human needs such; shelter, clothing and food. Shelter has always been the basic need of humankind, today and throughout history. In the past, nomads used to first live in open air, near to source of food and water. They chose location that could be defended against predators and rivals and that were shielded from the worst weather. Later with understanding due to evolution, they started living in caves or in the open air, with little of formal structures for living in, such as tents and huts. In an attempt to meet their basic needs easily and more efficiently, they later started living in the communities which shared a common beliefs, way of life and depended on each other for survival in terms of livelihood achievement and social interactions. In his book *House, Form and Culture*, Rapoport (1969) looks at other specific basic needs as shaping up the house forms i.e. breathing as a basic need influences the built form of a people in regard to how they handle fresh air and smells.

Lighting levels and comfort as variable impacts on the general form of buildings, hence there is need to study the slum dweller and ascertain what exactly they consider comfortable.

John Turner(1972),similarly, argues that housing depend on a particular functions which in turn depends on variables of human goals which are held by a household at any particular time and vary with context. In fact he describes housing holistically as materially measurable components (in terms of structures), serving the specific housing needs and other non-quantifiable basic, vital and existential needs that underlie them. In a slum upgrading scenario, where actors are the residents (slum dwellers), their social, economic or political engagements, and intended future goals and achievements should be influenced by the vital and corresponding housing needs. This brings into play the issue of hierarchy of needs in different income categories of people. The basic and specific needs should be well defined and accurately interpreted within a context and in case the observer (in this case the designer) has information on their housing resources available at a particular time, then they will be at a position to propose a reasonable accurate housing solution for the particular income group. The study deduces that for low income groups, the vital need is opportunity. These categories of people tend to create opportunity that will empower them economically and socially out of the slums areas. At this stage, Turner posits that other needs such as security or identity is the least of their concern, their main interest is survival hence their housing need should strive to allow proximity to unskilled jobs. Once the opportunities are met and the livelihoods are improved

through education and employment opportunities then they graduate to being less poor, thus their priorities changes as well.

At this stage security becomes their vital need for their future plans and goals, so their housing should reflect this. This rise in class continues accompanied with change in needs and priorities. From Turners theory of priorities of need, the study concludes that as long as urbanization caused by rural to urban migration exists, lower income level (slum dwellers) will always exist. Thus the best way slum-upgrading projects can impact on their lives positively is by providing housing that maximizes on opportunities such as infrastructure, jobs, education etc. as this is the vital need of slum dwellers at this stage. Spacious rooms, sanitation, security and the rest may not be their priorities at this time. For example, upgrading projects such as Brazil's Favela Bairro programme concentrated on urbanization of the settlement by providing infrastructure and social services (Mariana, 2013). So was CODI in Baan Mankong programme in Thailand. Besides, Mathare 4A and Kambi Moto projects' socioeconomic survey ascertained the priority of needs of the dwellers as being infrastructure and sanitation. Thus these upgrading projects entailed provision of infrastructure (Gitec Consult, 1995). This was in accordance to Turner's opportunity as being at the helm of priorities and entailed provision of infrastructure thus allowing for easy movement of people and goods in and out of the settlement, ensuring healthy conditions for operations. Therefore it is vital for any designer involved in the upgrading projects to know what the slum dweller has, what are their expectations, alternatives, before concluding on what kind of housing prototypes should be offered.

Social organization, integration and stratification of a people

In his book; *Ten books on Architecture*, translated by Morgan (1914), Marcus Vitruvius notes that men were born like wild beast, in woods, caves, grooves and lived on savage fares. It's through discovery of fire that brought them together (socialize) and from there they started constructing simple structures. Through social interactions, they were able to learn from each other and modified their inception idea of a dwelling. Therefore, social organization of a people actually influences their built forms. In addition, Pearson and Richards (1994, p.17) uses Giddens' theory of structuration, which provided conceptual approach where social structures (as embodied in traditions and social rules) have a dialectical relationship with human actions. It is further concluded that structures are both the medium and outcome of social practices that are continually modified as action that constitute them change. As a result of this structuration theory, spatial structure is not only seen as an arena in which social life unfolds, but also as a medium which social relations are produced and reproduced. i.e. environments are not only thought about before they are built but are actually built in order to think. This relationship is essentially dynamic and reflexive i.e. we first shape our buildings then afterwards our buildings shape us. This relationship is dynamic, subtle and complex since effects of environment are not direct, passive or readily predictable. Understanding the social organization and behaviour is essential as there is a direct link between the later and their form of settlements, i.e. by first understanding of the behaviour patterns, their view of life, including desires, motivations and feelings is essential to understanding the built forms, as the built forms reflect the embodiment of their patterns. On the other hand the forms, once built, affect behaviour and way of life. Therefore any outside designer should be at a position to understand those two aspects in order to come up with an integrated slum upgrading program as shelter is regarded as a social unit of a space. Rapoport (1969) explains how western notions of comfort, adequate lighting, heating, pleasant smells, absence of smoke, privacy, bathroom hygiene may not be shared by other cultures. According to Pearson and Richards (1994), many people like to consider that their taste or way of living is unique to them, that individuality is a concept that enables each of us to have the freedom to express ourselves uniquely. Yet uniformity in structuring our domestic shells is predicated by age, gender, class, ethnicity and other aspects of social context. The house not only embodies personal meanings but also expresses and maintains the ideology of prevailing social orders.

