ENHANCING THE LANDSCAPE OF BARAU DIKKO SPECIALIST HOSPITAL, KADUNA FOR THERAPEUTIC AND HEALING EFFECTS

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DECLARATION

I declare that the work in the Thesis entitled 'ENHANCING THE LANDSCAPE OF BARAU DIKKO SPECIALIST HOSPITAL, KADUNA FOR THERAPEUTIC EFFECTS AND HEALING' has been performed by me in the Department of Architecture under the supervision of L.Arc. Bartho Ekwero and Dr Oluigbo.

The information derived from the literature has duly been acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at any university

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CERTIFICATION

This dissertation entitled "ENHANCING THE LANDSCAPE OF BARAU DIKKO SPECIALIST HOSPITAL, KADUNA FOR THERAPEUTIC EFFECTS AND HEALING" by **ALAO**, Atumye Amos meets the regulations governing the award of the degree of Master of Science of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

To **Late Arc. Lewis Ugbabe**, with out whom Landscape Architecture in Ahmadu Bello University, Zaria would not have being a reality and to Landscape Architecture Education in Nigeria.

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ABSTRACT

In Nigeria, therapeutic landscape development is a grey area both in research and design implementation, and is yet to be given recognition in this part of the world. Therapeutic landscape is an aspect of landscape architecture that deals with healing through a conscious design process, simulating nature to provide a convivial environment for healthy living.

The model for the research is built on the works of Elizabeth C. Brawley, Sara O. Marberry and Joan M. Whale who attempted to develop unifying themes for the works of several therapeutic landscape architects such as Cooper Marcus, Clare Cooper Marcus, Annalisa Gartman Vapaa, Marni Barns and many others. These themes culminate into a set of principles used to analyze Landscape Architectural designs from a therapeutic perspective.

Case studies of various garden types and design consideration were researched and also comparative analyses of three specialist hospitals were carried out, two (2) from the northern part of Nigeria and the temperate region of the United States of America (U.S.A) have been documented, and the principles guiding the design of the landscape have been analyzed from a therapeutic perspective.

Finally, these findings were further drawn up in to criteria; to create a sustainable planting scheme, which will be proposed to enhance the healing process in Barau Dikko Specialist Hospital, Kaduna.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

It is often said that, the most unpleasant place to be if you are sick is the hospital. Every year thousands of patients are admitted for one problem and end up with another. Hospital centers play significant roles in our societies, especially in this age of numerous diseases, plagues and infinite epidemics. Encarta (2009) defines a hospital as a building for medical care: an institution where people receive medical, surgical or psychiatric treatment and nursing.

Over the past decade many people have become aware of the positive benefits of human interaction with plants and gardens. The recent surge of interest in this relationship in combination with a great increase in Landscape Architectural activities in treatment programs have led to the use of numerous terms for these programs and activities such as therapeutic horticulture, garden therapy, social horticulture, and therapeutic gardening to name a few. Because these terms are used interchangeably, it is difficult to distinguish one from another and landscape therapy has often been used as the catch-all phrase. There are in fact some crucial differences between terms.

Gardens designed to support people-plant interactions and human well-being have been referred to as healing gardens, therapeutic gardens, and restorative gardens, among others. An emerging trend in the healthcare industry in developed countries is the incorporation of therapeutic gardens.(www.bhadesigns.com). As an added patient service, therapeutic gardens can be incorporated at relatively low cost while adding measurable positive outcomes through appropriate treatment techniques. Virtually all patient populations can benefit from properly designed gardens. The ideal garden setting incorporates appropriate design strategies and is

balanced with a Horticultural Therapist (HT). The Horticultural Therapist (HT) interacts with physicians, nurses, physical therapists, occupational therapists, cardiologists and other caregivers to develop treatment protocols that are appropriate for given patient populations .As little as three minutes in an outdoor garden space can provide lowered blood pressure and lowered pulse rate. (www.healthwatch.com).

In the case of high stress hospital environments, accessible garden spaces can afford doctors, nurses, staff, patients and family opportunities to recharge and reduce stress. When these spaces incorporate specific evidence based therapeutic design principals, the results can be impressive.

Lausier.E (2010) argues that the idea that gardens are beneficial to patients in health care settings dates as far back as the Middle Ages when European monasteries created elaborate gardens to provide medicines as well as fulfil the spiritual needs of the ill. Today, we know that being surrounded by nature plays a significant role in patient outcome and as the health system expands, the garden spaces will grow, too. Gardens and landscaping will be integral to the design of Major Hospital Additions, according to early initial discussions.

Decades of research has shown that the hospital environment affects patients positively or negatively and that patient's benefit from views of nature and from private, refreshing spaces. Emotional benefits of gardening may derive in part from the sense of the natural rhythm of life that plants and gardens impart. It can divert thoughts about oneself and his situation. In the garden, you can create and control your environment. Research has proven that a view of trees may reduce the recovery time in the hospital after surgery by almost a full day (www.allaboutlandscape.com).

1.2 STATEMENT OF PROBLEM

There are many specialist hospitals today, but one must ask; is their environment really serving the function of healing? There is a strong relationship between the environment and healing however, many hospitals in Nigeria have not taken advantage of this.

The Barau Dikko Specialist Hospital has a large expanse of un-organized space (which is the case in most General/Specialist hospitals) and is largely without variety of garden schemes to enhance the quality of the hospital environment, which should be a pleasing experience for patients, workers and visitors. Virtually all specialist hospitals are an eye-sore in terms of external aesthetics and therapeutic landscape development. Consultants and developers do not attempt to harness the maximum use of natural potentials of the site in the design programme.Noise, pungent odor from gutters, dumps, broken septic tanks, excessive heat from asphalt paved parking lots, ponds etc. characterize our hospital environments. Care givers and workers inhabit hostile environments not to mention the pain and suffering for patients. With the current growing concern of environmentally conscious designs and better health environments in the world, therapeutic landscaping has become a very important field of architecture that is pushing the profession to more demanding and creative heights.

1.3 AIM OF THE STUDY

The aim of this thesis is to use therapeutic landscape features to enhance the environment and process of healing in Barau Dikko Specialist Hospital, Kaduna.

1.4 OBJECTIVES OF THE STUDY

The objectives of the research are:

i. To identify therapeutic landscape features.

ii. To study healing and therapeutic environment.

iii. To evolve a planting scheme and landscape features to compliment other healing processes.

iv. To create a place that offers conducive environment for healing, work and recreation in Barau Dikko Specialist Hospital.

1.5 SCOPE AND DELIMITATIONS

The scope of this thesis is limited to the Barau Dikko Hospital environment. This includes detailed study of the existing land use and their influence/impact on the prevailing activities and functions. Case studies of therapeutic gardens and successful hospital environment would be carried out to enhance the knowledge base. A new programme of outdoor development with therapeutic gardens and landscape features would be produced in context of redevelopment.

1.6 LANDSCAPE SIGNIFICANCE

The choice of this topic is based on a desire to enhance the landscape potentials of the Specialist Hospital. Having seen and experienced the hospital environment first-hand the need for awareness, improvement and dissemination of healing landscape knowledge in modern times is essential. This landscape possesses unique characteristics and immense potentials; adopting therapeutic landscape principles in development will enhance their sustainable use, help reduce the hospital-stay of patients, reduce the aura of fear and hostility in public hospitals.

1.7 RESEARCH METHODOLOGY

This research will involve the following processes namely: Literature Review and Case Studies.

1.7.1 Literature Review

A review of Gardening and Landscape Architecture magazines, journals and publications, unpublished thesis and internet based researches of the research area to enhance knowledge base.

1.7.2 Case Study

The case study method is basically qualitative.

This involves the analysis of similar facilities from around the world, with a view to understanding the factors and or principles behind their design and composition. Significant case studies of Specialist Hospitals within Nigeria and around the world will be examined.

The case studies will be analyzed based on spatial arrangement of available facilities, design concept, composition of landscape architecture features and planting.

Due to the possibility of limited information, in terms of un-availability of landscape drawings, or real-time access to facilities; some of the case studies analyzed on the basis of a few parameters, base maps, analysis of sketches, or pictures of the landscape. However, the various case studies will be sufficient to provide adequate information collectively, which will help to shed light on the trends and concepts. Information on the case studies within Nigeria were derived through visits, and interviews; while those overseas were derived through the internet.

The case studies are divided into two categories, namely:-

i. Two (2) case studies from Specialist Hospitals in Nigeria and
ii. One (1) from overseas.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPT OF SPACE AND PLACE

The concept of 'place' itself has been variously defined as space given meaning through personal, group or cultural processes (Low and Altman 1992), or space with the addition of distinctive character (Norberg-Schulz 1980). Altman and Zube (1989) suggest that the transformation of a 'space' into a 'place' occurs when the 'abstract geographical qualities of environments become transformed into meaningful places as people use, modify, or attribute symbolic value to specific settings'. In broad terms, these concepts refer to a person's identification with, and attachment to, places and associated features (Low and Altman 1992; Hummon 1992; Sime 1986). But the essential point is that people can possess a 'sense of place' associated with the 'character of places', or the aggregation of distinctive and familiar place features. While a place can possess unique and distinctive character, only people can have a 'sense of place'.

Tuan (1974a) maintains that people will experience a sense of place in two fundamental ways; through perceptual and aesthetic awareness of the environment, and through the meanings one ascribes to it over time. He refers to the former as 'public symbols' and the latter as 'fields of care', the distinction being that the former are more obvious visually, while the later are more inconspicuous, but elicit deeper affective responses (Tuan ,1974a). The more familiar a person is with a place the more he or she will weave such affective meanings into their conceptions of the place, while the less familiar, the more they will rely on perceptual cues, or what Tuan refers to as public symbols, in conceptualizing the character of the place. Depending upon familiarity and identification with the environment, conceptions of it will reflect both these modes of experience

to varying degrees. Sense of place is conceived of as being a highly multidimensional experience conveyed through environmental, social and cultural attributes of places, and people's psychological responses to these attributes (Low and Altman 1992; Rapoport 1985; Relph 1976; Tuan, 1974a). It is something encompassing more than simply the experience of physical appearances; although environmental aesthetic aspects are very important to its expression, the meaning ascribed to familiar, everyday places is thought to be particularly important to its establishment and maintenance.

People can also share socially-constructed place experiences, something that often occurs between people within small town communities. Over time, individual place images tend to be incorporated into socially-constructed group images, the degree to which depends on one's familiarity with the place. Relph (1976) suggests that such shared place images will be structured both vertically and horizontally, with the vertical dimension representing individual intensity and depth of experience, while the horizontal dimension represents the degree of knowledge about the place, shared by others whom one is intimately associated in that place. Conflicts can occur between different groups who share different conceptions of a place. For example, 'insiders' within a community might oppose a particular environmental change, like a, proposal for a new building that they feel will be incompatible with their conceptions of the character of the place. 'Outsiders' on the other hand may not be as troubled by the prospect of such a change because they have not yet had time to form a definite image of the place against which they can judge the compatibility of the change. To insiders, who would be more likely to have formed meaningful, often unconscious bonds with their familiar everyday environments, the change may be perceived as a threat to their very sense of self. Since outsiders will tend to lack such deep and meaningful connections, the change may not be a threat to their sense of self, and therefore, will

not necessarily be perceived as inappropriate. The implication here is that through long-term involvement in, and familiarity with a place, the insider will establish emotional attachments that outsiders will typically not have had time to form.

