UNIVERSITY OF NAIROBI

College of Architecture and Engineering

School of Art and Design

---

BDS 413: PROJECT PAPER

(Interior Design Specialization)

# FUSION OF BIOPHILIC DESIGN AND ETHIOPIAN TEXTILES FOR HUMAN WELL-BEING AND RESTORATION IN RECREATIONAL CENTRES

**By:**

B05/44456/2017

Mwangi Lynnet Wanjugu

**Supervisor:**

Mr. Collins Makunda

A 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

Date of Submission: 14th April 2020

**DECLARATION**

I, Mwangi Lynnet Wanjugu, declare that this is my original work presented to the school of the Arts and Design and affirm to the best of my knowledge that this project has not presented in the past for the fulfilment of any degree or certificate course in any other learning institution.

Signature:  Date: 14th April 2020

Mwangi Lynnet Wanjugu

B05/44456/2017

This project has been submitted for examination with my approval as a University Supervisor.

Signature …… Date ……

Mr. Collins Makunda

Lecturer School of the Arts and Design

This study has been submitted for examination with my approval as the Director of The School of the Arts and Design, The University of Nairobi.

Signature …… Date ……

Dr. Lilac Osanjo

Director, School of the Arts and Design

**ACKNOWLEDGEMENT**

I would like to express my gratitude to my supervisor, Mr. Collins Makunda, who guided me throughout this project. I would also like to thank my family and friends who supported me and offered deep insight into the study.

## ABSTRACT

In a time where urbanization is taking over, biophilic design concept aims at incorporating natural elements into the built environment in order to regain the connection human beings have with nature. This then ensures that any design in the built environment has a positive effect on the physical and mental wellbeing of human beings.

In line with the global trend that is sustainable design, people are becoming more aware of the environment and therefore getting alternatives to materials that pollute the environment. Aside from that, African design is widely spreading throughout the world and designers are now more open to more cultural and diverse ideas. This study therefore looks at the three mentioned aspects and merges them uniquely to fit the proposed case study which is Miwaleni Springs Farm in Moshi, Tanzania.

**TABLE OF CONTENTS**

**LIST OF FIGURES**

**LIST OF TABLES**

## LIST OF ACRONYMS/ABBREVIATIONS

**VR** Virtual Reality

**BP** Blood Pressure

**EPA** Environmental Protection Agency

**ICT** Information and Communication Technology

## DEFINITION OF TERMS

**Biophilia**

An innate and genetically determined affinity of human beings with the natural world.

**Biomorphic**

A painted, drawn, or sculptured free form or design suggestive in shape of a living organism.

**Biophilic Design**

A concept used within the building industry to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions.

**Miwale**

(Swahili term) an indigenous plant belonging to the palm tree family found in the semi-arid landscape of Moshi, Tanzania.

# CHAPTER ONE

## 1.1 INTRODUCTION

In modern day world, with societal trends like urbanization, building and lifestyle, there has been a decrease in human interaction with nature therefore individuals seek out parks, gardens, and outdoor recreational facilities because they understand the personal health and wellbeing benefits that arise from 'contact with nature'. By promoting positive interactions between people and nature in the built environment, the physical and mental well-being of humans is improved. Biophilic design is a design philosophy that encourages the use of natural systems and processes in the design of the built environment (Kellert, 2008). It proposes that humans have an innate connection with the natural world and that exposure to the natural world is therefore important for human wellbeing. (Wilson, 2003). The idea of biophilic design then is to incorporate natural features and systems into the built environment in order to provide beings with their much needed exposure to nature (Kellert, 2008).

As straightforward as it may sound, this adding is extraordinarily difficult to achieve, given both the limitations of our understanding of the biology of the human inclination to attach value to nature, and the limitations of our ability to transfer this understanding into specific approaches for designing the built environment (Kellert, 2008). This study aims at looking into these characteristics of biophilic design, its impacts and its limitations in order to create a well-designed recreational facility that not only is for relaxation but also promoting health. Good biophilic design is more than just adding a potted plant or two but incorporating elements like natural lighting, vegetation, living walls, natural textures and material and nature views in order to provide a positive impact. This concept consists mainly of providing not only strategies but also a set of principles to design built environments. Many biophilic researchers have proposed elements and components, favorable settings, and space attributes to create better places for people's health.

By fusing Ethiopian aesthetics in the interior, and still maintaining the biophilic concepts, it is expected that the facility will have both the "African" perspective feel and modern design while at the same time achieving the wellbeing benefits related to contact with nature. The beautiful colors and luxurious textures of Ethiopian fabrics and furnishings will give this facility the edge it needs as these materials a mostly hand-woven exposing traces of handcraftsmanship.

The proposed site is a recreational facility located within the countryside of Moshi Rural District, Tanzania called Miwaleni Springs Farm. This facility not only offers activities like camping, swimming, hiking, bike riding, team building activities and a picnic site, but also has a bar and restaurant where one can visit even for a day. The area has a moderately large landscape where people can rent out for small functions like birthdays, company retreats among others. Incorporating both Ethiopian aesthetics and biophilic concepts into this facility will improve its aesthetic value and therefore draw more people towards the site.

## 1.2 BACKGROUND OF THE STUDY

Today's society is more urban, digital and fast-paced than ever before. The downside of this is the overall loss of our connection to nature and the outdoors. People with contemporary lifestyles in urban settings, spend their time in static environments, characterized by florescent lighting and air-conditioning, and a lack of reference to nature or natural patterns (Heijdens, 2005).

According to the Environmental Protection Agency (EPA), the average American spends 93% of their life indoors. 87% of their life is indoors, while another 6% of their life in automobiles. Making only 7% of their entire life outdoors. In Europe, statistics show that Europeans spend approximately 90% of their time indoors: in their homes, workplaces, schools, and public spaces. It is estimated that approximately 2/3 of this time is spent at home (Sarigiannis, 2013). In East Africa, the same is happening due to urbanization and technological advancements. In the case of children, the potential impact of Information and Communication Technology's (ICT) on children's health and happiness is a matter of growing public concern (Keeley, Little and Imchen, 2017), In adults, most work spaces are now being designed differently due to these findings. Principles of biophilic design have begun to gain prominence as the resultant benefits such as reductions in staff stress levels and consequently absenteeism.

## 1.3 PROBLEM STATEMENT

As designers, we have a role and an opportunity to positively affect the fundamental ways people interact with space. We can accomplish this by creating facilities that incorporate elements of the natural environment into the overall experience. (Green, 2016) Recreational facilities are expected to provide an environment where one benefits both in the body and mind because they aim at isolating the digitalized world while focusing on nature and outdoor activities. While Miwaleni offers this experience in terms of activities, not much attention has been paid to the actual designing aesthetics that may enhance this objective; encouraging the use of natural systems and

processes in the design of the built environment. There is therefore a need to enhance this environment with these biophilic concepts in order to maximize on the physiological and cognitive performance of exposure to biophilic indoor and outdoor environment.

## 1.4 OBJECTIVES

The main objective of this research is to determine how Biophilic Design can be integrated with Ethiopian aesthetics and methods of textile production, in order to provide comfortable and calming interior and exterior spaces in a recreational facility.

The specific objectives of the design are:

1. To determine how Biophilic Design influences the well-being of people through natural elements.
2. To identify the extent to which Biophilia has been used in the hospitality industry.
3. To carry out a situational analysis of Miwaleni Springs Farm and therefore identifying the necessary changes that need to be applied that will include Biophilic design
4. To propose a design that combines Biophilic aesthetics and Ethiopian textiles that will ensure both human well-being and comfort at Miwaleni Springs Camp

## 1.5 RESEARCH QUESTIONS

This paper seeks to answer the following questions:

1. How has Biophilic design influenced the well-being of human beings?
2. To what extent has biophilic design been applied in the Hospitality industry?
3. What changes can be made to Miwaleni that will best accommodate biophilic design concepts?
4. How can Biophilic Design be fused with Ethiopian aesthetics in the redesigning of Miwaleni Springs to achieve comfort and human well-being?

## 1.6 SIGNIFICANCE OF THE STUDY

This research project aims at improving the interior and exterior spaces of this facility and therefore will have a whole new aesthetic that will contribute to the increase if its guests. The working

conditions of this facility will be positively enhanced and therefore improve the wellbeing of even those working there. Guests at Miwaleni will also have a better experience due to the aspects of biophilic design that will have restorative effects to those seeking relaxation and comfort.

The researcher will also gain more knowledge on biophilic design, its impacts to human health and how it can be incorporated to the built environment.

## 1.7 LIMITATIONS OF THE STUDY

1. Distance may be an issue as the researcher has to make site visits.
2. Due to the timeframe provided by the institution, the research can only be carried out within six months.
3. Financial constraints may affect the research because of the location of Miwaleni Springs.

## 1.8 SCOPE OF THE STUDY

### 1.8.1 Geographical

The case study is Miwaleni Springs, a recreational facility located in Moshi, Tanzania. This area is in the rural part of Moshi town and is surrounded by a forest whose main tree is the "Miwale." The population of study will include the staff members at Miwaleni neighborhood key informants and guests.

### 1.8.2 Contextual

This study's focus will mainly be in the hospitality industry. It will be limited to the field of interior design where the researcher will look at how to improve the four components of interior design which include; interior architecture, landscaping, furniture and exhibition and display.

### 1.8.3 Conceptual

This study will limit its focus to Biophilic Design as a concept and how it promotes human wellbeing especially in recreational and restorative facilities. The study will also look at Ethiopian aesthetics, specifically in the textile industry and their methods of production and how has been used in the past in the interior design industry.

## 1.9 Conclusion

In this chapter, the problem statement and objectives of the study are outlined. It also explains in brief the concept, content and geographical aspects present in the case study.

# CHAPTER TWO

## 2 LITERATURE REVIEW

### 2.1 INTRODUCTION

This chapter contains a review of literature concerned with aspects of biophilic design in the built environment and how these principles have been employed in the past in promoting wellbeing and the restorative effects that nature has on humans.

### 2.2 Biophilic Design

Erich From, a philosopher and social psychologist coined the term biophilia (Hildalgo, 2014). While Fromm originally introduced the notion of biophilia, it became popular in Wilson's characterization: namely, as the hardwired emotional affiliation with life like processes. From a psychological perspective, a person can be restored from stress by being exposed to nature (Joye, 2011). Wilson defines biophilia as the innate urge of humans to affiliate with nature and other forms of life and life-like processes Restoration (from Latin *recreation, recreationis* = restoration, refreshment, and recovery), refers to the experience of both psychological and physiological recovery that is activated in specific environments (Pals et al, 2014). Virtual and direct relation to nature and other features such as water, music, and colorful surfaces can be beneficial for psychological and physical health because of the reduction of the stress they promote (Hildalgo, 2014)

#### 2.2.1 Well-Being as a Result of Biophilic Design

In an urban world of technology and industrial design, the fundamental connection that humans have with nature can sometimes feel all but lost. Biophilic design is an innovative way to harness this affinity in order to create natural environments for us to live, work and learn. By consciously including nature in interior design, we are unconsciously reconnecting, bringing the great outdoors into our constructed world. Designers can promote social interaction within spaces through this concepts (Hildalgo, 2014). The integration of biophilic design elements and principles within a built interior can create or enhance a positive and soothing environment throughout the installation of features that echo the natural world (Price and Skolits, n.d.).

In most cultures, both present and past, one can observe behavior reflecting a fondness for Nature. For example, tomb paintings from ancient Egypt, as well as remains found in the ruins of Pompeii,

substantiate that people brought plants into their houses and gardens more than 2,000 years ago (Grinde and Patil, 2009). Moreover, in most cities, trees are planted and parks established in order to improve the environment. A tendency to add elements of Nature seems to be a universal human feature; evident wherever manmade surroundings tend to remove humans from a natural setting, and where the people are sufficiently affluent to afford doing something about it. The behavior is, presumably, a response to the biophilic quality of the human mind (Grinde and Patil, 2009).

Over the past decades, an increasing number of studies have documented that experiences in, or, of nature can be beneficial for human health and wellbeing. Aside from that there has been empirical evidence that confirm these aspects of biophilia prove to enhance human's overall sense of wellbeing, with positive and therapeutic consequences on physiology.

A study was done by the Department of Environmental Health at Harvard T.H. Chan School of Public Health, U.S.A, where twenty eighth participants spent time in an indoor environment featuring biophilic design elements and one without, with the order of the visit randomized. In each visit, they experienced the environment for five minutes in reality and virtually by using virtual reality (VR). Wearable sensors were used to measure blood pressure, galvanic skin response and heart rate. Cognitive tests were administrated after each exposure. The indoor biophilic environment was associated with a decrease in participants' blood pressure. The overall differential effects for participants experiencing an indoor environment with biophilic elements versus none was 8.6 mmHg lower systolic and 3.6 mmHg lower diastolic blood pressure (BP). In addition, their skin conductance decreased 0.18 μS greater than when they experienced the non-biophilic setting. Short-term memory improved by 14%. Participants reported a decrease in negative emotions and an increase in positive emotions after experiencing the biophilic setting (Yin et al, 2018). Moreover, their findings indicate that participants experiencing biophilic environment virtually had similar physiological and cognitive responses as when experiencing the actual environment. This gives rise to the possibility of reducing stress and improving cognition by using VR to provide exposures to natural elements in a variety of indoor settings where access to nature may not be possible. (Yin, et al. 2018)

In another study by Roger S. Ulrich at the College of Architecture, Texas A&M University, 120 subjects first viewed a stressful movie, and then were exposed to color/sound videotapes of one of six different natural and urban settings. Data concerning stress recovery during the environmental

presentations were obtained from self-ratings of affective states and a battery of physiological measures: heart period, muscle tension, skin conductance and pulse transit time, a non-invasive measure that correlates with systolic BP. Findings from the physiological and verbal measures converged to indicate that recovery was faster and more complete when subjects were exposed to natural rather than urban environments. The pattern of physiological findings raised the possibility that responses to nature had a salient parasympathetic nervous system component; however, there was no evidence of pronounced parasympathetic involvement in responses to the urban settings (Ulrich et al, 1991).

There were directional differences in cardiac responses to the natural vs. urban settings, suggesting that attention/intake was higher during the natural exposures. However, both the stressor film and the nature settings elicited high levels of involuntary or automatic attention, which contradicts the notion that restorative influences of nature stem from involuntary attention or fascination. Findings were consistent with the predictions of the psycho-evolutionary theory that restorative influences of nature involve a shift towards a more positively-toned emotional state, positive changes in physiological activity levels, and that these changes are accompanied by sustained attention/intake (Ulrich et al, 1991).

Looking at biophilic needs as an adaptive product of human biology relevant today rather than as a vestige of a now-irrelevant past, we can argue that the satisfaction of our biophilic urges is related to human health, productivity, and well-being (Kellert, 2008). In order to improve people's mental health, environmental psychology and public health have provided enough evidence on the link between nature and well-being. The challenge for designers is to incorporate these theories and evidence into spaces where people live. Since the achievement of well-being is a public goal, the design of recreational spaces as restorative places should be urgently addressed by designers in the built environment.

Not all interior spaces can be designed to include all the principles of biophilic design, but there are often many contributory elements that will collectively enhance the interior and the well-being of those within it.

