



UNIVERSITY OF NAIROBI  
College of Architecture and Engineering  
School of Arts and Design

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BDS 413: PROJECT PAPER  
(Interior Design Specialization)

**CONTEMPORARY SWAHILI DESIGN WITH RENEWABLE MATERIALS  
TO CREATE APPEALING APARTMENTS IN KILIMANI:  
A Case Study of Riana Woods Apartments, Kilimani, Nairobi**

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Project paper submitted in partial fulfillment of the requirement for the Bachelor of Art in Design Degree submitted to the school of the Arts and Design, University of Nairobi.

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**DECLARATION**

This Project Report is my original work and has not been presented to any other examination body.

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Sign:.......... Date:....14/04/2020.....

**Declaration by Supervisor**

This Project Report has been submitted for examination with my approval as School of the Arts and Design, University of Nairobi Supervisor

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## **DEDICATION**

To the almighty God, who enabled the success of this study, my parents who have molded and encouraged me. My husband, who continuously pushes me to be the very best version of myself and supports me unconditionally and my daughter, whom I hope to inspire as she grows up into a smart young lady.

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## **CHAPTER 1**

### **1.0 INTRODUCTION OF THE STUDY**

#### **1.1 Introduction**

In the past, interiors were put together instinctively as a part of the building process, with more emphasis on the lavish décor materials, finishes and products that make a space attractive. Thus, limiting the understanding of interior design to the improving of the outlook of a space to make it more attractive which is interior decoration. In the recent past, the scope of design has reached far and beyond this connotation. Interior designers are now training with the pursuit of effective use of space, user well-being, functional design, social needs, environmental and sustainability respects. Therefore, contributing to the development of the contemporary interior design profession.

#### **1.2 Background of the Problem**

Africa is urbanizing fast. Its rate of urbanization soared from 27 percent in 1950 to 40 percent in 2015, and is projected to reach 60 percent in 2050 (UN-DESA, 2014). With rapid changes, Interior design in Kenyan residential spaces is becoming more appreciated as years go by. The case is no longer as it were in the past when the concept was only known to the aristocracy. The main areas experiencing the upward surge include Nairobi, Mombasa, Kisumu and major towns across the country. As such it is the responsibility of local designers to integrate the traditional African ways of life with the realities of the modern world to create beautiful and attractive spaces for the rapidly growing African Market.

A multitude of houses in Kilimani are built under Western and European themes and influences. This is unfortunate due to the fact that more than half of the population in that area consists of the middle class in the region. The middle class is not only crucial to the country's economic and democratic development, but it is this class of citizens that is likely to shape the culture, values and entire future of the country. Basically, the middle class is that group of people that does not live in poverty but cannot be regarded as wealthy either. It ranges from what has been regarded as the "floating class" which lives at subsistence level but is vulnerable to slipping back into poverty in the event of

external shocks such as unemployment or sickness for instance. This research argues that building more houses using African themes and influences in this region will create a ripple effect in other regions where they will follow suit. African themes and influences can also be used to create lavish and appealing interiors and architecture if used in the correct manner. This paired with the use of sustainable materials in housing will result to exceptional designs which will not only draw attention to the middle-class market but to the entire economic sphere and foreigners as well.

### **1.3 Problem Statement**

In the upmarket of Kilimani, it is easy to be overwhelmed by a myriad of luxurious apartments built on European themes or cultures from other continents. Only a few apartments are presently designed using inspiration from African themes and sustainable measures.

### **1.4 Objective of the Study**

To determine the use of renewable materials in the Interior Design of Kilimani apartments and propose ways in which they can be integrated with the theme of contemporary Swahili design.

#### **1.4.1 Specific Objectives**

- i. Determine the extensiveness of the use of bamboo and hyacinth in Interior Design and ways in which to integrate bamboo and hyacinth in apartment interior décor.
- ii. Analyze how contemporary Swahili design has been applied in apartment décor and propose ways in which it can be applied in the design of apartments in Kilimani.

### **1.5 Research Questions**

- i. What is the extent to which bamboo and hyacinth have been used in Interior Design of apartments?
- ii. How has contemporary Swahili design been applied in the design of apartment in Kilimani?

## **1.6 Significance of the Study**

This study ensures that the executed solution is the most suitable. Most Kenyan homes are built on European themes. Most construction materials and furniture are made from unsustainable materials like hardwood and plastics. This practice is greatly compromising the environment for future generations. This paper seeks to vastly advocate for the use of sustainable design principles to promote the African culture, specifically Swahili culture in residential design in Kenya in a bid to prevent environmental degradation and erosion of traditional African ways of life.

For other students, the study will serve as a guide in enhancing their knowledge and design skills on the concepts of sustainability and the use of African art as an inspiration in their projects. It will also help students taking related research in future to identify the best way to go about it by having a basis and reference for their research.

## **1.7 Limitation of the Study**

The study is limited to data and information mainly gathered from primary sources on the Swahili peoples Sustainable Design Principles that can be useful in residential interior design. Time is also a limiting factor on the extensiveness of the research. Finances too as some respondents might want to be paid before undertaking the interview.

## **1.8 Scope of the Study**

### **1.8.1 Geographical**

This research will be based and limited to Nairobi, Kenya with the main study area being the neighborhood along Dennis Pritt Road, Kilimani. The case study will be the Riana Woods Apartments in the for mentioned locality.

### **1.8.2 Concept and Content**

The study refers to both primary and secondary information. Materials, ideas, and data will be sought out to have a proposal that will embrace the idea of exploiting opportunities for use of resources that have high levels of renewability, durability and

that require minimal energy to process for the sole purpose of environmental conservation.

### **1.8.3 Thematic**

The research will confine itself to the field of interior design as it seeks to investigate whether sustainable design principles and inspiration from traditional African art forms have been adequately explored in residential designs in Kenya.

### **1.9 Conclusion**

This chapter gave a general outlook of the whole study. It touched on the background of the study, which generally refers to the things that inspired the study, the problems that the study seeks to solve, the significance of the study, limitations and the scope of the study. The researchers goal therefore, was to give the reader a clear description of what to expect from the study and a preview what the study would entail.

## **CHAPTER 2**

### **2.0 LITERATURE REVIEW**

#### **2.1 Introduction**

The purpose of the literature review is to determine what has already been done in relation to the researcher's topic of study. This will help give the reader a clear path of what the study is based on. It looks at the two main philosophies guiding this project which are African design, specifically Swahili design and Sustainability. This chapter explains in depth the definitions, principles and application of these philosophies in the four thematic areas.

#### **2.2 Sustainability**

Sustainability is the ability to exist constantly. In the 21st century, it refers generally to the capacity for the biosphere and human civilization to coexist. It is also defined as the process of people maintaining change in a homeostasis balanced environment, in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. The greater sustainability movement, however, is guided by the three E's, commonly referred to as the "three pillars" of sustainability: environment, equity, and economics.

The main focus in this study will be the environmental pillar in the aspect of sustainability. It refers to the conservation of natural resources and the reduction of impacts on eco-systems. The environmental pillar concerns itself with protecting natural habitats, developing eco-friendly products, conserving resources, ensuring air and water quality, reducing pollutants, and reducing waste.

From a sustainable design standpoint, this includes appropriate site selection, reducing energy usage, the use of locally-sourced, recycled, and sustainable building materials, and storm water management techniques, to name a few. Sustainable design should incorporate a whole-systems approach. In order to minimize a project's impact on our environment, one must consider the building envelope, electrical and mechanical systems, site characteristics, local environment, and material selections.



Focusing on materials, the three R's – Reduce, Reuse and Recycle are the ways forward to manage materials effectively for a sustainable environment. Reduce simply means to use fewer resources in the first place. It takes resources to manufacture, transport, and dispose of products, so reduction minimizes the use of new resources. Reuse is basically using materials more than once in their original form instead of throwing them away after each use. Reuse keeps new resources from being used for a while longer, and old resources from entering the waste stream. Recycle is converting waste materials into new products, changing them from their original form through physical and chemical processes. Although recycling uses energy, it helps to prevent new resources from being used and old materials from entering the waste stream. This process of converting the waste into new products can however be costly in time and resources, therefore, renewable resources can be a more cost friendly option of sustainability as opposed to recycling. A renewable resource is one that can be used repeatedly and does not run out because it is naturally replaced.

### **2.2.1 Sustainability in Interior Design**

As a profession, designing interior environments can be defined as “determining the relationship of people to spaces based on psychological and psychical parameters, to improve the quality of life”. In the core of sustainability, these physical parameters gain importance in the means of long-term use. Kang and Guerin defined the sustainable interior design practice in three dimensions as: global sustainable interior design, indoor environmental quality, and interior materials. The indoor environmental quality, that is also an assessment category in the LEED, is the most important implication in considering the sustainability of interior environments. Improving indoor air quality which is mainly the activity of reducing indoor pollutants, improves the thermal comfort and quality of interior lighting. Moreover, using materials that can have the possibility of recycling is another criterion in obtaining sustainability. In considering these aspects, most essential interior design elements are materials, furnishing, and lighting.

In material selection, the most important criteria are to select the material according to the features of function. Each of every function has specific needs. As an example, materials used in the interior of a hospital and a shopping mall should be different due to the sterilization aspect. Especially, the selection should aim to long term use. It is

very important to use a material in its maximum potential in order to reduce waste of resources. Another important criterion in material selection is the recycling potential of the materials. There are many studies in the field of waste management which aim to innovate new construction materials. A Cierra Recycling can be an example to one of these. Basically, they collect and separate the waste, and then they transform it and remanufacture these waste products.

Moreover, the level of emission of toxic gases both used in the production process and during the usage period of the materials is an essential criterion in achieving sustainability. Especially, most traditional techniques in construction and materials are widely sustainable. As an example, traditional materials like mud brick and adobe are highly sustainable in the means of level of toxic gases emission. They are natural materials. All these criteria are important in maintaining indoor air quality. Finally, materials, as interior design elements, should meet the requirement of sustainability in the potential of long-term use, recycling, and level of toxic gas emissions.

