CHALLENGES OF PROTECTING URBAN GREEN OPEN SPACES

IN SOKONI WARD, KILIFI COUNTY

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DECLARATION

This research proposal is my original work and has not been submitted for examination in any University.

Signed-----  ----------Date **16TH JUNE 2021**

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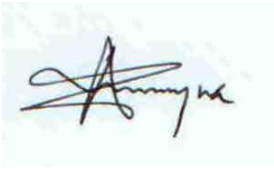
This research proposal has been submitted with the approval of the assigned supervisors

Signed:  Date **17TH JUNE 2021**

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DEDICATION

First of all, the Author dedicate this study to **Almighty God** for his strength and Knowledge for everyday life.

To my Parents, The **Late William Gakobo (RIP)** and **Mrs. Juliana Muthoni** for their understanding, overwhelming support morally and financially.

To My Loving Wife **Caroline Gachanja** for eternal Love and being a constant cheer leader.

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ABSTRACT

Urban green open spaces have emerged as a critical lifeline for cities and their residents. It has proven to be a timeless risk-reducing infrastructure, an essential urban service and an infrastructure of opportunity especially in times of crisis, including during the COVID-19 pandemic. The pandemic has exposed critical gaps in the accessibility, flexibility, design, management and maintenance, connectivity and equitable distribution of public space. These need to be addressed incrementally in order to improve health equity across the city, help the city build-back better and future-proof itself and its citizens. Temporal studies of urban green open spaces are essential in order to realize the conditions of improvement and deterioration. In the present study area, the existing open space provision is unsatisfactory both in quality and quantity.

The objective of this study is to evaluate the increasing pressure on urban green open spaces in Sokoni Ward, Kilifi County. This study aims to explore how these urban green open spaces can be used as a catalyst for the development of their environment. Combining analyses with a pragmatic design, this project uses a solid theoretical background as well as a functional case study, to conceptualize the unpacking of the potentials of urban green open spaces. Mixing practicality, economic feasibility and creativity, the proposed spatial plan of this project aims to create a realistic recommendations for Sokoni ward in the face of the challenges that urban green spaces are confronted. The proposals aim to deliver an interesting and thought stimulating project, not only in an aesthetic aspect, but also as an inspiration for the further implementation of urban green open spaces in the context of urban design. The proposals aim to achieve urban green open spaces as a catalyst for urban development, combined with technical information for Sokoni ward which can be replicated in the entire spatial entity of Kilifi County.

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LIST OF ABBREVIATIONS

CBO – Community Based Organisations

CGK – County Government of Kilifi

CIDP – County Integrated Development Plan

CSP – County Spatial Plan

DP – Development Plans

KNBS – Kenya National Bureau of Statistics

NEMA - National Environment Management Authority

NGO – Non-Governmental Organisations

SDGs –Sustainable Development Goals

UGOS – Urban Green Open Spaces

UN – United Nations

UNDP – United Nations Development Program

CHAPTER ONE

INTRODUCTION

1.0 Introduction and Background to the Problem

The rapid growth of cities and urban centres is one of the greatest challenges of 21st century. Our world is rapidly urbanizing. According to (UN-Habitat, 2014) by the end of 2017 an approximated 3.5 billion people lived in cities, equivalent to half of global population. Furthermore, projections by 2030 indicate almost 60 per cent of the world's population will live in urban areas (UN-Habitat, 2014). Cities and urban centres hold the key to unlocking national urban development by providing opportunities for unleashing economic potential, efficiency in energy use and sustainable livelihoods for present and future generations. In Africa and Asian continents, urbanization has demonstrated that it leads to development by transforming lives and livelihoods. Growth in cities and urban centres are associated with myriad of challenges such as majority of urban poor living in slums, lack of potable water and sanitation, unplanned peri-urban expansion, and conflict of scarce land resources, poor mobility systems and increased vulnerability to natural disasters among others. Additionally, the world over, numerous cities and towns struggle as a result of economic instability, diminishing resources, unemployment, high crime levels, political complexities and demographic shift (UN-Habitat, 2014).

Urban green open spaces are places that are accessible, enjoyable and used for free and by all and without motives for profit regardless of ownership, whether publicly or privately owned. Typical spaces that are considered public spaces comprises of beaches, parks, roads, highways, greenways, public squares, town squares and cemeteries among others. Government buildings that are open to the public are to a limited extend considered as open spaces. For instance, public libraries are considered public spaces though they tend to have greater limits on use as well as restricted sections. Similarly, privately owned property or buildings that are visible from public thoroughfares and sidewalks though are not considered public spaces as such. One of the earliest examples of public spaces are commons (those resources that are available for all society members to freely access; they

consist of habitable earth, water, air among others. These resources are commonly held, they are not privately owned). Providing urban green spaces promotes civic identity, enhances cohesion in the community and supports urban density levels that are required for economically and environmentally sustainable cities.

Green open spaces in urban areas are vital elements of neighbourhoods-built environment as they are designed to serve various important roles that improve the quality of city life, provide a number of significant benefits and motivate various physical activities (Kaczynski & Henderson, 2008). These spaces are mostly used as a recreational land use and are meant to be located within the towns to allow the surrounding population a green area to unwind and enjoy the benefits of nature. Urban centres that have adequate open spaces are attractive and safe to work and live in. Moreover, investing in public open spaces is investing in the quality of our lives.

Urban green open spaces are important for the following reasons: their natural scenery has several health benefits, builds a sense of community and culture, drives economic growth, transformation of spaces and enhance architectural diversity (Yang, 2015).

The influence of public spaces on the health of humans in urban areas is affected by multiple city dynamics and their intricate interactions. A good open space promotes human contact and social activities, it is safe for all uses, is properly planned and architecturally designed with interesting captivating features that seek to relax the users as well as reflect the culture and history of the local community.

The relationship between physical activity and different characteristics of public spaces has been examined by a growing body of literature. Literature review by Kaczynski and Henderson showed that most studies reported increased human physical activity as generally closely associated with human proximity to parks and recreational settings. Having access to urban green open spaces improves the quality of urban life and wellbeing as well as being a notable step towards greater access to political and institutional space and civic empowerment.

In Kenya most, urban designs and towns do not incorporate the use of urban green open spaces and even when this is done, then the maintenance by the county governments becomes a problem. As well, most public spaces do not meet the above characteristics for urban green open spaces meaning that their use is minimal and restrictive.

1.1 Statement of the Research Problem

Globally and mostly in developing world, availability of green open spaces has been challenging to urban populations. The world is rapidly urbanizing, and at this trend land-use change especially for residential, commercial, industrial, educational and transportation are consuming adjacent agricultural land surrounding urban centres. Kilifi County is experiencing a high population growth rate at a 3.1 % per annum with a population density of 116 people per square kilometre (KNBS, 2019).

The county where Sokoni Ward falls had long history of landlessness for last 200 years along the 10-mile coastal strip. The Arab Sultan of Zanzibar and his descendants amassed so great an amount of political influence that various European powers signed treaties with them in the belief that the Sultan of Zanzibar was the overall master of all the inhabitants of the East African coast. It was on the basis of this assumption that the British and German governments set aside a 10-mile coastal strip to remain under the jurisdiction of the Sultan of Zanzibar when they declared the hinterland to be their colonies. The result was that the Sultan was given a freehand to grant freehold titles to coastal land mainly to Arabs in disregard for the African land tenure system and the interests of the coastal inhabitants. To this date large tracts of land at the coast are still owned by the descendants of the Arabs that were originally granted the freehold titles. Many of them immigrated back to Oman soon after Kenya's independence, hence evoking the use of the term that has commonly been used to refer to them: the absentee landlords of the coast, however the African coastal communities occupied this land as squatters as they do not have ownership documents.

An Informal settlement (slum) sprung up along the Kilifi Creek in early 1900's. According to UNCHS a slum is "a term used to describe a wide range of low-income settlements and/or poor human living conditions". The resulting neighbourhood's scenario such as that exhibited in Sokoni Ward is of dusty narrow pedestrian access roads mostly muddy

during rainy seasons, compact housing with small building land space, unkempt and disorderly masses of vegetation lacking uniformity as well as bare surfaces, polluted air and drains from industrial wastes. This in turn compromises the usability of the private yards, inaccessibility with motor transport and parking and access to the street and the public squares. On the other hand, the functional feature of the resultant aspect is compromised in that, spaces within the neighbourhood get flooded during seasons of high rainfall; the benefit of the climatic conditioning by urban green open spaces is missed and spaces such as neighbourhood parks are not designed for recreation thus remaining unused. Where such recreational spaces exist, the situation is complicated by the lack of development and maintenance of green open space infrastructure. Aesthetic qualities of the built environment are reduced where urban green open spaces are not adequate to complement the architecture, the resultant landscape can be said to exhibit visual disorder. Open spaces lack the coherence that urban green open spaces networks should have within residential, street and neighbourhoods.

In comparison, high income neighbourhoods' like Bofa located adjacent to Indian Ocean on the Eastern side of Kilifi Town in Sokoni Ward exhibit an attempt at urban green open space planning with observable benefits. The access roads are wide, a low-density controlled development with parcels not less than half acre. In the same town however, northern side now considered to be largely occupied by the low-class population of the town, suffers inadequacy of urban green open space infrastructure. Developers are not motivated to create sustainable liveable communities, their aim being to maximize on rent payable to them, leading to a chaotic, harsh environment. However, urban development in Kenya shows a failure of the prevailing plans and strategies for urban development, and, to a greater degree in the prosecution of existing laws and standards. This is demonstrated by densification, congestion, sprouting of unplanned urban settlements, peripheralization, urban sprawl, land fragmentation and land developments that exceed the carrying capacity of available infrastructure. Barely 30 percent of urban areas in Kenya are planned and even in cases where plans are available, they are seldom enforced (Kimani & Musungu, 2010). Unfortunately, this is the trend in most urban areas of Kenya.

In Kenya, and particularly Kilifi urban area, the implementation of urban green open space and its maintenance can directly be attributed to the Development Control Regulatory framework that mainly constitutes the Physical Planning Act Cap 286, Building Code, Kilifi County By-laws and the Environment Management and coordination Act (EMCA), 1999. This legal framework gives guidelines to development. However, it is evident that it does not adequately provide direct guidance on the development of urban green open spaces infrastructure, a natural support system to the built environment.

The status of implementation of residential neighbourhoods' development plans and transport corridors as it concerns green urban open space development is not clear. Conspicuously, Kilifi Local Physical Development Plan approved in 1979 shows 11 sites were allocated to open spaces. Further observation on the Google Earth satellite map shows only three exist on the ground as per proposed land use. The proposed open spaces were perhaps grabbed or the rest occupied by informal settlements. It is apparent that the town's development control mechanism has insufficient capacity in the form of policy, legislation regulations and standards in providing guidance for the installation and maintenance of urban green open spaces within residential and commercial developments. The reasons for the apparent disregard for urban green open spaces within urban residential neighbourhoods are also unknown.

This study therefore inquiries into how Sokoni Ward development objectives can be matched with urban green open spaces benefits to achieve sustainable urban residential environments. The study sought to infer the best practices of integrating the built environment with green open space infrastructure in planning of sustainable neighbourhoods.

1.2 Research Questions and Objectives of the Study

1.2.1 Research Questions

This study sought to respond to the following research questions: -

1. What are the challenges of protecting urban green open spaces in Sokoni Ward?

2. What urban green open spaces were initially planned for and what is the existing situation in Sokoni Ward?

3. What planning interventions can be proposed to protect the urban green open spaces in Sokoni Ward?

1.2.2 Research Objectives

The research project specific objectives comprised of: -

1. To examine indicators and challenges of protecting urban green open spaces in Sokoni Ward, Kilifi County.

2. To find out what green open spaces were initially planned for and what is the existing situation in Sokoni Ward, Kilifi County.

3. To examine the institutional, legal and financial challenges of protecting the urban green open spaces in Sokoni Ward, Kilifi County.

4. To propose planning interventions that can enhance the potentials of protecting the urban green open spaces in Sokoni Ward, Kilifi County.

1.3 Assumptions of the Study

The study is based on the following assumptions:

1. Whereas the geographical scope of the study covers Sokoni Ward, proposals for urban green open spaces can be replicated within the Kilifi County and country at large.

2. Although the study is dealing with a small sample size which is interviewed, proposals can be generalized and validated globally.

1.4 Justification of the Study

Planners possess the conscious power to shape the urban developments they create.

Developments are outcomes of ideas of architects. The quality of developments people live in is derived overtime from occupants of these developments who live and work from them (Paramitha, 2011). Structures shape the lives and minds of their occupants. On this understanding, urban architecture can thus transform people in this way which is the initial step towards the transformation of the world. In a world of similar 'shapes' in multiple developments, their impact on people should be of concern. Some buildings deny humans the pleasure of beautiful space and so disconnect humans from the world they dwell in, disconnecting them from the magnificence of the natural environment and overlaying formless and dull containers onto it. As such, this is certainly not the procedure of changing people.

Countless benefits of nature on the psyche of humans have also been shown by literature. The later chapters will discuss and elaborate these studies in details. For instance, nature enhances human's immune system, emotional state and their cognitive function. Green urban design is of great value to the human's future wellbeing, mainly on their entire body, soul/spirit and mind. The consequences of land fragmentation and urban developments which are core elements of the property industry are of enormous implication, cities cannot exist without people whereas those people call for shelter (Kauko, 2012). This study comes at a time when Kenya is undergoing accelerated physical development backed up by population growth, increased rural urban migration and hence increased housing needs.

The dwindling green natural ecosystems is thus directly attached to the outward growth of Kilifi County and urban densification. Continuous densification leads to fragmented green cover. The outward growth of the county eats into the prevailing natural vegetation cover. As such, neighbourhood planning and design guidelines call for review since it concerns the provision, protection and sustainable management of urban green infrastructure.

Planners have historically been in charge of regulating subdivision and developments. They thus possess massive control over neighbourhoods' form and character. Further, they can potentially play a major role to establish more sustainable types of neighbourhood designs (Wheeler, 2004). This study therefore establishes a fundamental foundation for the transformation of neighbourhoods from unsustainable to sustainable and to plan new

neighbours that are ecologically sustainable. The study findings can form the criteria for creating favourable landscape planning, enriching building codes and managing land ordinances while planning for residential developments in urban areas.

1.5 Scope and Limitations of the Study.

1.5.1 Geographical Scope

Sokoni Ward, located in Kilifi North Sub-County, is the study area and the focus is on the challenges of protecting urban green open spaces. It encompasses majority of Kilifi Township. Kilifi Township is located in the former Coast Province, Kilifi County, about 420 km south-east of Nairobi and 60 km north of Mombasa. The town lies on the Kilifi Ocean Creek and sits on the estuary of the Goshi River. Sokoni Ward is bordered by Tezo Ward to the North, Kibarani Ward to the East, and Mnarani Ward to the South and the Indian Ocean to the East. Sokoni Ward covers an area of about 14.40 Km^2.

1.5.2 Theoretical Scope.

In the view of possible neighbourhood areas, urban green open spaces network in the context of this study is constituted by: open yards within plots, parks, cemeteries, streets and rights of way corridors. All these create an interconnected network of green urban spaces which is a key factor of green urban infrastructure. Within Sokoni Ward neighbourhood, green urban space is categorized mainly into three; the plot level, street level and the public open space level. This study dwelt on the status of green urban space development, the local authority capacity in urban green open space development guidance and enforcement and the dynamics of apparent disregard of urban green open space infrastructure. The study finally sought to propose measures that should be taken to protect the urban green open spaces infrastructure in residential neighbourhoods in Sokoni Ward, Kilifi County.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This is the chapter that provides a review of literary secondary materials that are relevant to the study topic. It explores and introduces relevant information and knowledge on urban green open spaces. It also elaborates on the theoretical framework that grounds the study. The literature review is presented in four sections: benefits of urban green open spaces, urban green open spaces fundamental concepts, theories of urban planning, and other countries or regions experiences on urban green open spaces planning and development. The initial sections delve into the investigations on the fundamental concepts of urban green open spaces. These concepts perceive urban green open spaces as a continuum regardless of their types, related functions and benefits and their location geographically. Owing to this feature, optimizing the spatial configurations of urban green open spaces to back up a collection of ecological, social functions, cultural functions as well as the needs of cities and their dwellers should be the core objective of urban planning and protection of urban green open spaces. Therefore, section 2.1 provides a conceptual ground for positioning standards, functions, concepts, together with other discourses related to urban green open spaces within the Kenyan setting. Principles and hierarchy of urban green open spaces are discussed in section 2.2. The sitting of developments should follow on certain principles and these spaces happen to be within plot level, street level and neighbourhood. The relevant planning approaches together with theoretical framework that underpin urban green open space planning are presented in section 2.9. Urban green open space planning is yet to be a stand-alone discipline. Conventionally it was, and still remains embedded to urban planning, mainly as a functional plan. However, recently, urban green open space has greatly been influenced by ecology and land scape ecology that avail guidelines and principles for planning sustainable landscapes. While most of urban green open space theories derive their origins from other disciplines, it is essential to investigate the theories themselves. Following this, section 2.10 is dedicated to reviewing of the current and historical dimensions of the theory from European countries, North America, Asia and

African Countries on urban green open space development. This section offers a basis upon which planning approaches within Kenya's urban green open spaces can be evaluated and compared.

2.1 Concepts and Definition of Urban Green Open Spaces

2.1.1 Urban is Not Just "Urban"

This study project is confined within the context of urban areas. However, what is "urban"? What are the areas encompassed as "urban"? What is the meaning of "urban" in the context of "urban green open space"? What does it stand for? Humans dwell in a broader range of places. These places can be classified as rural areas, urban areas and suburban areas. The term "urban" is referred by the Merriam Webster English dictionary as a "city", "town", or "conurbation", though not frequently expanded to include rural settlements like a hamlet or a village. More often than not, people conceptualize cities or urban areas as "relatively large and permanent settlements occupied by buildings and other concrete surfaces used for commerce, industry, transportation, houses and institutions. These cities or towns or urban areas have multiple means of transport including trains, buses or subways. Another unique aspect that aids in distinguishing urban areas is the concentration of intense developments and higher population densities as compared to natural or rural settings all around the cities. Houses and other city constructions are built in close proximity to each other and are much higher (taller) as compared to those in rural or suburban areas. With these features, "urban" is therefore usually portrayed as a distinct object from the natural environment (Beatley, 2000).

Governments therefore define urbaneness threshold on basis of population density. Different countries however have different ways of quantitatively defining "urban". To begin with, "urban" is defined by the United Kingdom as "the extent of at least 0.2km2 that hosts at least 1500 census residents (Office for National Statistics, UK, 2001)". Kenya on the other hand defines an urban area as "an urban district city and town with a population of at least five hundred thousand residents according to the final gazetted results of the last population census carried out by an institution authorized under any written law, preceding the application for grant of city status (Urban Areas and Cities Act, 2011)".

According to (Jorgensen, 1986) boundaries that are established politically hardly incorporate the entire topographical area under influence of urbanization. The academic viewpoint of "urban" is the progressive consideration of any place where people reside in settlements (Bradley, 1995): (Edwards & Bliss, 2003). The extensive understanding of urban greatly contributes to clearer description of the true definition of "urban" in the context of "urban green open space" as opposed to the government definition of "urban" grounded on population census and boundaries. Further, studies have increasingly continued to indicate that the extent of planning and practice in the context of urban green open spaces in urban areas is in the slightest sense not restricted to population alone. The immediate next segment gives an in-depth examination of the definition of "urban green open space". In this context, it is possible to argue that "urban" within "urban green open space" does not include the verbatim meaning of "urban". It is therefore a very extensive idea that encompasses the topographical area that extends beyond that which is impacted by humans and suburban areas altogether.

2.1.2 Nature and Landscape

That environment that has never been touched by man is nature or raw nature. This land is pristine, it exists without the influence of humans. Landscape architecture entails designing of outdoor environment by use of several elements including paths, plants, stones etc. to create a pleasing space aesthetically.

The definitions provided are in this study are unique to it. All the same, they need reinterpretation to qualify present day and age. This is explained by the fact that the line demarcating between what is influenced by humans and that which is raw nature is increasingly getting indistinct. Provided the extent of global human population is in excess of 7 billion, it is difficult to comprehend that any parts of worlds arid lands remain totally free of influence by humans (Nuwer, 2016).

Following this, a new definition of what nature is has been connoted in this research. It defines natural environment as those elements that have not been created by man. They are present in the planet in form of the water, the plants, the soil and all living creatures. These would co-exist as the pristine natural environment today without any human intervention.

Unfortunately, most landscapes have been interfered with or are in one way or another monitored particularly by humans. Therefore, nature is highly controlled. This is achieved through landscape architecture. Human beings decide where grass is kept manicured, where to place or keep trees, where shrubs and flowers are planted, the natural backdrop is adjusted to suit the intended function assigned by people and where stones are rearranged into paths. The main objective of all these is to achieve an aesthetically pleasing space for human habitation.

Richard Hobbs, a University of Australia ecologist postulates that there exists a growing realization that on the entire planet, only a few places that remain pristine. Currently, majority of global spaces have been influenced by man-based activities, regardless of the nature of impact, including indirect impacts (Nuwer, 2016). As a result, according to this research, nature is defined as the unbuilt context that surrounds proposed and prevailing physical developments. Within this context, natural elements can then be recreated (outside, inside and in between) the constructed surroundings. This may comprise of clearing some specific parts of landscapes to pave for construction together with their placement and design within and around the new building. The design toolbox humans borrow from nature aids in the designing of landscapes. Consequently, the altered natural environments are still categorized to as nature, and as such, landscaping can then be considered as the art of designing in nature. People can be influenced by the environment just as they can influence it. Therefore, nature can be included in design to improve and uplift the wellbeing of people. Nature is thus a material that can be used, the same way materials made by man are considered as building blocks.

2.1.3 Urban Green Open Space

This study defines urban green open spaces as those parts of urban areas that have been developed through the conversion of natural or semi-natural ecological systems into open spaces following the influence of humans. Urban green open spaces act as the link between nature and urban. Within this setting, green open spaces in urban areas mirror natural or near natural areas of urban green open spaces surrounding cities. In most cases, the green fields are a continuation of landscapes all-round the city (Bayram & Ercan, 2012).

Different researches in their consideration of urban green open spaces more often included gardens and public parks. Consequently, multiple range of other areas may or may not be incorporated as urban green open spaces. These range of areas consist of recreational grounds such as semi private and private gardens, golf courses; other open public spaces such as street trees, grounds for sporting, residential open areas, wastelands covered by vegetation, urban agriculture, roof gardens, commercial forests, and indeed any place that has natural surface or growing trees (WHO, 2016)

Due to pressure of work and increase of spare time, urban residents have led to high demand of green open spaces. Humans have started to recognize the crucial importance of urban green open space mechanism to change into ideal state the active mechanic space, that it, create the value of environment mechanism as relates to the life of people. It calls for urban spatial design to develop to a kind of broader system so as to relate to other spatial shapes while itself is able to offer a city with ecological safety value (Wuquiang, Song, & Wei, 2012). One of the major drivers of today's world city system is green open space requirement.

2.1.4 Classification of Urban Green Open Spaces.

There are various methods of categorizing green spaces. They can be categorized according to patterns of use (active or passive green spaces), their ecological function (greenbelts that surround the city, historic gardens, green buffer zones, and agricultural areas) and on recreational basis (parks, gardens, thematic parks, playgrounds, sports fields, corridors, natural and semi-natural areas) (Ayedemir, et al., 2004).

Table 1: Typology of urban green open areas

MAJOR TYPES OF GREEN OPEN AREAS			
All Urban Green Areas	Amenity Green Areas	Recreation Green Area	Gardens and parks, informal recreation areas, outdoor sports areas, and play areas
		Incidental Green Area Space	Housing green space, other incidental space
		Private Green Area	Domestic gardens
	Functional Green Areas	Productive Green Area	Allotments, remnant farmland, city farms
		Burial Sites	Cemeteries, church yards
		Institutional Grounds	School grounds, other institutional grounds
	Semi-natural Habitats	Wetland	Open/Running Water Marsh, Fen
		Woodland	Deciduous woodland, Coniferous woodland Mixed woodland
		Other Habitats	Moor/Heath, Grassland, Disturbed Ground
	Linear Green Areas		River and Canal Banks Transport Corridors (road, rail, cycle ways And walking routes). Other linear features (e.g., cliffs)

Source: (Ayedemir, et al., 2004)

Amenity Green Areas: these are the types of green areas that are primarily designed for access to both recreational and visual comfort. Specifically, they include both public spaces and private lands.

Functional Green Spaces: the fundamental purpose of these green spaces is their function; they may however be allocated for recreation use where they may serve city residents for this purpose. Their main purpose for consumption by city residents is the function they possess. The leading functions for these green spaces comprise of horticulture, agriculture, education, institutional and cemeteries use.

Semi-natural Green Spaces: These types of green spaces comprise of semi-natural living spaces. They are established following their transformation into new residential spaces alongside developments of rural areas before their inclusion to urban green areas as well as degraded or abandoned landscapes. These habitats may or may not be publicly accessible, nevertheless, the greatly contribute to the urban landscape.

2.1.5 Emergence of Urban Green Open Spaces.

The leading concern of 19th century planning pioneers including Patrick Geddes, Ebenezer Howard and Frederick Law Olmsted was for the preservation of natural beauty and ecological functions with planning tasks since they viewed landscapes as living entities (Hall, 2005). Kellert and Wilson proposed in 1993 nine hypothesized perspectives of the utilitarian, the green urbanism, naturalistic, aesthetic, ecologistic-scientific, humanistic, symbolic, doministic, negativistic and moralistic. These dimensions were used in an effort to elaborate the extent to which extreme reliance on nature possibly constituted the foundation of a sensible and satisfying existence of human being together with the manner in which pursuit of self – interest may constitute the leading persuasive argument for individuals to develop an ethic for conservation.

This research study delves into detailed discussion of naturalistic, aesthetic and humanistic values owing to their high prevalence of application in today's urban design processes. Naturalistic values relate to human fulfilment that is obtained following direct interaction with nature. However, these values interrogate extensively the human sense of fascination,

wonder and amazement accrued following an intimate involvement of nature's complexity and diversity. (Kellert, 1993) explains the manner in which exploration and discovery of diverse way of living has for long been the leading factor for growing level of acquiring knowledge and understanding about the natural world. These details were essential contributors to the evolution process of human beings.

Naturalistic experiments were also conducted by another researcher (Kaplan, 1989). The findings showed the critical importance of nature to human beings, small and big trees, colourful flowers, sparkling waters, budding bushes and singing birds are all key components to good human life. Fundamentally, the naturalistic kind of values are in close relation to human fulfilment derived from unhindered interaction with nature that gratifies the curiosity function, mental and physical development and outdoor skills.

This concerns urban design in the responsibility of availing spaces outdoor so as to fulfil human naturalistic tendencies. In the process of designing the public sphere, planners should therefore create urban green open spaces that allows people to assemble in, walk through, or utilize in other ways. Contrastingly, inspiration, peace, harmony and security functions are all as a result of aesthetical values specifically those that relate to the beauty of nature and its physical appeal.

In addition, studies postulate that the aesthetic components of nature are highly preferred and can be collectively articulated across all cultures. According to Kaplan, the aesthetic response to nature, to peace of mind, to that feeling of tranquillity and to relate sense of psychological self-confidence and wellbeing mirror a guide to the behaviour of humans that is both influential and ancient.

In conclusion, nature's humanistic experiences echo feelings of unfathomable emotive connection to the separate components of the natural surroundings. Humanistic experience concentrates on bigger invertebrates though they can as well be associated with entities without ability of reciprocating feelings to humans, like plants and trees. As described by Kellert, humanistic experience can contribute to strong inclinations towards caring and nurturing of individual constituents, backing up group sharing, bonding, companionship and cooperation. This is related to urban design in provision of access to green spaces or

parks for the majority of the population within 100 meters and other openings like walking trails, green urban features, garden plots and community gardens, and wild or semi-wild nature. By offering access to these features by urban dwellers, individuals are able to develop an emotional and love attachment to nature, perhaps forestalling the essence of protecting and preserving the global features of nature. As a result, these theories provide the grounds for understanding the motivation behind the behaviour of humans and their fondness to a natural surrounding that educates them on the way of making use of urbanism in the context of urban design practices.

2.1.6 Urban Green Open Space Management

In urban green open space management, every stake holder has a duty to play in meeting urban green aspirations. The benefits of green open space to society are immeasurable in terms of social, economic and environmental. Globally, effective and efficient management of urban green open spaces has largely been hampered by the fragmentation of mandates for diverse elements of managing urban green open spaces particularly those aspects that concern institutions of governance. Green open space management and operational roles can be shared among the citizens, organized private sector and any forms of partnership arrangements.

Those practises that reduce or eliminate these fragmentations to the least minimum and attempt to bring together the existing opportunities and resources afforded by stakeholders to an efficient and effective system of managing urban green open spaces are considered to be the best urban green open spaces management practices. To this end, there are very interesting examples in the literature that suggests that urban communities are emerging as active and powerful forces in the ownership, development and management of green spaces. One of such examples is the case of community garden projects in Berlin and Rotterdam (Bond van Volkstuinder, 1998) that shows what efficiency and positive results can be achieved if community resources are pulled together towards achieving a common goal and especially in this case development and management of green open spaces. Also, the trend described by (Hou , 2010) as “guerrilla urbanism” is a positive development that shows urban residents demonstrating awareness in the importance of public spaces (of

which green spaces are an important constituent) and becoming active in reclaiming and maintaining them. These evolving trends in management can be further strengthened with better linkages between urban communities and the local government which at the moment is missing or frail at its best.

Moreover, it is increasingly apparent of the special role played by the private sector in the management of urban green open spaces. In the cases of Hanover, Minneapolis and Paris for example, the city authorities contract the maintenance of the parks to the private sector for a fee (CABE Space 2004).

2.2 Principles and Hierarchy of Urban Green Open spaces

2.2.1 Principles of Urban Green Open Spaces

Principles of urban green open spaces addresses the criteria used to design urban green areas, type of users and usage to be carried out. Legibility, mystery, complexity, naturalness, coherence and depth are the most important aspects that define the kind of environments preferred by people (Beer, 1990). Table 2 provides a detailed elaboration of these key elements that describe environments.

Table 2: Features Defining the Preference of Urban Green Open Areas.

Feature	Description
Legibility	Legibility refers to simplicity of categorizing and processing natural elements that make up a view or the ease of an individual in learning the environment without losing the way. A space legibility is closely related to the sense of order and clarity it is made up of (Herzog & Leverich, Searching for Legibility. Environment and Behavior. 35, 459-477, 2003).
Complexity	This is the diversity of natural elements that make up a view and possess enough knowledge that keeps individuals concerned and interested (Kaplan & Kaplan, 1989). The urge to discover is stimulated by diversity.
Mystery	The potential of a view to offer new information or its ability to stimulate curiosity and avail more information is its mystery. It is essential to establish fragmental shadings or hidden sites to stimulate curiosity of an individual for a site to create a sense of mysteriousness (Bryce & Herzog, 2007; Nasar & Cubukcu, 2011).
Coherence	Coherence refers to the level of organization or orderliness of those natural aspects that create a sight since the coherent space organization is explicit. The varying areas that make up a space should be clearly and explicitly perceived. People can easily differentiate these various areas, and as such pave way for comprehending and making sense of the space (Kaplan & Kaplan, 1989).
Naturalness	The naturalness principle is associated with human-made elements. Naturalness increases with decrease in human-made elements. The continuity of topography together with plants strengthen naturalness (Harting , 1993; Kaplan & Kaplan, 1989; Schroeder, 1987).
Depth	The depth principle is connected to the visual perception of measurements in a landscape. The transparency offered by overlapping forms and the discernment of the element that covers behind the covered element on the front ensures an in-depth perception of a space in a view (Ulrich, 1983).

Source: (Beer, 1990)

2.2.2 Hierarchy of Urban Green Open Spaces

Urban green open spaces exist where nature can be found. The spaces are within and without physical developments. They create principles and patterns in space for human's wellbeing. Benyus attempt to formulate principles of green urban spaces proposed a set of nature inspired design elements that comprised of day lighting, organic form and structure, natural sounds, natural ventilation, the imitation of natural features, bio-inspired gardens, restorative landscapes and a dynamic palette of colours (Benyus, 1987). He further proposed physical processes and elements from nature that can be adopted in the design of artificial processes and products.

Table 3: Hierarchy of Urban Green Open Spaces

Scale	**Design Elements**
Building	Green Rooftops
	Rooftop Gardens
	Sky Gardens and Green Atria
	Daylight Interior Spaces
	Green walls/wall artwork
Plot	Fixed/Movable planters
	Lawn area
	Vegetated swales
Block	Green courtyards
	Clustered housing around green areas
	Native species yards and spaces
Streets	Urban trees
	Vegetated swales and skinny streets

	Green streets
	Sidewalk gardens
	Edible landscaping
	High degree of permeability
	Low impact development
Neighbourhood	Stream day lighting, stream restoration
	Urban forests
	Ecology parks
	Community gardens
	Neighbourhood parks and pocket parks
Community/city	Urban creek and riparian areas
	Urban ecological networks
	Green schools
	City tree canopy
	Community forests and community orchards
	Greening utility corridors
Region	River systems and flood plains
	Riparian systems
	Regional green space systems
	Greening major transport corridors

Source: (Benyus, 1987)

2.3 Benefits of Urban Green Open Spaces

There are many functions and benefits of urban green open spaces that are essential for improving the quality of human life in urban areas as they offer connectivity between

nature and people. The following is a detailed description of the benefits of urban green open spaces.

2.3.1 Environmental Benefits

2.3.1.1 Ecological Benefit

Urban green open spaces accrue ecosystem benefits that range from biodiversity maintenance to urban climate regulation in cities. As compared to rural areas, solar input differences, temperatures and rainfall patterns are common in urban areas. There is a significant variation in air temperatures, solar radiation, relative humidity and wind speed as a result of the built environment in cities. Large areas of surfaces that absorb heat together with high levels of energy consumption in cities contribute to urban heat island effect.

2.3.1.2 Pollution Control

Leading pollutants in cities consist of particulate matter, chemicals and biological materials that occur either as liquid droplets, solid particles or gases. The most normal phenomenon in urban areas include air and noise pollution. This is attached to the presence of high numbers of motor vehicles that produce noise and air pollutants like carbon dioxide and carbon monoxide in urban areas. Industrial emissions for instance nitrogen oxides and sulphur dioxide within industrial areas are highly toxic to both the environment and human beings. Children, the elderly and people with respiratory ailments are the most severely affected by such detrimental environmental contaminants. Urban greening has the ability to decrease air pollutants directly especially when vegetation traps smoke and dust particles (Haq, 2011).

2.3.2 Biodiversity and Nature Conservation

Green open spaces play a vital safety and protection role for soil, plants and water quality conservation and as centres for species reproduction. Urban green open spaces avail the connectivity between rural and urban areas. They offer seasonal change, visual relief and a link to the natural world. The maintenance of ecological components of sustainable urban

landscapes, complete with greenways and utilization of plants species that are adapted to local environmental condition of low maintenance costs, sustainability and self-sufficiency are hugely depended on functional networks of green spaces (Haq, 2011).

2.3.3 Economic and Aesthetic Benefits

2.3.3.1 Energy Saving

Tree planting in temperate climate cities together with increasing green open spaces are attributed to realization that use of vegetation to decrease energy costs in cooling of buildings is cost-effective. Plants provide shade, improve the quality of air in circulation and transpire. This offers a cooling effect and leads to low air temperatures.

2.3.4 Social and Psychological Benefits

2.3.4.1 Recreation Wellbeing

Recreational needs are mostly fulfilled by people within their locality. Green urban open spaces provide easily accessible and affordable resource opportunities for emotional warmth and relaxation.

2.4 Sustainable Urbanism

2.4.1 Introduction

Three reform movements of the late 20th century are credited with the growth of sustainable urbanism that climaxes on the importance of integrating natural features and humans. These reform systems consist of new urbanism, smart growth and the green building movements. These three vary significantly in their constituencies, focus, history and approach. Despite these variations, they have shared interests in comprehensive social, economic and environmental reforms. Douglas Farr observes that each of these movements agonize over a given insularity that leads to prejudice in attempt to search for sustainable solutions. Additionally, that among the three, there is a prevailing understanding but rather an unfortunate inclination towards self-validation, that results to reluctance to participate in broader detailed programme. Farr explains with an instance of a certified “green

building" that is in essence negative to the environment since it turns out to be encircled by a paved extensive motor vehicle parking or a walkable neighbourhood that is hard to sustain due to its houses being wastefully erected and energy inefficient (Farr, 2008). In its most basic principles, "sustainable urbanism" is walk able and transit-served urbanism that is integrated with buildings and infrastructure of high performance; has its core values in human access to nature and compactness, and, the characteristics of functionality, sustainability and interconnectivity are more valuable to design.

Nonetheless, design features play a pivotal role in sustainable urbanism. As a result, the new urbanism movement becomes more competitive over the other co-existing movements, whose main objective is on the quality of the design as a foundation for socially sustainable settlements. Most significant even is the fact that not only is sustainable urbanism the single most approach for designing and managing sites - but too is a complex agenda and network of interdisciplinary attentive stakeholders – in the form of architects, planners, engineers among others and thanks to this feature it possesses - and is poised to continue holding – that reform influence on the entire planning and developing community.

The main target of sustainable urbanism is to address critical issues and challenges including but not limited to urban design, social, economic and environment issues and challenges for sustainable community development together with local and global climate and health issues and challenges, and thus suggesting detailed solutions for present and future interdisciplinary tasks to be meaningful.

2.4.2 Smart Growth – The Environmental Consciousness of Sustainable Urban Growth

Smart Growth is a theory in urban planning and transportation. It concentrates growth at the city centre to contain urban sprawl. The theory calls for transit oriented, compact, walk-able, bicycle friendly land use, as well as neighbourhood schools, mixed – use developments with a range of housing choices and streets that work for everyone. 'Smart Growth' is a term primarily used in North America. The terms "Compact City" of "Urban Intensification" are used in Europe, specifically in the UK. These terms have mostly been

used to elaborate similar notions that have impacted government planning policies in the Netherlands, the UK and a few other European countries.

Smart growth prefers long term, regional sustainability considerations over short-term objectives. The main goals of smart growth are to expand the transportation range, housing choices and employment; to achieve unique sense of community; to preserve and enhance cultural and natural landscapes; to promote public health and to equitably distribute development costs and benefits.

Smart Growth as a concept came about in 1992 following the adoption of Agenda 21 by United Nations at the United Nations Conference on Environment and Development (UNCED) host by Brazil at Rio de Janeiro. The concept, driven by "new guard" urban planners, developers, architects, historic preservationists, and community activists, concurs that growth and development will definitely continue to take place, and as such it seeks to direct growth in a comprehensive and intentional way. The principles of smart growth are directed at building sustainable communities that are great places to live, work, do business and raise families. Urban growth can therefore be perceived as 'smart growth' is the extent of the growth incorporates the following elements of compact neighbourhoods, transit-oriented development (TOD), pedestrian and bicycle friendly design among others as listed (U.S Environmental Protection Agency, 2014).

a) Compact Neighbourhoods

Compact, liveable urban neighbourhoods appeal more businesses and people. Building such neighbourhoods is a core component of decreasing urban sprawl and climate protection. It encompasses the adoption of redevelopment strategies and zoning regulations that guide the growth of housing and job opportunities in urban areas and neighbourhood business districts, with the aim of creating compact, transit -, bike -, and walk able- friendly city hubs.

b) Transit-Oriented Development

Transit Oriented Development (TOD) is an urban planning concept that refers to a commercial or residential area that is designed to maximize access to public transport. Mixed use/compact neighbourhoods have a tendency to utilize transit at all times of the day. Developments of commercial or residential use are designed to align along major public transport routes so as to achieve the goal of TOD. Majority of the cities that are determined to adopt and implement better TOD strategies attempt to secure finances for improving existing public transport infrastructure as well as creating new ones. Other means may constitute regional cooperation to raise levels of efficiency and expand services, and move trains and buses more frequently through high consumption areas.

c) Pedestrian and Bicycle Friendly Design

Walking and biking to work in place of driving has the effect of reducing pollutant emissions to the environment, saves money on fuel and vehicle maintenance and fosters a healthier population. Essential improvements to cater for pedestrians and bicycle cyclists entails developments of bicycle lanes on main streets, creation of an urban bike-trail system, pedestrian crossings, pedestrian walkways, bike parking, and related master plans. Pedestrianism that separates pedestrians and motor vehicles on separate grids is the most pedestrian and bike friendly variant of smart growth movement.

d) Protection of air quality, water supplies, reusing land and preserving open green spaces and critical habitat.

e) Development rules are fair, predictable, cost-effective and transparent.

f) Large areas prohibited for development are set aside for nature is able to run on its own to provide clean water and fresh air.

g) Focus expansions on existing areas since this permits the location of public services at sites where people live, hence does not take away neighbourhoods from the core of the city in large urban areas.

Establishing developments around pre-existing areas reduces socio-economic discrimination permitting more equitable functioning of the society and generating a tax base for educational, housing and employment programs.