### 2.2.2 Patterns of Biophilic Design

Good biophilic design draws from nature in a manner that is equally inspirational and restorative without disturbing the functionality of the space to which it is integral (Ryan et al, 2014). "14

Patterns of Biophilic Design," a paper written by three members of the Terrapin Bright Green company, puts biophilic design in context with current interior and architectural practices and also presents biophilic design patterns. These patterns have been developed through extensive interdisciplinary research and are supported empirical evidence (Browning, Ryan and Clancy, 2014).

Many researchers have divided these patterns into three main categories namely *nature in the space*, *natural analogues* and *nature of the space* (Lerner and Stopka, 2016).

### 2.2.3 Nature in the Space Patterns

These Patterns address the direct, physical and ephemeral presence of nature in a space or place. This includes plant life, water and animals, as well as breezes, sounds, scents and other natural elements. Common examples include potted plants, flowerbeds, bird feeders, butterfly gardens, water features, fountains, aquariums, courtyard gardens and green walls or vegetated roofs. *Visual Connection with Nature*- A view to elements of nature, living systems and natural processes. They include:

*Non-Visual Connection with Nature*- Auditory, haptic, olfactory, or gustatory stimuli that engender a deliberate and positive reference to nature, living systems or natural processes.

*Non-Rhythmic Sensory Stimuli*- Stochastic and ephemeral connections with nature that may be analyzed statistically but may not be predicted precisely.

*Thermal & Airflow Variability*- Subtle changes in air temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments.

*Presence of Water*- A condition that enhances the experience of a place through seeing, hearing or touching water.

*Dynamic & Diffuse Light*. Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature.

*Connection with Natural Systems*- Awareness of natural processes, especially seasonal and temporal changes characteristic of a healthy ecosystem (Ryan et al, 2014).

### 2.2.4 Natural Analogues

Natural Analogues addresses organic, non-living and indirect evocations of nature. Objects, materials, colors, shapes, sequences and patterns found in nature, manifest as artwork, ornamentation, furniture, décor, and textiles in the built environment. These include:

*Biomorphic Forms & Patterns*- Symbolic references to contoured, patterned, textured or numerical arrangements that persist in nature.

*Material Connection with Nature*- Materials and elements from nature that, through minimal processing, reflect the local ecology or geology and create a distinct sense of place.

*Complexity & Order*- Rich sensory information that adheres to a spatial hierarchy similar to those encountered in nature (Ryan et al, 2014).

### 2.2.5 Nature of the Space

This addresses spatial configurations in nature. This includes our innate and learned desire to be able to see beyond our immediate surroundings, our fascination with the slightly dangerous or unknown; obscured views and revelatory moments; and sometimes even phobia inducing properties when they include a trusted element of safety. These are:

*Prospect*- An unimpeded view over a distance, for surveillance and planning.

*Refuge*- A place for withdrawal from environmental conditions or the main flow of activity, in which the individual is protected from behind and overhead.

*Mystery*- The promise of more information, achieved through partially obscured views or other sensory devices that entice the individual to travel deeper into the environment.

*Risk/Peril*- An identifiable threat coupled with a reliable safeguard. (Ryan et al, 2014)

## 2.3 EXEMPLARS

Below are a few designers who have implemented biophilic design.

### 2.3.1 Oliver Heath

Oliver and his team are a research led sustainable architecture and interior design practice focused on improving health and wellbeing in the built environment. They specialize in creating more productive, happier and healthier spaces to live and work in, by improving the human connections to nature.

Oliver Heath Design's human centered design incorporates Biophilic Design principles to deliver tangible and financial benefits.

*Vital Topics Installation*

This is a multisensory, biophilic installation at the University of Manchester. The installation made use of biomimetic carpets (mimicking the patterns and textures found in nature), modular furniture to offer comfort and retreat, natural imagery and scents and of course lots of plants. The space was warm and inviting with sheltered spots in which to work or relax.

*Figure 2.1 Vital Topics Installation (Source: https://www.oliverheath.com)*


*Figure 2.2 Vital Topics Installation (Source: https://www.oliverheath.com)*

They wanted to demonstrate that taking a human centered approach to workplace design and heightening our connection to the natural world can create tangible business advantages. A rise in productivity, creativity and wellbeing and a decrease in absenteeism and presenters can all be identified within offices incorporating biophilic design choices (Creative Conscience, 2019).

### 2.3.2 Bill Browning

Bill Browning is one of the green building and real estate industry's foremost thinkers and strategists, and an advocate for sustainable design solutions at all levels of business, government,

and civil society. Browning and his associates at Terrapin Bright Green, a green building and real estate consultancy and design firm with offices in Washington, D.C., and New York, is out to bring biophilia back into the mainstream as an economic necessity, instead of a cost burden, to improve production and satisfaction. Browning's perspective on sustainability and regenerative design goes deep, having worked for years with Amory Lovins at the Rocky Mountain Institute and as a founding board member of the U.S. Green Building Council (Binsacca, 2012).

Browning's steadfast mission is not to discourage building, but simply make it better. He quotes,

"We're not trying to take away buildings or not build, but instead build and operate in a way that replicates ecosystem scenarios that were in place before buildings came along, we want to design and provide places that increase daily contact with nature for the people who live or work there" (Binsacca, 2012).

From the Biophilic Concept, The Westin Hotels and Resorts is a good example of how Biophilic design can be incorporated in the hospitality industry. Browning and the Westin team focused on using biophilic design elements to promote better sleep and well-being of their guests.

### 2.3.3 The Westin Hotels and Resorts

In 2016, the Westin Hotels and Resorts opened Westin Buffalo, a 116-room hotel, 7,300 square feet of event space, a restaurant offering wood-fired cooking, and Westin's renowned fitness programs. However, unlike most new hotels, Westin Buffalo was built with biophilia in mind. Biophilia was a priority throughout the planning process, which makes Westin Buffalo truly noteworthy. Many buildings have been redesigned in a biophilic manner, but Westin Buffalo is part of a growing number of buildings that have biophilia built into them from day one. It's incorporating many of the concepts that Terrapin Bright Green considered in its Human Spaces 2.0 report, which found that biophilic design enhances the guest experience which in turn increases the value associated with the room cost, making it beneficial for both the hotel and guests. At Westin, they are using nature to both improve guests' experience and connect them to their destination.

#### *2.3.3.1 Characteristics*

A noteworthy detail is the hotel's meandering pathways; since straight lines do not exist in nature, these curved paths help to reinforce the natural connection.

In addition, Westin has maintained vertical gardens in public seating and lounge areas.

*Figure 2.3 Westin Buffalo Lounge. Source: (https://www.hospitalitydesign.com)*

*Figure 2.4 Westin Buffalo Room (Source: https://www.hospitalitydesign.com)*

The hotel also features abundant use of textured wood, incorporates planted walls, soaring banks of windows and exposed wooden beams into its common areas and decorates its guest rooms with carpets, walls and art suffused with earthy tones and replicating patterns of nature.

Some of the Westin locations also have lighting technology that mimics the sun at morning, noon, and night to tune up the circadian rhythm and combat jet lag which is a major aspect in biophilic design. In relation to human well-being, studies show that just a weekend of camping under natural light is enough to reset our body's internal clocks.

## 2.4 SUSTAINABILITY: REPURPOSING WOOD PALLETS

Pallet recycling is not a new activity. In fact, the industrial recycling of pallets emerged in the 1960s and grew rapidly in the 1980s and 1990s (Bush, Reddy and Araman, 1996). Most wood pallets can be reused and repaired multiple times, aside from a small proportion designed for single use. Reusing the pallets saves trees, energy and diverts useable materials from landfill.

Pallets that can't be reused can be recycled into a range of wood-based products. There are financial incentives to reuse pallets, with many producing companies requiring deposits on pallets, to encourage higher return rates. Investing in more expensive multiple-use pallets also offers long-term savings through an extended lifecycle.

Benefits of Pallet Recycling

1. **Environmental Effects**

Recycling pallets is the most eco-friendly way to dispose of unwanted wood. Once collected, your unwanted pallets may be broken down and refurbished into new, durable ones where they will remain in the pallet network for years to come. This process cuts back on the overproduction of brand new pallets and reduces the disposal of perfectly good resources.

2. **Health and Safety**

Keeping broken wooden pallets around a depot or workspace can lead to serious health and safety concerns. Not only do they pose a fire risk, but employees are also more likely to have an accident and injure themselves in an unsafe environment. When pallets are consistently repaired by recycling and repurposing processes, you are ensuring that pallets are in good working condition for the next customer.

3. **Become More Sustainable**

**Exemplars**

**Tembosign Company**

This is a small scale company based in Dar es Alam Tanzania that deals with branding, printing, fabrication woodwork and interiors.

Tembosign’s designs, for both interior and exhibitions stands utilize wood from pallets. The following images show some of their designs:

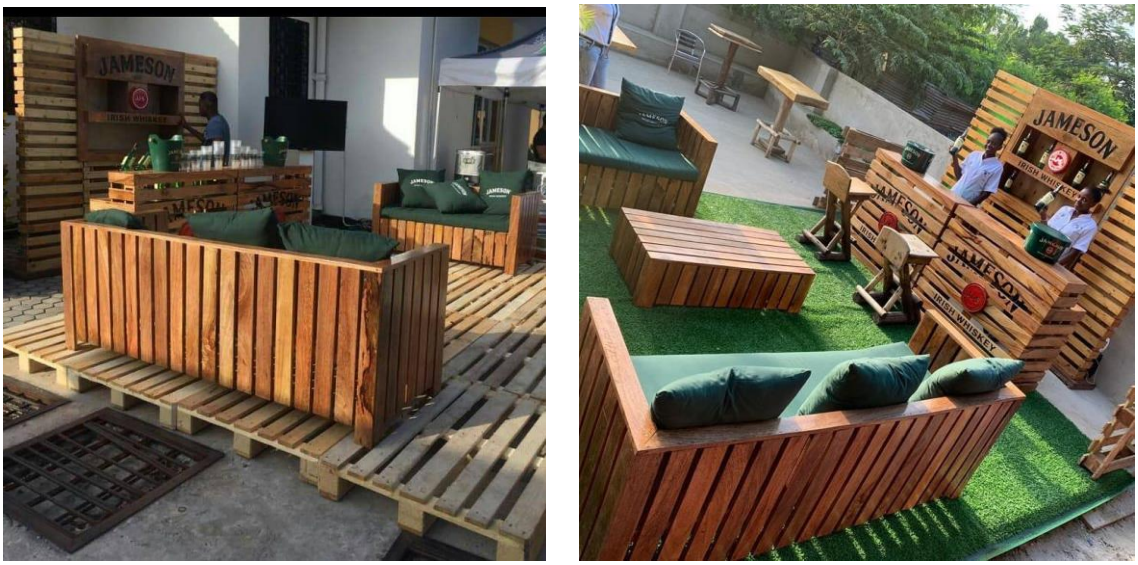



*Figure 2.5 Jameson Moveable Bar and Lounge (Image Source: tembosign.co.tz)*


*Figure 2.6: Jack Daniels Exhibition Stand (Image Source: tembosign.co.tz)*

*Figure 2.7 Pellet Kitchen (Image source: tembosign_co)*

*Figure 2.8: Pallet Staircase (Image Source: tembosign.co.tz)*

## 2.5 ETHIOPIAN TEXTILES

Africa in general has a rich history of textile production. Fabrics in the African continent play an important role in the lives and ceremonies of many traditional and indigenous communities. Not only are these intriguing patterns used in clothing but have now evolved and therefore seen in interior spaces such as in furniture upholstery, interior decoration and even on wallpapers. These textiles are made from substances like cloth, raffia (fibers from a type of palm tree), bast (fibers from plant stalks soaked in water, softened and woven into linen), and tree bark. Some cultures use wool and silk. From these fibers, fabrics may be woven with colored threads or dyed after weaving is completed (Przybylek, 2014).

**From the Ethiopian perspective, below is a designer who bases her work on textiles that originate from Ethiopia in both the method of production and design.**

### 2.5.1 Hana Getachew

Hana is a Brooklyn based designer who started Bole Road Textiles out of a desire to merge her love of Ethiopian hand-woven fabrics with her career in interior design.

Hana was born in Addis Ababa, Ethiopia. After a few years in Montreal, her family settled in New York. She graduated with a degree in interior design at Cornell University. Before starting her own business, she was formerly Associate Principle at Studios Architecture in New York. During her eleven years at that firm, Hana realized her affinity for bright colors and graphic patterns was a result of her upbringing in a home filed with amazing traditional Ethiopian textiles. Her designs for Bole Road Textiles are an homage to that cultural inheritance and a reflection of her own personal global modern aesthetic.

1. Design Process

Each of her signature products begins with a concept drawn from Ethiopia's cultures and natural beauty, Hana sketches ideas for patterns and repeats, playing with color schemes throughout the process. With her signature look in hand, she then builds out the rest of the collection with solid color pillows and more modern designs while still embracing the aesthetic of the collection and design concept. The designs are digitally recreated before being sent out to Bole Roads partner artisans in Ethiopia for weaving.

In addition to original designs, she also curates and reuses traditional Ethiopian motifs, often re-coloring them to create a modern and fresh palette that complements her collections. It's a wonderful example of Bolé Road's modern-meets-traditional aesthetic.

2. Materials

Bole Road Textiles uses many different yarns in their products each of which is common to traditional Ethiopia textiles. The most common being the Ethiopian cotton, which is known for its especially thick and soft texture. It's a softness you feel in their pillows, throws, napkins and table runners.

All of their Ethiopian cotton is processed by hand from start to finish, from harvesting, through the separating, and finally the spinning. It's common to see tiny flecks of leftover plant fibers in cotton fabrics that have been hand spun. They don't mind seeing these tiny traces of the process in their textiles, especially since they're traces of handcraftsmanship. Though, in their case the

hands belong to craftswomen. While weaving is traditionally performed by men, women typically spin cotton in Ethiopia.

In addition to their staple hand spun cotton, they also experiment with synthetic yarns, including polyester, rayon, acrylic and machine fabricated cotton. These synthetic yarns have long been used to create the bold and intricate flourishes on traditional Ethiopian textiles and clothing.

*Figure 2.1 Weaving process. Source: https://boleroadtextiles.com*

3. Collection

*Modern Heritage Collection*

For this collection, they went back to their roots. It was first launched in 2015. He patterns and palettes were simple and understand exploration of contrast and texture.

*Figure 2.2 Hana Getachew's Modern Heritage Collection Source: https://boleroadtextiles.com*

## 2.6 DESIGN PROCESS

The new design process flow was developed to help give a more streamlined approach to our design process.