Furniture is the major element in interior design. They have a wide range of materials and color. In the context of sustainability, materials used in the production process and the long-term use of the furniture are the major criterions. Wood products are the most widely used materials in the production of furniture as they can be recycled. However, some synthetic materials used in the wood production process cannot be recycled. Moreover, the wastes occurred in the production process damages their nature. These waste products contain same toxic polymer based synthetic materials. The rate of the waste to the product is about 30% of the total amount of the product. Rather than the production process, the old furniture also cannot be recycled. These wastes have a big role in increasing the amount of global waste. Achieving sustainable furniture, recycling is one of the important criteria. Recently, some of the furniture companies started producing furniture totally from waste. Furniture produced from waste may sometimes have a problem with their aesthetics. This type of furniture is sometimes considered as unaesthetic. This is the major problem in selecting this furniture. The aesthetic quality of the furniture should be considered. Then, it will serve both the purpose of sustainability and usage.

In recent years, there are also innovative examples in furniture production. In Cambridge University, design and engineering departments developed a joint project.

They created a technology in order to generate electricity from the plantation. They conduct this system in a table. There is a light fixture on the table and there is a plantation in the table. The lighting fixture gets its energy from the plantation in the table. It is an example to innovative sustainable design. It should be considered as an example for the essence of interdisciplinary study in achieving sustainable environments.

Lighting considerations in the interior design is mostly concentrated on the reduction of using electric energy. Energy used in the interior environment of the building is approximately 40-50% of the total energy used in buildings. It occupies a large amount of energy consumption. Therefore, designers should use the maximum possible natural light in interior environments. Environmental lighting is also one of the physical parameters affecting the indoor environmental quality. Day light is the main source in natural lighting. It can be explained as “the practice of bringing light into a building interior and distributing it in a way that provides more desirable and better-quality illumination than artificial light sources”. In this context, the building should be located accordingly to gain maximum day light. Also, the size and the depth of the room should be appropriate to use maximum day light. Recently, they developed new technological tools to carry day light to the deep interior space of the building even to the basements. The main principal in these tools are to collect the sun light and reflect the light through the reflective tubes. Laser cut panels, light piping systems, horizontal and vertical light pipes are examples of these systems.

Moreover, there are many research studies carried out about the benefits of day light in life quality in interior environments. These studies demonstrate that day light affects the productivity level in office environments. Yaldiz and Magdi considered day light in the context of sustainability in three categories:

1. Resource sustainability (using day light to affect the energy of the building performance).
2. Economical sustainability (in the dimension of financial benefit).
3. Human sustainability (in the dimension of human physical and psychological health).

Lighting is a major interior design element. It is obvious that it has an essential role in developing sustainable interior environments. It is both important in energy reduction and for the sake of human health.

This research intends to propose ways to integrate the sustainable principle of renewability together with Contemporary Swahili design styles. A renewable resource is a natural resource with the ability to reproduce through biological or natural processes and replenished with the passage of time. Renewable resources are exhaustible. Forests can be over-cut, resulting in barren landscapes and shortages of wood as occurred in many parts of Europe in past centuries. No continuous rate of use of any non-renewable resource is sustainable. However, if the rate of use is declining at a greater or equal rate to that of depletion, this can be said to be a sustainable situation, in that society's dependence on the resource will be reduced to insignificance before the resource is exhausted. (Richard 2007). This paper looks into how hyacinth reeds and bamboo which are renewable resources can be used in the redesigning of apartments in Kenya. This poses the question; how can plants be renewable?

Plants are a renewable resource because they grow quickly and can replace themselves at fast rates. Several factors influence the rate of photosynthesis and, therefore, dictate how quickly plants regenerate. Plants in warmer climates have higher photosynthetic rates than those in cooler temperatures. Plants regenerate quickly especially when there is little difference e.g. in degrees between daytime and night time highs. The greater the amount of light a plant receives, the more quickly it will grow. Thus, plants will grow more during months with prolonged light i.e. January. Plant nutrition also plays a role in growth. Plants growing in habitats containing sufficient concentrations of minerals such as phosphorus, nitrogen, Sulphur, potassium, calcium, and magnesium as well as several other micro-nutrients will grow better than plants growing in nutrient-poor soil. Increasing any of these factors: temperature, light, or nutrition that can increase the rate of renewal.

Christine also argues that although plants are a renewable resource, they often do not regenerate as quickly as they are harvested. In these cases, there are limits to the renewability of this resource, and conservation efforts must be put in place either to protect the plants from being over-harvested or to replace them at a high rate. (Christine

Lehman 1999). This article elaborates on the choice on bamboo and hyacinth. These are categorized within the fast-renewable plants that replenish a lot faster.

The renewable resources extension act (RREA) was established in 1978 to designate federal funds for expansion and comprehensive natural resource extension research-based and stakeholder-driven programs to sustain renewable resources on forests and range lands. Renewable resources are those whose supply becomes available for use at different time intervals and in which present use does not diminish future supply. Tree and plant biomass, water and wildlife are a few renewable “natural” resources. In Delaware, RREA programs are offered to all age groups and individuals as an outreach effort of the university of Delaware cooperative extension. The RREA program is a state-wide program with the central office located in the Ud-Kent county cooperative extension Parade building.

This research also incorporates the concepts of prevention through design which is a concept that seeks to prevent occupational hazards by designing the out. This is the process by which designs or parts of a design that are harmful to humanity are identified in a project and corrected. This concept aims to reduce workplace safety risks and lessen workers’ reliance on personal protective equipment and user centered design besides renewability for sustainable design. (Dorothy Abbott 2012).

### **2.2.2 Bamboo**

Bamboo is a rapid growing grass with an impressive variability. The chemical composition and mechanical properties of the bamboo culm allow a broad use such as construction material. It is an excellent source for furniture production as well. Bamboo has some beneficial features such as mechanical strength, easy process-ability and availability in many tropical and sub-tropical areas which presents its attributes to become a renewable material as substitute of wood. A number of wood processing companies have recently come to prefer bamboo for sustainable building material and furniture design with the growing trends in environment awareness. Bamboo furniture has been called a green or ecofriendly material for furniture since the natural resources are being depleted. It may be utilized both in building structure, interior design and furniture structures to make long lasting and competitive products due to its many disadvantages.

Historically, Kenya's bamboo natural habitat has been in the cold areas around Mount Kenya, the Aberdares and Mount Elgon. However, there are new species being introduced that can survive in tropical or arid climates such as Kibwezi, Maseno, Homa Bay, Migori and parts of Coast. KEFRI (Kenya Forestry Research Institute) has been running bamboo conservation and livelihood forums around Kenya since 2006. Bamboo is actually a grass, which is why it grows so fast. Ordinary bamboo can grow a meter in a week, to reach some 15 meters at full height, according to Dr. Godfrey Netondo a botanist at Maseno University. Giant bamboo, now being farmed in Thika, can grow 20 meters in just two to three months in ideal conditions. (James Karuga. 2012)

Many turns to bamboo for its sleek appearance and "green" cache. The plant is a fast-growing grass that can take less than five years to mature. Hardwoods, on the other hand, can take decades. The material is also incredibly durable, harder than maple and though tough on tools. It comes as veneer or as laminated plywood which is also one of the brand names. (Fine wood working. 2010)

Bamboo is an extremely renewable material compared to other hardwood species which are growing at least 50 years. Bamboo grows quickly (6 months to 2 years) to its mature height and can be harvest after 3 to 5 years. Bamboo which is the fastest growing woody plant and counts over 1,200 species doesn't need to be replanted after each harvest because it can be harvested from the same stand every few years without harming the plant. It may not reach the height and volume of the trees, but they are fast growing, the culms are made by har walls and stand tall in extreme weather. Bamboo plants grow from seeds or rhizomes, are a major non-wood forest product and play an important economic and cultural role in South East Asia, Africa and South America. The bamboo selection of raw materials in furniture industry is ideal to ensure an easy recyclability too. The different designs of bamboo furniture can be developed for structural and decorative purposes. Because bamboo can be used for both natural and modern-themed setting, it is possible to be curved into different 3D shapes and it is remarkable for use in building structures and furniture industry (Malanit et al. 2008, Janssen 2000, FAQ 2005, Gyansah 2012, Pebble 2013).

### 2.2.3 Application of Bamboo in Interior Design

The interior design industry has experienced a huge demand for sustainable designs and has been leaning towards eco-friendly material. Sustainable design can be achieved through the usage of materials that have the minimum amount of environmental impact. Not only do people search for stylish and trending designs, but also opt for building materials that are healthy. These healthy materials are the ones that have least impact on the ecosystem. Thus, the use of bamboo in interior design comes into play.

Bamboo is a form of grass that grows really fast in tropical countries around the world. At first, bamboo started catching the eyes of interior designers as a flooring material. But over the years, bamboo has found various uses as home décor as well as building materials. Reasons to use bamboo in interior design are manifold. The colour of bamboo adds a lot of character to any living space.



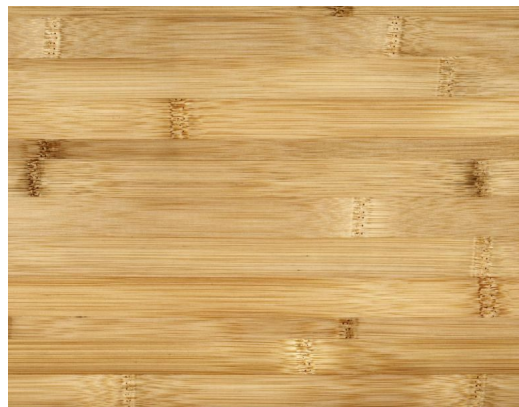
**Figure 2.1:** Bamboo furniture design (Source: hometone.com)

Bamboo comes with benefits such as sustainability and durability and has emerged as a breakthrough material in the design industry. The plant itself is aesthetically pleasing in appearance and structure and adds to the interiors of the room. The delicate grainy texture of bamboo adds gravity to the interiors of any living space. The amber tone of bamboo ensures that it can easily blend in with any surroundings it is kept in.

Bamboo is also quite versatile and can adapt to any weather conditions. Changes in temperature, humidity, soil and climates does not affect its growth. The rate of growth of bamboo is so high that it does not require any usage of fertilizers or pesticides. That plant itself is anti-fungal, anti-bacterial and anti-pest and hence it does not require any other form of pest control.