Some studies suggest that the degree of openness and the presence of definite spatial definition are key structural attributes associated with how people mentally categorize natural landscape scenes. Open spaces that lack spatial definition tend to not be preferred as much as relatively open settings that have clear definition (Appleton, 1975).

Kaplan (1989) found that the most highly-preferred landscape scenes are those that convey a sense of 'mystery'. A scene containing mystery is visually inviting because it holds the promise that one might be able to gather more information, or learn something more about the environment, if one were to venture further into the scene. It suggests the promise of information that is available beyond what is immediately visible. Mystery evokes a sense of curiosity and entices the viewer to imagine, or anticipate, what it might be like if they were to explore the landscape further.

2.2 DISTINCTIVENESS AND UNIQUENESS OF PLACE

The degree to which a place is said to have 'a lot of character' is often strongly associated with how distinctive the environmental, social and cultural features are that distinguish it from other places. These are features that are somehow unique, different, unusual, special or rare to a given locality (Garnham 1985).

2.3 EMOTIONAL RESPONSES TO THE ENVIRONMENT

Affective responses to the environment, particularly pleasure, arousal (for example, peacefulness, excitement), interest (Herzog et al. 1976; Wohlwill,1976) and a sense of belonging (Feldman 1996) have been identified as being strongly involved in sense of place (Low and Altman 1992).

Generally, meaningful place character is associated with positive affective responses, while negative responses are associated with more placeless environments.

2.4 THE HISTORY OF GARDENS

Garden styles at a glance:

a.) **Roman Britain:** formal, low hedges

b.) **Medieval:** small enclosed, with turf seats and mounds

c.) **Tudor:** knot gardens, enclosed in hedges or walls

d.) **Stuart:** formal Italianate and French styles

e.) **Georgian:** informal, landscaped, open parkland

f.) **Victorian:** bedding plants, colourful, public gardens

g.) **20th Century:** mixed styles, herbaceous borders

Gardens and the cultivation of plants have been around for thousands of years with the first examples dating to around 3000 years ago in ancient Egypt and Mesopotamia. The Romans were also keen gardeners and they were also aware of the medicinal properties of plants. Following on from the Romans in identifying the medicinal properties of plants were the monks. They also used the beauty of plants and flowers as a celebration of God. The first of these monastic gardens

was created in the 8th century. These gardens were the pre-cursor to the physic gardens that appeared in the 16 century.

None of the gardens mentioned so far can be regarded as "botanic gardens" though. A botanic garden is not an easy thing to classify (see the definition page for a detailed definition) though an underlying scientific basis is a necessity. Therefore the world's first botanic gardens were the physic gardens of Italy in the 16th and 17th centuries. The first of these physic gardens was the garden of the University of Pisa which was created by Luca Ghini in 1543. Following this other Italian universities followed suit and gardens were created in Padova (1545), Firenze (1545) and Bologna (1547). These gardens were purely for the academic study of medicinal plants. By the 16th Century these medicinal gardens had spread to universities and apothecaries throughout central Europe such as Cologne and Prague. (*See Plate I*). The University of Oxford botanic garden was the first garden established in the United Kingdom in 1621 with a mission to promote learning and the glory of god.



Plate I: The Botanical Gardens of Padua University as seen in a 16th Century Print
(Source: http://www.bgci.org/resources/history/)

Botanic gardens then experienced a change in usage during the 16th and 17th century. This was the age of exploration and the beginnings of international trade. Gardens such as the Royal Botanic Gardens, Kew and the Real Jardín Botánico de Madrid were set up to try and cultivate new species that were being brought back from expeditions to the tropics. Not only did these gardens promote and encourage botanical exploration in the tropics, they also helped found new gardens in the tropical regions to help cultivate these newly discovered plant species. The British established Calcutta Botanic Gardens in 1787 while the French set up Pamplemousse Botanic Gardens in Mauritius in 1735 and the Real Jardín Botánico de Madrid established the botanic gardens of La Orotava on Tenerife.(http://www.bgci.org/resources/history/)/These tropical gardens were created almost solely to receive and cultivate commercial crops such as cloves, tea, coffee, breadfruit, cinchona, palm oil as well as chocolate. It was during these times that Para rubber was introduced to Singapore, teak and tea to India and breadfruit, pepper and star fruit to the Caribbean.

These tropical gardens could not strictly be called “Botanic Gardens” as there was no real scientific basis to their work and this almost led to their decline. Separate institutions and schools of agriculture were developed which meant that these ‘cultivational’ gardens were almost redundant.

During the 19th and 20th century municipal and civic gardens were created throughout Europe and the British Commonwealth. Nearly all of these gardens were mainly pleasure gardens with very few of them having any scientific programmes. Missouri botanic garden is an exception to this and was the first botanic garden to be established in the United States of America in 1859. During this section of botanic garden history the only real scientific activities undertaken by gardens was the labelling of collections correctly and exchanging seeds on a worldwide basis.

In the last 30 years, botanic gardens have seen a revival as scientific institutions due to the emergence of the conservation movement. They are now seen as very important due to their existing collections and the scientific knowledge they posses in the propagation of plant species. Conservation is now seen in many gardens as their *rasion d'etre*. The beginning of this was seen in the 1970's when IUCN began encouraging *ex situ* conservation of threatened plants.

There are now currently 1775 botanic gardens and arboreta in 148 countries around the world with many more under construction or being planned, one of such is the first botanic garden in Oman which will be one of the largest gardens in the world once it is completed and will house the first large scale internal fog-forest in a huge glasshouse. (http://www.bgci.org/resources/history/).

2.5 TYPES AND CLASSIFICATION OF GARDENS IN HISTORY

Gardens cater for different human and space requirements, and can be classified accordingly:-

a) English Gardens
b) French Gardens
c) Italian Gardens
d) Egyptian Gardens

Gardens on a broader note can be categorized under the following eras:

a) Victorian age
b) Medieval age
c) 18th Century

2.5.1 English Gardens

The earliest English gardens that we know of were planted by the Roman conquerors of Britain in the 1st century AD. The Roman and English gardens that we know the most about are those of the large villas and palaces. The best example of the latter is probably Fishbourne Roman Palace in Sussex, where an early garden has been partly reconstructed.

Fishbourne shows a carefully symmetrical formal planting of low box hedges split by graveled walks. The hedges are punctuated by small niches which probably held ornaments like statues, urns, or garden seats. The formal garden near the house gave way to a landscaped green space leading down to the waterside below. There is also a small kitchen garden which is planted with fruits and vegetables common in Roman Britain. (http://www.britainexpress.com/History/english-gardens.htm).

Very little is known about the gardens of Anglo-Saxon England, which is another way of saying that the warlike Anglo-Saxons did not hold gardening to be important. It was not until the Middle Ages that gardens once more became important in British life. Monasteries had both kitchen gardens and herb gardens to provide the practicalities of food and medicine. The monastery cloister provided an open green space surrounded by covered walks, generally with a well, or fountain at the centre. Castles sometimes made room for small courtyard gardens, with paths through raised flower beds (*See Plate II and III*). Other common features of medieval castle gardens include turf seats and high mounds, or mounts, which provided a view over the castle walls. As castles gave way to fortified manor houses in the later medieval period, the garden became a simple green space surrounded by hedges or fences. Games such as bowls or tennis took place on the lawn

The next stage of the English garden was after the Reformation. Many landowners enclosed common land to create parks for keeping deer or cattle. This 'natural' landscape gave way to formal gardens near the house, still sheltered from the outside world by hedges or walls.



Plate II: An English Garden *(Source: http://www.maldenyachtclub.org/blog/?p=672)*



Plate III: Painting of a Typical English Garden
(Source: http://www.ozclimatesense.com/2010/03/national-trust-english-gardens-

2.5.2 French Gardens

The French Garden design was a very formal, very ordered gardening style with lots of straight lines and symmetry (*See Plate V*). The focus of the garden tend to be the house, usually a palace or chateau and paths radiate out of this creating long axial views. Paths tend to be gravel and edged with clipped hedges and topiary laid out in symmetrical patterns (*See Plate IV*). Water is often a key feature of French garden design and lots of round pools and long rectangles of water were incorporated, the reflection of the water adding to the symmetry and tranquillity of the scene. Fountains and cascades were also very common features.

The French Garden Design is above all a style created to impress, but not therapeutic in nature. The prime survivors of this style can be seen at Blickling Hall (Norfolk), Melbourne (Derbyshire), and Chatsworth. Andre Le Notre created the extraordinary gardens of Versaille and the style was copied by nobility throughout France and, indeed, by some of the large aristocratic buildings of Europe too. (http://en.wikipedia.org/wiki/Garden_design).



Plate IV: Gardens of the Chateau de Villandry, France
(Source: http://www.french-gardens.com/gardens/villandry.php)



Plate V: Gardens of the Palace of Versailles, France
(Source: http://www.french-gardens.com/gardens/versaille.php)

2.5.3 Italian Gardens

The Tudors followed Italian influence in creating gardens which mirrored the alignment of the house, creating a harmony of line and proportion that had been missing in the medieval period (*See Plate VI*). For the first time since the Romans left, sundials and statues were once more popular garden ornaments. But the most prominent contribution of the Tudors to gardening was the knot garden. Knots were intricate patterns of lawn hedges, usually of box, intended to be viewed from the mount, or raised walks. The spaces between the hedges were often filled with flowers, shrubs, or herbs. No Tudor gardens have survived intact, but some of the best examples still remaining can be glimpsed at Haddon Hall (Derbyshire), Montacute House (Somerset), and Hampton Court Palace (near London).(http://www.livinginitaly.com/italian-topiary.html).The latter has reconstructions of Tudor knot gardens, but these were planted in the early 20th century.



Plate VI: The Italian Garden at Hatley Park, Victoria,BC
(Source: http://www.victorialodging.com/about/garden-wedding-victoria)

2.5.3 Egyptian Gardens

Gardens were very much a part of life in ancient Egypt. Ancient Egyptians designed and spent much time in garden houses. Egyptian gardens (in the larger estates) were composed of both trees and flowering plants.

Gardens with a few fruit trees to large botanical and zoological gardens which had exotic trees, birds, ponds stocked with fish, and caged animals were depicted in many tombs. In the countryside, the houses and palaces were all set in large gardens and surrounded by a wall. Temples also were associated with large gardens and formal landscaping.

Temple gardens had plots for cultivating special vegetables, plants or herbs considered sacred to a certain deity and which were required in rituals and offerings like lettuce. Sacred groves and ornamental trees were planted in front of or near both cult temples and mortuary temples. As temples were representations of heaven and built as the actual home of the god, gardens were

laid out according to the same principle. Avenues leading up to the entrance could be lined with trees, courtyards could hold small gardens and between temple buildings gardens with trees, vineyards, flowers and ponds were maintained. (http://quezi.com/2104).

The ancient Egyptian garden would have looked different to a modern viewer than a garden in our days. It would have seemed more like a collection of herbs or a patch of wild flowers, lacking the specially bred flowers of today (*See Plate VII*). Some of the more common plants in Egyptian gardens include daisies, cornflowers, mandrakes, roses, irises, myrtle, jasmine, mignonettes, convolvulus, celosia, narcissus, ivy, lichens, sweet marjoram, henna, bay laurel, small yellow chrysanthemums and poppies.(http://en.wikipedia.org/wiki/History_of_gardening). There were also papyrus, willows, acacia, sycamore fig, pomegranate, jujube, nut trees, tamarisk, lotus and grape**s**. (http://oaks.nvg.org/sa5ra5.html).

Due to the arid climate of Egypt, tending gardens meant constant attention and depended on irrigation.