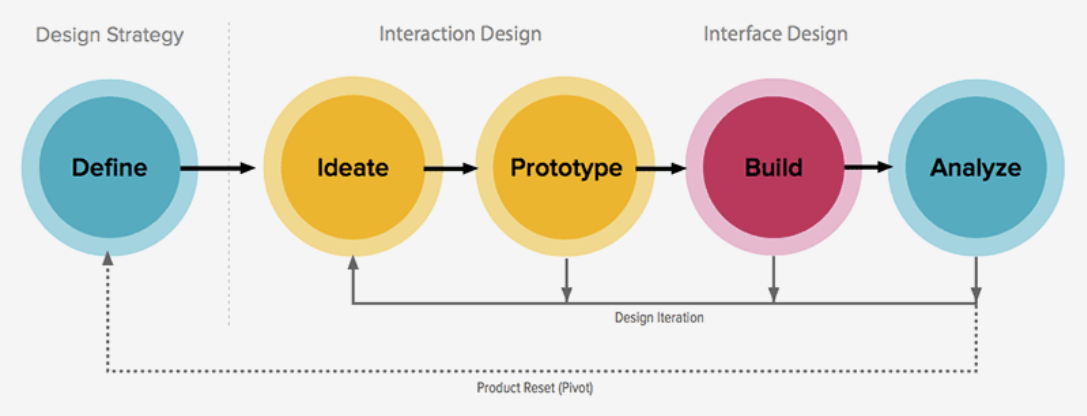
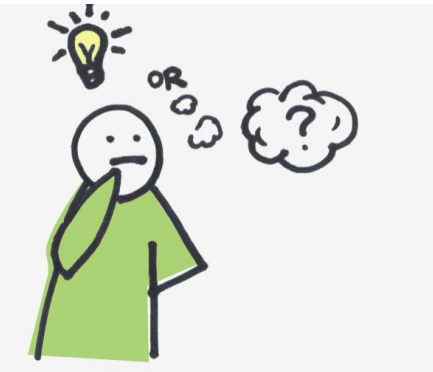



*Figure 2.3. The Design Process (source: https://zurb.com/)*

1. Define




One must *define* what they plan on creating this includes defining user needs and goals plan to accomplish. In this case the problem statement clearly elaborates the objective of this project.

2. Ideate

Following the problem statement, this study will execute this stage by coming up with ideas by generating sketches, drawings and otherwise developing a visual flow of the end result. This will act as the skeletal system that will be developed throughout the design process.

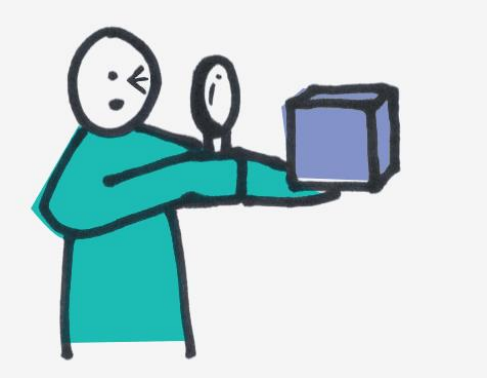
3. Prototype

At this stage, the skeletal sketches will be fleshed out and turned into actual models in order to test the design. This will assist in interacting with the design therefore providing a clear and elaborate assessment of what can and cannot work.

4. Build

All information gathered during prototyping will contribute to the building of the actual design. At this point, the final plans and designs are therefore established.

5. Analyze



At this point, the final designs are studied in order to get final insight which is necessary in the design project.

## 2.7 CONCLUSION

The science supporting biophilic design is still emerging. In many ways, it could be argued that the research is really just corroborating the rediscovery of the intuitively obvious. Unfortunately, too much of our modern design is oblivious to this profound knowledge (Browning, Ryan and Clancy, 2014). Biophilic design, as a fundamentally different approach to the built environment, takes on special meaning for practitioners in the field. The impulse to explore an idea through space, materials, and light is what motivates the creation of interior spaces, and inspiration can emerge from both natural and human experience. Aside from the biophilic concept of design, African textile design pieces and accessories also add some elegance and touch to interior spaces. The elements found in these fabrics have interesting shapes, arrangements and method of production that have not been done 'consciously'. The blend of colors and various sizes of these elements (motif) give a completely new outlook to designs (Acquaye, Sawyerr and Kusi, 2018). By conducting this research, the researcher will be able to identify the gaps in Miwaleni springs and propose a concrete solution that will best fit the location.

# CHAPTER THREE

## 3 RESEARCH METHODOLOGY

### 3.1 Introduction

According to Kothari (2004), research methodology has many dimensions and research methods constitute part of the research methodology. He stresses the importance of considering the logic behind each research method chosen. He further states that explaining why a certain method has been chosen enables the researcher or others to evaluate the research results.

The contents of this chapter will include the target population and the methods of sampling. It will also highlight the data collection methods. A situational analysis will be made to identify the necessary changes that need to be applied that will include both Biophilic Design and Ethiopian aesthetics of Miwaleni springs camp. An appropriate design will be proposed that combines Biophilic aesthetics and Ethiopian textiles that will ensure both human well-being and comfort. A follow up intervention will be arranged to guide the implementation of the proposed changes.

### 3.2 Research Design

This research used qualitative research methods to acquire the necessary information to conduct the project. Qualitative research methods helped to gain the insight into the process involved in co-construction of meaning, lived experiences, cultural rituals and day to day practices. Qualitative methods such as focus groups and interviews, as well as participant observation, have the potential to play integral roles for academic endeavors in terms of the formulation of questions, building operational definitions and designing research instruments (Atkinson, 2017).

### 3.3 The Study Population

Participants of the study are the group of population that meets a designated set of criteria. Groove, (2003) describes population as all the elements that meet the criteria for inclusion in the study. Thus comprised workers at Miwaleni camp and key informants in the neighbourhood.

### 3.4 Sampling Methods

#### 3.4.1 Random Sampling

A selected number of guests were interviewed during this process. A sample of about 15 people of which included employees and guests of Miwaleni were interviewed to get insight of the recreation facility.

*Table 1: List of Participants and Sampling Methods*

| Participants | Number | Sampling Method |
|---|---|---|
| Owner of Miwaleni Springs | 1 | *Voluntary sample* |
| Guard | 1 | *Convenience sampling* |
| Waiters | 2 | *convenience sampling* |
| Guests | 9 | *Systematic random sampling* |
| Local neighbours | 2 | *Systematic random sampling* |

## 3.5 Methods of Data Collection

Qualitative methods such as questionnaires and interviews, as well as participant observation, have the potential to play integral roles for academic endeavors in terms of the formulation of questions, building operational definitions and designing research instruments (Atkinson, 2017).

### 3.5.1 Data Collection Procedures

1. **In-depth interviews**

In-depth interviews were conducted with purposively selected persons in Miwaleni and it included the owner, and those working in at the recreational center.

The purpose was to gather information that helped in understanding the actual gap and perceived improvement. An interview guide was used to collect the information from the study participants. An observational checklist was developed and included relevant items regarding the recreational centre. The interview guide was made up of several questions about perceived well-being related issues and design.

2. **Photo Elicitation and Photography**

*Photo elicitation*

This is the use of photographs to generate verbal discussion. (Thomas 2009). The visual images can be produced by the informant or by the researcher. Photo elicitation is now a widely known and a frequently used technique which involves using one or more visual images in an interview and then asking participant's to comment on the visual images used. The aim was to promote more direct involvement of the informants in the research process and to encourage and stimulate the

collection of quantitatively and qualitatively different information to that obtained in conventional interviews. (Bigante 2010)

Pictures from Miwaleni Springs Farm were used to get opinions on the site and relate it to how the respondents react to the site's environment. This enabled the researcher to understand how natural elements in building design affects human well-being.

The difference between conventional interviews and photo elicitation lies in the way participants respond to the symbolic representations in the photographs. The parts of the brain that process visual information are in evolutionary terms older than the parts of the brain that process verbal information; therefore, visual images evoke deeper parts of human consciousness than words do. (Harper, 2002).

*Photography*

Photographs can be seen as a form of storytelling, exploring narrative, and providing insight into memory and identity construction. Photographic images were produced during the research process (Harrison, 2002).

Through photographs, the researcher was able to collect and analyze the site keenly and still refer to the photos even after conducting a site visit. The use of photography in this study enabled better presentation of the research as the problems were identified by visual representation.

**3. Immersion**

This is a qualitative research strategy that involves the researcher interacting with the people or place of study and therefore experiencing the case study first hand while collecting information. It is also referred to as 'participant observation'.

The advantage of immersion, is that the researcher gains more qualitative information about a subject matter than through any other method. However, it may take a while to set up and carry out depending on the case study. In this case, experiencing Miwaleni, the recreation facility, even for a day was the best way to collect information on this site. The researcher was able to understand the needs of anyone accessing the area and how biophilic design were incorporated to make the facility even better than it already is.

### 4. Questionnaires

This entails a set of printed or written questions with a choice of answers, devised for the purposes of a survey or statistical study.

In this study, self-administered structured questionnaires were used to collect data from the clients as they are less intrusive than interviews. It also helped to reach to some stratum that are not easily accessible and even harder to get an interview with them.

**Limitation:** Many respondents found filling of questionnaires cumbersome and therefore it took more time for them to send their responses.

## 3.6 Data Analysis Tools

This is where the researcher encoded the information by listing emerging ideas, drawing relationship diagrams and identifying keywords used by respondents frequently as indicators of important themes. This process helps in getting final conclusions to the problems. In this study, in-depth interviews were analysed using content analysis guideline described by Elo and Kyngäs, (2008).

The following stages took place during data analysis:

**Data Preparation**

The first stage of analyzing data was data preparation, where the aim was to convert raw data into something meaningful and readable. It included four steps:

*Step 1: Data Validation*

The purpose of data validation was done to find out, as far as possible, whether the data collection was done as per the pre-set standards and without any bias. This took a four-step process, which included;

- Fraud, to infer whether each respondent was actually interviewed or not.
- Screening, to make sure that respondents were chosen as per the research criteria.
- Procedure, to check whether the data collection procedure was duly followed.

- Completeness, to ensure that the interviewer asked the respondent all the questions, rather than just a few required ones.

Step 2: Data Editing

Typically, large data sets include errors. For example, respondents may fill fields incorrectly or skip them accidentally.

To make sure that there were no such errors, the researcher conducted basic data checks, checked for outliers, and edited the raw research data to identify and clear out any data points that could hamper the accuracy of the results.

Step 3: Data Coding

This is one of the most important steps in qualitative data preparation. It refers to grouping and assigning values to responses from the interviews.

In this study, during analysis, the researcher dealt with simplified age brackets, rather than a massive range of individual ages.

## 3.7 Methods of Data Analysis

### Visual Analysis

Visual analysis is used to communicate how the aesthetic or formal qualities of an image relate to seemingly relevant ideas, histories, narratives, politics, cultures, affects, and/or experiences. In this study, the photos of Miwaleni Springs Farm were included, whereby the researcher gave a detailed interpretation of how the space has been utilized.

### Content analysis

This is a research tool used to determine the presence of certain words, themes, or concepts within some given qualitative data (i.e. text). Using content analysis, researchers can quantify and analyze the presence, meanings and relationships of such certain words, themes, or concepts. Researchers can then make inferences about the messages within the texts, the writer(s), the audience, and even the culture and time of surrounding the text (Kyngas, et al. 2014).

Data from the in-depth interviews and focus groups was analyzed through content analysis. This included:

- Describing attitudinal and behavioral responses to communications made by participants.
- Revealing patterns in communication content.
- Analyzing focus group interviews and interview questions to complement quantitative data.

**Thematic Analysis**

Thematic analysis is the process of identifying patterns or themes within qualitative data **(**Clarke and Braun, 2013).

To identify the patterns within the qualitative data from Miwaleni Springs, specific ideas within the qualitative data were coded and then major themes were grouped into an overarching theme. Finally, by using thematic analysis, data was interpreted to make sense out of the themes.

## 3.8 Logical Framework

*Table 2. Logical Framework*

| | | | | |
|---|---|---|---|---|
| 1. **Objective 1:** To determine the ways in which Biophilic Design influences the well-being of people through natural elements. | | | | |
| **Data Needs** | **Data Source** | **Data Collection Tools** | **Analysis Method** | **Expected Output** |
| The effects of incorporating biophilic design to the built environments. | Literature | Literature Review | Content Analysis | Knowledge on how biophilic design relates to human wellbeing. |
| **Objective 2** To identify the extent to which Biophilia has been used in the hospitality industry. | | | | |

| **Data Needs** | **Data Source** | **Data Collection Tools** | **Analysis Method** | **Expected Output** |
|---|---|---|---|---|
| Determining whether other facilities in the hospitality industry have employed biophilic design, and if so, in what way. | Literature | Literature Review | Visual Analysis<br>Content Analysis | Knowledge through exemplars of facilities that have incorporated biophilic design. |
| **Objective 3** To carry out an analysis of Miwaleni Springs Farm and therefore identifying the necessary changes that need to be applied that would incorporate biophilic design. | | | | |
| **Data Needs** | **Data Source** | **Data Collection Tools** | **Analysis Method** | **Expected Output** |
| Features of the site within the four thematic areas of Interior Design. | Miwaleni Springs Farm.<br>People | Photography, photo elicitation, in-depth interviews, immersion. | Visual Analysis<br>Site Analysis<br>Narrative Analysis | Detailed analysis of Miwaleni Springs Farm |
| **Objective 4** To propose a design that combines Biophilic aesthetics and Ethiopian textiles that will ensure both human well-being and comfort at Miwaleni Springs Camp | | | | |
| **Data Needs** | **Data Source** | **Data Collection Tools** | **Analysis Method** | **Expected Output** |
| Design proposal that will include, Interior Architecture, Exhibition, Landscape and Furniture design. | Literature | Literature Review | Needs Assessment | Recommendations for a new and improved Miwaleni Springs farm. |

## 3.9 Data Presentation Methods

### Photographical Representation

Primary data collected during this research are represented in form of photographs. These images give a clear and detailed representation of the site involved. Detailed descriptions are also added next to the picture for better understanding.

### Graphs Pie Charts

Charts used in this report provide a quick visual impression of data and readers can easily interpret since they have a striking visual impact.

## 3.10 CONCLUSION

The qualitative methods were best suited for this study and provided a rigour of the study because all data were logically and systematically analysed using inductive coding and categorization. The recruitment method was done well to ensure data quality. Triangulation also ensured broader views from the participants. Keeping different types of personal notes as measure of an audit inquiry consistent ensured dependability of the results. The study encouraged a thorough iterative questioning to follow-up on proceeding comments that are not clear. Coexisting analysis followed up on emerging findings and this confirmed data saturation and where no new findings are recognized.

# CHAPTER FOUR

## 4 SITE ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

### 4.1 4.1 Overview

This chapter will look at the geographical analysis of the site, the structure of the recreational facility, both interior and exterior and also the surrounding's climatic condition. The analysis will be done based on the four thematic areas which include Interior Architecture, Furniture, Landscaping and Exhibition and Display. This chapter will also contain an analysis of the primary and secondary data obtained from the data collection methods mentioned in chapter three.

### 4.2 Qualitative Analysis

#### 4.2.1 Geographical Location


*Figure 4.1. Geographical Map Location (Source: Google Maps)*

Miwaleni Springs Farm is located on the countryside of Moshi Rural District in the Makuyuni ward of Kilimanjaro Region in Tanzania. The site is on a two and a half acre piece of land off Moshi-Dar es alam road by about 7 kilometers.

Miwaleni Springs is a recreational site that offers many activities the major one being camping and bike riding. The area acts as a stop for long distance bike riders who visit the place and camp overnight. It is positioned in the middle of a semi-arid landscape surrounded by a large forest with indigenous tress, the main one being the Miwaleni Tree, hence the name. The forest also

acts as an activity zone where guests go for long distance forest hikes lead by a guide provided by the facility.

Aside from the above mentioned activities, the land also serves as a space for hosting events such as birthdays, weddings, picnics and many more.

The front area consists of a driveway which leads up to the main building that includes a reception area, kitchenette, changing room, storage room and a manager's office. The structure is made of concrete blocks and an aluminum roofing. The interior of this building is not complete. The floors obtained the original rough texture of the concrete while the walls have been left with only one coat of white paint. The design composes of an open ceiling where the wooden beams and roofing is exposed. The landscape of the area is covered with grass that extends from the parking all the way to the swimming pool area which is bordered by concretes blocks.