The plant is capable of consuming carbon dioxide at a higher rate than most hardwood plants. It is also able to produce more oxygen than most hardwood plants. The specialty of bamboo as an eco-friendly material is reinforced by the fact that it is not a tree. Bamboo is a grass and hence, it can be renewed endlessly. Because of this reason, cutting it does not have a tremendous impact on the environment.

It takes a bamboo shoot only five years to reach complete maturity. It is also renewable as it does not need to be planted again after harvesting. A new plant develops from the pre-existing remains of the shoot. Bamboo shoots take an average of 60 days to be replaced, whereas hardwood trees like oak take nearly 60 years. Bamboo is stronger than oak and does not expand or shrink like wood obtained from most hardwood trees.



**Figure 2.2:** Bamboo flooring (Source: hometone.com)

One of the most antiquated and versatile uses of bamboo are in the form of material used for flooring. The primary demand for flooring material is that it should be unaffected by environmental conditions such as expansion and contraction. Bamboo possesses all these properties. Even hardwood floors are prone to climate changes. Hence it is perfect for the construction of floors and home furnishing such as furniture and wall décor. Bamboo also had a tensile strength that is greater than that of steel. This is the reason why bamboo is used to construct houses in earthquake-prone areas.





**Figure 2.3:** Bamboo bathrooms (Source: hometone.com)

Wood made from bamboo shoots has a greater density and provides low conductivity of heat combined with thermal insulation. Hence it has gained popularity due to its use in the construction of bathtubs in tropical countries. It is also a good material for the construction of bathroom floors as its fibers prevent water from soaking in. Such bathrooms are quite relaxing as the light amber interiors give off an aura that is quite ‘Zen’-like.



**Figure 2.4:** Bamboo inspired interior (Source: groliehome.com)

In order to use Bamboo in interior design while considering bedrooms, we have to take a look at home furniture. Bedrooms go really well with nature-centric wall decoration ideas such as birds made of bamboo. Bamboo beds are another way to add character to your bedroom.

Modern home furnishing ideas are trying to substitute four-poster beds made of hardwood with those made from bamboo. The vibes associated with bamboo beds are also different. Bamboo is a plant that is frequently associated with relaxation amidst nature. Bamboo beds would thus have an overall effect that is more relaxing to the senses. Other decorative things that can be introduced are bamboo headboards or bamboo panels above the bed.



**Figure 2.5:** Bamboo interior (Source: 12.hfilcdn.com)

There are a number of wall decoration ideas related to use of bamboo in living rooms. Most of these include wall inserts such as bamboo poles installed into a panel in the living room. These panels are then provided with LED lights which emanates a warm and welcoming glow. This bamboo-laced wall will give off a tropical yet modern oriental feel to the living space.

A simple yet elegant and minimalistic way to brighten any living space is to decorate it with potted bamboo plants. Bamboo takes very little sunlight to grow and looks extremely aesthetic in a muted living space. Chinese bamboo can also be used for this purpose since they are harbingers of good luck according to Chinese tradition. Using bamboo sofas and chairs as statement furniture is also another way to incorporate bamboo into the décor.



**Figure 2.6:** Bamboo indoor landscaping (Source: 1 mut.com)

Bamboo is a plant that requires little maintenance and hence, it might be possible to construct tiny bamboo gardens indoor. As discussed earlier, bamboo is extremely versatile. It absorbs more atmospheric carbon dioxide than most hardwood trees and emanates 30% more volume of oxygen. In order to facilitate better ventilation, it might be a good idea to construct and maintain such indoor bamboo gardens. Not to mention that bamboo trees definitely blend in with their surroundings and décor. Thus, it is a really good option to use Bamboo in interior design.

Bamboo is an excellent material for indoor and outdoor furniture with its lightweight structure, superior mechanical properties and naturally resistance against biological attacks (Solomon-Ayeh 2002, Chele et al. 2012). It is easy to produce different bamboo furniture designs because it is a versatile material, easy to shape and process with simple equipment. The knowledge of a proper processing of bamboo is still not well distributed over the world. Green bamboo processing is quite different than in dry state (Hidalgo 2003, Zehui 2007, Malanit et al. 2010). The Tensile strength of bamboo is higher than teak or walnut and twice as stable as oak.

The obvious economic and environmental advantages of bamboo follow as: it grows quick as a straight reinforced segmented culm, after drying it is resistant to swelling or shrinkage due to climate change, it is extremely durable and resistant after some treatments for preservation, it has a very fine grain, allowing it to come in different styles. Bamboo which is an excellent material for eco-friendly furniture products has

drawn as a green building material. It decreases the atmospheric concentration of carbon dioxide which is the main reason of global warming (Yiping et al. 2010)

Bamboo is usually used as office, home, garden furniture, interior design, decorative purposes etc. it is often combined with other various environmentally friendly materials to obtain the piece of furniture. These materials which are recyclable, natural, and biodegradable materials enable to generate strong building materials and furniture parts for a large office or a small home. Glass, plastics, fabric, and other materials are also combined to produce bamboo furniture (<http://www.green-furniture.com/bamboofficefurniture.html>). The bamboo furniture includes beds, chest of drawers, workstations, desks, tables, stools, rockers, chairs, couches, kitchen cabinets, and bathroom cabinets etc.

#### **2.2.4 Water Hyacinth and Interior Design**

Water Hyacinth (*Eichhornia Crassipes*) has become a major invasive plant species in Lake Victoria and while it is native to the continent of South America, human activity has introduced the greenery to Lake Victoria, where it is claimed to have negatively affected local ecosystems. Also referred to as the ‘golden plant’ in Thailand it grows in dense clumps and can double in volume in around 2 weeks – forming a dense mat across water surfaces. It’s durability and simplicity along with its natural look and organic texture attracts the interests of interior designers and architects the world over.

The exact time and place of introduction has been debated, but the plant is native to South America so it appears to have reached Lake Victoria due to human activity. As its flowers are reputed for their beauty, it might have been brought over as an ornamental for garden ponds. The consensus is that water hyacinth entered Lake Victoria from Rwanda via the river Kagera, probably in the 1980s. The hyacinth has since spread prolifically, due to a lack of natural predators, an abundance of space, agreeable temperature conditions, and abundant nutrients, including increasing heavy metal pollution in the lake. Water hyacinths increased rapidly between 1992–1998, were greatly reduced by 2001, and have since resurged to a lesser degree. Management techniques include (hyacinth-eating) insect controls and manual beach cleanup efforts.

A water hyacinth infestation is seldom totally eradicated. Instead, it is a situation that must be continually managed.

Water hyacinth affects the Lake Victorian population in many negative ways. There are economic impacts when the weed blocks boat access. The effects on transportation and fishing are immediately felt. Where the weed is prolific, there is a general increase in several diseases, as the weed creates excellent breeding areas for mosquitoes and other insects. There are increased incidents of skin rash, cough, malaria, encephalitis, gastrointestinal disorders, and bilharzia/schistosomiasis. Water hyacinth also interferes with water treatment, irrigation, and water supply. It can smother aquatic life by deoxygenating the water, and it reduces nutrients for young fish in sheltered bays. It has blocked supply intakes for the hydroelectric plant, interrupting electrical power for entire cities. The weed also interrupts local subsistence fishing, blocking access to the beaches.

There are also indications that water hyacinths can provide benefits to the Lake Victoria Region. Water hyacinths have been planted in an attempt to purify eutrophicated water. Once established, the plants can be harvested and used for biogas production, fertilizer, and other things. In 2018 two biogas digesters were installed in the village of Dunga in Kenya, with many more slated to be installed in Kenya.

In 2019, Kisumu Governor Anyang Nyong'o announced a major milestone in dealing with the water hyacinth choking a huge portion of Lake Victoria. In a tweet, the county boss hailed the creative minds now using the weed to earn a handsome income. He said that some of the area artists have come up with a special way of dealing with the weed and using it to make artistic merchandise from it. These included furniture, wall charts and table, wall decorations and award frames which he said would go a long way in attracting more attention to the weed. "From water hyacinth our people have been creative enough to make these artefacts, improving their living standards after making sales." He wrote. This came at a time when the government had deployed massive effort to eliminate the weed which had affected economic activities within the lake.(Curtis Otieno, 2019, hivisasa.com)

Water hyacinth is handled in a specific way to make furniture. The furniture is made in a 5-stage production process which undoubtedly produces the best results.

1. Stage 1 – It is harvested and dried naturally in the sun for several days – this is critical to the strength of the finished product.
2. Stage 2 – The stems from 3 plants are then plaited to form a braid. Each stem is around 80 centimeters long, which means when the braids are woven into furniture there are no joins.
3. Stage 3 – The braids are then either immersed for 24 hours into dye for the chocolate/charcoal color ways or left unstained for the natural color way. The immersion of the braids into the dye allows the dye to penetrate the water hyacinth giving it a beautiful depth of permanent color.
4. Stage 4 – The dyed braids are then allowed to dry naturally in the sun.
5. Stage 5 – The braids are then woven onto the hardwood or cane frames that form the basis of the furniture. All the hardwoods used in the frames come from sustainable sources for instance bamboo.

### **2.3 African Design**

The term African Design has had several descriptions over the years as African designers try to shake off the externally fostered definitions of what exactly African design is. One thing that is that Africa design is as diverse and dynamic as the continent and the people in it. It can be described as a blend of the cultures of the people in Africa, their day to day activities, their religion, the nature around them and creative force and impact of newly emerging styles in the continent (Akou. 2010).

African design is unique to the people who create it and requires an understanding of cultures to understand it. Customarily, it's very easy to identify design that is traditionally considered African, because it uses styles that are unique to African design such as balance, symmetry, patterns, earth tones, bright colors, grungy texture and the use of natural resources such as bones, skins and hides among others. Although much of modern African design goes beyond these boundaries and explores design further, these remain the major defining items of African design, which are widely recognized and appreciated for their uniqueness (“But is it ‘African’? | Design Indaba,” 2019).