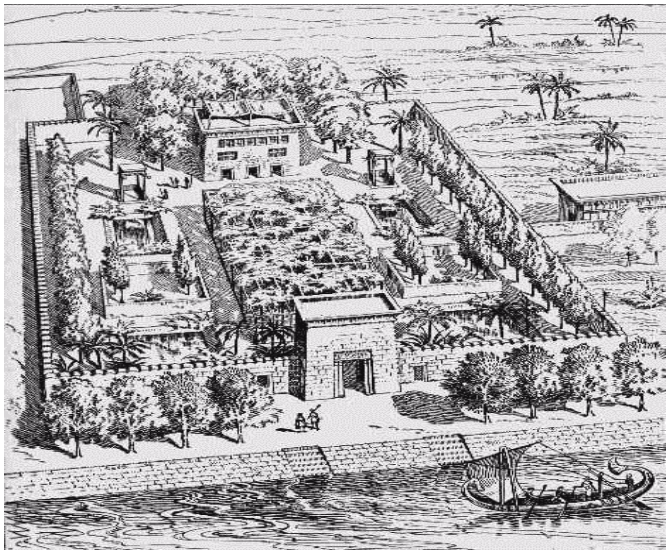


Plate VII: An ancient Egyptian Garden Home
(Source: http://oaks.nvg.org/sa5ra5.html)http://oaks.nvg.org/sa5ra5.html)

2.5.4 18th Century Garden Style

The 18th century saw a swing from Renaissance formality to a more "natural" look. One of the prime movers of this style was the art patron, Lord Burlington. William Kent designed an influential garden for Lord Burlington at Chiswick House based on carefully calculated vistas with temples, statues, and classical ornaments punctuating openings in treed parkland.Lines were no longer straight, paths curve and wander, and parterres are replaced by grass. Trees were planted in clusters rather than in straight lines, and rounded lakes replaced the rectangular ponds of the earlier style. The garden became open, a park joining the house to the outside world rather than a carefully nurtured refuge from it. This natural style begun by Kent evolved into the "landscape garden" under Kent's pupil and son-in-law, Lancelot "Capability" Brown. Brown, whose curious nickname came from his habit of telling prospective clients that their gardens showed "great capabilities", had an enormous effect upon the course of English gardening and architectural style.

The landscape garden made the English country house a part of the fields and farmlands surrounding it (*See Plate VIII*). Gone were hedgerows and fences. Gone, too, were formal beds and walks. Grass parkland was brought right up to the doors of the house. The greatest surviving landscape gardens by Capability Brown are at Longleat (Wiltshire), Burghley, Petworth, and Blenheim Palace (Oxon). Humphrey Repton carried on Brown's landscape garden mastery, though Repton introduced gravel walks and re-introduced separate flower gardens (See Plate IX). Repton replaced the earlier classical ornaments with romantic structure like grottoes and fake ruins.



Plate VIII: 18th century style gardens at The Manor, Los Angeles
(Source: http://themostexpensiveintheworld.blogspot.com/2011/01/top-10-most-expensive-houses-in-world.html)

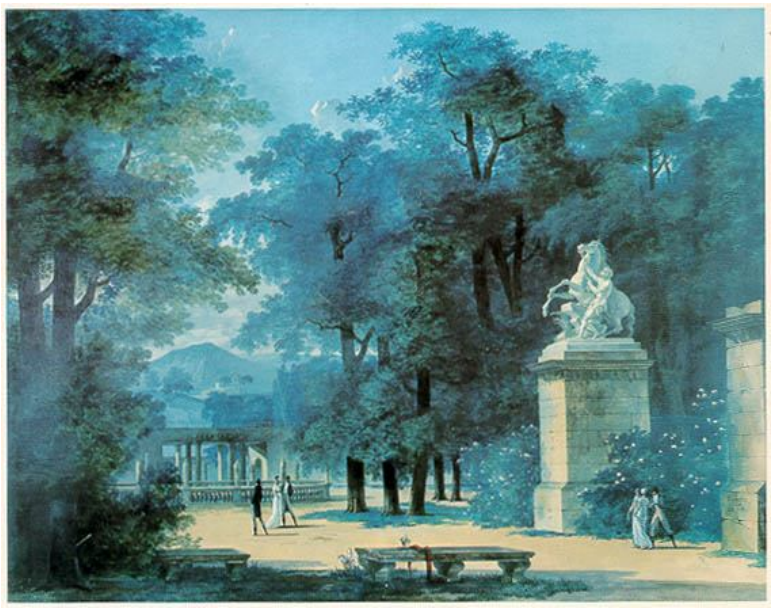


Plate IX: An 18th Century Garden painting; Vue de Marly, Mongin, c. 1800 *(Source: http://www.mtholyoke.edu/courses/rschwart/hist255s01/pleasure/bourgeois_garden*

2.5.5 Victorian Age

In the Victorian era the pendulum swung again, to massed beds of flowers (bedding out plants raised in greenhouses), exotic colours, and intricate designs. The most influential gardeners of this period were J.C. Loudon, and later, Joseph Paxton (Chatsworth House and Kew). The

Victorian period also saw a profusion of public gardens and green spaces aimed at bringing culture to the masses (*See Plate X*). Some of the finest Victorian gardens are public parks, like People's Park in Halifax. Taste in the late Victorian period varied between formal and the "wild" garden advocated by the influential writer William Robinson. Sometimes the formal and informal looks were combined in the same garden, as at Sissinghurst Castle (Kent), and Hidcote (Gloucestershire).

Gertrude Jekyll is arguably the most influential gardener of 20th century England (http://www.gardensoflondon.co.uk/articles/garden/articles_history_english_gardens.htm)..She popularized the herbaceous border and planning a garden based on colour schemes. This built on the tradition of the "Cottage garden", with its profusion of flowers wherever space permits, and climbers on trellises and walls. Jekyll saw the house and garden as part of an integral whole, rather than the garden as an afterthought to the building. Her work survives at Marsh Court (Hampshire) and Hestercombe (Somerset).

Gardening has always been a matter of personal taste, and often the outstanding works of previous generations are torn down to make way for the style of the next. For that reason it is hard to find unaltered examples of historical gardens in England.



Plate X: A typical example of a Victorian Garden; Kew Gardens, The Museum, London, England, c1900 *(http://www.victoriana.com/gardening/britishgardens.php)*

Kew Gardens, known today as the Royal Botanic Gardens, are located on the River Thames in southwest London, England. Kew Gardens was originally a private fruit and vegetable garden belonging to the Prince of Wales, the father of George III. The dowager princess of Wales, the mother of George III, began to improve it as a botanical garden and pleasure ground about 1760. Under Queen Victoria's patronage, Kew Gardens flourished and by the late nineteenth century, the Garden was said to be one of the finest and most complete botanical collection and arboretum in the world.

2.5.6 Medieval Gardens

The beginning of garden-making in Britain is said to be the medieval period – partly because little is known about gardens in this country before the Norman Conquest.

This period is signified by an emergence from the 'Dark' Ages with increased stability, the establishment of the monasteries and the development of an increasingly ordered society. The

Crusades extended trade and rising commerce brought a growth in towns and with that, the establishment of weekly or seasonal fairs.

Consequently one of the greatest influences on gardening at this time came from the monasteries. In the 6th century the Benedictine order was founded and established in areas across the British Isles. Great importance was attached to manual labour and self-sufficiency and a series of gardens were created around the monastic buildings. Plans from St Gall, a Benedictine monastery dating from the 7th century show the extent of these gardens. Each area provides for a different function laid out in a geometric pattern around the main buildings of the monastery.(*See Plate XI*).



Plate XI: Painting of a Medieval Garden
(Source: http://www.whittingtoncastle.co.uk/history/the-medieval-garden.shtml)

2.6 Estate Garden Parks

Estate park gardens were some of the largest and most majestic of all the different kinds of gardens in the 18th century. Far from the small kitchen and medicinal gardens of the commoner or the orchards and infirmary gardens of the monasteries, these focused on a new style of design

for landscapes, and the best operating example to compare for modern Americans is Central Park in New York City. Acres and acres of neatly tended lawn and walkways, statues and reflecting ponds, whimsical topiaries and everything from low growing shrubs to tall fruit trees made up this type of garden. With an eye for the natural beauty of nature, these parks were well tended, but kept the original shapes of the woods that they were a reflection of.

One of the first great 18th century landscape designers was Charles Bridgeman. Bridgeman became a popular name with other landscape architects of his time with his very dramatic redesigns of the estate gardens belonging to wealthy English nobles. He laid out the plans for the extravagant estate garden of Lord Cobham, which incorporated temples, finely carved stone statues, pillars, summer houses, and a miniature replica of an Egyptian pyramid. Bridgeman participated in the design of a garden at Rousham House in Oxfordshire that included cascades, fountains, square pools, an outdoor theatre, and a wilderness area that could be viewed from a vantage point within the main garden. He was an inspiration for the landscape architects of today. These estate pleasure gardens often ended with high walls, on the other side was the forest, and often times the lord of the estate would stock the forests with wild boar and other animals to hunt at his leisure. These hunting expeditions were a big part of 18th century wealthy entertainment, and while the men were out hunting, the women would walk the smaller sections of the estate gardens or sitting quietly talking by one of the many reflecting pools. Walls were to ensure privacy and their stark lines also set off the landscaped grounds.

These gardens had full service areas for a luncheon. Stone pathways opened up to covered areas where the lady of the house could entertain outside, and her guests would be served lunch on the huge patios by the servants. As the leading landscape gardener of his time, he was known for favoring the distinctively English style of grand and picturesque, "tended nature", and

asymmetrically structured landscapes with lots of expensive orchards and evergreen trees, expansive lawns on which to have garden parties, meandering streams, and sylvan lakes (http://www.gardenhistoryinfo.com/gardenpages/estateparkgardens.html).During the 18th century he was in high demand, as every wealthy land owner wanted his grounds turned into an estate park. The result was an amazing design, coupled with the natural landscape as the earth had intended it.

The 18th Century English, Victorian and Edwardian garden styles each have their own distinctions. The background and tradition of the English gardens started with the interest of the well to do in the seventeenth century. Landscape paintings, increased travel and a longing to have the French designs brought over and made their own led the wealthy of this era to consult and hire landscape architects. The English had begun to think of nature as something beautiful and ideally wild instead of the strict designs seen in the French designs of the day. The natural environment of the estate was enhanced and accentuated to encourage picturesque views, especially those views as seen from the high windows of the second floor of the estate. From this vantage point the owners could watch the seasons change in such a way as to be inspired to write and paint, a popular pastime during the winter months. The English climate and current landscape made it easy for the great designers of the day, as it was well suited to this expression. William Kent and Lancelot "Capability" Brown advanced this landscape estate garden expression (http://www.gardenhistoryinfo.com/gardenpages/estateparkgardens.html). With respect to the spatial planting of the era, the opening up of the small gardens of the past enabled the landowners to include more and more of the landscape, leaving behind the formality in favor of nature, with her softer contours and features.

These huge pieces of estate garden lands were not only used for pleasure. The wooded areas behind the park like surroundings were often a source of income for the families who owned them. The timber industry proved to be a lucrative investment for the estate owners. The pastures were often turned into lush lawns by allowing sheep to graze, providing another source of income. The no fences or hedges idea for the English park gardens and the grazing sheep in the landscape added to the overall feeling of a natural English garden. Today a small part of this era has been recaptured in the estate parks; some are open to the public and have been turned into public parks by the cities.