Upon an evidence review on urban smart growth, intensification and their influence on travel behaviour, (Melia & Parkhurst, 2014) established that planning policies that increase population densities in urban areas have a tendency of reducing the use of cars, though its effect is weak, and thus the doubling of an area's population density most likely does not halve the distance or frequency of car use. These findings informed their proposal of the paradox of intensification. It postulates that, "Ceteris paribus, urban intensification which increases population density will reduce per capita car use, with benefits to the global environment, but will also increase concentrations of motor traffic, worsening the local environment in those locations where it occurs".

Their study findings further showed that positive measures are generally insufficient to counteract the effect of traffic of raising the population density at the neighbourhood or individual level. As a result, policy makers are limited to only four choices of: sprawl and accept its wider consequences, intensify and accept the lo al consequences, reach a compromise with some components of both concepts, or intensify alongside radical adoption of radical measures such as closing roads to traffic and car free zones, parking restrictions among others.

Smart growth principle is criticised by some libertarian groups like the Cato Institute. Their critique is founded on the grounds that smart growth concept leads to greatly increased values of land, and average income earners no longer have the ability to afford detached houses (O'Toole, 2001).

Douglas Farr contends that Urban Growth Boundaries (UGB) put the least effort in ensuring quality developments within UGB. He argues that this leads to "well located – bad developments", o rather what can be referred to as smart sprawl. Consequently, the smart growth brand was dissolved by the vagueness of its standards and the decision of smart growth movement to lend its name to development projects of some minimal incremental improvements (Farr, 2008).

2.5 Challenges of Protecting Urban Green Open Spaces

These are problems faced when protecting urban green open spaces. They include:

2.5.1 Legal Challenges

a) Mapping Green Open Spaces and Understanding and Measuring their Recreational and Cultural Value

Urban green open spaces are conventionally considered a cultural service, however determining their use has been extremely challenging. Despite the possibility of having more intelligent use of modern technology to determine their use, it remains difficulty to understand who uses green open spaces, when do they use them and why do they use them. To avail this information calls for the adoption of an 'urban green space map' that would make such details readily available. Mapping would ensure policy makers, communities and individuals have the ability to make the best use of available green open spaces.

2.5.2 Financial Challenges

a) Budget Constraints

Urban green spaces' budgets are by now highly stretched and will most likely continue to be put under further strain. Prevailing financial stresses are additionally likely to influence the quality of urban green open spaces. Budgets for green open spaces are narrowly derived from a single source despite the fact that a broad range of benefits are accrued from them across all spheres. As a result, it therefore would be much appropriate to draw funds from across all budgets of the local authority in a manner that better indicates the spread of benefits accrued from investments in urban green open spaces, particularly comprising present and future health and environmental benefits.

b) Protected Funding for Urban Green Open Spaces

Increasing demand for housing together with tight funding for green open spaces, local authorities are faced with the potential of having to dispose of green open spaces that are not protected to raise funds for developing and maintenance of the remaining green spaces.

It is of paramount importance that should this happen, the proceeds are protected and re-invested in other green open spaces without being diverted to other places.

2.5.3 Institutional Challenges

a) Measuring, Monetising, and Maximising Environmental Benefits of Urban Green Spaces

Currently, the huge environmental benefits presented by urban green spaces are highly undervalued. However, these benefits have the potential for far much greater input in mitigation against future climate changes which is presently underdeveloped. Notable benefits comprise of flooding prevention through stormwater runoff and drainage, improved air quality and temperature through creation of cooling effects and reduction of carbon emissions, and biodiversity promotion.

b) Cost-Benefit Analysis

There is lack of robust tools for cost-benefit analysis that are sophisticated enough to capture the benefits of certain aspects of urban green open spaces that are more challenging to value. Nevertheless, it is vital to have robust methodologies that can support better business cases to continue arguing for investments in green open spaces. Procedures for measuring and monetising social, environmental, wellbeing and health benefits pf urban green open spaces ought to be developed by policy makers and academics.

2.5.4 General Challenges of Urban Green Open Spaces

In order to achieve sustainable management of urban green open space, the following parameters must be observed:

a) Accessibility of urban green open spaces

The accessibility of urban green open spaces refers to the degree of difficulty for residents to go to the green open spaces. The accessibility of an urban green open space determines the impact of green open space on residents' well-being to a large extent and it is an important bridge connecting urban green open space and residents' well-being.

b) Green-space provision per inhabitant related to green spaces within walking distance to residential areas

This refers to the mean distance covered by a population to access the closest public green space. It captures the portion of the population that have easily accessible green spaces with clearly demarcated minimum size in near distance.

c) Green-space provision per inhabitant related to total amount of green space

This refers to the per capita green space in a well-defined commuter belt that has a provision of residents with urban green space in a clearly defined commuter belt, that supply the needs whereby the total urban supply situation of residents that have green spaces grounded on city specific quantitative benchmarks.

2.6 Indicators of Sustainable Management of Urban Green Open Spaces

Urban green open spaces sustainable management indicators reveal how green spaces should be managed for good performance as the end result. Urban green spaces can be considered as sustainable or not after they have been able to satisfy the needs of urban residents over a long period of time. This study classifies the indicators for sustainable management of urban green spaces as either legal, financial or institutional.

2.6.1 Legal Indicators

Planning regulations by county and national governments underline the planning of major towns in Kenya. The operations of several laid down planning regulations that cover urban green open spaces in Kenya is problematic despite their availability in various towns across the country. The effective operation of urban planning regulation in Kenya's urban green open spaces is hindered by regrettable issues. these issues include bureaucratic processes involved in issuing development permits, weaknesses of planning organizations or institutions owing to insufficiency of resources to work with and the dysfunctional nature of urban planning regulations (Muderere, 2011): (Awuah, et al., 2011). The dysfunctional nature of urban planning regulations in Kenya is closely associated with the outdated nature

of some of the regulations to sort the present trends of development in urban areas. It is apparent that some of the urban planning regulations in operation in Kenya were made along the colonial masters planning regulations (Awuah, et al., 2011).

Legal indicators, sometimes known as governance indicators, indicators of public service performance or rule of law indicators are quantitative measures of the performance of legal systems. They are aimed at measuring the effective enforcement of environmental law at international, regional, national and local levels. Such indicators provide specific instruments, which are objectively verifiable, for qualitative and quantitative assessment of the existence, the substance, the procedures and the enforcement of environmental law.

The creation of legal indicators requires identifying, formulating, qualifying and prioritizing indicators on the law-making process, on the content of the rules, on procedural matters and on administrative, judicial and social controls. In this respect, various criteria of effectiveness should be considered, in particular: the existence or absence of a given rule; its content and relevance in terms of progress or regression; public participation in its development; its social value vis-à-vis public expectations; and its enforcement level through administrative, judicial and social mechanisms. Some of the legal indicators used in this research for Sokoni Ward will be Acts passed by Kilifi County Assembly on urban green open spaces which include: The Kilifi County Solid Waste Management Act (2016), The Kilifi County Environmental (Regulation and Control) Act (2016), Revenue Administration Act (2014), The Kilifi County Finance Bill (2014), The Kilifi County Planning Bill (2016) And the Kilifi County Water and Sanitation Service Act (2014).

On the national context the following legal indicator will also apply for Sokoni Ward: The Constitution of Kenya (2010), Urban Areas and Cities Act (2011), The County Government Act (2012), The Planning Act (1996), Environmental Management and Coordination Act (1999), National Land Commission Act (2012) And National Land Policy (2009). These will be discussed in the subsequent chapter.

2.6.2 Financial Indicators

A wide range of different approaches can be used to fund sustainable and high-quality urban green open spaces. Funding successful urban green open spaces is often underpinned by a management that includes a variety of multiple funding mechanisms, sources and partnerships and a strategic approach to funding. The most key elements of the funding include both the amount of urban green space funding together with the manner in which the funding is utilized. The quality and sustainability of urban green open spaces is heavily reliant on the capacity and skills of the people operating the green spaces both at operational and management levels. Main sources of urban green open space funding in Kenya comprise of: -

a) National and County Government

The County Governments Act Sections 104 (1) and 107(2) require that, "A county government shall plan for the county and no public funds shall be appropriated outside a planning framework developed by the county executive committee and approved by the county assembly", and "The County plans shall be the basis for all budgeting and spending in a county." The County Annual Development Plans forms the basis for the implementation of County Integrated Development Plans (CIDP) and as such link urban planning at the county level with the national budgetary system.

b) Multi-Agency Public Sector Funding

A range of government departments and agencies can provide necessary funding for the execution of projects that meet cross cutting objectives.

c) Taxation Initiatives

Revenues by the government can be classified as direct or indirect contributions. Direct contributions are received through taxes on incomes from tourism businesses, tourism employment and direct charges. Indirect contributions are generated from duties and taxes on goods and services delivered to tourists. These revenues can be ring-fenced to finance the provision and management of urban green open spaces.

d) Planning and Development Opportunities

The management and provision of urban green open spaces in and around new commercial and residential developments can be funded through planning agreements.

e) Income-Generating Opportunities

Private companies and community organizations have notable roles to play in the funding for the provision and management of urban green open spaces. For instance, private operation of public spaces often enables more intensive and innovative consumption of revenue generation that helps meet maintenance costs, while partnering community organizations can aid effective fund raising for provision and maintenance of urban green open spaces. The former approach can as well reduce or defray expenses from budgets of county governments.

2.6.3 Institutional Indicators

These indicators bring out the linkages in a planning exercise in terms of how the institutions operate and link with statutes and policies within and at all levels of operation. This research project sought to understand the institutional indicators of urban green open spaces within Sokoni Ward and their capacity to execute their duties. There are various institutions tasked with the responsibility of overseeing the proper management of urban green open spaces within Sokoni ward. It is therefore expected that these institutions carry out their duties and responsibilities regarding urban green open spaces and other supporting infrastructure appropriately in order to achieve the desired results. There are a number of governmental, private and communal institutions which are responsible for the sustainable management of urban green open spaces. These institutions are expected to be integrated in the management of the urban green open spaces so as to achieve their optimal functionality (Nations, 2007). Some of these institutions include the Kilifi County Government, NEMA, Environmental Groups, Community Based Organisations, National Land Commission and the Ministry of Housing and Physical Planning.

This study therefore sought to understand the ways in which the performance of the institutions in question reveals the achievement of the desired state or their shortcomings. This will be achieved through the scrutiny of various aspects relating to urban green open spaces in Sokoni ward so as to determine whether the associated institutions are conducting their roles as they are supposed to be or they need to improve in order to achieve sustainable management of urban green open spaces.

2.7 Planning for Green Open Spaces Infrastructure in Kenya

Guidelines for preparation and implementation of physical development plans in Kenya are provided for in the Physical Planning Handbook (2002). The handbook is meant for use by local authorities, physical planners, land administrators and other relevant individuals and institutions mandated with the responsibility to guide and control land use and development in Kenya. This study observes that, the Physical planning handbook is a document that provides direct guidance on planning for urban green open spaces in Kenya's planning practice. It also provides other planning standards applicable in the country. This study discusses key guidelines relevant to development of green infrastructure as sighted from the handbook.

2.7.1 Site Planning

The Physical Planning Handbook gives guidance on plot frontages, plot coverage's and building lines. On site planning, the handbook calls for observation of the following controls:

a) Plot Frontage

The handbook calls for proper and sufficient frontage to a street of all plots for which residential buildings are to be constructed. The frontage streets should not be passages or sanitary lanes. The table below shows the recommended minimum frontages for residential plots.

b) Plot Coverage

As applied to a building, plot coverage refers to the portion of horizontal area of a site a building is allowed to be erect. The main objective of fixing plot coverage is to ensure a healthy surrounding and provide room for expansion and improvement of social amenities and infrastructural facilities. Table 6 provides details of the recommended plot coverage in Kenya by the physical planning handbook.

Table 4: Recommended Maximum Plot Coverage

RESIDENTIAL DEVELOPMENT TYPE	MAXIMUM PERCETAGE PLOTS COVERAGE		
	DETACHED HOUSING	SEMI DETACHED HOUSING	ROW HOUSING
1. Slum rehabilitation and upgrading schemes	50	65	65
2. Low-cost housing	50	60	65
3. Normal housing	40	50	60

Source: Physical Planning Handbook, 2002

c) Building Lines

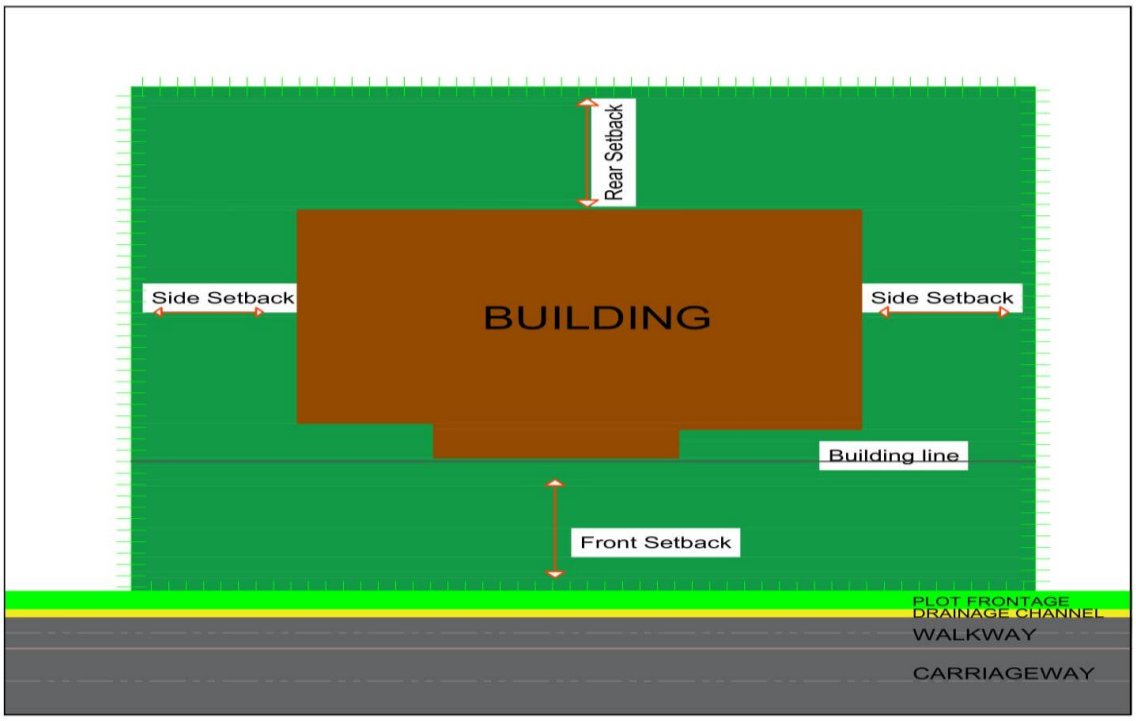
The principal value of building lines also referred to as setback lines is to either reserve a certain access of area of ground or to achieve a visual effect. It is unnecessary to set similar lines, however, they may be drawn flexibly to produce a variegated character and spatial coherence. In prime areas, it may be essential to set both minimum and maximum lines. The table below indicates the minimum distance of a house or ancillary structure from the boundary/plot line.

Table 5: Minimum Setback of Dwelling from Plot Lines

TYPE OF RESIDENTIAL DEVELOPMENT	MINIMUM SETBACK IN METERS		
	FRONT	SIDE	REAR
1. Slum rehabilitation and upgrading schemes	2.5	1.5	3
2. Low-cost housing	3	1.5	4.5
3. Normal housing	4.5	3	6

Source: Physical Planning Handbook, 2002

Figure 1: Site Planning



Source: Author, 2020

On the other hand, **Part II** of the Building code on siting and space about buildings tackles determination of sizes of open space in association to residential buildings as follows:

Space in front of buildings, **Section 17 (1)** States that "a domestic building shall so be sited as to leave an open space immediately in front thereof which extends along the whole width of the front of the building and is not less than 20 feet (6 metres) wide measured at right angles therefrom: Provided that if the building fronts on a street of a less width than 20 feet (6 metres)., the width of such open space may be not less than the width of the street plus one half of the difference between that width and 20 feet (6 metres)".

Minimum measurement of courtyard, **Section 19** States: "where any building contains more than one dwelling and is designed to have an internal courtyard or open space, there shall be provided within such courtyard or open space an area free from obstruction of not less than 350 sq. ft. and having no dimension less than 15 feet (4metres)".

Frontage, **Section 26** States thus, "unless otherwise agreed by the council, no building shall be so sited to as to have a principal frontage abutting on to a street of a less width than 30 feet (4metres)".

There is therefore a conflict of the regulations quoted above, which in turn would cause inconsistencies in siting of buildings. The resulting open spaces within neighbourhoods would then not be consistent.

2.7.2 Demand for Recreational Facilities

Traditionally, recreational open green spaces are the setting of concentration of green infrastructure even within residential areas. They could be in the form of parks and playgrounds. The Handbook notes the presence of several socio-economic factors within the urban population that indicates a real need for generous provision of green spaces within an urban surrounding. They include: -

a) New Urban Population

Migrants from rural areas form the majority of adult population in Kenya's urban areas and indicates a strong connection to land. the formative influence in their lives is basically the rural environment.

b) Low Earnings

Majority of the urban population have money for their basic needs and lack it for all other needs. As a result, they are mainly pedestrians and their recreation sites must be within walking distance from their homes. They can hardly afford much living space and this have a tendency to reside in cramped overcrowded settings. As such, a form of relief is essential from the pressures of overcrowding.

c) Population Structure

The largest proportion of the urban population in leading urban areas are below 25 years. Open spaces are thus essential for their physical health and psychological development. Overcrowded living environments do not have varieties in the environment and is free of opportunities for exploration and independent play during their formative years and thus tend to hinder their cognitive development. therefore, it is of paramount importance to avail opportunities for children to play in attractive, safe and stimulating environments within their living areas.

d) Limitations on Public Expenditure

Limited public funds can contribute to poverty in the form of human made environment. One of the most effective and cheapest way of counteracting eyesores in the human made surroundings could be a sensible landscaping policy; whose result is to generate an urban environment that is attractive to live, work, and do business and offering affordable opportunities for recreation.

2.8 Planning Intervention for Green Open Space Infrastructure and Physical Development in the Urban Areas.

Expansion of cities is basically through secondary urban areas. Secondary urban areas grow owing to congestion at the central business district of major cities. These urban areas help in the provision of opportunities for urban stakeholders to plan better for the city population. In most cases, these secondary towns are characterised by high rise buildings whose plot ratio exceed 300%. They have residential, commercial and light industries within their zoning frameworks. They for the surrounding that majority of urban residents presently inhabit on a day-to-day basis. Design and planning at the secondary urban areas influence the daily lives of city dwellers. They determine the kind of facilities that are locally available, the distance to travel to access the city centre, and the opportunities for interaction with neighbours (Wheeler, 2004).

Early in the automobile age in the 1920s, Clarence Perry, an American Architect opined that neighbourhoods and the aspects that make up good neighbourhoods were affected by the rise of automobiles and growth of cities (Legates, et al., 2011). Private developers have historically played a leading role in the planning of cities, especially because they are indeed involved in the plotting and/or constructing cities. Developers obtain large chunks of land, lay out streets, subdivide the land into small portions (sub-plots), at times include parks and other social amenities, and either sell the parcels to other developers or construct infrastructure and offices by themselves. This has become the norm for new commercial districts within large scale development model, where entrepreneur play a major role in the planning the form and structure of a city (Wheeler, 2004). A core challenge to sustainable development is a better connection between the natural environment and humans. Neighbourhood planning should therefore endeavour to establish a variety of natural areas and urban green open spaces to enhance sustainable development.

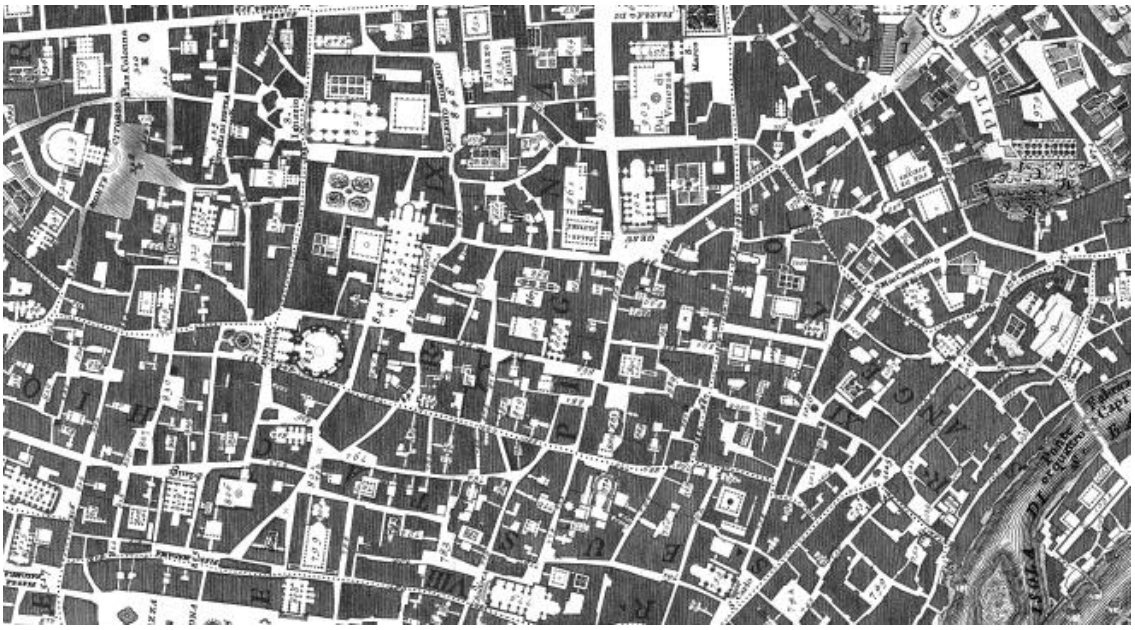
2.9 Theoretical and Conceptual Perspective of Urban Green Open Spaces

2.9.1 Urban Design Theories

2.9.1.1 Figure Ground Theory

Figure ground theory refers to a case where the urban fabric comprises of development of solids and voids. The solids influence the configuration of blocks and shape the urban form. The street network links an area and is vital for movement of goods and people and for the continuation of activities within the area. Positive voids or "space as object" are created as a result of the building coverage being denser than its exterior space. During peak hours, traders erect open markets along the street network to take advantage of high number of customers moving along the streets at that time. The open space along the street is therefore less than the built-up area as multiple buildings line up along either side of the street.

Figure 2: Figure Ground Theory



Source: (Robert Venturi, 2004)

2.8.1.2 Linkage Theory

It refers to the organization of lines that connect the parts of the city and the design of a spatial datum. It shows linking elements that connect the parts of the street. This describes

the manner in which the street connects the other areas. More emphasis is stressed on circulation as opposed to the spatial structure of the figure ground theory. Infrastructure efficiency and movement systems take precedent over patterns of distinct outdoor space.

There are two principles which guide linkage within a place:

a) Principle of Universal Accessibility

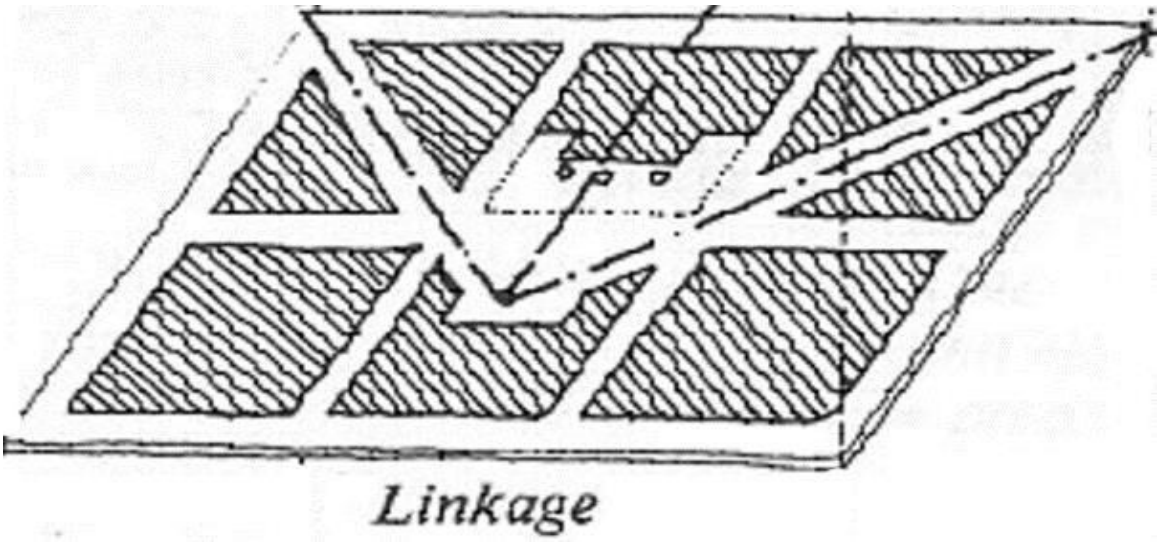
The principle of universal accessibility explains urban infrastructure and facilities adaptation to the broadest range of potential users, including individuals with visual impairments and mobility challenges, pregnant women, people walking with children, people in wheelchairs, the elderly, and people carrying heavy loads like firewood, water among others. The principle of urban universal accessibility demands that urban spaces should accommodate comfortably both 8- and 80-year-olds. Spaces should be suitable for everyone; they should be adapted for the most vulnerable users. This principle therefore encourages broader social inclusion and welcomes all to benefit from the urban experience.

b) Principle of Complete Streets

Complete streets are those streets planned from edge to edge of buildings. Complete streets include walking and cycling infrastructure, including ramps, signage and other facilities for aiding the physically challenged. Further, they incorporate urban furniture such as street lamps, covered bus stops, vegetation and trees in line with the context and rain water harvesting infrastructure. Complete linkages incorporate all principles of universal accessibility and promote safety of all users. Some street elements are compulsory and must be provided in any street.

The basic principle for constructing pedestrian facilities hugely depend on building of complete streets with adequate provisions for all street modes and functions. A complete street is inviting to bicycles, pedestrians, wheelchairs and motor vehicles. The design of complete streets incorporates urban furniture, street lighting, signage alongside cycling facilities and sidewalks.

Figure 3: Linkage Theory



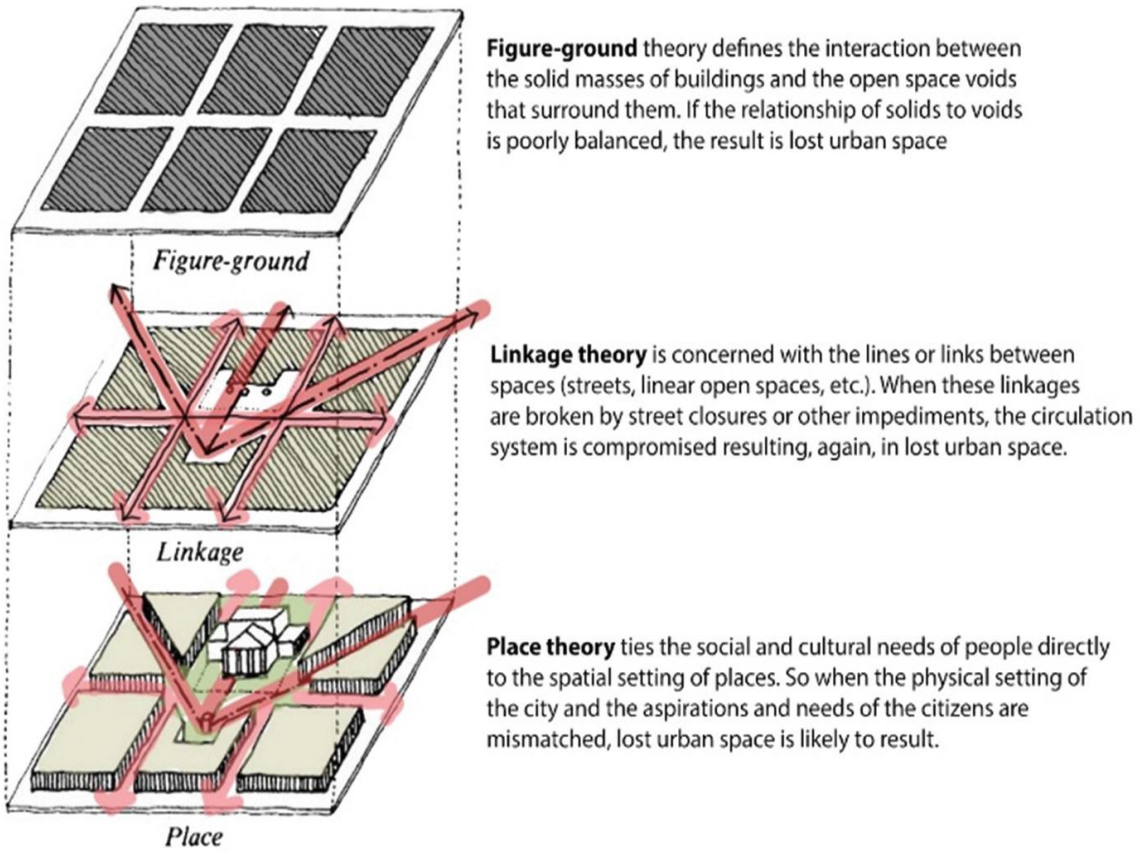
Source: (Bahrainy & Bahrainy, 2016)

2.8.1.3 Place Theory

In spatial design, the main essence of place theory is to understand the human and cultural aspects of physical space. Physical terms, if in abstract, space refers to a purposeful or bounded void that has the potential of linking things physically. It becomes place when it is given a contextual meaning that is drawn from a regional or cultural context.

Its emphasis on human needs and cultural, historical and natural contexts. The richness of physical space is accrued by including unique details and forms indigenous to its setting. Visual perceptions of users, socio-cultural values and individual control over the public environment are essential just as are the enclosure and linkage principles.

Figure 4: Summary of Theories of Urban Design



Source: (Bahrainy & Bahrainy, 2016)

2.9.2 Theories of Urban Green Space Design

This section investigates and deduces the most relevant theories as related to the design of urban green open spaces. It considers theories and components as patterns.

Under this domain, the following theories are discussed: -

a) The Attention Restoration Theory (ART)
b) The Stress Reduction Theory (SRT)
c) The Perceptual Fluency Theory (PFT)

2.9.2.1 Attention Restoration Theory (ART)

The Attention Restoration Theory (ART) was put forward by a psychologist Dr. Stephen Kaplan in 1977. The theory avers that "human beings respond to nature generated stimuli through involuntary actions backed up by involuntary attention". The effect is that of reduction of stress and wastage of energy attached to cognitive thinking as a result of stressing environment that deviate the attention of a person.

The theory elucidates nature's restorative quality as argued by its proponents Dr. Stephen Kaplan and Racheal Kaplan. This quality restores a person's attention from lengthy tasks that are mentally draining. Literature reviews points evidence to the fact that nature, especially natural elements offer restoration effect on an individual, as evidenced by ancestral chronicles of the restorative effect of nature.

ART therefore suggests that four elements of nature offer cognitive restoration. These include fascination, being away, extent and compatibility.

a) Fascination

Fascination refers to those ART elements that are accessed in several dimensions. They eliminate all chances of stress on the brain, for mental attention to fascination and soft. ART is the involuntary action stimulated following the beauty of nature.

Hard fascination: this form of fascination stresses on a specific natural setting or natural element that does not leave any room for any form of interference.

Soft Fascination: this kind of fascination underscores on a diversity of natural elements, organized in a specific pattern, as occupy the person, through a distinct path, engendering the stimuli for exploration and creation of excitement.

b) Being Away

This is the ART component that accentuates on the aspect of being mentally and physically away from an urban green space element and the quality of restoration effect it produces. This may comprise of being physically absent from the natural element while remembering

or reconciling it with closed eyes, decreasing psychological exhaustion and wastage of energy on the functioning of the brain or cognition. As a result, an individual's mind is diverted from work stresses and assumes it on natural elements which do not stress the brain, availing relocation and reinstating the neuro-muscular system together with the brain, and thus re-establishing the attention of the person.

c) Extent

Extent as a component of ART delves on the degree of natural environments that are efficient to occupy one's mind through successive sequence of attention stimulating elements, further creation fascination.

A micro level extent such as potted plants generates minimal attention restorative effect as compared to macro level extent like say forest or field of flowers that offer ample extent.

d) Compatibility

The component of compatibility in ART stresses on the provided natural elements and environment, and the leanings of human beings towards these natural elements and environment must be compatible and complimentary. This means that the inclinations of humans should be easily fulfilled without much effort or struggle. Therefore, those experiences which occur in the confines of this component should have a high extent of compatibility.

2.9.2.2 Stress Reduction Theory

Roger Ulrich in his 1983 article "Aesthetic and effective response to natural environment" brought forward the stress recovery theory which concerns itself on the recovery from psychological stress. According to Stress Recovery Theory (SRT), stress is defined as "a process of generation of human stimuli in response of events, environmental features or situations that are considered as a threat to persons wellbeing. This further generates negative emotions".

Ulrich, following review of (Zajonc, 1980) works, argued that a person's initial reaction to an unknown or unfamiliar surrounding is one of disinterests or dislikes. He goes on to note that this goes on until particular features in the environment are addressed such as availability of vegetation, symmetries, complexity, vistas, views and lack of elements, resulting to generation of threat.

These topographies are considered as effective in the reduction of negative emotions and disliking and stimulates attachment, affording an uplifting experience. These sceneries originate from the evolutionary adaptation and the present environmental conditions at the point in time. Therefore, nature-based topographies have the potential to decrease stress, unlike non-natural or artificial features such as aluminium, glass etc.

2.9.2.3 Perceptual Fluency Account

Perceptual Fluency Account (PFA) intersects ART and SRT theories of urban green open spaces. The theory is founded on the premise that the brain of human is able to more fluently and frequently understand and create stimuli to a natural environment in a planned way, thus an urban setting, governing on the built environments. Therefore, fluent human brain encounters with natural settings decreases mental stress, reinstating attention and eventually reducing stress.

2.9.3 Nature Based and Environmental Preferences Theories

Environmental preferences and nature-based theories are premised on the idea that humans are affectionate towards nature. This is witnessed by ancestral evolutionary adaptation to natural environments and surroundings.

As per current literature, theories in this sphere are categorised into the following four categories: -

a) Savannah Hypothesis
b) Prospect and Refuge Theory
c) Fractal Theory
d) Aesthetic Appeal of Natural Theory

2.9.3.1 Savannah Hypothesis

Ecologist Gordon Orions introduced the Savannah Hypothesis theory in 1980. The main emphasis of the theory was on "Environment Selective Theory". Savannah Hypothesis postulates that, human beings prefer to have African Savannah natural elements. Orions contended that humans generated psychological relations with savannah like landscapes as a result of humans' long survival history in the savannah and the evolutionary adaptations that occurred in the savannah environments. As such, savannah like landscapes would be intrinsically preferable by humans owing to their ability to result to a person's wellbeing as compared to present cityscape. Savannah like landscapes is mainly characterised by animal lives, high varieties of flowers, topographic changes, scattered cluster of trees, multiple long distance's view corridors for predator surveillance, scattered water bodies and a bright sky that is free of any obstructions.

2.9.3.2 Prospect and Refuge Theory

This theory was developed by a photographer (Appleton, 1975). The motivations behind prospect and refuge theory are a person's ability to view a space without being noticed by another person. In this context, a "Prospect" is that ability to view a space, while "Refuge" is that aspect of not being seen by others while viewing the space. The existence of Prospect and Refuge theory is attached to our ancestors, for whom shelter was considered a very key element, in whatever form, it afforded them Refuge from the external world, while simultaneously carrying out a surveillance of the surrounding areas from an enclosed space, which is Prospect. Both Prospect and Refuge are at equilibrium with potential of dividing Prospect into two parts, and as such they can't exist singularly. "Direct" stresses on vistas and views, directly visible from a point. "Indirect", or "directed vistas" occurs when at every point of viewers movement - vistas change, and refuge being dark and small where a person feels secured.

2.9.3.3 Fractal Theory

Fractal Theory is premised on fractal geometrics that exist in nature. If mirrored in differing contexts of the built environment, fractal geometrics can visually enhance reduction of

stress and wellbeing. As suggested by (Mandelbrot, 1977), the concept postulates that components of fractal geometrics have the potential to enhance human wellbeing as opposed to non-fractal components. Therefore, fractal components can be encompassed into the different aspects of the built environment such as stair case, roofing etc that denote fractals.

2.9.4 Planning Intervention for Green Space Infrastructure and Physical Development in the Secondary Commercial Cities.

Secondary commercial cities sprout as extensions of expanding cities. Secondary commercial cities grow as a result of congestion within the central business district. These secondary commercial cities help in availing opportunities for city stakeholders to develop better plans for the city population. Secondary commercial cities are mostly characterised by high rise buildings and a plot ratio of over 300%. Within their zoning framework, they feature residential, commercial and light industries. Design and planning secondary commercial cities influence our daily lives. They determine the location of facilities, what facilities are locally available, the distance we need to travel to acquire goods and services, and more on the available opportunities for interaction with our neighbours (Wheeler, 2004).

An American architect, Clarence Perry, in the early automobile age of 1920s argued that the rise of automobiles and the growth of cities affected neighbourhoods and those features that make good neighbourhoods (Legates, et al., 2011). The most active role in city planning has historically been played by private developers. This is out of the fact that they are actively involved in plotting or construction of cities. In the context of large-scale development model which has since become the order for new commercial districts, these private entrepreneurs acquire large portions of land, they lay out streets, subdivide the land chunks into small plots, and at times include parks and other amenities, then sell these subdivided plots to other private developers or construct offices and infrastructure themselves (Wheeler, 2004). Meanwhile, sustainable development is heavily reliant on better linkages between natural and human environments. Owing to this, neighbourhood planning should strive to establish a variety of open spaces and natural environment.

2.10 Legal, Policy and Institutional Framework

2.10.1 Legal Framework

The Constitution of Kenya (2010)

Kenya's 2010 constitution is the country's supreme law. It has given notable attention to matters land, land use planning and environment conservation and protection. **Article 66 (1)** states that "The State may regulate the use of any land, or any interest in or right over any land, in the interest of defence, public safety, public order, public morality, public health, or land use planning".

Article 42 is focused on ensuring every Kenyan has a right to a clean and health environment. This includes the right to environmental protection for the benefit of the current and future generations. This is to be achieved through legislation and other actions; and, to fulfil environmental related obligations.

In addition, **Article 69** calls for the state to uphold particular obligations in respect to environment, including: -

a) to ensure the sustainable exploitation, use, management and conservation of the environment and natural resources as well as equitable distribution of the resulting benefits (environmental justice)
b) to promote the participation of the public in the protection, management, conservation and preservation of the natural environment
c) to eradicate activities and processes that have the ability to threaten the environment
d) to make use of natural resources and the environment for the benefit of Kenyans

Urban Areas and Cities Act (2011)

The Urban Areas and Cities Act (2011) is a legislative Act of Parliament that implements Article 184 of Kenya's 2010 Constitution. This Act makes provisions for the categorization, governance and management of cities and urban areas. Further, it also makes provisions for procedures of creating urban areas, for public participation and the principle of governance, as well as for connected purposes.

The Act fortifies community engagement. It strengthens devolution as a means of achieving sustainable management of the city in all aspects of planning and environmental management. Section 22 in particular makes provisions for "citizen for a" to be orchestrated for the sole aim of ensuring citizen engagement in city or urban area activities established under the Act. Moreover, Section 36 calls for a framework of planning for integrated development as a foundation for preparing environment management plans in the development of cities and urban areas. Section 20 concerns the institutional framework as regards planning for cities and urban areas. The section calls for the establishment of a municipal or city board of management that is tasked with the promotion of a healthy and safer environment.

The County Governments Act (2012)

The County Governments Act (2012) is an Act of Parliament that actualises Chapter 11 of Kenya's 2010 constitution. The Act bestows functions, powers and responsibilities to the 47 county governments for service delivery and connected purposes.

Under the Act, County Governments are tasked by Section 103 to sustain a functional system of green and open space for an effective ecological system within the county. The study area falls within the jurisdiction of Kilifi County Government.

The Physical and Land Use Planning Act No. 13 of 2019

The Physical and Land Use Planning Act of 2019 was enacted by the Kenyan legislature in 2019. The core objective of the Act is to provide for land use, planning, development and regulation of human activities on land and for connected purposes. Under the Act's Section 9, it makes provisions for nine objects that among others include: -

a) makes provisions for standards, principles and procedures for preparation and execution of physical and land use plans at the local, county, national, rural, urban and cities level
b) physical and land use planning administration and management in Kenya
c) the regulation of physical and land use planning as well as development control standards and procedures

d) a platform for county governments coordination of physical and land use planning

Moreover, The Act provides the criteria for the preparation of Local, County, Inter- County and National physical and land use development plans. The Act creates a planning authority at the county level. It among others comprises of the county executive committee (CEC) member tasked with matters land use planning.