Therefore an upgrading project should be at a position to capture the meaning of the existing spaces in the informal settlements if at all it is to respond to them. The thought behind their existence and after their formation, the influence they have on the behaviour of the dwellers should be well understood as it has a direct influence on the proposal for upgrading. The existing spaces in the informal settlements should therefore be studied in relation to the social orders and behaviours in the slums as discussed below.

1. Households composition and characteristics i.e in terms of size, age, sex composition, single and polygamous families, who are head of families. Family structure among them: the size of basic family, extended; monogamous/polygamous exogamy and their influence on the space planning and form. Housing plans, and forms are greatly influenced with the sizes of households such that the bigger the family the bigger the house and vice versa, but this is subject to discussion. Sex composition mainly influences the privacy levels, positioning and use of some shared facilities like washrooms. This also influences the probability of crowding and emergence of the anti-social behaviours. The house hold character also influences the housing prototypes that are needed in the slums/peasant societies as posited by Rapoport (1969).

2. Social function of dwellings/Lack of Differentiation i.e. is there clear definition of function and spaces within informal settlements. According to Rapport (1969), lack of differentiation of functions and forms is a major characteristic of peasant societies and this affects the resulting form type. This lack of differentiation is witnessed in their various aspects of life, thoughts, space and labour i.e. there is no separation among a man's life, work and religion. This lack of differentiation in the vernacular industrialist countries and peasants is also witnessed in the developing countries informal settlements. The scenario is innovative such that, a room can be a lounge during the day, removing the furniture it can be transformed to a meeting space/gathering /prayer room, at night the same room is converted into a bedroom at night. This multiple use of one space for different functions should be well captured in upgrading project as it saves on space required. According to Pearson and Richards (1994), in the modern scenario, the places of work and leisure have been differentiated and yet where people live is more determined by their place of employment. To some extent this explains the springing of slums next to high end residential areas such as Kibera, next to transport systems or near an industrial park in Kenya such as Mukuru Kwa Njenga (Mitullah, 2003). In his book, Freedom to Build, Turner (1972) notes that housing should be judged as a function of what it does in the lives of its dwellers, the role it plays i.e. allowing food preparation, clothing, and care for our bodies, procreation and nurture of children rather than being judged by its material quality. Once the role of housing is established then the structures should be designed that satisfies the above mentioned roles. Therefore since the slum dweller is the master/ expert in their own situation then they are better placed to come up or involved in the design and construction process of their dwelling. These considerations therefore influences the upgrading projects of a settlement in terms of acceptability and it's economic viability. Thus in situ upgrading witnessed in Kambi Moto and Baan Mankong, Thailand ideally seeks to upgrade the settlements while maintaining the social and economic orders. In fact, according to Gitec Consult, 1995 it is recommended that in case of an upgrading, the streets should be designed to maintain it's multi-functional aspects such as economic and social networks. In case of a relocation, Boonyabanha (2009) notes that it should not be so far away from the original location so as not to interfere with the already established networks.

3. Social interaction between the people: Settlements arise from people who share certain generally accepted goals and life values. The social interaction in the neighbourhoods will influence their use of space in terms of social gatherings of different age groups and at different times i.e. where people meet, is it in the house, streets, bath etc. This interaction will actually affect the urban orientation as was the case in Baan Mankong (Boonyabanha, 2009).

Economic activities (livelihood)

In an economy of scarcity as in the case of slums, the need to survive and use resources maximally is essential and this influences their settlement patterns and housing forms. The means of achieving livelihood affects their overall space planning. Together with the differentiation as a concept discussed earlier, this influences their internal space partitioning and settlement patterns as a whole. Rapoport (1969) sites that peasant houses plans are arranged according to the economic requirements i.e. they are characterized by work, storage and living. Their means to livelihood impacts directly on the choice of site for slum growth. In most cases, slums sprung up adjacent to industrial areas, or high end neighbourhoods. The distance to the source of employment is kept as minimal as possible, justifying their lack of differentiation on a bigger scale. Since most of their livelihood activities such as small scale tailoring, carpentry, welding etc. require longer working hours to achieve substantial profits, their workplaces are situated next to the residential houses to achieve efficiency in both social and economic life (Mukeku, personal communication, July 06, 2015). Thus an integrative slum upgrading project should come up with housing typologies that strikes a balance between livelihood and social life. In addition to that, in the modern scenario, economic considerations always have an impact on investment and building decisions. Cost versus benefit, payback analysis, internal rate calculations, assessment of risk and inflation are some of the standard tools used in feasibility assessment of an architectural project. In his book, *New Architecture and Technology*, Gyula and Pollington (2003) notes ‘... Architects are frequently compelled to insist on their design in the face of economic objections. They must learn to live with economic influences and eventually to fight for the realization of their ideas and, in other cases, to accommodate the necessary adjustments or revisions...’