2.7 CONCEPTS OF HOSPITALS

The word brings to mind many immediate images, but these images have changed since this writer began this research work. Initially the conceptions included thoughts/feelings/fears when you stop and think about "hospital." Others perception include cleanliness, medicine, waiting for nurses, filling out menus, sponge baths, wheelchairs, tests, and diagnoses. For others it may be the "hospital smell", the sound of hard shoes walking down long corridors, pacing, waiting, and praying.

2.7.1 HOSPITAL

A hospital is a building designed to diagnose and treat the sick, injured or dying (en.wikitionary.org).Usually it has a staff of doctors and nurses to aid in the treatment of patients. Other definitions include a building for medical care: an institution where people receive medical, surgical, or psychiatric treatment and nursing care (Encarta dictionary).It also includes Social welfare or charitable institution providing shelter, care, or education for orphaned children, senior citizens, or the homeless or destitute (Webster's Dictionary).

2.7.2 Federal Medical Centers and Specialist Hospitals in Nigeria

STATE	HOSPITAL NAME	TYPE OF TREATMENT
Abia	(a) Abia State University Teaching Hospital, Aba	General
Abuja, F.C.T	(a) University of Abuja Teaching Hospital, Gwagwalada. (b) National Hospital, Abuja	General and referred cases General
Adamawa	(a) Federal Medical Centre, Yola	General
Akwa Ibom	(a) University of Uyo Medical Centre, Uyo	General
Anambra	(a) Nnamdi Azikiwe University Teaching Hospital, Nnewi	General
Bauchi	(a) Federal Medical Centre, Azare (b) Abubakar Tafawa Balewa University Teaching Hospital, Bauchi	General General
Benue	(a) Federal Medical Centre, Makurdi	General
Borno	(a) University of Maiduguri Teaching Hospital (UMTH) (b) Federal Neuro-Psychiatric Hospital (FNPH) Maiduguri	General General
Cross River	(a) Federal Psychiatric Hospital, Calabar Road, Calabar (b) University of Calabar Teaching Hospital (UCTH), Calabar	Psychiatric General
Delta State	(a) Federal Medical Center, Asaba (a) Federal Medical Center, Onicha-Olona	General General
Ebonyi	(a) Ebonyi State University Teaching Hospital (b) Federal Medical Centre, Abakaliki	General General and referred cases

Edo	(a) University of Benin Teaching Hospital, Benin City	General and referred cases
Ekiti	(a) Specialist Hospital, Ikole Ekiti (b) Federal Medical Centre, Ido-Ekiti (c) University Teaching Hospital, Ado-Ekiti	General General General
Enugu	(a) Federal Neuro-Psychiatric Hospital, Chime Avenue, New Haven, Enugu (b) National Orthopedic Hospital, Enugu (c) University of Nigeria Teaching Hospital, Enugu	Brain Surgery and Psychiatric Bone surgery General and referred cases
Imo	(a) Federal Medical Centre (FMC) Owerri	General and referred cases
Jigawa	(a) Federal Medical Centre (FMC) Birnin Kudu	General and referred cases
Kaduna	(b) Barau Dikko Specialist Hospital,Kaduna (c) National Eye Centre,Kaduna. (d) Ahmadu Bello University Teaching Hospital, Kaduna	General, Orthopaedic Eye General
Kano	(a) National Orthopaedic Hospital, Dala, Kano (b) Murtala Mohammed Specialist Hospital, Kano (c) Infectious Disease Hospital, Kano	Orthopaedic General Infectious Disease
Katsina	(a) Federal Medical Center, Katsina	General
Kogi	(a) Federal Medical Centre, Lokoja	General
Kwara	(a) University of Ilorin Teaching Hospital, Ilorin	General
Lagos	(a) Lagos University Teaching Hospital (LUTH), Idi-Araba, Yaba (b) Lagos State University Teaching Hospital (LASUTH), Ikeja	General General

	(c) Federal Medical Centre, Ebutte-Metta (d) University Teaching Hospital, Lagos	General General
Niger	(a) Federal Medical Centre, Bida	General
Ondo	(a) State Specialist Hospital, Akure (b) Federal Medical Centre, Owo	General General
Oyo	(a) University College Hospital (UCH), Ibadan	General
Ogun	(a) Neuro-Psychiatric Hospital, Aro, Abeokuta (b) Federal Medical Hospital	Brain Surgery and Psychiatric General
Plateau	(a) Jos University Teaching Hospital, Jos	General and referred cases
Rivers	(a) University of Port Harcourt Teaching Hospital, Port Harcourt	General
Sokoto	(a) Federal Neuro-Psychiatric Centre, Kware (b) Usmanu Danfodio University Teaching Hospital, Sokoto	Brain Surgery and Psychiatric General

Table 2.7.2: Federal Medical Centers and Specialist Hospitals in Nigeria.

2.8 HOSPITAL AND ITS LANDSCAPE

Modern hospital landscapes are designed to minimize the effort of medical personnel and the possibility of contamination while maximizing the efficiency of the whole system. Travel time for personnel within the hospital and the transportation of patients between units is facilitated and minimized. Landscapes are also designed to accommodate care-givers, patients and staff, while space for special waste disposal is allowed for in the design. However, the reality is that many hospitals, even those considered 'modern', are the product of continual and often badly

managed growth over decades with utilitarian new sections added on as needs and finances dictate.

Some newer hospitals now try to re-establish design that takes the patient's psychological needs into account, such as providing more fresh air, better views and more pleasant colour schemes. These ideas hearken back to the late eighteenth century, when the concept of providing fresh air and access to the 'healing powers of nature' were first employed by hospital architects in improving their buildings. Another ongoing major development is the change from a ward-based system (where patients are accommodated in communal rooms, separated by movable partitions) to one in which they are accommodated in individual rooms. The ward-based system has been described as very efficient, especially for the medical staff, but is considered to be more stressful for patients and detrimental to their privacy. A major constraint on providing all patients with their own rooms is however found in the higher cost of building and operating such a hospital; this causes some hospitals to charge for the privilege of private rooms, which in no small way has caused pressure on the hospital building.

2.9 CONCEPT AND DEFINITION OF A HEALING GARDEN

Healing is defined as “the act or process by which anything is healed or cured; the power to heal. – Tending to cure or heal.” (Webster, 1990). According to the Oxford English Dictionary, there are four definitions of the word "heal". As a transitive verb heal is defined as:

i. To make whole or sound in bodily condition.

ii. To cure (a disease).

iii. To restore from some evil condition (to cure, repair and amend).

A fourth definition of heal as an intransitive verb:

iv. To become whole or sound.

A ‘healing garden’ encompasses these definitions to an extent, the benefits are related more to the alleviation of stress and the abilities of the space to soothe, to calm, to rejuvenate or to restore one’s mental and emotional health. A main role of the space is to provide sanctuary, to allow for meditation or to evoke other qualities desired by the garden user. The World Health Organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. Based on research by Ulrich et al (1991), it could be argued that any garden is a healing garden. However, for the purposes of this research,more pertinent to this research is Eckerling's definition of a healing garden: "a garden in a healing setting designed to make people feel better" (Eckerling, 1996). According to Ekerling (1996a), the goal of a healing garden is to make people feel safe, less stressed, more comfortable and even invigorated. Potential activities in a healing garden range from passive to active:

i. Viewing garden through window
ii. Sitting outside
iii. Dozing/napping/meditation/prayer
iv. Gentle rehabilitation exercises
v. Walking to preferred spot
vi. Eating/reading/doing paper work outside
vii. Taking a stroll
viii. Child playing in garden
ix. Raised bed gardening

Such gardens have been parts of hospitals, hospices, rehabilitation centers, and more recently nursing homes for the infirm and elderly.” (Gerlach-Spriggs, Kaufman, and Warner, 1998).

2.10 DISTINCTION BETWEEN HEALING GARDENS AND THERAPEAUTIC GARDENS

2.10.1 Healing Gardens

Healing gardens are plant dominated environments, including green plants, flowers, water and other aspects of nature. They are generally associated with hospitals and other healthcare settings, designated as healing gardens by the facility, accessible to all, and designed to have beneficial effects on most users. A healing garden is designed as a retreat and a place of respite for clients, visitors, and staff and to be used at their desire. Healing gardens may be further divided into specific types of gardens including therapeutic gardens, horticultural therapy gardens, and restorative gardens. These garden types are likely to have overlap and the following definitions should be regarded as guidelines since no two gardens are the same (http://www.search-results.com/).

2.10.2. Therapeutic Gardens

A therapeutic garden is designed for use as a component of a treatment program such as occupational therapy, physical therapy, or horticultural therapy programs and can be considered as a subcategory of a healing garden. A garden can be described as being therapeutic in nature when it has been designed to meet the needs of a specific user or population. It is designed to accommodate client treatment goals and may provide for both horticultural and non-horticultural activities. It should be designed as part of a multi-disciplinary collaborative process by a team of professionals. A therapeutic garden may exist on its own as an extension of an indoor therapeutic program area or it may be part of a larger healing garden.

2.11 TYPOLOGY OF HEALING GARDENS AND CONSIDERATIONS

2.11.1 Psychiatric Hospital Gardens

Psychiatric hospitals are facilities for people with psychiatric disorders: a hospital dedicated to the treatment, care, and protection of people with serious psychiatric disorders who are judged to be unfit or unsafe to live unsupervised and untreated in society.

Common knowledge design considerations for such facilities include:

(a) Use materials that can withstand abuse over time.

(b) Use of materials that are impossible in harming anyone.

(c) Use of non-poisonous plants irritating to plants. .

(d) The layout of the garden should be easily "readable" to minimize confusion for those who are not functioning well. Paths should be clearly laid out.

(e) Create planting buffers between people in the garden.

2.11.2 Children's Gardens in Healing Centers

Children's gardens are for minors under a legally specified age who are considered not to be legally responsible for their actions (http://en.wikipedia.org/wiki/Child).

Common knowledge design considerations for such facilities include:

(a) Make all entrances welcoming and child-friendly. (*See Plate XIII, XVI and XVII*).

(b) Provide differentiation of spaces for preadolescent / adolescent groups, if appropriate (*See Plate XIV and XX*).

(c) Provide a comfortable social environment with plenty of places for parents and staff to sit and share the space with children. (*See XV*).

(d) Provide as many options as possible for children to interact with nature through their senses and/or hands-on activities. (*See Plate XII and XVIII*).

(e) Provide opportunities for planting and harvesting.

(f) Provide a range of appropriately scaled, accessible multi-purpose settings for hands-on activity as well as for social gatherings of different types. (*See Plate XVII*).



Plate XII: Lawn chair at the Children's Garden–Catigny Park, Illinois-USA
(Source: www.cantigny.org)



Plate XIII: Na ʻĀina Kai's "Under the Rainbow" Children's Garden, Kauai-Hawai *(Source: www.naainakai.org/)*



Plate XIV: Morton Arboretum, Illinois-USA *(Source: www.mortonarb.org)*



Plate XV: Children's garden-Neotetem, Seattle Center, Seattle, Washington-USA
(*Source: www.waymarking.com/)*



Plate XVI: Na 'Āina Kai's "Under the Rainbow" Children's Garden, Kauai – Hawaii
(Source: www.naainakai.org)



Plate XVII: The Gardens on Spring Creek in Fort Collins, Colorado, USA
(*Source: www.westerngardeners.com)*



Plate XVIII: Spoehrer Children's Garden, Missouri, USA *(Source: www.mobot.org)*



Plate XIX: Legacy Emanuel Children's Garden Birdhouses, Portland, Oregon *(Source: www.gardentherapy.ca)*



Plate XX: Map of the Helen and Peter Bing Children's Garden, Huntington Garden, Alexandria, VA *(Source: www.huntington.org)*

2.11.3 Nursing Homes Garden

Nursing Homes are a long-term health care facility that provides full-time care and medical treatment for people who are unable to take care of themselves (Encarta ,2009).

