LEARNING FROM INFORMAL URBANISM: A CASE OF KAMUKUNJI, NAIROBI.

A research thesis.

Author: WENDY W. NELIMA.
DECLARATION

This Thesis is my original work and has not been presented in any other University or Institution for the purpose of awarding a degree to the best of my knowledge.

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This thesis is submitted in partial fulfilment of the examination requirements for the award of the Bachelor of Architecture degree, in the Department of Architecture and Building Science at the University of Nairobi.

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DEDICATION

All architecture is shelter, all great architecture is the design of space that contains, cuddles, exalts, or stimulates the persons in that space (Philip Johnson.). My research is inspired by the words above because if I am able to give people a different way of looking at their surroundings. That is art to me.
ACKNOWLEDGEMENT

This research would not have been possible without the love and support from different parties as I am very honoured to have them in my life. Firstly, to the love and support of my family; beloved mum Mrs. Lillian B. Chimungeni for your prayers, constant encouragement and strength. To my one and only brother Mr. Derrick Lusitche for your continued struggle for hard work no matter what life throws at you.

To the artisans at Kamukunji jua kali centre for providing me with the required information when I went to gather information on this thesis. I specifically appreciate, Chairman of Kamukunji jua kali association, Mr Francis Mwangi. Mr. Martin Osundwa, Ofula Juma, Moses Karanja who introduced me to other artisans. Also, Kenya Industrial Estates Mrs Janet Nyakio for information on current statistics of the artisans in Kamukunji.

In the course of my research, I have learnt to write intellectual topics based on the various subject studies through my six year course. Moreover, I have been able to build friendships that have enabled me to not only grow as a student but also as an intellectual. I would therefore like to thank my lecturers in the Department of Architecture and Building Science, at the University of Nairobi; My tutors Mr. Adnan Mwakulomba and Mr. Musau Kimeu for their diligent guidance and insatiable quest for quality. Moreover, this would not have been possible through various consultations with the following:- Mr. Norbert Musyoki, Dr. Alfred Omenya, Mr. Yasir Brek, Mr. Abonyo Erastus, Prof. Magutu, Mr. Robert Rukwaro, Dr. Laban Shihembetsa, Mr. Allan Otieno, Mr. Kahare Miano, Mr. Liku Eliud, Mr. Kigara Kamweru, Mr. Yusuf Ibrahim and Mr. Kamenju Joseph.

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ABSTRACT

This thesis focuses on the concept of informal urbanism which has become an emerging trend within developing cities. Cities globally therefore, can no longer exclude it. This thesis highlights the architectural elements brought out from studies of informality by various architects with an aim to understand the logics of informality and to bring out knowledge that the architectural discourse can learn from. Informal spaces essentially are self-organised spaces i.e. human beings creating their own perception of their built environment without the influence of an architect. The inhabitants bring to life experiential urban spaces through the activities they undertake. They recognize streets as a places where human activities are concentrated, channels of movement that connect one place to another, communication space, a place of commercial encounter and exchange, a place to do business and finally, a symbolic and ceremonial space within the city. In the context of Kamukunji as case of the informal sector, it will highlight the informal logic that makes it thrive, how the contextual neighbourhood has contributed or not to its inception and finally salient architectural concepts that we can learn from it. This is so as to bring forth what architects can learn from how an informal sector thrives and how architecture can contribute to informality as it is here to stay.

1. Informal sector: Self-organized, un-registered activities undertaken by self-employed persons in open air markets, market stalls and undeveloped plots, or on street pavements within urban centres with or without licenses.
CHAPTER 1: INTRODUCTION

Fig 1.1: A view of a jua kali artisans shed. Kamukunji, Nairobi. Source: Author
Informality has been looked at in many ways since its emergence as an established term in the 1970’s by Kevin Hart. It may be known as ‘a state of exception and ambiguity’ or as ‘a dynamic that releases energies. Just by that definition it alludes that they are considered different from the ‘norm’. According to the UN-HABITAT\(^2\) survey, it highlights that 53% of the world’s population live in cities and even more alarming is that 33% of these people live in slums. Therefore, cities have been pushed to create a balance of the growing urban population and the rights for shelter in the city. This has led to marginalization of spaces and people. Most of the projects done by architects to curb this problem had aimed to completely redevelop these areas thereby changing the character of these environments\(^2\) or to relocate the inhabitants away from the city as illustrated in Fig 1.2 \\& 1.3.

Rem koolhas in his book on *Mutations*\(^3\) published research on Lagos as an informal city. Koolhas unlike other architect’s, was not interested in redeveloping the informal part but to understand how the city works as a process rather than its spatial morphology. Informal trade, recycling, infrastructure and mobility were the major processes looked into and it was discovered that they are self-organized and rely on survival by their own wit.

Therefore with that in mind, this thesis investigates the theory of informal urbanism\(^4\) and the process of informality and how it can contribute to architecture. Our premature assumption on informality as ‘chaos’, ‘informal’, ‘dis-organised’ has been looked at extensively. It is time to look at informality so as to gain from this consistent inclusion in our cities. More specifically, Kamukunji in Nairobi, Kenya, which is the location of the ‘jua kali’ who are metal fabricators that operate informally and inhabitants who created their own idea of space.

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\(^2\) www.un-habitat.org  
\(^4\) http://lsecities.net/media/objects/articles/rethinking-african-urbanism-from-the-slum/en-gb/
1.2 PROBLEM STATEMENT

Architects have realised that architecture recognizes the acts of building and claiming space as acts that define the status of inhabitants and their right to the city\(^5\). This is not to allude that the problems experienced by informality e.g. health and safety among other will not be highlighted but recognition of the problems they face does not negate the fact that they are urbanities that have their own urban structures. By highlighting strategies of interventions on informality by other architects, we are able to see how these architects have resolved some 21\(^{st}\) century urban conditions through their research and projects on conceptions of informality so as to learn from them.

Using Kamukunj as a case of informality as seen in Fig 1.4, this thesis will bring out how informality is conceived in terms of its urban structures and perceived with reference to this context. Concepts on informality cannot be generalized because each context perceives informality differently so the jua kali\(^6\) in Kamukunj will be one of the many informal sectors that exist in Nairobi, Kenya and throughout the world that many other architects should consider studying. Moreover, it will look at informality from the perspective of everyday life as seen in Fig 1.5; studying their spatial nature of informal practices, how they interact with the street and examine complex relations between the formal and informal. Their self-organisation alludes that the architect has had no influence over its design. It will also bring out ways of looking into design away from the structured way of organisation.

\(^5\)www.architectureindevelopment.com
\(^6\)http://access-collective.com/indiegogo/jua-kali-2-2/
1.3 OBJECTIVES

The objectives in this study are:-

I. To understand the logics of informality so as to inspire architectural creativity through concepts by various architects so as to learn from informal systems of organization.

II. To analyze the manifestation of Kamukunji as an informal sector with the immediate neighbourhood context to highlight the architectural space logic of Kamukunji.

III. To recommend lessons learnt from Kamukunji for future informal sector development in Kenya’s urban areas.

1.4 RESEARCH QUESTIONS

I. What concepts from other architects can we learn from informal systems of organization?

II. How does the context around Kamukunji influence its architectural space logic as an informal sector?

III. What lessons can be learnt from Kamukunji for future informal sector development in Kenya’s urban areas?

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7 Informality: a state of exception and ambiguity or as a dynamic that releases energies. (Kevin Hart, 1970)

1.6 JUSTIFICATION

Sarkis, H asserts that a description of a process is itself a product of that process\(^8\) i.e. to understand informality, it’s no good staying outside the process. Consequently, an architect from the outside, only sees the movements i.e. what stands still, shifts and disappears. From the inside, an architect understands the direction things are going in, what is changing and what new things are emerging. Thus with regards to the urban renewal of Nairobi, the logic of space production in the informal sector needs to be looked at so that in the event of renewal there is existing knowledge on what informs there spontaneous growth.

This thesis therefore brings to light that it is not necessary, and even undesirable to up-root complex social-spatial systems that make Nairobi the vibrant place it is today as illustrated in Fig 1.8 & 1.9. Rather, whilst retaining a strong presence, subtle architectural interventions can create more elaborate solutions to problems facing the informal sector.

1.5 SIGNIFICANCE

The freedom, flexibility and creativity of informality is the key to understanding what some may consider a nightmare or hopeless as a model for sustainability as its inhabitants work with the bare minimum\(^9\). The downsides of informal urbanisation shall not be disregarded but viewed as minor details. This research will highlight that the phenomenon of urban informality is a part of the city’s process and has become part of their aesthetic and only by understanding the logic of informality will we be able to develop alternative strategies to counteract the growth of informality within our cities. Consequently, by their maximization of the spatial qualities in these spaces, informal areas will become a testing ground for a new approach of planning the city, from the view of the common people.

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1.7 SCOPE AND LIMITATIONS

**Geographical scope:** Informal sectors being numerous in Nairobi as illustrated in Fig 1.10 & 1.11, this study will focus on Kamukunji jua kali centre as one of them due to the time constraints of this research and also so as to critically document the salient architectural features present in the area.

**Architectural scope:** Due to the complexity of mapping out informal areas, illustrative sketches to bring out different organizing architectural concepts will be used. The immediate neighbourhood context of Kamukunji will be analyzed to highlight how they relate to each other.

The **limitations** of the study is that from the onset biases on informality by other architects from highlighted cases will be seen. Furthermore, a bias from me as a researcher to focus on the positive aspects of informality as opposed to the negative although they will be highlighted is important to note. Also, published literature on the Jua kali of Kenya is very limited and had to be sourced from industrial corporations and the Jua kali artisans themselves in order to highlight the problems facing them.

Very little research architecturally has been carried out in this area, so there was a vigorous search for problems either through interviews or photography will be the most appropriate way of gathering information. This is because the author relies a lot on the cooperation of the respondents and their willingness to access their places of work.
1.8 STRUCTURE OF THE RESEARCH

CHAPTER 01 introduces the problem of informal urbanism and how informality can contribute to architecture. Moreover that it is time to look at informality so as to gain from this consistent inclusion in our cities. It then highlights the objectives of the research and gives the short comings likely to be faced during the research. An elaborate structure of how the research has been carried out has been given and methods employed in under taking the research. Lastly, this chapter highlights the reasons and importance of the study.

CHAPTER 02 focuses on an overview of relevant literature and reflections on informal urbanism and articulates the issues related to this phenomenon as illustrated in Fig 1.12 & 1.13 in Sao Paulo. The discussions include different approaches on the understanding of informality in the city. It also looks at various cases by different architects with an attempt to understand this phenomena and also projects undertaken to manifest this theory. Finally a summary of the learnt concepts on informal urbanism have highlighted to inform the next chapter.

CHAPTER 03 shows various data collection tools used to carry out the research. The main research method adopted however is the case study method. The collection tools include:-

Mapping: This highlights the basic movement around Kamukunji from entry to exit

Case studies: This is the main research method used to bring out the urban character of Kamukunji and the proliferation of informal structures with the area that may eventually threaten the existence of formal structures.

Interviews: This brings out what the people of the ‘Jua kali’ need architecturally and what has enabled their business to thrive. Also, it enabled data collection on the scale of the 'Jua kali' sheds construction.
Observation using Photography and sketches: This method demonstrates the importance of the built forms within 'Jua kali' that are informal in contrast of the formal buildings adjacent. Photography provides an understanding of the spatial quality of the area.

Measured drawings: Provides a technical input on the existing 'Jua kali' sheds and provides more statistical data in the case of local case studies.

CHAPTER 04 provides a historical evolution of Kamukunji and the beginning of informal urbanism within the area. Consequently, it highlights views of the government on future development of the area and Non-governmental institutions contribution to the area.

CHAPTER 05 narrows down to the urban analysis of Kamukunji to highlight this phenomenon as seen in Fig 1.14. A case study research method was employed as the most appropriate for the study. Kamukunji in Nairobi is the chosen area of study as it is the heart of scrap metal operators in Nairobi. This investigation aims to: express how the structures function, how it is perceived by its users or observers on the street, study the movement patterns within the sheds and the connections that they make with the external environment. This research has been carried out in different scales: the scale of entire Kamukunji in terms of structure, the scale of street patterns from major to minor streets with an aim to map out movement around Kamukunji, the scale of the block especially along the road as it is the face of the ‘Jua kali’; storage, display and how transaction takes place as seen in Fig 1.15.