SUMMARY

The above discussion indicates that demographic dynamics such as household sizes, age, gender, sex distribution, income, social stratification and livelihood all has an influence on the built forms. Besides, it’s also true to deduce that as much as the slums are in a dire need of improvement of sanitation and other services, it is clear that there exists innovative ways of efficiently using the scarce space to accommodate both their livelihood and social life at a minimum costs e.g. use of vertical neighbourhoods, combination of work, living and storage under the same roof etc. With their meagre level of education and technology, the slum dweller have actually evolved their skills from generations and mastered what technology best suits their needs and at the lowest cost. In addition to that, different theories by other scholars in an attempt to explain the relationship between the housing demographics and the resulting built forms include:

- i) Housing being informed by priorities of basic, vital and existential needs as this will generally influence choice of site and the housing typologies.
- ii) Function of the dwelling unit which is mainly informed by social and economic activities resulting into innovative space use to accommodate all these innovative space use and functions under one roof (lack of differentiation).
- iii) Economy / livelihood also influences the capability of the dwellers to invest in housing as well as informing the space layouts and use. In an economy of scarcity, the ability to use the minimally occurring resources and technology available to achieve housing that actually satisfy their basic needs.
- iv) Modifying factors such as climate, physical environment and construction materials and technology also affects the final form of the housing.

Finally, from the discussion above and the cases alluded to, it can be concluded that the slums have characteristics which remain constant despite an upgrading project and variables which can change depending on environment without much resistance from the dwellers.

RESEARCH METHODS

This study was based on a cross-sectional survey carried out around June to August 2017 with the study area being the eight villages within Korogocho slum. This survey allowed for a comparative analysis of the eight villages in terms of their socio-economic organization as well as their physical characteristics and layouts. Apart from being the fourth largest slum in Kenya, Korogocho slum was chosen by the authors due to interaction with the dwellers on a daily basis thus strong social bonds and its proximity to the home place. The slum also portrayed inclusiveness of the variables being investigated.

Korogocho slum had a population of 42,000 inhabitants according to 2009 census with 18,386 households and a high population density of 47,895 people/km² (Government of Kenya, 2009; UN-Habitat, 2012). Korogocho slum was divided into 8 villages namely; Grogan A and B, Korogocho A and B, Highridge, Gitathuru, Kisumu Ndogo and Nyayo (**Figure 1**). Multi-cluster random sampling was used to establish the sampled homestead. The socio-economic organizations were studied as well as the physical characteristics and layout of each village. Multi-cluster random sampling was used to select a representative sample of 59 households from 8 Korogocho slum villages (**Table 1**). The chosen sample size was statistically adequate and manageable according to researchers' time and financial constraints. The authors worked closely with village elders to access the randomly sampled households. This was important to assure the researchers' security and recognition to structure owners and tenants as Korogocho slum was the fourth largest and most dangerous slum in Nairobi. The data collection techniques used for this study were interviews, observations and questionnaires. **Table 2** shows a summary of parameters, deduced from the literature review, that were investigated in each household using these research tools. The data was analysed using qualitative techniques that included descriptive and graphical presentations.



Figure 1: The eight villages in Korogocho

Source: Compiled from Korogocho streetscape UN-Habitat, 2012

Table 1: Calculating representative sample of households in Korogocho villages

Korogocho Villages	Population of Villages	Proportion Populations	Ratio of Population	Sample size per village (ratio x 3)
Grogon A	1,471	0.08	1.6	5
Grogon B	2,022	0.11	2.2	7
Korogocho A	2,574	0.14	2.8	8
Korogocho B	2,574	0.14	2.8	8
Gitathuru	2,758	0.15	3	9
Highridge	4,413	0.24	4.8	14
Kisumu Ndogo	1,655	0.09	1.8	5
Nyayo	919	0.05	1.0	3
Total	18,386	1		59

Source: Field survey, 2016

Table 2: Physical, social and economic characteristics of households and its neighbourhood within Korogocho slum