Section 5 of the Act specifies the norms and principles of physical and land use planning to be adhered to by all individuals involved in physical and land use planning and regulation. For instance, the Act demands that physical and land use plans should advocate for sustainable land use and liveable communities that integrate the needs of humans in any setting. It furthers calls for planning of development activities in a way that encompasses social, economic and environmental requirements of both current and future generations. These development plans should as a matter of fact consider sustainable optimum use of land as well as the preservation and conservation of rare land resource even the protection of land that has critical functions. Further, planning of development activities must be inclusive, putting into consideration the people's culture and heritage. Physical and land use planning shall adopt new strategies like mixed land use development, transit-oriented development (TOD), public and non-motorized transport planning etc in order to attain a more effective and efficient utilization of natural resources as well as sustainable development.

Environmental Management and Coordination Act (1999)

This Act of Parliament elaborates on the institutional and legal aspects of environmental management in Kenya. The fundamental principle of the Act is that every Kenyan is entitles to a health and clean environment and that each citizen is mandated to enhance and safeguard the environment. As per EMCA (1999), an assessment of a project's impact on the environment must be undertaken for every single development project within the country. the main objective of this call is to assess the possible impacts a development project will have on the environment and advise on mitigation measures to preserve the environment. Proper planning and management of green urban spaces is essential since they have a vital social, environmental and economic role in the society.

National Land Commission Act (2012)

This was an Act of Parliament enacted in 2012 following the promulgation of Kenya's 2010 Constitution. The Act establishes the National Land Commission (NLC) and provides for the commission's powers and functions. The Act stipulates the criteria and qualifications for appointment of members to the commission. Further, it gives effect to the principles and objects of devolved governments in the management and administration of land and for connected purposes. The Act specifies of the key roles of the commission to comprise of: -

a) managing public land on behalf of both county and national governments
b) recommending to the national government a national land use policy
c) advising national government on a detailed methodology for land title registration across the country
d) undertaking research on matters land and natural resource use and make appropriate recommendations to the authorities
e) launching investigations, either on its own volition or by way of acting on a complaint, into current or historical land injustices, and making the suitable recommendations for redress
f) encouraging the adoption of traditional mechanisms for resolutions of land related disputes and conflicts
g) assessing tax on land and premiums on fixed property across the country as by law required
h) monitoring and oversighting land use planning responsibilities across the entire country

2.10.2 Policy Framework

National Land Policy (2009)

The National Land Policy's overarching objective is to secure land rights and make provisions for sustainable investment, growth and poverty alleviation in tandem with the general development objectives of the Government. Particularly, the National Land Policy

avails a platform of laws and policies crafted to ensure that a system of land management and administration is maintained so as to provide: -

a) for each citizen the chance to access and benefit by occupying and using land
b) for the allocation and use of socially equitable, economically feasible and environmentally sustainable land
c) for the economical, effective and efficient functioning of land markets
d) for the effective and efficient use of land and land-based resources
e) for the transparent and efficient mechanism for resolving land related disputes and conflicts

In an effort to solve issues regarding the environment, the National Land Policy calls for the implementation of the following measures: -

a) forbid the release of untreated waste (solid and liquid) into water bodies such as rivers, lakes, oceans etc through adoption of suitable methods of waste management
b) promote and demand for separation and labelling of waste for easy waste management
c) regulation of excavation and quarrying activities
d) promote the re-use and recycling of urban waste
e) establish a mechanism for the rehabilitation of waste dumping sites as well as environmentally degraded land

The Government shall implement the following measures in an effort to address coastal land related challenges: -

a) create an appropriate legal and administrative methodologies for addressing antique calls emanating from adoption and implementation of the Land Titles Act (Cap 282) 1908.
b) Undertake a stock of all government land situated within "10 – mile coastal strip" as well as all other areas of the coastal region with prevalence of squatter issues and establish a procedure for the eventual conversion of squatter land into community land for the subsequent adjudication and resettlement

c) Avail a legal platform for the protection of tenants at will
d) Create appropriate public utility parcels along the coastline to act as sites for landing and public recreation, and develop all access roads leading to the beach
e) Control the erection of walls along the high-water mark
f) Deliver a strategy for the management of beaches as well as the conservation, management and protection of land originating from natural sea recession or sea reclamation
g) Create a mechanism for the engagement of indigenous land inhabitants prior the establishment of land settlement schemes and supplementary land use projects
h) Conserve and preserve the Tana and Sabaki Delta ecological systems in partnership with adjoining communities
i) Create awareness and educate citizens on their rights to land and the procedures for the management and administration of land
j) Avail a platform for communities' equitable distribution benefits emanating from land and land-based resources
k) Start and support the preparation of an Integrated Coast Resources Management Plan
l) Control foreigner's ownership and use of Islands in respect to public policy deliberations like national security
m) Salt mining to be rationalized with the other uses of land
n) Create strategies for controlling all kinds of disposing strategic public institutional land putting into consideration the needs and plans of future developments by these institutions

Kenya Vision 2030

The Kenya Vision 2030 is the country's long-term development framework whose leading objective is to transform Kenya into a highly industrialized middle-income country. The Vision 2030 blue print targets to achieve this by affording Kenyans high quality life in a secure, clean and healthy environment. The blue print is grounded on three pillars of social, economic and political pillars. The aim of the economic pillar is to attain prosperity of all Kenyans via a sustained annual economic growth rate of 10 percent. On the other hand, the

social pillar endeavours to establish a cohesive and just society that takes pleasure in equitable social developments in a safe, secure, clean and healthy surrounding.

The main objective of the political pillar is to uphold an issue based, accountable, transparent, citizen centred and democratic system of politics that honours and upholds the rule of the law together with the protection of the rights and freedoms of Kenyans. The major objective of availing infrastructure such as roads, ports, railways, airports, water and sanitation among others is to promote neighbourhoods and places interconnectivity and accessibility as well as improving people's quality of life.

Big 4 Agenda

The Big 4 Agenda is a medium-term development framework designed to support the implementation of Vision 2030 by the Kenyan Government. The development blue print runs between 2018 and 2022. The core objective of the agenda is to avail Kenyans decent and affordable housing, access to affordable healthcare, food and nutritional security and enhanced manufacturing. This study is established in cognizant of the development objectives under the umbrella of the Big Four Agenda. The study objectives take into perspective environmental conservation as a leading enabling element in the implementation of the fundamental objectives of the Big Four Agenda. Particularly, the research objective of providing sustainable solutions to concerns of biodiversity related to urban green spaces will substantively influence the four goals of decent and affordable housing, access to affordable healthcare, food and nutrition security and manufacturing.

Table 6: Big Four Agenda

Contribution of Urban Green Spaces	**Implications on the Big Four Agenda**	**Overall outcome**
1. Biodiversity and Nature Conservation	Industries raw materials supply.	Enhancing Manufacturing
2. Universal access to safe, inclusive and accessible, green spaces.	Sense of peace enhances productivity at work place hence high yields at low costs	
3. Recycling of nutrients for regulation of climate change and soil formation		Food security and nutrition

Contribution of Urban Green Spaces	Implications on the Big Four Agenda	Overall outcome
4. Pest Control	This aids in regulation of floods and enhanced food and water supply	
5. Palatable Landscapes (farming in open spaces)	Urban agriculture encourages sustainable production of food, enhances health and promotes good consumption patterns	
6. Recreational and Leisure areas	• Physical activity • Physical & Psychological Wellbeing	Accomplishment of universal access to health owing to decrease of disease burdens in the country
7. Noise reduction, absorption of air pollutants like CO, CO_2, SO_3 and NO_3 which are extremely toxic to both humans and the environment	• Reduced respiratory illnesses • Decreased pollution related mortalities • Better human health and tranquillity	

Source: Author, 2020

National Spatial Plan (2015 – 2045)

The National Spatial Plan (NSP) is Kenya's spatial vision that is aimed at guiding the country's long-term spatial developments. NSP makes available national physical planning policies whose objectives is to guide micro-level physical development plans. Land is an inelastic resource suffering from multiple competing uses. In Kenya, land is utilized optimally while at the same time land use has at times brought about conflicts over its use. NSP avails a strategy for productive, efficient and sustainable land use as is constitutionally required.

Kenyan environment consists of a wide variety of ecosystems that comprise of wetlands, forests, mountains, fresh waters, coastal and marine, arid and semi-arid together with stunningly diverse populations of wildlife. Vital cultural and natural resources of heritage to the country are present within these ecosystems. These resources are a source of natural

capital for supporting livelihoods and economic development. further, they are essential elements for supporting diverse aspects of biodiversity.

Sustainable Development Goals (SDGs)

The research project was guided by the Sustainable Development Goals (SDGs) of the United Nations. Adopted in 2015 by all United Nations member states, Goal Number 11 calls for cities to be resilient, safe, inclusive and sustainable. This goal is a backbone to this research study. The profile of public space has been raised significantly through adoption of target 7. *"By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities "* (UNDP, 2015).

The main target of SDG 11 focuses on ensuring that the average share of the built-up area within cities is made up of public open spaces for all to use regardless of their age, gender, sex, and physical abilities. It clearly specifies the specific proportion of public space to cumulative city space, not neglecting the space set aside for street network. To compute this proportion, it is integrated into metrics that factor: -

a) Land assigned for public open spaces
b) Land designated for streets

UN-Habitat-Global Public Space Programme

The Global Public Space Programme was launched in 2011 with an aim to improve the quality of public spaces worldwide. The United Nations (UN) observes that historically, public spaces have largely been undervalued and overlooked particularly by urban authorities. However, the situation is changing drastically and public spaces are increasingly viewed as the mainstay of cities. Public spaces are defined as areas that are enjoyable and readily accessible by everyone. Their motive is not for profit. Public spaces adopt several spatial forms and as such they may comprise of streets, parks, sidewalks, playgrounds, markets among other forms. Good public spaces advance cohesion among members of the community and bring about good health, wellbeing and happiness among citizens.

In addition, public spaces sustain high population densities. They form a pivotal component for future's sustainable cities. Over 20 countries have found the program functional. These include among others Kenya, Bangladesh, South Africa, India, Kosovo, Haiti, Mexico and Peru. The main focus of the program is cities in upcoming countries with sizeable proportions of their urban population residing in informal settlements. Local governments and cities are the primary partners. Local governments are mandated with the establishment and administration of public spaces at the local level.

2.10.3 Institutional Framework

The United Nations Environment Programme (UNEP)

The United Nations Environment Program (UNEP) is the world's leading environmental authority that sets the agenda for global environment, advocates for cohesive and sustainable execution of the dimensions of environment within the framework of the United Nations, and it is the global environment's sole authoritative advocate.

The core mission of UNEP is "to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations". To achieve this, UNEP: -

a) Promotes international environment cooperation and recommends the suitable environment cooperation policies,
b) Monitors the standing of world environment, collects and disseminates information as regards the environment
c) Acts as a catalyst for creating awareness in relation to the environment and addresses major threats to the environment within the private sector, governments and the civil society
d) Facilitates the coordination of UN activities on environment related affairs. Through the cooperation, UNEP ensures participation and liaison and that the UN activities make considerations for the environment.
e) UNEP develops regional programs for environmental sustainability

f) Upon request, UNEP helps ministries of environment and other environment related authorities, especially in developing countries together with those which their economies are in transition, to frame and execute policies on environment.
g) Provides capacity building and technological support on environment at the country level
h) Helps formulate international law on environment. It provides expert advice on structuring and use of instruments and concepts of environment.

Kilifi County Government

Kilifi County Government is one of the 47 county governments in Kenya that were created by the New Constitution 2010. It has a clearly defined structure of governance. **Article 174** of the Constitution states that, "the objectives of the devolved governments are to promote democratic and accountable exercise of power, to foster national unity by recognizing diversity, to give powers of self-governance to the people and to enhance the participation of people in the exercise of powers of the state and to make decisions that affect them". The county government of Kilifi has a role in the sustainable management of urban green open spaces.

National Land Commission (NLC)

Established under **Article 67(1)** of the Constitution of Kenya, 2010, NLC is tasked with the management of public land on behalf of both county and national governments. NLC is responsible for recommending a national land use policy to the national government. It is also mandated to advise the national government on a more detailed strategy for land title registration in the country.

The Commission is also mandated to conduct research on land and the use of natural resources, initiate investigations on its own initiatives or upon complaint into present or historical land injustices and recommend appropriate redress. It is also empowered to use traditional dispute resolution mechanisms in land conflicts, assess tax on land and premiums on immovable property in any areas designated by law as well as monitor and discharge oversight responsibilities on land use planning throughout the country.

Ministry of Lands and Physical Planning

The Ministry of Lands through the department of Physical Planning is charged with developing a national land use policy, a national land use development plan, preparation of short- and long-term physical development plans and preparation of metropolitan plans. The department is also charged with the responsibility of assisting in the implementation of a national land-use information system and ensuring full implementation of the Physical Planning Act.

The department of Surveys which is also within the Ministry of Lands undertakes all functions of land surveys and mapping. Its main functions are to provide and maintain plans for property boundaries supporting land registration throughout the country and to provide all kinds of topographical and thematic maps covering rural and urban areas of the country for use by other government departments and the general public.

2.11 Case Studies

2.11.1 Case Study 1: Portland Oregon Holmen Park and Green Street

Portland is a city in United States of America's Oregon State. Oregon city population began to increase in 1830's following its provision of convenient transportation of goods through its easily accessible waters and the growth of its timber industry which played a pivotal role in its development. Oregon then developed a negative reputation in the end of 20th century. It was considered one of the dangerous port cities in the world while still grappling with urban problems of urban decay. Nevertheless, policies on land use and other legislations aided in turning around the city in the end making it more sustainable and liveable. Presently, Portland is a notable environmental leader, playing vital role as part of C40 (a network of mega cities that are in attempt to battle climate change). In this context, Portland has executed a wide range of programs that have upheld its position as a model of sustainable urban development (C40 Cities, 2011).

Portland today is majorly involved in Timothy Bradley's green urban cities project. Portland is recognized for her green street initiative as well as the city's commitment to appreciating and protecting nature. Portland has the leading per capita park acreage in the

country, comprising of big chunks of natural areas like The Oaks Botton Wildlife Refuge and The Forest Park. The city, in the context of street level design, is famous for its massive efforts in relation to natural management of storm water. A significant majority of streets in Portland imitate natural habitats via use of facilities that are vegetated to combine the runoff of storm water where it originates. This helps in reducing the flow of storm water, improves on water quality, improves on the safety of pedestrians and bicycle cyclists and it enhances watershed health. For a few years now, Portland has been applying urban design elements that are water sensitive. For instance, rain gardens and bio-infiltration pits that are erect into storm water curb sidewalks and extensions. Moreover, the rain gardens offer visual amenity and habitat and combined sewer overflows (CSOs) to the Willamette River. They also aid in the reduction of urban heat island effect.

Figure 5: Portland Oregon Holmen Park and Green Street

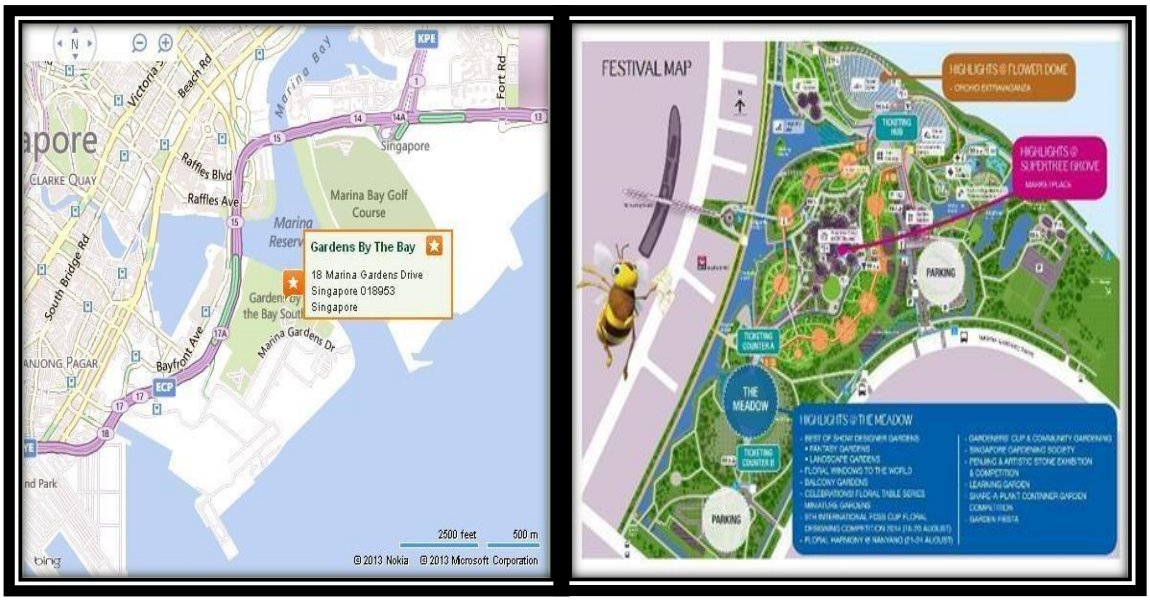
Source: City of Portland, Oregon, USA (2020)

2.11.2 Case Study 2: Singapore, Gardens-By-The City

Singapore is an Island city state off the coast of Southern Malaysia. It is a global financial centre. Singapore's notable features include its multicultural population and tropical climate. The 1960's industrialization and manufacturing towards the end of the decade had become the country's leading sector in her economic growth. Today, the strong service and manufacturing sector have become root of Singapore's economy (World Bank Group, 2016)

Singapore has realized the importance of green environment to the sense of belonging, peace of mind and wellbeing to its citizens. It uses nature as a core component of its urban landscape. Incorporating nature to the highly populated dense city of 5 million residents on a land mass of 700km^2, majority of which reside in high rise towers, was a daunting challenge as identified by Singapore's City Council. Nevertheless, the city emerged as a world model. It achieved this by adopting creative urban designs that used extensive park and green areas. A 200km park connectors in the form of elevated walkways and canopy walks were developed. Further, the city installed green rooftops and green walls. LandSat images show that the percentage of green areas in Singapore actually increased from 36 to 47 percent between 1986 and 2007 despite the notable growth of the city population by 2 million over the same period. Just a few such dense cities in the world can boast of a garden in the manner that Singapore does.

Figure 6: Singapore, Gardens-By-The City



Source: Singapore, Gardens-By-The City, 2020

2.11.3 Case Study 3: Kirstenbosch Botanical Gardens Cape Town

Kirstenbosch is located on the eastern slopes of Table Mountain. The city is globally celebrated as among the seven most glorious botanical gardens in the world. Occupying a total of 258 hectares, it includes a nature reserve and a cultivated garden in its estate. The developed botanical gardens exhibit a collection of Southern African plants including multiple rare and endangered plant species.

The gardens consist of a broad range of biodiversity. Its walks and views make it a must visit tourist destination. Kirstenbosch botanical gardens landscape is preserved. People are motivated to picnic and walk in nature of learn about the environment. As a result, the gardens combine a recreational function with an educational one. In this manner, people are brought to the knowledge of the essential value of conservation while concurrently appreciating the moments spent on the beautiful nature.

Figure 7: Kirstenbosch Botanical Gardens Cape Town

Source: Kirstenbosch Botanical Gardens Cape Town, 2020

2.11.4 Issues Arising from Case Studies

The case study review has thrown up issues which attempt at protecting improving green space planning. These issues though not mutually exclusive can be grouped into three categories; the legal issues, the planning issues and the management issues.

The legal issues are essentially centred on the land tenure and green space legislation or laws. These two are very important requirements for successful green space development because in the case of the former, it determines the ownership of the land on which green space is to be developed and the latter sets out policy direction for green space development and management. Both these legislations are expected to be adequate in their scope and designed to meet existing realities.

Secondly, the management issues have at the centre as an important requirement for good green space planning and development, the need for strong political will and support at the highest level of governance that will drive and integrate green space planning and management into the wider urban planning and development policies and programmes.

Third and perhaps most importantly is the concern on how what has been provided as urban green space can be maintained and managed properly. To this end, innovative approaches that combine the organization and financial probity of the private sector and the unwavering commitment of civil society to matters of the "common good" with the public sector serving as the regulator and facilitator are considered to be the most viable strategies in urban green space management.

2.12 Conceptual Framework

The following conceptual framework captures the relationship of urban green open spaces as the key variable under investigation and the various factors that are critical to sustainability, protection and management of green open spaces. These include the issue of land fragmentation, plot characteristics, building-plot ratio characteristics and legal and institutional interventions. It illustrates the relationship between quality green open spaces and accrued benefits. Social, economic, environmental and aesthetic benefit arise from quality green open spaces.

These benefits combined lead to sustainable residential development and growth of its populace. The purpose and role of residential open spaces is to service the recreation needs of the present residential population. This nature of open spaces is chiefly utilised for recreation and may incorporate small areas of nature space. This approach will address forces which leads to sustainability of urban open spaces. For interventions on the status quo, proper urban green open spaces planning is needed to reconcile and address primarily the social and economic conflicts and contestations on urban land uses, urban green open spaces and as a strategy for conservation to protect the spaces from diminishing.

Land fragmentation issues have been fuelled by a number of factors. The leading factors to land fragmentation include pressure from population growth attributed to progressive

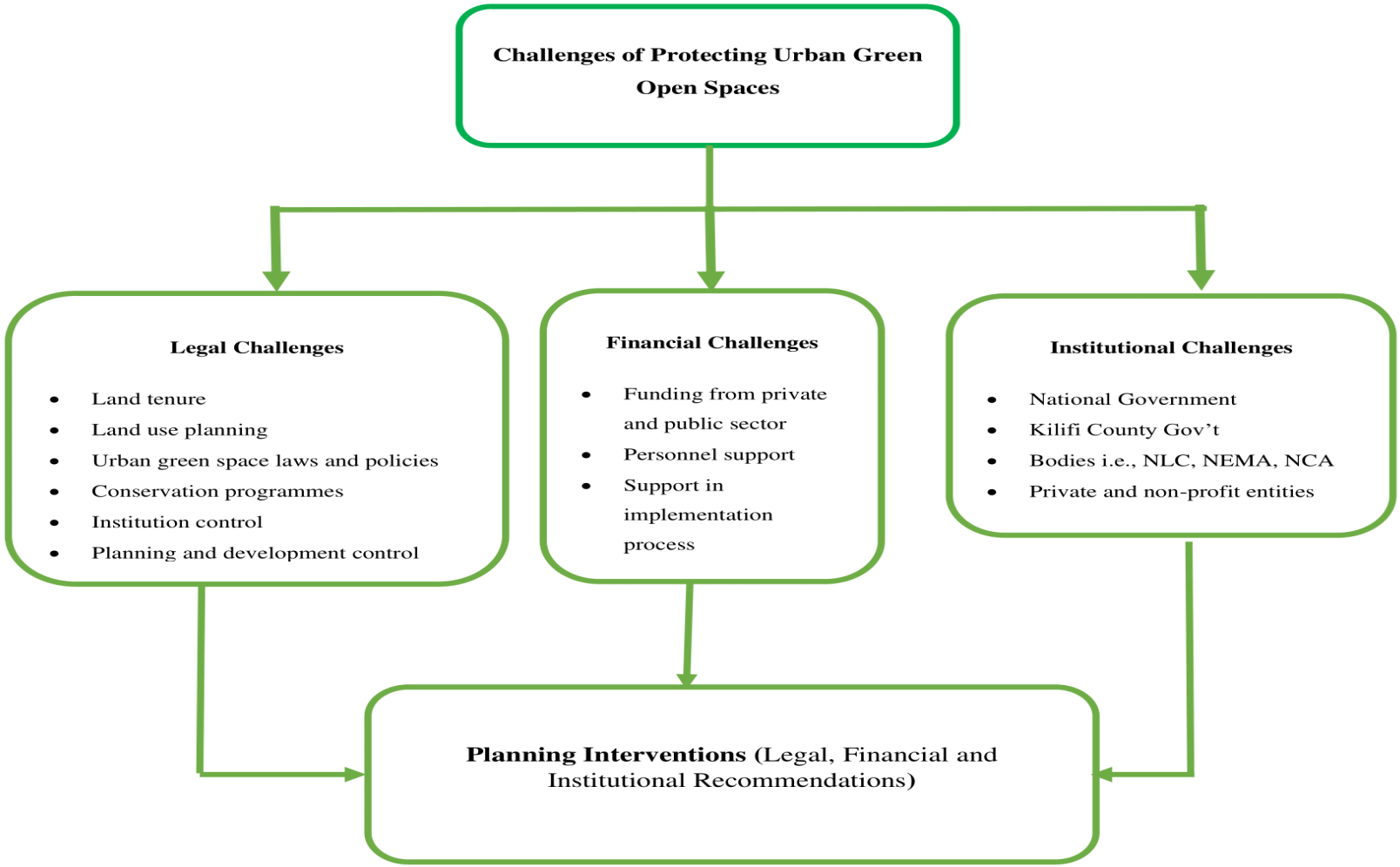
increase in the number of people that puts strain on the available land parcels. A strong policy, legislative and institutional framework for urban green open spaces is a prerequisite for supporting the overall process of urban planning. A strong policy, legal and institutional system will: -

a) aid in establishing local accessibility, quantity and quality standards so as to allow various user groups appropriately benefit from urban green open spaces
b) create and advance on the processes of participation that grow trust, harness participants cooperation and motivate members of the public to protect and maintain urban green open spaces
c) assist in the execution of strategies that are more sustainable for the development of urban areas at both local and regional scales
d) aid in the creation of mechanisms that will sustainably avail human and financial support for those departments mandated with the management and development of urban green open spaces so as to allow for their planning, development and maintenance in line with basic needs and local conditions (counting natural, social, economic and climatic conditions)
e) bring about new financial resources for protecting, developing and conserving urban green open spaces
f) promote the influence of developed green spaces to the ecological performance of cities, that is, adopt strategies that enhance the urban ecological and climatic functions
g) promote the exchange of skills and experiences between spatial planning and urban green spaces departments both across counties and at national level
h) integrate suitable finances foe the adoption, development, monitoring and evaluation of strategies on urban green open spaces

The primary implication of a consolidated legal, policy and institutional arrangement for planning and management of urban green open spaces is reflected in the protection and conservation of urban green spaces. A positive or good performance of urban green spaces is mirrored in the availing of a broad variety of social, economic and environmental benefits that meet the needs of urban residents.

The lasting outcome will be sustainable urban green open spaces management. This will echo on increased urban ecological footprint, promote environmental justice by according urban dwellers easy access to the benefits of urban green open spaces irrespective of their social standing, and urban resilience through sufficient supply of ecosystem service. These will effectively enhance equity in environmental resources distribution. Moreover, sustainable urban green open spaces will periodically monitor and evaluate the performance of urban green spaces to safeguard its long-term effect in the conservation and protection of urban green natural ecosystems for intergenerational equity by generally contributing to the wellbeing of humans and supporting ecosystem services delivery.

Figure 8: Conceptual Framework



Source: Author (2020)

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides detailed explanation of the methods and procedures for conducting the study. A research methodology describes instrumentation, validation and reliability of the research instrument, data collection procedures and methods of data analysis.

3.1 Research Design

Research design can be defined as the framework formulated to aid in getting answers to study questions. It includes a mixture of the philosophical assumptions identified by the researcher, the processes of inquiry, and the particular procedures of data collection, analysis and interpretation (Creswell, 2014). This study will adopt a descriptive survey design. This descriptive survey research design is defined as a method of collecting data using research instruments such as questionnaires and observation lists (Kombo & Tromp, 2006). The chance afforded the interviewer by questionnaires and interviews to correctly interpret word and phrase meanings in case of semantics or meaning confusion and answer respondents questions that aided in reduction of the measurement error of variance were the major advantages of the research design adopted by the researcher. Both qualitative and quantitative approaches were adopted.

3.2 Target Population

Target population refers to the total number of elements from which a researcher desires to infer (Cooper & Schindler, 2003). In this case, inferences were drawn from people with access to urban green public spaces in Sokoni Ward, Kilifi County. The key informants targeted by the study included: county physical planning officer, county environmental officer, county health officer, county revenue officer, community group leader and the area chief.

3.3 Sampling Procedure

3.3.1 Sampling Frame

Lohr defined target population as the total population for which the study intends to investigate (Lohr, 2010). The spatial sampling frame for this study is defined by the existing urban green open spaces. All Sokoni Ward residents were the target population for this study. The study also sought to gather information of green open spaces on the plot level, block and neighbourhood scale.

3.3.2 Sampling Method

Sampling involves the assortment of a subset of individual respondents from the target population so as to approximate the aspects of the entire population (Kish & Leslie, 1965). Sampling can as well be defined as the procedure used by researchers to select places, things or people to investigate. The leading advantages of sampling include its being cheap/affordable, consumes less time and possibly it's the only practical data collection method in cases where investigations call for destruction of the item to measure its strength or if the population being studied is infinite (Kombo & Tromp, 2006).

Different sampling strategies were employed to provide a representative view of the population so as to achieve the study objectives. In order to identify the urban green open spaces within the study area, Sokoni Ward was divided into four strata according to the existing development plans. Spatial stratified sampling and simple random sampling were used. The spatial stratified sampling was used to map out households next to the open green urban spaces in the study area for the survey. Simple random sampling was then applied to select the households for the study. Simple random sampling method ensures that each unit under investigation has equal chance of being included in the sample frame. It therefore provides better parametric estimates and it is highly unbiased.

Finally, purposive sampling also referred to as selective, judgemental or subjective sampling was used to identify and select the study's key informants. The key informants included the county environment officer, county revenue officer, county physical planning

officer, county health officer, area chief and community youth group. This method of sampling was used because the researcher had prior knowledge about the purpose of the study and therefore already knew the eligible key informants who would be relevant to the study so as to provide specific information that would aid in realizing the objectives of the study.

All the key informants had specific information to add in the study since they played important roles in urban green open spaces. The County Physical planning officer gave information on the zoning plans available for this area as well as whether the county spatial planning took into the consideration the urban green open spaces within the county and the health officer provided information on the health benefits of urban green open spaces. The environment officer gave information on the protection and management of the existing green open spaces. Finally, the revenue officers gave the information allocation of funds from the county government to plan for protection of urban green open spaces.

3.3.3 Sample Size

The proportion of a population is a sample (Pilot & Hungler, 1999). There is no specified absolute fixed number or percentage and method relied upon to determine a sample size, however emphasis by researchers is on getting the optimum sample size (Lohr, 2010). "An optimum sample is one which fulfils the requirements of efficiency, representatives, reliability and flexibility". A perfect sample size ought to be big enough to provide sufficient representation of the whole population which a researcher is interested in generalizing. It should also be small enough to be economically selected in relation to time and cost expenses and subject availability (Kombo & Tromp, 2006).

A good representation of the population can be achieved by a sample size of between 10 and 30 percent, and as such the 30 percent rule is suitable for analysis. This is necessitated by resource and time constraints. Therefore, in any research, the sample size must not be too small or too large, rather, it should be optimum to adequately represent the entire population, fulfil desired efficiency, reliability, flexibility, representativeness and validity (Mugenda & Mugenda, 2003).

According to the 2019 National Housing and Population Census by Kenya National Bureau of Statistics, the total population of Sokoni Ward if 35,027. Exploring Kenya's inequalities 2018 report shows the total number of households in Sokoni Ward is 8,528 households. By use of the following formula, the sample size of Sokoni Ward is determined as shown.

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1+\left(\frac{z^2 \times p(1-p)}{e^2 N}\right)},$$

Where:

N is the population size = 8,528

e is the margin of error = 10% expressed as a decimal (0.1)

z is the Z-score = 1.96

The proportion of the population is represented by p. The estimated proportion of an attribute present in a population is 50% which translates to 0.5 expressed as a decimal. Upon computing the formula with the available figures, the sample size of the study is determined to **164** respondents.

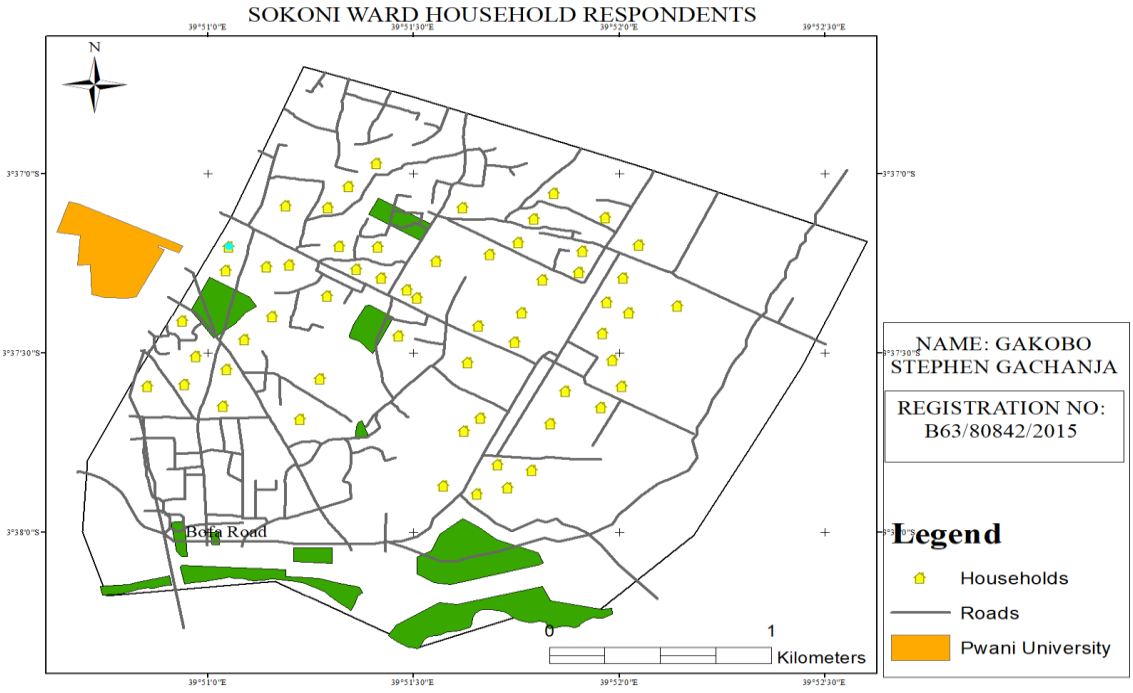
3.3.4 Distribution of Sample Size

Table 7: Distribution of Sample Size

	Sample Frame	**Sampled Number**
1.	Area Residents	164
2.	Key Informants	6
	TOTAL	**170**

Source: Author, 2020

Map 1: Distribution of Household Respondents



Source: Author (2020)

3.4 Types of Data

3.4.1 Primary Data

This was the main source of data that informed the study. It entails data that was directly sourced from respondents through field survey, as well as contacts well familiar with the study area who were highly valuable in providing a greater understanding of the study phenomena.

3.4.2 Secondary Data

This is data from recorded materials. The study gathered secondary data related to the subject under investigation through the review of literature in existing publications. It was made possible through a broader understanding of the subject under study together with understanding discoveries in the study area by previous researchers. Journals, articles,

internet sources, periodicals, government publications and maps were the leading sources of secondary data.

3.5 Methods and Instruments of Data Collection

The vital component of a research study is data collection. Selecting appropriate method of data collection is critical for effectiveness of any research (Buckley, 2007). This research adopted both qualitative and quantitative approaches to data collection. Sokoni Ward residents participated in the collection of data for the study.

The methods of data collection employed in the research included:

3.5.1 Photography

Photography involves the use of camera to capture images and videos of study area for evidence and interpretation of phenomenon being investigated. The study adopted this method on grounds of human activity and functions in open urban green spaces as well as the physical environment such as terrain, ecology, topography and natural land cover. The captured images were used for evaluation of conditions on the environment that influenced green infrastructure.

3.5.2 Structured Questionnaires

Questionnaires are considered as a set of questions that are standardized and follow a fixed scheme so as to aid in collection of individual data on one or more particular subjects. Questionnaires were used in this study as the major data collection instrument. They were administered to Sokoni Ward residents, particularly to the determined representative sample for the study.

3.5.3 Interview Schedules

Key informant interviews involve structured and purpose based personalised conversation between two individuals. The aim of individual interview is to elicit knowledge of perspective of the interviewee on a particular topic. Individual interviews also permit researchers to obtain information of complex issues under investigation and learn more on

the contextual elements that dictate individual experiences (Neil & Salkind, 2010). The key informants included the county environment officer, county revenue officer, county physical planning officer, county health officer, area chief and community youth group.

3.5.4 Direct observation

This method of data collection observing keenly and taking notes on the prevailing situation in relation to the study topic. An observation checklist played a guiding role in implementing this mode of data collection.

3.5.5 Measurement

Spaces located within the study area were measured together with any specific areas of interest to the study that emerged in the course of data collection. Measurement tools including measuring tapes were used to determine lengths of plot frontage, setbacks as well as compute ratio of greenness.

3.6 Data Analysis

Both qualitative and quantitative techniques were adopted for the analysis of gathered data. The raw data gathered from the field was edited, coded and keyed into computer systems software for analysis. The analysis of the field collected data was done by use of Statistical Package for Social Science (SPSS) together with Microsoft Excel (Ms Excel). Data comparisons was done by use of percentages and descriptive statistics of the analysed data. Sokoni Ward land uses were analysed by use of Geographic Information System (GIS).

3.7 Data Presentation

For ease of understanding, interpretation and deduction of inferences and recommendations, the analysed data was graphically presented. Various graphics were adopted and included tables, graphs, bar charts and photographs in line with each data type. Tables were used to organize data from the field survey, and therefore aided in understanding relationships between the study variables.

The relationship between variables in respect to data collected from the field were presented inform of bar graphs. They were preferred in this context due to the non-ordered scale. Variables were matched against respondents' frequencies to show relationships between the variables and the subject under study.

The study also used illustrative sketches to graphically present information for easy visual interpretation particularly on analysis of open spaces within the study neighbourhood. They were relied upon for inferring the findings in sections of subsequent chapters.

3.8 Ethical Consideration

The set of principles or rules of conduct used in line with conduct or behaviour of a given group or profession are ethics (Mugenda & Mugenda, 2003). The privacy and confidentiality of gathered data used for this study was strictly observed. The identity of respondents was protected by the researcher through keeping in confidence the data collected from field survey. Non authorised disclosures were strictly adhered to especially on identity of respondents. The principle of voluntary consent was conformed to with only willing respondents participating in the research.