### 4.2.2 Landscape

This is the main feature of the site. Because it is a camp site, it requires a large open area to accommodate as many campers as possible. The site is also used for any functions therefore also requires a big space to accommodate events such as weddings, birthday parties, team building sports such as tag of war, football and the like.

From the main entrance, Miwaleni is 'gated' with a temporary log that is manually controlled. No proper signage has been placed to show arrival to the destination. From there, is an open landscape that is usually used as a parking lot.

*Figure 4.2. Parking Lot (image source: author 2019)*

After the parking lot contains a brick pillar that lead to a driveway leading towards the entrance of the first structure. This building contains the reception area, changing room, manager's office, kitchenette and a toilet facility. The driveway is surrounded by assorted indigenous plants and bushes.

*Figure 4.3. Driveway 2 (image source: author 2019)*

*Figure 4.4. Driveway (image source: author 2019)*

After the building, there is a small pathway that leads to the bonfire pit and pool area.

*Figure 4.5. Slab Pathway (image source: author 2019)*

*Figure 4.6. Bonfire Pit (image source: author 2019)*

Right next to the pit contains another structure; a thatched house. This building has an extension that acts as a veranda and a ‘shade’ for when it rains.

*Figure 4.7. Thatched House (image source: author 2019)*

The swimming pool is also on this side of the landscape. It covers about eighty square meters of the space.

*Figure 4.8. Swimming Pool (image source: author 2019 2019)*

*Figure 4.9. Path to the Pool/Bonfire Pit (image source: author 2019)*

The other section of the landscape is not as busy as the rest of the area because that is where most tents are pitched.

*Figure 4.10. Camping Area (image source: author 2019)*

*Figure 4.11. Temporary Pergola (image source: author 2019)*


Site Inventory of Existing Landscape

**Below are other pictures taken of the general site appearance**

*Figure 4.12. Picnic Area (image source: author 2019)*

*Figure 4.13. Bike area (image source: author 2019)*

## Lighting

The electricity line only runs through the entrance of the building therefore use oil lanterns around the campground. An extension is also used for any other electricity needs.

### 4.2.3 Furniture

The existing furniture is mostly outdoor furniture and are all functional. Each type serves its own purpose. The material used in making the furniture at Miwaleni Springs is wood. Some of the furniture pieces are unstable and weak due to long term use therefore the wood has worn out.

Picnic Benches

Aside from being a campsite, the facility also hosts picnics for interested guests. These benches are essential for the said activity.

*Figure 4.14. Picnic Benches (image source: author 2019)*

Sun Loungers

Located near the poolside, this furniture piece is used for sun basking and contains a very simple design.

*Figure 4.15. Sun Loungers (image source: author 2019)*

## Outdoor Patio Seats

There are two designs of this furniture. Type one is mainly used around the camp fire at night while type 2 is used during day visits. The logs in the picture below serve as side tables.

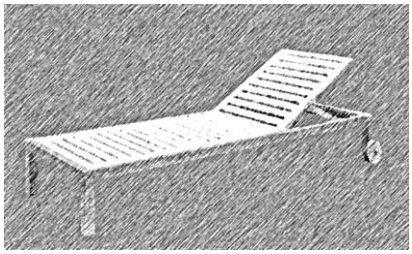
*Figure 4.16. Type 1 Seat (image source: author 2019)*

*Figure 4.17. Type21 Seat (image source: author 2019)*

## Outdoor Sofa

*Figure 4.18. Outdoor Day Sofa (image source: author 2019)*

The following a sketch drawings of existing furniture (sun lounger, picnic bench, foldable seat)



### 4.2.4 Interior Architecture

The site has only one structure that is located near the main entrance of the land. This building consists of the reception area, manager's office, the kitchenette, camp equipment storage room, changing room and a washroom.

*Figure 4.19. Side View of the Building (image source: author 2019)*

*Figure 4.20. Entrance to the building (image source: author 2019)*

*Figure 4.21. Reception (image source: author 2019)*

*Figure 4.22. Kitchenette (image source: author 2019)*

Lighting

All rooms use low voltage bulbs making it difficult to see at night.

Floor and Wall Finishes

The floor of this building was left incomplete due to unknown reasons. It composes of raw concrete that sometime emits dust when walking which can be a threat to anyone with allergies.

The wall was also not done to perfection. Traces of concrete from repairs done earlier were left uncovered and the paint job was left half done.

The images below show sketches of a plan and elevations of the existing interior space.

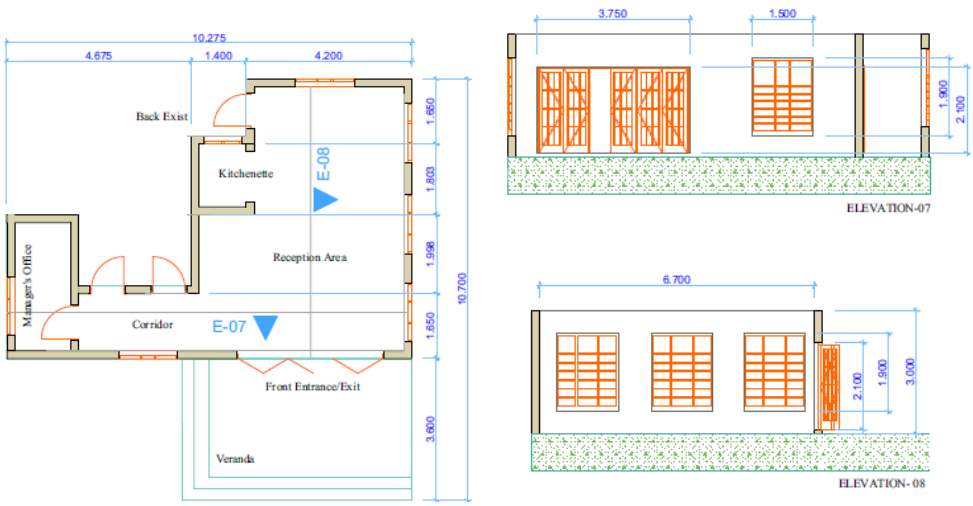



*Figure 4.23 Existing Site Plan and Elevation ( Source: Author)*

### 4.2.5 Exhibition and Display

*Figure 4.24. Thatched House (image source: author 2019)*

This structure is made of wood and is multifunctional but was mainly constructed for aesthetics and to shade guests from the rain. The veranda may sometimes act as a stage during campfire activities or band performances. It is also used as a storage area for food and drinks when there are many visitors.

It is surrounded with assorted flowers, some of which are indigenous while others planted.

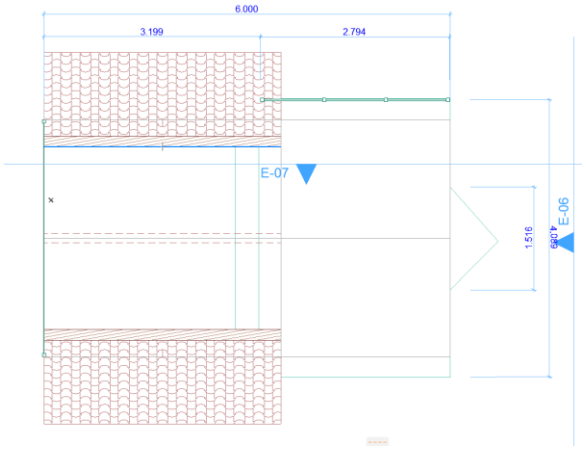



*Figure 4.23 Existing Site Plan ( Source: Author)*

## 4.3 Quantitative Analysis

### 4.3.1 Climate

The Moshi lies on 805m above sea level Moshi has a tropical climate. In winter, there is much less rainfall than in summer. This location is classified as Aw by Köppen and Geiger. In Moshi, the average annual temperature is 23.4 °C | 74.2 °F. About 856 mm | 33.7 inch of precipitation falls annually.

Below is a graph showing Moshi's climate/weather by Month.

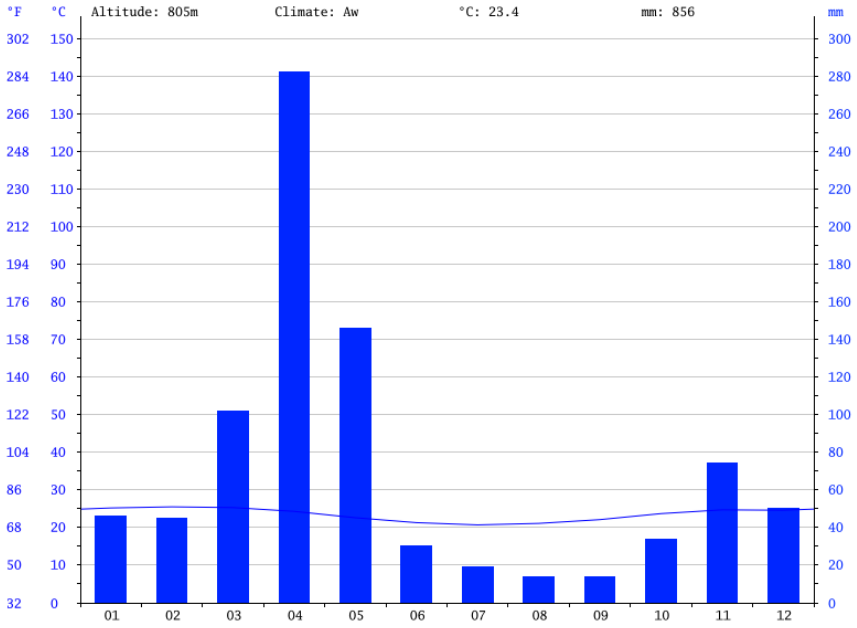



*Figure 4.25. Moshi's Climatic Conditions*

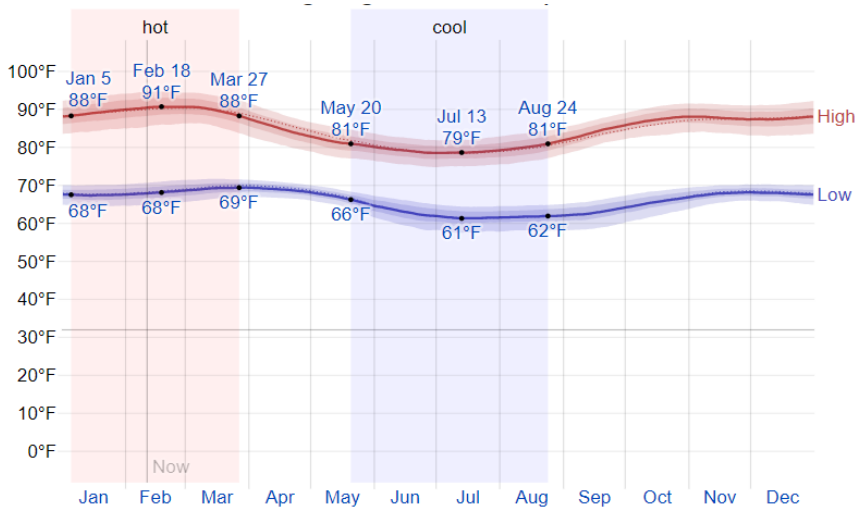
### 4.3.2 Temperature

The hot season lasts for 2.7 months, from January 5 to March 27, with an average daily high temperature above 88°F. The hottest day of the year is February 18, with an average high of 91°F and low of 68°F.

The cool season lasts for 3.1 months, from May 20 to August 24, with an average daily high temperature below 81°F. The coldest day of the year is July 13, with an average low of 61°F and high of 79°F.

The graph below shows Moshi’s Average Temperature.

**Average High and Low Temperature**




*The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.*

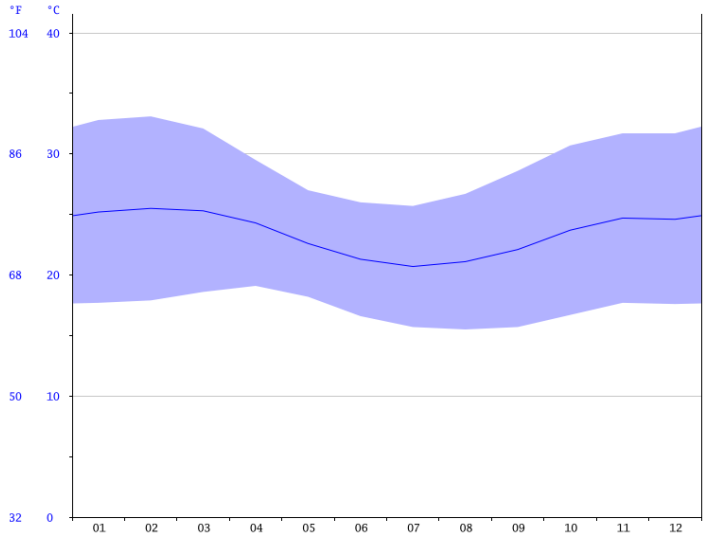



*Figure 4.26. Rainfall Chart*

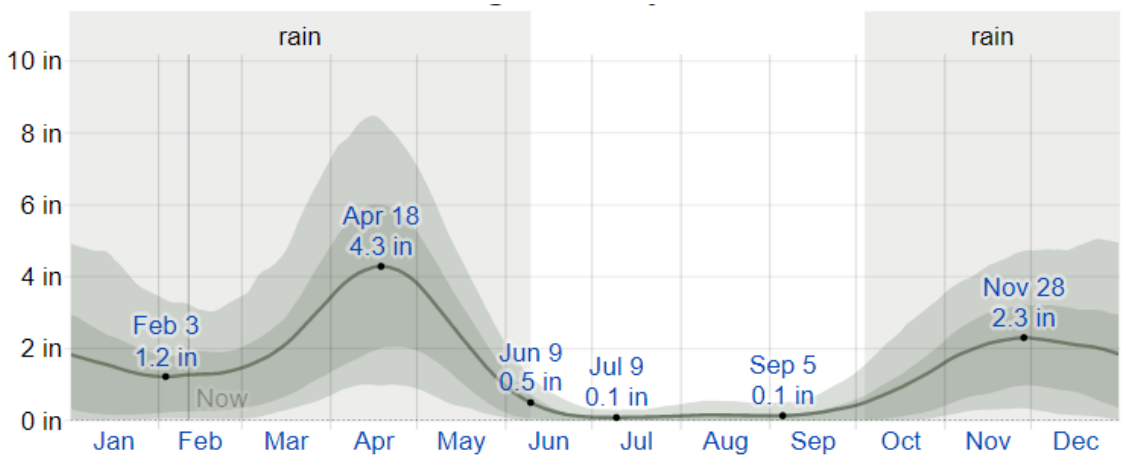
### 4.3.3 Rainfall

Moshi experiences extreme seasonal variation in monthly rainfall.

The rainy period of the year lasts for 8.2 months, from October 4 to June 9, with a sliding 31-day rainfall of at least 0.5 inches. The most rain falls during the 31 days centered on April 18, with an average total accumulation of 4.3 inches.

The rainless period of the year lasts for 3.8 months, from June 9 to October 4. The least rain falls around July 9, with an average total accumulation of 0.1 inches.