Building type	Household demographics statistics	Housing constants	Architectural / planning constants
Residential (single, polygamous, monogamous, others)	Household heads, age, gender and occupation Type of family Total number of people in a household	Communal living Sense of security Separation of functions Shared priority of need	Planning principles used to achieve security for instance courtyards, fenestrations, lighting, ethnic segregation
Commercial (Kiosks, restaurants, movie theaters; others)	Monthly income Monthly expenditure Basic and luxury furniture	Minimization of expense in daily life Territoriality Construction materials	Space or time differentiation of functions. Housing typology for commercial, residential or mixed use
Institutional (religious, hospitals, school, others)	Nature of livelihood Number of owned rooms Tenant	Cultural orientation Social stratification Ethnicity	Innovative use of scarce space Villages identity based on street character, social and economic activities
Light industry (tailoring, carpentry, others)	Structure owner Type of tenure system preferred	Political or economic status	The influence of family size on housing priorities and choices
Mixed use (commercial-residential)			

Source: Field survey, 2017

RESULTS

The purpose of this study was to establish the social economic and spatial dynamics of the slum dwellers. Below are the findings from the eight villages of Korogocho where data was collected.

Type of households & their sizes

Majority that of the households are monogamous (62.5%), followed by single families (35%) i.e. widows, widowers, bachelors, bachelorettes, and single mothers. There was a rare instance of polygamy (2.5%) witnessed. This can be attributed to the tight economy of scarcity that does not allow room for luxury for men to marry many

wives. This was further illustrated when 40% of the households lived with extended families while 60% just lived with their nuclear family. The household sizes varied according to the number of rooms occupied and the type of ownership of the structures as well. For tenants, their family sizes ranges from 1, 2 with majority being 4 to 6 members staying in a single room of 3metres by 3metres. On average, tenants have a family size of 4.3 persons per house though in some isolated cases, where the income was Ksh.20,000 and above the tenants tend to live in 2 or more rooms. On the other hand, structure owners tend to have larger family sizes with 2 to 4 or more rooms to live in. Their average family size is at 7.8 persons per household living in an average of 3.6 rooms i.e. ranging from 2 to 8 rooms. Besides, for security reasons influences on the number of rooms owned e.g. in Grogon B, structure owner(Jayne Kalekye) stays in more than 4 rooms as the place is so isolated, next to Mathare river and prone to robbery hence she lost all her tenants as they moved out to more secure places. On averagely, out of 40 sampled households, 55% lived in single rooms, 27.5% in two rooms and 17.5% in three and above rooms.

Social stratification

Korogocho shows a strong sense of division along ethnic and political orientation and status quo to some extent and these are reflected in the 8 villages as shown in **Figure 2**. Villages such as Korogocho B, Gitathuru and Grogon B are Kikuyu dominated while Kisumu Ndogo and Nyayo are Luo dominated as Highridge is Somali's dominated. This segregation along ethnic lines can be attributed to the need for security and social wellbeing i.e. they feel safe living among their tribes mate. Highridge was among the well-off villages in Korogocho with economic activities such as house- help (ladies washing clothes for living) only witnessed in this area alone and dominated with tailoring and small scale garment industries. Since Kenyan politics is played along tribal lines, this was well depicted in the settlement as a whole. Additionally, there was a high sense of territoriality within the villages to an extent that the thieves that hang around the road are only allowed to target strangers passing within their villages beyond which they cannot trespass to the next village. These youths hang along the main roads, such as Kamunde road as it is the busiest with strangers coming to the settlements for various reasons including purchasing of cheap merchandise. The youths also form the security of the village and each household pays Ksh.200 per month for security. The elderly on the other hand have a tendency of sitting for '*kamkunjis*' in the evening discussing politics and other issues. The young ladies after finishing house chores, either go to the market to sell or just sit by the road sides, relaxing, gossiping and plaiting each other. Some of the house chores such as washing were carried onto the street. The Entire Korogocho has two Mosques and they are all located in Highridge where there's a dominance of Somali's and Muslims. On the other hand, there were a number of Pentecostal churches spread across the settlement.