Mc. Bride (1986) maintains that Nursing Home cares for seniors suffering from chronic ailments that prevent them from caring for themselves and for whom there is no adequate alternative source of care (http://www.caf.wvu.edu/RESM/faculty/mcbride/).

(a) Warm, highly saturated hues (red, orange, yellow) that are easier for the elderly to see than cooler hues (blue, purple, green) should be used.

(b) Plants with different leaf textures, forms, and smells to stimulate the senses and memory should be used.

(c) Provide different lengths and difficulty of walking routes that will provide choice to residents with different needs.

(d) Providing handrails will encourage less able residents to participate in outside activities.

(e) Provide transition areas between indoor and outdoor spaces, such as screen porches or overhangs, to provide protection from the elements, allow eyes to adjust to bright outdoor light, and provide a place to sit and view the activities without being involved in them.

(f) Provide sunscreens, trellises, fences, walls, baffles, and plant materials to alleviate the harsh effects of the sun and wind in outdoor spaces.

(g) Carefully place and select trees with dense canopies to reduce glare and control light penetration.

(h) Provide a clear organizational pattern with well-identified paths, a clear hierarchy of spaces and features or focal points to help orient residents (*See Plate XXIII*).

(i) Pathways should contrast with planting areas to help define the boundary between path and plantings for residents with reduced depth perception. - The colour of chairs and tables should contrast with floor material so they are distinguishable by people with sight impairments (*See Plate XXI*).

(j) Choose seating with back support and arm rests.

(k) Situate plantings to provide views from windows looking out onto the garden for people who are unable to go outside (*See Plate XXII*).



Plate XXI: St Vincent de Paul Nursing Home, Box Hill, VIC, Spain (*Source:http://www.drewdesign.com.au/gallery.asp)*

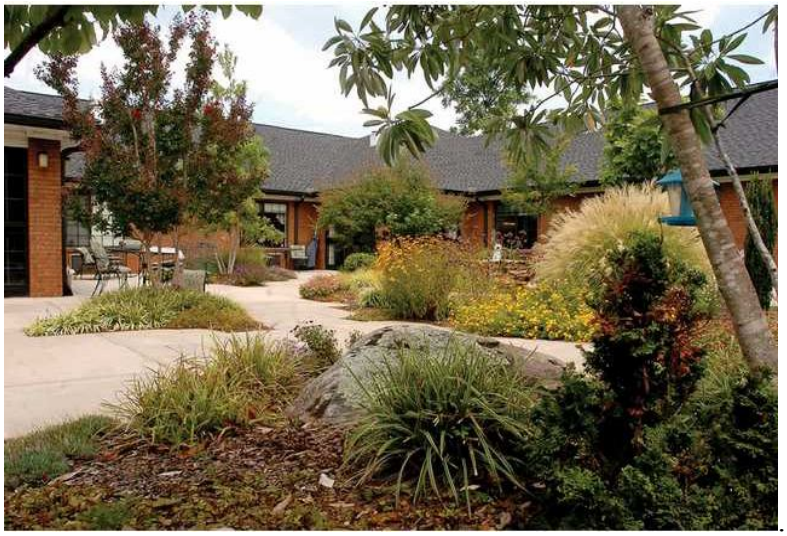


Plate XXII: Healing garden at The Oaks, Limestone nursing home. *(Source: http://www.healinglandscapes.org/blog/2008/08/gainesville-times-article-on-healing-gardens/)*



Plate XXIII: Homeland Centre
(Source:http://www.pennlive.com/midstate/index.ssf/2008/12/14-week/)

2.11.4 Alzheimer's Treatment Gardens

Alzheimer's disease is the most common form of dementia. Most often, it is diagnosed in people over 65 years of age, although the less-prevalent early-onset Alzheimer's can occur much earlier. The role of the main caregiver is often taken by the spouse or a close relative. Alzheimer's disease is known for placing a great burden on caregivers; the pressures can be wide-ranging, involving social, psychological, physical, and economic elements of the caregiver's life (en.wikipedia.org)'

Common knowledge design considerations for such facilities include:

(a) Paths should be a continuous level loop without dead ends which may frustrate dementia residents. (*See Plates XXVI and XXVII)*.

(b) Provide non-poisonous plants.

(c) Utilize plants and other elements that stimulate memory, conversation, and activity. (*See Plate XXV*)**.**

(d) Use subdued colours, textures and forms to create a calming environment. (*See Plate XXIV*).

(e) Choose seating with back support and arm rests.

(f) Provide landmarks such as sculpture, a profusion of flowers, or a water feature to help orient the users of the space. (*See Plate XXVII*).



Plate XXIV: Easy walkways in an Alzheimer's Garden *(Source: http://alzheimers.about.com/od/readersstories/ig/My-Garden-for-Alzheimer-s/Easy-Walkways-in-the-Garden.htm)*



Plate XXV: Memory Gardens at Monroe Community Hospital, NY *(Source:http://www.ilovethefingerlakes.com/recreation/gardening-publicgardens.htm)*



Plate XXVI: Harkness Mansion and Garden, Connecticut, USA
(Source:http://www.gardenvisit.com/garden/harkness_mansion_garden)



Plate XXVII: Cleve West's Bupa Sensory Garden.
(Source:http://www.architectmagazine.com/design/nature-that-nurtures.aspx)

2.11.5 Hospice Gardens

The word “hospice” is believed to have derived from the Latin words “hospes”, meaning both “hosts” and “quests”. The root word also evolved in to English words, such as “hostel”,” hospital” and “hotel” (Stoddard, 1978).In the medieval era Hospices provide physical and spiritual comfort to pilgrims, the homeless, sick and dying. Over time, a distinction was drawn between hospices-a house for permanent occupation by the poor, the orpharned, the insane and

incurable; and the hospital-a place where the sick were accommodated temporarily for medical treatment (Kerr, 1993).

(a) Transition spaces between indoor and outdoor spaces to allow adjustment to bright outdoor light should be adequately provided for. *(See Plates XXVIII and XXXI).*

(b) Hearing is often the last of the senses to leave a dying person. Soothing natural sounds in the garden should be considered.

(c) Quiet places to sit and contemplate should be provided.

(d) To encourage people to touch things in the garden, use plants and structures with a variety of textures. *(See Plate XXIX).*

(e) Provide a view from the window for patients that can't go outside.

(f) Design with materials that improve, rather than wear out with age. *(See Plate XXX).*

(g) Provide a water feature. Water is a soothing agent. Still water can provide a setting for meditation or prayer while the sound and view of moving water is undeniably restorative.



Plate XXVIII: Callie & John Rainey Hospice House Garden, South Carolina, USA
(Source:http://hospicehouse.net/callie_&_john_rainey_hospice_house.htm)



Plate XXIX: Hospice of the East Bay Garden
(Source: www.hospicecc.org)





Plate XXX: Solihull Hospice Garden. *(Source: www.mariecurie.org)*

Plate XXXI: Solihull Hospice Garden. *(Source: www.mariecurie.org)*

2.11.6 Gardens for the Visually Impaired

These are often referred to as Gardens for the blind. They are characterised by well scented plants and flowers and Hardscape dotted with rough low surfaces for tact of movement. *(See Plate XXXII).*

(a) To aid orientation, the garden can be laid out with straight edges and right angles. Avoid curves and intricate patterns *(See Plate XXXIII).*

(b) Provide landmarks or reference points to assist in orientation. Examples of landmarks are: scented or tactile plants, ornaments and furniture, sound elements such as wind chimes or running water, or path materials such as gravel or bark.

(c) Use vivid colours and bold materials as reference points for people with partial sight.

(d) Colour contrast can be used for containers, pathways, fences, gate latches, steps, and other things the gardener might have trouble finding or noticing *(See Plate XXXV).*

(e) Distribute scent in the garden to various locations and at different times of year. Too many scents in one place can confuse and hinder orientation.

(f) Ornaments and seating should be recessed from pathways *(See Plate XXXIV).*

(g) Use texture changes in paths to indicate changes in direction.



Plate XXXII: A special fragrance garden for the blind-Brooklyn Botanic Garden, USA
(Source:http://www.coffeehousemystery.com/featured_blend_archive.cfm?FromRec=51&)



Plate XXXIII: Fragrance garden at Miami Hospital, Florida *(Source: www.maimi.org/)*

Planted in raised beds for easy touch and smell, the Garden for the Blind is meant to be explored with the senses other than sight. Brushing against or crushing a few leaves of the Mexican mint marigold in this corner engages the sense of smell.



Plate XXXIV: Fragrance garden at Picket Hospital *(Source: www.pinellascounty.org)*

This structure was built in the Village in 1983 and is surrounded by a unique "Garden for the Blind," which features ten aromatic plants and herbs with captions given in Braille. Heritage Village, Pinellas County Florida.



Plate XXXV: Garden for the Blind and Disabled, Whitley Sands, North Tyneside, GB
(Source: http://www.yourlocalweb.co.uk/tyne-and-wear/whitley-sands/pictures/)

2.11.7 Meditation Gardens

The aim of these gardens is to aid relaxation and provide a focus for concentration, which will enhance the healing experience.

(a) Garden layout should be as simple and uncluttered as possible.

(b) Some possible layouts are a circle which represents the cycle of life, a square representing universal order, or symbols such as a Celtic knot which represents a journey.

(c) Provide an area of lawn or some type of seating suitable for sitting for long periods of time. Provide a focal point within view of the seating area.

(d) Include a water feature where possible. It is the perfect focal point for contemplation.

(e) Avoid using clashing colours. Choose cool colours (violet, blue, green) in the plantings.

2.11.8 Sensory Gardens

Sensory gardens are designed to appeal to all five of the senses-Hearing, touch, sight, smell and taste. The following are examples of sensory gardens:



Plate XXXVII: Sensory garden at Eden House Children's Hospice, Carlisle
(Source: www.liveforgardening.com)



Plate XXXVIII: Cranford Hospice. *(Source: www.cranfordhospice.org)*

2.2 Restorative Effects of Viewing Nature in Healthcare settings

Restorative benefits of viewing nature are greatest when persons experience high level of stress, such as those who are obliged to spend times in hospitals or other types of healthcare facilities (Ulrich, 1979).

Coss (1990) used an experimental design to evaluate the effects of viewing ceiling mounted nature posters on acutely ill patients lying on gurneys waiting to under go surgery. His findings suggested the patients assigned to "serene" arousal-reducing nature scenes had lower blood pressure than patients assigned to stimulating,arousal-icreasing outdoor scenes or to control condition of no picture. A pilot study by Heerwagen and Orians obtained heart rate data and effective self ratings to access the restorative effects of a nature scene on anxious patients in a dental clinic (Heerwagen, 1990).Both the heart rate and self-report data suggested that patients felt less stressed on days when a large natural picture was hung on the wall of the clinic waiting room, in contrast to days the wall was blank.

The studies described above strongly suggest a few minutes of visual exposure to nature can significantly reduce patient stress. It is reasonable to expect that longer duration exposures to nature in healthcare facilities could have comparatively persistent and perhaps larger restorative effects on emotional, psychological and behavioural components of illness and stress.