There remains a large pool of items from which African design draws inspiration from ranging from design from North Africa and along the African Mediterranean coast, which is formed around Islamic art and culture, West African design that mostly

revolves around traditional masks which is very much resemble the masks of Central Africa, whose main distinguishing characteristics include heart-shaped faces that are curved inward and display patterns of circles and dots and finally, East African design that is known for Tinga Tinga paintings, Makonde sculptures and textile art (“African art”,2019). The East Africa region consists of Kenya, Tanzania, Uganda, Ethiopia, Rwanda, Burundi, Somalia, Madagascar, Eritrea, South Sudan, Mozambique, Zambia, Djibouti, Malawi, Mauritius, Seychelles, Zimbabwe and Comoros (“East African countries – Google Search”, 2019).

For the purpose of this research paper, the scope of design in Africa will be narrowed down to that of the Kenyan culture. The aspects of design that are considered authentically Kenyan are influenced by the different ethnic groups and use readily available local materials. The most popular Kenyan designs and artifacts include colorful hand-woven sisal baskets, Maasai beaded jewelry, gold and silver jewelry, musical instruments, soapstone sculptures, tribal marks, figurines, paintings, prints, batik cloth, kikoyis and the beautiful kangas (“Kenya Culture – Unique Customs, Etiquette and Identity”, 2019).

This research paper explores the Interior Design of the Swahili people as an influencing aspect of African, more specifically, Kenya design.

### **2.3.1 Swahili Design**

The Swahili Coast. Its name conjures up the minarets and narrow streets of old stone towns, the scent of spices roasting on an enclosed balcony, the full sails of trading dhows drifting on the evening breeze. Merchants and sailors have returned here for more than a thousand years, mooring their wooden boats in the archipelagos and natural harbors of the thousand kilometer stretch of coastline between southern Somaliland and northern Mozambique. Swahili style is a discovery of the traditions of the East Africa coast, investigating the many threads that make the tapestry of Swahili culture so rich in color and alluring in detail. The meeting of African and Arab culture, the arrival of European explorers and Indian merchants, the slow blending of style, language and traditions from around the Indian Ocean – all worked to create a beautiful way of life and a sumptuous way of living.

For millennia, the stretch of pristine coastline along eastern Africa has been the continent's point of contact with the outside world, a place of discoveries and meetings, shared traditions and trade. As early as the second century A.D., the ancient seafarers' handbook *Periplus of the Erythraean Sea* describes a scattering of ports along the Swahili Coast, referring in Greek to the Lamu Archipelago and describing the ivory trade in the town of Rhapta, whose location still remains unknown "They are brought to these parts of Azania things made specially in southern Arabia," wrote the ancient mariner, "spears, axes, small swords, awls and several kinds of glassware. Exported from here are quantities of ivory, as well as tortoise shell and pearly seashells." By the 9th Century, permanent trading settlements in the Lamu Archipelago and in Mafia and Kilwa further South created a constant supply of gold, slaves and ivory in high demand all over the Indian Ocean. Gradually, a distinctly Swahili civilization came into existence, one whose aesthetics drew from Arab, Indian and Bantu African roots to create a purely distinct culture with its own language, musical styles, oral history and literature.

The Swahili house is a stately structure, a stone edifice of enduring strength, every corner built to withstand harsh tropical sun and strong monsoons. Stone houses set the residents of Swahili towns apart from their village neighbors, who built their dwellings from mud and wattle, for the sturdy houses were constructed to withstand for centuries the ravages of time. The materials for the houses that line the narrow streets of Swahili stone towns all came from the ocean itself – the beds of old coral quarried for blocks and fired to make lime for mortar and plaster, long mangrove poles cut from sand swamps to line the high ceilings of narrow rooms, reef coral whose soft surfaces made it ideal for carving ornamental lintels and niches.

Although their layout, design and décor varied widely depending on their location along the coast, Swahili stone houses shared similar architectural features. Beside traditional baraza benches, the daka entrance was usually composed of stone steps leading to a carved door, whose geometric designs often indicated the status and origins of the house's owner, whether Arab, Indian or from other parts around the Swahili Coast. Just inside the door but hidden from the public gaze was a staircase that led to the house's upper rooms. On the second floor a small veranda called *msana wa tini* overlooked the *kiwanda* courtyard downstairs. The open air of the *kiwanda* led to common rooms,



storerooms, a usual bathroom, a stairway to the rooftop kitchen and a cistern of fresh well water. It was around the courtyard that much of the daily activities of the household would take place and where the family's livestock and slaves would sleep at night. On the second floor were the private quarters of the houses inhabitant's, divided into a series of long horizontal rooms with varying degrees of privacy. The first room set off the msani wa tini veranda was commonly used as a bedroom, with both ends screened off by a curtain of expensive fabric hung from a miwandi pole built into the wall. The head of the household, slept in the most private room of the house, the ndani, and an en-suite bathroom and toilet extended to the corner of one side.

Deep inside the upstairs rooms, the decorative features of the stone house's rooms increased. Ornamental niches called zidaka lined walls and multi-foil arches decorated open doorways that led to inside rooms. Often, the wall of the master bedroom would have an entire wall of zidaka niches, their geometric patterns visible from the outermost room. Carved plaster borders and wall friezes made from coral lime were also a popular feature and often contained a single niche at their center. Woven rugs covered the soft lime floors but furniture was extremely costly and remained sparse. Hardwood four poster beds called pavilao stood high off the floor, accessible only by use of a small ntazanyao stool. Carved wooden chests often decorated with metalwork were used to store clothing and jewelry. Ornate chairs woven with ute string were made from hardwood or ebony and used during wedding celebrations and special occasions.



and Ntazanyao stool



**Figures 2.7 – 2.9:**  
Swahili door, Kiti cha Enzi  
made from ute, and  
Miwanda pole, Pavilao bed



**Figures 2.10 – 2.11:** The Daka and Zidaka Lined Walls of The Msana Rooms (Source: Lamu, Kenya’s Enchanted Island, 2009 Rizzoli International Publications, Inc.)

#### **2.4 Design Exemplar: Tudor Swahili Gem by Urko Sanchez**

Born and raised in Madrid, Spain, architect and interior designer Urko Sanchez is the architect behind the Tudor Swahili Gem apartments in Tudor Creek, Mombasa, Kenya. Urko’s interest in traveling sparked at an early age by his pilot father who flew the family to different countries during holidays. Consequently, travel has informed much of his life and his work – all the colors, the art, people and cultures he’s been exposed to adding to a sense of what Urko wanted to build for himself and others. After living in Lamu for eight years, operating a construction firm, Urko decided to move to Mombasa. The city opened up to him with more opportunities to practice architecture at large scale and hence Urko realized the need to work on the legal requirements to establish himself as an architect. He enrolled for a two-year short course at the University of Nairobi to learn about the practice of architecture and the regulations after which he sat for the BORAQS exam and was registered as an architect in Kenya. Urko’s projects have bagged numerous awards globally: to mention but a few – Vipingo Club House as the best golf development in Kenya in the International Property Awards, Architectural Association of Kenya and the Red Pepper House as the best hospitality project in the French Association for Young Architects in Africa and in the AAK Excellence Awards 2015.

Tudor Swahili Gem is a development that explores the complexities of traditional cultural extrapolations and the rigor of environmental comfort within the modern

demands of aesthetics. This is a scheme that is terse but pith in the way that it handles the elements that it sets out to tackle and ultimately explores the narrow and delicate element of updating the tenets of Swahili architecture. The project consists of 14 apartments, all offering breath-taking panoramic views on the creek in Mombasa-Kenya. Characterized by a mashrabiya structural shell, it is distinct with its search for privacy and optimized natural ventilation and light. The apartments benefit from the experience of outdoor living, contact with nature and the integration of the surroundings into each private home.

Located on the East Coast of Kenya, Mombasa is the second largest city in the country. A multicultural and strategic center known for trading and skilled craftsmen, it is characterized by a savanna tropical climate and a land crossed by creeks. Tudor, their intervention zone, is situated on the creek's waterfront, which is a privileged location north of Mombasa Island. Lush vegetation all around and a serene neighborhood, the project naturally fits into this environment. The architects worked with the client to create a building with minimal environmental impact, by adapting to the land's natural slope, and by using locally available materials and know-how. Tudor Apartments is a development that prides itself in its innovative architecture, showing its attachment to Mombasa's history by borrowing inspiration from the rich Swahili design. This development project is committed to harmonizing Mombasa's past present and future.



They developed an iconic building, with innovation or architectural designs, highest standards of product finishes, luxurious, contemporary lifestyle, and respect for the natural and local heritage.

**Figures 2.12 – 2.14:** Tudor Swahili Gem; Mashrabiya shell; and Windows inspired by Geometry (Source: Javier Callejas) (Source: Lamu, Kenya's Enchanted Island, 2009 Rizzoli International Publications, Inc.)

Once the functional disposition of the apartments was determined – an investigation on the building skin ensued. The in-depth research involved the understanding of: Swahili ventilation techniques; closing systems of lattices; in and out spaces; use of local materials; privacy gradients; climate control and highlights of view towards the adjoining creek. The architects designed the mushrabiya skin following a study of different traditional patterns. It serves for the privacy in relation to the surroundings, and for the filtered, natural light we wanted for the houses. This skin wraps itself around the apartments block, leaving its Northern façade free, with balconies facing the sea and taking full advantage of the breath-taking scenery. Moreover, the skin was rendered entirely structural thanks to the engineering team. A novelty to Kenya, such structural skin was possible thanks to local and international engineers working hand by hand, and to the steel workers on-site who managed, by dedication and care, flawless bar bending work without access to any technology. Spatially, this skin also redirects people’s local tendency to put bars on their windows, becoming itself the border and the filter. Sometimes the direct limit of the internal house spaces, the shell is at other times a first filter of sunlight and heat, doubled by internal handcrafted wood-lattice shutters. In this way, light is generous and heat is broken down.



**Figures 2.15 – 2.16:** Tudor Apartments Interior (Source: Javier Callejas) (Source: Lamu, Kenya’s Enchanted Island, 2009 Rizzoli International Publications, Inc.)