CHAPTER 06 analyzes the data collected from the field. Through the findings, we find realize that 'Jua kali needs some architectural definition based on the existing structure as it forms the genus loci of the place. Conclusions from cognitive recommendations are made from data and literature review.
Definition of terms

a. **Informal sector**: Self-organized, un-registered activities undertaken by self-employed persons in open air markets, market stalls and undeveloped plots, or on street pavements within urban centres with or without licenses.

b. **Informal urbanism** is a setting in which residents come up with solutions with few resources, changing economic factors and various other forces with little communication and planning within a city.

c. **Informality**: a state of exception and ambiguity or as a dynamic that releases energies.

d. **Juakali**: Kiswahili, literally 'hot sun' (referring to the outdoor nature of the work by small-scale craft or artisanal work, such as making tools or textiles)

e. **Formal organization**: Is a fixed set of rules, procedures and structures under a recognized form of authority within a particular area.

f. **Artisan** - A skilled or semi-skilled manual worker who makes items that may be functional or decorative, that include furniture, clothing and household items. An artisan creates products through experience and talent for expression.

g. **Mabati** - Corrugated iron sheets which is a common material used by the artisan’s in Kamukunji.
CHAPTER 2: LITERATURE REVIEW

Form follows life; the market flows into all parts of the city and the functions are directly or indirectly linked with the markets activities (Nick sickenga, 2010)

Fig 2.1: View of a juakali artisan in Kamukunji, Nairobi. Source: Author
2.0.0 DISTINGUISHING BETWEEN FORMAL AND INFORMAL

a. Formal organization

Consider an organization with an explicitly coordinated structure\textsuperscript{10}. The word to note is coordinated structure. Individuals are merely functional parts of this overall structure and their roles are strictly defined to fulfill business purposes. Moreover, procedures are formally and rationally planned by top management according to organizational directives. In this web of roles and procedures, there is no question about who is doing what, when or how. The organizational set-up is maintained through supervision and control. The organization functions as clockwork.

b. Informal organization

These are spaces that emerge out of spontaneous developments according to Uechi\textsuperscript{11} but it does not mean that they are not planned. Informality questions the modernist tradition of totalizing, singular ideal plan. Moreover Jorge\textsuperscript{10} alludes that they are aggregate of behaviors, interactions, norms, personal and professional connections through which work gets done and relationships are built among people who share a common organizational affiliation or cluster of affiliations but are not under a recognized form of authority thus rendered illegal. This happen majorly because man is intrinsically created with a strong desire to order his own environment so as to make his existence meaningful. The fact that they are self-produced spaces the user and the producer are one and the same. The people constructing the spaces and places are always in transformation and reconfiguration as an open-ended process making the producer, designer, one and the same holding over its authority.


According to Mitchell, he asserts that objects of analysis do not occur as natural phenomena; but are partly formed by the disclosure that describes them. Cases will be used to explain each conception of informality with an aim to look at various informal situations and look towards the opportunities to which they give rise. Each case will be explained from research output and physical interventions by different actors and architects form different cities around the world. This is to bring out that the physical environments encompassed by informality as seen in Fig:2.4,2.5 and 2.6 are all different and should be looked at differently thus bringing out the various nature of informality.

Architecturally, informality has become an element around which the field of urbanism must position itself and establish a productive relationship. Informality is so diverse and varied, and manifests itself in so many contexts around the world, that the knowledge produced thorough research and design, will communicate this complexity and reconsider architecture’s role in addressing informality. Therefore the literature review will contain conceptions on informality from various scholars and how they have interpreted informality with an aim to identify the conception of informality.
2.1.1 INFORMALITY AS A MANIFESTATION OF TENSIONS

This conception will highlight a broader relation of the informal and formal. **Case 1 of San Diego (United states) and Tijuana (Mexico)** that are found globally in the North and South and separated only by a border fence as seen on Fig 2.7 which shows that a physical barrier fence had to be used to separate the two worlds but ironically through the border cracks the formal an informal world co-exist. These two places are unique because of their geopolitical positioning, and the mix of two worlds creates tension of the Mexican border. According to Teddy Cruz\(^2\), informality in this case is seen as a manifestation of tensions.

This is because some of the wealthiest neighbourhoods in the United States are just a short drive from some of the poorest communities in Mexico. The houses in Mexico are usually placed on top of a one storey steel tram, there by leaving room for a work space below or parking beneath the house as seen in Fig 2.8. The irony comes in when the informal houses in Mexico actually come from the United States i.e. another man’s trash. Cruz further highlights that in every first-world city a third world exists and every third-world city replicates the first. San Diego (United States) have physically put a border but exchange of people, materials and urbanism still continues between the cities. The ‘border zone’ in this case is seen as a laboratory through which informality may be explored i.e. a manifestation of tensions.

**MAJOR FEATURE:** ‘border zone’ which distinguishes the formal and informal.

**WHAT WE LEARN:** According to Cruz, the future may resemble this mix of formal and informal. Thus as architects we must find ways to include informality as it is here to stay. What creates these tensions? Fragmentation of institutions and country budgets exclude those that cannot match up to

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the stated government costs. What will relieve these tensions? Inclusion of informality in the first world.

Case 2: Caracas, Venezuela

Another area where informality is as a manifestation of tensions is Caracas Venezuela. Caracas is a hill town in the metropolis; highways, tunnels and bridges are some of the main elements that constitute the city as illustrated in Fig 2.10. Located in a valley of 15 km long, Caracas is a place where gasoline is cheaper than water and a city with no common political base and a place where more people live, work and die in the informal part than in the formal part of the city as seen in Fig 2.9.

Caracas’s informal growth is exponential and constantly on the move. The formal city is built by the poor during the day and the informal during the night. While the ‘architects’ of the mountain are building in a “nomad style” overnight, upper-class inhabitants live in fear in modern and protected building blocks.

Contrast is the term that defines this city the most: vertical vs. horizontal, public vs. private, shacks vs. tower blocks, wealth vs. misery, formal vs. informal, rural vs. Urban. An unequal city with an urgent need to become equal. This clearly highlights that there is a need to connect the formal city and the informal one and an analysis of the spaces that divide both that creates tension. Inhabitants of the formal city need to be integrated into the formal city and vice versa. The most powerful parts are the interstices that divide them. Dwellers go down the hill to become market vendors while inhabitants of the formal city use these areas either to use the public transport or pass nearby to reach

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their cars. Inhabitants from the informal city should not be excluded by others citizens, who identify slum dwellers as “the others”. This collective of people need a place for them as a way of escaping from routine (school- family- work) and spare time, which is what provokes them to get into drugs, delinquency and violence. This place should strengthen cultural networks, connect groups of people and emphasize the cultural potential of the area.

**WHAT WE LEARN:** British architect John FC Turner who introduced the phenomena of informal urbanism, introduced infrastructure (Metro Cable) to not only earn revenue for Caracas but create a co-existence between the formal and informal city as seen in Fig 2.11. The aim being to unify the whole city together through art, culture and music, creating a prototype building, which can be replicated and integrated in multiple “in between” spaces throughout Caracas.
2.1.2 INFORMALITY AS A MANIFESTATION OF FREEDOM

Case 1: Favelas, Colombia

Slavoj Žižek, a Slovenian philosopher asserted that people living in informal areas are in some way more free than those who live in the formal city. Moreover, the philosopher alluded that inhabitants in informal areas are “free” in the double meaning of the word—“freed” from all substantial ties and dwelling in a free space outside state and police regulations’. The concept of freedom is experienced outside of the realm of the city boundary.

This argument can further be explained by Lebbeus through a talk about ‘radical construction’. This is an architecture that can emerge after the destructions caused by ‘war’. He refers to ‘war’ as a levelling effect that reduces their multi-layered complexity of meanings into its most logical and terrible extreme. Informal areas suffer from neglect as seen in Fig 2.13, a form of violence that Woods refers to as ‘War’.

Consequently, he continues to say that their exists ‘authored construction’ where ownership comes from the top-down and are spaces that respond to demand of cooperation’s and are therefore designed for a single purpose while the ‘radical construction’ exists in free spaces ‘those who make them their own, those whose lives, day to day, consecrate space with their own densities of meaning thus highlighting that ‘radical construction’ is a manifestation of freedom of informality as illustrated in Fig:2.12.

15 War’ neglected informal areas as they are reduced to their most logical terrible extreme.
Architects like Woods have realized that 'radical construction', has now transformed into one of the accepted aesthetic languages of postmodern culture. This is because it overlooks the structures of exploitation and exclusion that produce informal urbanisation. It also ignores the claims of millions of poor urban dwellers to be included in the rule of law and formal institutions, where they can find a platform to demand their rights. Therefore only by recognizing informality as a manifestation of freedom will we be able to include them into the city process of informal urbanisation.

Case 2: La Ramblas, Barcelona

La Ramblas\textsuperscript{16} in Barcelona is a clear example of informality as a manifestation of freedom. This is because the existence of informal activities can be traced back since the establishment of medieval cities in Europe. Barcelona became the central hub for ship trade as it developed as a port city as illustrated in Fig 2.14. The city evolved concentrically around the old roman city. The Ramblas\textsuperscript{8} 1.5km long locates itself at the heart of the medieval city, once a riverbed marking the border of medieval Barcelona during the 15th century. The city then still expanded informally across the river to accommodate population growth by the 18th century. By this time, the river was transformed into a long paved boulevard. This clearly highlights that the river was transformed to a long boulevard enabling informal activities to continue along and across the border thus manifesting the freedom to express itself and accepted by the people in Barcelona.

According to Gehl (1987), informal cities offer for life between buildings. Rather than seeking to eliminate the presence of the informality, La Ramblas\textsuperscript{8} has been able to accommodate this important component in the urban landscape. With time, the Ramblas\textsuperscript{16} then became the central route to both sides of the city and a line of orientation towards the sea.

\textsuperscript{16} Ramblas: 1.5km long paved boulevard in Barcelona

\textsuperscript{17} Lok Bing, C. (2007): Seamless space: What makes a street successful? In Strathclyde University, UK.
Architectural transformation highlighted from when it began as a river bed that represented a boundary now it consists of:-

(i) 5 pedestrian oriented streets string end to end with a slight curve to break the long distance. They include:- Rambla de Canaletes, RambladelsEstudis, Rambla de SantJosep, RambladelsCaputxins, and Rambla de Santa Mònica as seen in Fig 2.15.

(ii) Columbus statue is at the street’s beginning

(iii) The ending is marked by a large square to the north, Placa de Catelunya that marks the 19th century expansion as seen in Fig 2.16

The street became an important entrance for traffic arriving from all over Catalonia. This led to many establishments to be located along this street. The square enters at a corner, giving a strong presence and allows a view to all the activities taking place. The buildings on this street contain street-level transparent windows and are about five to seven storeys high with many entrances. This allows a sense of transparency for people to view. Some buildings step back giving more depth and character to the street. The buildings frontages can be as narrow as five meters, offering a variety of shops (Jacobs, 1993). This is therefore a vivid description of a city that has grown in population and its character (Ramblas) has expanded and transformed with it concurrently.

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The following informal aspects summarize La Ramblas as a manifestation of freedom:

(i) **Access and linkages**: Major thoroughfare connecting central city plazas with waterfront by way of Gothic quarter; extraordinary pedestrian access from central promenade; walkable along entire length (less than one mile); excellent Metro access.

(ii) **Comfort and image**: The proportion of street given over to pedestrians is quite pleasing, as is the harmony between street width, building height, landscaping, and intensity of usage. A mix of activities promotes diverse image and flexible character; Las Ramblas are seen as Barcelona's characteristic, most important, and best streets.

(iii) **Use and activities**: Pedestrian promenade and sitting area for people-watching, discussions, entertainment, etc.; retail and market space; exhibition space, festivals, bazaars, demonstrations. Restaurants, eateries, bars; cultural institutions, museums, monuments (Columbus statue, Canaletas fountain)

(iv) **Sociability**: Convivial mixed-use retail/eating/entertainment area promotes sociability between users. Ample seating is provided along central promenade (benches, planters), with additional seating in vicinity of cafes and restaurants. Comfortable atmosphere promotes social contact; Ramblas have reputation as forum for interaction. Diversity of uses helps ensure a diversity of people.

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19 Ramblas: 1.5km long paved boulevard in Barcelona

2.1.3 INFORMALITY AS AESTHETICS

Bernard Rudofsky’s 1964 MoMA exhibition *Architecture Without Architects* differentiated itself from the discourse of its time as an intellectual counterpart to the unquestioned authority of the architect as the only valid form giver. It gave credence to the notion that owner built communities as seen in Fig 2.19 (a) and (d) were a perfectly valid form of architectural and social development, an important underlying assumption in the support of informal settlements. For the modern designer, the interest of the bazaar, must lie particularly on its use of space and materials as seen in Fig 2.19 (c) and (b). The primary movement system of the bazaar is a central linear circulation space, splendidly domed throughout its length, parallel to which on both sides run the small irregular dependent spaces of the shops. Consequently, to clearly define the transition of spaces, within the bazaar lies a dark, arched passage way, stripped by band of sunlight and ending in a brightly lit archway as illustrated in Fig 2.19 (c).