2.3 Advantages of Gardens in Health Care Facilities

Given the limited amount of scientific knowledge currently available on healthcare gardens, what advantages might be claimed as justifications for creating these settings? On the basis of a broad assessment of the research that is both directly and indirectly relevant to healthcare gardens, the following outcomes can be realistically attainable by a supportively designed

healthcare garden. According to Cohen (1988) the list of advantages is not intended to be comprehensive.

Probable advantages include:

a.) Patients, visitors and staff will experience reduction of anxiety and stress

b.) Reduction of depression for patients with life threatening ailments.

c.) Higher reported quality of life for chronic and terminal patients.

d.) Increased patient mobility and independence (if for instance gardens serve as destination for walks and wheel chair travel).

e.) Increased staff job satisfaction.

Altman (1975) argues that, although outcome listed above pertain to appropriately designed gardens. However there is nothing inherently healing about any kind of setting that is called a "garden". Altman (1975) further argues that, that there is some scientific evidence that inappropriately designed gardens can be hinder stress recovery and may worsen other outcomes. Regarding ambiguity, theory and some empirical findings imply that designers should exercise caution before including abstract features in a healthcare garden. Current research implies that the safest course for garden designers is simply to capitalize on the restorative,un ambiguously positive qualities of most nature content and configurations.

CHAPTER THREE

CASE STUDIES/COMPARATIVE STUDIES

3.1 INTRODUCTION

There is a great need to draw together and assess a wide range of existing hospital landscapes in order to identify and develop effective measures for the integration of therapeutic or healing effects in hospital designs.

3.2 CASE STUDY SELECTION CRITERIA

The three (3) case studies selected for this work are hospital landscapes and gardens that were designed specifically for healing purposes. These case studies were assessed based on their Landscape Architectural Expression, Technology and Composition of form.

A. Case studies within Nigeria.

i. National Hospital, Federal Capital Territory, Abuja.

ii. University of Abuja Teaching Hospital, Gwagwalada, Federal Capital Territory, Abuja

B. **Case study outside Nigeria**.

i. Dublin Methodist Hospital, Ohio, USA.

STATE	HOSPITAL NAME	TYPE OF TREATMENT	LANDSCAPE
Federal Capital Territory (FCT)	National Hospital, Central Business District, Abuja	General and referred cases	Developed
Federal Capital Territory (FCT)	University of Abuja Teaching Hospital, Gwagwalada	General and referred cases	Underdeveloped
Ohio	Dublin Methodist Hospital, Ohio, USA	General and referred cases	Developed

Table 3.2: A brief description of the selected case studies

3.2.1 Analytical Criteria

The following independent variables were used for the research for the selected case studies:

i. General perception

ii. Hospital type

iii. Landscape Architecture style and planting concept

iv. Emerging trends

While the under listed dependant variables were adopted for the assessment of the selected case studies:

(a) Landscape Architectural Expression

i. Expressiveness

ii. Design Style

(b) Composition of Layout

i. Plant Massing

ii. Hardscape materials

iii. Softscape materials

3.2.2 Physical Observation

This involves the physical visits to the site for the careful observation of its features, and a guided tour around the landscape and its facilities. The information gathered was used to assess the outlined variables for the comparative study of the area.

3.2.3 Structured Interview

Structural interviews involved oral interviews of administrative staff of the hospital on several aspects of the hospital for example its history, construction, administration, clinics and other relevant information. These interviews provided detailed and precise information on the functionality of the landscape.

3.3 CASE STUDY ONE: DUBLIN METHODIST HOSPITAL, OHIO, U.S.A.

Landscape Architect: MSI Design/Karlsberger

Location: Ohio, United State of America.

Date: 2007-2008

Landscape Type: General

Climate: Temperate

Context: Suburban

Style: English/French

3.3.1 DESCRIPTION OF FACILITY

Dublin Methodist Hospital, Ohio includes a 332,900 square foot, 94-bed community hospital on an 89-acre Greenfield site. The facility includes an emergency department, in-patient and

outpatient surgery services, labor and delivery, general medical/surgical services, and universal care rooms in a unique patient-and family-centered environment.

The hospital incorporates a variety of evidence-based design principles including abundant natural light, and easy access to outdoor gardens, enabling staff to care for patients in an environment promoting the natural healing process while respecting patient privacy and dignity. Utilizing the perspective of customers and employees, the hospital is designed to fit into the landscape of the community with a natural rhythm that breaks down the fear and intimidation of a hospital visit.







Plate XXXIX: Exterior views of Dublin Methodist Hospital, Ohio. USA *(Source: http://www.karlsberger.com/dublin-methodist-hospital/)*

3.3.2 GARDENS IN DUBLIN METHODIST HOSPITAL

3.3.2.1 Zen Garden

The Zen Garden is very intimate in scale and is located within the emergency department of the Dublin Methodist Hospital. The granite fountains offer subdued water sounds, bamboo engages the wind, herbs offer refreshing scents, and contrasting colors of ferns and bloodgood maples add visual interest, all culminating into a space that encourages meditation, self-reflection and healing.

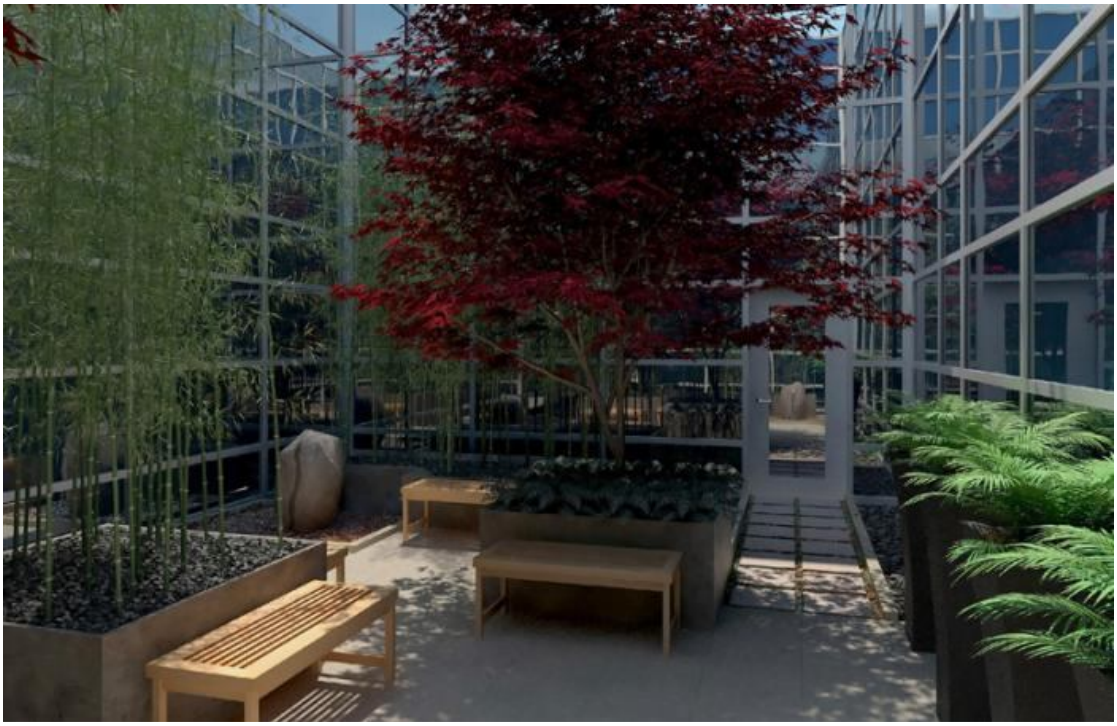


Plate XL: Zen Garden at Dublin Methodist Hospital, Ohio. USA *(Source: http://brentaaronking.com/index.php?option=com_portfolio&id=2&view=category&Itemid=29)*

3.3.2.2 Patient Discharge Garden

The Patient Discharge Garden is located along the corridor that leads to patient pickup, affectionately nicknamed the 'goodbye garden'; it is the last thing the post-patient sees before they go home. Also serving as a waiting area for family, this garden boasts zen-like wabi basin fountains, the dramatic bark interest of calming bamboo, teak furnishings, and evergreen ferns.



Plate XLI: Patient Discharge Garden at Dublin Methodist Hospital, Ohio. USA *(Source: http://brentaaronking.com/index.php?option=com_portfolio&id=2&view=category&Itemid=29)*

3.3.2.3 Comfort Garden

This garden is located in the centre of the labour and delivery pavilion of the Dublin Methodist Hospital. All round of vision glass encourages patient and visitor engagement, while supplying the surrounding stations and corridors with natural light. The comfort theme is reinforced by warm colours throughout, soft lighting, and large comfortable teak chairs and rockers. A large

mobile of oragami bird sculptures accompanied with crystal eggs parallel the human journey underway nearby, while the sounds of bubbling water relaxes and sooths. The crystal eggs catch and disperse sun rays, adding a touch of excitement eclipsing foreshadow the anticipated birth.



Plate XLII: Comfort Garden at the Dublin Methodist Hospital, Ohio. USA *(Source: http://brentaaronking.com/index.php?option=com_portfolio&id=2&view=category&Itemid=29*

3.3.2.4 Labyrinth Garden

This garden is located next to the surgery waiting room in the Dublin Methodist Hospital. The labyrinth theme allows the metaphorical reflection of the journey of our lives, where we have been, where we are, and where we are to go from here. An assortment of furnishings allows group or individual seating, fountains provide soothing sounds of water, herbs offer refreshing scents, and a romantic mix of English garden plant material provides positive distraction.



Plate XLIII: Labyrinth Garden at Dublin Methodist Hospital, Ohio. USA *(Source: http://brentaaronking.com/index.php?option=com_portfolio&id=2&view=category&Itemid=29)*

3.3.3 VARIABLES



Plate XLIV: Landscape plan of Dublin Methodist Hospital *(Source: http://msidesign.com/index.php/dublin-methodist-hospital/)*

1. **Landscape Architectural Expression**: The gardens integrate the French style in an eclectic whole: French stylistic use of dramatic forms and paths, decorated with rich array of colorful flowers.
2. **Composition of Layout:** Simple non-dramatic rectangular massing, a Romanic and punctuated seen from the glass and stone walls.
3. **Technology:** On-site water harvesting systems are integrated in to the landscape.
4. **Planting Scheme:** Luscious array of colorful flowers.
5. **Materials:** Concrete, Ceramic, wood, glass.

Variable	Weight Factor	Remark
Landscape Architectural Expression	5	Very High
Composition of Layout	5	Very High
Technology	5	Very High
Materials	4	High
Planting Scheme	5	Very High

Table 3.3.4: Summary of findings for Dublin Methodist Hospital, Ohio. USA

3.4 CASE STUDY TWO: NATIONAL HOSPITAL, FEDERAL CAPITAL TERRITORY, ABUJA, NIGERIA

Landscape Architect: Green Fingers (Private Landscape Contractors)

Location: Central Area, F.C.T, Abuja

Date: 1999

Landscape Type: General

Climate: Mild Temperate

Style: English

3.4.1. DESCRIPTION OF FACILITY

The National Hospital, Abuja was formally established under Decree 36 of 1999.Gen. Abdusalam Abubakar commissioned the hospital on 22nd May 1999.It was originally National Hospital for Women and Children, the hospital opened to the public on 1st September, 1999.

From the street, the hospital is aesthetically pleasing; its appearance is in sharp contrast to the more typically landscaped hospitals in the Federal Capital Territory.

Internally, the viewing gallery forms a gentle helical spiral from the ground level up to the top of the building. Paintings are displayed along the walls of the buildings to blend with the landscape.