The interior consists of edges and opening; transitional spaces; spatial layers; courtyards; surprise and delight; materiality; and light and shadow. This was done after

an analysis of the site and research of Swahili cultural heritage. In addition to white, plaster finishing, the project used mtomo finish, a coral stone cladding technique original to Lamu that helps keep thermal capacity thanks to the porosity of the coral stone. Wood work was realized entirely thanks to outstanding hand carving by local artisans from Mombasa and Lamu. Furthermore, artisans produced in-situ terrazzo for the flooring of the patio houses.

The furniture is characterized by Lamu's extraordinary and unforgettable woodcarving which is not only an art form, but also an important source of income. The most popular items include doors, headboards, chairs, chests, and tables. Lamu's carved doors are large and impressive and give status to the owner. Woodcarving was first introduced by Hindu craftsmen, who were careful to only use floral designs so as not to offend their Swahili or Arab patrons whose strong Islamic beliefs prohibit the making of images and idols. Besides its magnificent carved doors, it also consists of the high-backed chair, the kiti cha enzi (literally "chair of power" commonly referred to as kiti cha mpingo, the "ebony chair"). It is striking for its angular design and hard wood (often ebony), elaborate string panels, and delicate ivory or bone inlay. The kiti cha mpingo is now considered a collector's item. Beautifully carved beds are prized prestige items that have been used in the Interior as well. Most of the styles seem to have been adopted from India, and include the pili pili and samadari beds. These turned wood and lacquered beds were very fashionable, but have slowly given way to modern furniture. The older homes of the island and Lamu Museum showcase some of these more intricate styles. Coffee tables have been replaced by wooden chests ornately decorated with brass, often referred to as "Zanzibari chests" which were once highly prized among Lamu's wealthy inhabitants. Smaller ones were used to keep clothes. Also, included are mats and fans made of woven palm fond.

## **2.5 Conclusion**

This chapter has brought into light the two philosophies the study will be limited to and has also described into detail their meaning, history and also impact it will have on the study. The exemplars in these philosophies have also been mentioned and have given the study an epitome that it can follow. It also contains design guidelines such as standards and anthropometrics that will guide the researcher when giving recommendations.

## **CHAPTER 3**

### **3.0 RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

This section comprises of research methods, research design, data collection and analysis used in the research execution. Research methodology is discussed. A qualitative research approach was employed, the aim being to establish whether there are opportunities for inclusivity of African design, use of bamboo and hyacinth in the re-design of Riana Woods Apartment space and what barriers are likely to be encountered in the same. The study aims at presenting rich descriptions that reflect on data obtained from the field study after permission was obtained from the University of Nairobi prior to commencing with the field study. The methodology used included collection of primary and secondary data that was collected through the review of literature from publications such as books, reports, articles, journals, academic papers, as well a web sources and Primary data collected from selected interior designers and the tenants through in-depth interviews, non-participant observation and examination of existing records. Analysis of the data collected involved field notes, narratives, records and visual observations.

#### **3.2 Research Design**

A research design ensures that the evidence obtained help us answer initially asked question as unambiguous as possible with relevant evidences that tests a theory, evaluates a program or accurately describes a phenomenon (De Vaus, 2001). Research design deals with logical problem and not logistical Problem (Yin, 1989). Here, a descriptive qualitative approach was used as illustrated above to help understand sustainable phenomena in a natural and experimental setting with focus on participants' views with expounded research questions based on their experiences. Research design focuses on general strategies in place to integrate different components of the study in a more coherent and logical way therefore ensuring effective addressing of the existing research problems. For instance, it constitutes the blueprint for the collection, measurement and analysis of data. Basically, the research problems in place usually

determines the type of research design to be conducted (Vaus D, 2001) (William K and Trochim, 2006).

The main function of a research design is to ensure evidence obtained effectively address the research problems obtained both logically and unambiguously. In social sciences research, information obtained that is relevant to the research problem specifies the type of evidence needed to test a theory, evaluate a program or rather, accurately and specifically access and describe meaning related to the observable phenomenon (Vaus, 2001). Data collection instruments were in a short-scale tested on the specific tenants including the sites structure after the subjects were identified and field research conducted. Most of the data will be presented in descriptive form.

In line with the above stated objectives, the research will be a design research that is inquisitive and seeks to investigate the use of renewable resources specific to bamboo and hyacinth in apartment design in Kilimani and how they can be integrated with the theme of contemporary African design. This proposal will therefore use investigative research methods since it seeks to answer questions on whether or not renewable resources are being used in apartment designs in Kilimani.

### **3.3 Methodology**

There isn't one of the "best" data collection methods, every process has its pros and cons. Some techniques are best suited for projects that only require quantitative data, while others are better for uncovering qualitative data. A combination of techniques that gathers both quantitative and qualitative information will yield the most comprehensive results. The researcher will use tools such as observation guides. This method of data collection includes taking photographs, writing relevant notes and sketching of diagrams that would be useful in data collection. Face to face interviews can also be used. This consists of procedures such as interviewing various respondents within the sample target. Discussions with focus groups can also be held; these groups will consist of respondents from the selected sample. Case study can also be used as a qualitative research method. It is used to examine contemporary real-life situations and apply the findings of the case to the problem under study. Case study involves a detailed contextual analysis of a limited number of events or conditions and their relationships.

Behavioral change will be put in place with subject; researcher direct interaction being on high emphasis. The study will be conducted from a specific single site, an apartment, thus enable consumer behaviors observations in terms of their beliefs, lifestyles, attitudes and culture. This will also facilitate ergonomics analysis. Ergonomics analysis seeks to address comfort between individuals and their space, and design language that dictates how individuals respond to different products deliverance. The study goes through a series of defining user need, products functionality and user feedback. It mainly addresses comfort and convenience through sustainable African theme incorporation.

A normative research sets 'normal' ways for future improvements. The researcher will propose solutions to the current state. These problems which may be psychological or social will get solved through research development.

A case study is an experimental survey that studies subjects and try to draw conclusions based on their observations, interviews and other involved data. Knowledge differ merely in the relative emphasis put upon one or the other of the two essential and complementary directions of the scientific research; in both cases we find a movement from concrete reality to abstract concepts and vice versa, a ceaseless pulsation which keeps science alive and forging ahead (Znaniecki,1934).

The study opted for this type of experimental survey due to scarcity of interior design information in application of sustainable materials of hyacinth to the interior and exterior designs. There are little records in secondary sources on the phenomenon in practice. In addition, the existent interior design firms which are not registered and serve as different business bodies to evade tax have no existent work done or comprehensive records on the phenomenon. Undocumented street Artists are the ones majorly involved in the practice. A case study approach was therefore appropriate as it captures specific meaningful details to the study in this case, Riana Woods Apartments in Kilimani Estate.

### **3.4 Target population and sample**

A target population refers to the entire group that a researcher is interested in that they wish to draw inference from. A selected sub set of these subjects which represent the entire population can be drawn from a sufficient size to enable effective statistical



analysis. Non-probability samples can be effective with qualitative research as its purpose is to contribute to an understanding of the phenomenon in study thus the sample can be chosen to provide best required data that is appropriate and more effective for the study (Pharahoo, 2006). Most research studies are conducted on sample rather than the general population usually but poses many difficulties in determining the best sample selection due to sample bias (Banerjee, 2010). Riana Woods Apartments has its clientele limited to the middle class, who are high income earners comprising of business owners and high-status employees from different undertakings within the locality. Foreign tenants are common due to the location and environment.

### **3.5 Data Collection Instruments**

Interviews and visual observation tools like photographs will be used to collect primary data in a sense that the researcher will get information on what happens on their absence through interviews and additional knowledge that might have been left out through observation.

#### **3.5.1 Photographs**

Photographs are a cheap and easier way of keeping observed data. Photography will be used as a form of data collection method in order to remember all observed meaningful phenomenon.

#### **3.5.2 Direct Observation**

Observation enables one to be equipped with non-spoken human behavioral changes in relation to their current space and how they respond to the products and services offered. For instance, the preferred settings by the tenants, non-verbal expressions when guests interact with the space and the ergonomic standards of the present fixtures and equipment. Non participant observation required the researcher to observe without interfering with the on-going activities. For instance, this facilitated non-verbal data collection that was recorded using visual observation tools.

### **3.5.3 Sketches**

Sketches are a faster method of collecting inspirational data. The researcher intends to use pencil sketches to take drawings of the sites approximate interior plan, interesting structures, the display styles and landscape design.

### **3.5.4 Interviews**

Interviews are more effective since they explore views and beliefs openly. They are believed to provide deeper understanding on the investigated phenomenon and trigger expansive responses from the participants. They are also best at exploring sensitive issues as participants would find it insecure in a group setting (Gill K, Stewart, Treasure and Chadwick, 2008). Interviews will enable the researcher to obtain first-hand information from not only the selected sample but also top informants in the hotel industry. Questionnaires tend to limit participants to the set questions despite interviews which are open to new queries. This study undertook unstructured interviewing method.

### **3.5.5 Unstructured interviews**

Unstructured interviews don't reflect any preconceived theories and are usually performed with minimum or no organization. They can start with any simple starting question like, 'Can you please tell me what made you interested with these apartments,' progress to the next. It is therefore effective in an in-depth knowledge digging and where virtually not theoretical in the subject area (Gill P, 2008). These unstructured/informal interviews were used by the researcher to gather information. This interviewing method was so effective due to the fact that participants were comfortable with it as it didn't make them feel uncomfortable or interrogated. The information, offering clarity during misunderstandings, giving relative responses and also, getting sensitive information since the participants felt obliged to provide answers and not just sit in front of the interviewer in silence.

### **3.5.6 Secondary Data**

After data collection, the whole process of transforming and analyzing the data collected takes place with an aim of getting meaningful information, suggestions,

assumptions that will aid in decision making process. Data analysis based on the interview's response and analysis of the data collected.

### **3.5.7 Photographs**

The photos taken from the site showing variations in furniture set up, landscaping designs, exhibition and display and the interiors showing different angles, styles used, lighting, material finishes and coloring were sorted to identify images that were relevant to the study and critiqued for a descriptive presentation. The images show case the current existing conditions and pose a question on how they can be bettered.

### **3.5.8 Sketches and recordings**

The sketches of the site plan drawings and recordings from the interviews were analyzed through open coding.