(a) Fig 2.19: View of the colourful streets of the bazaar souq market. Source: http://www.wildjunket.com/2010/11/03/top-ten-travel-tips-marrakech-morocco-2/

(b) Fig 2.19: View of the bazaar souq market with a variety of materials to bring in light and linear circulation movement of pedestrians. Source: http://www.wildjunket.com/2010/11/03/top-ten-travel-tips-marrakech-morocco-2/

(c) Fig 2.19: View of the arched passage way and ending brightly lit space. Source: http://www.wildjunket.com/2010/11/03/top-ten-travel-tips-marrakech-morocco-2/

(d) Fig 2.19: View of the bazaar at night. Source: http://www.wildjunket.com/2010/11/03/top-ten-travel-tips-marrakech-morocco-2/
Rudofsky, B. highlights that informal structure are represented by the almost pointillist pattern of Zanzibar as illustrated in Fig 2.20 (c) and (d) the relaxed geometric one of Marrakesh as seen in Fig 2.21 (a) and (b). A good part of the town of Zanzibar has preserved its village like character with its detached huts, streets or any vacant spaces available that run erratically like raindrops. Marrakesh (Morocco) is the archetype of an Islamic town with its quadrangular houses organized around interior courts.

In both Zanzibar and Marrakesh people make their living on the streets, some living their lives out on the street. The street as a public space becomes more relevant in informal settlements, where in the absence of traffic, the entire street is used for all kinds of activities. Even narrow alleys provide spaces for chatting with neighbours. The combination of mixed uses, and slow, minimal car traffic encourages residents to turn every residual space into a playground or a public square.
2.1.4 FACTORS THAT AIM IN CREATING A NEW URBAN THEORY TOWARDS INFORMAL URBANITY

1. From the functional city to the city as a process: the form of urban growth.

Rather than seeing the city as a finished design, this theory aims in understanding the city in relation of space and time\(^\text{21}\). Process of physical production can be explained in terms of old town, new town extension, self-built areas, sub-urban growth etc. As seen in Fig 2.22. The designer comes in as a mediator to highlight their contribution on urban form, i.e. the space of the project which may take up different forms.

2. Struggle for urban space as a structural cause of the city.

This is when the physical appearance of the city is not focused on but urbanism prioritizes in the material production i.e. Inhabitant are more interested in the production of the items than the appearance of their shelters. Through urban acupuncture\(^\text{22}\), it will focus on local resources rather than capital-intensive city programs and will promote the idea of citizens installing and caring for interventions. This will lead to small-scale interventions being able to transform the larger urban context as illustrated in Fig 2.23.

Advantages of urban acupuncture as a structural theory

1. Boost community morale
2. Catalyse revitalization
3. Focuses on narrow pressure points in cities

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4. Involves interventions that can be accomplished quickly to release energy and create a positive ripple effect.

2.1.5 MINIMALISTIC APPROACH OF INFORMALITY

Informal settlements have very little resources to sustain them thus every single resource is important to them. Architects such as Alejandro Aravena who solves the problem of not just providing social housing but in creating an investment for families through design. This is achieved by providing the half of the house that the residents would not have the capacity to construct themselves, such as the structure, vertical circulation and services, while leaving some structural bays open for future self-built completion as illustrated in Fig 2.24 and 2.25 in Dharavi, India. Alejandro Aravena came up with the following quality performance for informal spaces as mentioned above, which are the physical characteristics they should imbue:

1. The spaces should be scaled to the pedestrian, although commonly neither the pedestrian nor the motor car has absolute dominance.
2. Strong spatial feel, with well-defined public spaces.
3. They are compact, having relatively high building densities.
4. Structural elements are integrated and composite parts reinforce each other.
5. Spatial structures are complex, offering choices in terms of intensity if interaction, privacy, lifestyles and movement systems.

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Fig 2.24: Shows the minimalist approach the infrastructure is tucked into the staircase in the city of Dharavi, India. Source:

Fig 2.25: Shows a before and after look of the staircase. Source:

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2.1.6 INFORMALITY AS A TRANSITION

Kejetia market in Kumasi, Ghana as seen in Fig 2.26 is founded at the junction of trade routes linking the northern, southern and western regions of Ghana. Traders are in constant movement from the north to the south delivering goods, socializing and networking as seen in Fig 2.27. This led Nick Sickenga to highlight informality as a transition as it is always on the move. This market will show spatial considerations depicted by actors and objects around the market and the importance of market life.

Context

Ghana is located almost in the centre of countries along the West coast of Africa. It is located between latitude 5° 3' and 11° North and between longitude 1°12' East and 3° 15' West. It was the first black African nation to achieve independence in 1957 and is one of the only countries in West Africa to have achieved a peaceful electoral transfer of power and dubbed the most developed country in Sub-saharan Africa. This is due to the rich minerals and resources and good education system it has.

Kumasi is the capital city of the Ashanti Kingdom were the dominant tribe, which is the largest in Ghana called Akan. They are most famous for their hand carved stools, craft work, dolls and colourful Kente cloth. Kente cloth is characterised by complex patterns of bright coloured strips, usually made from cotton and always woven outdoors – exclusively by men. Kente and Akan culture has greatly influenced the culture in Kejetia market which will be highlighted later.

Importance of an informal market

Nick highlights that as architects, with the intension to intervene, we should be aware of the complex interrelations of urban dynamics and built structures to be able to create a smooth transition from

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infor
tional to formal activities. At a glance, you will notice an organisational process that works very smoothly. There is comfort to the chaos and an order that literally can be found in the basic details.

Rem Koolhaas asserts that ‘what we are expecting to find in Africa is that there are urban patterns which do not rely on any kind of formal structure, but which develop an immediate degree of informality and nevertheless have a very high and intense form of organisation. So what we are looking at are forms of urbanization that orchestrate urban life.’

Informal markets are spaces of transition in one way or another as seen in Fig 2.29. They are seen as adaptors between deregulated conditions and controlled order. Why the transition notion? This is because it is a condition that is not yet known and whose spatial character reveals itself slowly.

Boeri considered the following characteristics of informal markets as transition spaces:-

i) Constant reshuffling of activities

ii) Reinvention of products thus consequent change of space

iii) Fixed on ideological belongings of individuals and cultures

According to Michel Foucault : Society must be defended, that by looking away from the clinched notions of slum culture and economic chaos we should hope to strive other notions, expressions, images and experiences which throw some light upon how local coordination within informal markets take place such as commodity lines as illustrated in Fig 2.30.


27 Boeri, S. Multiplicity: Uncertain states of Europe
Depending on the commodities sold by each trader, each market location attracts a certain type of buyers and sellers. The social ties are important as they create trading relationships and mutual reciprocities between families and trading groups See Fig. (Nick Sickenga, 2010).

b) Commodity lines

This is when similar commodities are grouped along the same path e.g. Tomato sellers See Fig. This union like formation by the traders ensures that competition does not become too extreme so that each trader is able to earn a decent income. Competitive advantage is achieved through creative ways of displaying products.

2.1.7 **INFORMALITY AS AN EXPERIENCE**

a. Adaptation of space

This is how space becomes better suited to the needs of the users as seen in Fig 2.31. Lack of space for trading forces them to adapt to certain parts of the city. Foot paths are taken over by relatives of shop owners who also try to sell their things, then the road is taken over by pedestrians and thus there is no space left for vehicles.

b. Continuity of movement

The energy network of informal areas is due to the movement flow of people as seen in, finance, goods and services as seen in Fig 2.32. The most accessible points and links will attract activities

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with the greatest degree of exposure. E.g., Traders aligned along the main road. The movement exhibits its own ordering structure. At informal markets level, the energy potential in the network is released through stopping. Different movement modes have different patterns of stopping. Therefore, depending on where the stops are placed, its coordination can be strongly reinforced thus attracting and creating opportunities for the clustering of activities. Routes which do not allow stopping e.g. such as freeways have little positive structural impact at a local level. They tend to emphasize points of exit and entry rather than lines of accessibility. The continuity of space will be highly synergetic, with each part of the informal system benefiting.

c. Non-flow spaces

These are spaces within informal markets where people can escape from mass flow of people. Because of the long distances covered by traders Nick highlights that there is need to create places of rest.

d. Mobile traders

They are the conspicuous lot within informal markets.

Characteristics

1. Attracted by a large number of traders and shoppers

2. Mobile character i.e. circulate goods on head trays, boxes or basin as seen in Fig 2.33

3. Have a daily route walk based on relations or social networks with the people as seen in Fig 2.34.

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e. Drain

The market contained an open drain as shown in Fig 2.35 (a). This drain caused unsanitary conditions within the market, and the only empty area within the market. The remedy was to create better conditions by covering the drain and control the smells coming from it as seen in the Fig below 2.35 (c).

The focus is on "open" urban space, which one would associate with "public" space. But the notion of "public" and "private" needs to be viewed more attentively. They are all based on upon the perception, conception and representation of space from within the city. The relation of static and dynamic space is exemplified at Kumasi central market as illustrated in Fig 2.35 (b).
The notion of conservative surgery is used to articulate the form of the market, where the existing fabric is analyzed and changed in places where it will have the most impact as this will create a dynamic transformations as seen on the plan view in Fig 2.36 (a) depicting flexibility of work spaces to the rest of the market.

2.1.8 FLEXIBILITY TO RESILIENCE

According to Rem Koolhas when he was looking into informality in cites in Africa he highlighted that these organisational structures reconfigure as different possibilities and situations require thereby verifying that the informal sector is flexible as seen in Fig 2.36 (b).

Why the informal sector is rigid towards formalization (inflexible) when looked at architecturally?

1. A rigid plan would not provide a large enough interface between users products and services.
2. Plans address fixed needs and functions whereas the informal sector is ever changing in needs, functions and typologies depending on materials produced.
3. Services and products are situated along roads and interstitial spaces as they maximize on potential profit of buyers.

(c) Fig 2.36: Shows a section of how the form can be of different sizes and is accessed directly from the street. Source: Sikenga, N. (2010): Transformation of the urban structure of Kumasi. In Kumasi, Ghana.
Moreover Rem Koolhaas put into perspective the theory of *urban resilience* which says that the informal sector has the ability to survive, to make it work against all odds. Nick in this case highlights that informal markets are highly variable in nature and this is what makes them alive and unpredictable. Moreover, that flexibility is done through generation of rich responses to social and urban changes.

3. **Expandability** – The form created has the ability to expand to accommodate the growth of the market. Despite the typologies of the market changing all the time the integrity and identity is maintained.

4. **Versatility** – The form has been designed to allow for a variety of potential uses to occur within that space at the same time. Form changes function while still maintaining its character as seen in Fig 2.37.

5. **Fluidity** – Over time the components and identity of the form can evolve to accommodate changes in context and function.

6. **Convertability** – Spaces can be physically transformed to accommodate changes in size; share of opacity.

7. **Creation of shadow** – Temperature in Ghana is about 30\(^\circ\) so the traders have to look for shade as they are exposed to heat for about 12 hours in a day. The traders thus hang plastic sheets to create shadows on the path although it is dangerous due to the rapid use of fire. A variation of wood rafters are used to create different plays of light and shadow as seen in Fig 2.38.
8. **Principle of reinforcement** - To think structurally about elements (traders manufacturers and service providers) within informal markets specifically Kumasi, each element should reinforce the otherwise interconnected modes of movement within a cluster. The integration of the elements as seen in Fig 2.39 (a) and (b) increases the potential impact to a far greater extent than if they were to be considered in isolation.

The plan - still the major tool of urban planning - does not allow us to perceive much more than an abstraction of the statically created structure of a city. It contrasts drastically with the reality of the experienced physical space by excluding all dynamic aspects. Consequently, the city needs to be read and analyzed from different points of views, including visual, sequential and thematic perspectives from within. Nowhere else than in the inner city of Kumasi can architects become so obviously aware of the power of these dynamics and the limits of architecture and urban planning in the conventional sense: This experience can be best exemplified at Kumasi's Central Market and the surrounding city: Engaged in commercial, cultural and social activity, actors create multifaceted networks in constant interaction with each other, with the objects of trade and the city's architectural structure.

**LESSONS LEARNT FROM KUMASI, GHANA**

1. The physical structure of the market is a *homogenous repetition* of generic stalls, the generic mesh however shelters a wide *diversity* products and activities.

2. Many traders from the market survive on a daily wage, therefore the interventions have to be extremely cautious with extended displacement or extended closure of market parcels.

3. While the activity on the market in first instance seems *chaotic*, a closer look reveals a discipline regime and *order*.

4. Market activities are *not formally managed*, but rely on complex and *dynamic social structures* and hierarchies that are often unwritten and tactility understood by all traders.

5. The market lacks basic access to public amenities, this causes a significant *decrease in productivity* as well as general discomfort of traders.
SUMMARY OF CONCEPTIONS ON INFORMAL URBANISM

The intention of these conceptions is to acknowledge informality’s role and contribution in the generation of present and future cities. A series of methods and approaches are presented to the study of informality, offering a cross-section through aspects such as policymaking, social transactions or operations, and urban evolution.

2.1.1 Informality as a manifestation of tensions (Case: 1. San Diego (United states), Tijuana (Mexico) Case: 2. Caracas, Venezuela) British architect John FC Turner who introduced the phenomena of informal urbanism, introduced infrastructure (Metro Cable) to not only earn revenue for Caracas but create a co-existence between the formal and informal city.