3.9 Limitations to the Study

The research study was carried out successfully. Nevertheless, a few challenges were experience though they did not have a significant influence on the research findings. Notable limitations to the study comprised of: -

1. Scarcity of current relevant information relating to Kilifi urban green open spaces design.

2. Respondent's willingness to frankly offer information.

3.10 Overview of Data Needed, Types and Sources

Table 8: Data Needs Matrix

Research objectives	Key research questions	Data needs and variable to be observed	Sources of data	Data collection method and survey instrument	Data analysis method	Data presentation technique	Expected results
To examine indicators and challenges of protecting urban green open spaces in Sokoni Ward	What are the indicators and challenges of protecting urban green open spaces in Sokoni Ward?	Accessibility of green spaces Green space provision per inhabitant related to green spaces within walking distance to residential areas Green space provision per inhabitant related	Field survey Secondary data	Questionnaires Interviews Key informant interviews	Content analysis Spatial analysis	Photographs Descriptive and Analytical report	Study report

Research objectives	Key research questions	Data needs and variable to be observed	Sources of data	Data collection method and survey instrument	Data analysis method	Data presentation technique	Expected results
		to total amount of green space					
To find out what green open spaces were initially planned for and what is the existing situation in Sokoni Ward	What is the existing situation of urban green open spaces in Sokoni Ward, Kilifi County?	Adequate provision of open spaces Usage pattern of urban green open spaces Urban green open space management Residents' usage, misuse and disuse	Field survey Secondary data	Questionnaires Interviews Observations Photographs	Content analysis Spatial analysis	Maps Photographs Descriptive and analytical report	Study report

Research objectives	Key research questions	Data needs and variable to be observed	Sources of data	Data collection method and survey instrument	Data analysis method	Data presentation technique	Expected results
To examine the institutional, legal and financial challenges of protecting the urban green open spaces in Sokoni Ward	What are indicators of protecting urban green open spaces from institutional, legal and financial aspect?	Legal indicator Financial indicator Institutional indicator	Field survey Secondary data	Questionnaires Interviews Checklists	Content analysis Spatial analysis	Photographs Descriptive and analytical report	Study report

Research objectives	Key research questions	Data needs and variable to be observed	Sources of data	Data collection method and survey instrument	Data analysis method	Data presentation technique	Expected results
To propose planning interventions that can enhance the potentials of protecting the urban green open spaces in Sokoni Ward	**What planning interventions can be formulated on enhancing the potentials of protecting urban green open spaces?**	**Planning policy standards on open space** **Management of open spaces and public attitude and awareness of use** **Open space organization** **Financial Mitigation**	**Field survey** **Secondary data**	**Questionnaires** **Interviews** **Key Informants**	**Content analysis** **Spatial analysis**	**Maps** **Photographs** **Descriptive and analytical report**	**Study report**

Source: Author, 2020

CHAPTER FOUR

BACKGROUND OF THE STUDY AREA

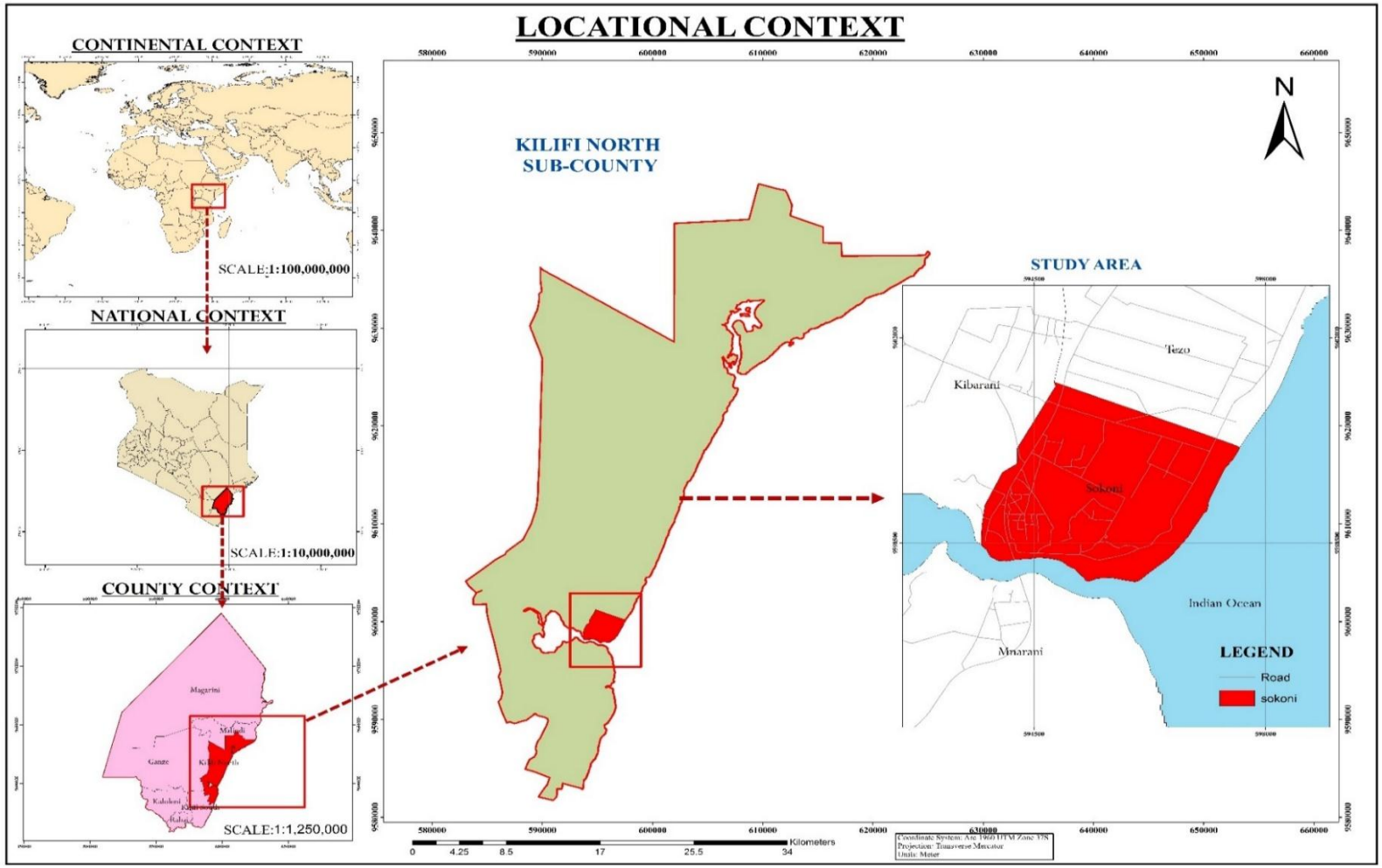
4.0 Overview

This chapter introduces the study area from the perspective of locational context, physiographic and natural conditions, population and demographic characteristics. It also accompanies the spatial inventories and descriptions with illustrations in the form of maps, tables and figures. Moreover, spatial information captured communicates of the spatial relationships among existing land uses and abutting land uses.

4.1 Locational Context

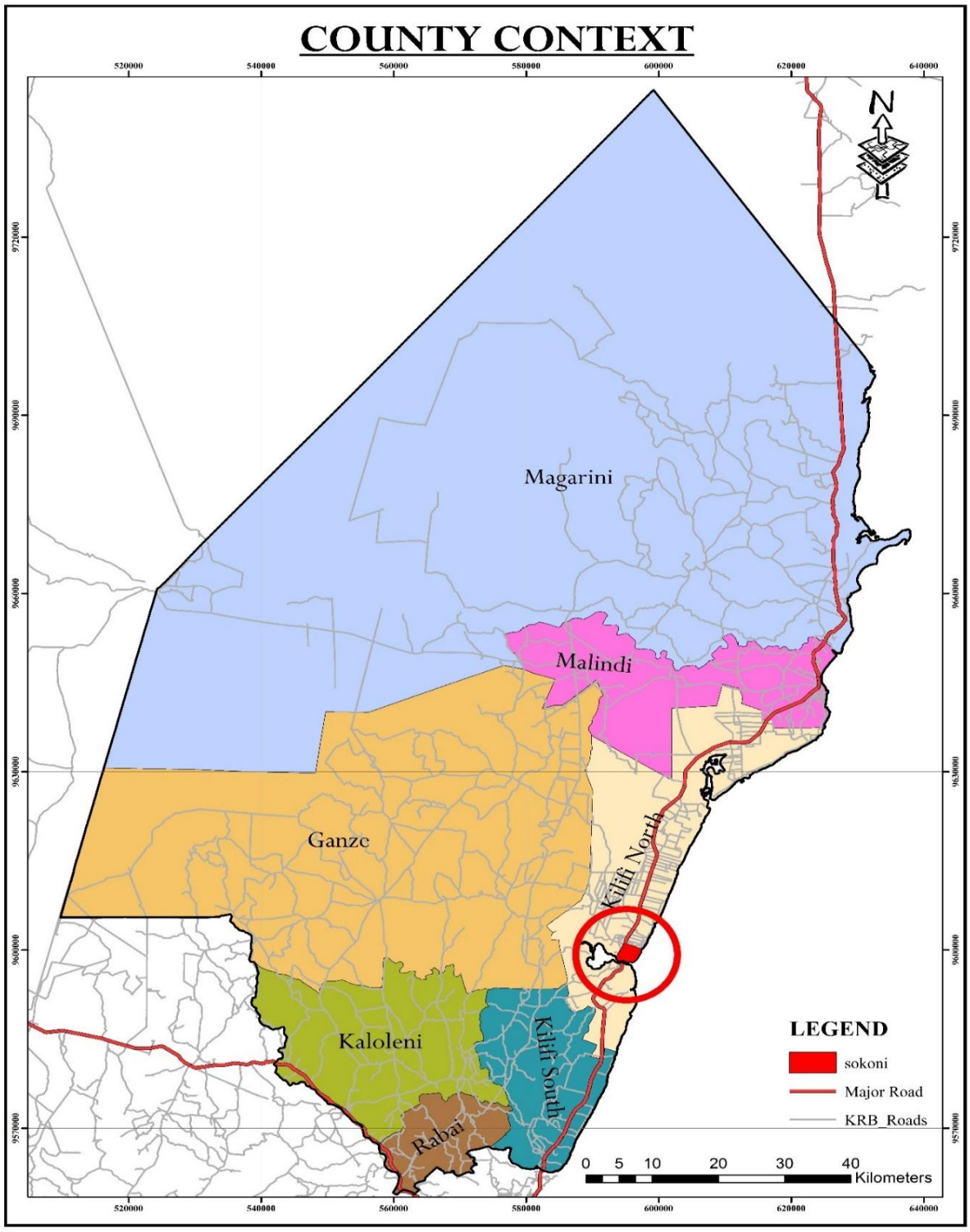
Kilifi County, located along the Kenyan coast, is one of the six coastal counties that make up the Coast Region of Kenya. Kilifi county is situated between the latitudes 2°20′′ and 4°0′′ South and longitudes 39°05′′ and 40°14′′ East. The county borders the Indian Ocean to the East, Mombasa County to the South, Kwale County to the South West, and Taita Taveta and Tana River Counties to the West and North respectively. Kilifi County has a total area of 12,370.8km^2. Further, Kilifi County is subdivided into seven sub-counties of Malindi, Kaloleni, Rabai, Kilifi South, Kilifi North, Ganze and Magarini sub-counties. The study was carried out in Sokoni Ward, Kilifi North Sub-County. Sokoni Ward is bordered by Tezo Ward to the North, Kibarani Ward to the East, and Mnarani Ward to the South and the Indian Ocean to the East. Sokoni Ward cover an area of about 14.40Km^2.

Map 2: Locational Context



Source: Author, 2020

Map 3: County Context



Source: Author, 2020

Map 4: Base Map

Source: Author, 2020

4.2 Physical Environment Characteristic of Study Area

4.2.1 Topography

There are four major topographic features in Kilifi County. Kilifi's Coastal plain is made up of the narrow belt whose width varies between 3km and 20km and is a major topographic feature in Kilifi county. The coastal plain is positioned less than 30m above sea level. The Western side of the coastal plain features leading peaks like Mwembetungu Hills. Several creeks are present across the plain. These creeks have outstanding marine swamps which are ornately endowed with mangrove forests. They avail a high potential for marine culture. This topographic zone boasts of marine sediments consisting of limestone, coral, clay stones, marble and alluvial deposits that aid agriculture.

The Foot Plateau located on the east of the coastal plain forms the second topographic feature of Kilifi County. The main natural elements of this feature are its gently undulating terrain that fall at altitudes that range between 60m and 150m. The Foot Plateau slopes towards the ocean. The surface is traversed by a number of dry river courses with underlying Jurassic sediments comprising of sandstones, shells and clays. This topographic zone is covered by stunted shrubs and grasslands. The coastal range makes the third Kilifi County topographic feature. It falls between 150 and 450m altitude beyond the foot plateau and prides of unique low range sandstone hills. The hills are Kiwava, Simba, Wacha, Daka, Gaabo, Mazeras, Mwangea and Jibana.

Lastly, the Nyika Plateau forms the fourth major topographic feature in Kilifi County. The Nyika Plateau rises between 100m to 340m above sea level. It covers an estimated two thirds of Kilifi county on the western side. The main characteristics of the Nyika Plateau includes thin vegetation cover, low population density, slightly undulating terrain and shallow depressions. Due to its arid and semi-arid nature, the Nyika Plateau forms the most suitable ranching site in the entire Kilifi County.

The fourth is the Nyika Plateau, which rises from 100m to 340m above sea level covering about two thirds of the county area on its western side. This plateau is characterized by a low population density, thin vegetative cover, shallow depressions and gently undulating

terrain. It constitutes the arid and semi-arid areas of the county, which are suitable for ranching.

4.2.2 Drainage System

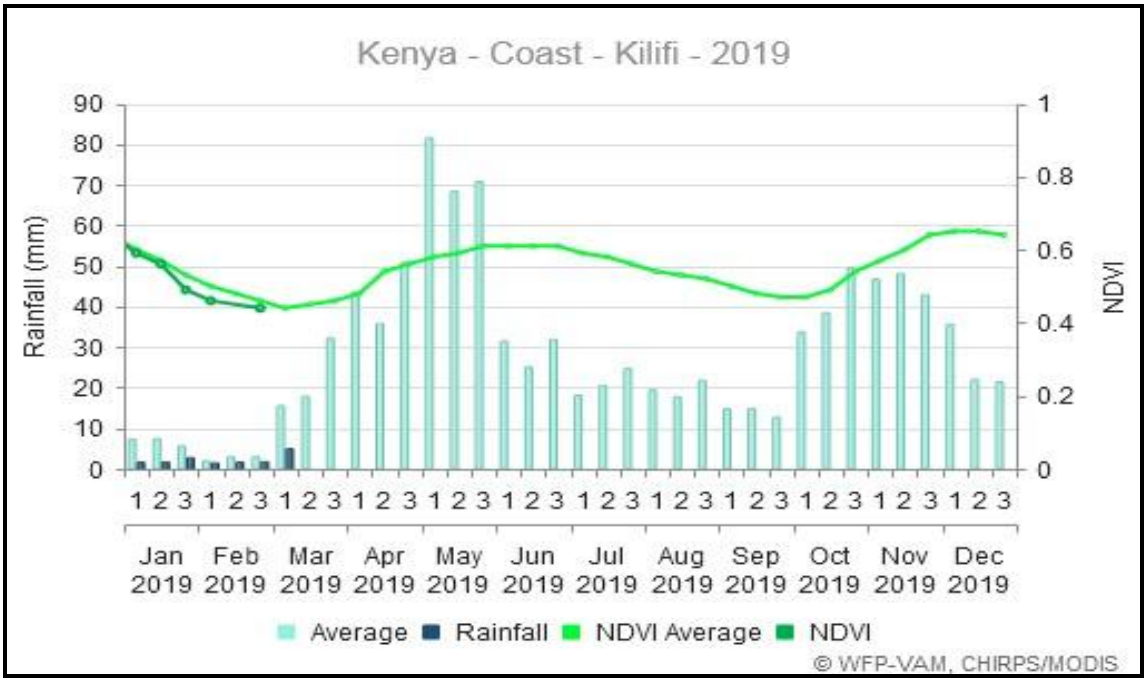
Kilifi county drainage system is made up of a major permanent river and numerous seasonal rivers and streams that drain their waters into the Indian Ocean. River Sabaki, commonly known as Athi River, is the only permanent river in Kilifi County. Leading seasonal rivers across Kilifi county include Rare, Nzovuni, Kombeni and Goshi rivers. Notable streams comprise of Kinangoni, Wimbi, Masa, Mleji and Muhomkulu streams.

4.3 Climatic Condition

4.3.1 Rainfall

Sokoni Ward sits along the coastal belt and therefore receives an annual average rainfall of approximately 900mm to 1300mm. The ward experiences two recognizable rainfall seasons with the long rains received between March and May and the short ones between October and December (County Government of Kilifi, 2018).

Figure 9: Rainfall in Kilifi County



Source: Drought Early Warning Bulletin for March, 2019

4.3.2 Temperature

The annual temperatures in the coastal belt range between 21^0C and 30^0C while the hinterland ones vary between 30^0C and 34^0C.

4.3.3 Wind Patterns

Kilifi county is endowed with a major wind field. Moderately, the relative speed of the wind range between 4.8km/h to 12km/h along the coastal strip to the hinterlands correspondingly.

4.3.4 Evaporation

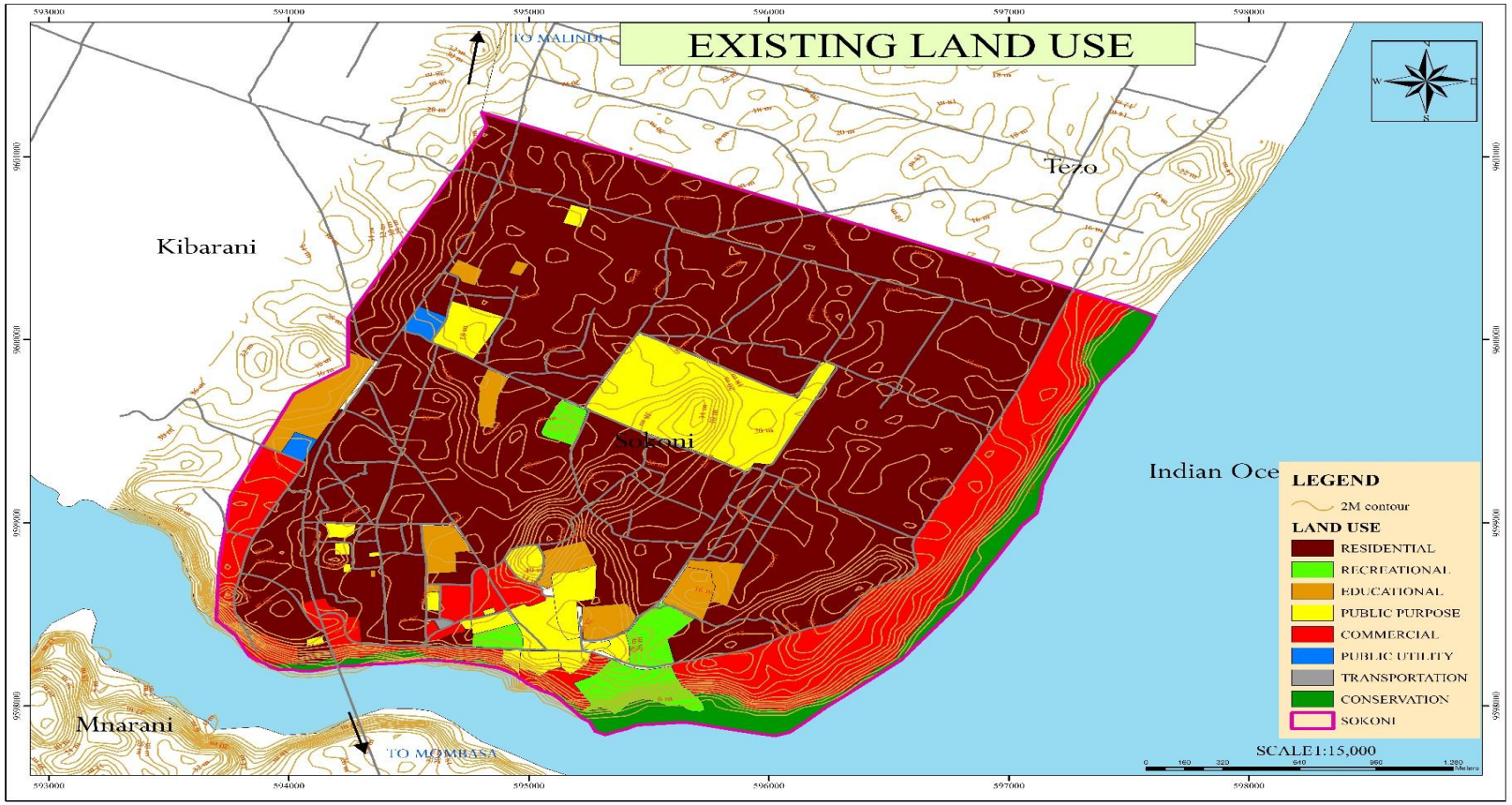
The rate of evaporation is least along the coastal strip at 1800mm and peaks at the interior of the county in the Nyika Plateau at 2200mm. The highest rate of evaporation in Kilifi county is experienced over the months between January and March across the entire county.

4.3.5 Vegetation

The natural vegetation found in the county is mainly grassland, stunted vegetation and mangrove forests growing in the shallow swampy areas along the creeks. The Arabuko Sokoke Forest is also found within the county which has suitable varieties of trees.

4.4 Land Use Analysis

Map 5: Existing Land Use



Source: Author, 2020

4.4.1 Residential Land Use

Housing densities erected within Sokoni Ward township are the major residential land uses within the study area. These housing structures are a mixture of low, medium and high-density residential dwellings. The low-density residential houses comprise of single-family traditional homes with a single dwelling allowed per legal lot. Single family detached houses with private yards are the most common residential typologies in this category.

The main aspects of the medium density residential housing include detached or attached units with a density range between zero and 16 dwelling units per acre. The high-density residential category is characterised by a wide range of residential unit types that can be attached or detached. These dwelling units naturally consist of condominiums, apartments and town houses constructed at a maximum density of 25 multi dwelling units per acre.

4.4.2 Industrial Land Use

Industrial land in Sokoni Ward is concentrated within the town. This is witnessed by a zone of light industries within the town.

4.4.3 Educational Land Uses

These are those land parcels within Sokoni Ward that are used for educational purposes including educational offices, schools and institutions of higher education. They include: Kilifi Mixed Secondary School, Kilifi Township Secondary School, Kilifi Day Star Secondary School, St Thomas Girls Secondary School, Kilifi Primary School, Kiwandani Primary, St. Thomas Academy Primary School and Kilifi CDF Nursery School.

Figure 10: St Thomas Girls Secondary School

Source: Author, 2020

4.4.4 Recreational Land Use

Those land parcels that are mainly used for recreation, pleasure and enjoyment are recreational land use zones. The leading recreational areas in Sokoni Ward consist of a few green parks and enjoyment parks.

Plate 1: Mazingira Park

Source: Author, 2020

4.4.5 Public Purpose Land Use

Public Purpose land uses refers to the category of land uses that houses public facilities. These public uses as considered to be directly associated with government or quasi-government functions or activities that are legitimate. Major public purpose land uses comprise of water wells, public utilities, reservoirs, as well as utility easements and related uses.

4.4.6 Commercial Land Use

Typically, commercial land uses provide an extensive range of opportunities for retail, wholesale and service commercial as well as professional office uses. The main objective of commercial land uses is to address business needs of residents while also addressing demands for regional shopping.

Figure 11: Tuskys Branch Kilifi

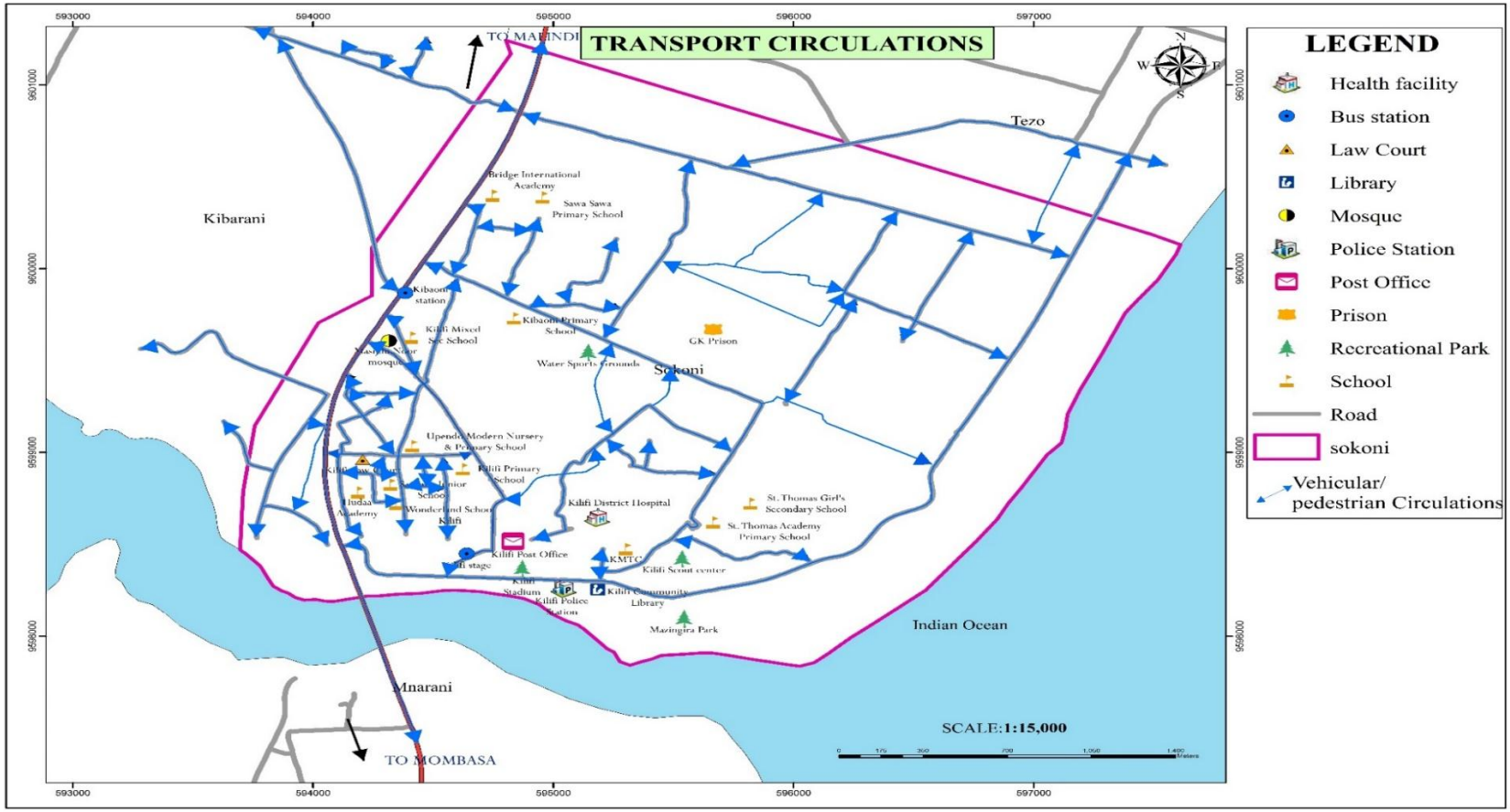
Source: Author,2020

4.4.7 Conservation

Conservation planning concerns itself with the conservation and preservation of an active landscape/seascape's natural values and aesthetics. Typical landscape/seascape natural values comprise of values, competing uses as well as other threats and opportunities. These conservation planning may include a plan that integrates other human values and needs, may be a conservation strategy for a complete biodiversity or the conservation plan for a single species. For Sokoni Ward the conservation is land adjacent to the Indian Ocean.

4.5 Traffic Circulation in the Study Area

Map 6: Traffic Circulation in the Study Area



Source: Author, 2020

4.6 Population and Demographic Characteristics

4.6.1 Population Growth

According to the KNBS (2019) census report KPHC Volume (III), the population growth rate in Kilifi County is 3.1 percent per annum. The population growth projection by 2025 on the basis of the inter-census population growth rate at 3.1% is as shown below.

Table 9: Population Projection

Year	**1979**	**1989**	**1999**	**2009**	**2019**	**2025**
Population	10,121	13,895	19,393	26,063	35,027	42,068
% Growth Rate	3.22	3.39	3.0	3.0	3.1	3.1

Source: KNBS (2019)

Leading assumptions on changes in demography comprise of:

a) high rise in fertility rates
b) increase in life expectancy
c) high rate of rural - urban migration

CHAPTER FIVE

RESEARCH FINDINGS AND ANALYSIS

5.0 Overview

This chapter gives a descriptive interpretation and findings of the study. The data collected was analysed using SPSS to generate frequency tables, bar graphs, charts. Descriptive statistics was used to analyse the different variables. Data was collected through use of instruments like questionnaires and oral interviews. A total of one hundred and sixty-four (164) respondent questionnaires were distributed among all the respondents from 1st August, 2020 to 15th August, 2020 for the study.

5.1 Respondent's Basic Information

This section provides a profile of the respondents who were part of the study. These respondents constituted Sokoni Ward area residents, county health officer, county revenue officer, county physical planning officer, county environmental officer, area chief and community group leader. This data is presented on a number of basic attributes including gender, age bracket and highest level of education. An analysis of these variables provides the socio-economic context within which other subsequent factors fall.

Table 10: Residents Basic Information

Respondents	Category	Categories	N	%
Area Residents	**Gender**	Male	108	66
		Female	56	34
		Total	**164**	**100**
	Age	18-19 years	6	4
		20-29 years	66	40
		30-39 years	51	31
		40-49 years	24	15
		50-59 years	14	8
		60-74 years	1	1
		75 and above	2	1
		Total	**164**	**100**
	Highest Level of Education	None	3	2
		Primary	27	17
		Secondary	65	39
		College	37	23
		University	32	19
		Total	**164**	**100**
	Employment Status	Employed	72	44
		Unemployed	35	21
		Retired	8	5
		Student	8	5
		Self Employed	41	25
		Total	**164**	**100**
	Period you have lived here	Less than 3 months	5	3
		3-12 months	17	10
		1-2 years	7	4
		2-5 years	34	21
		5-10 years	10	6
		Above 10 years	91	56
		Total	**164**	**100**

Source: Author (2020)

5.1.1 Gender of Respondents

Out of the 164 respondents, 66% were male while 34% were female. The finding did not however necessarily mean that there were more males than females in Sokoni Ward as going by the (KNBS, 2019), there were more females than males in Sokoni Ward. This was also in line with the population ratio both at the county and sub-county levels.

According to (KNBS, 2019), Kilifi County consists of 48.8% males and 51.2% females while Kilifi North Sub- County where Sokoni is located consists of 48.6% males and 51.4% females.

5.1.2 Age Group

Age determines a number of human factors that vary from perception to competitiveness. Most respondents 40% were aged between 20 - 29 years, 31% were aged between 30 – 39% years, 15% were aged between 40 -49 years, 8% were aged 50 – 59 years, 4% were aged 18-19 years. The remaining age groups 60 -70 years and 75 years and above were 1% each. According to the KNBS (2019) census report KPHC Volume (III), the population of Kilifi North Sub-County consisted of more people in the age bracket of (21-30) than the other age brackets employed for sampling in this study and the same applied for the county age bracket population statistics. In Kilifi North sub-county, there were 32,799 people in the age bracket of (21-30) compared to 24,518 in the age bracket of (15-20), 20,540 in the age bracket of 31-40 and 14,208 in the age bracket of (41-50). This showed that the statistics gathered by the study were in line with that of the county and sub-county. This finding implied that there were more youthful people in Sokoni Ward than the elderly and the younger age group.

5.1.3 Level of Education

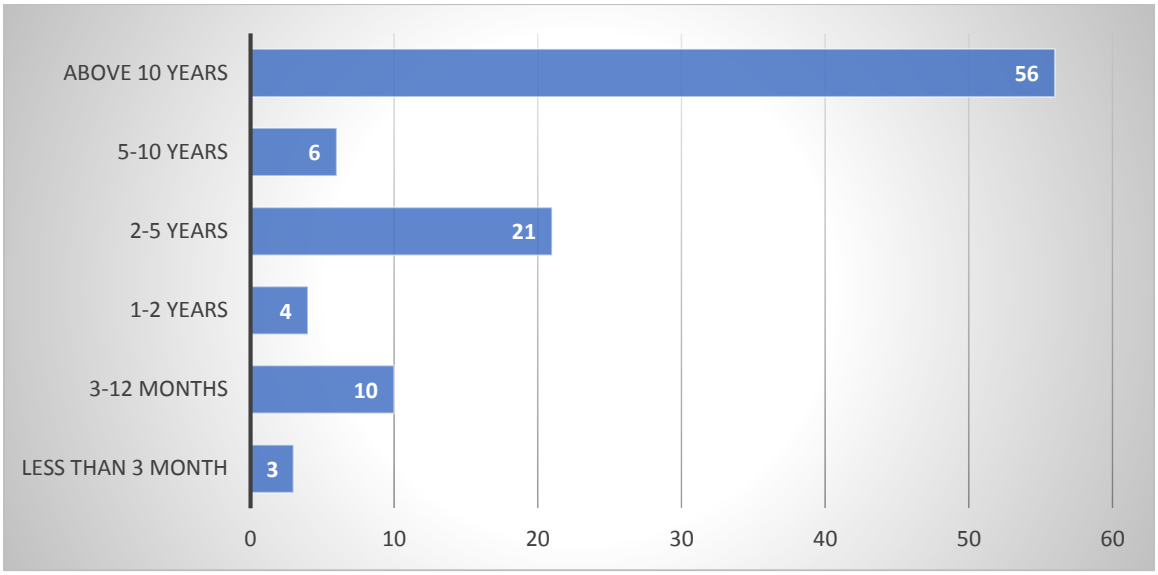
The findings revealed that 19% of the respondents had attained university education as their highest level of education, 23% had attained college education as their highest level of education, 39% had attained secondary education, 17% had attained primary education as their highest level of education while 2% had not attended any educational institution. With at least a secondary certificate qualification, one is always assured of fitting somewhere within the Kenyan job market.

5.1.4 Period of Residency in the Study Area

A sizeable portion of the respondents (56%) had stayed in Sokoni ward for more than 10 years, 21% had lived there for 2 -5 years, 10% had lived there for 3 -12 months, 6% had

lived there for 5 -10 years, 4% had lived there for 1-2 years while 3% had lived there for less than 3 months. From the findings, most of the residents are born in Kilifi with very low immigrants coming to settle within Kilifi Township.

Figure 12: Period of Residency in the Study Area

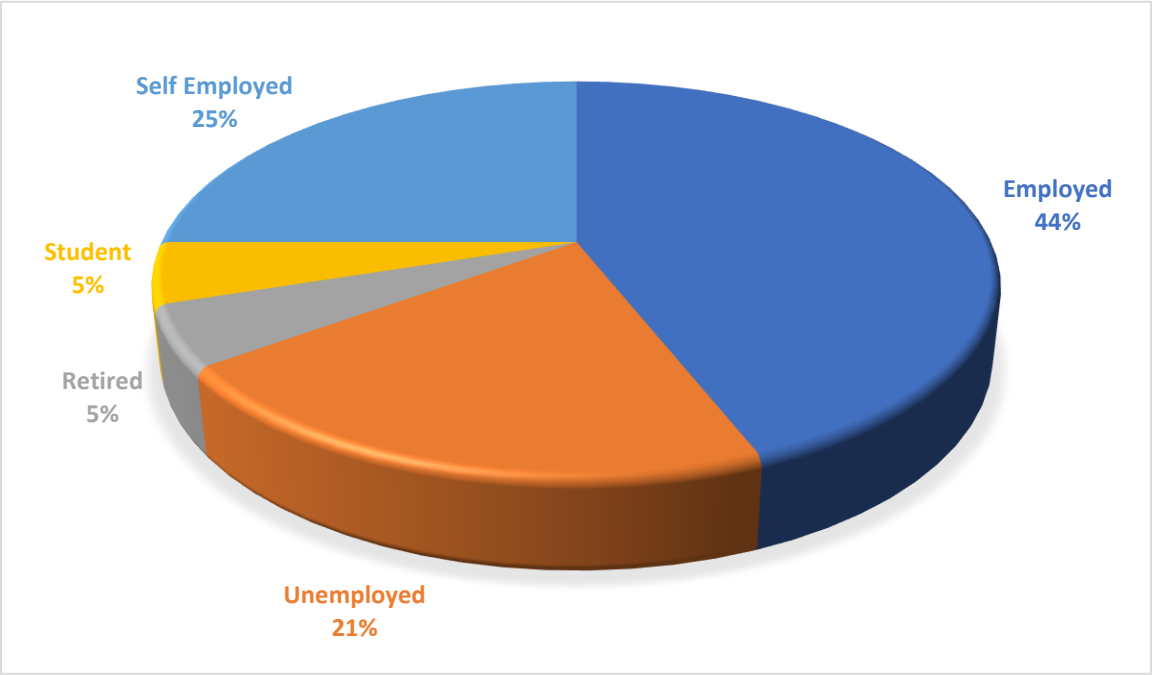


Source: Author, 2020

5.1.5 Employment Status

From the study, 44% of the respondents were employed, 25% of the respondents were self-employed, 21% of the respondents were unemployed while respondents who were students at different institutions and those who had retired were 5% each. The high employment level is because the government through the Kazi Mtaani initiative has employed youths in more than 10 informal settlements in Kilifi County in July, 2020 as part of the ongoing initiative to clean the environment in its effort to combat Covid-19 pandemic.

Figure 13: Employment Status



Source: Author, 2020

5.2 Mode of Transport Available

The most common mode of transport in Sokoni Ward is motorcycle (bodaboda). This is because they are flexible and readily available. This mode of transport is complimented by walking, matatu, bus, tuktuk and taxi. From the field study, the use of bodaboda is increasing since it is cheaper compared to the other modes of transport.

Table 11: Mode of Transport Available

Mode		Frequency	Percentage
Bicycle	Yes	29	18
	No	135	82
	Total	**164**	**100**
Matatu	Yes	46	28
	No	135	72
	Total	**164**	**100**
Bus	Yes	24	15
	No	140	85
	Total	**164**	**100**
Walking	Yes	57	35
	No	107	65
	Total	**164**	**100**
Railway	Yes	1	1
	No	163	99
	Total	**164**	**100**
Taxi	Yes	9	5
	No	155	95
	Total	**164**	**100**
TukTuk	Yes	43	26
	No	121	74
	Total	**164**	**100**
Motor Cycle (Bodaboda)	Yes	134	82
	No	30	18
	Total	**164**	**100**
Private Car	Yes	23	14
	No	141	86
	Total	**164**	**100**

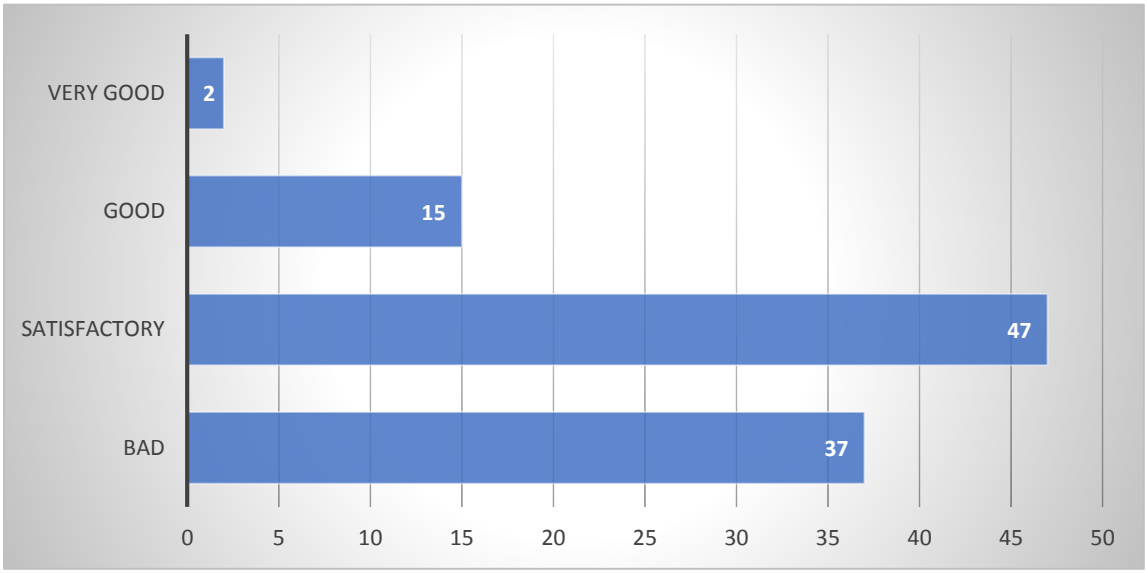
Source: Author ,2020

5.2.1 Experience When Using Roads in Sokoni Ward

Most of the respondents' experience when using roads in Sokoni Ward was satisfactory which was represented by 47%, this was followed by 37% of the total respondents who found the roads in Sokoni Ward to be bad in nature while 15% of the total respondents described the roads in Sokoni Ward to be good and 2% of the respondents described the roads to be very good. The state of the roads is worrying in Sokoni Ward since most of the road flood during the rainy seasons and are dusty during the dry seasons.

This is an indicator that there are institutional shortcomings when it comes to transportation within Sokoni ward. The County Government of Kilifi, KURA, KeNHA and other institutions tasked with the responsibility of overseeing development within the transportation sector need to do more so as to improve road conditions, especially of the access roads within the study area.

Figure 14: Experience When Using Roads in Sokoni Ward

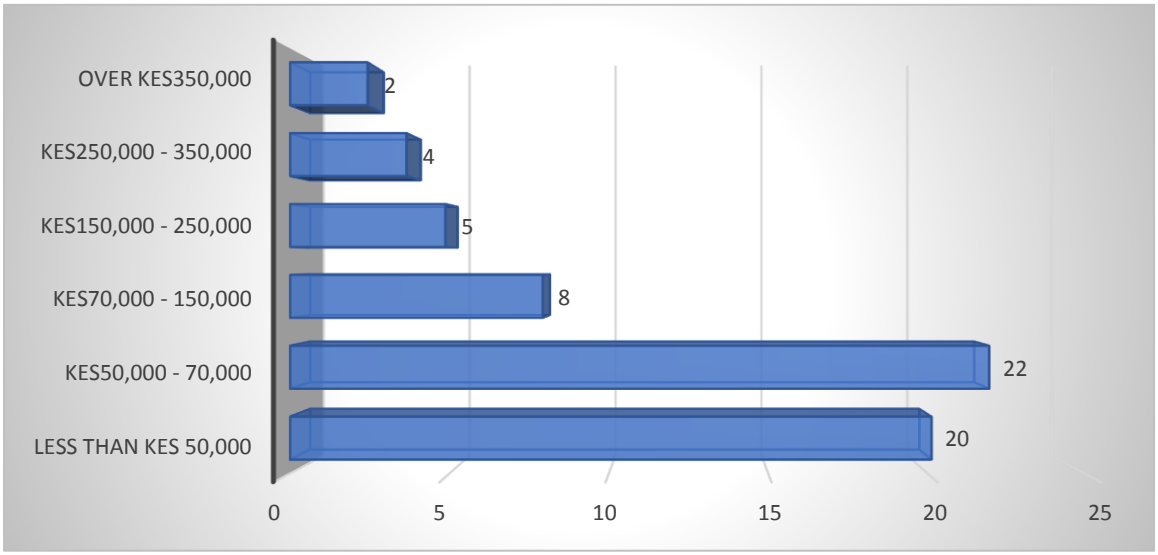


Source: Author, 2020

5.3 Annual Income

Of all the respondents 20% earned an annual income of less than Ksh. 50,000, 22% of the respondents earned an annual income of Ksh. 50,000 – 70,000, 8% of the respondents earned an annual income of Ksh. 70,000 – 150,000, 5% of the respondents earned an annual income of Ksh. 150,000 -250,000, 4% of the respondents earned an annual income of Ksh. 250,000 – 350,000 while 2% of the respondents earned an annual income of over Ksh. 350,000. It was difficult to account for annual income since most of the residents are paid on daily basis.