Plate XLV: Satellite imagery showing an ariel view of the National Hospital, Abuja *(Source: Abuja Geographical Information System, High resolution Satellite Imagery*



Plate XLVI: Exterior View of the National Hospital's main gate *(Source: Author's field survey, 2011)*



Plate XLVII: Exterior View of the Emergency ward *(Source: Author's field survey, 2011)*



Plate XLVIII: A poorly maintained landscape situated at the main entrance of the National Hospital, Abuja *(Source: Author's field survey, 2011)*



Plate XLIX: Sculpture of Mother and child at the Consultants Car park. *(Source: Author's field survey, 2011)*



Plate L: Plant beds and trees at the National Hospital, Abuja *(Source: Author's field survey, 2011)*

GENERAL LANDSCAPE LAYOUT

1. **Architectural Expression:** Reflection of English traditional landscape architecture.
2. **Composition of Layout:** Sculptured and concrete forms.
3. **Technology:** On-site drainage, solar night luminance, efficient irrigation technique
4. **Materials:** Sandcrete blocks, reinforced concrete frames, bamboo rods.

5. **Planting Scheme:** Luscious array of colorful flowers.

Variable	Weight Factor	Remark
Landscape composition of Layout	4	High
Landscape Technology	3	Moderate
Landscape Materials	2	Fair
Planting Scheme	3	Moderate

Table 3.4.1: Summary of findings for National Hospital, Abuja. Nigeria

3.5 CASE STUDY THREE: UNIVERSITY OF ABUJA TEACHING HOSPITAL, GWAGWALADA. ABUJA. NIGERIA

Landscape Architect: Unknown

Location: Gwagwalada, F.C.T, Abuja.

Date: 5th May, 1992

Landscape Type: General

Climate: Mild Temperate

Context: Urban



Plate LI: Exterior View of the main entry gate in to the Hospital *(Source: Author's field survey, 2011)*



Plate LII: View showing sculpture at the roundabout on entry *(Source: Author's field survey, 2011)*



Plate LIII: View of plant bed and drainage *(Source: Author's field survey, 2011)*



Plate LIV: View showing bare landscape at the parking area *(Source: Author's field survey. 2011)*

3.5.1 DESCRIPTION OF FACILITY

University of Abuja Teaching Hospital is located in Gwagwalada Area Council of the Federal Capital Territory, Nigeria. It is about 45 kilometers from the City Centre. The 350-Bed hospital complex with room for expansion to 500-beds was formerly known as Gwagwalada Specialist Hospital. It was completed in 1990 and commissioned on 5th May 1992 by the then military President and Commander-in-Chief of the Armed Forces Ruling Council, Gen. Ibrahim Badamosi Babangida. At that time the hospital was being run by the Federal Capital Development Authority (FCDA) as a reference hospital.

3.5.2 OBJECTIVE

To render qualitative and prompt clinical services, teaching and research as applicable in modern University Teaching Hospitals.

3.5.3 VARIABLES

1. **Landscape Architectural Expression**: It has an expression that is characterized by traditional recreational parks. High planting visibility space.
2. **Composition of Layout:** The main entrance has towering white columns supporting a concrete canopy, and a statue on the round-about greets you as you approach the hospital grounds, other parts of the landscape look bare with no definite form. Provides a pleasing image on entering the hospital environment.
3. **Technology:** Street Lighting
4. **Planting Scheme:** Few plant species mostly Xerophytic Plants.
5. **Materials:** Concrete slabs, granite aggregates, concrete cladding on the landscape.

Variable	Weight Factor	Remark
Landscape Architectural Expression	3	Moderate
Landscape composition of Layout	2	Fair
Landscape Technology	1	Poor
Landscape Materials	1	Poor
Planting Scheme	1	Poor

Table 3.5.3: Summary of findings for University Teaching Hospital, Abuja. Nigeria

3.6 CASE STUDY FINDINGS

1. Forms are sources of inspiration for landscape designs.eg Sculptures.
2. There is a preference for simple geometrical shapes in form.
3. The external environment of a hospital landscape says a lot about the hospital as regards psychological perception.
4. There is always a unique symbolic theme associated with hospital landscapes.

5. Concrete, Stones, Bricks, metal and wood are the major contemporary landscape finish materials.

3.6.1 General Inferences

1. Cost is essentially the deciding factor for Landscape designs.
2. For hospitals of these scales funding is usually by the government..
3. The design of these hospital landscapes are to impress as a whole.
4. Planting scheme is dependent on ecology and geographical region.

3.6.2 Other Findings

Planting materials:

66% of the cases studied were built in or around concrete. (Concrete is the dominant landscape construction material).

Planting Scheme:

A different planting scheme was used for each case study.

Landscape Architectural Expression:

All cases are landscape architecturally expressive. However, 63% showed inclination to therapeutic design (most of which were inspired by nature).

Circulation and transportation:

Ramped lobbies are used to create free-flowing change in levels, for wheel chairs and trolley beds access.

VARIABLE	CASE STUDY 1 DUBLIN METHODIST HOSPITAL, OHIO.	CASE STUDY 2 NATIONAL HOSPITAL,ABUJA	CASE STUDY 3 UNIVERSITY OF ABUJA TEACHING HOSPITAL,ABUJA
LANDSCAPE ARCHITECTURAL EXPRESSION	HIGH	MEDIUM	LOW
COMPOSITION OF FORM	HIGH	MEDIUM	MEDIUM
TECHNOLOGY	HIGH	MEDIUM	MEDIUM
PLANTING SCHEME	HIGH	MEDIUM	LOW

Table 3.6.2: CASE STUDY SUMMARY SHEET

Rating = High, Medium, Low.

Variable 1: Landscape Architectural Expression: 80% of the hospitals studied have Landscape Architectural Expressions.

Variable2: Composition of form: 65% of the hospitals studied have landscape form composition.

Variable 3: Technology: 75% of the hospitals studied used local skills and construction techniques.

Variable 4: Planting Scheme: 33% of the hospitals studied applied plants indigenous to their regions.