**Average Monthly Rainfall**



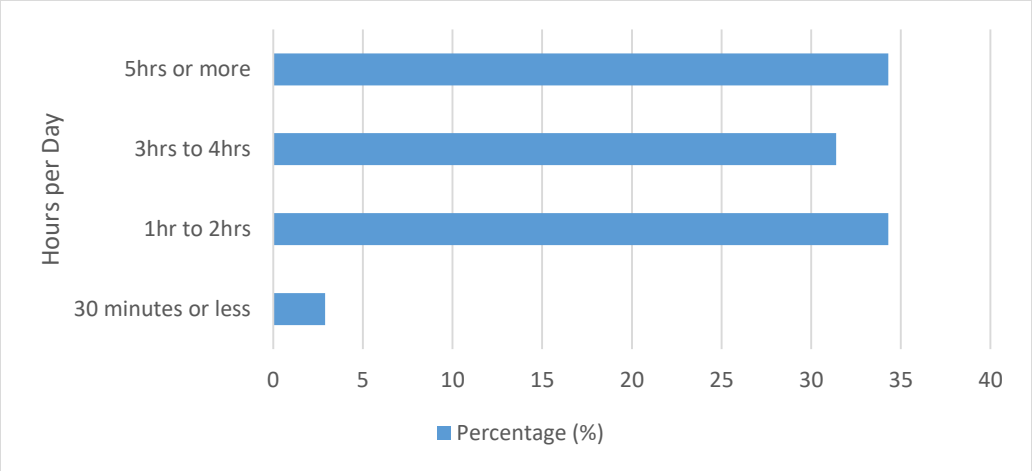

*The average rainfall (solid line) accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands. The thin dotted line is the corresponding average liquid-equivalent snowfall.*

### 4.3.4 Sun

The length of the day in Moshi does not vary substantially over the course of the year, staying within *19 minutes* of *12 hours* throughout. In 2020, the shortest day is *June 21*, with *11 hours, 56 minutes* of daylight; the longest day is *December 21*, with *12 hours, 19 minutes* of daylight.

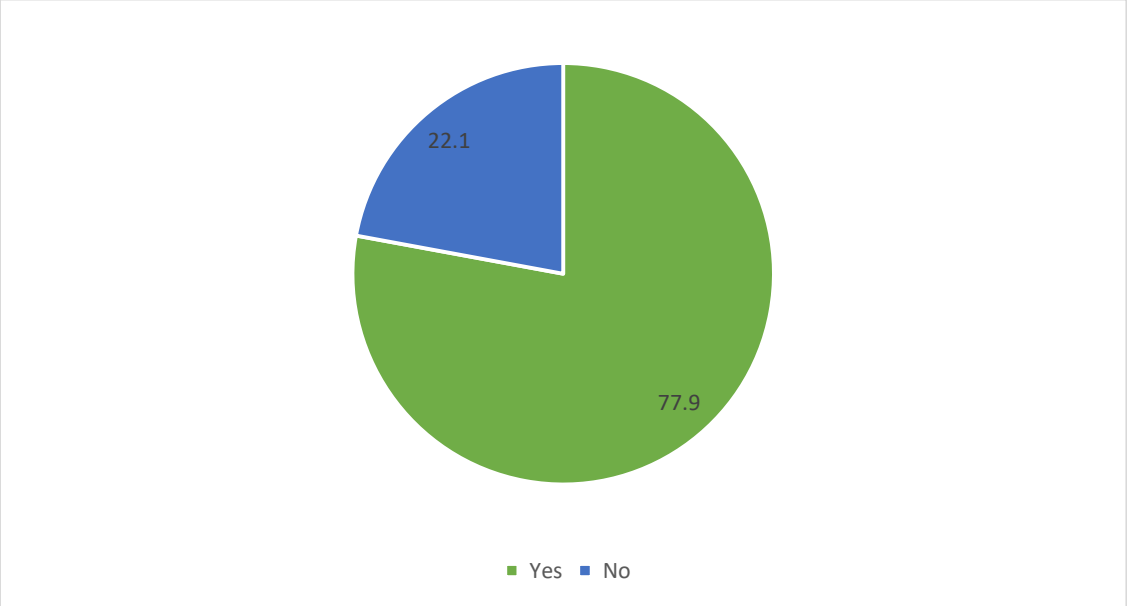
## 4.4 Presentation of Findings

**Fig. 1: Daily hours spent outdoors**



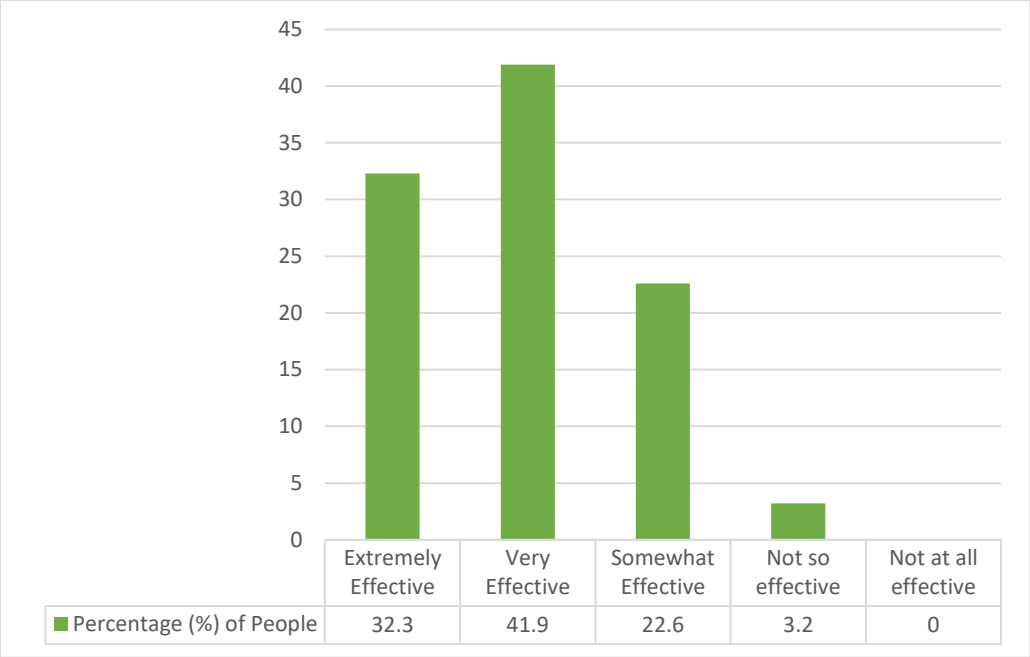

From the responses above, majority of people spend an average of 2 to 3 hours a day outside.

**Fig. 2: Location of Occupation**



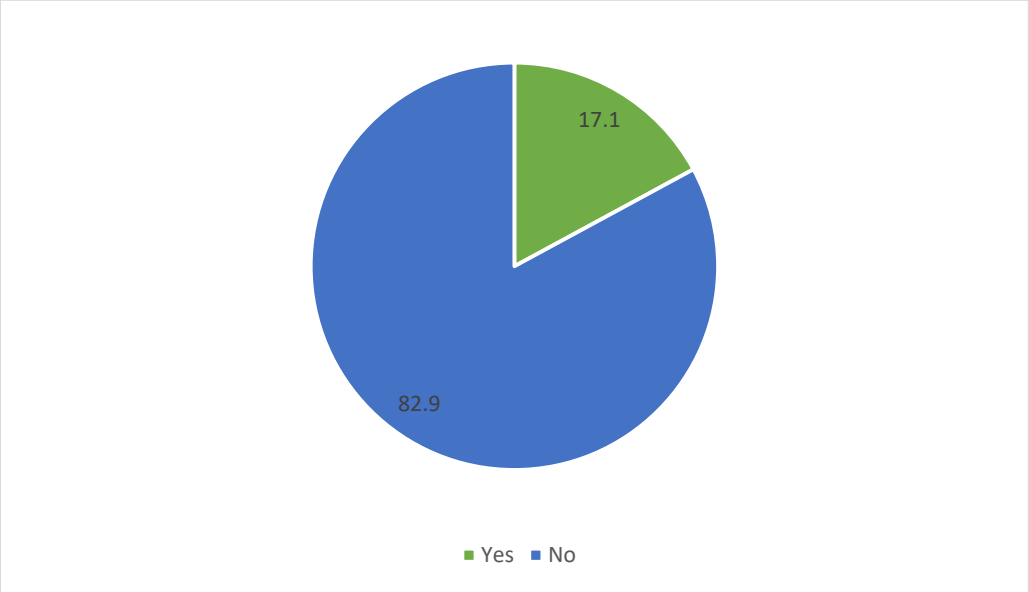

77.1% reported that their place of work was indoors compared to those whose daily work activities were done outdoors

**Fig 3: Effect of nature in work and study performance**



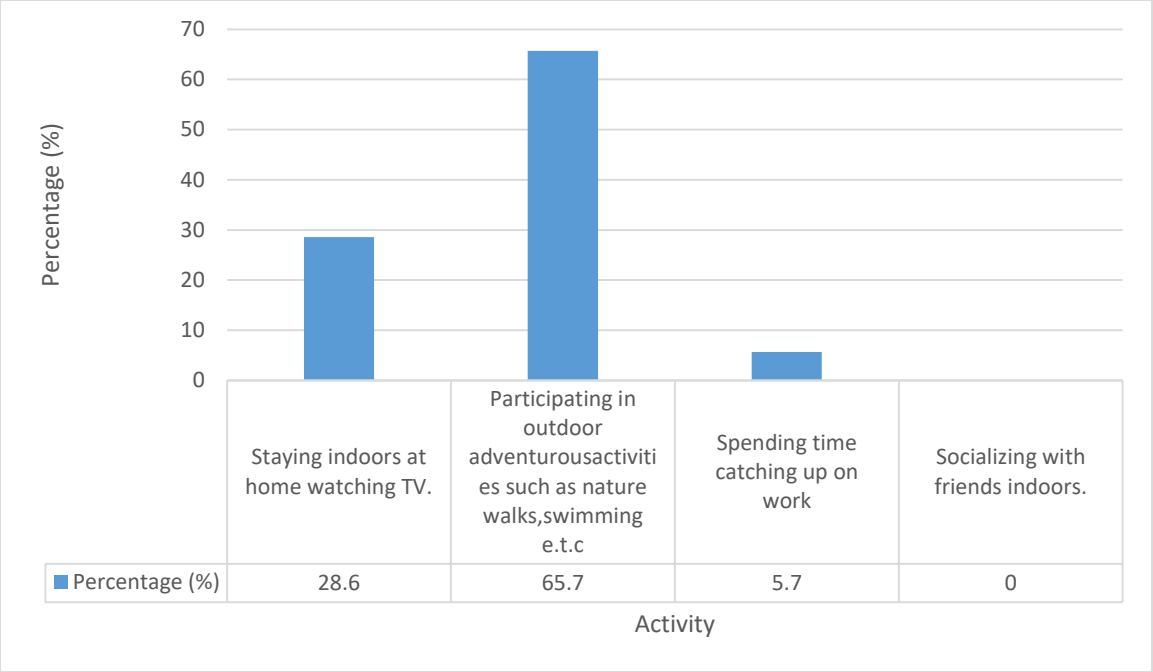

Nature was found to have work and study effect. Majority reported a positive effect with 74% reporting an extremely positive or very good effect on their work

**Fig 4: Nature and Concentration**



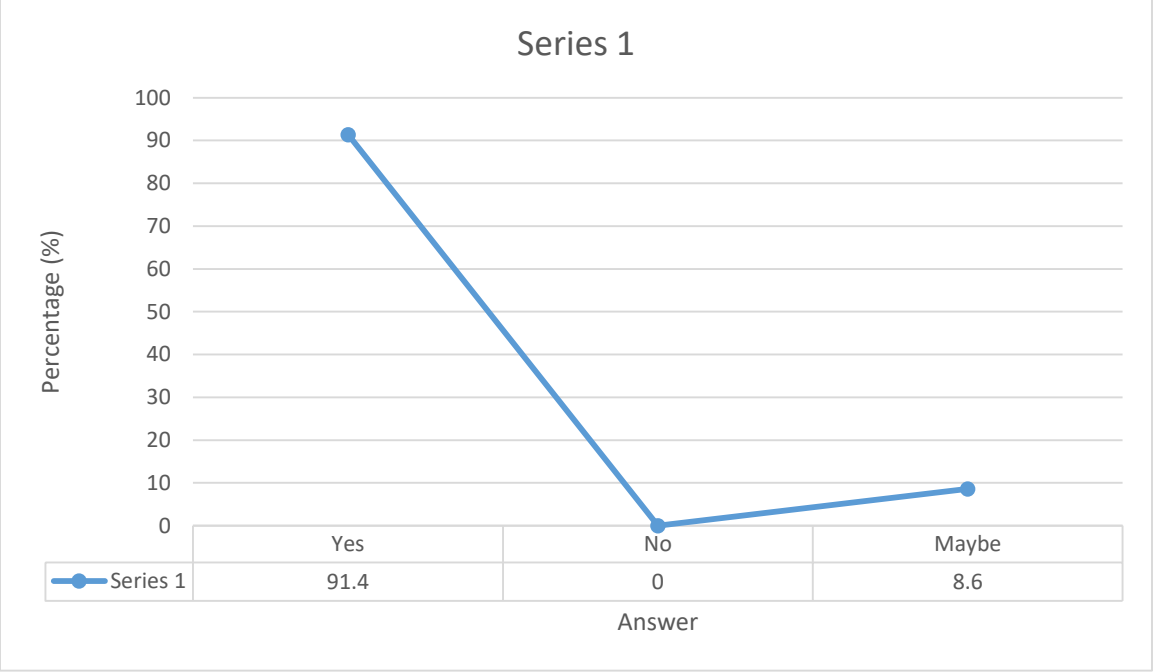

Data collected shows that nature improves concentration of 82% of people.

**Fig. 5: Leisure time activity preference**




Outdoor activities have the highest percentage of leisure time activities.