Figure 15: Annual Income of the Residents



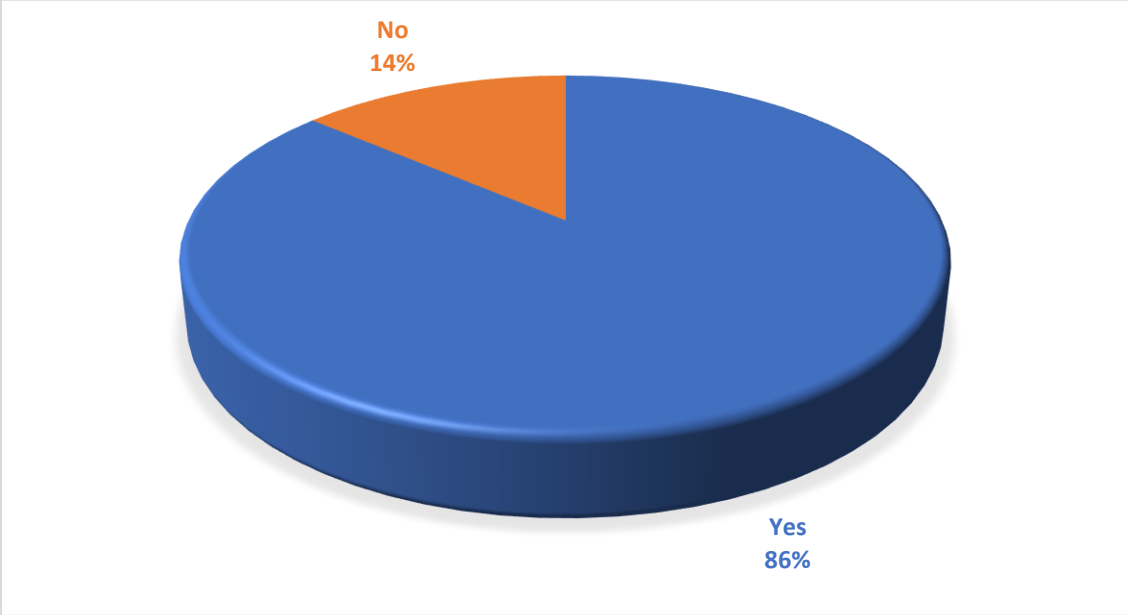
Source: Author, 2020

5.4 Ability to Identify Common Spaces of Flora and Fauna

Of all the respondents, 86% were able to identify common spaces of flora and fauna in the study area while 14% of the respondents were unable to identify common spaces of flora and fauna in the study area. It is evident that in Sokoni Ward there are many common places of flora and fauna as shown by the study.

This is an indicator that households within Sokoni ward, as an institution, know the existing urban green open spaces and they can easily identify them. There are, however, a number of households who are not able to identify existing urban green open spaces within the study area. This implies that there is still an opportunity for the institutions responsible and with the necessary capacity to popularize the existing urban green open spaces within the community.

Figure 16: Ability to Identify Common Spaces of Flora and Fauna



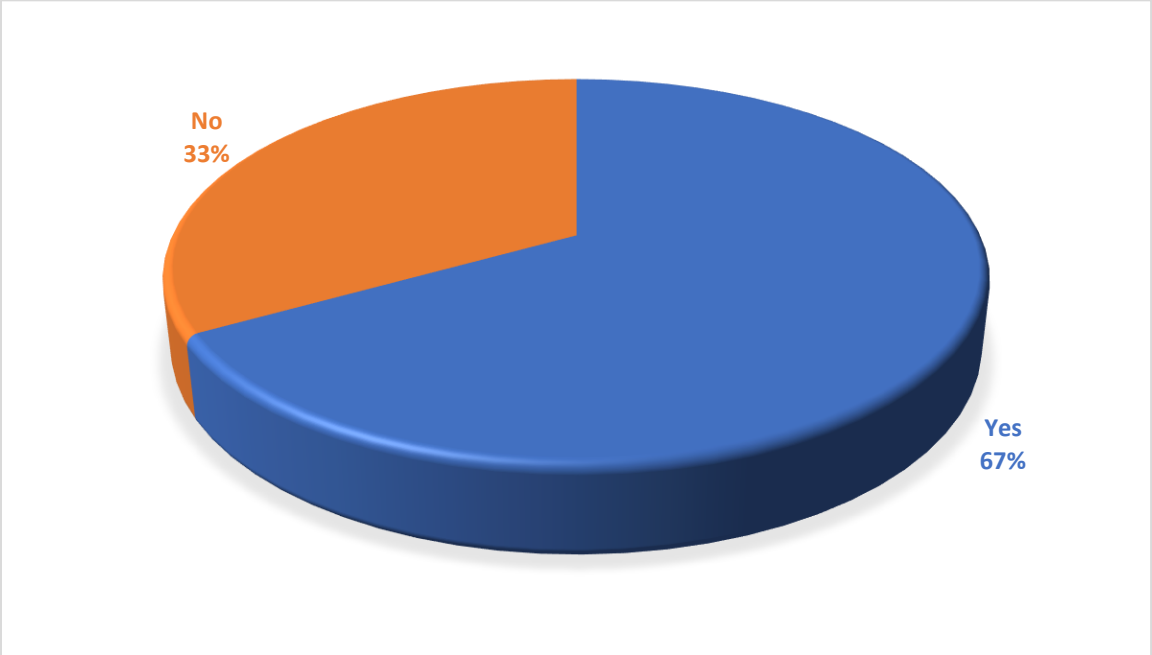
Source: Author, 2020

5.5 Disconnection from the Environment in Our Society

Of all the respondents 67% noted that there is a disconnection from the environment in our society while 33% of the respondents found no disconnection from the environment in our society. From the study, the disconnection from the environment is mainly due to man's activities such as pollution and encroachment of natural environments within Sokoni Ward.

This implies that there are failures on the part of various institutions who are tasked with the responsibility of sensitizing the community on the importance of connection with the environment. Kilifi County, NEMA, community groups, environmental groups, the ministry of sports and other institutions need to do more in ensuring that the Sokoni ward community has a connection with the environment.

Figure 17: Disconnection from the Environment in Our Society



Source: Author, 2020

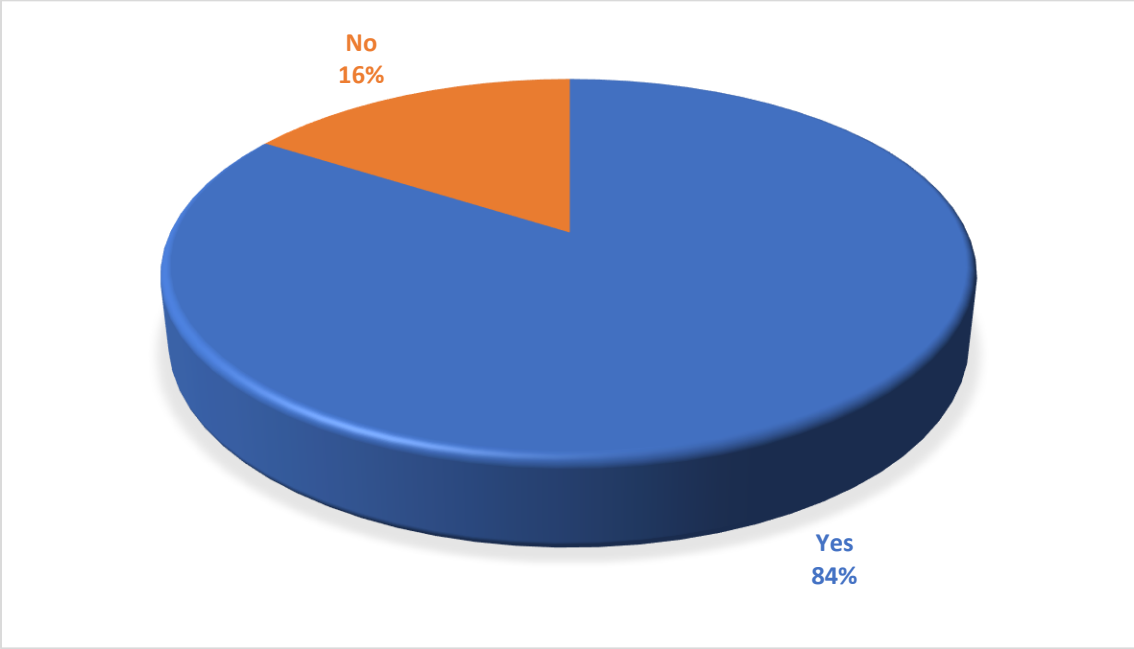
5.6 Urban Green Open Spaces

5.6.1 Awareness of Any Existing Urban Green Open Spaces

From the field study, 84% of the respondents were aware of existing urban green open spaces while 16% of the respondents were not aware of any existing urban green open spaces. The high level of awareness of existing urban green open spaces in Sokoni ward is due to eco- literacy programmes conducted in the county. These programmes are conducted by the county government in collaboration with community-based organisations. The main aim of these programmes is to encourage the residents of Sokoni Ward to conserve such areas and help improve health of the residents.

This shows that there are failures on the part of various institutions who are tasked with the responsibility of sensitizing the community on the existence and importance of urban green open spaces. Kilifi County, NEMA, community groups, environmental groups, the ministry of sports and other institutions need to do more in ensuring that the Sokoni Ward community has a is aware of the existing urban green open spaces and their importance.

Figure 18: Awareness of Any Existing Urban Green Open Spaces



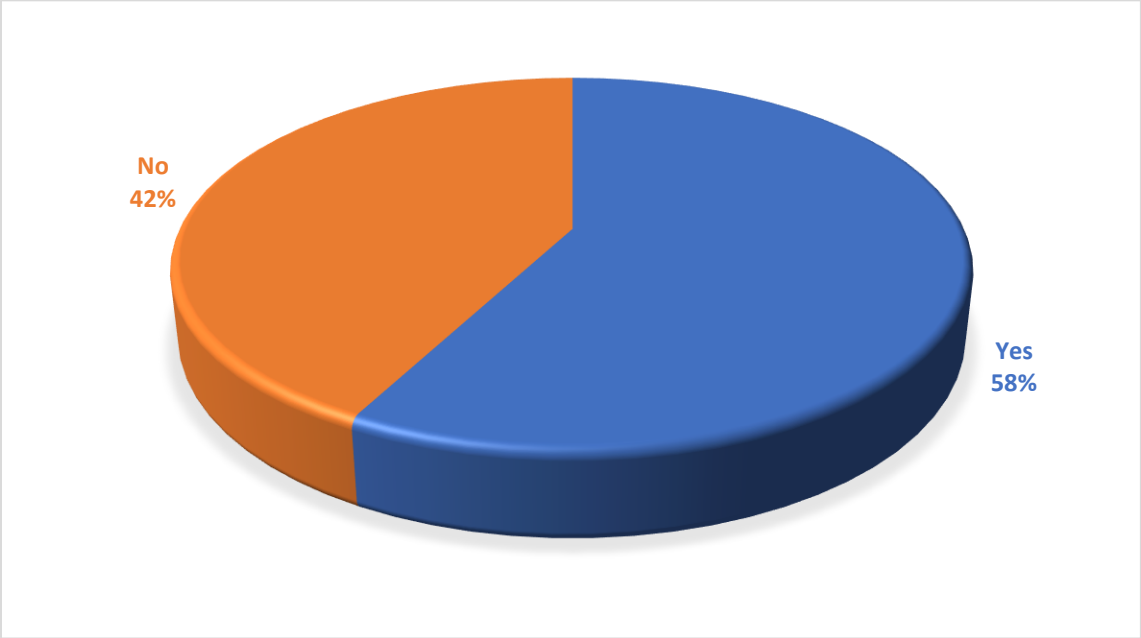
Source: Author, 2020

5.6.2 Live or Work Within 300m of Green Space, Park or another Natural Element

From the research, 58% of all the respondents live or work within 300m of green space, park or another natural element while 42% of the respondents did not live or work within 300m of green space, park or another natural element. This shows it is important to incorporate green open places in residential area so that people can live, work and play within a compact neighbourhood.

We can therefore conclude that the institutions charged with the responsibility of designating green open spaces in the area has tried to place them within areas accessible to the people using them. However, more still needs to be done in providing sufficient and adequate urban green open spaces within Sokoni Ward, which requires that all institutions involved work in harmony to ensure that this is achieved.

Figure 19: Live or Work Within 300m of Green Space, Park or another Natural Element

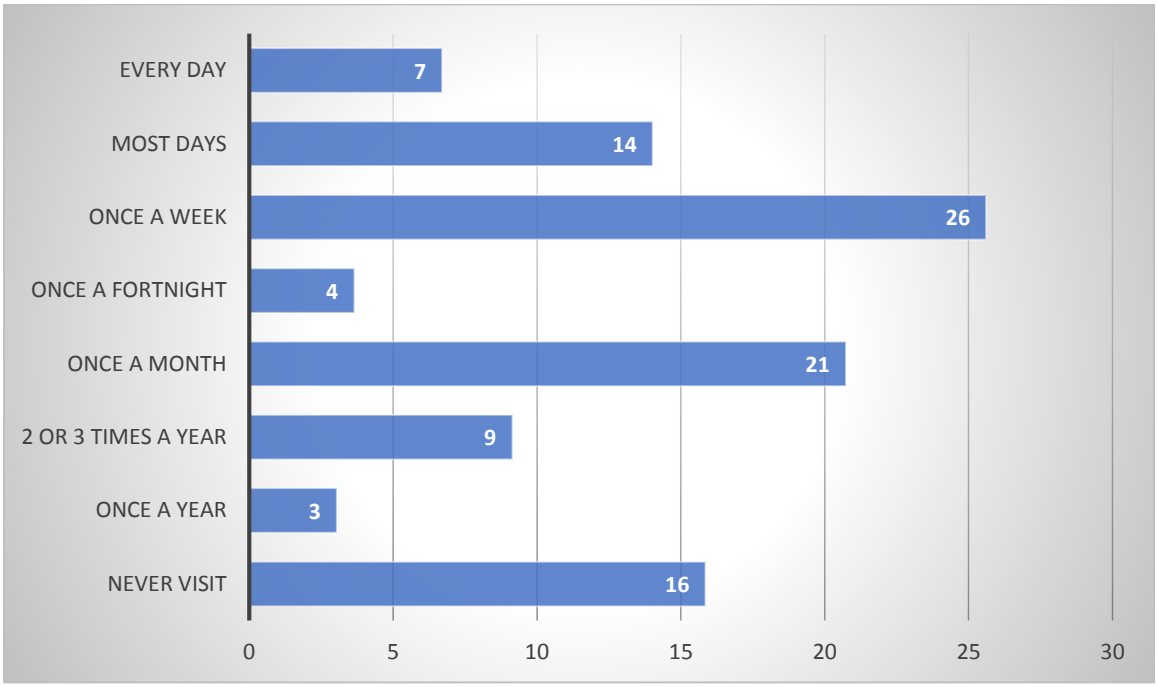


Source: Author, 2020

5.6.3 How Often Do You Visit Open Green Space?

From the field study,26% of all the respondents visited open green spaces once a week, 21% of all the respondents visited the open green space once a month, 14% of all the respondents visited the open green space most times, 9% of the respondents visited open green space 2 or 3 times a year,7% of the respondents visited open green spaces every day, 4% of the respondents visited open green spaces once a fortnight, 3% of the respondents visited the open green spaces once a year while 16% of the respondents never visited the open green spaces. It is evident that residents in Sokoni Ward regularly visit green open spaces since they are easily accessible.

Figure 20: Frequency of Visiting Open Green Space

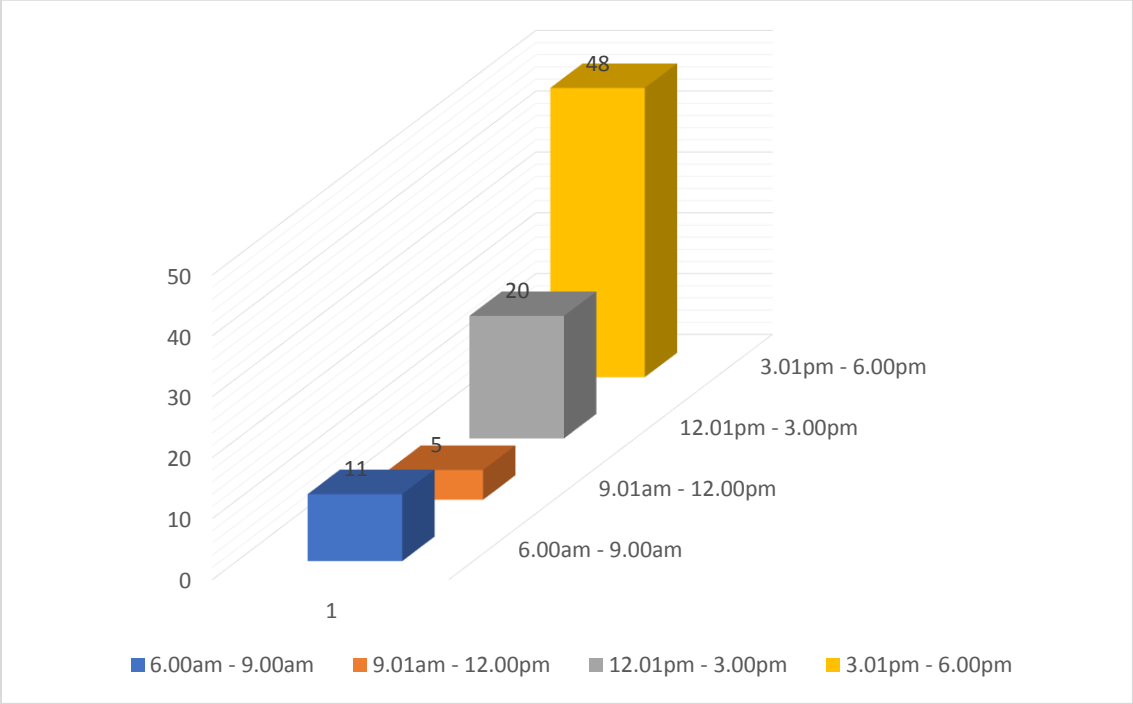


Source: Author, 2020

5.6.4 Time You Normally Visit the Green Space

According to the research findings, 48% of all the respondents visited the open green space from 3.01pm to 6.00pm, 20% of the respondents visited the open green space from 12.01pm to 3.00pm, and 11% of the respondents visited the open green space from 6.00pm to 9.00pm while 5% of the respondents visited the open green space from 9.01am to 12.00pm. Residents in Sokoni Ward mostly visit the green open spaces in the evening since they get off work during that time and children are out of school by then.

Figure 21: Time You Normally Visit the Green Space

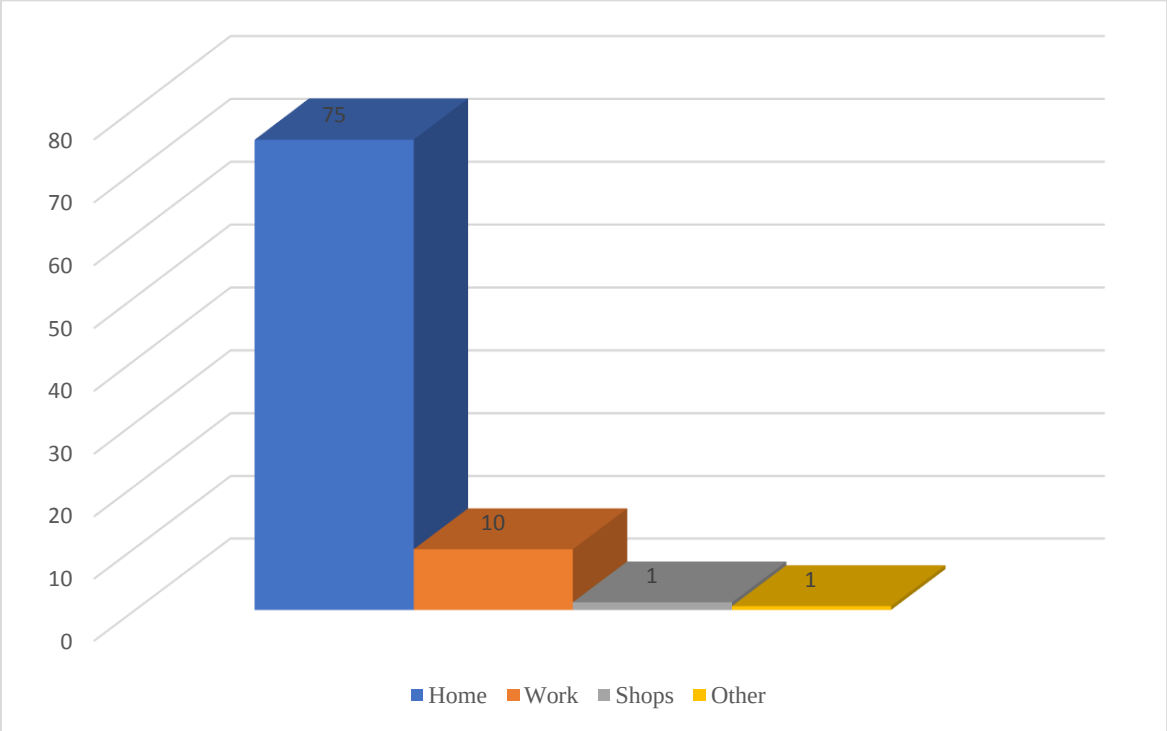


Source: Author, 2020

5.6.5 When You Visit the Green Space, Where Do You Usually Travel From?

The bulk of the respondents (75%) visit the urban green open space coming from home, 10% of the respondents visited the urban green open space coming from work while those respondents coming from shops and other places were represented by 1% each.

Figure 22: When You Visit the Green Space, Where Do You Usually Travel From?



Source: Author, 2020

5.7 Accessing Urban Green Open Spaces

5.7.1 How would you Normally Travel to the Green Space?

From the research, 45% of all the respondents travelled to the green space on foot, 30% of the respondents travelled to the green space via motorbike, and 5% of the respondents used a car to travel to the green space while 4% of the respondents travelled to the green space via a bicycle. It is evident due to close proximity of the green open spaces that most of the residents in Sokoni Ward prefer to walk to the urban green open spaces.

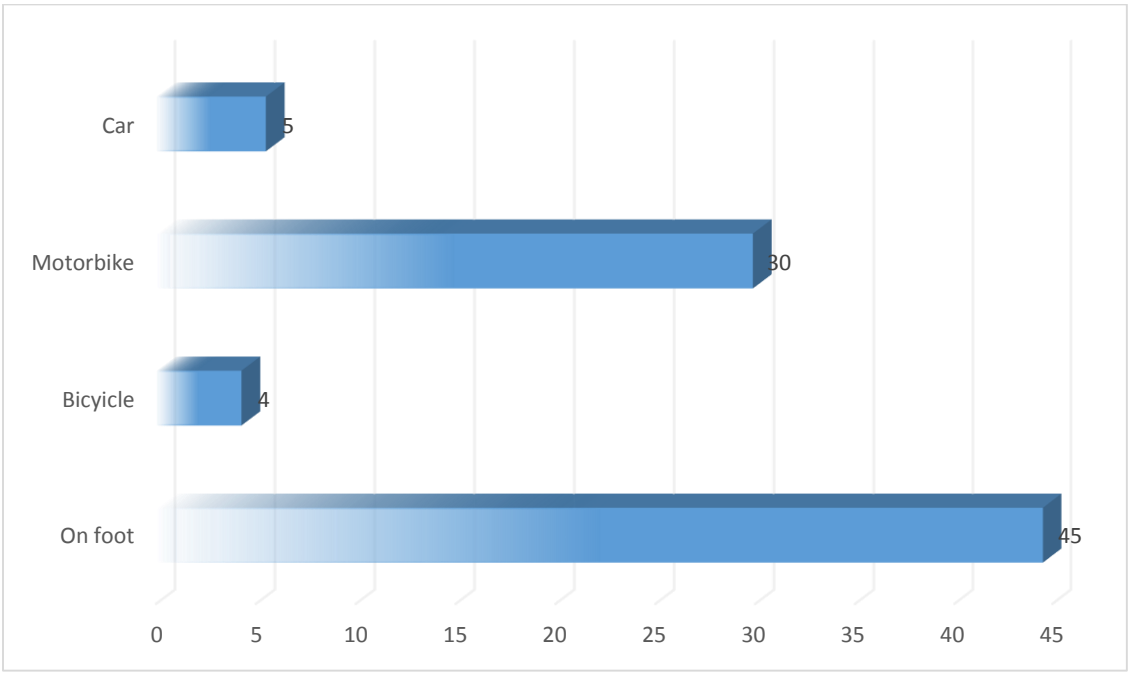
This shows that the access to urban green open spaces within Sokoni ward is good within areas close to these urban green open spaces, but still wanting for those areas in the ward where people have to travel for long distances to access these spaces. Therefore, there is need to improve access to urban green open spaces in Sokoni Ward through proper coordination and efficiency within the relevant institutions, for instance Kilifi County

government and KURA. These are the institutions that come first in matters access and development within the transportation sector.

Plate 2: State of Roads in Sokoni Ward

Source: Author,2020

Figure 23: How would you Normally Travel to the Green Space

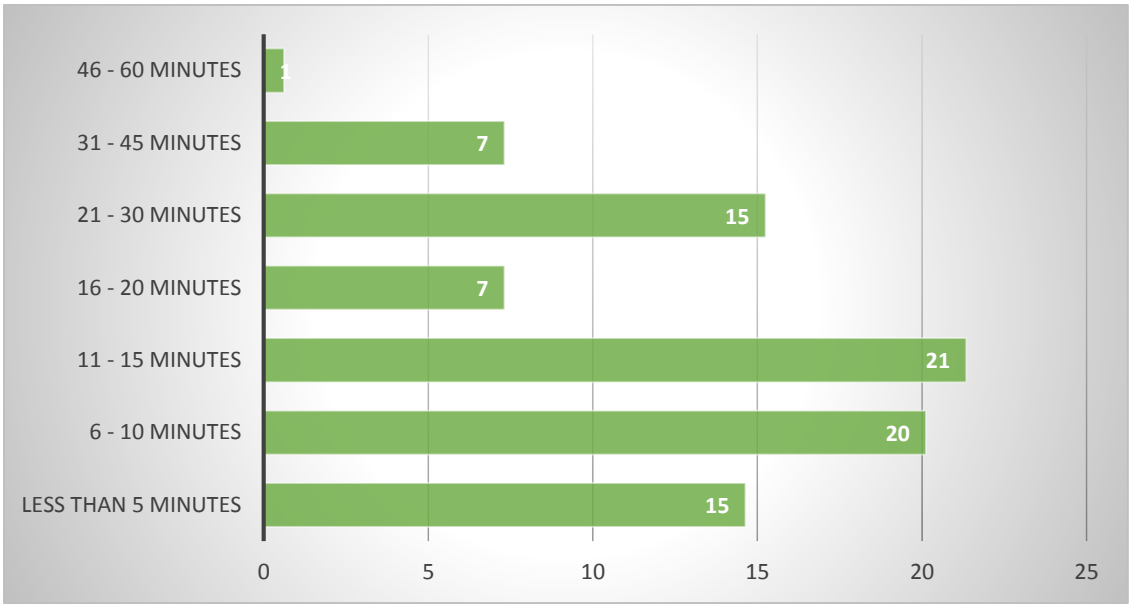


Source: Author, 2020

5.7.2 Approximately how long does your usual journey take?

Of all the respondents 21% of the respondents take approximately 11-15 minutes to arrive at the urban green open space, 20% of the respondents take 6-10 minutes to arrive at the urban green open space,15% of the respondents take less than 5 minutes to get to the urban green open space, 15% of the respondents also take 21- 30 minutes to arrive to the urban green open space, 7% of the respondents take 16-20 minutes to arrive to the urban green open space, 7% of the respondents also take 31-45minutes while 1% take 46-60 minutes to arrive at the green space.

Figure 24: Length of the Journey



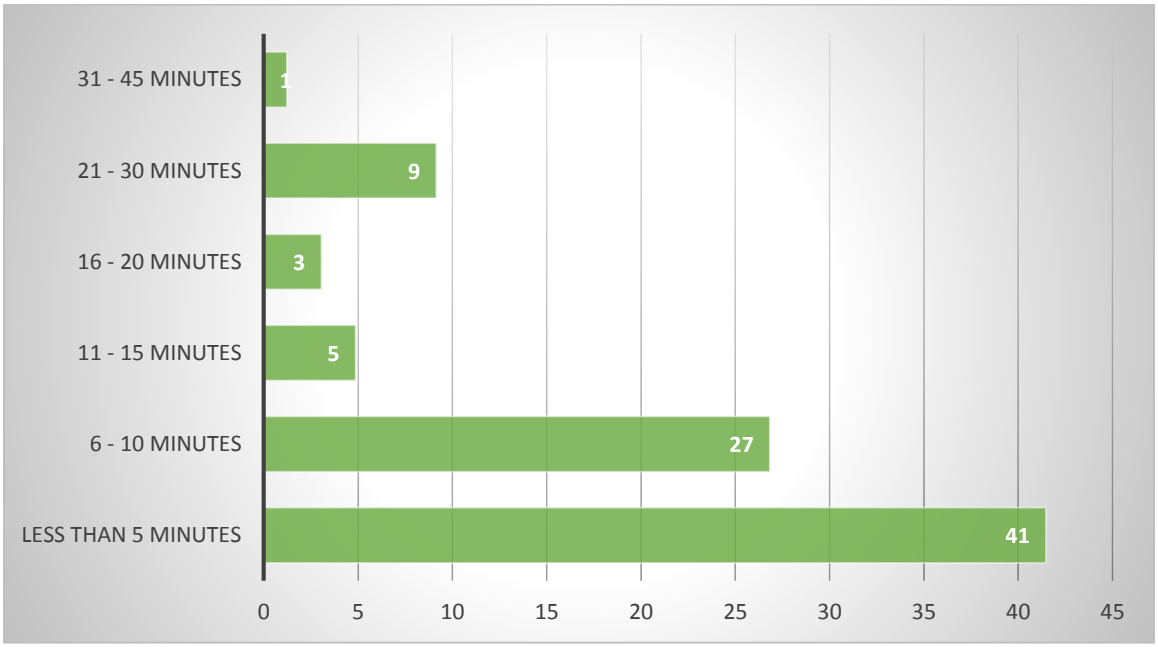
Source: Author, 2020

5.7.3 Ideally, how long would you like your journey to take to your preferred green space?

Of all the respondents, 41% preferred the journey to the urban green open space to take less than five minutes, 27% preferred the journey to take 6-10 minutes, 5% ideally wanted the journey to take 11-15 minutes, 3% preferred the journey to take 16-20 minutes, 9% preferred the journey to take 21-30 minutes while 1% preferred the journey to the urban green open space to take 31-45 minutes.

This is evidence that there is an issue of access to the urban green open spaces in Sokoni Ward. Institutions like the County Government of Kilifi and KURA bear the burden of ensuring that access to such spaces within the county is improved through development of transportation infrastructure. Therefore, these institutions have failed on their part to take appropriate action in ensuring that access to urban green open spaces is at the desired levels.

Figure 25: Ideal Length of the Journey

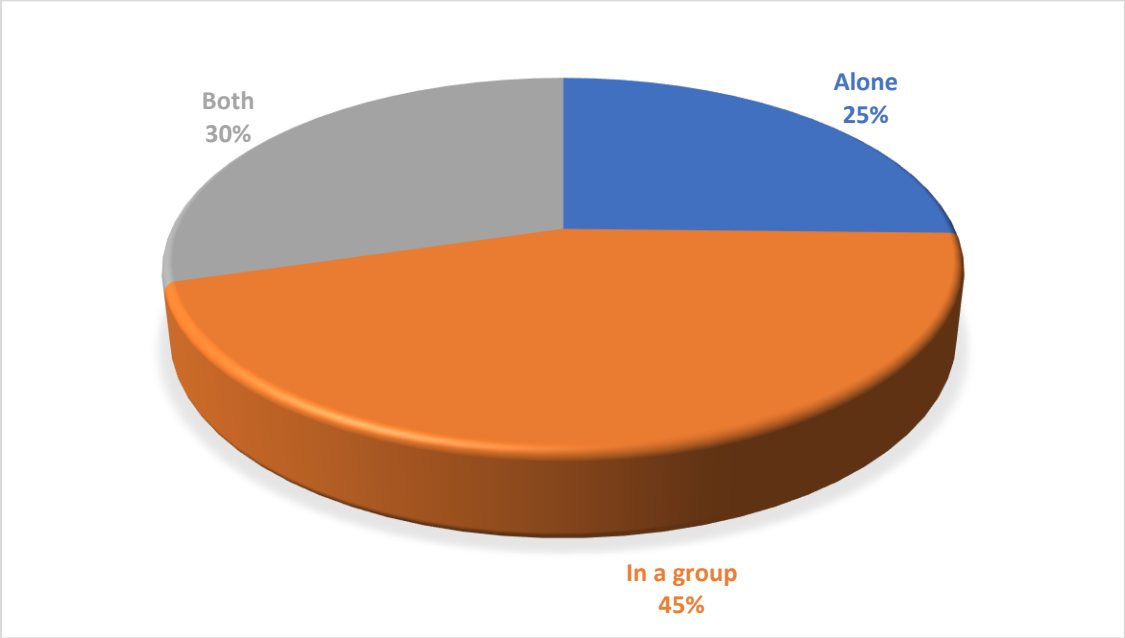


Source: Author, 2020

5.7.4 Normally visit the green space alone or in a group

From the field study, 45% of the respondents normally visit the urban green open space in a group while 25% visit the urban green open space alone. Many of the residents within Sokoni Ward tend to visit green open spaces in groups since this increases social ties.

Figure 26: Normally visit the Green Space alone or in a Group

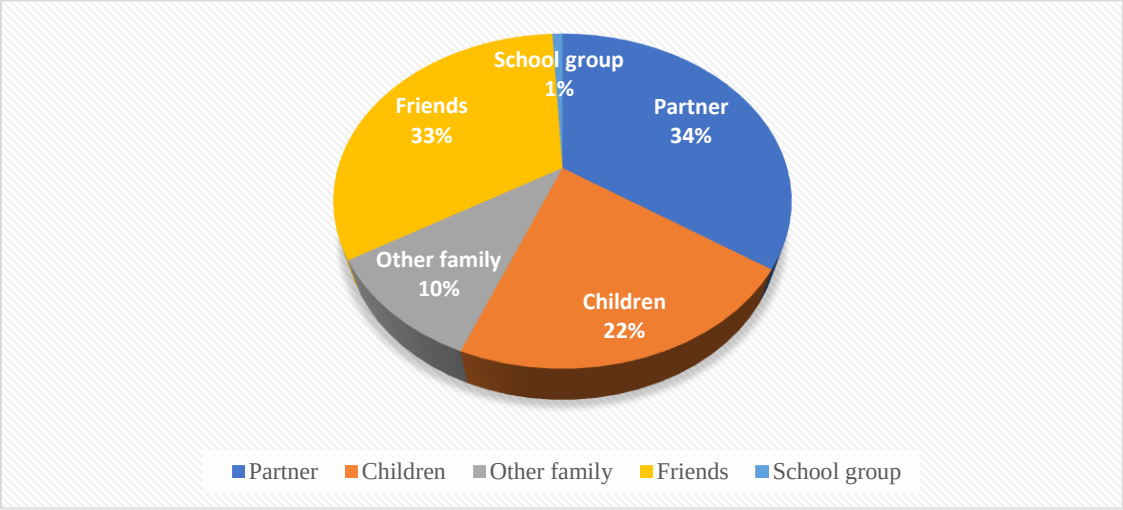


Source: Author, 2020

5.7.5 Who normally accompanies you?

Out of the respodents,34% normally visit the green space with their partners,33% visit the green space with their friends,22% visit the green space with their children,10% normally have other family members accompanying them while 1% go there as a school group. Play helps kids develop muscle strength and coordination, language, cognitive thinking, and reasoning abilities. Play also teaches children how to interact and cooperate with others, laying foundations for success in school and the working world.

Figure 27: Company to the Green Space

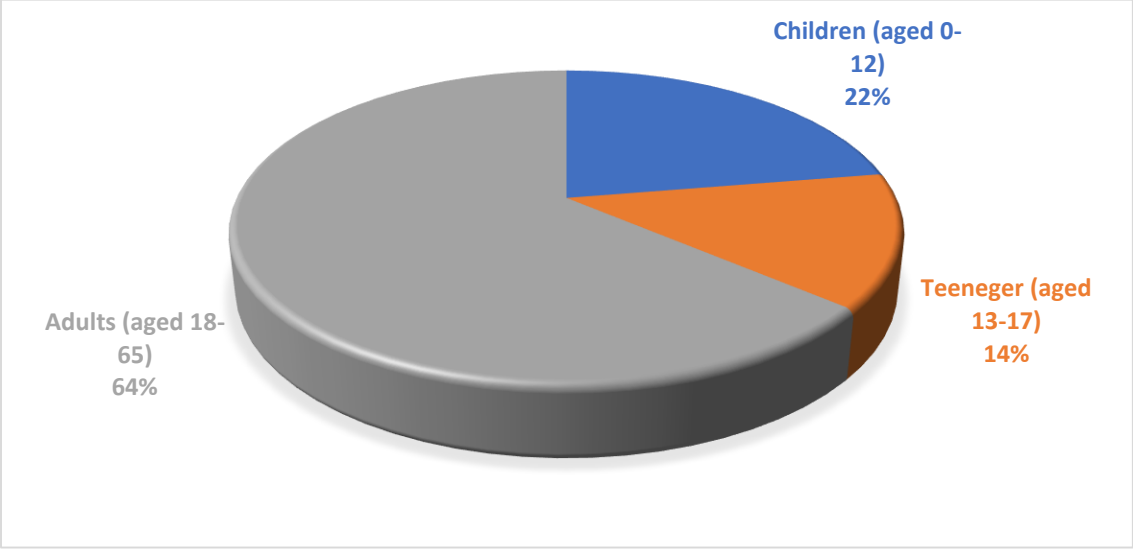


Source: Author, 2020

5.7.6 People would normally accompany

From the findings, 64% of the residents are accompanied by adults between the ages of 18-65 years whereas 22% are normally accompanied by children between the ages of 0-12 years while 14% are accompanied by teenagers aged between 13-17 years.

Figure 28: People who normally accompany you

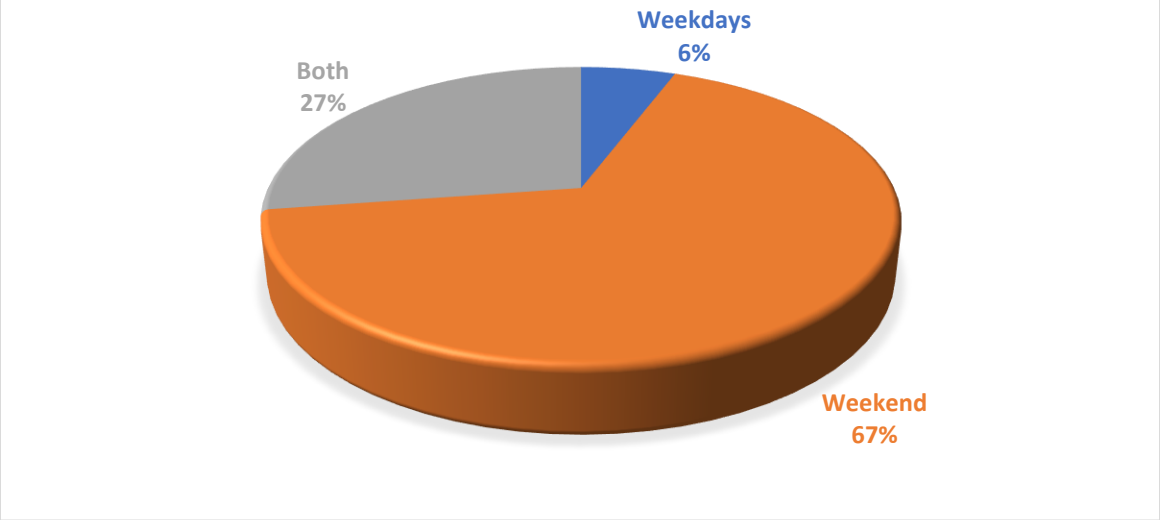


Source: Author, 2020

5.7.7 When do you normally visit the green space?

From the study, 67 % of the respondents normally visit the urban green open spaces on weekends, 6% usually visit these urban green open spaces on weekdays while 27% of the respondents visit the urban green open spaces on both weekdays and weekends. Most of the residents visit the green open spaces on Saturdays and Sundays since they are not at work.