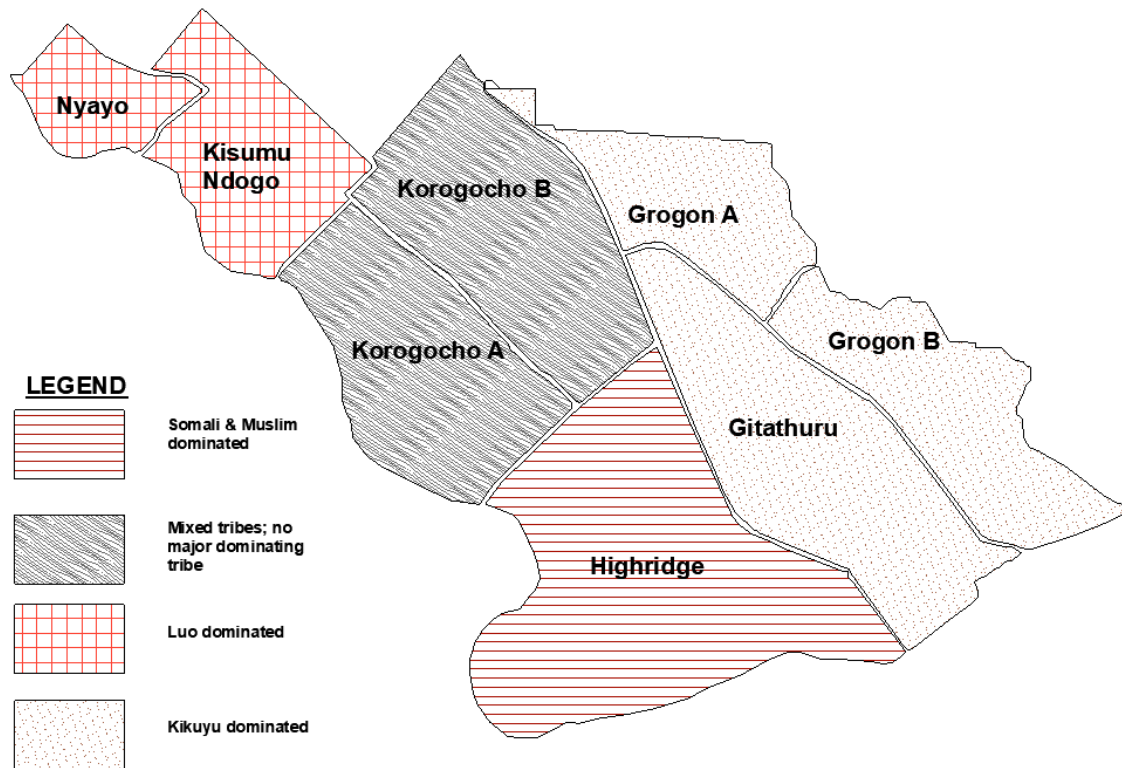


Figure 2: Ethnic segregation reflected within Korogocho villages. Source: Author, 2017.

Social engagements

Organizations such as Hope raisers organized events to showcase the talents of the youths such as the yearly Korogocho Cultural Festival. During this event, workshops are held where the youths are educated on ways of how to use their talents such as music, poetry, acting etc. to earn a living. Consequently, the author identified music, acting, beadworks, painters, movie creation (animation), writing, poetry and modeling as some of the activities engaged by the youths. The workshops and exhibitions took place at the rooftop of Landmark Plaza. This explains the need for a performance theatre, exhibition spaces for showcasing various talents (for a capacity of 100 people and separated by differentiation of time). Educational spaces for some entrepreneur skills are also important. The use of the same spaces for several functions is a common phenomenon in the slum areas hence the functions such as exhibition, workshops as well as performances or talks can occur in the same space just differentiated by time and achieved by use of foldable partitions and movable multipurpose furniture. They have least interest in their housing or planning of their settlements so long as they get a space to do their performances and exhibit their talents. Other organizations supporting the women such as 'link the hidden treasure' would also benefit from this development as they will be able to access training halls and exhibition space for their hand crafted works. Due to lack of open spaces for playing, children play along the streets and open sewer drains that endangering their lives.

Social misgivings/evils

Just like most slums in Kenya, where there are crowded people staying together in inhuman conditions social evils are bound to rise. In Korogocho this was mainly rampant among the youths. Due to lack of employment opportunities maybe because of lack of education or structural poverty, the youths become idle and engage in

social misgivings to either earn a living or forget about their problems. Cases such as drug abuse and delinquency were common among the youths who were born and have grown in the neighbourhood and did not get any formal education, or if they did, they dropped out. Peer pressure was cited as the cause of primary school drop outs and kids joining drug gangs, and getting into robbery. Girls on the other hand are also vulnerable to these evils as they get lured by their brothers or boyfriends to join the criminal lifestyle. Some of them get into early motherhood, stop their education and are left with prostitution as their main source of income or armed robbery/carjacking baits for their male counterparts. With organizations such as Link the Hidden Treasures which is involved mainly by rehabilitating young women who have been criminals in the settlement, by teaching them better ways of earning a living hopefully this will impact largely and positively in their livelihoods. Confirming the survey done by UN-Habitat, 2012 on the impact of street upgrading, Grogon was listed as the most dangerous places with incidences of murder, guns, rape, robberies etc. being reported (**Figure 3**). Kisumu ndogo was associated as unsafe and prone to stone throwing by the residents as well.