## **3.6 Conclusion**

An investigative approach was extensively applied in the methodologies which was majorly qualitative in order to cover all areas of interest. Design and social methods were used to collect information like photography with data collection tools including non-participant observation, interview guides, photography and note books. The population was downscaled to a sample of 1 family consisting of 3 adults and a child with the data collected analyzed and presented as photographs, charts and narratives complimented by descriptions.

## **CHAPTER FOUR**

### **4.0 SITE ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS**

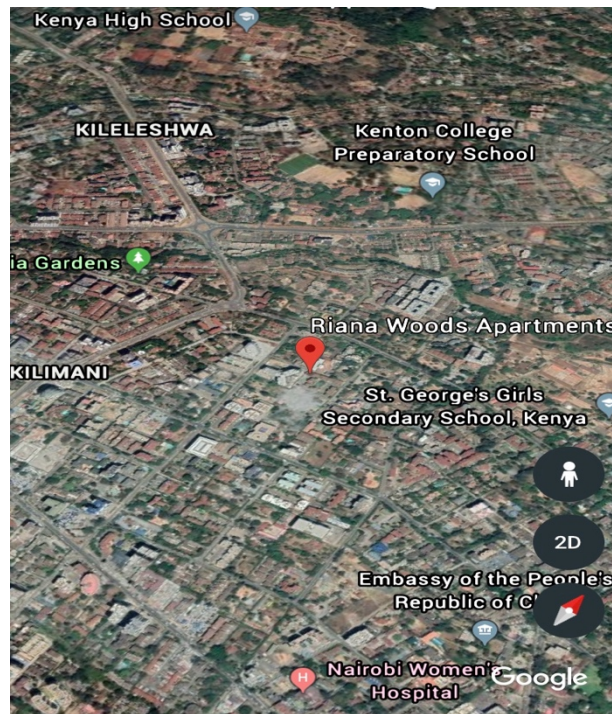
#### **4.1 INTRODUCTION**

Based on the study carried out, Riana Woods Apartment has not properly applied the concept of sustainability and African design in its design, however, it has a clear theme that cuts across its furniture designs, landscape and interiors. Chapter four focuses on data interpretation obtained from the primary research. Observation and interviews were mostly used as primary sources since the researcher found out that the tenants who lived their preferred unstructured interviews which were informal. Findings are based on interviews, photographs and observations. Photography enabled capturing of different aspects of the apartments in the four thematic areas that is landscaping, interior design, furniture and exhibition and display. Data was first assembled then transformed into a format that enabled data analysis and interpretation. The research input was to investigate application of bamboo and hyacinth in sustainable interiors to establish a Swahili theme. The barriers were also highlighted and recommendations suggested. Important notes were taken down during the interview and observation.

#### **4.2 Analysis**

##### **4.2.1 Site Location**

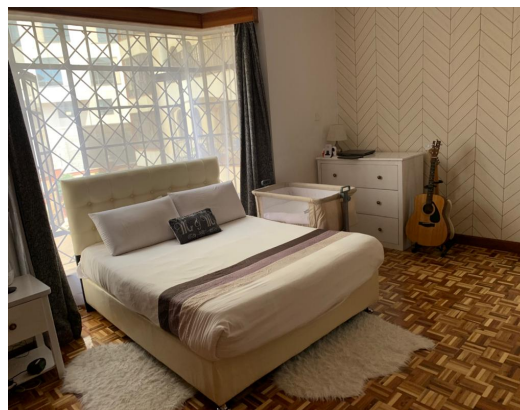
Riana woods apartments are located in Nairobi's Westland side, Kilimani area along Dennis Pritt Roads. It is approximately 4.6km from Nairobi's CBD built in the year 1990. It can be accessed through Valley road and Ngong' road. It is surrounded by schools, petrol stations, hospitals and Embassies. The apartments function as homes and Airbnb's. Within the compound, there is an ample parking area, swimming pool and a pool house. The study will be limited to the apartment space, exhibitions in the apartment and the pool area.



**Figure 4.1:** The aerial view of Riana Woods Apartments (Source: Google Maps)

#### 4.2.2 Interior Architecture

The type of interior space is Urban Modern. It is characterized by fusing various opposing and complementary traits. Minimalist modern, glamorous chic, ethnic heirlooms, edgy experimental designs all collide in a distinctively 21st Century setting.



**Figure 4.2:** Master Bed (Source: Author, 2019)

This particular interior space encompasses Large furniture which is uniformly sleek with low profile, trailblazing modern furniture designs with decorative accents, artistic

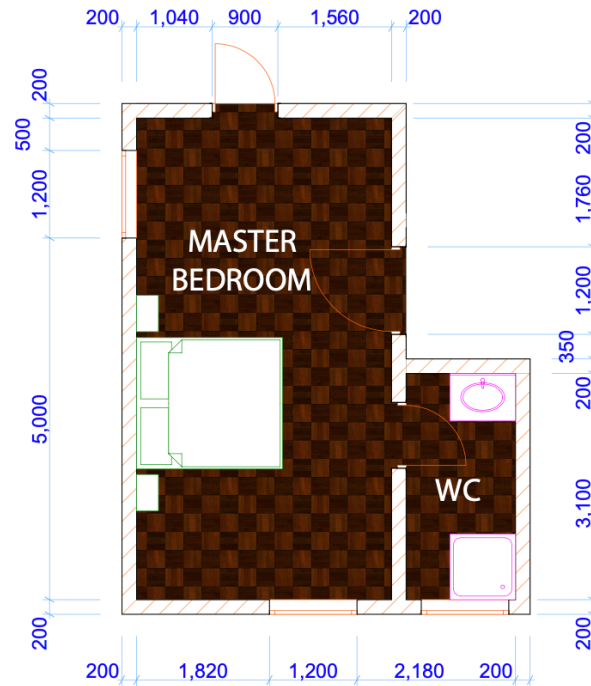
and creative expression which is done by adding elegant geometric designs, or vintage items with traditional embellishments.

The current bedroom space is in the direction of natural sunlight which has been controlled using sheers and windows from all angles of the room. There's also the option of artificial light, which is warm and the most welcoming option for residential areas. The type of interior light used in this specific space is the general lighting. This provides a uniform glow over an entire room space functionally rather than for aesthetic reasons. A flush ceiling light has been used as the source of light in this particular space.



**Figure 4.3 & 4.4:** Lighting fixtures (Source: Author, 2019)

The wall finishes used in the current space are wall paper, a minimalistic geometric pattern regular wall paper for the master bedroom, a non-woven metallic glitter off white and silver vertical stripped wall paper for the living room and pastel apricot plain wall paper for the dining area. The floor is a wooden parquet styled by a warm beige shaggy carpet in the living room and dining area to create a lush and fizzy surface. Smooth and flat ceiling finishes which have a classic and understated look but tend to show every imperfection easily.



**Figure 4.7:** Dimensioned Plan of the existing Interior Space (Source: Author)

### 4.2.3 Exhibition and Display

Exhibition is an organized presentation and display of a selection of items. Exhibition and display has been portrayed in various features of the current interior space, for instance;

- 5) The photo gallery in the living room.



**Figure 4.6:** Photo gallery (Source: Author, 2019)

A well-arranged photo gallery displaying pictures of a nuclear family set up paired with a few Knick Knacks and a wall hanging. The arrangement is symmetrical and aesthetically pleasing.

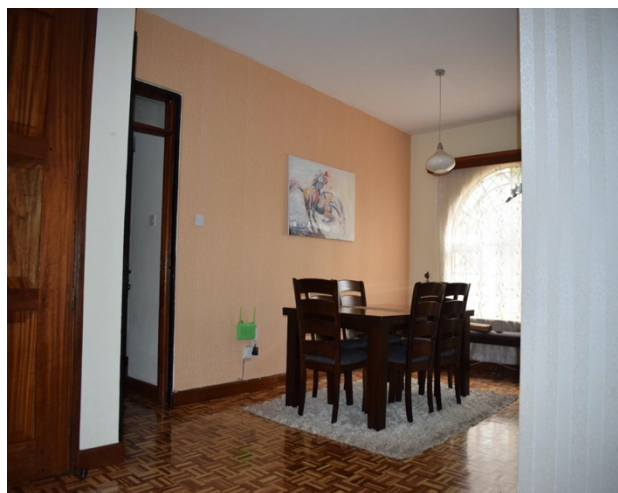
ii) The console table and the mirror at the main entrance (Living Room)



**Figure 4.7:** Console table (Source: Author, 2019)

A glass top bronze console table used to display a picture frame, home telephone, a few Knick Knacks, flower vase and used to place the house and car keys for easy access. This has been paired along with a beautiful beveled bronze mirror for a lush feel.

iii) A wall painting in the Dining Area



**Figure 4.8:** Wall Paining, Dining Area (Source: Author, 2019)

A beautiful piece of artwork has been displayed in the dining area to create a sense of style and complete the urban modern look.



#### 4.2.4 Furniture Design

The furniture at the current space consists of moveable pieces namely;

##### Wingback Sofa

2 Classical Wingback sofas add an antique touch to the Living room area. Typically, this sofa is accompanied by rounded arms and can be found in luxurious homes, this style of sofa is starting to disappear in modern times but it's not yet extinct. These specific Sofas are a dull printed grey but the mauve pillows add a pop of color to them.



**Figure 4.8:** Living Area Sofas (Source: Author, 2019)

##### Straight Back / Tuxedo Sofas

The general definition of a tuxedo sofa is when the backrest of the sofa is leveled/flushed with the height of the armrests. This is actually a pretty common sofa – by that definition, even a ‘Chesterfield’ sofa falls under this category (as well as round arm). This particular Straight back is a Grey Chesterfield Sofa with 8 white and grey assorted pillows.



**Figure 4.10:** Living Room Sofas (Source: Author, 2019)

## TV and Console table

Console tables are often used interchangeably with end tables (also known as sofa tables) because they are long, thin, and narrow, and fit nicely behind a sofa or in an entry way. If you need some extra dimensions a console table makes itself very useful. This specific one is placed under the mounted TV and it is a wooden, specifically walnut console table.



**Figure 4.11:** Console table and Tv (Source: Author, 2019)

## Walnut stool set

A stool is one of the earliest forms of seat furniture. It bears many similarities to a chair. It consists of a single seat without back or armrest with a base of either two, three or four legs. This particular stool comes as a set of three stools made of wood specifically walnut.