Figure 29: Visiting Time of Urban Green Open Spaces



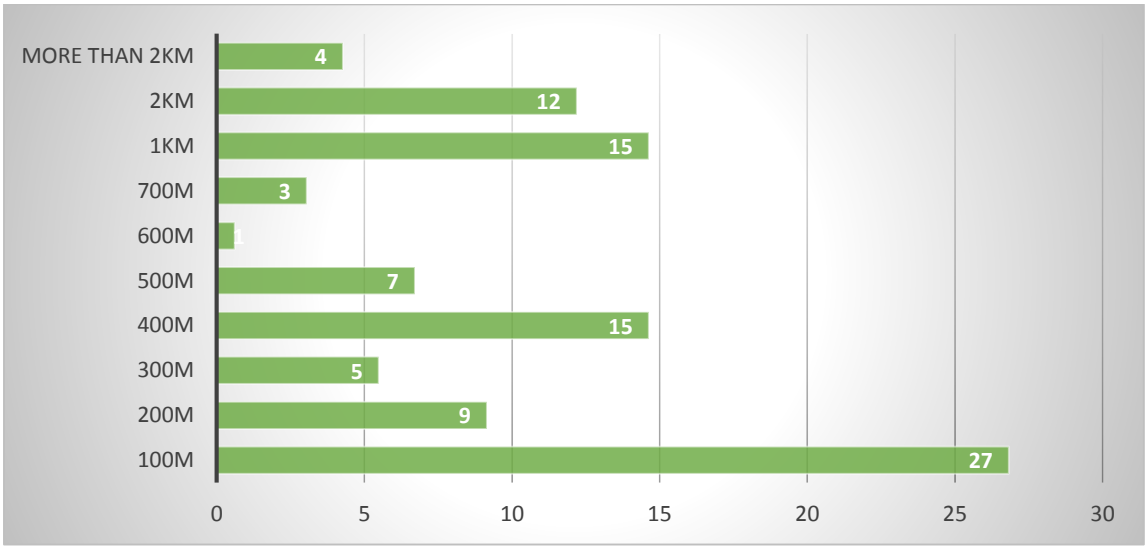
Source: Author, 2020

5.8 Proximity to Urban Green Open Spaces

5.8.1 Ideally, how close do you want to live to a green space?

Sizeable (27%) of the respondents would ideally want to live 100 m close to an urban green open space, 9% would like to live 200m close to a green space, 5% would like to live 300m close to a green space, 15% would like to live 400m close to a green open space, 7% would ideally like to live 500m from a green space. From the research 15% would like to live 1km close to a green open space,12% would want to live 2km close to a green space while 4% would like to live more than 2km close to a green open space.

Figure 30: Preferred Proximity to a Green Open Space

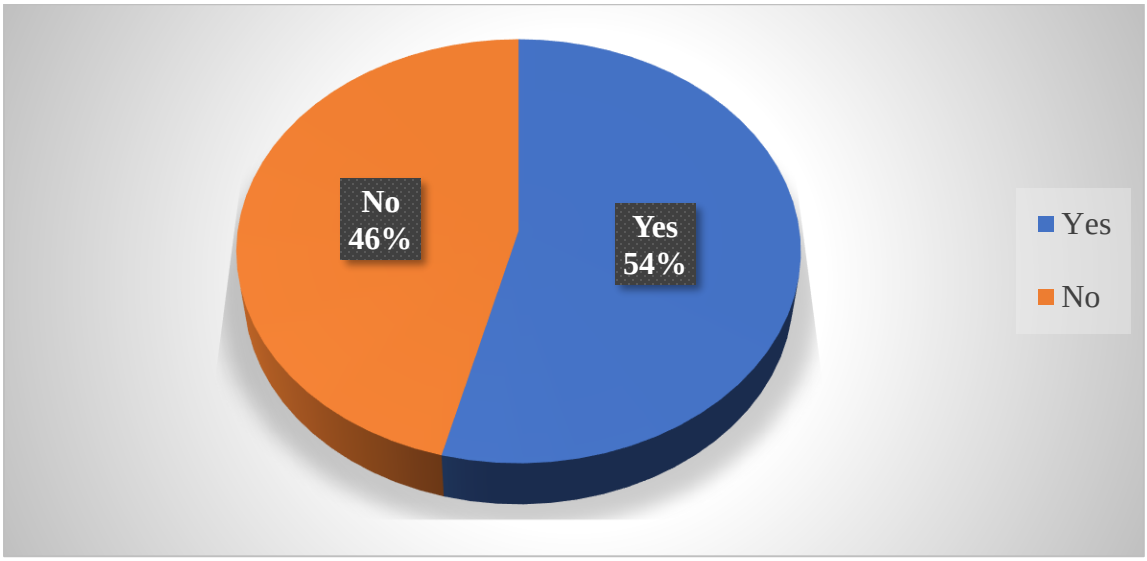


Source: Author, 2020

5.9 Use of Urban Green Open Spaces in Sokoni Ward

5.9.1 Use of Unconstructed Areas

Figure 31: Use of the Area Not Covered by Building for Parking

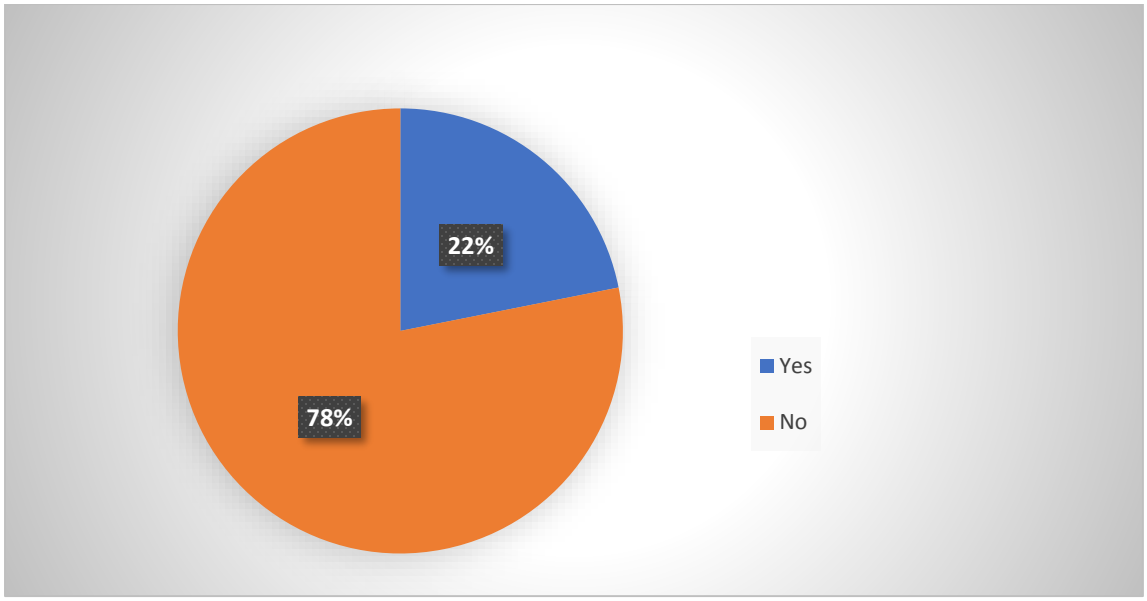


Source: Author, 2020

As illustrated in the figure above, 54% of residents in Sokoni Ward use the area not covered by buildings on their plots for parking while 46% do not use the space for parking. This is

because most of the people within the study area have vehicles, motorcycles and bicycles for moving around. Therefore, designation of space for parking is an important consideration while coming up with a plot plan in Sokoni Ward.

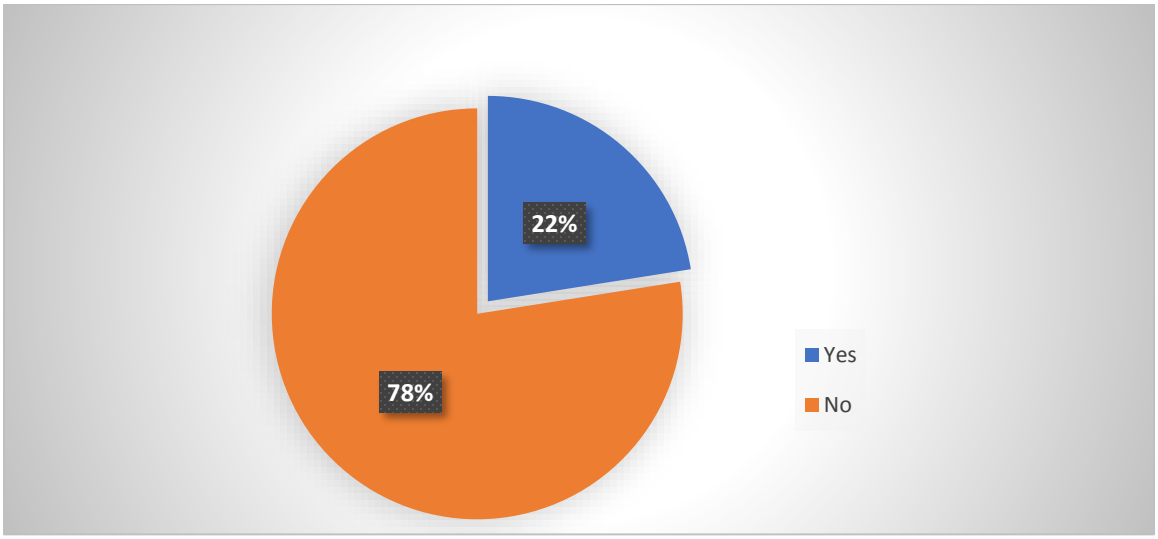
Figure 32: Use of the Area not Covered by Buildings for Storage



Source: Author, 2020

As seen on the pie chart above, 22% of the residents in Sokoni Ward use the area not covered by buildings on their plots for storage whereas the remaining 78% do not use it for storage. This is so because the 22% of residents in Sokoni Ward have no places designated within their houses for storage while the 78% have storage spaces in their houses or detached stores.

Figure 33: Use of the Area not covered by Building(s) for Growing Trees, Shrubs, and Grass



Source: Author, 2020

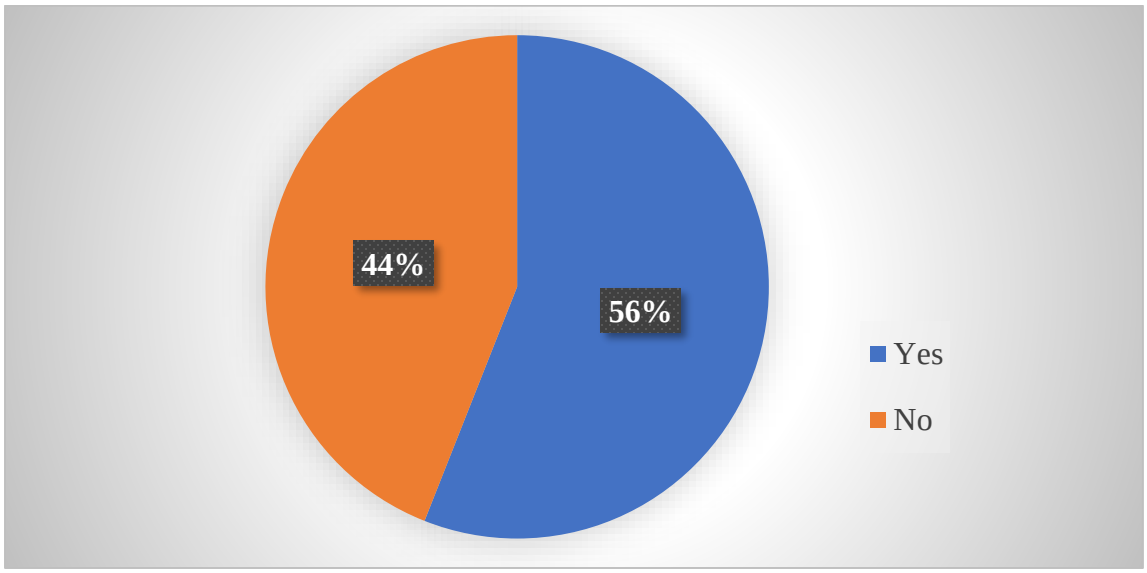
The figure above shows that 22% of the residents of Sokoni Ward use the area not covered by buildings on their plots for growing trees, shrubs, grass et cetera, while 78% do not use the area for these reasons. This illustrates that only a minority of the residents in Sokoni Ward have put the space not occupied by buildings on their plots under uses that would be considered as green space. This is so owing to the fact that most people may not know the importance of vegetation on their plots. Without the appreciation for green open spaces, these people will not have the willingness to develop urban green open spaces within their homesteads.

This scenario again shows that there is lack of awareness among the residents of Sokoni ward on the importance of vegetation and trees on their plots. It is therefore failure on the part of the institutions (the County government of Kilifi, community groups, environmental groups) tasked with the responsibility of sensitizing the community on this issue.

Plate 3: Area not covered by Building(s) Used for Growing Vegetation

Source: Author, 2020

Figure 34: Area Not covered by Buildings Used as Playground

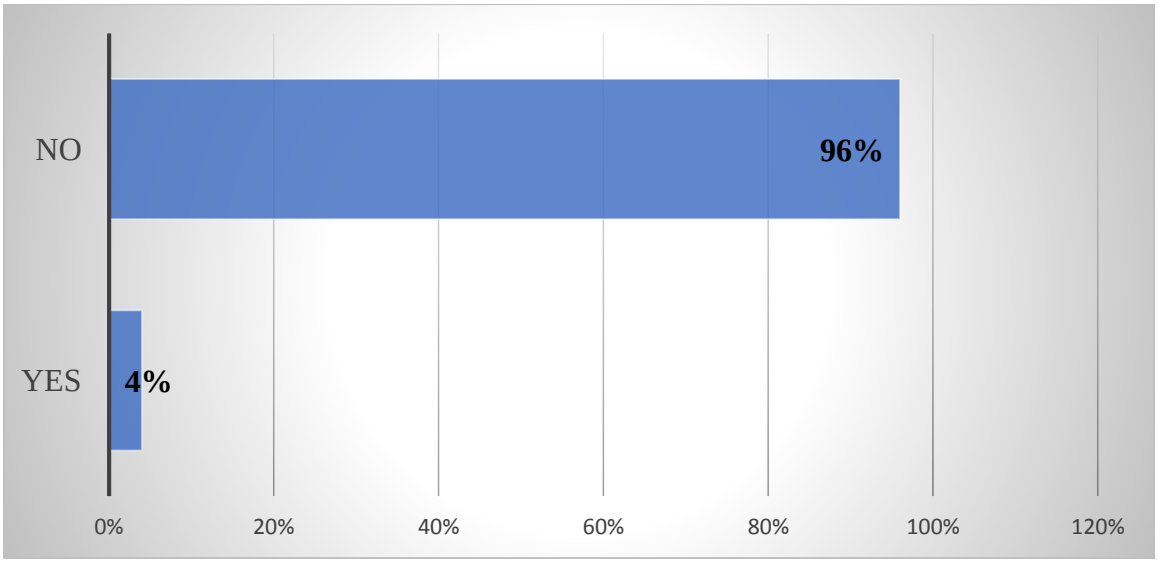


Source: Author, 2020

The pie chart above shows that 56% of the residents of Sokoni Ward use the space not covered by buildings on their plots for children to play while 44% do not use the space for

children to play. This is so because most of the residents of Sokoni ward have compounds where children can play, and on top of that, even with public green open spaces in the ward, the conditions are too deplorable for the children to play from.

Figure 35: Use of the Area Not Covered by Buildings for Drainage



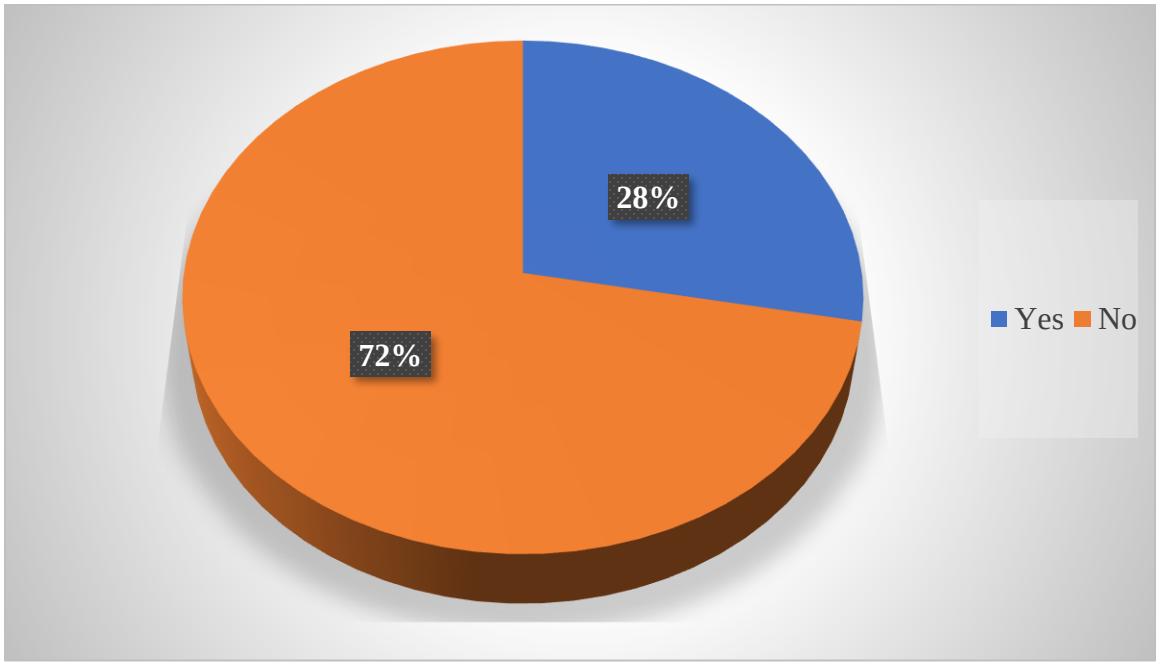
Source: Author, 2020

According to the figure above, 96% of the residents of Sokoni ward use the space not covered by buildings on the plot for drainage whereas 4% do not use this space for drainage.

Plate 4: Open Drainage

Source: Author, 2020

Figure 36: Use the Area not Covered by Buildings as Kitchen Garden

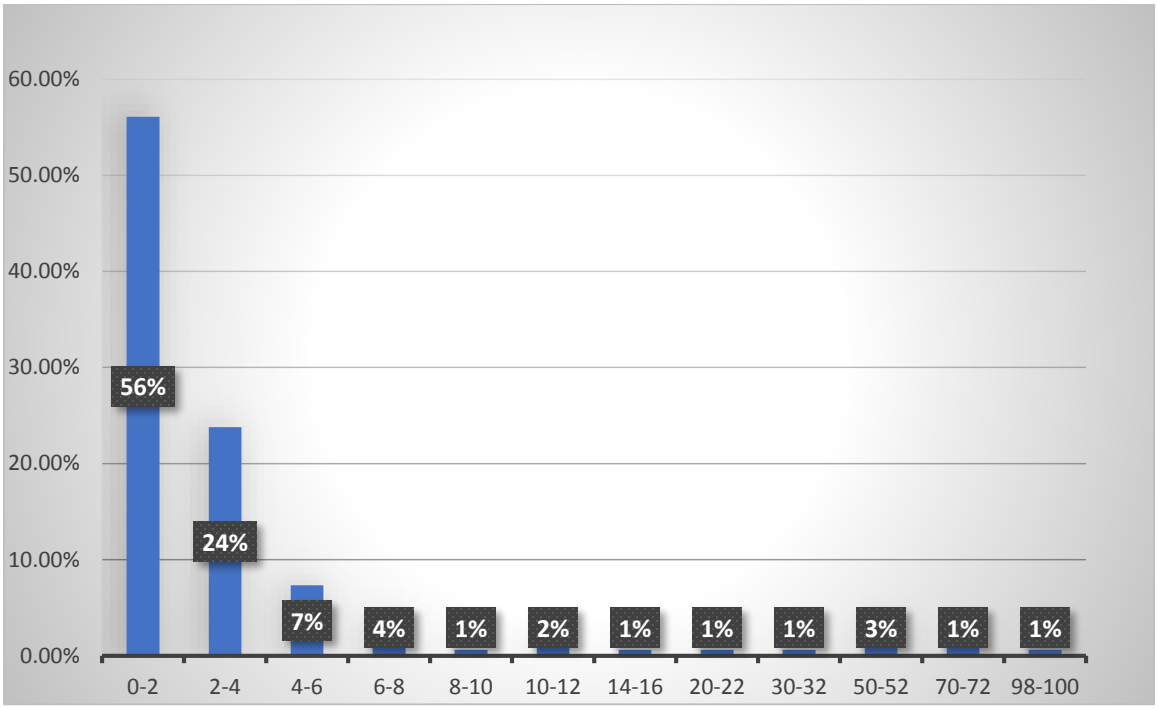


Source: Author, 2020

The figure above illustrates that 28% of the residents of Sokoni Ward use the space not covered by buildings as a kitchen garden while 72% do not use the space as a kitchen garden.

5.9.2 Use of Plot Frontage

Figure 37: Width of Frontage Strip in Metres



Source: Author, 2020

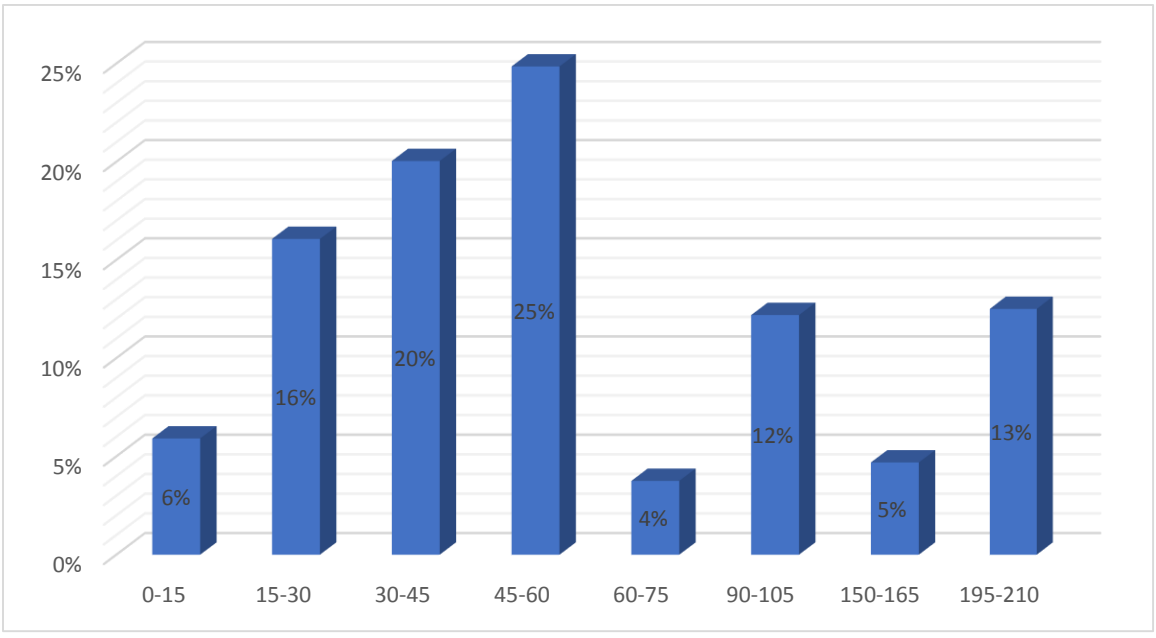
The bar graph above shows the percentages of people in Sokoni Ward according to the width of the frontage strip on their plots. 56% of the respondents have frontage strips with a width of up to 2 metres while 24% have frontage strips of a width between 2-4 metres. Another 7% have frontage strips of a width between 4-6 metres and 4% 6-8 metres. 3% have frontage strips of between 50-52 metres and 2% 10-12 metres. 1% have frontage strips of width between 8-10 metres, 14-16 metres, 20-22 metres, 30-32 metres, 70-72 metres and 98-100 metres. This is so because of the nature of land sub-division and development/ construction within the ward. When over 50% of land owners develop plots of land without giving much consideration to the width of the frontage strip, there will be very little space

left for the frontage strip. Therefore, the majority of the residents of Sokoni ward have frontage strips that measure up to 2 metres. This could be again attributed to the use(s) of the frontage strips, which in most cases does not need a big width.

Plate 5: Plot Frontage

Source: Author, 2020

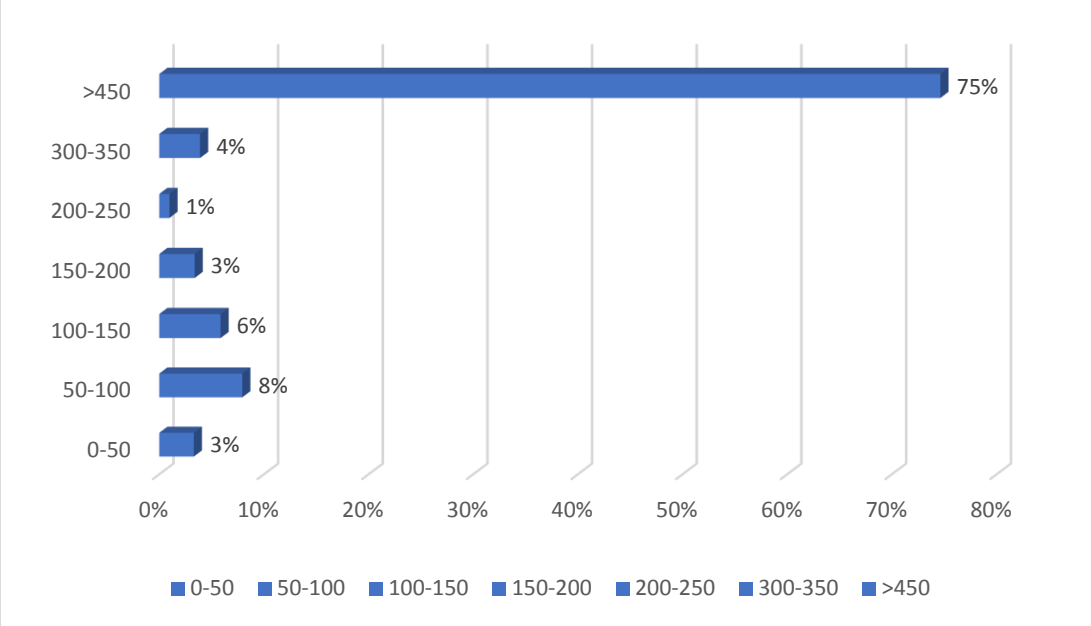
Figure 38: Length of Frontage Strip



Source: Author, 2020

The bar graph above shows the percentage of the residents of Sokoni Ward according the lengths the frontage strips on their plots. 6% of them have frontage strips of a length of up to 15 metres while 16% have strips of between 15-30 metres. 20 % of the residents have frontage strips of between 30-45 metres while another 25% own strips of lengths between 45-60 metres. 4% of own frontage strips of between 60-75 metres while 12% have strips of between 90-105 metres and another 5% have strips of between 150-165 metres. This is so because of the layout of the plots when subdivided. Therefore, the longer side of the plot gets to have a long frontage strip.

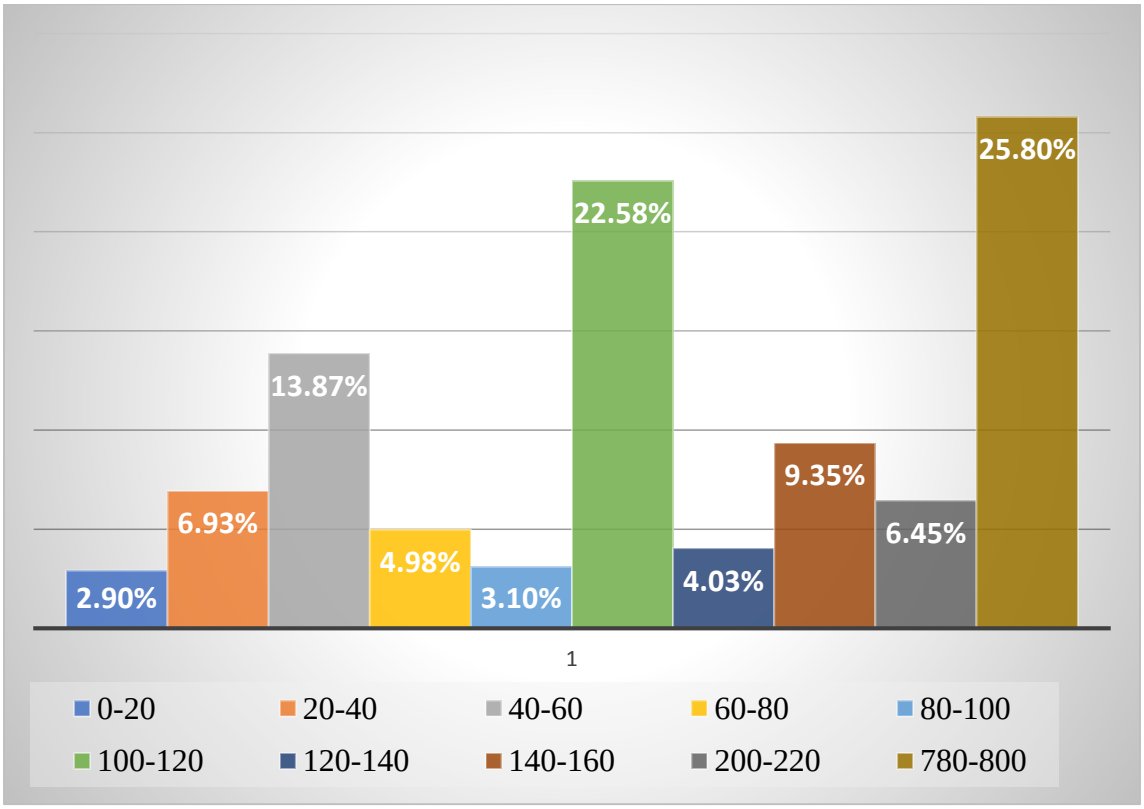
Figure 39: Area of Frontage Strip



Source: Author, 2020

The bar graph above shows the area of frontage strip as owned by the people of Sokoni Ward. 3% of the residents of Sokoni Ward have frontage strips of up to 50 square metres while 8% have frontage strips of 50-100 square metres. 6% of the residents have frontage strips of 100-150 square metres while 3% have frontage strips of 150-200 square metres. 1% of the residents of Sokoni ward have frontage strips of 200-250 square metres while 4% have strips of 300-350 square metres and 75%, the majority, have frontage strips of over 450 square metres.

Figure 40: Area of Frontage in Square Metres not Covered by Hard Surface or Drainage Channel

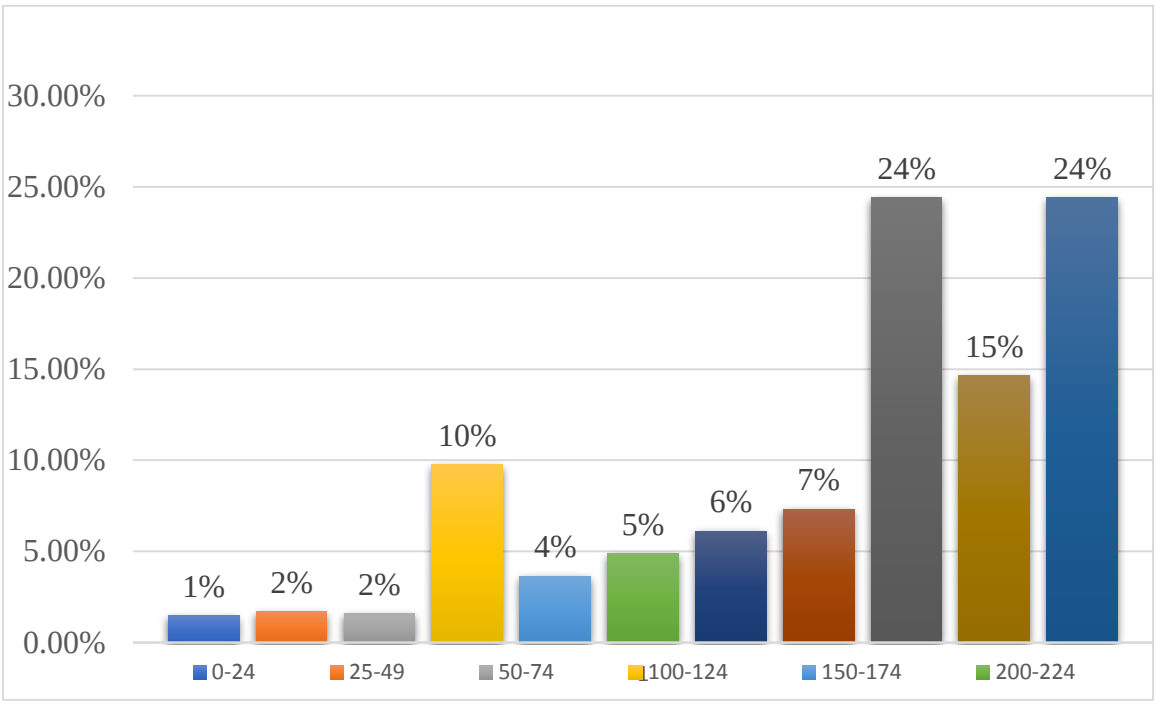


Source: Author,2020

The figure above shows the area of frontage in square metres not covered by drainage channels on the plots owned by the residents of Sokoni ward. 2.90% have an area of up to 20 square metres not covered by hard surface while 6.93% have an area of 20-40 square metres. 13.87% have 40-60 square metres not covered by hard surface while 4.98% have an area of 60-80 square metres not covered by hard surface. Another 3.10% have an area of 80-100 square metres not covered by hard surface, 22.58% have an area of 100-120 square metres while 4.03% have an area of 120-140 square metres not covered by hard surface. 9.35% have frontage strips of 140-160 square metres not covered by hard surface while 6.45% have frontage strips of 200-220 square metres not covered by hard surface and another 25.80% have 780-800 of their frontage strips not covered by hard surface. This implies that majority the people of Sokoni Ward prefer to leave the areas not covered by a

hard surface or drainage channel bare, for probably future development, playing and resting.

Figure 41: Plot Frontage in Square Metres that is Green



Source: Author,2020

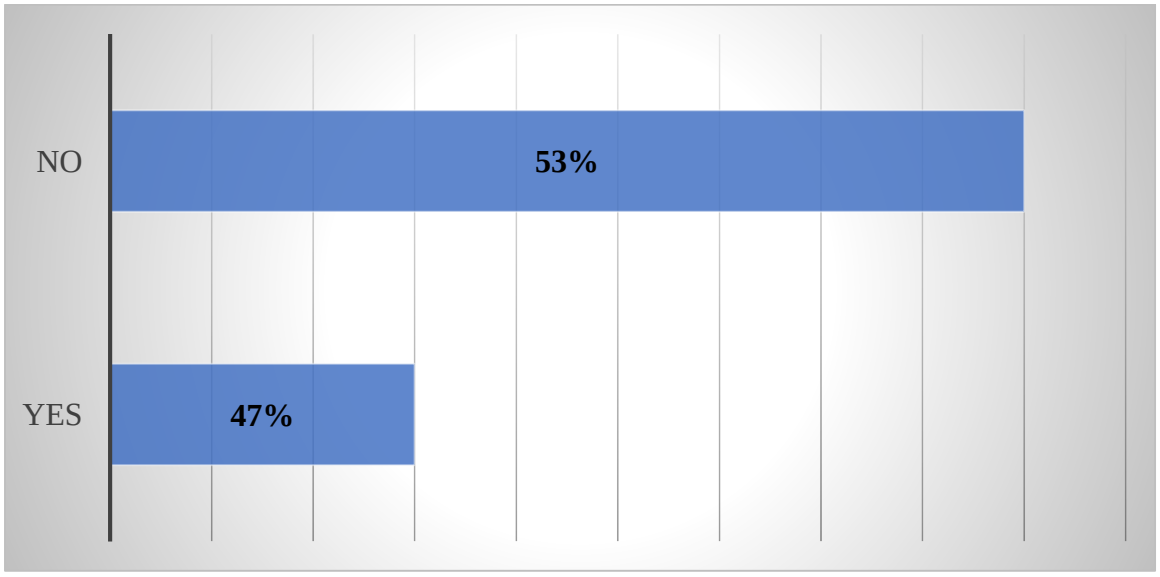
The bar graph above illustrates the area of the frontage that is green on the plots owns by the residents of Sokoni ward. 1% of the respondents have up to 24 square metres, while 2% have 25-49 square metres of green frontage on their plots and another 2% have 50-74 square metres of green frontage. 10% of the respondents have 100-124 square metres of their frontage strips covered by vegetation while 4% have 150-174 square metres of the frontage covered by vegetation. 5% have 200-224 square metres of the frontage that is green and 6% have 250-274 square metres green frontages. 7% have 300-324 square metres of green frontage, 24% have 500-524 square metres of their frontages green and 15% have 600-624 square metres of the frontage green. 24% have 975-1000 of their frontages covered by vegetation. This is so because majority of the residents of Sokoni ward have not used most of the bare space on their plots for green open spaces, most likely due to lack of knowledge of the importance of these urban green open spaces.

Plate 6: Green Frontage with Open Drainage

Source: Author, 2020

Use of the Plot Frontage Strip

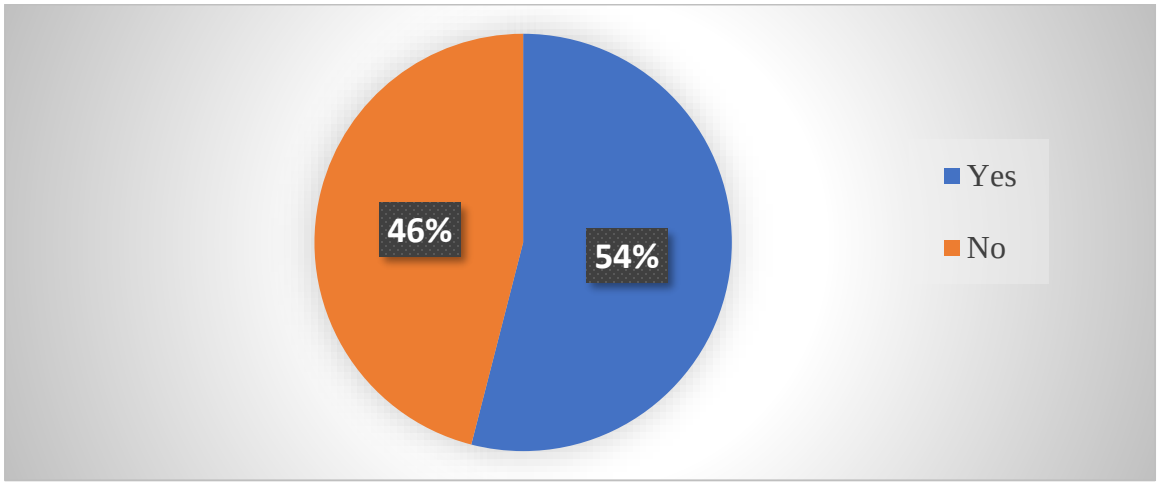
Figure 42: Use of the Plot Frontage for Parking



Source: Author, 2020

As illustrated in the figure above, 47% of residents in Sokoni Ward use their plot frontage area for parking while 53% do not use the space for parking. This is so because around 53% of the residents of Sokoni Ward do not have motor vehicles like cars and bikes to park on their homestead. Therefore, such households have more space for other uses compared to those households who have dedicated their frontage strips to parking.

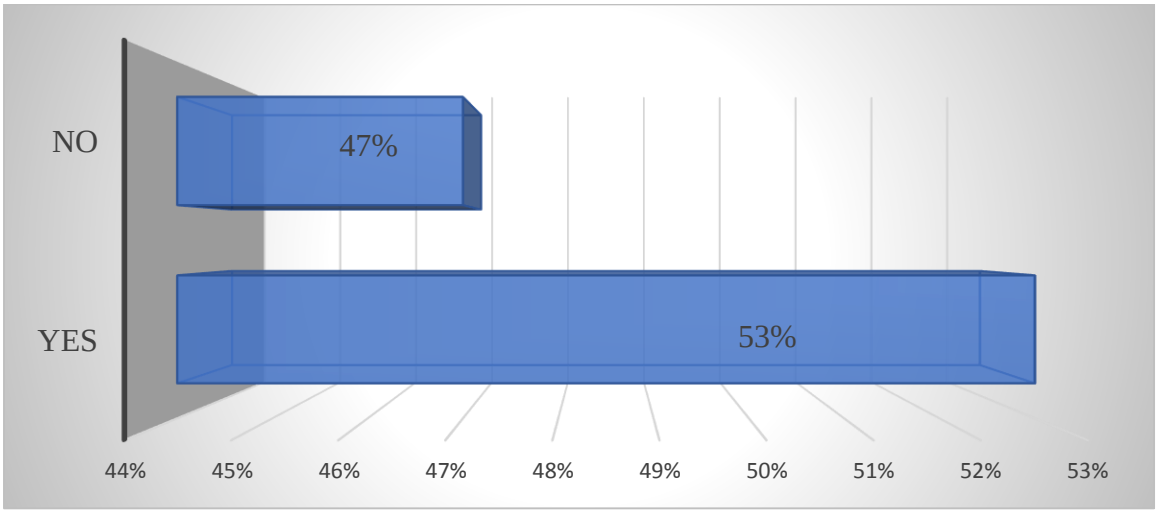
Figure 43: Use of the Plot Frontage for Walking



Source: Author, 2020

As illustrated in the figure above, 54% of Sokoni Ward residents use the area not covered by buildings on their plots for walking while 46% do not use the space for walking. This scenario is so owing to the fact that within Sokoni Ward, the access roads are hardly developed to provide for pedestrian walkways. Therefore, most of the households and passers-by end up using the frontage strips as walkways.