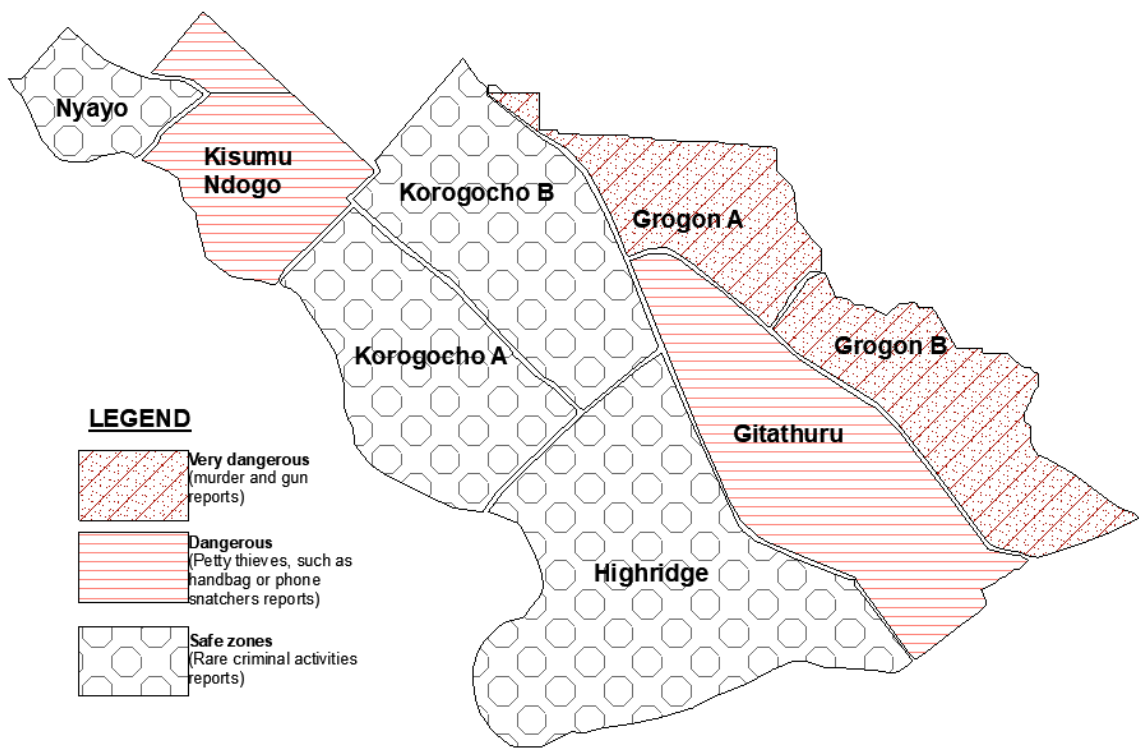


Figure 3: Level of safety in Korogocho slum villages based on instances of social evil

Source: Field survey, 2017

Economic activities (livelihood)

In Kenya, the informal sector which is not dependent on the public expenditure or commitment of the public investment in advance contributes largely to the Nairobi’s economy. This sector is characterized with simple technology that produces jobs at a lower cost. **Figures 4, 5 and 6** are examples of some unique economic activities engaged by the slum dwellers.



Figure 4: Outdoor cooking business
Source: Field survey, 2017



Figure 5: Skating
Source: Field survey, 2017



Figure 6: Urban agriculture
Source: Field survey, 2017

The slum economic activities to a certain extent influences the location of these informal settlements such that most slums are located near potential employment places either near a high end residential estate, transport system or industrial area. The activities also inform their space use and planning. While discussing the means of getting livelihood in the slums, it is equally important to discuss the average house expenditure versus income. The monthly per capita of a slum dweller according to the MuST et al. (2012) is estimated to be Ksh.5,000 per household which calculates to a daily per capita of Ksh.128 shared on an average of 3 people per household and this is below the poverty line (The absolute poverty line in urban Kenya is an expenditure of approximately Ksh 3,250 per adult equivalent per month, excluding rent. The average income per household is shared for different household needs proportionately as follows; food (51.6%), rent (7.6%), sanitation (7.5%), health (7.4%), water (4.7%), and others (12.4%).

Consequently, according to the Mathare 4A development programme feasibility study recommends that an upgrading project should be designed to maintain the multi-functional characters of the streets i.e. residential and commercial (Gitec Consult, 1995). No attempt at any point should be focused on formalizing the settlements. In situ upgrading is encouraged as in the as it taps into the existing socio-economic activities and ideally minimize on relocation of business activities from the original position. According to Boonyabacha (2009), the upgrading process should not interfere with the social and economic networks that exist within the settlement. Contrary to Baan Mankong, Kibra Soweto East upgrading (decanting site) did not consider the livelihood issue in their design thus the dwellers had to modify the open spaces which were not designed for economic activities to perform these functions in the process creating slum scenarios. Besides, according to Flore and Calas (2011) the Kibera Soweto East upgrading project suffered from lack of analysis and consideration of residents' economic activities and physical challenged people such that there were loss of social networks as well as extreme individualization led to fragmentation of social ties. The latter is further supported by Higgins (2013) that brought the same reasons explaining reasons for upgraded dwellers moving back to the slums.

FACTORS INFLUENCING BUILT FORMS /SPACE ORGANIZATION AND USE

This section discerns what it is that the dwellers are trying to respond to and how are they doing this. By understanding exactly what they are trying to achieve with their space use, establishes emerging trends and consequently enable us to come up with better ways of helping them achieve their needs efficiently and

appropriately.