**Fig. 6 Effect of nature on Stress control**

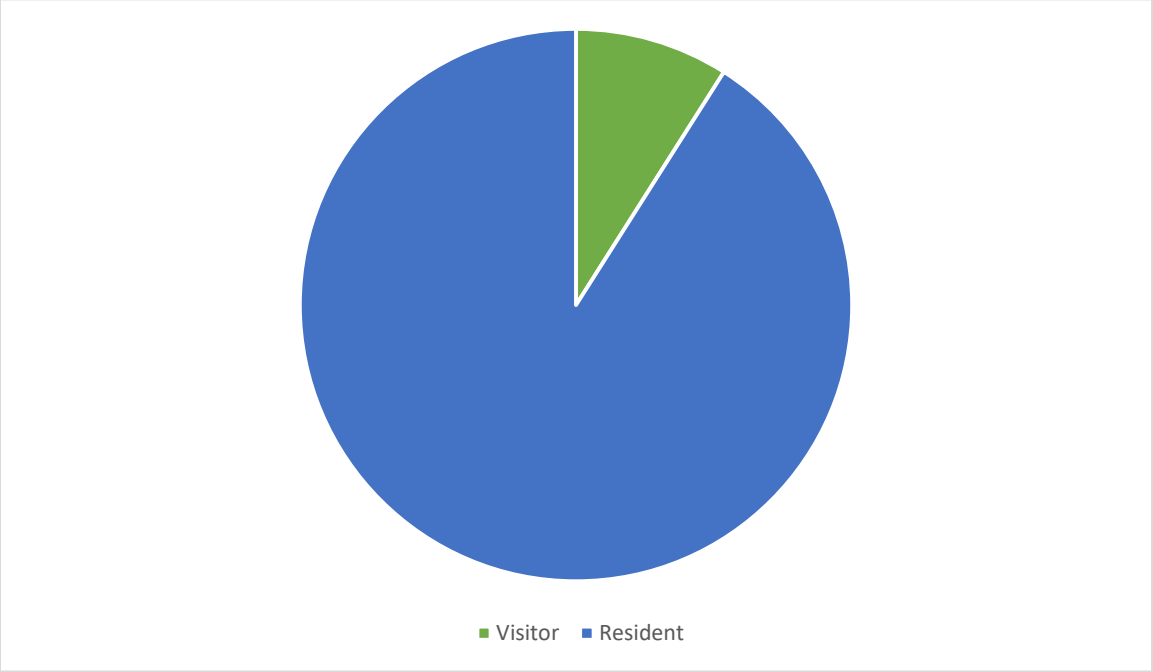



91.4 Percent of people said that being in a natural environment helps in stress reduction.

**Questionnaire 2**

**Figure 1: Visitor/Resident Chart Comparison**

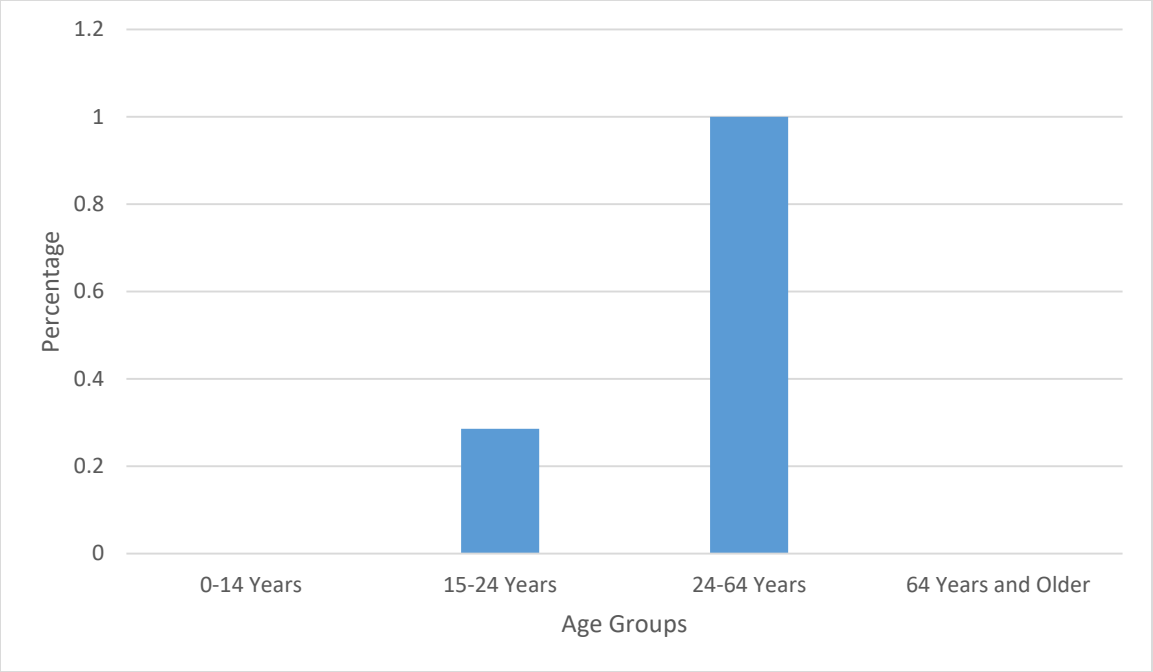
(*Are you a visitor or a resident of the area?*)




From the above chart, most of the people who visit Miwaleni are not residents of the area but visitors from either within the country and outside.

**Figure 2: Guest Age bracket**

(*Which age group would you say mostly visit the place?)*




Visitors at Miwaleni comprise mainly of the youth and middle aged adults.

Question 3

*What was your first impression of the site?*

The following are some of the responses gotten from the interviews.

Beautiful Landscape

It's a beautiful place

Quiet and lonely place but so green

It is a great gate away place to relax.

Very quiet, cool, and natural environment

Question 4

*Which aspect of the site mostly captures your attention?*

Landscape

Landscape

Swimming, camping, bonfire, games

The place looks amazing, especially the overall landscape.

The natural aspect of it all, and the fact that it's in the middle of nowhere, there is a sense of peace.

Section 2

(In this section, Photo Elicitation was used in this section to gain insight on the general outlook of the site)

Question 5 (*Please mark your level of satisfaction with these camp features*)

Results

Figure 1: Camp Landscape and Upkeep

*Figure 4.25. Miwaleni Campsite (image source: author 2019)*

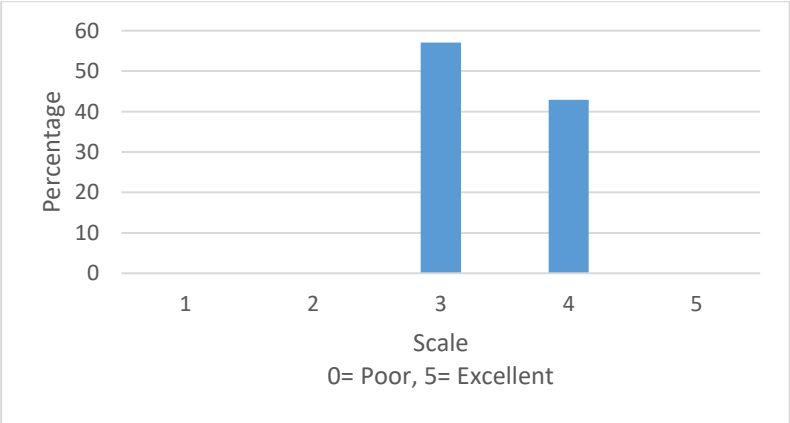


Figure 2: Kitchenette Interior design and Layout (Interior Finishing)

*Figure 4.26. Kitchenette (Image Source: Author)*

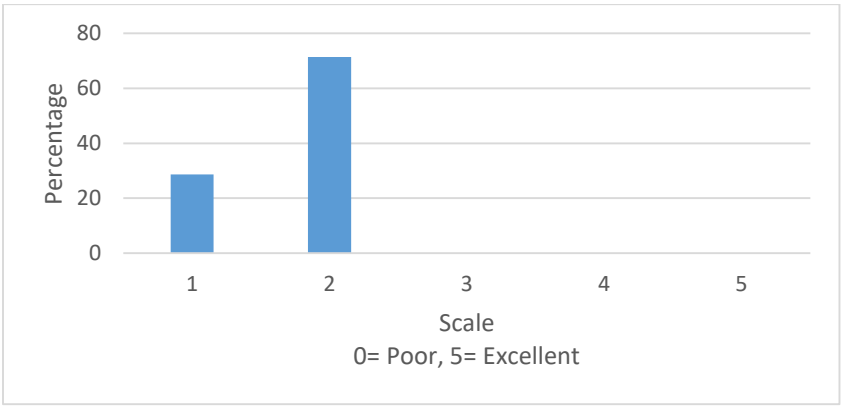



Figure 3: Food and Drinks Storage and Reception Area

*Figure 4.27. Reception Area (image source: author)*

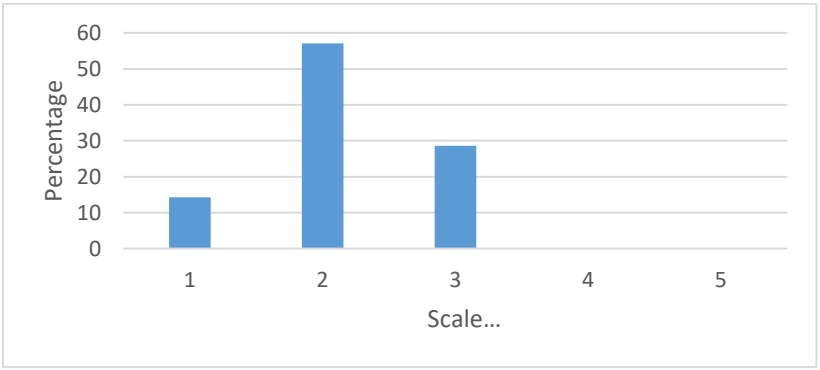



Figure 4: Swimming Pool

*Figure 4.28. Swimming Pool (Image Source: Author)*

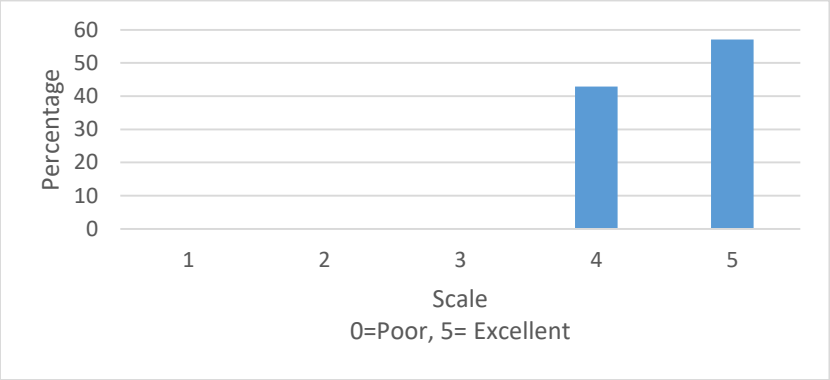



Figure 5: Furniture

*Figure 4.29. Furniture Layout. (Image Source: Author)*

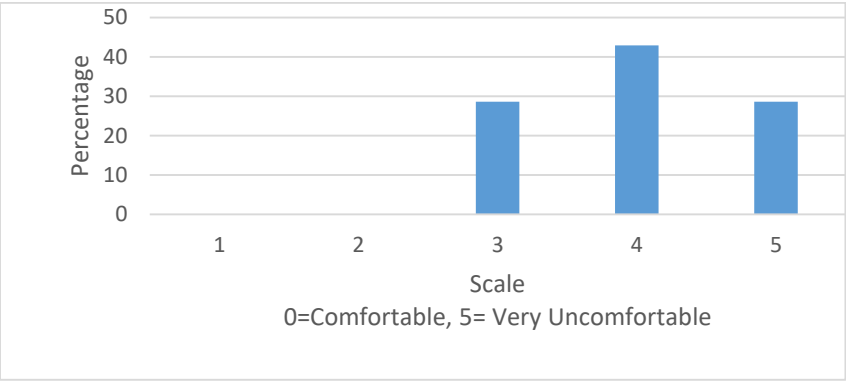



Figure 6: Bonfire Pit

*Figure 4.30. Bonfire Pit 2*

## 4.5 CONCLUSION

This chapter examined the case study in detail in regards to the four areas of study which include Interior Architecture. Exhibition and Display, Furniture Design and Landscape Design.

# CHAPTER 5

## 5 SUMMARY FINDINGS CONCLUSIONS AND RECCOMENDATIONS.

### 5.1 Introduction

This chapter will discuss the results from the data analyzed in the previous chapter and the knowledge gained from the literature review research. The information gathered will enable the researcher to come up with appropriate and suitable recommendations that can be implemented at Miwaleni Springs Farm that will later on result in a better and more sustainable design in the Landscaping, Furniture, Exhibition and Display and Interior Architecture.

Thereafter, a conclusive summary of the research will be provided followed by suggestions for further study and research for the exhaustiveness of the Biophilic Design concept in the hospitality industry.

### 5.2 Summary of Data Analysis

From this research, the data shows that biophilic design in the hospitality industry will make a great impact in both the aesthetic appearance and overall look of Miwaleni and the mental and physical health of the guests and staff visiting the area. This information was extracted from the first questionnaire which was solely based on discovering the effects of nature on human beings. This questionnaire was sent out not only to visitors of Miwaleni but other participants that have never visited the area but all had the same opinion on the same. Aside from the above mentioned questionnaire, literature confirms that nature has a great impact in promoting health and well-being in humans.

It is therefore safe to conclude, from the findings that incorporating Biophilic Design Concept will positively impact on the facility.

The second questionnaire was based on Miwaleni's general appearance and design. Majority of the answers led to the conclusion that the facility could do better in terms of design especially in the interior architectural field, exhibition and display and furniture. The landscape design was satisfactory though could do better in terms of general appearance and additional outdoor features.

## 5.3 Recommendations

The general design of spaces has a profound influence on our health physiological and energetic state of being. Harmony and balance, color and light, the relationship to our surroundings and green materials are all contributory elements of the built environment that aspire to be positive rather than negative. Creating an atmosphere that is supportive to both our inner and outer senses can enhance rather than alienate our so much needed earthly links to nature.

From this study, recommendations based on the literature reviewed and data collected from the different research methods were complied.

### 5.3.1 Recommendations Based on Literature

The hospitality industry is more vibrant than ever, and with this boom has come an increased focus on customer experience. Hospitality designers have been looking to the field of experience design to provide more targeted, immersive experiences that leave smiles on customers' faces. Ultimately, this means designing for the people you'll be serving, and that requires a close consideration of customers' wants and needs.

One of the best methods to unexpectedly delight and enhance customer experience, no matter what sector of hospitality, is to use biophilic design elements. The following are some of the elements suggested by various companies that solely aim at utilizing biophilic design and sustainable materials in design regardless of the industry.

1. Abundant natural materials create a strong connection to nature

*Figure 5.1. Design Studio: Westin Buffalo*

This hotel boasts several biophilic elements: plenty of reclaimed wood, a living wall, and plants. For an easy way to enhance the biophilia effect of any space, place several biophilic elements near each other. Even the simple placement of a plant next to a wooden wall can make a

noticeable impact on people's mood and behavior. Doing so creates a visual connection with nature as well as a connection with natural systems, which are two of the 14 patterns of biophilic design as stated by Terrapin Bright Green. The more natural elements you include, the happier and more relaxed your patrons will feel, culminating in a positive experience.

2. For indoor spaces, try biophilic focal points

*Figure 5.2 : New York's Hotel Hugo*

This living wall in New York's Hotel Hugo is a striking biophilic focal point. Indoor spaces without abundant daylight or sightlines to the outdoors are most in need of biophilic elements. For these types of indoor areas, including a biophilic focal point will foster the natural connection needed for customers to feel their best; it is important to draw guests' eyes, impress them, and satisfy their desires to be closer to nature. Living walls, gardens, waterfalls, fountains, ponds, and fireplaces are some examples of biophilic focal points that can be implemented in any indoor environment.

3. Hanging plants provide a unique biophilic effect

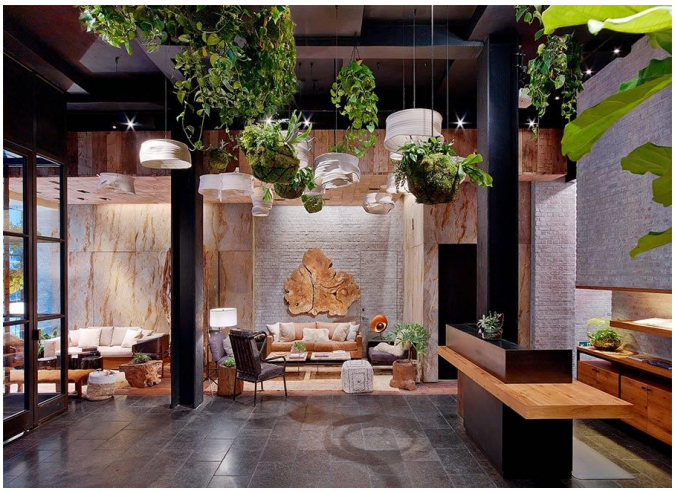


*Figure 5.3. Unknown Hotel (Image Source Mason)*

Hanging plants can be used to create a suspended garden that can create a ‘wow factor’ to visitors. This biophilic technique is easy but a bit unexpected. A small assortment of hanging plants placed together can be used to simultaneously add biophilic elements and make a room feel fuller and more alive. Different types of hanging greenery can be used to make a floating garden or place the plants more sparsely to create points of visual interest throughout a space.