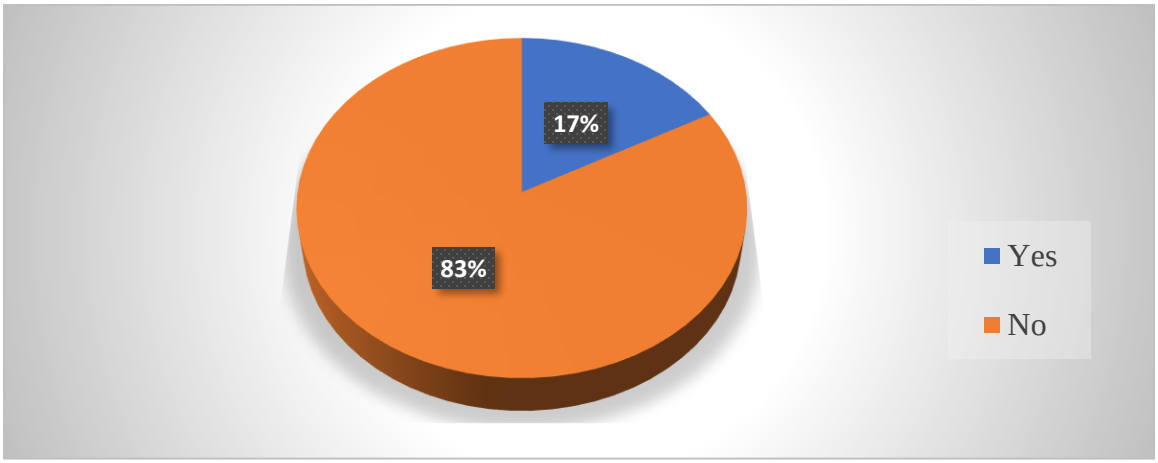
Figure 44: Use of the Plot Frontage by Children to Play



Source: Author, 2020

The bar graph above shows that 53% of the residents of Sokoni Ward use the plot frontage area for children to play while 47% do not use the frontage for children to play. This implies that majority of the residents of Sokoni ward do not have enough space within their plots for children to use as playgrounds, therefore they end up using the frontage strips for this purpose. This scenario is so owing to the development of land without full consideration of various functions of land within the plots.

Figure 45: Use of the Plot Frontage for Growing Green Vegetation

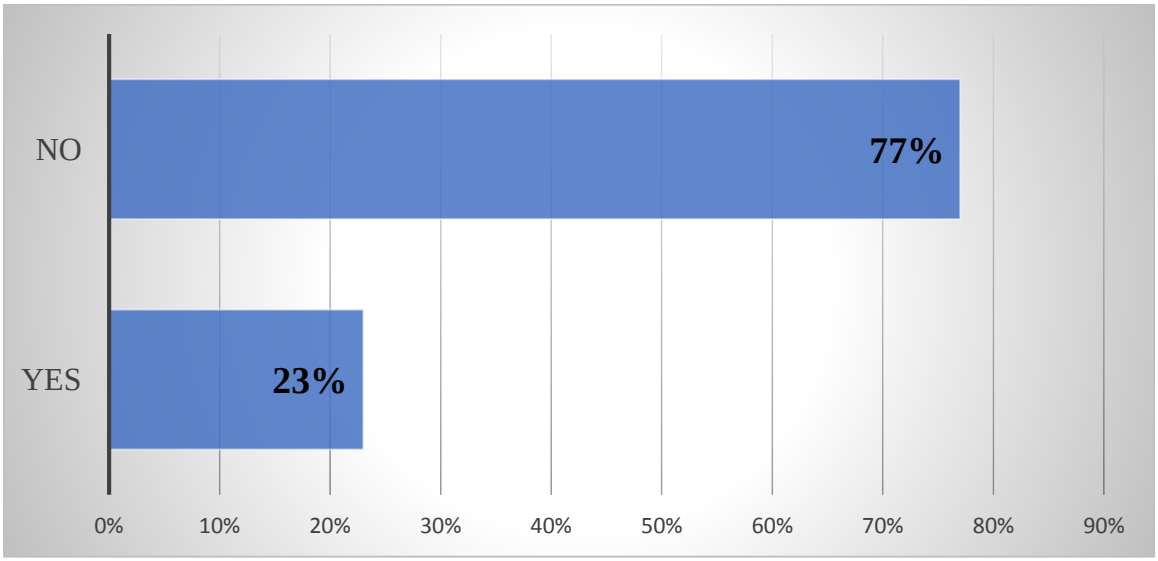


Source: Author, 2020

The figure above shows that 17% of the residents of Sokoni Ward use the area plot frontage area for growing trees, shrubs and grass, while 83% do not use the area for these reasons. This illustrates that only a minority of the residents in Sokoni ward have put the space on the plot frontage under uses that would be considered green uses. Such a scenario is so owing to the fact that majority of the residents of Sokoni ward have not understood the essence of urban green open spaces even at the plot level, indicating the need to sensitize the community on urban green open spaces and their essence.

From the discussion above, it is evident that there is very little of lack of sensitization on the importance of having vegetation cover and trees around the homestead. This scenario again shows that there is lack of awareness among the residents of Sokoni ward on the importance of vegetation and trees on their plots. It is therefore failure on the part of the institutions (the County government of Kilifi, community groups, environmental groups) tasked with the responsibility of sensitizing the community on this issue.

Figure 46: Use of the Plot Frontage for Drainage

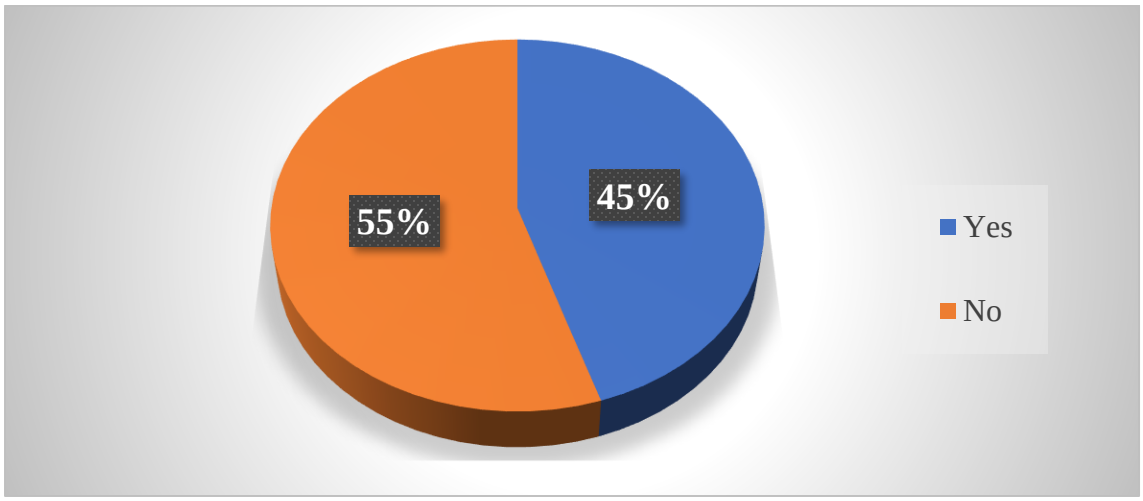


Source: Author, 2020

According to the figure above, 77% of the residents of Sokoni Ward use the space on the plot frontage for drainage whereas 23% do not use this space for drainage. This is so owing to the fact that about 77% of the residents of Sokoni Ward have not designated space for

drainage systems within their plots. In general, the drainage within Sokoni Ward is wanting especially at the plot level.

Figure 47: Use the Plot Frontage for Resting



Source: Author,2020

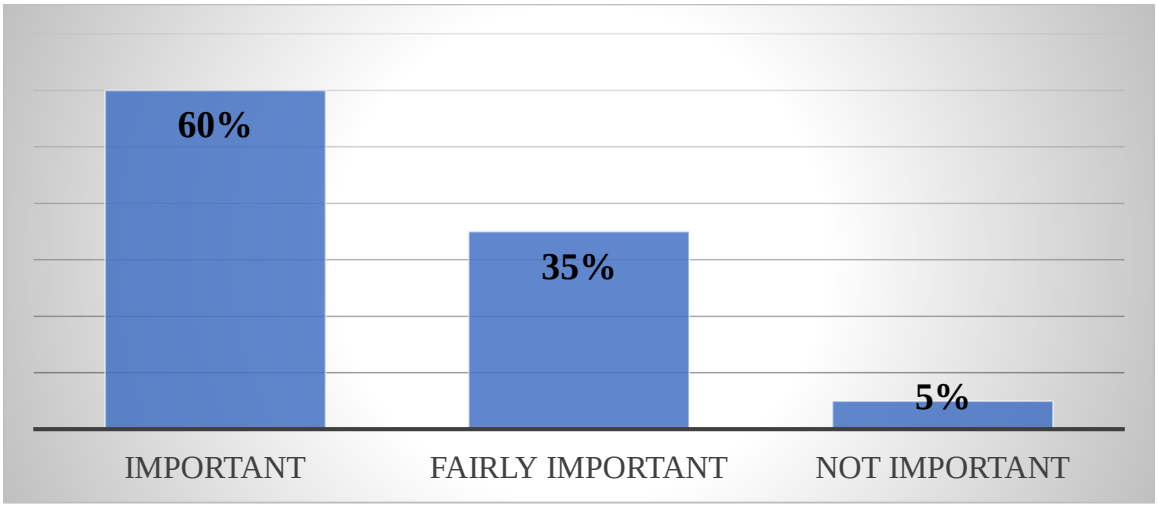
As illustrated in the figure above, 55% of Sokoni Ward residents use the area not covered by buildings on their plots for resting while 46% do not use the space for resting. A place within the plot where people can take a rest needs to be comfortable and clean. Therefore, the fact that around 55% of the residents of Sokoni ward do not use the frontage strip for resting means that these frontage strips are not in conditions good enough to accommodate those who want to rest.

5.10 Importance of the Environmental Factors and Provision of Access to Facilities

5.10.1 Appearance

60% of the respondents consider appearance to be important when it comes to urban green open spaces while 35% consider it to be fairly important. Another 5% consider appearance not to be important when it comes to urban green pen spaces. Majority of the people in Sokoni Ward consider aesthetics to be important when it comes to urban green open spaces.

Figure 48: Importance of Appearance With Regard to Urban Green Open Spaces

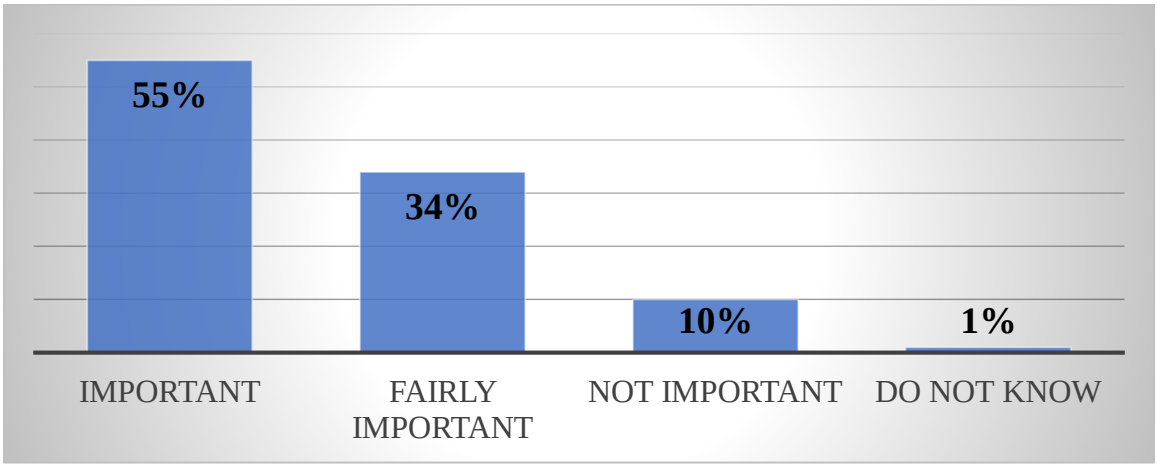


Source: Author, 2020

5.10.2 Distance

From the field survey, 55% of the respondents consider distance to be important when it comes to visiting green open spaces while 34% consider it fairly important. 10% consider distance not an important factor when it comes to access to urban green open spaces and 1% do not know whether distance is importance with reference to urban green open spaces.

Figure 49: Importance of Distance with Regard to Urban Green Open Spaces

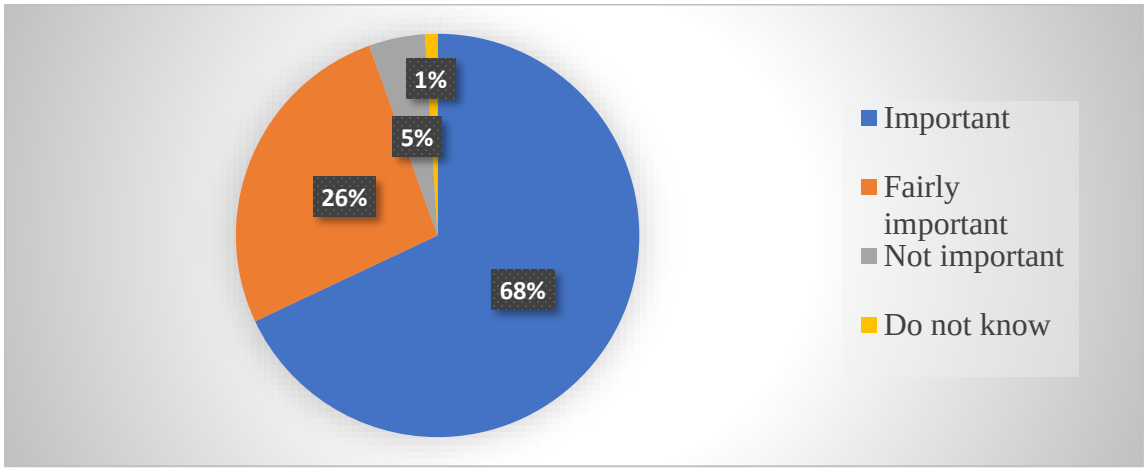


Source: Author, 2020

5.10.3 Cleanliness

68% of Sokoni Ward residents consider cleanliness important when it comes to green open spaces while 26% consider it fairly important and 5% consider cleanliness unimportant. The remaining 1% said that they do not know whether cleanliness is important or not with reference to urban green open spaces.

Figure 50: Importance of Cleanliness with Regard to Urban Green Open Spaces



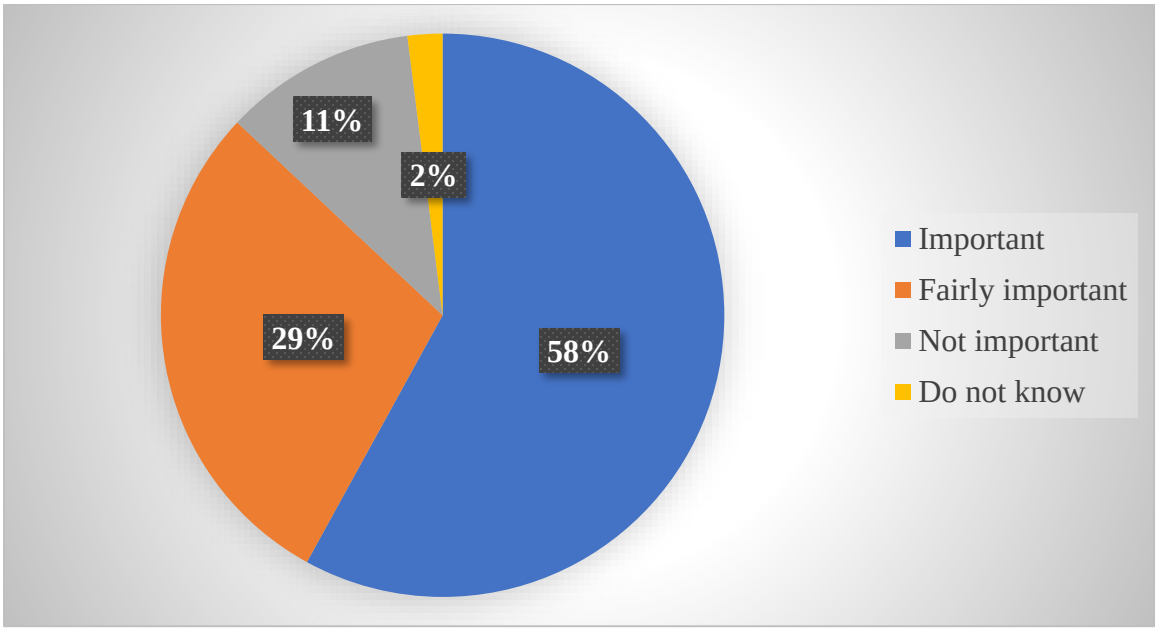
Source: Author, 2020

5.11 Provision of Access to Amenities/Facilities

5.11.1 Access to Sports Facilities

58% of the respondents consider provision of access to sports facilities important with regards to urban green open spaces while 29% consider it fairly important.

Figure 51: Importance of Provision of Access to Sports Facilities with Regard to Urban Green Open Spaces

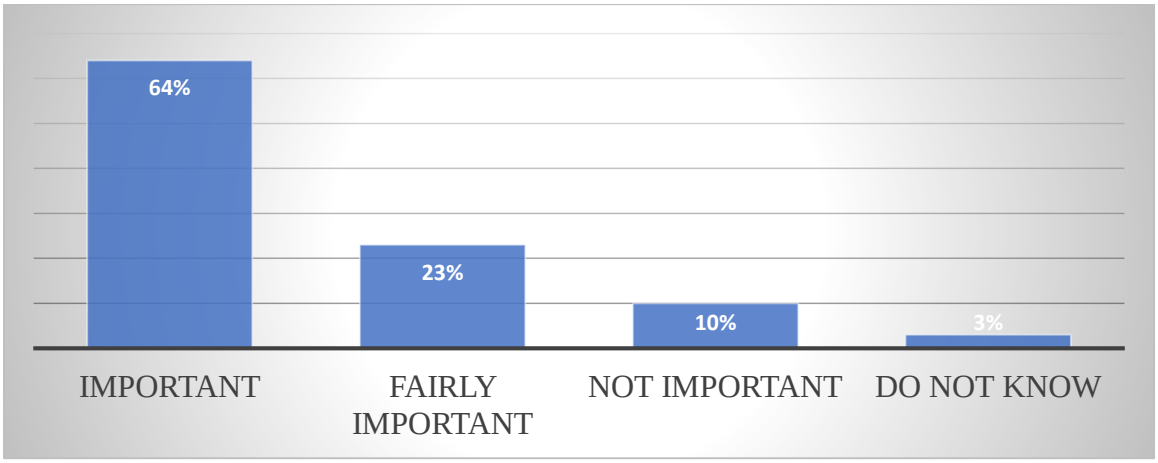


Source: Author, 2020

5.11.2 Provision of Access to Playgrounds

As shown on the figure above, 64% of the residents of Sokoni ward consider the provision for access to playgrounds important while 23% consider the same to be fairly important. Another 10% consider this not to be important while the remaining 3% do not know whether it is important, fairly important or not important.

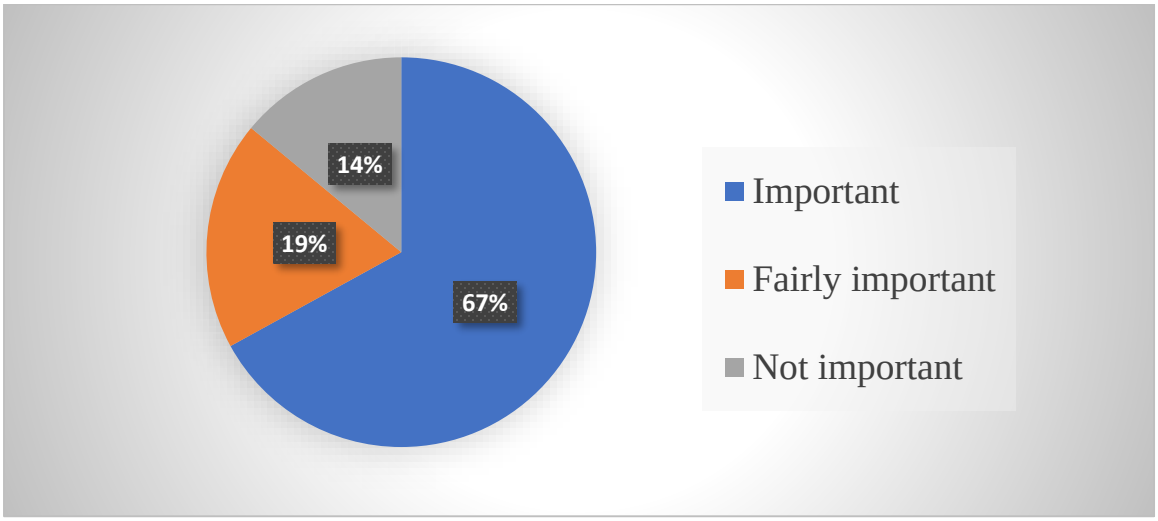
Figure 52: Importance of Provision of Access to Playgrounds with Regard to Urban Green Open Spaces



Source: Author, 2020

5.11.3 Provision for Access to Shops

Figure 53: Importance of Provision for Access to Shops with Regard to Urban Green Open Spaces



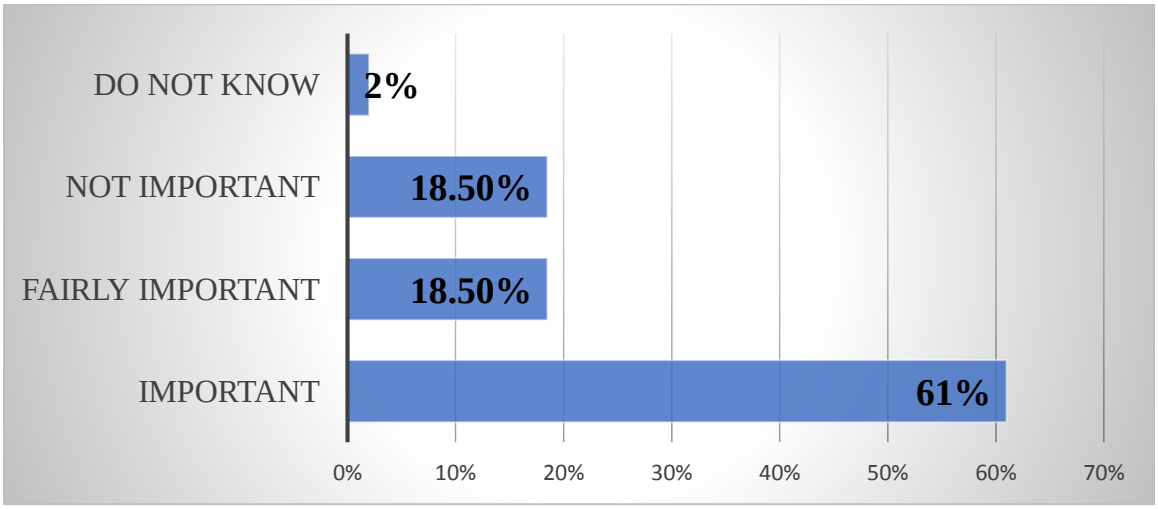
Source: Author, 2020

According to the pie chart above, 67% of the residents of Sokoni Ward consider the provision for access to shops important while 19% consider the same to be fairly important. The remaining 14% consider this not to be important at all.

5.11.4 Provision of Access to Public Toilet

As seen in the bar graph below, 61% of the residents of Sokoni Ward consider the provision for access to public toilets important while 18.5% consider the same to be fairly important. Another 18.5% consider this not to be important at all while the remaining 2% do not know whether it is important, fairly important or not important.

Figure 54: Importance of Provision of Access to Public Toilet with Regard to Urban Green Open Spaces

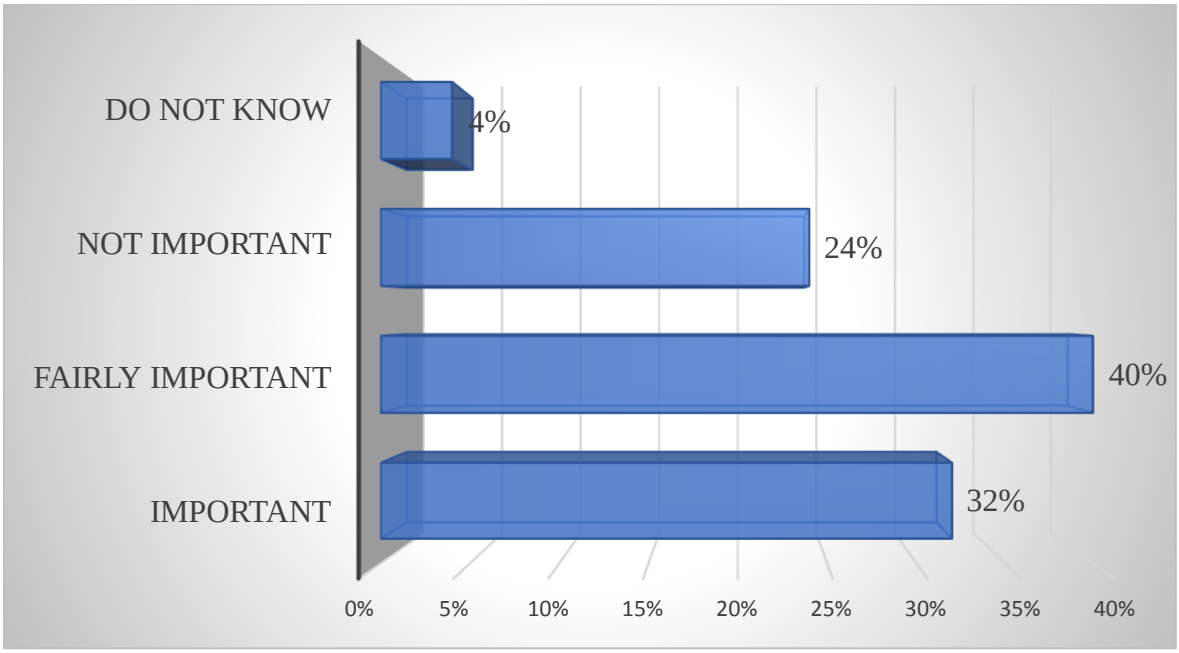


Source: Author, 2020

5.11.5 Provision of Access to Places to Walk the Dog

The bar graph shows the importance of provision of access to places to walk the dog with regard to urban green open spaces for the people of Sokoni ward. 32% of the respondents consider this to be an important aspect while 40% deem it fairly important. Another 24% consider this not to be important and the remaining 4% consider it not important.

Figure 55: Importance of Provision of access to places to walk the dog with regard to urban green open spaces

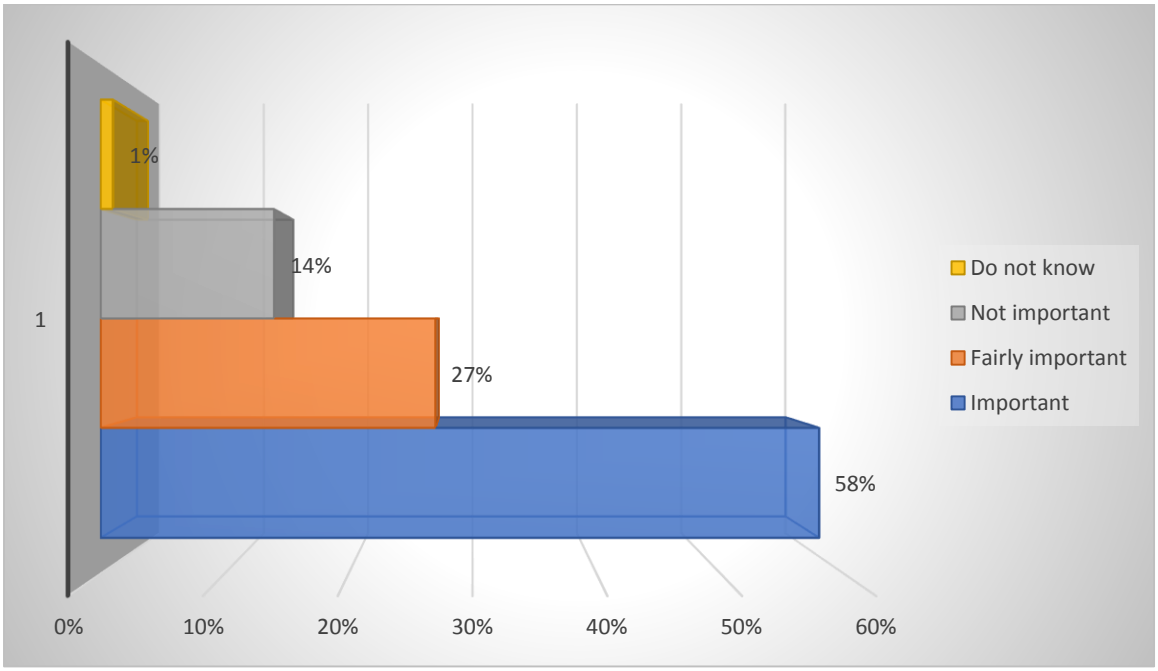


Source: Author, 2020

5.11.6 Provision of Access to Car Park

The bar graph shows the importance of provision of access to car parks with regard to urban green open spaces for the people of Sokoni ward. 58% of the respondents consider this to be an important aspect while 27% deem it fairly important. Another 14% consider this not to be important and the remaining 1% consider it not important.

Figure 56: Provision of Access to Car Park

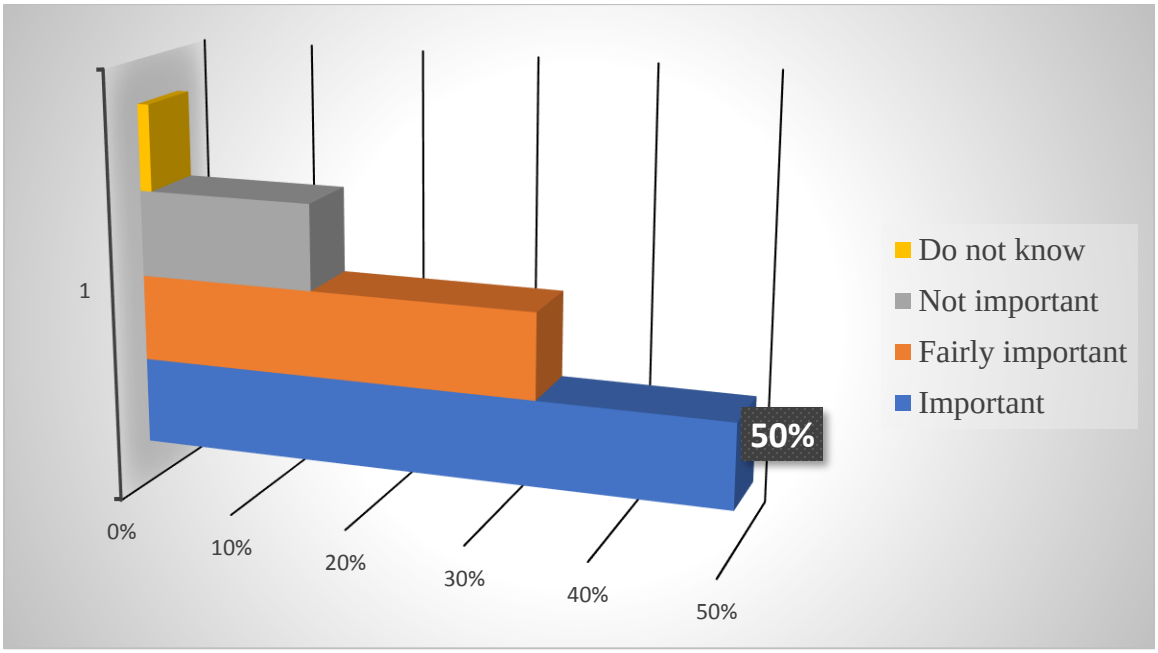


Source: Author, 2020

5.11.7 Provision of Access to Bike Park

The figure below shows the importance of provision of access to bike parks with regard to urban green open spaces for the people of Sokoni ward. 50% of the respondents consider this to be an important aspect while 34% deem it fairly important. Another 15% consider this not to be important and the remaining 1% consider it not important.

Figure 57: Importance of Provision of Access to Bike Park with Regard to Urban Green Open Spaces

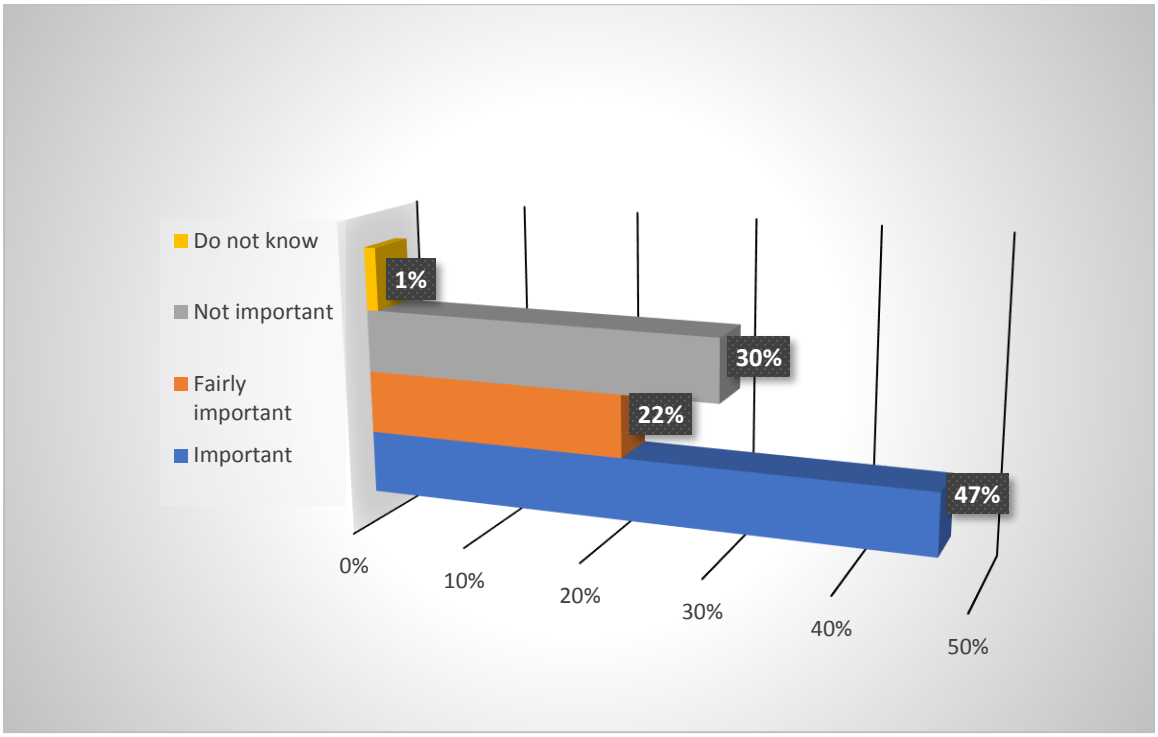


Source: Author, 2020

5.11.8 Provision of Access to Public Transport

The figure below shows the importance of provision of access to public transport with regard to urban green open spaces for the people of Sokoni ward. 50% of the respondents consider this to be an important aspect while 34% deem it fairly important. Another 15% consider this not to be important and the remaining 1% consider it not important.

Figure 58: Importance of Provision of Access to Public Transport with Regard to Urban Green Open Spaces



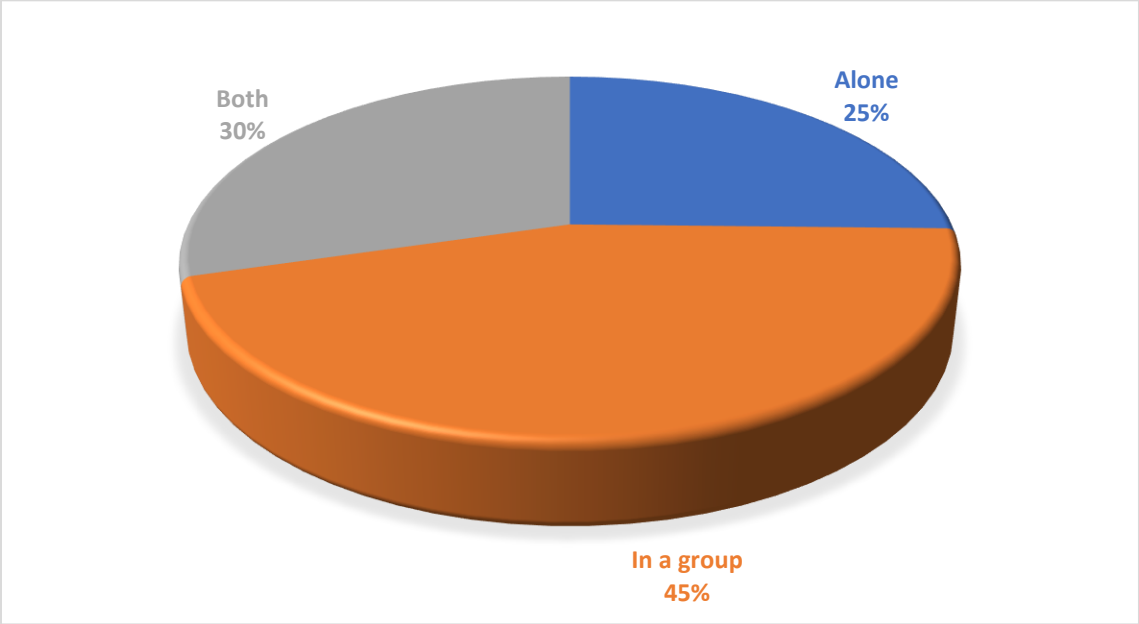
Source: Author, 2020

Urban green open spaces play an important role when it comes to sustainable development. Developments of urban green open spaces need to consider interdisciplinary and integrative approaches such as economic, political, social, cultural, management and planning aspects to improve existing urban green spaces' facilities and services, and to optimize urban green open space policies. This section inspects the sustainable management of urban green open spaces in Sokoni ward from social, economic, physical and environmental aspect.

5.12 Sociability Aspect

Sociability-Involves creating open spaces where the social life of the residents can be enriched and enhanced. There should be a range of facilities for all in proximity to attract different persons in terms of age, income levels, cultures, and races.

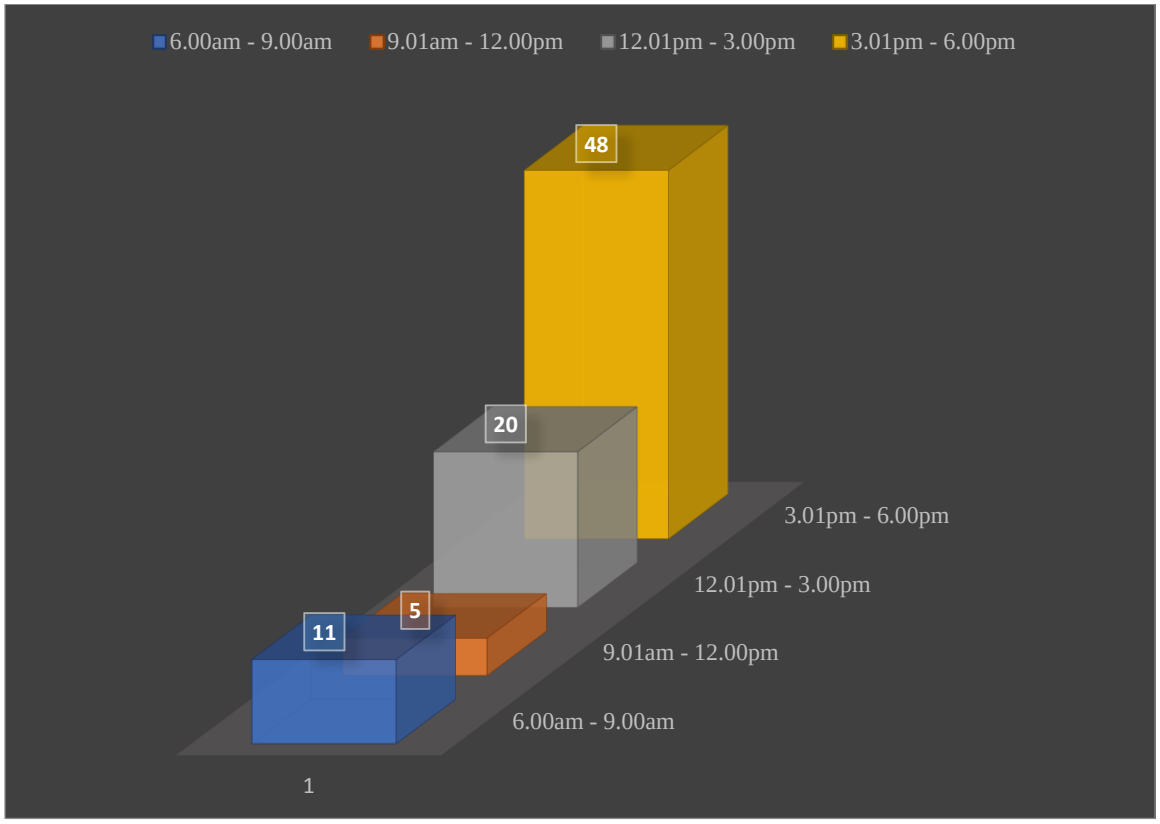
Figure 59: Sociability Aspect



Source: Author, 2020.