Need for security

Apart from this being exhibited on a larger scale within the settlement where dwellers preferred close to their kins/tribes mate for a perceived sense of security and wellbeing just as noted by Mitullah (2003). On a domestic scale, there is use of courtyard system that ensured that everyone is safe at night as the gates are locked by 11pm. Security also contributed to absence of openings on the wall facades such as operable windows. Where they existed before, it was evident that they were later on blocked. In areas where it was perceived to be too insecure, the space between the wall was fully blocked and the mode of construction was mud and wattle which is more solid than the used tins and iron sheets i.e. it influences the materials used for construction. Lastly, security has also influenced the densities of the villages, whereby insecure villages such as Grogon B where the population was very low due to cases of tenants migrating to other more secure villages.

Need for privacy

This can be discussed at a larger scale where houses along the residential streets had blank walls with little or no direct opening to the streets. In these scenarios the courtyard are used as buffer and transition zone between the house and residential streets. To complement this, the residential streets are characterized with low economic activities and house chores tend to extend onto the streets. In some cases where the activities along the streets were so low translated reduced public surveillance on the street and this compromised on the security e.g. Community lane separating Grogon A and Gitathuru. The need for privacy among a family living in a single room was achieved by furniture arrangement and other activities such as conjugal rights was most of the time done with consciousness of time. The furniture was arranged in such a way that there was privacy between children and parents bedroom as well as the lounge (public) and the bedrooms as shown in **Figure 7**. The clothe partition ('pazia') together with the storage place between the children and parents bedroom ensured visual and noise privacy or insulation. In scenarios like in Kisumu Ndogo, the small separating court between the houses served as a place for more private that cannot be undertaken onto the streets e.g. bathing at dusk.

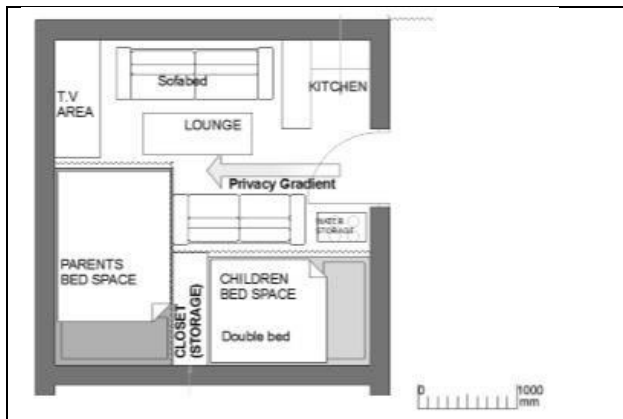


Figure 7: Privacy gradient increasing from the entrance to the bed spaces
Source: Field survey, 2017



Figure 8: Display of goods along the edge zones of commercial streets
Source: Field survey, 2017

To achieve healthy hygienic conditions

In an attempt to achieve hygienic conditions, this has been witnessed mainly in the way they handle food i.e. the way they handle food vending along the streets in the unhealthy open sewers scenarios. Along the streets in Korogocho there is a tendency of merchandise being laid along the edge zones for sale. The difference come in where scrape and second hand goods are laid directly on the roads on either a matt or directly on the ground without any consideration of hygiene. On the contrary, food vending or selling of household consumables such as groceries has been given a little bit of hygiene thought by either raising the vending platform off the ground to avoid dust and germs from the open sewers. **Figure 8**, show the display of second hand goods along the street edgezone. This attempt to achieve health is further illustrated by butcheries having gunia lining on the internal walls for sterility of meat as opposed to other general stores that has no lining at all. On the same note, the living spaces/ houses of well off dwellers that have gunia and are made of loosely fixed scrape metals tend to have better cleaner air circulation , as gunia filters out dirt from the outside air as well as reflecting the available lighting therefore a cool well lit conditions for the habitable spaces.

Need for gender and age segregations

The gender separation influence can only be seen on the outdoor living spaces more as compared to the indoors. It is mainly illustrated through the spatial use of different spaces with different genders and age groups. In most scenarios, which is the case, the men are the breadwinners of the family while the women are tasked with house chores. Therefore the women and children tend to use the outdoor spaces by extending household functions into the courtyards and the streets thus they are likely to be found outdoor more often. On the contrary, the male aged 35 to 50 use the outdoor spaces less often as they spend most of their time at work places fending for their families unless it is during the evenings and on weekends. In scenarios such as highridge which has majority of Muslims and of Somali tribe, their housing has been done in a courtyard systems for the purposes of their women privacy i.e. the women tend to socialize, plait their hairs within the courts. Their residential streets have also been privatized to cater for these functions as opposed to the public commercial streets such as Kamunde Road.