4. Reclaimed wood adds natural elegance

*Figure 5.4 Hotel (image Source Metropolis Magazine)*

This bar’s reclaimed wood paneling is a classy design touch that also serves as a biophilic focal point

In terms of green design materials, reclaimed wood is certainly one of the most versatile and beautiful. Its authentic charm is perfect in any built environment. It can complement laid-back or upscale spaces, and it works in tandem with a room's existing décor. It especially shines in hospitality environments. Whether it is used for the floors of a lounge, the walls of a restaurant, or to clad a reception desk, reclaimed wood can make customers and guests feel better and more satisfied with their experience.

5. Lobbies present wonderful opportunities for biophilic design

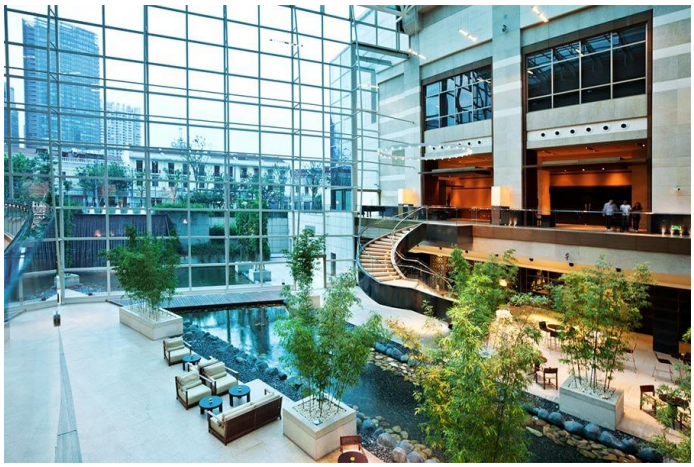


*Figure 5.5: Unknown Hotel (Image Source from Ambius)*

This lobby's breathtaking view is perfectly paired with a soothing pond that stretches between trees. Lobby design is of increasing importance in the world of hospitality. Since lobbies are getting more use today than ever before, it makes sense to optimize them for guests and visitors. Best of all, lobby spaces are ideal for biophilic design, and whether the lobby is small or large, they can be transformed into a sanctuary for the guests. Any sort of biophilic focal point will work wonders in a lobby. A noticeable biophilic element in a lobby will ensure that guests receive all of the benefits associated with biophilia, and it's a great way to give an outstanding first impression.

6. Seating areas can benefit greatly from potted plants

*Figure 5.6 Unknown Hotel (Image Source from Kinorigo)*

Potted plants are an easy way to add biophilic elements. Potted plants are small but mighty. Research demonstrates that they can help to purify the air even if air filters are already in use. They also reduce stress and thus facilitate more positive moods. Even just a few indoor plants will provide all these benefits, and when plants are combined with other biophilic elements, the indoor environmental quality of a space improves dramatically. Potted plants work particularly well in lounges and other seating areas, especially ones that don't have a clear view of nature. As shown above, a few pops of greenery in a seating area can be incredibly effective in enhancing the biophilia effect.

7. Create clear sightlines to the natural world outside

*Figure 5.7: Ladera Resort (Image Source Matador Network)*

Ladera Resort in Hawaii features breathtaking views of the lush trees, hills, and ocean surrounding the building. One of the most important patterns of biophilic design is visual connection with nature. A direct sightline of nature often provides the most benefits for guests, especially if the building is located near trees or bodies of water. This can be crucial for hotels; Terrapin Bright Green found that the cost of a hotel room with a view of nature is typically 18% higher than a room without a view. Of course, if a view of nature isn't feasible, one can simulate the results with other biophilic elements. An appealing natural vista will not only improve guest satisfaction but also increase the chances of them returning.

8. Bring uncommon outdoor elements inside

*Figure 5.8 Unknown Hotel (Image Source Traveler Made)*

This inspired Portugal hotel includes a unique tree-through-table installation. For an especially creative way to implement biophilic design, take an uncommon natural element that exists outdoors and bring it indoors. This is the basic idea behind biophilic focal points like living walls and waterfalls, but there are many interesting ways to bring this concept to life. For example, the hotel pictured above features an indoor tree, which is both biophilic and novel. Other hospitality spaces have brought stone walls, large gardens, and even beaches indoors. The sight of an outdoor element in the built environment will generate interest among guests and can even encourage social interaction.

*Figure 5.9: Unknown Resort (Image Source Daily Mail)*

This German resort's one-of-a-kind indoor beach is a biophilic design haven

9. Find innovative ways to implement greenery

*Figure 5.10: Unknown Restaurant (Image Source form the Plant the Future)*

This eye-catching plant map is a wonderful and interesting biophilic focal point. There's something to be said for coming up with new and exciting ways of showcasing greenery. The more visually interesting an installation is, the more guests will talk about it and enjoy it. This can be as simple as creating a wall garden of potted plants or as complex as installing larger topiaries. This is another concept that's ideal to execute when an environment doesn't have a direct and open view of nature.

10. Turn a room into an indoor garden

*Figure 5.11: Unknown Hotel Reception (Image Source: Retail Design Institute)*

Lots of plants on the walls and throughout the room make this industrial space much more biophilic. The merits of potted plants and gardens: improved air quality, better biophilic impact, and heightened moods, to name a few. An alternative idea to this is to take a room and transform

it into an indoor garden. Since this involves creating patches of soil in which plants may grow, it's a more intensive biophilic design technique, but it's extremely effective. Seating areas, event spaces, meeting rooms, and eating areas are a few types of indoor environments that can benefit from large gardens.

11. Experiment with raw, unfinished biophilic elements

*Figure 5.12: (Image Source: From Momentum)*

Connection with natural systems is one of the patterns of biophilic design discussed in this project. The rough reclaimed wood on the desk and the raw tree installation boosts the biophilia effect. A connection with natural systems reflects the ongoing changes and processes present in various ecosystems. Some examples include erosion, weathering, aging, and plant cycles. This is one of the reasons why reclaimed wood is such a boost to biophilic design; its natural variances are perfect for creating a connection with natural systems. Other unfinished natural materials like rough stone can also strengthen the connection.

### 5.3.2 Recommendations Based on Quantitative Data

1) Interior Architecture

Color Scheme

The Interior Architecture of the facility should be improved such that all materials that will be used should conform to the Biophilic Design philosophy. The preferred color palette identified by the respondents lean towards colors that mostly appear in nature such as blue, brown and

green tones. These colors will be used in such a way that they blend together with the natural environment.

*Figure 5.13: Color Schemes (Image Source: SchemeColor.com)*

Flooring

The recommended flooring is wooden laminate flooring therefore incorporating a natural texture. One of the biggest benefits of wooden floors is that it ensures better indoor air. They don't absorb particles such as dust and pollutants which would be beneficial to Miwaleni's interiors as it is located in a remote place.

Walls and Partitions

For the walls, white paint will best suit the interiors because the windows will cover most parts therefore enabling adequate natural lighting. For the partitions, i.e. the reception's back room, repurposed wooden pallets will be used.

Below is a sketch of the plan and some sections of the proposed reception and manager's office:

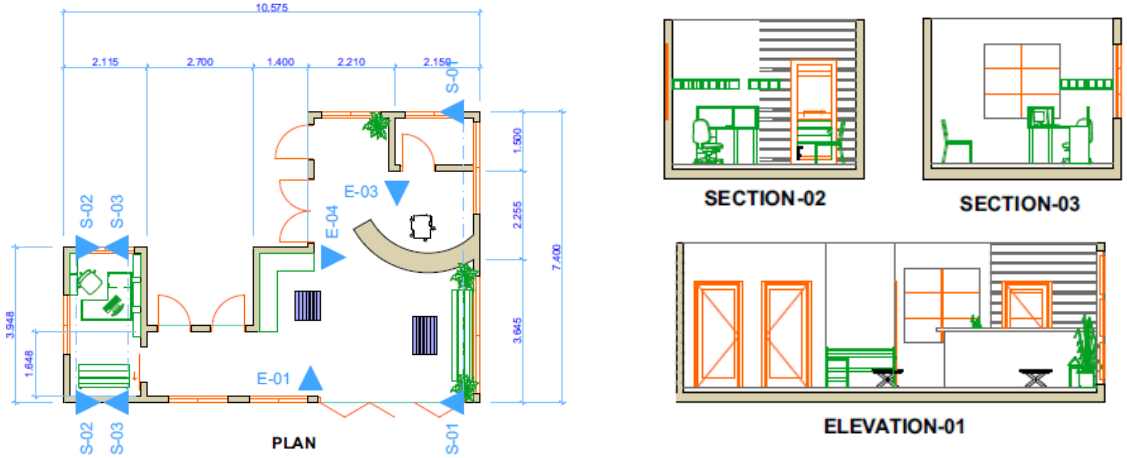



*Figure 5.14: Reception + Manager's Office Plan Elevations and Sections (Image Source: Author)*

The above image contains Miwaleni's main building which would act as a reception area. From the front entrance, benches made of wood pallets can be laced strategically to provide room for a waiting area. This should then be followed by a round reception desk where all inquiries and bookings can be made. Behind it is a small room partitioned by wood specifically made for storage of office files and accessories.

2) Furniture

The recommended furniture for such a facility would be functional, comfortable and durable due to the fact that most of these furniture pieces are used outside. These include sun loungers, picnic tables, camp fire seats and bar stools and tables for an outdoor bar setting among others. Most of the furniture should be made from repurposed wooden pallets and recycled bike parts. For comfort, the cushions will be lined with Ethiopian woven fabric which will bring in an African aspect to the design.

Below are sketches of suggested designs of three furniture pieces; Sun Lounger, Bar Stool and Bar Table respectively.

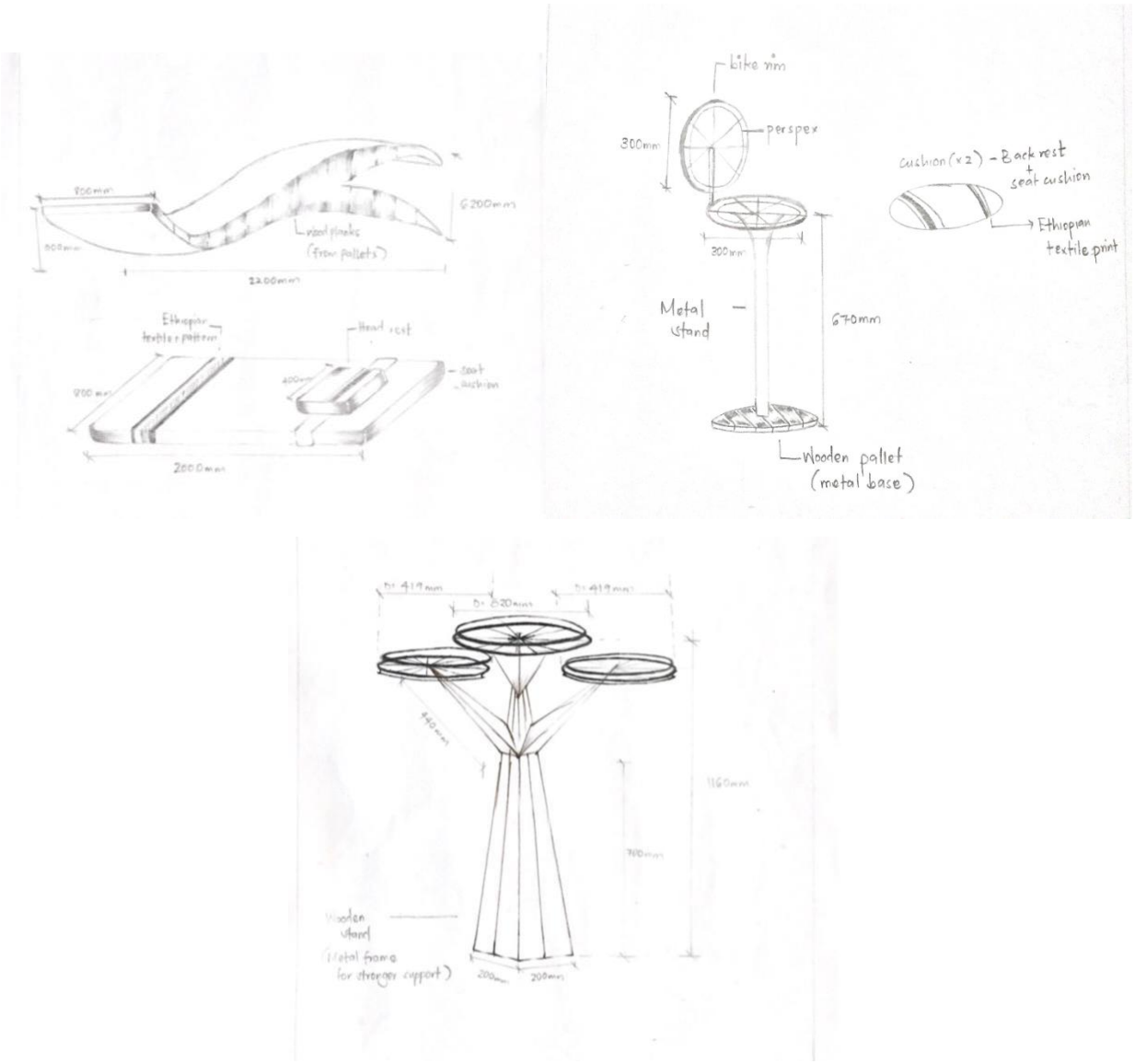



*Figure 5.14. Sketch Designs off Furniture Pieces*

## Proposed Furniture Renders

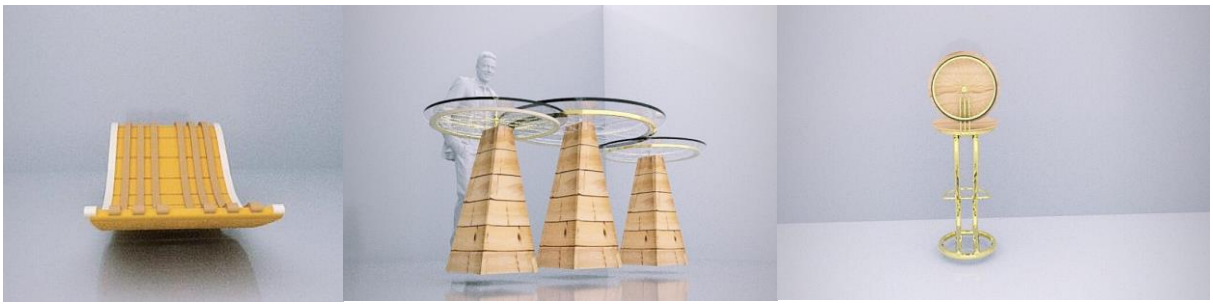


*Figure 5.15. Furniture Renders*

3) Exhibition and Display

Lighting is a key factor in this field. Appropriate lighting can either make or break the overall look of a room. For the bar area, since it is an outdoor bar design, the design will maximise the use of natural lighting. When it gets dark, string lights will best suit the bar as they resemble shinning stars.