**Figure 4.12:** Stool set (Source: Author, 2019)

## Coffee table

A coffee table is generally used in a living room or seating area and placed in front of the couch. You can place food on it, drinks, or use it to display coffee table books, plants, or small knick-knacks. This specific one is a walnut coffee table with no decoration on it.



**Figure 4.13:** Coffee table (Source: Author, 2019)

## Carpet

Carpets are used for a variety of purposes, including insulating from cold tile or concrete, making a room more comfortable, reducing sound from walking and adding decoration or color to a room. There are many types of carpets, this specific one is a warm beige shaggy carpet with short fibers to create a lush and fuzzy surface.



**Figure 4.14 & 4.15:** Carpet (Source: Author, 2019)

## Console table and mirror

Console means a ledge on the wall acting as a support. Console tables are perfect pedestals for items of décor. Besides displaying Knick knacks on it, can be used to place additional light fixtures and can also be used for additional storage. This specific one is a glass top bronze console featuring a square mirror top.



**Figure 4.16:** Console table and mirror (Source: Author, 2019)

## Dining set

This is a brown mahogany dining set consisting of 1 rectangular table and 6 ladder back chairs. Ladder back chairs feature horizontal slats evenly spaced along the chair's back, creating a light, open look.

## 4.3 Landscape Design

### 4.3.1 Site Layout

The land at Riana Woods Apartments is generally flat, neighboring the popular media house, Royal Media. The site has proper space planning and landscaping design with most spaces utilized to the best of its ability. The site has been planned to be more of functional rather than aesthetically pleasing. As a result, most of the space is occupied by the parking lot and the only recreational space is the swimming pool.

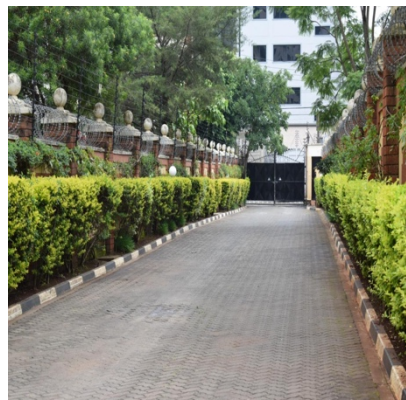
### 4.3.2 Climatic Analysis

Riana Woods Apartments are situated in Nairobi therefore experiences tropical upland climate which is hot temperatures during the day and cool temperatures during the

night. These seasonal climatic changes are evident throughout the year but are not as drastic as what is experienced in some countries like North America, for instance. The warmest months are usually from the start of the year – January to April. It warms up again in the month of October. The hottest season is usually around February and April with temperatures reaching around 78 F (26 C) during the day which drops to around 55 F (13 C) during the night. The coolest times in Nairobi are around July and August with highs around 70 F (21 C) and lows closer to 50 F (10 C). Nairobi has two distinct rainy seasons usually in March to around May and later in the month of November and December.

#### 4.3.4 Site Inventory

Little has been done in Riana Woods Apartments in terms of landscaping with indigenous plants linearly planted all around the swimming pool area. The plants are in pots and look healthy and taken care of. This has allowed the tenants to explore nature as they visit outside. The neighboring building however, blocks the sunlight from reaching the pool thus making the tenants less likely to swim, apart from other reasons such as the fact that the pool is at the front side of the compound.





**Figure 4.17 & 4.18:** Current pool area (Source: Author, 2019) **Figure 4.19 & 4.20:** Pool Area (Source: Author, 2019) **Figure 4.21** Compound area (Source: Author, 2019)

#### **4.3.5 Opportunistic Spaces**

The site has potential space that if well utilized, can produce good designs that are appealing thus encourage more tenants to spend time outside. The space includes the interior space balcony space and the pool area.

### **4.4 Presentation and Findings**

#### **4.4.1 Introduction**

With a competitive market that has more inventions geared towards customer satisfaction, customers have more options to select where to live with most of them having their preference based on the living experience as well as the type of ambience experienced according to the research carried out. The living experienced can be enhanced through effective manipulation of the interior's design, landscaping design, furniture and creative display of items that are in line with the proposed theme in meaning and style in this case, a Swahili design theme.

#### **4.4.2 General Analysis**

The tenants living in Riana woods apartments were interviewed with the researcher attempting to establish the factors that influences the tenant's choices of residential homes and what keeps them staying in this particular one. It is evident from the notes taken that customers mostly influenced to a large extent by the quality of experience offered followed by the décor in a place. In this case, the décor design involves the

interior design of the space that is; furniture, lighting, designs and finishes. This whole phenomenon was proved as interviewed tenants said so. The other main reason secondary to quality of experience that makes them loyal in living at Riana Woods is the security, service and ambience experienced which is a preferred relaxing atmosphere from everyday busy work schedule. Customer satisfaction and maintenance is further enhanced by good customer service by the service providers.

#### **4.4.3 Indoor Area**

The Interior used a European theme that can be traced from its interiors and furniture layout. The furniture and interior architecture have been done excellently and the delivery is exceptional. However, this resulted to a monotonous mood because most apartments around the Kilimani area are built with inspirations from the same theme. The finishes are all in great condition. The lighting is appropriate for the current Modern Urban style the Interior upholds. The furniture is in good condition, both the upholstery and the wooden frames.

#### **4.4.4 Landscape Design**

The apartments have a clear structure of landscape design. It has linearly planted indigenous plants at the edge of the pool area and shrub bushes at the peripheral of the perimeter wall and apartment wall. They occupy the area around the entrance signage too. The environment is clean and well taken care of. Outdoor lighting, including the parking area exists.

#### **4.4.5 Summary of data analysis/findings**

The researcher found the materials used in the interior not sustainable. In addition, there is lack of an African theme that cuts across the designs of furniture, interior space, exhibition and display and landscape. In that case, the apartments re-design will enable application of sustainable materials such as bamboo and hyacinth to create contemporary designs that add nature to the settling and more so, portray a Swahili interior design theme.

## **CHAPTER FIVE**

### **5.0 SUMMARY OF FINDINGS CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter offers solutions, recommendations and suggestions for further studies in research based on limitations stated earlier and the results obtained from the study. The study focused on investigating how effective sustainable materials of bamboo and hyacinth can be applied Riana Woods Apartments, Nairobi and states feasible recommendations focusing on the objectives stated earlier in chapter one. The researcher's main objective being to determine the use of renewable materials in the Interior Design of Kilimani apartments and propose ways in which they can be integrated with the theme of contemporary Swahili design. Literature review confirmed how great attention is being steered towards sustainable products including interior spaces. The study's conclusions and recommendations are as discussed below.

#### **5.2 Summary of findings**

Based on the research conducted, Riana Woods Apartments have a Western theme to them. Considering the respondents feedback, data analysis and synthesis, several factors have been identified which form the conclusion of the study and suggestions which when integrated, will enable promotion of sustainable interior design practices. The materials used in the apartment space are not sustainable per say. The furniture in place are all movable. The interior of the space is a Modern Urban style which doesn't capture the contemporary African theme. The landscape design has been done appropriately considering the space of the land. There is evidence of maintenance on the plants and the compound in general. The interior walls have been covered by wall paper finishes that are in pristine condition. The flooring is a wooden parquet that is in good condition and is cleaned often.

#### **5.3 Recommendations**

This study identified the following in the four areas that could receive attention in order to encourage and promote the use of bamboo and hyacinth in interior spaces. In addition, it also provides solutions to potential interior designers who are not yet



financially stable due to its availability and affordability. If well put in practice, the expertise would have positively impacted on the barriers identified in the study through their skills.

### **5.3.1 Interior Architecture**

#### **5.3.1.1 Theming in the Apartment**

Interior design makes both commercial and residential buildings be designed with user consideration with basic elements of interior design, furniture, landscaping and exhibition and display being well implemented. Interior architecture is the process through which the interiors of buildings are designed with all aspects of human uses of structural spaces (Interior architecture, 2012). With the current apartment design not having an African theme put in place, the study proposes the application of an interior design Swahili theme with its concept being applied on the wall partition finishes, ceiling and furniture designs.

#### **5.3.1.2 Color Scheme**

Color schemes of our homes can be changed completely in cases of complete transformation. Colors do not communicate aspects of personalities and brand in cases of companies. In addition, it has the power to produce psychological and physiological effects (Taylor M, 2013). According to Jill Morton, the founder of Colorcom and the author of Color matters for the home, “color is a very important component in interior design mostly viewed as overwhelming and intimidating due to its profound significance. Color addresses basic neurological need for stimulation; it is ‘hard-wired within us,” Says Morton. We intuitively love color and prefer colored interiors yet most individuals live in boring white boxes. For instance, most people are not afraid of color but lack confidence in making decisions of using them (Morton J, 2013).

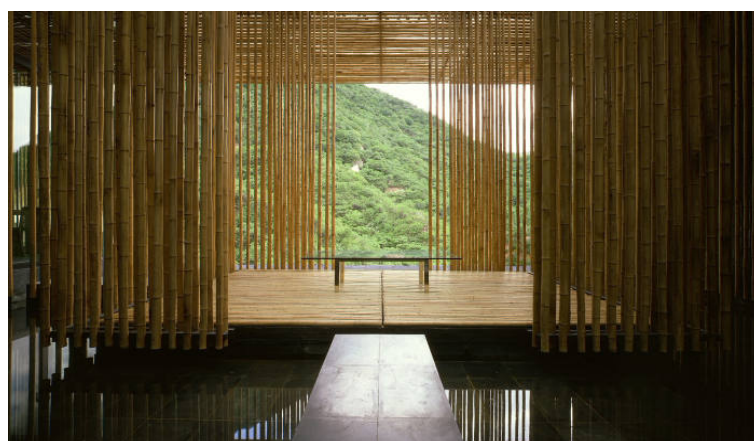
Using colors that range from whites to a multiple of golds and earthy tones work well in the proposed theme complimented with materials like metal and wood. Greens help to underline the view thus providing focus on the color framework. Gold looks rich and sophisticated, earthy tones are best in broken patterns to avoid looking heavy while red is effective with purest white hues. For instance, chalky hues of brown with glossy whites and reds create well defined Swahili schemes that look more natural and bring out other colors in the room as more bold/vibrant.