2.1.2 Informality as a manifestation of freedom (Case: 1. Favelas, Colombia 2. La Ramblas, Barcelona) Architects like Woods have realized that ‘radical construction’, has now transformed into one of the accepted aesthetic languages of postmodern culture. This is because it overlooks the structures of exploitation and exclusion that produce informal urbanization.

2.1.3 Informality as aesthetics (Case: 1. Dharavi, India 2. Bogota, Colombia) For the modern designer, the interest of the bazaar, must lie particularly on its use of space and materials. The primary movement system of the bazaar is a central linear circulation space, splendidly domed throughout its length, parallel to which on both sides run the small irregular dependent spaces of the shops.

2.1.4 Factors that aim in creating a new urban theory towards informal urbanity. Rather than seeing the city as a finished design, this theory aims in understanding the city in relation of space and time. Process of physical production can be explained in terms of old town, new town extension, self-built areas, sub-urban growth.

2.1.5 Minimalist approach (Case: 1. Dharavi, India) Informal settlements have very little resources to sustain them thus every single resource is important to them.

2.1.6 Informality as a transition (Case: 1. Kumasi, Ghana) Nick highlights that as architects, with the intension to intervene, we should be aware of the complex interrelations of urban dynamics and built structures to be able to create a smooth transition from informal to formal activities.

2.1.7 Informality as an experience (Case: 1. Kumasi, Ghana) An informal area has the ability to expand to accommodate the growth of the market. Despite the typologies of the market changing all the time the integrity and identity is maintained.

2.1.8 Flexibility to resilience (Case: 1 Lagos, Nigeria) A rigid plan would not provide a large enough interface between users products and services.
CHAPTER 3: RESEARCH METHODOLOGY

Fig 3.1: Shows a juakali artisan carrying goods in Kamukunji. Source: Author
3.1 INTRODUCTION

This chapter deals with the description of the methods applied in carrying out the research study. It is organized under the following sections: research design, research site, population, sampling techniques, research instruments, data collection procedures and data analysis.

3.2 RESEARCH PURPOSE

To bring out how informality manifests itself within an urban fabric (Nairobi) and specifically Kamukunji with reference to its context. It looks at informality from the perspective of everyday life by studying the spatial nature of the juakali sheds that promote informality, how they interact with the street and examine complex relations between formal and informal. Finally, come up with recommendations on how the situation can be improved.

This thesis draws on a descriptive investigation as the underlying research methodology in an attempt to look and understand through documentation. Principles highlighted in the literature review on how to improve informal spatial arrangements have enabled me to identify common ideals of informal systems.

3.3 RESEARCH STRATEGY

The case study strategy has been used to carry out the research.

Why? It has allowed an in-depth descriptive analysis of the phenomena of informal urbanism with an emphasis on detailed contextual analysis of Kamukunji as a case.
WHY THE CHOICE OF KAMUKUNJI AS CASE STUDY

i) Kamukunji is the main metal working cluster in Nairobi city.

ii) History: It is the first to develop even before independence and is located near the centre of Nairobi and continues to thrive as an informal area and the centre of production and training.

iii) Transport: The cluster is well connected to all parts of Kenya through Machakos Bus Station.

iv) Kamukunji brings out the important role the cluster plays in employment and wealth creation for majority of low-income Kenyans who mostly originate from informal settlements.

v) Being the centre of production, it has brought out aspects of informal urbanism that other jua kali clusters face and specifically Kamkunji sector.

3.4 RESEARCH STRUCTURE

i) Scale of Kamukunji as the entire jua kali sector: Master plan of the physical layout of Kamukunji in terms of access and exit points, slope profile, road widths conflict points. Mapping of informal and formal building footprints.

ii) Scale of typologies (Traders, service providers, manufactures and argo-based) From it I have picked e.g. Traders section mapping out flow movements of traders and suppliers.

iii) Scale of the urban block: I have picked a shed from each cluster and highlight the spatial features, how it is put together and materials used.
3.5 STUDY QUESTIONS

i) What concepts from other architects can we learn from informal systems of organization?

ii) How does the context around Kamukunji influence its architectural space logic as an informal sector?

iii) What lessons can be learnt from Kamukunji for future informal sector development in Kenya’s urban areas?

3.6 DATA COLLECTION

The data collection was carried out in two main phases namely: pilot study and main study. The pilot study comprised general reconnaissance studies which included observing buildings along the main streets specifically Landhies road as well as random movement within the general fabric. The study started by making an inventory of building typologies present in Kamukunji. To introduce the research objectives, informal communication played an important role as meetings were carried out with the association (Kamukunji jua kali association) which is the governing body in Kamukunji. Due to the descriptive nature of the results collected from the field, descriptive techniques have therefore been used to analyze it.

Data in Kamukunji has been collected in the following ways:-

1. Direct observation through the use of sketches, photographs and measurements
2. Documented records i.e Mapping out drawings from the survey of Kenya on Kamunkenji, literature from Institute of development studies on jua kali and statistics from the Kenya Industrial estates on statistics of products produced by the jua kali

3. Structured and unstructured interviews have be carried out with the association leaders of Kamunkenji and jua kali artisans on the products produced and space use

3.7 TIME HORIZON

The research has been carried out over a period of six weeks from July 7th 2014 to September 7th 2014.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>METHOD</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>General data collection</td>
<td>Observations</td>
<td>General description of the architecture of Kamunkenji and the neighbourhood context</td>
</tr>
<tr>
<td></td>
<td>Measuring and sketching</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Photography</td>
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<td></td>
<td>Archival documenting and outsourcing</td>
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</tr>
<tr>
<td>In-depth case documentation</td>
<td>Observations</td>
<td>Spatial and physical data</td>
</tr>
<tr>
<td>(Description of the case Kamunkenji to identify concepts)</td>
<td>Measuring and sketching</td>
<td>Existing processes</td>
</tr>
<tr>
<td></td>
<td>Photography</td>
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</tr>
<tr>
<td></td>
<td>Archival documenting and outsourcing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interviews with officials and artisans</td>
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</tr>
</tbody>
</table>

Fig 3.8: Shows a summary of how the research on Kamunkenji will be carried out. Source: Author.
CHAPTER 4: HISTORY AND EVOLUTION OF KAMUKUNJI

Fig 4.1: View of the existing Kamukunji. Source: Author
Africans were viewed as second class labourers as the British dominated the formal industry. Majority Indian population was introduced between 1895 and 1905 for the construction of the Kenya-Uganda railway. This led to the growth of economic activities in Nairobi. Specifically on the eastern side of the city, businesses found on these areas were mostly small, and merely serve the indigenous African market as shown in Fig 4.2. At this time, food was sold together with services for repairing and artisan manufacturing.

Kamukunji Jua kali was started by the former detainees of the British government during the Mau Mau rebellion. During the war for independence as shown in Fig 4.3, they had been put in detention camps to prevent them from fighting against the British. Villages next to the mentioned camps also had some detainees. Skills in metal working (e.g. making ‘jiko’s’) were gained as these detainees had an opportunity to work with tools in these camps.

4.0 HISTORY OF THE JUA KALI SECTOR IN NAIROBI

Informal sector – means economic activities that operate outside the national and local legislative or regulatory context.
In 1960-1961, the detainees were released and a total of nine artisans settled at the present Maridadi building. They settled there because it was an empty place in Nairobi, near Undugu society. They were the first to work with old metal at this location. In 1965 however, Maridadi building was constructed and artisans were removed from the place. Consequently, they located themselves on the other side of the road currently called Gikomba as seen in Fig 4.5.

1953-1966’s

During this time, the East Africa Royal commission of 1953-55 and Report of the 1966 Kericho conference were done in Kenya, noted that clusters of settlements just outside the boundaries of all towns were not so much eye sores as they were important centres of African trade. The commission also argued for individualizing of land tenure, an initiative that was rapidly put in rural parts of Kenya. This meant that African enterprise development was inseparable from urban land reform. During this post-independence period, nationalization of state agencies solidified and indigenous capacity was built up within the informal sector with particularly strong auto-repair, textile and metalwork and carpentry industries as shown in Fig 4.6.

1966 marked the second milestone, three years after independence in a conference in Kericho. They discovered that there was growing rate of unemployment that faced the dramatically rising numbers of young people. At this time, it was also realised that this enterprises began to spread around the country mostly owned by Kikuyu’s who were even more daring to trade into other communities. I.e. boundaries of tribe started being broken.
The Comprehensive Employment Strategy Mission came to Kenya in 1971. It was responsible for dramatizing the concept of the informal sector in 1972 as part of the recommendations of a World Employment Programme mission. They selected Kenya as the first site in Africa for some of the earliest programmes of support to micro-enterprise development. The acknowledgement that stands out is that human life consists of more than just a series of functional needs to be met. Moreover, they discovered that petty enterprises and services had quite rapidly attached themselves to Nairobi and other towns that had been colonial and racially segregated creation. It was also reinforced by fascination with non-formal education, the process of education and training that were going on outside the formal education system.

Moreover, at this time, there were around 150 artisans working in Kamukuji. In the next five years, the number later increased to 350. At this time, many of the artisans were being harassed by the police, provincial administration and the city council, so as to curb the expansion of the cluster of workers. In 1983-84, the government requested that an association be created to represent the artisans. The association was called Kamukunji Jua kali Association.

In the 1986, a football match between Gor Mahia and AFC leopards was to take place in the city stadium with the former president Daniel arap Moi in attendance. On his way, he heard some banging down in Kamukunji and he stopped. He met the artisans who were working with no sheds (Jua kali – hot sun) and he promised that he would put up sheds for them. Once the construction of the sheds commenced, the artisans were temporarily moved to the lower side of the road as illustrated in Fig 4.8.
375 artisans were settled and allocated space within these sheds. There were 3 big sheds and small sheds within each, making a total of 37 sheds. Around 10 people occupied each shed. Allocation of sheds was done by the first Jua kali chairman John Njuguna. Despite the artisans having settled, the products that they were producing were limited to ordinary jiko’s, blacksmith’s products, metal boxes and pans. Other people started joining them and they brought new ideas and technologies.

Further, during the late 1980’s and early 1990’s, the World Bank and International Monetary fund marked the beginning of Kenya’s age of globalization. Structural adjustments were made to privatized government agencies and as well as lower barriers to international trade with the intention of empowering the free market to direct development.

**1992-1997**

In 1992, the Kamukunji Jua kali association was formally registered and the artisans had increased enormously in numbers especially the youths. The energy-saving jiko as shown in Fig 4.10 was also developed at this time. In 1994, the artisans realized that they required capital to grow their businesses and this led to formation of micro-finance institutions.

The first micro-finance institution was K-rep introduced by former women-leader, Jacinta Wanjiku. Sisi kwa Sisi (‘we for us’) another self-help group was formed in 1995. From 1996-97 others followed such as Faulu Kenya.

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The association has received external help over the years. In the year 2006, the association received a three-phase power line from the provincial administration through the Provincial Commissioner, Mr James Waweru. The Constituency Development Fund (CDF) repaired the roof through Norman Nyaga who was an MP at the time. The abolition block (office) was built in 2008 through the Ministry of labour and it is currently still being used as an office housing officials and committee members.

The relationship between the Jua kali and the government cannot be compared to what it was 30 years ago. They are more willing to assist because they realize they are a major source of economic growth and culture. The Jua kali have since taken courses and seminars on different areas. Currently, the association has over 5000 members who are more than the beginning 375 still occupying the same space since pre-colonial times. The Kenya Bureau of Standards and Kenya Industrial Research and Development are working closely with the Jua kali to improve the standards.

**2006-2014 (Current)**

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4.1 Summary of characteristics found in Kamukunji jua kali centre from the history:

1. Small-scale of operation
2. Family ownership
3. Reliance on indigenous resources
4. Labour intensive activity and technology is adapted to local conditions
5. Operation is unregulated, competitive markets
6. Ease of entry

There are two types of informal sector activities that have been identified to exist in Kenya according to McCormick and Kinyanjui10


b. **Coping strategies** (survival activities): casual jobs, temporary jobs, un-paid jobs, subsistence agriculture, multiple job handling.

---


Waste materials has been seen to be utilized in the informal sector such as scrap metal, old tyres etc. to produce goods and services that would otherwise been imported or too expensive for low income groups. Further Fawcett alludes that these small businesses are often started by individuals with little capital and with virtually no support from the government. The informal sector is here to stay as long as it is creating jobs for the ever increasing population.