The drinks display unit should be made using wood pallets with a clear vanish. Plants can be used to acentuate the outdoor feel. Lighting should also be placed in these units, i.e. LED lights for proper diplay pf the drinks. The proposed layout of the bar is designed in such a way that the counter is well accesible to both the guests and the staff.

Below is a sketch of the plan and some sections of the proposed bar and kitchen design:

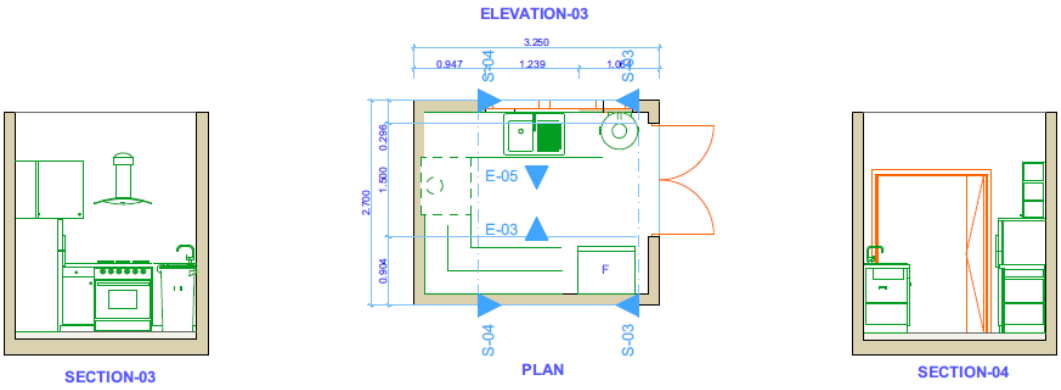



*Figure 5.16: Kitchen Plan and Sections (Image Source: Author)*

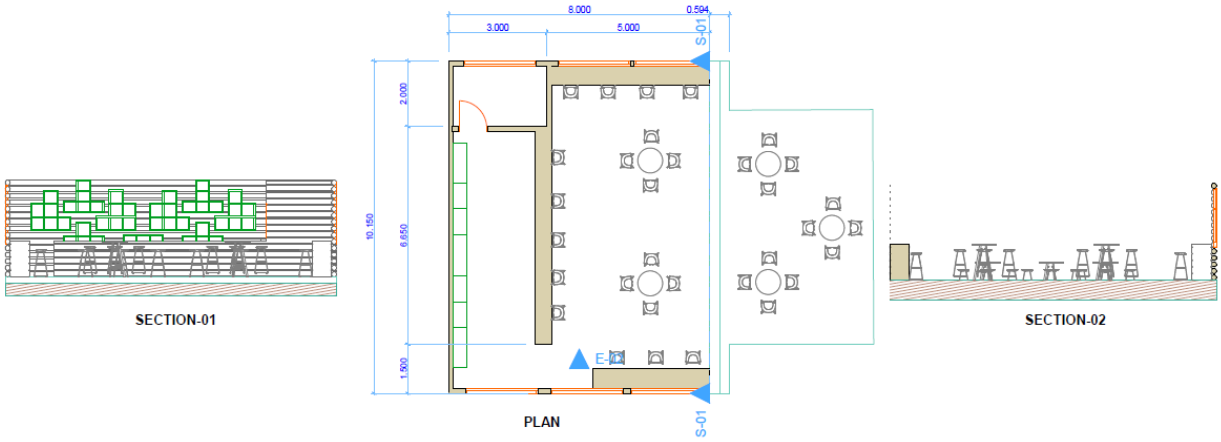



*Figure 5.17: Bar Plan and Sections: (Image Source: Author)*

4) Landscape Design

The landscape design will revolve around creating more sustainable outdoor features that will blend in with the natural environment without having to change much.

Signage: The current facility has no signage therefore the proposed design consists of wooden sign boards that clearly indicate the location and direction of certain facilities such as washrooms, car park, reception area, swimming pool and the like.

Bicycle and Firewood Rack: For the bike rack, it should be positioned near the reception of the facility therefore making it easier to monitor. The firewood shed should be place nearest to the bonfire pit therefore campers have easy access to it at night.

Swimming Pool: The pool could be expanded to accommodate a larger capacity than it already does.

Bonfire Pit: A sunken bonfire pit would be more conventional as opposed to the average bonfire pit.

Pathways: the pathways should be lined with assorted flowers. The suggested pavement should be made stone and gravel.

The image below depicts the recommended planned layout of Miwaleni's landscape in for of a bubble diagram:

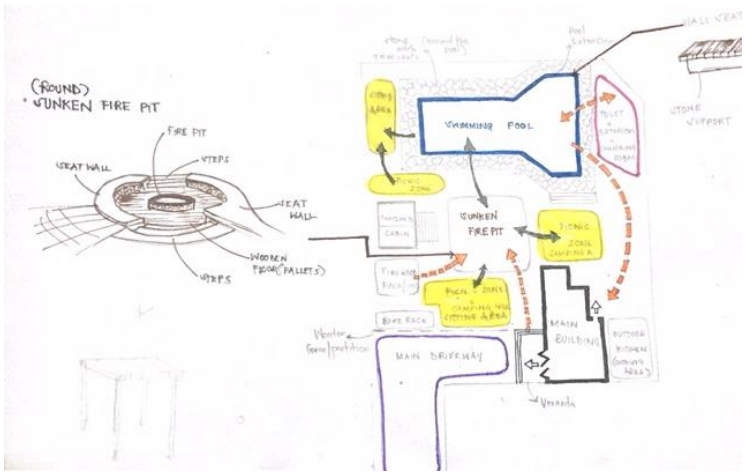



*Figure 5.18: Landscape Bubble Diagram (Image Source: Author)*

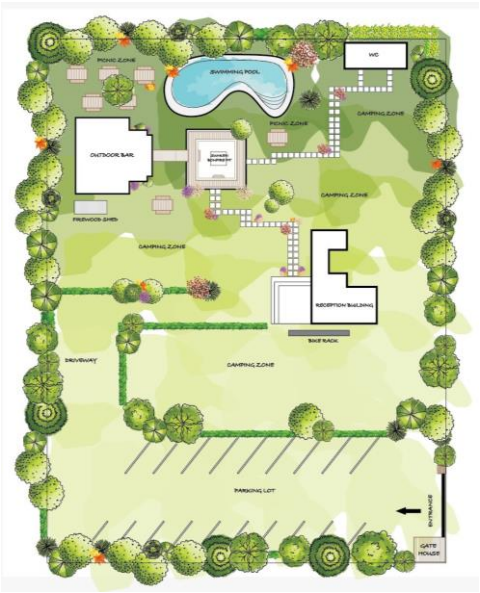



*Figure 5.19: Proposed Master Plan (Image Source: Author)*

## 5.4 CONCLUSION

This chapter looked at the summary of the researcher's findings from which various recommendations and proposed design ideas were generated that could be used to create a new and improved Miwaleni Springs Farm. In conclusion, by applying the recommended solutions, the site would be transformed into a biophilic environment and therefore contribute to the physical and mental wellbeing of people accessing the site.

## 5.5 Suggestion for Further Study

This study was focused on Biophilic design in the hospitality industry. Though the data covered was a lot, there is still room for further studies regarding this particular concept. Biophilia does not just apply to the built environment but also extends to the health and psychological aspect of it. This study only covered the basics of this concept but could be looked at different perspectives for better and efficient results. A larger sample size can be taken for a wider range of responses therefore a more diverse study.

## REFERENCES


Asante K.M., and Mazama A., (2005). *Encyclopedia of Black Studies.* Carlifornia: Sage Publication.

Atkinson J. D., (2017), In Journey into Social Activism. *Qualitative Approaches,* 65-98.

Beatley T., and Newman P., (2013). *Biophilic Cities are Sustainable, Resilient Cities', Sustainability.*

Bigante E., (2010). "*The Use of Photo-Elicitation in Field Research.*"

Binsacca R., 2012. "Bill Browning on Biophilia." *The Journal of the American Institute of Architects* (Architect Magazine).

Browning W., Ryan C, and Clancy J.. (2014) *14 Patterns of Biophilic Design.* New York, Washington DC: Terrapin Bright Green LLC.

Carey M.A, and Smith MW., (1994). "Capturing the Group Effect in Focus Groups: A Special Concern in Analysis." *Qualitative Health Research.*

Clarke V., and BraunV., (2013) "Teaching Thematic Analysis: Overcoming Challenges and Developing Strategies for Effective Learning." *The Psychologist* 120-123.

Delafosse M., n.d. *African Art.* New York: Parkstone Inernational.

Green T.B. (2016). *Human Spaces 2.0: Biophilic Design in Hospitality.*

Grinde B., and Patil GG., (2009). "Biophilia: Does Visual Contact with Nature Impact on Health and Well-Being?" *International Journal of Environmental Research and Public Heath* (2332-2343)

Harper D., (2002). "Talking About Pictures: A Case for Photo Elicitation." In *Visual Studies*, by Douglas Harper, (13-26.)

Harrison B., 2002. "Photographic VIsions and Narrative Inquiry." *Narrative Inquiry* 87-111.

Hildalgo K.A.,2014. "Biophilic Design, Restorative Environments and Well Being."

Keeley B., Little C., and Achila I., 2017. *Children in a Digital World.* New York: United Nations Children's Fund (UNICEF).

Kellert S.R., (2008). "The Theory, Science, and Practice of Bringing Buildings to Life." *Biophilic Design.*

Kellert S.R., (2012). *Birthright: People and Nature in the Modern World.* New Haven: Yale University Press.

Kitzinger J., and Barbour R.S., (1999). *Developing Focus Group Research: Politics, Theory and Practice.* London: SAGE Publication.

Kothari C.R., (2004). *Research Methodolody: Methods and Techniques.* New Delhi: New Age International (P) Ltd.

Kyngas H., Elo S., Kaariainen M., Kanste O., Polkki T., Utriainen K., (2014). "Qualitative Content Analysis: A Focus on Trustworthiness."

LaGamma A., (2009). "The Essential Art of African Textiles: Design without End." *African Arts* 88-99.

Nuttal S., (2007). *Beautiful/Ugly: African and Diaspora Aesthetics.* London: Duke University Press.

Pals R., Steg L., Dontje J., Siero F.W., and Karen I van der Zee. (2014). " Restorative environments." *Journal of Environmental Psychology* 108-116.

Papaneck V., (1985). *Design For The Real World: Human Ecology and Social Change.* London: Thames and Hudson Ltd.

Price C., and Gary S., n.d. "Connecting with Nature- Biophilic Design in Environments Built for Communal Living."

Przybylek S., 2014. *A Whole Continen of Textiles.*

Ryan C.O.,. Browning W.D., Clancy J.O., Andrews S.L., and Namita B. Kallianpurkar. (2014). "Biophilic Design Patterns." *Internation Journal of Architectural Research* 62-76.

Sarigiannis D.A., (2013). *Combined or Multiple Exposure to HealthStressors in Indoor Built Environments.* Bonn. Germany: World Health Organization.

Smith R.A, (1989). *A Study in Aesthetic Education.* New York: Routledge Taylor and Francis Group.

Ulrich R.S., Simons R.F., Losito B.D., Fiorito E., and Miles M.A., (1991). "Stress Recocery During Exposure to Natural and Urban Environments." *Journal of Environmental Psychology* 201-230.

Wilson E.O., (2003). *Biophilia.* Massachusetts and London: Harvard University Press.

## APPENDICES

### Observation Guide

- Analyze the landscape and interiors of the case study i.e. Miwaleni Springs Farm.
- Identify if there is a dominant color scheme.
- Take note of the materials used for the floor and wall finishes, furniture, signage and lighting.
- Note down problems in the design of the case study.
- Which features are lacking in the design of Miwaleni Springs Farm

### Interview Guide

This included the owner, waiter and some of the guests of Miwaleni Springs Farm

- Get their opinion on the current state of Miwaleni Springs Farm
- Get insight on new ideas that can be implemented in this facility.
- Ask about their knowledge in Biophilic Design and what they think if these aspects of the philosophy are incorporated.

### Questionnaire 1

# Biophilic Design

Biophilic Design philosophy recognizes that humans are more drawn towards natural world as opposed to the human created or artificial forces. This Questionnaire aims at determining the extent to which biophilia impacts on human health and well-being. * Required

1. How long do you spend your time outdoors in a day? *

*Check all that apply.*

- ☐ 30 minutes or less
- ☐ 1hr to 2hrs
- ☐ 3hrs to 4hrs
- ☐ 5hrs or more

2. Does your occupation require you to be indoors? *

*Mark only one oval.*

- Yes
- No

3. Is it effective by having an open window when studying/working to aid in your performance? (Answer only if question 2 is "yes") *Mark only one oval.*

- Extremely effective
- Very effective
- Somewhat effective
- Not so effective
- Not at all effective

4. Does the sound/view of water elicit a feeling of serenity?

*Mark only one oval.*

- Always
- Usually
- Sometimes
- Rarely
- Never

5. Does being in contact with nature improve your concentration? *

Answer yes or no. If "yes", please specify

6. Which of the following would you prefer to do after a long work week for relaxation purposes? *

*Mark only one oval.*

- Staying indoors at home watching TV.
- Participating in outdoor adventurous activities such as nature walks, swimming etc.
- Spending time catching up on work.
- Socializing with friends indoors.

7. Does being in a natural environment help with stress reduction? *

*Mark only one oval.*

- Yes
- No
- Maybe

8. Based on your answer above, give reason/example. *

**Questionnaire 2**

# Miwaleni Springs Farm

The purpose of this questionnaire is to gain insight on the above mentioned site which will in turn help in proposing suitable recommendation that will best improve the Miwaleni Springs Farm.

* Required

1. Have you ever visited a campsite? *

*Mark only one oval.*

- [ ] Yes
- [ ] No

2. What is your idea of a good campsite? *

3. Have you ever been to Miwaleni Springs Farm? *

*Mark only one oval.*

- [ ] Yes
- [ ] No

4. How did you hear of Miwaleni?

*Mark only one oval.*

- [ ] Recommended by friends/family
- [ ] Social Media

5. Are you a visitor or a resident of the area?

*Mark only one oval.*

- Resident
- Visitor

6. What was your first impression of the site?

7. Which age group would you say mostly visit the place? (select one or more choices) *

*Check all that apply.*

- 0-14 Years
- 15-24 Years
- 24-64 Years
- 64 Years and Older
- All the above

8. Which aspect of the site mostly captures your attention? *

9. What is your opinion on the overall interior design of the kitchen, reception, changing room and storage area? *

Please mark your level of satisfaction with these camp features

10. Camp Landscape and upkeep *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Poor | ◯ | ◯ | ◯ | ◯ | ◯ | Excellent |

11. Kitchen Interior design and layout (Interior Finishing) *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Poor | ◯ | ◯ | ◯ | ◯ | ◯ | Excellent |

12. Food and Drinks storage and Reception area *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| POOR | ◯ | ◯ | ◯ | ◯ | ◯ | EXCELLENT |

13. Swimming Pool *

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| POOR | | | | | | EXCELLENT |

14. Furniture *

*Mark only one oval.*

1 2 3 4 5

15. Bonfire Pit *

| | | | | | | |
|---|---|---|---|---|---|---|
| UNCOMFORTABLE | | | | | | VERY CONFORTABLE |

*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| POOR | ◯ | ◯ | ◯ | ◯ | ◯ | SATISFACTORY |

16. Would you recommend this site to anyone else? *

*Mark only one oval.*

- ◯ Yes
- ◯ No
- ◯ Maybe