As for the age, this is mostly illustrated where the youths are always present along the streets and open spaces throughout the day as opposed to the elderly who may use the street corners and nodes for meetings and Kamkunjis in the evening hours only. The elderly are rarely found along the streets during the day partly because of the hustle and bustle of the streets together with the noisy environment. On the other hand, kids tend to be playing along the streets mid-morning and during afternoon and are absolutely absent in the evening and early morning. Early mornings are characterized with heavy traffic of pedestrians and motorbikes of people going to work and in the evening with vendors and the work force coming from work. Therefore, the gender and age segregation has subconsciously created a time differential of use of the public realm and social places.

Need for lighting and ventilation in slum rooms

Rapoport (1969) emphasized that specific needs such as lighting and air circulation for breathing had influence on the internal arrangements of the houses. This had been done through understanding of different activities and lighting and air change levels required. As much as the end result failed to meet architectural standards, there was surely an attempt to achieve it. For example, a family staying in a single room had cooking activities located next to the door that opened to the courtyard to allow easy flow of air exchange and lighting (**Figure 7**). With the courtyard being the main source of light and air circulation, activities were arranged in the order of priority of lighting and air flow requirements. Other technologies such as solar bottle bulb was used to light their housing interiors during the day in some cases. In some instances, cooking and laundry activities were done in the courtyard or extended onto the residential streets where there was free air flow and lighting.

DISCUSSION

The purpose of this study was to consider the questions, what are characteristics of the slum dweller? And how does these characteristic influence the built environment of the slum dweller? In addressing these questions, this study discusses the findings and implications to practitioners and policymakers and those involved in the integrated slum upgrading projects.

The findings illustrate that the low household income influence the level of improvement of the slum structures and space use. The research has demonstrated that the monthly income distribution allowed very little to be spared by families to improve the housing conditions.

The findings show that low income of household lead the families of an average of 4.3 persons to live in single rooms of 3x3 metres squared. The confined room had their social and economic activities extended to the courts and the street sidewalks. At spatial level, this implied that the multi-use nature of the houses such that lounge areas could turn into children sleeping area by night among others innovative space use should be captured in upgrading projects.

The economy of scarcity had led to high level of functional differentiation of space and time. The furniture in single rooms were rearranged at different times to create space for economic and social household activities. This flexibility of transforming spaces in time is key to sustenance of the slum dwellers livelihood.

This implies that it is important to consider integrating socio-economic lifestyle of slum dwellers during any house condition improvements. Its planning and design level of any improvement of slums, it is supportive to take into account the proximity and integration of the living, working and recreating spaces.

Further, this idea can be expanded to embrace the proximity and integration of living working and recreating spaces during the improvement of slums to achieve convenient lifestyle for the dwellers.

This study found the perceived sense of security and psychological being of ethnic groups is leading to settlement patterns. The strong ethnic segregated urban life was not inclusive and communal. This urban life was found to be unique since it assured the slum dwellers on their safety and security during political strives. However, a cohesive urban community should co-exist without any fear of their neighbours.

Despite community based initiatives on engaging the youths positively, the high rate of unemployment among them still contributed greatly to the insecurity of the settlement. Therefore there is need for the facilitation of these organizations to upscale their outreach thus reaching out to a large number of youths as this would have a direct impact on improved security in the settlement. Construction of art center or community performance halls and exhibition would be one of the successful facilitation that would ensure talent harvesting among the youths.

CONCLUSION

The main objective of understanding the slum dweller was to enable interpretation of his desires to spatial dimension. The findings of this study has establish the constants that characterize slum dweller include; need for proximity of residential to work places, time differentiation of space, multiple use of a single space, rooms being multi-functional, importance of external spaces and street over interior spaces. The dwellers have adapted innovative ways of space use and of attaining their daily livelihoods. These were some of the dearly held constants by slum dwellers. The slum dwellers tended to be in sync with their neighbours, understanding their economic potential, weaknesses as well as their social needs thus creating a conducive environment for small scale businesses and engagements. In view of these constants; it means any transformative projects for slum

dwellers must be in cognizance with their socio-economic structure, social organization and space economy to succeed.

RECOMMENDATIONS

Arising from the findings and conclusion, this study recommends the following on how the Korogocho slums can be improved:

- i) There is need to support, recognize and appreciate the nature of livelihood, social spatial definition and multi-functionality of the slum environment.
- ii) More open spaces in terms courts and public recreational areas should be provided for social interaction of pedestrians and children.
- iii) More communal facilities such as for educational and recreational among others should be provided for empowerment of the youth.
- iv) Housing typology using the courts should be increased for security, privacy, natural lighting and ventilation levels as well as allow extension of indoor to outdoor activities. Further, the court should enhance economic and social interaction of different dwellers and community at large.
- v) There is need to provide adequate direct combination of residential and commercial uses for social and economic sustainability of upgrading projects.
- vi) Streets should be enhanced to accommodate social and economic interactions

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