### 4.2 VISION 2030 ON KENYA’S INFORMAL SECTOR

A high powered secretariat delegation was done on the 2nd May 2012 Nairobi on Kamukunji Jua kali Association as one of the most active micro and small industrial cluster. Kamukunji Jua kali association represents one of the 800 primary Jua kali associations in Kenya representing the Metal Fabricators Sub-sector. The discussion focused on the following:

1. Technology transfer
2. Innovation
3. Standardization and patenting of MSE products to international standards.

According to the Vision 2030 chapter 4 asserts that the economic vision and strategy should add value to our products and services. It said that the government aims strengthen the informal sector through investment in infrastructure, training and linkages to wider local and global markets. Moreover, it talks about manufacturing for the region market and flagship projects for manufacturing: development of a strategy for establishment of at least 2 special economic clusters and the development and creation of at least 5 small and medium enterprises industrial parks. This was a clear indication of a national wide
engagement with the MSE sector towards a better and more inclusive wholesale and retail trade as shown in Fig

4.3 NGO’S VIEW ON JUA KALI

Statistics according to the (ILO, 2002) highlights that 60% of Africa’s employment is attributed to informal work. 40% to 60% in Asia accounts for informal work also. In China new microenterprises have emerged since economic liberalization in 1979. Eastern Europe a small informal economy exists and informal work that is linked to tax evasion and international migration is also found in North America.

The above information indicates that the informal sector is embedded in the economies of developed and developing world. Therefore, this marks a paradigm shift where the informal sector were seen as survivalist, parasitic and inefficient, the post-modern economy has created a reclassification of the informal sector as a source of growth and flexibility (Cross, 2000)

(UNHSP-HABITAT, 2006) states that 70% of the world’s population living in urban areas will have increased by 2050in developing regions due to the increased poverty levels.
Looking at Kenya, 61% of the 14 million labour force in Kenya is in non-agricultural employment, while 35% of urban and 59% of rural households respectively are involved in small businesses. (UNHSP-HABITAT, 2006). UNHSP highlights that these small enterprises produce and distribute basic goods and services in unregulated competitive markets. 

The following issues were highlighted by the NGO'S:-

1. Lack of effective policy implementation
2. Traders trade from insecure contested spaces
3. Lack of access to workspaces is complicated by land allocation and tenure issues

4.4 GROWTH AND EXPANSION OF JUA KALI BUSINESSES

Morris (2004) argues that the entrepreneurial potential is extensive in many people in society but certain environmental conditions are necessary to prompt these entrepreneurs into realizing their potential. Ultimately, the aim of an entrepreneur is growth of his/her business and the growth is evident in very few areas in the Jua kali sector. It is therefore important to highlight factors that influence growth and expansion of businesses. The business owner is the main driver of the business performance but other factors also come into play when it comes to growth of the business.


Table 1: Some of the influences on a business

<table>
<thead>
<tr>
<th>TYPE OF INFLUENCE</th>
<th>INTERNAL</th>
<th>EXTERNAL</th>
</tr>
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<tbody>
<tr>
<td>Positive influence</td>
<td>Owner’s desire to increase profitability and/or to prove him/herself, impetus for earlier growth</td>
<td>Stimulus of competition; Encouragement of others; Favourable tax incentives; Encouragement and support from small business agencies</td>
</tr>
<tr>
<td>Negative influence</td>
<td>Bounce back from earlier uncontrolled growth; lack of ability of the owner and/or management team</td>
<td>Adverse tax, interest and exchange rates; improvements in the competition products</td>
</tr>
<tr>
<td>Influences that can encourage businesses not to change</td>
<td>Owner’s lifestyle and the consequent need for the present level of return but not for more inertia. Difficulty of mobilizing the resources needed to do more. Limits on internal capacity to plan, coordinate and supervise</td>
<td>Peer-group pressure</td>
</tr>
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</table>


The Kenya Economic survey of 2008 indicates that the informal sector created 426.9 thousand new jobs compared to 420.4 thousand jobs in the previous year. Nairobi was found to have about 1,806 thousand employees in the informal sector which is a quarter of informal jobs in that year. Fawcett, K (2010)
Fig 4.23: Summary of connecting historical issues and interview topics to current key issues. Source: Author
CHAPTER 5: ANALYSIS OF KAMUKUNJI

Fig 5.1: Sketch of jua kali workspaces in Kamukunji. Source: Author
Scales of analysis

Since the aim of this study is to trace instances of informal urbanism in Kamukunji, there is a need to dismantle it into different sections of similar characteristics and analyze each section in order to grasp what informal urbanism entails.

1. **City level** (Kamukunji and Nairobi)
   - Position of Kamukunji within Nairobi and relation to major centres
   - Systems of access and circulation
   - Land use
   - Public facilities and open spaces

2. **Cluster level** (In Kamukunji: Manufacturers, traders and service providers)
   - Position of clusters within Kamukunji
   - Legibility (streets, nodes, districts, edges)
   - Services and infrastructure

3. **Unit level**
   - Typology type
   - Typology dimensions
   - Display criteria

(a) Fig 5.2: Kamukunji and Nairobi context of formal and informal entities. *Source:* Author

(b) Fig 5.2: Cluster position of different activities in Kamukunji. *Source:* Author

(c) Fig 5.2: Different typologies in Kamukunji. *Source:* Author
5.0 Introduction

Kamukunji is a Kiswahili word which means gathering as shown in Fig 5.3 with a member of parliament for Kamukunji. In the context of Kamukunji jua kali artisans; which means a group of scrap metal operators, are a group of people who share common interests with one another, who respond to a set of rules and regulations designed by themselves and share a sense of identity and belonging with others. Further, they are least equipped with the skill to organize space but they attempt to draw meanings from their environment and translate those meanings in one way or another to an architectural order.

At a glance, the area seems to be a chaotic mass of individual vendors, but through the analysis it has shown clearly that it is a highly complex social structure and pattern of use, nurtured and built up over time. This intangible fabric is perhaps more important to the functioning of the area than the built fabric, and care must be taken not to damage this intangible informal system. The complexity of this system is also staggering, and considering the stall requirements for various vending levels for different sectors, sub-sectors, and the varying individual experience and vending expertise, becomes a highly intricate task. Spaces in these circumstances become spaces of facilitation rather than of prescriptive spaces.

Therefore, by studying the Jua kali sector in Kamukunji, I have been able to understand the logic of space production in informal areas which is the true nature of the inhabitants as the givers of space which may be different from how an architect organizes spaces. This will pave the way to highlight uncontrolled creativity and freedom as it focuses on local resources rather than capital intensive city programs that do not promote the idea of citizen’s interpretation of urban space.

4Kamukuni a Kiswahili word which means gathering.
Fig 5.5: Map showing position of Kamukunji (Light industry) from the CBD and the major and minor roads.

Source: Illustration by author
5.1.1 LOCATION OF KAMUKUNJI

Fig 5.10: Muthurwa market along Landhies road
Located adjacent to the Machakos bus stop giving people an opportunity to shop before they depart to other areas. Structures provided however are not interactive.

Fig 5.11: Machakos bus station
Major stop for passengers from up country to Nairobi who are coming to work e.g. in Kamukunji or the rest of the urban areas.

Fig 5.12: Residential for Kenya Railways
 Houses the railways employees and are oriented following the railway line.

5.1.2 NEIGHBORHOOD CHARACTER OF KAMUKUNJI

Fig 5.13: Mathare primary school
Located adjacent to Kamukunji. Children from neighboring Shauri Moyo estates and other parts of Nairobi attend the school.

Fig 5.14: Shows the zoning of different locations around Kamukunji. Source: Author.

Fig 5.15: Market on Landhies road
It is a daily market of traders. Concerned is an increase of traders thus propose creation of another level to curb the problem.

Fig 5.16: Gikomba market
An informal market with a variety of products from fresh produce to fresh produce zones. A node for residents of Kamukunji and the rest of Nairobi.

Fig 5.17: City stadium at Jogoo road roundabout
Its central location at a major intersection acts as a node. Holds national games with the country with local football teams being most popular.

Fig 5.18: City stadium market at Jogoo road roundabout
Another informal market located due to the major intersection as it attracts customers. Contains both fresh produce and mitumba cloths.

Fig 5.19: Motor world centre
Formal building in Kamukunji. Contains enterprises that sell spare parts and some sell products made by the jua kali artisans.

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Located adjacent to the Machakos bus stop giving people an opportunity to shop before they depart to other areas. Structures provided however are not interactive.

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5.1.3 ACCESS ROADS IN KAMUKUNJI

**APPROACH AND ENTRY:**

Definition of entrances

Kamukunji jua kali entry points can be approached from three points: 1. Sakwa road (Fig 5.21) 2 Gikomba market (Fig 5.22) 4 Secondary road from Landhies (Fig 5.24). The area is clearly identified by the display of items along the road. A buyer may be able to gain entry to Kamukunji due to the clear road network. Movement around the market itself however is very confusing due to the narrow paths created by the traders without well defined entrances.

Parking for shoppers is a major problem as most cars were seen to park along the roadsides as shown in Fig 5.24. Supplies were also dropped the same way. Clear definitions of arrival at Kamukunji is the noise from the beating of pans, the crowded traders by the roadside attempting sell goods to passersby and smoke from the manufacturing section. Despite the environmental hazard's present in the area the vibrant life is what brings people to Kamukunji and should be something that is maintained.

For legibility the entrances need to be more clearly defined through nodes which can be in form of buildings or infrastructure such as water points that can be used as way finding devices by the users in Kamukunji.

**ANALYSIS**

Learning from informal urbanism: A case of Kamukunji

**Fig 5.21:** Sakwa road entry: Major access entry into Kamukunji. 2-way 12m wide road connecting to Gikomba and multiple soft holy routes to Eastleigh and major parts of the CBD. Source: Author

**Fig 5.22:** Major intersection at Kamukunji (Sakwa road & Narok road): Node as activities in gikomba and Kamukunji jua kali meet creating a point of conflict and traffic jams during morning hours. Source: Author

**Fig 5.23:** Landhies road: Highway road with major traffics during morning hours 6-9hrs and 6-8pm. Major pedestrian traffic and major source of street display of jua kali products. Source: Author

**Fig 5.24:** Secondary road into Kamukuji from landhies road: Shows the contrast of the formal enterprises on one side of the road and the informal jua kali activities opposite it. It is also not tarmac road. Source: Author

**Fig 5.25:** Ahero street: Contains major supplies for Kamukunji jua kali artisans especially plastic drums displayed along the street. Formal enterprise buildings are also found here. Source: Author

**Fig 5.26:** Shauri moyo Sakwa road: Creates access to the residential areas at Shauri moyo which contain old government buildings and shifting extensions along the road. Source: Author

**Fig 5.28:** Shows access roads into Kamukunji and supplies sections to understand movement round the area. Source: Author.
Scrap metal is delivered to Kamukunji in bulk, by small trucks which arrive at any time of the day. Vendors know when the truck will arrive and leave their stalls to help remove the metal sheets from the trucks which are then transported to their sheds by use of hand pushed carts as illustrated in Fig 5.27 on the left. This shows that the links into the market are deliberately weak, since the hand pushed cart serve as a type of back-of-house function. Most of the sheets delivered to Kamukunji come from industries or sometimes metal drums that have been split open and flattened.

Vendors often organise themselves into co-operatives which buy larger bulk quantities which they divide among several vendors to sell. Goods need to be moved from their point of purchase or storage to their point of sale especially for daily vending equipment. Hand pushed carts are often used by the operators of these move large amounts of goods throughout the market and often over large distances on behalf of their customers. Thus, these transport agents form an important part of the market and are essential to the operation of the market.

The internal streets within the jua kali however can be so narrow that goods can only be delivered by use of wheelbarrows or carried by hand which is very dangerous as illustrated in Fig 5.29. This makes delivery to the internal sheds much slower as compared to those along the street.

5.1.4 MOVEMENT OF GOODS IN KAMUKUNJI

Fig 5.30: Step 2: View of a scrap metal ware house where traders receive the scrap metals into their warehouses accessible from secondary streets. Source: Author.

Fig 5.27: Step 1: Scrap metal is delivered to Kamukunji via trucks or by street sweepers using hand pushed carts or from bottle manufacturing industry in Mombasa. Source: Author.

Fig 5.28: Step 3: Shows the contested space between pedestrian, trader and manufacturer and materials being brought into the manufacturing area in Kamukunji. Source: Author.

Fig 5.29: Paths that cannot be accessed by the hand pushed carts are carried in by people. Source: Author.

Fig 5.31: Sketch shows a section of typology 4 with large doors for cars to deliver. Source: Author.

Fig 5.32: Metal buckets being transported into Kamukunji via a pick-up. Source: Author.

Fig 5.33: Steps 2: View of a scrap metal ware house where traders receive the scrap metals into their warehouses accessible from secondary streets. Source: Author.
5.1.5 INFORMALITY AS A MANIFESTATION OF TENSIONS IN KAMUKUNJI

From Fig 5.33 to the left, it clearly illustrates that informal spaces are now encroaching the existing formal areas almost in bid to face them out thus the beginning of the concept Informal urbanism. The structures form their own pattern vividly distinct from the norm from the street patterns to the orientation of buildings around the area. The formal structures appear symmetrical while the informal structures appear asymmetrical and these translate concurrently to the internal streets. Therefore, we can conclude that where there is a break in symmetry then the emergence of complexity and informal urbanism begins.