The respondents were asked if they visited the open spaces alone, with other people, or on both instance and what time, this was to cross check the principle of universal accessibility within Sokoni Ward. The figure above shows that approximately 25 % of Sokoni Ward residents visit open spaces alone, 30% both (alone and in a group) and 45% of the residents visit open spaces in groups. This indicates that majority (45%) of Sokoni ward residents prefer to visit an open space with other people. Therefore, it is important to manage this urban green open spaces sustainably by providing and equipping them with all the necessary amenities. This is to make them conducive for meeting, play, relax and usable environment for other sets of visitations.

Figure 60: Preferred Time to Visit Urban Green Open Spaces



Source: Author, 2020.

Additionally, the respondents were asked what time and why they preferred to visit nearby/preferred Urban Green Open Spaces. Figure 2 above shows that 5% of the Sokoni ward residents preferred to visit Urban Green Open Spaces from 9.00am to 12.00am, 11% of the residents preferred 6.00am to 9.00 am, 20% of the residents preferred 12.00pm to 3.00pm while 48% of the residents preferred 3.00pm to 6.00pm. The main reason as to why Sokoni ward residents preferred to visit Urban Green Open Spaces at 3.00pm to 6.00 and on weekends is that, it's like a norm, this is the main time (known by Kilifi residents) you will meet people while enjoying fresh air and watch beach games.

Plate 7: Access Road

Source: Author, 2020.

The study sought to ascertain whether the urban green open spaces and its amenities are safe. From the discussion above on preferred time to visit urban green open spaces, where majority picked 3.00pm to 6.00pm, demands for supporting infrastructure provision i.e., streetlights and pedestrian walkways. The figure above shows the condition of access road serving Baobab beach among other urban green open spaces. This observation concedes with information acquired from area Chief, to put up streetlights to enhance security within the area.

The analysis above infers that there is the need for security provision, inclusion of pedestrians' walkways and proper maintenance of the urban green open spaces and all that contained therein. Provision of facilities such as siting ground covers, and resting areas are important for elderly residents and those enjoying the surrounding and taking a walk.

5.13 Economic Aspect

The presence of high-quality public spaces has a significant impact on the economic life of urban centres. As towns and cities increasingly compete with one another to attract investment, the presence of good parks, squares, gardens, streets and other public spaces become an important marketing tool and a vital economic lever to first attract and then

retain new businesses. **Employment Opportunities-** urban green open spaces create employment, directly and indirectly, by involving local people to carter to the needs of tourist. Local people work as guides and vendors at tourist spots, providing food and transit facilities to the travellers. The image below shows bodaboda operators waiting for travellers from Baobab beach. Wages and salaries received from tourists creates secondary economic effects in the area. This calls for a development plan for Sokoni ward to avoid future land conflict.

Plate 8: Bodaboda Shade

Source: Author, 2020.

Tourism. – Kilifi County rely on tourism to provide a substantial part of their annual revenue. The public parks and green space in, or immediately around the town contribute to its attractiveness as a tourist destination. Whilst the green space may not always be the primary attraction, they are the most visible; any significant decline in quantity, or quality, will quickly have a detrimental effect on visitor numbers.

According to the information acquired from the area Chief, Urban Green Open Spaces within Sokoni ward can be self-sustaining. Area Chief Officer suggested that, the concerned bodies should allow youth groups to put up swimming pools or any other income generating activities which will not interfere with the Urban Green Open Spaces

functionality on the available urban green open spaces and use the generated income to buy more Urban Open Green Spaces and equipping them.

From the NEMA Environmental Officer there is relaxation on the part of the county in provision of amenities in the urban green open spaces citing that the county government has no clear-cut budget allocated to it. This has led to programmes geared toward the conservation and restoration of these spaces for example Kazi Mtaani which is involved in beautification and conservation around Mazingira. The locals are also involved in cleaning exercises around the urban green open spaces. There are various strengths and weaknesses of urban green open spaces in Sokoni ward.

The first strength is the employment potential for the residents of Sokoni ward within the green open spaces when managed sustainably. The hawkers and other small traders who would like to conduct their businesses within these spaces stand a chance to win when effective interventions are taken by the relevant stakeholders.

5.14 Physical and Environmental Aspect

Urban green open spaces provide several benefits to the general environment from: - Landscape creation; habitat creation; enhancing wildlife corridors; and helping to manage carbon emissions and to manage the effects of climate change, including providing space for surface water management; micro-climate management (for example providing cool spaces in built up urban areas); and carbon sequestration.

The average number of people visiting each of the designated urban green open spaces is about 100 people per day. From the NEMA Environmental Officer, there is basic eco-literacy/bio literacy among the residents. These sensitization days held on: World Environment Day, World Wetlands Day, and World Day to Combat Desertification and Drought, National Tree Planting Day and during National Holidays.

For effective sustainable management of urban green open spaces all stakeholders should be involved. These stakeholders include:

a) Kenya Forest Services

b) Kenya Wildlife Services

c) Private Sector for example Ocean Sole, Watamu Marine Association

d) County Government of Kilifi which provides tree nurseries and seedlings

e) Education Institutions mainly done through the environment clubs in primary and secondary schools. Pwani University is also a major stakeholder since it provides expert advice in environmental issues.

f) Water Resource Authority

g) Community Based Organisations for example Eco –Word which consists of residents of Fiboni, Friends of Bofa which fights against encroachment of urban green open spaces.

To ensure sustainable management of green infrastructure the following measures should be taken: Tough enforcement actions through arresting of law breakers, enforcement of policies by bodies that are mandated to protect open spaces and regulating development especially from the construction industry.

Other observed important data is naturalness which defines the general environment and also a principle of urban green open spaces.

Figure 61: Human-Made Elements

Source: Google Earth, 2020(Modified by Author)

Borrowing from (Harting , 1993; Kaplan & Kaplan, 1989; Schroeder, 1987). Naturalness is related to human-made elements, naturalness increases as the human-made elements decrease. Plants and the continuity in topography strengthen the naturalness. In contrast, Sokoni ward is experiencing increase in human-made element leading to decrease in natural environment. This is a threat to existence of Urban Green Open Spaces within Sokoni Ward. Kilifi County gets a substantial part of their annual revenue from tourism and decrease in natural environment will have a detrimental effect on general economy. The analysis infers the lack of inclusion of urban green open spaces/mismanaged urban green open spaces. Therefore, there is need for proper management and maintenance of urban green open spaces.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Overview

This study examined planning issues that could inform protecting of urban green open spaces. This chapter therefore provides concrete recommendations on possible ways the planning issues identified can be solved in a sustainable way. The main theme of this study was to enhance protection and sustainable management of urban green open spaces and therefore recommendations will be geared toward achieving that theme. This chapter will also give conclusion of the study and areas of further research.

6.1 Conclusion

Provision of public open spaces in Kilifi is threatened by a rapid rate of urbanisation against the weak capacity of county authorities to cope with the growth. Little effort has been made to conserve the existing public open spaces, never mind create new ones. Public open spaces, which were meant to serve 430,000 people in 1979, are now serving 1.45 million, exemplifying the serious shortage of green open spaces in Kilifi County. Furthermore, illegal alienation of public open spaces by both the state and members of the general public have made matters worse. The political leadership with the active engagement of technocrats have presided over the illegal alienation of public open spaces for private use.

Therefore, we conclude that various institutions who bear the responsibility of overseeing the protection of urban green open spaces have neglected their respective responsibilities within Sokoni Ward. It is partly out of this that the urban green open spaces in Sokoni Ward are not being managed sustainably thus the current situation. These institutions include Kilifi County Government, the National Land Commission, the National Environmental Management Authority of Kenya, the United Nations Environmental Program, the local community in Sokoni Ward, Environmental Activist Groups and various Community Groups within Sokoni Ward. There is a financial gap when it comes to the management of urban green open spaces, budgets that are not allocated for urban

green open spaces. Legal regulations and processes that are not comprehensive enough, others that are not enforced and new ones that need to be adopted.

Recommendations and interventions should be formulated to address the planning problems of managing and protecting urban green open spaces and particularly in Sokoni Ward, Kilifi County. Such recommendations should therefore ensure effective and sustainable utilization, management and protection of urban green open spaces. Implementation of such recommendations should change the negative perception of users about urban green open spaces. It should provide adequate space for urban green open spaces, enhance aesthetic, and address the current need and the future needs of urban green open spaces, secure and sustainable green open spaces that would attract all age groups. They should also ensure protection and conservation of natural environment that is under threat of being encroached by built environment. It is through such approach that Sokoni Ward residents can enjoy the benefits of urban green open spaces.

6.2 Recommendations.

6.2.1 Institutional Recommendations

a) Kilifi County Government

The Kilifi County Government as an institution has the responsibility to designate the urban green open spaces, oversee their management and enforce laws and regulations governing the use and management of the same. Therefore, Kilifi County Government is expected to carry out its duties and responsibilities regarding urban green open spaces and other supporting infrastructure appropriately in order to achieve the desired results.

Kilifi County Government should initiate programs for creating awareness on importance of urban green open spaces, also on existing regulations and guidelines regarding the use of land for the Sokoni ward community since only 84% of the respondents were aware of any existing urban green open spaces.

Kilifi County through the Department of Lands, Energy, Housing and Urban Development should deal with regularization of property, approval of buildings, urban renewal and

regeneration of old housing. It should also deal with rating and valuation, property management, forward planning, development control, urban design, land survey, enforcement and management.

Kilifi County through the Department of Finance and Economic Planning should have a clear-cut budget on the sustainable management and protection of urban green open spaces. This is because the department is responsible for revenue mobilization. This would solve problem of budget allocation since funding from the county is meant for recreation purposes.

Kilifi County through the Department of Gender, Culture, Social Services and Sports, directorate of sport, should be consultant of sports that involve these green open spaces. The department should give guideline on sporting events on the open spaces and also be involved in protection of these spaces. For example, skating activities on the road reserves and open spaces.

Kilifi County through the Department Health Services should be involved in the protection and management of urban green open spaces. This is because these open spaces play a vital role in promoting of good health habit in the county. People satisfy most of their recreational needs within the locality where they live. Urban green spaces serve as a near resource for relaxation; provide emotional warmth.

Kilifi County Government has a big role to play and should be encouraged to develop tools and mechanisms for effectively identifying public spaces and ensuring proper management and use of the spaces. Kilifi County Government should lead the way in regard through their partnership with UN-Habitat to see the development of Kilifi Open Public Spaces Inventory that will be validated by stakeholders. The inventory should lay proper ground for developing strategies aimed at reclaiming, protecting and managing public spaces in Kilifi. Public spaces have a direct bearing on our economic, environmental, health and social wellbeing and every responsible citizen should take an interest in protection and management of the spaces.

b) National Land Commission & Ministry of Lands and Physical Planning

Established under **Article 67(1)** of the Constitution of Kenya, 2010, National Land Commission is responsible for managing public land on behalf of national and county governments. The commission has a mandate to recommend national land policy to the national government as well as advising the national government on a comprehensive programme for registration of land title throughout the country. The National Land Commission and Kilifi County Governments Department of Lands and Physical Planning need to work together and develop urban green space zoning, planning and design framework to guide in the allocation, planning, design and development of public land at the national and county levels. The findings that one of the challenges that Sokoni Ward faces regarding public space management, County lack framework for the identification, allocation, planning and design of green open spaces as explained by County Physical Planner.

The National Land Commission has the responsibility under Article **67(2) of COK 2010** to manage to initiate investigations, on its own initiative; or on a complaint, into present or historical land injustices, and recommend appropriate redress regarding illegally acquired open spaces and return them to the public.

Therefore, the National Land Commission should also improve on the enforcement and managerial duties as regards the sustainable management of urban green open spaces. Tough enforcement actions through arresting of law breakers, enforcement of policies by bodies that are mandated to protect open spaces and regulating development especially from the construction industry should be enforced. The Ministry of Lands and Physical Planning acting in conjunction with National Land Commission should be in forefront in cancellation of illegally acquired title deeds affecting title deeds.

c) The Local Community and Schools

The Local Community within Sokoni Ward should help in the sustainable management and protection of urban green open spaces. From the field study, the County Physical Planner stated that there has been illegal allocation and occupation of land allocated to

urban green open spaces. To reduce this the local community should abide by the existing regulations and guidelines on occupation of land allocated for urban green open spaces. The community should seek to use the existing urban green open spaces in more sustainable ways so as to achieve the desired state for the urban green open spaces.

Grabbing of children's playground and other spaces meant for social amenities is common place in most neighbourhoods. It is becoming increasingly common to walk into an estate and find children risking their lives by playing on the estate roads because there are no open playing spaces for them. What is more disheartening is that there are Government officers who are colluding with unscrupulous developers to circumvent laws and policies that are meant to protect such public spaces. Poor planning, corruption, non-enforcement of laws and uncoordinated constructions have all contributed to interference and misuse of urban green open spaces.

The Educational Ministry with stakeholders should craft greening strategy for Schools within Sokoni ward. The strategy should be through formation of environmental clubs to initiate tree and orchards planting days and Clean-up in their playgrounds. From Observation made during the study there are Nine (9) Schools with various land sizes raging in from 0.1 Ha which should be used for agroforestry.

d) Environmental Activist Groups

Environmental Activist Groups, both from within Kilifi County and even outside should engage in activities and programs that help increase awareness on the importance of urban green open spaces and environmental conservation in general. From the field study, from the NEMA Environmental Officer, there is basic eco-literacy/bio literacy among the residents. These sensitization days held on: World Environment Day, World Wetlands Day, and World Day to Combat Desertification and Drought, National Tree Planting Day and during National Holidays. This will help improve the appreciation for the urban green open spaces in Sokoni Ward and indeed overly improve on the protection of urban green open spaces in Sokoni Ward.

e) United Nations Environmental Program

UNEP is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. UNEP's mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations. From the field study, UNEP environmental programs are not implemented due to lack of awareness by the residents of Sokoni Ward.

UNEP is tasked with the responsibility to monitor the environmental aspects as regards urban green open spaces, creating awareness on environmental issues, and providing environmental capacity building and technological support. UNEP therefore should embrace programs that are outreaching to help create awareness within Sokoni Ward on environmental protection and promotion of activities that encourage improvement of the environment in Sokoni Ward.

It is comforting to note that the world has recognized the importance of public spaces and their impact on urban development. Sustainable Development Goal number 11, target 7 specifically highlights provision of universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities by 2030. Additionally, United Nations drew attention to the challenges and issues around public spaces by choosing the motto for last year's World Habitat Day to be *Public Spaces for All.* Several activities were carried out aimed at creating awareness and rallying support for the protection and proper use of public spaces.

6.2.2 Legal Recommendations

The National Land Commission and The County Govt Department of Lands and Physical Planning need to work together and develop urban green space zoning, planning and design framework to guide in the allocation, planning, design and development of public land at the national and county levels. It emerges from the findings that one of the challenges that

Sokoni Ward faces regarding public space management is lack of a framework for the identification, allocation, planning and design of public spaces. Such a framework would reconnect the concerned institutions as well as the public with urban open spaces.' It emerges from the findings that a majority of the respondents (76%) are disconnected from the environment due to encroachment and poor planning. This however seems to be a challenge in most Kenyan towns have established low utility of green urban spaces, for example established that in town there was little urban public space due to encroachment and this discouraged people from utilizing such spaces in the town. An urban green space zoning, planning and design framework would not only prevent encroachment but also enhance the management of such spaces. Legislation enhances protection, vitality and utility and ensures good management of public spaces.

The following legal recommendation will help improve management, sustainability and protection of urban green open spaces within Sokoni Ward:

1. Develop urban planning and design policy in Kilifi County that allocate land to a network of public spaces and that guard against encroachment by private interests. From the field study, Kilifi Local Physical Development Plan approved in 1979 shows 11 sites were allocated to open spaces. Further observation on the Google Earth satellite map shows only three exist on the ground as per proposed land use. The implementation of this will help establish county urban planning and land zoning frameworks that clearly distinguish public spaces from buildable land. This will support development of territorial planning instruments to improve management, maintenance and protection of urban green open spaces in Sokoni Ward, Kilifi County.

   Professional ethics is a fundamental requirement of curbing illegal land allocation which is sited as the main danger facing urban green open spaces. Different professions play important roles when it comes to land development. Urban and regional planners and land surveyors are assigned to guide the general public on how to do land transactions, but according to Area chief officer this is not happening instead public open spaces are illegally allocated to the well-off individuals or even political allies. It is highly recommended that strict penalties should be introduced (revocation of licence)

to any professional-stakeholder aiding in any form of unhealthy land transactions by their respective professional boards i.e. Kenya Institute of Planners and Land Surveyors Board. Maintaining professional ethics must be consistent with the principles of correct moral conduct constantly.

2. Set up cross-sector / transdisciplinary and multilevel coordination framework among departments and different levels of government respectively to ensure coherence in urban green open space management and protection. From the field study, the legal, financial and institutional framework should work together in order to prevent shortcomings being experienced in Sokoni Ward. Kilifi County can work with other sectors to develop coordinated and sustained action to protect urban green open spaces while leveraging the resources, knowledge and expertise of the private and non-profit sectors. Kilifi County Government should develop green open space creation, management and protection frameworks based on unique strengths and expertise and maximize communication and interaction among them. These unique strengths should be based on the on how people use urban green open spaces and views from all stakeholders involved.

   Urban green open spaces are shared widely among different sectors i.e. KURA, KPLC. These challenges require developing capacity to work collaboratively to enhance.

   - **Increased scale** – Successful partnerships leverage combined resources to reach more people and amplify impact and results.
   - **Improved effectiveness** – Shared expertise and knowledge can spark innovation and unlock new opportunities and networks to assist.
   - **Better efficiency** – Coordination improves alignment and accelerates success while reducing individual funding commitments.

   Effective cross-sector should encompass all land developing boards, the public, private and social sectors collaborate in different ways (e.g. financially, operationally,), working towards common societal objectives and outcomes.

3. Define urban green open spaces and uses in accordance to national urban growth and development projections. Kilifi County should ensure the provision of green open spaces will accommodate the growing population in the county. This also includes the proportion between built-up areas and provision of green open spaces. The provision and accessibility of these green open spaces should match with the population e.g., 2 hectares per 1000 population.

   This will go in hand with adoption of an urban green open space *Inventory and Assessment Tool* created by UN Habitat. By applying this tool, cities are able to understand the state of their public spaces, specifically the network, distribution, accessibility, quantity and quality of green open spaces. This guide sets out the "hooks" that will support the development of a comprehensive evidence-based public space strategy or policy building on the results of the assessment. Kilifi County government and partners are therefore encouraged to apply this guide tool fully or in par.

4. Develop inter-ministerial framework policy to secure stakeholders' participation and development of urban green open space strategies and adopt participatory green open space planning and design practices. Kilifi County government should involve all stakeholders in the management and protection of green open spaces. The various stakeholders include: the citizens, public sector, private sector, national government and other county governments.

6.2.3 Financial Recommendations

a) County Government

The County Assembly plays a fundamental role when it comes to protection and management of urban green open spaces. The County Assembly receives and approve plans and policies for the management and exploitation of the county's resources as well as for the development and management of its infrastructure and institutions and allocate funds for the same. A given percentage of the county budget not less than 1%(up to 200 million) should be allocated toward the protection and management of urban green open spaces. The fundamental reasons be hide this is in 1979 the population was approx. 430,000

and designated for public open space Land-use (Land Budget) was 11 sites totaling to 16.1 Ha this translates to 26,708 persons per Ha. With projected population in 2025 at 1,642,408 persons representing 102,012 persons per Ha. The National standard per Physical Planning Handbook is 1 hectare per 10,000 of population.

The study findings revealed that there is slackening on the part of the County Government in provision of finances and amenities in the urban green open spaces citing that the county government has no clear-cut budget allocated to it. The strategy recommended is to have Kilifi County government prepare development plans incorporating urban green open spaces and sharing financial support for the same. Also, Kilifi County government should set aside funds to acquire more urban green open spaces within Sokoni Ward.

b) Multi-sectoral Funding Collaboration

Multi-sectoral funding collaboration has been proposed as a key means by which governmental organisations can work with other sectors to develop coordinated and sustained action to protect urban green open spaces while leveraging the resources, knowledge and expertise of the private and non-profit sectors. Multi-sectoral funding collaboration among decision-making entities like KERRA, KURA, and KENHA among other relevant authorities, as no single ministry or government can achieve targeted goal alone. This arises since from the field study, most of the respondents' experience when using roads in Sokoni Ward was satisfactory which was represented by 47%, this was followed by 37% of the total respondents who found the roads in Sokoni Ward to be bad in nature. This strategy suggests all stakeholders to have a budget for urban green open spaces, for example, KERRA should have a budget set aside to plan and implement non-traditional public spaces such as way leaves.

c) Innovative Funding Mechanisms

Innovative funding mechanism advocates for inclusion of community-based organizations whom will be responsible for cleaning and the general public to come up with innovative ideas like artistic paintings/traditional activities within urban green open spaces. From the field study, the community groups are not allowed to get involved in business activities in

these urban green open spaces. In return, Kilifi County Government to collect revenue from business permits, tax assessments of properties in close proximity, rents, value sharing with motorists, corporate sponsorships, and charging for particular uses like parking and weddings. Hence raising funds for maintenance, management and protection of the existing urban green open spaces.

6.3 Area for Further Studies

This study has only covered aspects as outlined by the topic, however there are other areas which can contribute to the formulation of a more comprehensive policy on urban green open spaces for Sokoni Ward. Future research is required to include all types of urban green open spaces such as town square, public squares, greenways, cemeteries and beaches. Also, re-examination of existing urban space, its environmental poverty and its performance on how well it satisfies man's needs and requirements in all his roles.

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ANNEX 1: RESEARCH INSTRUMENTS

HOUSEHOLD QUESTIONNAIRE

University of Nairobi

School of Built Environment

Department of Urban and Regional Planning

Master of Arts in Urban and Regional Planning

Title: Challenges of Protecting Urban Green Open Spaces.

A Case Study of Sokoni Ward, Kilifi County

Household/ Residents Questionnaire

Declaration: The information obtained will be accorded confidential treatment and will be used for academic purposes only.

Questionnaire

No.……

Name of respondent (Optional)…….....

Name of Interviewer…….……...Place of interview……...

Time of interview……...……. Date of Interview……

Section A: Respondents' details

1. What is your gender? Female ☐ Male ☐
2. What is your age group?

   18-19☐ 20-29☐ 30-39☐ 40-49☐ 50-59☐ 60-74☐ 75 or over☐

3. Highest level of education

None☐ Primary☐ Secondary☐ College☐ University☐

4. What is your current employment status?

   Employed ☐ Unemployed ☐ Retired ☐ Student ☐ Other ☐

5. In which estate do you live in?.....

6. For how long have you lived/worked in the mentioned estate

   Less than 3months☐ 3-12 months☐ 1-2 years☐ 2-5 years☐ 5-10 years☐

   Above 10 years☐

7. What mode of transport is available to you (multiple answers acceptable)?

   Bicycle ☐ Matatu☐ Bus☐ Walking☐ Railway☐ Taxi☐ Tuk Tuk☐

   Motor cycle (boda boda) ☐ Private car☐

8. What is the experience like when using the roads around Sokoni Ward?

   Bad☐ Satisfactory☐ Good☐ Very Good☐

9. What is your annual income? (optional)

   Less than Kshs50, 000☐ Kshs50, 000-70,000☐ Kshs70, 000-150,000☐

   Kshs150, 000-250,000☐ Kshs250, 000-350,000☐ over Kshs350, 000☐

Section B: Block and Street details

1. Are you able to identify common spaces of flora and fauna ? Yes ☐ No☐
2. Do you think that there is currently a disconnection from the environment in our society?

   Yes ☐ No☐

3. Are you aware of any existing urban green open spaces?

   Yes ☐ No☐

4. Do you live (or working) within 300m of green space, park or another natural element?

   Yes ☐ No☐

5. How often do you visit the green space? (Please tick one only)

   Never visit ☐ Once a year ☐ 2 or 3 times a year ☐ Once a month ☐ Once a fortnight ☐

Once a week ☐ Most days ☐ every day ☐

6. What is the purpose(s) of your visit to the green space?

Get some fresh air	☐	Walk the dog	☐
Enjoy flowers/trees	☐	Meet friends	☐
Relax or think	☐	Enjoy family outing	☐
Enjoy the beauty of nature	☐	Eat/drink	☐
See and feed birds/wildlife	☐	Picnic/BBQ	☐
For a walk	☐	Enjoy entertainment	☐
To keep fit	☐	Voluntary activities	☐
To improve health	☐	Guided walk/talk	☐
Use playground	☐	For educational walk	☐
Play sports/games	☐	Take a shortcut to get	☐

7. Please specify what time (i.e., am and/or pm) you normally visit the green space and why you prefer this time……
.....

8. When you visit the green space, where do you usually travel from? (Please tick one box only)

Home ☐ Work ☐ Shops ☐ School ☐ College / University ☐

Other ☐ (elaborate)……

9. How would you normally travel to the green space? (Please tick one box only)

On foot □ Bike □ Motorbike □ Car □ Bus □ Taxi □

Other (elaborate)……

10. Approximately how long does your usual journey take? (Please tick one box only)

Less than 5 minutes☐ 6 - 10 minutes☐ 11 – 15 minutes☐ 16 – 20 minutes☐

21 - 30 minutes☐ 31- 45 minutes ☐ 46-60 minutes ☐ More than 1 hour ☐

11. Ideally, how long would you like your journey to take to your preferred green space?

Less than 5 minutes☐ 6 - 10 minutes☐ 11 – 15 minutes☐ 16 – 20 minutes☐

21 - 30 minutes☐ 31- 45 minutes ☐ 46-60 minutes ☐

12. Do you normally visit the green space alone or in a group? (Please tick one box only)

Alone☐ In a group ☐ Both (equally) ☐

13. When you visit the green space as part of a group, who normally accompanies you? (Please tick as many as appropriate)

Partner☐ Children☐ Other family☐ Friends☐

Team/Club members☐ School group☐ Other☐

(Please write in): ……

14. Including yourself, how many people would normally accompany you when you visit the green space as part of a group? **(**Enter typical numbers for each age group)

Children (aged 0–12) ☐ Teenagers (aged 13–17) ☐ Adults (aged 18–65) ☐

Retired (aged 65+) ☐

15. When do you normally visit the green space?

Weekdays ☐

Weekend ☐

Both ☐

16. Ideally, how close do you want to live to a green space? (Please tick one box only)

100 metres ☐ 400 metres ☐ 700 metres ☐ 1 kilometre ☐

200 metres ☐ 500 metres ☐ 800 metres ☐ 2 kilometres ☐

300 metres ☐ 600 metres ☐ 900 metres ☐ More than 2 kilometres ☐

Do you think that spending time in nature is important?

Yes ☐ No ☐

Why?

17. Why (in your opinion) is it so important to go green and protect the environment?

……
….
……
….
……
….

18. How can the construction industry be influenced to use green infrastructure and natural resources instead of the current working solutions?

……
…….
……
…….

19. What are the most efficient ways to make a building greener and more sustainable?

……
…….
……
…….
……
…….

Section C: Green space details

Open space within the plot

1. What is the total area of the plot in square meters_____?

2. Indicate setback distance in meters. 1.5 [ ] 1.5m [ ] 3m [ ] 4.5m [ ] 6m [ ]

(Setback is the distance between the edge of a building and the plot boundary facing it)

3. a. Area of plot in square meters covered by buildings_____

b. percentage of plot area covered by buildings_____

4. a. Area of plot in square meters not covered by buildings_____

b. percentage of plot area not covered by buildings_____

5. a. Area of open space in square meters that is green_____

b. percentage of open space area that is green_____

6. a. Area of open space in square meters that is hard surface _

b. Percentage of open space area that is hard surface_____

7. a. Area of open space in square meters that is bare (soil) _____

b. Percentage of open space area that is bare (soil) _____

8. What are the functions of the area not covered by buildings within the plot (open spaces)? See table below.

	Function	Tick one
a	Parking	
b	Storage	
c	Children play	
d	Growing trees, shrubs, grass etc.	
e	Drainage	
f	Kitchen garden	
g	Resting	
h	Drying clothes	
i	Others	Specify:

9. What are the types, amount and use (benefits) of vegetation within the space

		Amount	No of species	Predominant species	Maintenance (use the codes None -0, pruning-1, watering -2, weeding -3 others, specify)	Function
a.	Trees	No.				
B	Shrubs	No.				
c.	Ground covers	Area				
d.	Grass	Area				
e.	Live (green) fence	Length:				

10. Which of the following are available in the space? Tick appropriately.

Planting(flower) beds	Fixed Planters	Movable planters	Vegetated swales for drainage	Lawn areas

11. Plot frontage (strip of land between the property line and the edge of the road)

a. Width of frontage strip in meters_____

b. Length of frontage strip in meters_____

c. Area of frontage strip in square meters –_____

d. Total area of frontage strip in square meters covered by a built walkway_____

e. Type of drainage channels available. Tick appropriately.

Type of Drainage channel	Open	Below ground
(Tick appropriately)		

f. Area of frontage strip that is covered by open drainage channel_____

g. percentage of frontage strip that is covered by open drainage channel

h. Area of frontage in square meters not covered by hard surface or drainage channel.

_____

i. Percentage of frontage in square meters not covered by hard surface or drainage channel. _____

12. a. Area of plot frontage in square meters that is green_____

b. Percentage of plot frontage that is green_____

13. a. Area of plot frontage that is hard surface_____

c. Percentage of plot frontage that is hard surface_____

14. a. Area of plot frontage that is bare (soil) _____

d. Percentage of plot frontage that is bare (soil) _____

15. What are the functions of the plot frontage (front open space)?

	Function	Tick Appropriately

a	Parking	
b	Walking	
c	Children play	
d	Growing trees, shrubs, grass etc.	
e	Drainage	
f	Resting	
g	Others	Specify:

16. Please specify how you evaluate the importance of the following environmental characteristics and provision of the following facilities in terms of accessibility to green spaces. (Please rate all the 15 parameters.)

	The importance of the environmental factors and provision of access to facilities	**Important**	**Fairly Important**	**Not Important**	**Do not know**
1	Appearance				
2	Size				
3	Distance				
4	Cleanliness				
5	Provision of access to sport facilities				
6	Provision of access to playground				
7	Provision of access to shops				
8	Provision of access to public toilet				
9	Provision of access to places to walk the dog				
10	Provision of access to car park				
11	Provision of access to bike park				
12	Provision of access by public transport				
13	Adequate lighting				
14	Feeling safe				
15	Organizing social events in green spaces				

17. Is there anything else that you would like to tell regarding urban green open spaces in Sokoni Ward

KEY INFORMANTS

UNIVERSITY OF NAIROBI

SCHOOL OF BUILT ENVIRONMENT

DEPARTMENT OF URBAN AND REGIONAL PLANNING

MASTER OF ARTS IN URBAN AND REGIONAL PLANNING

Key Informant: County Physical Planner

Title: Challenges of Protecting Urban Green Open Spaces.
A Case Study of Sokoni Ward, Kilifi County

1. For how long have you served in your current station?
   .....
2. Has the county prepared a county spatial plan? Yes ( ) No ( )
3. If yes, in which year was it prepared? .....
4. If yes, how have urban green open spaces been captured on the County Spatial plan?
   ……
   ……
   ……
5. Is there a region(s) that has been designated as urban green open spaces on the County Spatial Plan? Yes ( ) No ( )
6. Do we have existence of urban green cities strategy, action plan or the equivalent e.g., biodiversity action plan green infrastructure?
   ……
   ……
   ……..
7. How many applications of change of user to urban green open spaces do you receive per month within Sokoni Ward?
   ……
   ……
   ……..

8. How many applications of change of user from urban green open spaces to other land uses do you receive per month within Sokoni Ward?

   …….....

   ……
   ……...
9. What does the above scenarios reflect regarding sustainable urban green open spaces within Sokoni Ward?

   ……....

   ……
   ……...

   ……
   ……...
10. What do you think should be done in order to achieve sustainable urban green open spaces in Sokoni Ward?

    ……...

    ……
    ……...

    ……
    ……...
11. What planning interventions should the County Government of Kilifi take to contribute to sustainable urban green open spaces?

    ……...

    ……
    ……

    ……
    ……..**.**

UNIVERSITY OF NAIROBI

SCHOOL OF BUILT ENVIRONMENT

DEPARTMENT OF URBAN AND REGIONAL PLANNING

MASTER OF ARTS IN URBAN AND REGIONAL PLANNING
OBSERVATION CHECKLIST

County Environmental Officer

Title: Challenges of Protecting Urban Green Open Spaces.
A Case Study of Sokoni Ward, Kilifi County

1. How long have you served in your current station?
   ……..
2. Do you have a percentage of people visiting parks or green spaces daily?
   …….
3. Do you do a basic eco-literacy or bio-literacy among residents?
   …….
4. Do you have a budget devoted to nature conservation, restoration and education? ....….
5. Do you have an urban green space town strategy, Action plan, Policy, Regulations, Guidelines and public engagement and education to incorporate and create basophilic values and goals through city planning, sign and development practice?
   ……
   ……
   ……
6. Do we have any evidence of leadership and support of global nature conservation, and nature conservation efforts in other cities (e.g., City to city and agreements, pacification I global conservation initiatives and conferences, etc.)?
   ……..
   ……
   ……

7. What measures can be taken to ensure sustainable management of green infrastructure in the streets?
   ……
   ……
   ……
   ……
   ……
   ……

UNIVERSITY OF NAIROBI

SCHOOL OF BUILT ENVIRONMENT

DEPARTMENT OF URBAN AND REGIONAL PLANNING

MASTER OF ARTS IN URBAN AND REGIONAL PLANNING
OBSERVATION CHECKLIST

County Revenue Officer

Title: Challenges of Protecting Urban Green Open Spaces..
A Case Study of Sokoni Ward, Kilifi County

1. For how long have you served in your current station?
   .....
   .....
2. What is the monthly revenue collection out of urban green open spaces within the sub-county?
   ……
3. Out of the total revenue collected what percentage goes back to help the community to improve the condition of urban green open spaces?
   .....
   .....
4. Is there legislation within your department that is related to urban green open spaces within the county? Yes ( ) No ( )
5. If yes to the above question which one?
   .....
   .....
6. What percentage is the revenue from urban green open spaces out of the total revenue collection in the county?
   .....
   .....
   .....
7. What challenges do you face in collecting revenue from urban green open spaces?
   .....
   .....
   ……
   .....

…………………………………………………………………………………………
......

8. What plans do you have within your department to improve revenue collection for green urban open spaces within the county?
....
....
…………………………………………………………………………………………
…
…………………………………………………………………………………………
…
…………………………………………………………………………………………
…
9. What do you think should be done to ensure sustainable urban green open spaces?
....
....
....
10. What do you think the County government should do to improve urban green open spaces?
....
......
…………………………………………………………………………………………
......
…………………………………………………………………………………………
......
…………………………………

UNIVERSITY OF NAIROBI

SCHOOL OF BUILT ENVIRONMENT

DEPARTMENT OF URBAN AND REGIONAL PLANNING

MASTER OF ARTS IN URBAN AND REGIONAL PLANNING

Title: Challenges of Protecting Urban Green Open Spaces.
A Case Study of Sokoni Ward, Kilifi County

Community Leaders (Community Elder, Chief, MCA)

Position of Leader_____

Name of Leader_____

Date_____

1. What is your leadership role in Sokoni Ward?

   .....
   .....

2. What would you say are the best aspects of living in Sokoni Ward?

   .....
   .....

3. Are there adequate urban green open spaces for the residents of Sokoni Ward?
4. What are the strengths and weaknesses of urban green open spaces in Sokoni Ward?
5. What gaps in services exist or what barriers keep people from using the current urban green open spaces in Sokoni Ward?
6. What would you say are the role of urban green open spaces in providing a high-quality life?
10. What can be done in order enhance the quality of urban green open spaces?
11. What are the main challenges that urban green open spaces face in Sokoni Ward?
12. What management measures can be put to ensure best use and functional urban green open spaces in Sokoni Ward
13. Is there anything else that you would like to tell regarding urban green open spaces in Sokoni Ward?

KEY INFORMANT INTERVIEW QUESTIONS:
Community group

Name of Group_____

Date_____

1. What are the major population groups that you serve and what services do you offer? *(Optional)*
2. What would you say are the best aspects of living in Sokoni Ward?
3. Overall,

a) What are the major urban green open space needs of this group?
b) What are the barriers to accessing urban green open space needs for this group?
c) How can we improve the delivery of urban green open space needs?

4. What are the strengths and weaknesses of urban green open spaces in Sokoni estate?
5. What gaps in services exist or what barriers keep people from using the current urban green open spaces in Sokoni Ward?
6. What would you say are the role of urban green open spaces in providing a high-quality life?
7. How can we enhance the quality of urban green open spaces?
8. Aside from the subjects that we have already discussed, what would you say are the three biggest challenges that urban green open spaces are facing?
9. Is there anything else that you would like to tell regarding urban green open spaces in Sokoni Ward?

OBSERVATION CHECKLIST

UNIVERSITY OF NAIROBI

SCHOOL OF BUILT ENVIRONMENT

DEPARTMENT OF URBAN AND REGIONAL PLANNING

MASTER OF ARTS IN URBAN AND REGIONAL PLANNING
OBSERVATION CHECKLIST

Title: Challenges of Protecting Urban Green Open Spaces.
A Case Study of Sokoni Ward, Kilifi County

Declaration: The information obtained will be accorded confidential treatment and will be used for academic purposes only.

Required: Scale rule, counter, calculator, drawing equipment, copy of the original development plan

Researcher's Name _____ Date of review_____

Plan Approving Authority: _____ Date of Approval: _____

Spatial Planning Variables

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1. a. Area of plan in square meters of the plan to be reviewed_____

   b. No of proposed land uses according to the existing plan_____

List of land uses,

Land Use	Tick Appropriately	Total Area (square meters)
Residential		
Industrial		
Educational		

Recreational		
Public purpose		
Commercial		
Public Utility		
Transportation		
Deferred		
Agricultural		

OPEN SPACE QUALITY			
ITEM TO OBSERVE	**PRESENT**	**NOT PRESENT**	**NOTES**
Urban parks/Allotments/community gardens			
Urban open green spaces			
Parks and public gardens			
Grass			
Tree's cover			
Flowers			
Drainage systems and Water courses			
Riparian reserves			
Outdoor sports facilities			
Available passive recreational facilities			
Amenities			
Public rights of way, cycle ways and other recreational routes.			
Pollution: Water, Air			
Access features			
BEHAVIORAL AND USER OBSERVATION			
Main Activities			
Location of the activities			
Uses			
Users' characteristics			
How long do visitors stay on the spaces			

ANNEX 2: RESEARCH APPROVAL LETTER

University of Nairobi
Department of Urban and Regional Planning
School of the Built Environment
P.O. Box 30197, 00100 GPO Nairobi, Kenya
e-mail:durp@uonbi.ac.ke
Tel. 020 4913526

October 6, 2020

TO WHOM IT MAY CONCERN

RE: STEPHEN GACHANJA GAKOBO – B63/80842/2015

This is to confirm that the above named is a Master of Arts (Planning) student in the Department of Urban & Regional Planning, University of Nairobi.

As part of the continuous assessment culture in the Masters of Arts in Planning Programme our students are encouraged to acquire some experience through training in the field of Urban and Regional.

We wish to request you to allow him collect data from your institutions/households for his Masters Project title "***Sustainable Management of Urban Green Open Spaces: Case Study of Sokoni Ward, Kilifi County***".

Any assistance accorded to him will be highly appreciated.

Department Of Urban and Regional Planning
CHAIRMAN
P.O. Box 30197 - 00100 Nairobi

PROF. KARANJA MWANGI, MKIP FKIP
CHAIRMAN
DEPARTMENT OF URBAN & REGIONAL PLANNING

KM/rm

ANNEX 3: RESEARCH LICENSE FROM NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **143069**

Date of Issue: **15/October/2020**

RESEARCH LICENSE

This is to Certify that Mr.. STEPHEN GACHANJA GAKOBO of University of Nairobi, has been licensed to conduct research in Kilifi on the topic: SUSTAINABLE MANAGEMENT OF URBAN GREEN OPEN SPACES: A CASE STUDY OF SOKONI WARD, KILIFI COUNTY for the period ending : 15/October/2021.

License No: **NACOSTI/P/20/7146**

143069

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearence from relevant Government Agencies
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