**Figure 5.1:** Swahili inspired color scheme (Source: [www.google.com](http://www.google.com))

### 5.3.1.3 Wall Finishes

Wall papers that blende well with the color scheme in meaning and style will give an extra interesting look in an inexpensive way. In the living room area, at the balcony, the researcher recommends the introduction of bamboo wall partition/dividers instead of the enclosed glass balustrade to establish the officially intended privacy and child safety function but also uphold the living green characteristic of the Sustainability theme.



**Figure 5.2:** Traditional Japanese bamboo room dividers (Source: [www.ft.com](http://www.ft.com))

#### 5.3.1.4 Floor Finishes

The interior Riana Woods Apartments is highly dependent on the flooring for perfect application of sustainability in terms of floor and wall coverings/wallpaper. The researcher therefor recommends the use of bamboo flooring. One of the most antiquated and versatile uses of bamboo are in the form of material used for flooring. The primary demand for flooring material is that it should be unaffected by environmental conditions such as expansion and contraction. Bamboo possesses all these properties. Even hardwood floors are prone to climate changes. Hence it is perfect for the construction of floors and home furnishing such as furniture and wall décor. Bamboo also has a tensile strength that is greater than that of steel. This is the reason why bamboo is used to construct houses in earthquake-prone areas.



**Image 5.3:** Bamboo Flooring Home Ideas (Source: Bob Vila)

#### 5.3.4.3 Access in Space layout

Space planning is a fundamental element of the interior design process. It begins with an in-depth analysis of how the space is to be used. The designer then draws up a plan that defines the zones of the space and the activities that will take place in those zones. The space plan will also define the circulation patterns that show how people will move through the space. The plan is finished by adding details of all the furniture, equipment and hardware placement. The plan is finished by adding details of all the furniture, equipment and hardware placement. (Design Rules Interior Design, “What is space

planning and how to create a space plan,” by Grant Pierrus, <https://interiorstylehunter.com/what-is-space-planning-and-how-to-create-a-space-plan/>).

The researcher recommends consideration of balance. Furniture arrangement is a balancing act. There are two types of balance you can achieve: symmetrical and asymmetrical. In this case, asymmetrical style can be used to balance unequal objects. In the living room, the large Sofa can be placed on one side of the room mirroring small pieces of art placed in niches (*Vidaka*) on the other side of the wall. As long as the objects complement each other in size, shape and color, they can still create balance in a room without having to be exactly the same in size or number. This can be applied in the dining area, for the purposes of creating a serene and peaceful feel.

#### **5.3.1.6 Ceiling**

The apartment ceiling is in a good state. The researcher proposes that the ceiling should be left as it is.

#### **5.3.1.7 Lighting**

The use of lighting can add to or subtract from the overall colors of a room or from only those surfaces the light is meant to enhance. Darker colors make a room feel smaller and cramped, while light-colored walls do the opposite. The illusion of space is defined by light reflected off of the surfaces of the walls. (Tim Anderson, December 10, 2018)

Currently, the types of lighting used in the apartment are ambient, accent, decorative and task. Ambient light means the light that is already present in a scene, before any additional lighting is added. It usually refers to natural light, either outdoors or coming through windows etc. It can also mean artificial lights such as normal room lights. In the living room, there is the ambient light from the balcony through the glass sliding doors and the windows. There’s also the chandelier which lights up the whole room during night time. There are also the accent lights on the walls which create a very sophisticated atmosphere and evoke feelings of meaning and importance to the images it displays. On the bed side tables in the bedroom are the task lights which help in naturally stimulating the brain. The contrasting light allows for the user to be more alert

and concentrated. This helps to see more details as the user works, creating higher quality results. In the dining room, a chandelier to make the room seem less overwhelming and to add a touch of personality.

The researcher proposes to change the fixtures to Swahili inspired lighting as the rooms are well and adequately lit.

### **5.3.2 Exhibition and Display**

The researcher recommends the following to enable application of a sustainable Swahili design in the apartment's exhibition and display practices.

#### **5.3.2.1 Wall Displays**

It is recommended that artworks and family portraits displayed in the Swahili set up be put in place. These displays can be made by making niches on the living room and dining room walls. A wall niche is a decorative box nested inside the wall. The niches won't be the ordinary western themed, these niches will be made using the Swahili inspired *Vidaka* in mind including, curved arches and mashrabiya design pattern on the wall to further enhance the effect and also break monotony. Proper planning for more organized displays will be an added advantage for good results.



**Image 5.4** Swahili wall display (Source: For the love of wonder, 2016)

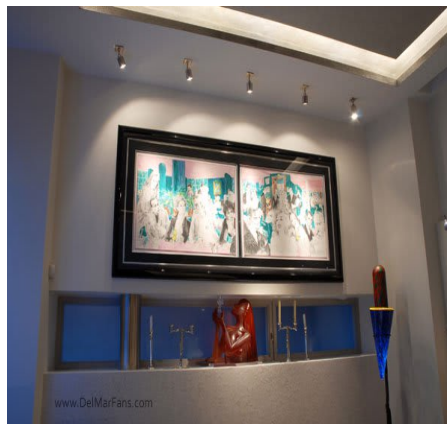
### 5.3.2.2 Display Stands

The display stands are recommended to be designed using Mahogany wood so as to give the Coastal feel and for additional strength of the display. The display stand will be a console made using the Swahili style of carving and will have the Arabesque pattern to portray the Swahili theme.

### 5.3.2.3 Display Lights

The current lighting in the apartment include wall lights that can act as display light. The researcher recommends that the lighting fixtures should be changed to Swahili inspired ones so as to create a coastal feel in the space.

Recessed lighting can also be used for for accent lighting depending on where you place them. The researcher recommends that its placed on the display stand and inside the *Vidaka* to create a wall washing effect to illuminate a beautiful portrait, a colorful paint design or display knickknacks.



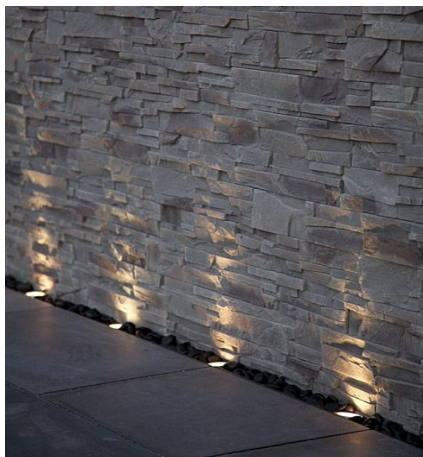
**Image 5.5:** Recessed lighting (Source: Pinterest, 2019)

### 5.3.3 Landscape Designs

Based on the apartments current state, little has been done as far as landscape design is concerned. With availability of unutilized spaces, tropical plants in pots can be placed in these areas. This can be done adjacent to the perimeter wall and next to the pool area.

The pool house can be converted into a bamboo-built structure so as to uphold the eco-friendly theme of using renewable materials. The pool house will still be fully equipped with washrooms and bathrooms completely fitted with vanity designs.

Outdoor structures are also recommended for kids and guests to enjoy the environment which is not the case currently. This includes a play area for the kids and garden benches as outdoor furniture ideal for enjoying your favorite peaceful spot, along a path, under a tree or among the flowers. For a good landscape design, the designer recommends outdoor furniture made from hyacinth reeds and bamboo to uphold the theme of sustainability in the design. A perimeter wall lighting is also recommended as it is more advantageous as opposed to the current lighting in that, it acts as security lighting. In the field of physical security, security lighting is lighting that intends to deter or detect intrusions or other criminal activity on a piece of real property. It can also be used to increase a feeling of safety. Lighting is integral to crime prevention through environmental design.



**Image 5.6:** Outdoor lighting (Source: [Lightingstore.eu](http://Lightingstore.eu))  
**Image 5.7:** Bamboo pool house (Source: [Phuketrenthouse.com](http://Phuketrenthouse.com))

**Image 5.8:** Outdoor furniture (Source: TJ Hughs)

**Image 5.9:** Play area for kids (Source: Garden sheds and summerhouses)

#### 5.3.4 Signage

The entrance signage needs to be renovated for clear vision and in addition, be in a position to portray the restaurant's Coastal theme in meaning and style. It is the major marketing tool for potential tenants and proprietors who have no idea what the apartments are offering. A bamboo light feature can be installed at the entrance. This can be done by putting up a laser cut screen, with the bamboo shape and the name 'Riana Woods Apartment' at the entrance, including a backlight for security purposes. Clear signage that is easy to interpret and easy to understand keeps you top-of-mind and draws people in on impulse.



**Image 5.10:** Tree outdoor wall screen (Source: wgoutdoorlife.com)

#### 5.3.5 Furniture Design

Sustainable materials of trees and plants displaying a Coastal interior design theme are recommended as the source of inspiration for furniture designs with the main material being hyacinth reeds. Other materials like wood can also be used as compliments for strength and creation of the framework respectively.



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## **APPENDIX I**

### **INTERVIEW GUIDE FOR TENANTS**

1. What is the major challenge you are facing at Riana Woods Apartments?
2. How do you use your home (rooms)?
3. Are there any special needs that need to be accommodated?
4. Do you have any hobbies, extra-curricula activities that need to be factored in?
5. What would you do if placed in a position to make changes?
6. What style(s) are you drawn to?

## **APPENDIX II**

### **OBSERVATION GUIDE**

#### **Interior Architecture**

1. Is there a dominant theme that has been incorporated?
2. What are the different areas in the apartment?
3. Which mood is portrayed in the entire interior space?
4. What materials have been used in the construction?

#### **Furniture Design**

1. Which setting has been incorporated in terms of the sitting arrangement?
2. What is the state of their furniture in terms of materials used and maintenance? Are they eco-friendly?

#### **Exhibition and Display**

1. Which units have been used for display?
2. Has human relationship with space been considered in the displays? Are the displayed items easily reachable?
3. Is their visibility clear?

#### **Landscaping**

1. Which style of landscaping has been employed? Symmetrical? Asymmetrical?
2. Are there any interesting features in the landscape design? Discuss