There is high continuity and connectedness of the negative and positive spaces in Kamukunji and a high scale of hierarchy. The formal/modern city on the other hand the streets are disconnected because of its discontinuous set of isolated elements in rigidly connected transport infrastructures. Nairobi city maps clearly shows the building footprint of formal buildings around but because of the complexity of informality the footprints appear sketchy as if not wanting to be read like an open book. Varied sizes pack up, built forms present high adaptive resilience, and grow through becoming more complex even when starting from regular patterns.

Architectural character of Kamukunji in many ways is like a typical African city where the formal city sits side by side with the informal city as shown in Fig 5.34. At first glance, the jua kali centre seems to be a chaotic mass of individual vendors, but analysis shows a clear, but highly complex social structure and pattern of use, nurtured and built up over time. This intangible fabric is perhaps more important to the functioning of the market than the build fabric, and care must be taken not to damage this intangible market system. The complexity of this system is also staggering, and considering the stall requirements for various vending levels for different sectors, sub-sectors, and the varying individual experience and vending expertise, becomes a highly intricate task. Spaces in these circumstances become spaces of facilitation rather than of prescriptive spaces.

Majority of the formal streets are arranged out in a structured grid format oriented by the railway line, serviced with electricity and water. The ‘other city’ begins where the formal city ends with tarred roads and is a sprawling mass of poorly serviced informal buildings which are laid out informally by the inhabitants in the area. The structures are made using locally available materials such as timber, corrugated iron, concrete blocks and polythene sheets as shown in Fig 5.35. They appear to form their own unique that cannot be compared to that of the formal city because it contrasts and softens the industrial nature of the buildings around it.

Fig 5.33: Formal (disconnected isolated elements) and informal structures (continuous connected elements) in Kamukunji. Source: Author

Fig 5.34: Formal versus informal in Kamukunji. Source: Author

Fig 5.35: Shows supplies section in Kamukunji and the background a formal building mimicking juakali building materials. Source: Author
5.6 INFORMALITY AS A TRANSITION IN KAMUKUNJI

(Continuity of movement)

Fig 5.36 shows the pedestrian movement in Kamukunji is in constant flow. The need for movement is determined by the type of activities carried out. In Kamukunji, there are a variety of activities from traders, buyers, transporters, drivers and even manufacturers. The streets in this case aid in transit of people from one place to another. Traders align themselves along the main road and secondary streets so as to easily access customers who are in transit to different parts of the city as shown in the sketch Fig 5.38.

Formal streets are designed for a particular destination i.e. points of entry and exit whereas informal streets are highly synergistic enabling instances of stopping and converging. Stopping allows for movement networks to breath; thus depending on where the stops are placed, its coordination can strongly reinforce the activities around it. It becomes advantageous to a shopper as he/she is able to access products from any direction without it being predetermined by a designed path.

Streets are places of social encounters, political protest, sites of domination and resistance, places of pleasure and anxiety. Therefore streets are not only spaces that enable a person to get from point ‘A to B’ but also a place to live in. The streets in Kamukunji have been designed to foster and complement new urban lifestyles (Informal urbanism).

Fig 5.37: Shows a photo and a sketch of the varied shed stall sizes and entrances at Kamukunji. Source: Author.

Architecture is the material image of the city in transformation, a moment of modification for both the physical and cultural structure of place (Aldo Rossi, 1982). Therefore, the streets of Kamukunji depict a city in transformation through constant change in material use of different types of sheds i.e. iron sheets, rusted iron sheets, coloured iron sheets and or different sizes. The architecture of jua kali sheds in Kamukunji becomes a domain of natural organization through human intervention of patterns, textures and the natural slope of the site creating different sizes and types of openings on the facades as shown in Fig 5.37 below.

Fig 5.38 reflects movement patterns of people to and from important parts of the market. The stalls are mostly self-built, apart from a few areas which have been inhabited by formal companies. Each of the sheds responds to the owner’s unique requirements and preferences. The sheds are built haphazardly at different ground levels due to the sloping site and different angles. The streets are not built at once but instead they grow organically when structures are gradually added to the area one after the other. Therefore, the sheds by themselves work on their own and do not depend too much on the immediate neighborhood context; not rigid able to find its natural shape. Finally this is evidence of the self sustaining mechanism of informal urbanism.

Fig 5.38: Above shows a sketch and photo representations of jua kali sheds which vary in sizes and orientation because the streets constantly changes either becoming narrower or wider thus forming informal streets. Source: Author.
5.1.7 INFORMALITY AS AN EXPERIENCE

(How trade operates in Kamukunji)

Life at Kamukunji begins as early as 4am with some of the jua kali artisans getting ready to commute via train from the eastern part of Nairobi to the Imara Daima train station at the Central Business District in Nairobi. Most of the artisans find using the train too expensive due to the high rate of unemployment thus most of them prefer to walk despite living far away from Kamukunji. Fig 5.39 shows a summary of trade in Kamukunji as an experience form morning to evening.

The energy network of informal areas is due to the movement flow of people, finance, goods and services. The most accessible points and links will attract activities with the greatest degree of exposure whether it is from the bottom up or the top down approach. The catalytic approach is evident in Kamukunji due to the ability of informality being open to modification and has a capacity to evolve (Sheds are now growing vertically as opposed to horizontally to accommodate more spaces). Therefore, this shows that there is room for an architectural insertion that could slowly mutate to the rest of the centre and completely transforming its image.

At one corner a juakali trader is trying to sell a metal box, yet at another corner someone is displaying clothes across at Gikomba on the pavement blocking the movement of pedestrians. The major customers include:

1. Product suppliers picking up orders.
2. Bulk buyers from formal enterprises especially supermarkets.
3. People from up-country through Machakos bus station come to look for employment.
4. Local customers looking for household and industrial products.

At 12-2pm which is still lunch hour, most of the workers at Kamukunji eat at their workplace with the help of service providers mostly women who cook and deliver food to the artisans. The environment is more relaxed with some artisans still working and others enjoying conversation under a tree or along the streets.

2-4pm during the evening, gradually the activities become slower and lesser and eventually close at around 8pm. The artisans who do not live in Kamukunji make their way to their preferred modes of transport. After 8pm, vehicles are still stuck in traffic, while the number of pedestrians reduces considerably.

Towards the residential zone of Shauri moyo however, the residents children are still wondering around the streets and some doing their homework at the houses entry porches. This clearly highlights that Kamukunji has a mixture of services and it has a commercial residential mix (LIVE-WORK) that should be maintained.

The energy network of informal areas is due to the movement flow of people, finance, goods and services. The most accessible points and links will attract activities with the greatest degree of exposure whether it is from the bottom up or the top down approach. The catalytic approach is evident in Kamukunji due to the ability of informality being open to modification and has a capacity to evolve (Sheds are now growing vertically as opposed to horizontally to accommodate more spaces). Therefore, this shows that there is room for an architectural insertion that could slowly mutate to the rest of the centre and completely transforming its image.
5.1.8 INFORMALITY AS A MANIFESTATION OF FREEDOM IN KAMUKUNJI
(Urban streetscape and architecture)

The streets of Kamukunji create a dynamic environment with people from all walks of life, although this can be a bit overwhelming for people who are not used to the hustle and bustle of an informal area. The streets along the roads (Landhies road) and secondary streets are highly congested and crowded See image. This is because Kamukunji is strategically located for people alighting from bus stops, personal vehicles and people on foot. This alludes that informality is a manifestation of freedom as people freely create their own meanings on public spaces.

Main road (Landhies) street

It is accessible to both pedestrians, jua kali trading their products and major vehicular traffic towards Jogoo road. Smoke from the jukali manufacturers can also be viewed from landhies road. Positioning of the Jukali is so as to immediately capture buyers from the street as shown in Fig 5.41 (a, b and c).

Secondary streets

They are mostly used to supply materials into Kamukunji and pedestrian access from the surrounding slum areas. Some are tarmac and in good condition while others are murram and filled with littering. Trading of jua kali products also continues around these streets as shown in Fig 5.42 (a, b and c).

Tertiary streets

They are mostly accessible by jua kali artisans as they lead to the internal manufacturing zones in Kamukunji. Courageous shoppers also use them to buy metal products although they are very narrow and unsanitary. There is a major struggle for space by artisans as illustrated in Fig 5.43 (a, b and c).
Contest can arise from a number of sources, for example, the protectionist approach of vested interests such as land owners and formal businesses, the desire of urban managers for orderliness and control. The exclusion of ‘undesirable activities’ is an integral part of modern city management (Contested space: Brown).

One of the major problems faced by informal activities is conflict of use, between the activities and designated uses, which largely results from lack of regulation. The need for survival in an environment of rising unemployment continues to draw thousands of Nairobi city residents to invade the city’s unplanned open space which is the case with the jua kali artisans in Kamukunji. This can be seen in Fig 5.44 that shows the distribution of different zones in Kamukunji.

The location of street traders is seen to be in high pedestrian flows, particularly shopping streets, transport terminals and office locations. From the image it is clear to state that the pedestrian is alienated from movement along Landhies road. This is because he is constantly intercepted by a trader trying to sell him a sufuria or jiko, manufacturers trying to produce products, service providers collecting the scrap metals and finally the major vehicular traffic along landhies road. This shows that space contestation is a major aspect of the jua kali operators in Kamukunji.

Composition of clusters in Kamukunji include:

1. Traders: They are mostly situated along the streets to capture clientele. They mostly sell energy saving stoves, chips cutters and warmers.
2. Manufacturers: They make folding and pressing machines and other metal handling accessories for use within the cluster or elsewhere. They are the most important category and are classified on the basis of the products they make.
3. Service providers/Suppliers: These clusters consists of mostly women who polish and paint the finished products. Others include: scrap metal dealers, metal cutters and folders, gas and electrical welders, welding rod suppliers.
4. Agro-based: These are traders that came next to the sector to offer fruits and food to the workers at subsidized costs. (Kamukunji Jua kali Association, 2014)
5.2.1 HIERARCHY OF INFORMAL SPACES IN KAMUKUNJI

The sheds along the roads have spaces where there is constant movement (continuous) of people to different destinations i.e. to work or home. Moreover, there are major displays of jua kali products and interaction between traders and shopper so I viewed it as a Public/Trading space. The sheds are also grouped around public yards, these functions as Semi-public spaces, for people to meet and cooperate in doing things and sell jua kali products, in everyday life and during special occasions. They contain functions that would not ordinarily fit in the sheds i.e. for groups of people especially cooperative meetings, events or relaxation and minimal manufacturing of products.

The Private spaces are the heart beat of Kamukunji once it stops functioning the whole system crumbles. They are not public, but they do not completely shut out the world. They are mostly inhabited by manufacturers how are most of the times shirtless thus require some little privacy from the constant bustle. However, people can observe as they work and interfere without ‘fences’. They monitor themselves and their work by collectivism, by being within groups and by caring about each other forming a strong bond.

The architecture of the sheds and spaces in Kamukunji physically respond to the street and entrance condition through the use of transparency at ground level. This gives an opportunity for the interior space to be translated out onto the streets. The different configurations of product displays, creates small gathering spaces for transactions to take place. If the products are arranged in a linear way adjacent to the street it seamlessly leads a buyer into their spaces as shown in Fig 5.48 (Invitation to buy jua kali products).

Non-flow spaces

From the literature review, these are spaces that allow rest from the continuous movement along streets. The jua kali sheds are more than internal rooms; they are links that join private spaces with social spheres. Combining closeness and privacy with openness and publicity gives people opportunities not only to do their own things but also for communities to grow. In Kamukunji, the non-flow spaces are right adjacent to the street at a lower level of -450. This enables the person on the street to easily flow into the space. Most of them are created by the jua kali products for sell creating small courts as seen in Fig 5.47. The courts are an important factor in creating a base for social life, cooperation and security between neighbours. From the section sketch below of Kamukunji landscape, it shows that the jua kali centre as a public space can provide critical pockets that foster social processes (such as gathering and community building) and spatial processes (such as legibility and hierarchy). By recognizing the presence of these urban voids, architects will be able accelerate urbanization within cities and improve lives by creating new forms of public spaces which will be the starting point of revitalization of Kamukunji jua kali centre.

Finally, Rem Koolhas highlighted that identification of these differentiated urban voids and material architecture of the voids suggests that the structure of informal sectors is vehemently inclined towards differentiation and not homogeneity as the rest of the world looks at informality.
5.2.2 VERTICAL LINKAGES (Catalytic approach to informality)

The energy network of informal areas is due to the movement flow of people, finance, goods and services as illustrated in Fig 5.50. The most accessible points and links will attract activities with the greatest degree of exposure whether it is from the bottom up or the top down approach. The catalytic approach is evident in Kamukunji due to the ability of informality being open to modification and has a capacity to evolve (Sheds are now growing vertically as opposed to horizontally to accommodate more spaces). Therefore, this shows that there is room for an architectural insertion that could slowly mutate to the rest of the centre and completely transforming its image.

Importance of jua kali culture

Culture means meeting between people which keeps identity in our changing world, it has a social aspect in the meeting and has a big importance to the economic world as it gives the image of the city. By searching for the unique, we attract attention to the city. This is because they create something new and different that other cities do not have. Culture has a different meaning to different people, but the important thing is the individual experience and that is why it is an important issue in Kamukunji as illustrated in Fig 5.51 and the city of Nairobi as a whole.

Aspects of cultures

1. Deal with conflict. Jua kali artisans address and resolve any pertinent issues that may be interfering with their success.
2. Strive for consensus. Jua kali artisans hold group meetings to express any doubts held on emerging issues around the area.
3. Communicate using a common language. This should not be taken literally but instead means jua kali artisans have a common goal and to change anything in their neighbourhood an architect must understand their way of life.

Fig 5.50: Shows that the jua kali artisans do not work in isolation but it is a symbiotic system with different people involved. Source: Author.

Fig 5.51: Shows importance of culture within the jua kali. Source: Author.
### 5.3.1 PRODUCTS MADE BY JUA KALI IN KAMUKUNJI

<table>
<thead>
<tr>
<th>Frequency (%)</th>
<th>Products</th>
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<tbody>
<tr>
<td>0.00%</td>
<td>Boxes</td>
</tr>
<tr>
<td>5.00%</td>
<td>Others</td>
</tr>
<tr>
<td>10.00%</td>
<td>Pot/Sufuria</td>
</tr>
<tr>
<td>15.00%</td>
<td>Jiko</td>
</tr>
<tr>
<td>20.00%</td>
<td>Wheelbarrows</td>
</tr>
<tr>
<td>25.00%</td>
<td>Chips cutter</td>
</tr>
<tr>
<td>30.00%</td>
<td>Popcorn maker</td>
</tr>
<tr>
<td>35.00%</td>
<td>Trolley</td>
</tr>
</tbody>
</table>

**Source:** Author

**Fig 5.52**: Shows a table of the most and least made products in Kamukunji.

The activities in Kamukunji are categorized according to the type of product that is made within the site. All the products are hand-made. The categories include:

- a. Agricultural products
- b. Building supplies products
- c. Cooking equipment products
- d. Domestic use products
- e. Storage products

**Fig 5.53**: Shows products in Kamukunji. **Source:** Author

### A. Agricultural products
- Chaff cutter
- Rake
- Jembe

### B. Cooking equipment products
- Cake cooker
- Barbeque grill
- Frying pan
- Chips warmer
- Sufuria

### C. Building supplies products
- Steel doors
- Window frames
- Wheelbarrows
- Guirus

### D. Domestic use products
- Bucket
- Metal drums
- Plastic drums

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5.3.2 DISPLAY WAYS IN KAMUKUNJI

Fig 5.54: Shows ways of roof display in Kamukunji. Source: Author

Fig 5.55: Shows ways of cage display in Kamukunji. Source: Author

Fig 5.56: Shows ways of ground display in Kamukunji. Source: Author

Fig 5.57: Shows ways of linear display in Kamukunji. Source: Author

Fig 5.58: Shows ways of hanging display in Kamukunji. Source: Author

Energy on the street is dependent on the surrounding mixed use activity and internal space interact with external spaces through ‘threshold filters’ (Paths) the in-between spaces. The richness of the vibrant street life is a catalyst used to create a unique cultural/social atmosphere not only for the place but also for the city. All types of users are on the street from day to night and the street acts as a means of communication and without it there would be no cities. Gaehl in life between buildings asserts that between buildings is just as important as within buildings because the assembling and mixing of various functions is necessary to create a self-reinforcing process.

Streets create a variety of spaces because of different people displaying in different ways as illustrated in Fig 5.54, 5.55 and 5.56. Moreover, they create an opportunity to interact with buyers, to enjoy its setting and sense of community. The city therefore cannot separate the pedestrian as the key form of mobility. Kamukunji continues to be vibrant because it is a common place where the community can be able to feel comfortable and have the ability to express one’s mind. If this opportunity was not available, the environment would be dead.

Fig 5.59: Shows a 3-dimesion illustration of the streets in Kamukunji. Source: Author

Fig 5.60: Shows the plan view of the streets in Kamukunji. Source: Author.
5.3.3 DIFFERENT SHED TYPOLOGIES IN KAMUKUNJI

1. CRAWL SPACES
Fig 5.61: They are structures mostly used by service providers to keep and mix paint. Also for storage of spare parts needed for assembly of products. Source: Author

2. 1 STOREY STORES
Fig 5.62: They are mostly used by juakali artisans to keep scrap metal and store their tools after use. Source: Author

3. 1.5 STOREY STORES
Fig 5.63: They are mostly used by juakali artisans to keep scrap metal and store their tools after use with minimal manufacturing. Source: Author

4. Fig 5.64: Mostly used for display of juakali products. Source: Author

5. Fig 5.65: Warehouses used for storage of scrap metal and delivery trucks park halfway into the warehouse to off-load materials. Source: Author

Fig 5.66: Mostly used for display of juakali products. Source: Author

Scrap metal storage

Delivery truck

Display
5.3.4 MANUFACTURING OF PRODUCTS IN KAMUKUNJI

The sheds highlighted with dimensions belong to the manufacturers and were built by President Daniel arap Moi and are still in use up to date. Originally they were constructed to house about 375 artisans. By 2013 there were 4,000 members but it was estimated to about the 5,000 total populations.

Characteristics
1. Three long (70m) sheds
2. Narrow (about 7m)
3. Parallel to each other with about 20m between

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Fig 5.71: Shows a manufacturer heading to the space below with materials and the bellowing smoke into the air from the burning of charcoal. Source: Author
A. MANUFACTURING OF METAL BOXES

During my visit to Kamukunji, the artisans highlighted that they use a variety of corrugated iron sheets (Mabati) to make metal boxes. The mabati comes from Mabati Rolling Mills (MRM), which has a sub-branch near Nairobi and the main branch in Mariakani (coast province). Moreover, the tin sheets are miss prints of e.g. beer and soda bottle caps and cans and they originate from a Nairobi based factory called the Crown Cork Co (East Africa) Ltd. The flattened roof (and other) sheets originate from de-construction sites across Nairobi, and the flattened oil drums originate from the nearby industrial area, road construction (bitumen) and military airport.

These are the type of mabatis identified:
1. Black
2. Colour coated
3. Galvanized
4. Zink coated
5. Tin sheets
6. Flattened roof (and other) sheets
7. Flattened oil drums

Variety of boxes produced

<table>
<thead>
<tr>
<th>W</th>
<th>H</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>600</td>
<td>500</td>
</tr>
<tr>
<td>1000</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>1200</td>
<td>600</td>
<td>1000</td>
</tr>
</tbody>
</table>

 Variety of boxes produced

W  D
800 x 600 x 500
1000 x 600 x 600
1200 x 600 x 1000

Fig 5.72: Step 1: The mabatis are off cuts/ reject so they do not have straight (short) edges. Therefore, before measuring out the box parts a 1-inch strip is removed then the box is measured and marked using a ruler (1). Source: Author

Fig 5.73: Step 2: Once the cutting lines have been marked, cutting is done using the scissors (size 12-inch) by lifting the mabati off the floor in order to start cutting (2). Source: Author

Fig 5.74: Step 3: Shows a detail of one of the frames’ corners. First, the gauge lines (dotted lines) these are the ones the jua kali artisan draws using a gauge. The dashed/ dotted line (on the left) is to indicate the alignment to be cut by a machine. The dashed line (on the right) is the ‘folding line’. Lastly, the artisan marks the (uncut) outlines (dashed lines). Source: Author

Fig 5.75: Step 4: Bending the edges and folding the sides is the next step. When making any bend, the alignment with the edge of the rail is key (4). The fundi secures the top by pressing the parts on to the rail with his foot and with his left hand. Source: Author

Fig 5.76: Step 5: The short edges are folded last they are also bent by hand, but this time not supported by the rails edge. When they are folded, they are made sharp and sides welded together. Source: Author

Fig 5.77: Step 6: The customer decides what colour they would like or none, then in spray painted by a service provider who are mostly women and ready for display at the workshop. Source: Author
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Despite the jua kali at Kamukunji being informal, they exchange material with formal industry thus making them inter-dependent to each other. Producers (Jua kali artisans) also form linkages with suppliers, traders, and consumers to build their social capital. It can be advantageous to form relationships with hardware stores and materials suppliers in order to earn privileges like buying on credit. Connections to traders can establish consistent and reliable access to customers. Therefore the process below will show how formal industries and informal industry work hand in hand.

1. **Formal industrial process**
   - Step 1: Steel is melted in a furnace
   - Step 2: Steel is then rolled into sheets
   - Step 3: Sheets rolled into oil drums
   - Step 4: Jua kali artisans flatten them into sheets
   - Step 5: Used to create various products
   - Step 6: Any unsold sheets are recycled
   - Step 7: View of a jua kali artisan recycling the unsold sheets

2. **Informal industrial process**
   - Jua kali artisans exchange material with formal industry thus making them inter-dependent to each other.
   - Producers also form linkages with suppliers, traders, and consumers to build their social capital.
   - It can be advantageous to form relationships with hardware stores and materials suppliers in order to earn privileges like buying on credit.
   - Connections to traders can establish consistent and reliable access to customers.

**B. MANUFACTURING OF FRYING PANS**

1. **Formal – informal exchange of materials**

   ![Formal–informal exchange process](source: Author)

2. **Manufacturing process**

   - **Step 1**: The metals used to make the frying pans are mostly found hard metals because according to the artisans they retain heat which is good for cooking. Thus hard metals are smoldered in the furnace area of the manufacturing section which have been cut from a larger sheet. **Source: Author**

   - **Step 2**: Disks are then beaten to shape with a hammer and convex anvil. Holes are punched for the handles, either with a hammer and punch on an anvil, or with a lever actuated punch. The wire handle is threaded through the hole and then hammered to form a head that keeps the handle in place. **Source: Author**

   - **Step 3**: Finally the pans are smoothened to create the shiny feel and are ready for display. Unlike the metal boxes they are not painted on but just left in their natural state. **Source: Author**
Fig 5.84: Shows the lack of space in the artisan’s manufacturing workshops. Sense of community can also be felt as they have each other’s back while they work and share equipment. Source: Author

Fig 5.85: Shows the character of the juakali sheds on Landhies road and space contestation as goods are transported within the same path, also pedestrians are heading to other destinations and the traders confront them so as to make a good sale. Architecturally the elevation of the sheds are not uniform which is a unique character of different variation of self initiated form. Source: Author

Fig 5.86: Shows an open drain flanking Landhies road on both sides. Source: Author

Fig 5.87: Shows the railway housing opposite Kamukunji. The fence shows how people interpret and use space best to suit them. Its transparency enables them to engage with the street without necessarily being on it. Source: Author

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5.3.5 ENVIRONMENTAL ISSUES: Topography, flooding, fire

The physical topography of the site in Kamukunji is slightly sloping. The site slopes gradually toward the Nairobi river. The gradual slope has advantages and disadvantages to the jua kali artisans. Advantage: Shoppers are gradually led to different sheds with ease and movement along the streets is leisurely. Disadvantages: The area could be prone to flooding of some sheds as some are not raised above the ground. Unstable and leaking roofs also present a challenge.

The flatness in some areas in Kamukunji does however, cause some problems, with streets formed at most intersections on Sakwa road, the epicentre of the flooding problem in the Kamukunji. A system of open surface drainage channels that allow for the fast drainage of this flood water has been proposed, and it is assumed that this will be effective in draining this area once the right infrastructure has been put up. Investigation has showed that established stalls within the market are often raised by 300 - 800mm above the surrounding level, as a flood defense. It may therefore be appropriate to raise certain levels of the area to promote drainage, and possibly as a flood defence.

The jua kali sheds are constructed very close together so in the event of fire evacuation and prevention processes are not available and the owners of the stores suffer big losses. A remedy to this would be creation of better entries to the stalls to allow fire hydrants to be installed that can be accessed by the fire fighters in the event of a fire.

5.3.6 IMPORTANCE OF SHADE

Nairobi experiences upland tropical climate thus shading is very important to market functions in Kamukunji. Vendors almost always sell from a shaded area, to the extent that shade almost becomes a spatial defining element. These shading elements are often street arcades, but also include trees, umbrellas and light roofing structures.

Shaded spaces are often congested with informal vendors. Often, where there is no built shading, trade areas are defined by large umbrellas, or nestled into the shade of a tree. The importance of shade, and shelter to informal vending should therefore not be underestimated.

5.3.7 THE TOILET STORY

The hustle and bustle at Kamukunji made me wonder where one would go if the needed to use the washrooms. Flexibility concept in Kamukunji in this case applies here. These small 900 x 900 boxes Sketch are located in different areas in Kamukunji but especially adjacent to the streets. This goes against the grain of ordinary urban design of locating the washrooms in one central location.

Fig 5.91: See sectional profile of Kamukunji Source: Author.

Fig 5.89: Shows Surface drainage of jua kali sheds. Source: Author.

Fig 5.90: Shows Section A-A. Source: Author

Fig 5.93: Shows hard metal plate being heated to be shaped by an artisan. Source: Author

Fig 5.92: Shows surface drainage of jua kali sheds. Source: Author

Fig 5.94: Shows a group of people standing under a tree in Kamukunji having conversation. Source: Author

Fig 5.95: Shows different locations of toilets in Kamukunji that easily accessible Source: Author
5.3.6 STALL CONSTRUCTION & MATERIALS IN KAMUKUNJI

Wattle slats to support drums displayed on the roofs

Recycled iron sheet roofs of varied sizes

50 x 50mm square metal bar or timber

Wiremesh 25 x 25mm creates transparency for box

Fig 5.96: Stage 1: An artisan who has finished training in Kamukunji constructs a shed as shown below with locally found materials on found open space (Kamukunji). Source: Author

Fig 5.97: Stage 2: The artisan is the joined by three of his friends who set up next to him with one side of each façade attached to another so that they can share materials available. Source: Author

Fig 5.98: Stage 3: Soon the three friends are then joined by other new artisans and outdoor pockets between the informal structures are created. Source: Author

Fig 5.99: Stage 4: Finally a view of a complex web of informal structures are formed. Source: Author

Fig 5.100: Shows construction of a juakali shed in Kamukunji. Source: Author

Fig 5.101: Shows a summary of materials needed in stall construction in Kamukunji. Source: Author

Fabric  Metal  Plaster  Wood  Corrugated iron sheets  Steel i-beams  Wattle  Pipes
### SUMMARY OF TYPOLOGIES IN KAMUKUNJI

<table>
<thead>
<tr>
<th>SERVICE PROVIDERS (Painters, wash ladies and spare parts stores)</th>
<th>PERMANENT SHEDS (Manufacturers)</th>
<th>MIXED SALES SHEDS (Traders)</th>
<th>OPEN AIR SPACES</th>
<th>FRYPAN PRODUCTION (Frying pan manufacturers)</th>
<th>SUPPLY STORAGE SPACE (Suppliers &amp; scrap metal collectors)</th>
<th>COMMUNITY CENTRE (Kamukunji officials: Chairman, Ass.Chairman, Secretary and Treasurer)</th>
<th>RESIDENTIALS AT KAMUKUNJI (Shauri Moyo)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>1. Spaces are mostly used by service providers to keep and mix paint. Also for storage of spare parts needed for assembly of products. 2. Located against the main and secondary streets to intercept buyers. 2. Located adjacent to the manufacturers because they are responsible for the aesthetics of the final product.</td>
<td>1. Spaces are open planned with no partitions to enable easy exchange of work between different manufacturers. 2. Located along the main and secondary streets to intercept buyers.</td>
<td>1. Spaces are open planned with no partitions to enable easy exchange of work between different manufacturers. 2. Located along the main and secondary streets to intercept buyers.</td>
<td>1. Spaces where manufacturing of frying pans are done and is open to sky. 2. Located adjacent to the main road for easy delivery of hard scrap metals.</td>
<td>1. Spaces where scrap materials are kept and artisans buy from the suppliers and payments are made depending on the weight of the metal. The heavier the metal the more expensive it is. 2. Located along ahero and Loriani streets. Materials are stored in warehouses or displayed directly on the streets especially the plastic drums which are a major character for Kamukunji.</td>
<td>1. Is the only formal building in Kamukunji and forms of authority as it houses the leaders that manage the area. 2. Located adjacent to the main street of Sakwa road for easy access. Meetings concerning the area are occasionally held here.</td>
<td>1. They are old governmental buildings with 6 units in each block. They have been transformed into live/work environments as some of the artisans have made of the rooms stores. 2. Located at Shauri Moyo with a mix of formal government buildings and informal structures cropping up every day.</td>
</tr>
<tr>
<td><strong>Sizes</strong></td>
<td>W X L X H (m): 7m X 10m X H (m)</td>
<td>W X L X H (m): 6m X 12m X H (m)</td>
<td>W X L X H (m): 7m X 13m X H (m)</td>
<td>W X L X H (m): 6m X 16m X H (m)</td>
<td>W X L X H (m): 7m X 10m X H (m)</td>
<td>W X L X H (m): 6m X 16m X H (m)</td>
<td>W X L X H (m): 7m X 15m X H (m)</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>Poor</td>
<td>None</td>
<td>Very good</td>
<td>Good</td>
<td>None</td>
<td>Very good</td>
<td>None</td>
</tr>
<tr>
<td><strong>Summary</strong></td>
<td>The variety of stall typologies depict the need to have varied space as each space in Kamukunji is design for a given purpose and not simply replicated.</td>
<td></td>
<td></td>
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<tr>
<td><strong>Relationship strength</strong></td>
<td>Strongest</td>
<td>Co-existence</td>
<td>Weakest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

Fig 6.1: Shows the poor working conditions of the artisans in Kamukunji. Source: Author.
6.1 INTRODUCTION

Once the descriptive analysis of an area that is Kamukunji has been carried out as shown in Fig 6.2 and 6.3 as examples, it becomes imperative that one summarizes the findings in a format that can help inform on the lessons learnt on informal urbanism and make recommendations on the findings.

SUMMARY OF FINDINGS FROM EACH CHAPTER

i) CHAPTER 1: It has been established that the objectives of the thesis is to understand the logics of informality so as to inspire architectural creativity through concepts by various architects so as to learn from informal systems of organization. Further, to analyze the manifestation of informality in Kamukunji to highlight the architectural space logic of Kamukunji and finally recommend lessons learnt from Kamukunji for future informal sector development in Kenya’s urban areas.


iii) CHAPTER 3: A case study method of analysis is chosen to test the highlighted concepts in the literature review using descriptive analysis and finally data is collected through sketches, photographs and tables to confirm the presence of the identified concepts.

iv) CHAPTER 4: Historical background research is carried out on the evolution of Kamukunji as an area of study and the various aspirations by other actors such as NGO’s and the government on
 improving the area. This enables the reader understand the importance of Kamukunji to Nairobi and impact it could have on other informal sectors.

v) CHAPTER 5: Kamukunji is used to ascertain this phenomenon as it appears to deviate from the norm of formality that it is surrounded by. This therefore makes strong case for a descriptive analysis of to test the concepts highlighted in chapter 2.

vi) CHAPTER 6: Summarises the findings from the analysis and gives the way forward towards better articulations by architects as far as informal sectors are concerned.

### 6.2 SUMMARY OF FINDINGS FROM THE ANALYSIS OF KAMUKUNJI

The summary of findings will be based on the objectives highlighted in chapter 1 which are:-

1. **6.2.1: To understand the logics of informality so as to inspire architectural creativity through concepts by various architects so as to learn from informal systems of organization.**

   The following lessons were learnt from various architects and found to vividly exist in Kamukunji as an informal sector:-

   a. **Additive architecture**

   The sheds in Kamukunji have depicted a tendency of adding to the existing formally existing sheds as shown in Fig 6.4 and 6.5 adding to the intensity of the existing commercial character. Just like a bacteria spreading through, once the formal sheds were constructed by president Moi, an additional informal structure then attaches itself on part of the faces with a different size and height. Any other
available open space another shed is created. **LESSON LEARNT:** That this process is repeated continuously forming a complex web. As the complex web of informal structures continues to grow then any available open space reduces making the place congested and read as one.

**b. Functional disposition of the streets and importance of commodity lines within informal areas**

In Kamukunji, we can conclude that the functional disposition of the streets depicts that a large part of the streets sell one common merchandise eg. Products commonly sold along Landhies road are mostly metal boxes while products sold along Sakwa road are mostly household products such as (pots, pans, jikos). Also, Ahero street specializes commonly in the supply of products.

**LESSON LEARNT:** This concludes that commodity lines within informal areas are important as identity features (Legibility).
c. **Edges of Kamukunji and informal areas**

The character of the form and facade appears to be changing on a day to day basis in Kamukunji because of continuous addition and subtraction of spaces, but their two major variables that remain constant i.e. Main streets acting as directional tools e.g. Landhies road and the plot boundary where the formal and informal meet as illustrated in Fig 6.8. **LESSON LEARNT:** This concludes that the final structures created by informal settlements are varied but ironical as they read as one element because they use similar materials.

**II. 6.2.2: To analyze the manifestation of Kamukunji as an informal sector with the immediate neighbourhood context to highlight the architectural space logic of Kamukunji.**

Major architectural characteristics in Kamukunji identified are:

1. Irregular/asymmetrical building footprint due to lack of space. This causes complexity of internal routes making it hard for customers to find their way and direction of movement in Kamukunji.

2. High continuity of negative and positive spaces creating vibrant streets e.g. Landhies road.

3. Complex mix of low lying jua kali sheds and new vertically sprawling multi-storey buildings.

4. Commercial activities make the place vibrant making the residential at Shauri Moyo to also start transforming into a commercial area creating a live-work relationship; despite
this it has inadequate facilities such as Parking where people park along the streets and overstrained open spaces being encroached upon making the area congested.

To answer the question on the logic of informality in Kamukunji from the analysis we can say that the key actors (manufacturers, service providers, traders and buyers) and the processes involved (buying, selling, conversing, hawking e.t.c) are what produce the asymmetrical spaces in Kamukunji. Through ‘investment patterns’ depicted on the symbiotic relationships they have, provides an understanding of how capital is invested communally and orderly through ‘economic linkages’ creating a strong local culture. Therefore, it is right to allude that the concept of hierarchy and change provides an understanding of the morphological results towards informal urbanism in Kamukunji and the table below summarises it.
6.3 RECOMMENDATIONS AND WAY FORWARD

From the series of initial findings illustrated above that have been developed from a synthesis of the collected and analyzed information about Kamukunji and informality, through concepts that were defined prior to me visiting the site, and they are meant to provide the guideline or methodology by which interventions should take place within informal settlements. The concepts are not defined as finite projects because this allows for them to be applied and transformed depending on the changing specific circumstances of the place. The following aspects are recommended on the way forward for Kamukunji as an informal sector and informality as a whole:-

1. **Creation of innovation centres** within Kamukunji that will provide new knowledge on different products to enable the sector to grow architecturally and economically.

2. Architects should recognize that adding access to mass transit will allow for greater accessibility within informal settlements.
   a. Transportation projects are perhaps some of the most important interventions because they affect the vision of the city as a result of the politics of mobility.
   b. Good transportation is a transfer of wealth.
   c. Adding physical mobility is a key aspect of allowing for social mobility which is crucial within informal settlements.

3. Architects should capture open public spaces that have a potential for community spaces and revitalize them keeping in mind the existing informal activities.
   a. These can become consolidated valuable public spaces giving previously unimagined spatial possibilities to a neighborhood. As Urban Think Tank asserts, “the task of imbing these lineal spaces with activity, life and purpose usually requires a new stimulus—linking spaces, introducing amenities or simply rehabilitating surfaces.”
4. Architects should learn to hybridize functions as informal settlements detest formality. This can be done through:

   a. Where infrastructure and walls act as barriers, transform them into connectors without erasing their capacity to act as edges.
   b. Mixing uses and functions can alleviate the competition for space in the overcrowded informal areas.
   c. Hybridizing functions allows for flexibility, a quality of the heterogeneous, “un-authored” space that is not codified to a single typology.

5. Architects should acknowledge that informal settlements are developed from necessity and ingenuity thus construction is often developed intuitively and based on low-technology methods so practicality of designed spaces is key.

   a. The material choice and building technique has a logic to it as well, for it allows for the buildings to grow over time. As families accumulate more money, they tend to invest in their homes by building more rooms and floors and this should be considered.
Appendix 01

Questions fielded to officials in Jua kali centre in Kamukunji

1. How did jua kali begin from after independence and there after?
2. Which areas of relocation have the jua kali been given in Nairobi according to the Nairobi Planning for industries?
3. Have the production processes changed over time and have you allocated more spaces to accommodate these processes?
4. What health regulations are given by the Kenya Industrial estates for safety to the workers?
5. Do artisans respond to your authority?

Questions fielded to the artisans in Jua kali centre in Kamukunji

1. How to you create your work space?
2. Where do you get materials to put it together?
3. How long does it take to put up a structure?
4. What do you benefit from by being located in Kamukunji?
5. How do you get to work every day?
6. How are products brought in and out of Kamukunji?
7. How are the new products made stored?
8. In what ways would you like Kamukunji to grow?
9. What is your largest target market to sell your product?
10. What make Kamukunji the vibrant place it is?
11. Where do you rest or have lunch/dinner/
12. How would you like to improve your work space conditions?
5.5 REFERENCES

Published works


**Journal Articles and Refereed Papers**


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