3.7 COMPARATIVE ANALYSIS

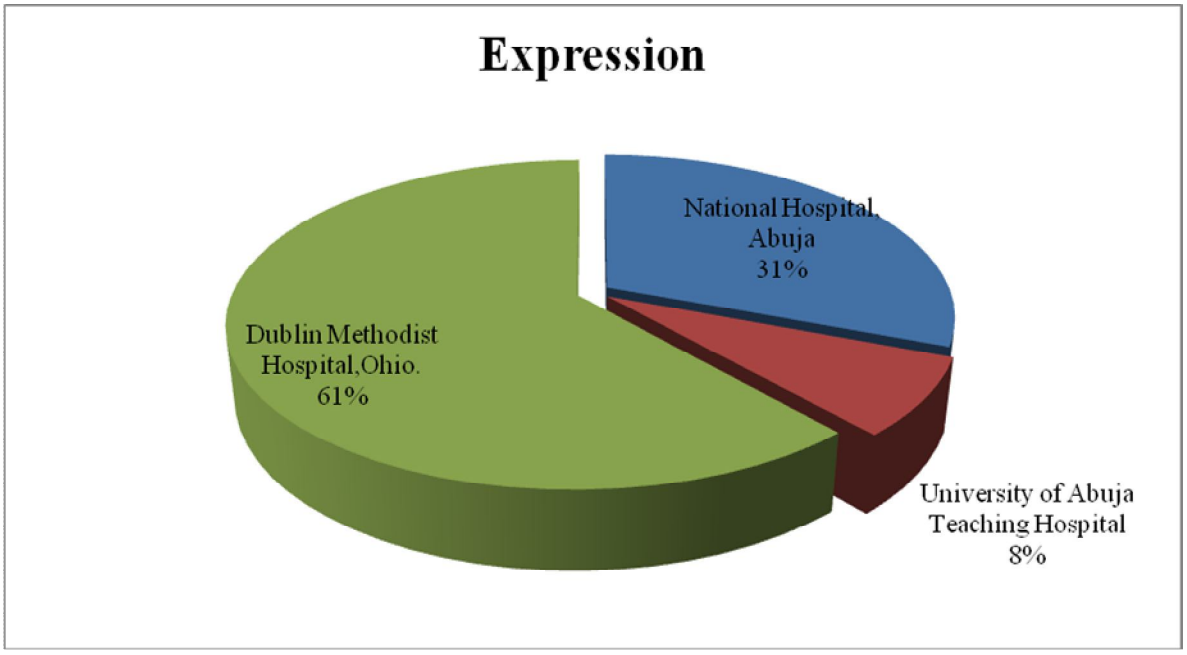


Figure I: Landscape Architectural Expression

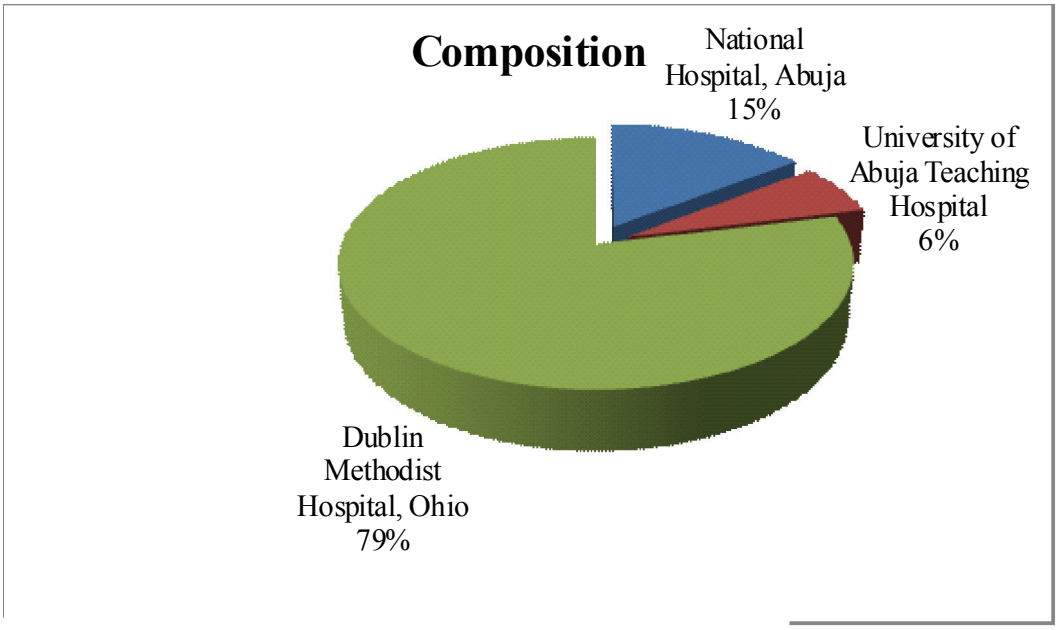


Figure II: Landscape Composition of form

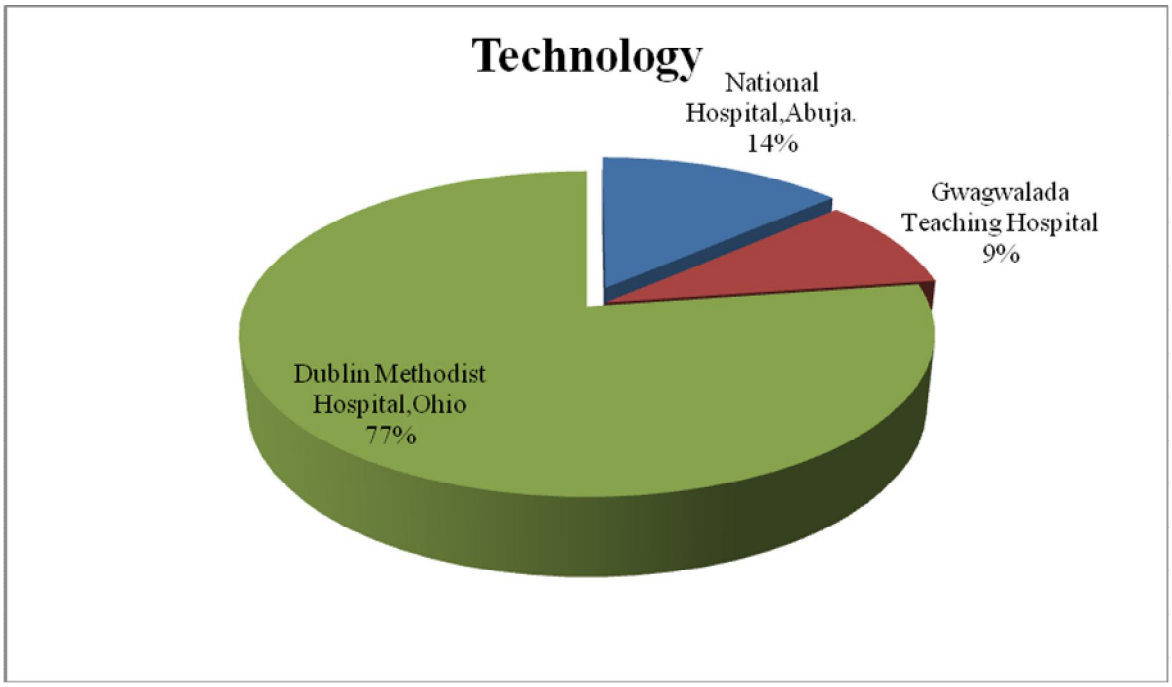


Figure III: Landscape Technology

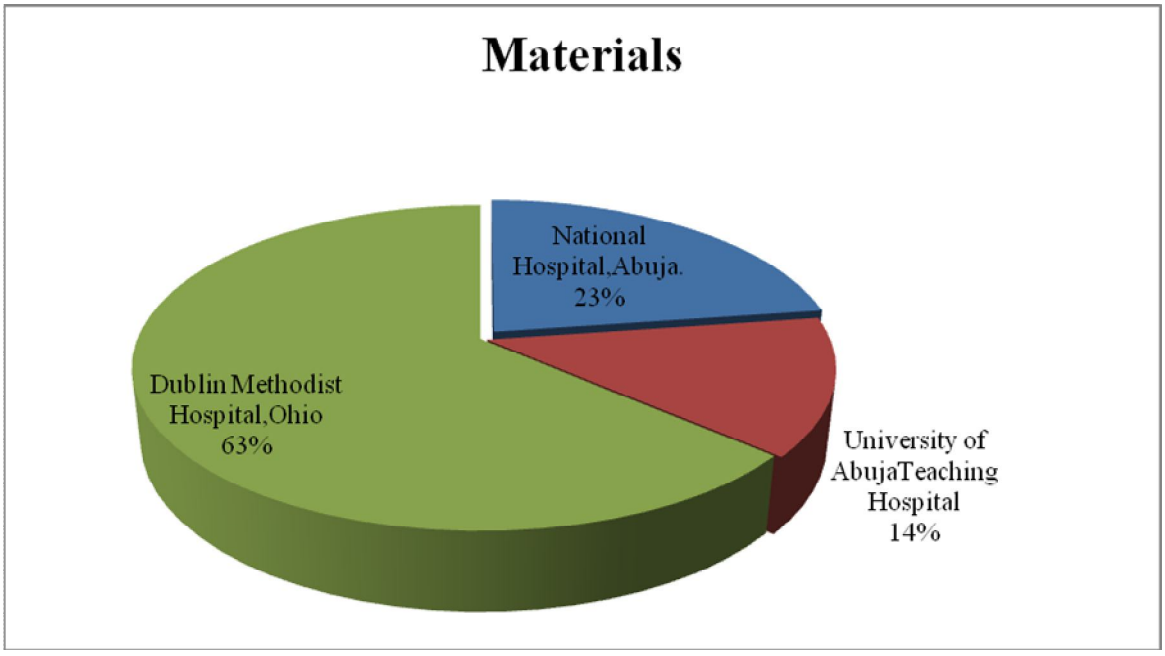


Figure IV: Landscape Materials

CHAPTER FOUR

SITE ANALYSIS OF BARAU DIKKO SPECIALIST HOSPITAL

4.1 INTRODUCTION

The site characteristics and analysis of the design scheme examines all the environmental factors of the site that will have an effect on the design. Major environmental factors of the site such as climate, topography, orientation, wind direction, drainage, noise directions, altitude, geology and nature of the site were examined and conclusions drawn based on these factors. The site analysis is directed towards exhaustively examining all factors and their effects on evolving a design scheme on the site. (See Appendix AA1).

4.2 SITE AT REGIONAL SETTINGS

Kaduna State is centrally located, in the country. Kaduna City is located in the guinea savannah region of Nigeria between latitudes 8°25" and 9°20' north of the equator and longitudes 6°45" and 7°30" east of the Greenwich meridian. It is bounded by Zamfara, Katsina and Kano states to the north, Niger state to the west, Bauchi and Plateau states to the east, while Nasarawa and the Federal Capital Territory bounds the state to the south (See Appendix AA5).

The Barau Dikko Specialist Hospital is located in Kaduna North Local Government Area of the Kaduna metropolis and is bounded to the west by Abdulrahaman Okene road, to the south by Golf Course road, to the East by the office complex of Nigerian Emergency Management Agency (NEMA) and to the North by Independence way (See Appendix AA2).



Plate LV: Satellite imagery of Barau Dikko Specialist Hospital, Kaduna. *(Source: Google Earth 2010)*

4.3 BRIEF HISTORICAL BACKGROUND OF BARAU DIKKO SPECIALIST HOSPITAL

Barau Dikko Specialist Hospital (BDSH) is a 240-Bed Secondary Care hospital located in Kaduna metropolis. It is made of two major sections – The adult section and the Paediatric section.

The paediatric section is the oldest building and was established in 1930. It used to be called Nursing Home and served British colonial administration officials and their families and top civil servants of the defunct Northern Region and North Central State of Nigeria. In 1985, a new hospital was built adjacent to Nursing Home and was named New General Hospital which now serves mainly adult patients.

During the Military regime of late Nigerian Head of State, General Sani Abacha, The paediatric section was refurbished and named Ibrahim Sani Abacha Children Hospital and administered as

a separate entity. In 1999 it was merged with the adult section again and the whole hospital was renamed Barau Dikko Specialist Hospital after Dr Russel A. Barau Dikko, the first medical doctor from Northern Nigeria. This coincided with the return of the four Kaduna State indigenous doctors who had completed postgraduate training in Medicine, Surgery, Obstetrics and Gynaecology and Radiology and who were appointed consultants.

Barau Dikko Specialist Hospital is the largest hospital in Kaduna Metropolis. It has a staff strength of over 583.

The Hospital is made up of various wards/Units and their functions as follows:

1. **THE SURGERY WARD: -** Hospital department which administers all departmental functions and the provision of surgical diagnostic and therapeutic services.
2. **OBSTETRICS AND GYNAECOLOGY DEPARTMENT: -** Hospital department where cases of childbirth, care of the mother and all women related cases and diseases are attended to.
3. **MEDICINE DEPARTMENT: -** this arm of the hospital attends to various medical problems in adult males and females.
4. **LABORATORY DEPARTMENT: -** a department for examination of materials derived from the human body for the purpose of providing information on diagnosis, prognosis, prevention, or treatment of diseases.
5. **RADIOLOGY DEPARTMENT: -** Hospital department which is responsible for the administration and provision of x-ray diagnostic, scans and therapeutic services.
6. **PAEDIATRICS UNIT: -** The department renders healthcare services to children within the ages of 0 and 12 years. It is a 70-bed unit.

7. **PHYSIOTHERAPY DEPARTMENT: -** a department where the treatment of disease, bodily defects, or bodily weaknesses is carried out by physical remedies, as massage, special exercises, etc., rather than by drugs.
8. **HAEMODIALYSIS DEPARTMENT: -** hospital department which provides in- and out-patient dialysis treatment of renal (kidney) insufficiencies.
9. **PHARMACY DEPARTMENT: -** hospital department where drugs are dispensed.
10. **MEDICAL RECORDS DEPARTMENT: -** unit where all medical records of patients in the hospital are maintained/managed.
11. **AUTO MECHANIZED LAUNDRY DEPARTMENT: -** unit where all laundry related services are carried out.
12. **TUBERCULOSIS CLINIC: -** this is the designated clinic for the reporting, treatment, and investigation of all tuberculosis cases.
13. **IMMUNIZATION DEPARTMENT: -** hospital unit/department where all vaccines and immunizations against BCG, HBV CSM, polio, yellow fever, measles etc are administered.
14. **CASUALTY UNIT: -** (trauma unit) where accident victims are attended to.
15. **MATERNITY DEPARTMENT: -** a hospital ward that provides care for women during pregnancy and childbirth and for newborn infants.
16. **DENTAL AND MAXILLOFACIAL SURGERY DEPARTMENT: -** The department is a unit of the hospital concerned with taking care of patients with dental and maxillofacial diseases. Diagnosis and treatment of oro-dental diseases and various maxillofacial conditions is the primary function of the unit.

17. **EYE DEPARTMENT:** a department where all patients with clinical or surgical problems/diseases related to the eye is attended to.
18. **EAR, NOSE AND THROAT (ENT):** a department where all patients with clinical or surgical problems/diseases related to the Ear, Nose or Throat is attended to.
19. **ADMINISTRATIVE DEPARTMENT: -** The department carries out general administrative activities of the hospital. It is responsible for the day to day running of the hospital affairs that includes policy formulation and implementation.

These activity areas formed the criteria for delineating the entire premises into micro spaces for effective analysis (See Appendices AA3 and AA4).



Plate LVI: Exterior view of the Barau Dikko Specialist Hospital, Kaduna
Source: Author's field survey (2011).



Plate LVII: Exterior view of the main gate of Barau Dikko Specialist Hospital, Kaduna *(Source: Author's field survey, 2011)*



Plate LVIII: Exterior view showing the typical planting style at the Barau Dikko Specialist Hospital, Kaduna
(Source: Author's field survey, 2011)



Plate LIX: Typical unorganised court yard between the Administrative block and the General ward.



Plate LX: View of Central Transition Parking Area
(Source: Author's field survey, 2011)



Plate LXI: View of the Mortuary area *(Source: Author's field survey, 2011)*



Plate LXII: View of the drainage in front of the Hospital Emergency Entry Gate *(Source: Author's field survey, 2011)*



Plate LXIII: View of a courtyard with foot path made as a result of walking across the lawn. *(Source: Author's field survey, 2011)*



Plate LXIV: View of a shrub bed used as Laundry driers *(Source: Author's field survey, 2011)*



Plate LXV: Desolate court yard used as refuse dump site. *(Source: Author's field survey,*



Plate LXVI: Entry court into the Hospital. *(Source: Author's field survey,2011)*

4.4 PHYSICAL CHARACTERISTICS OF STUDY AREA

4.4.1 Vegetation

The vegetation of Kaduna State is characterized by Guinea savannah with scattered trees and woody shrubs. *(See Plate LXVII).* The tree crown is less dense than that of the savannah woodland, but more substantial than that of the shrub savannah.

Sparsely distributed vegetation comprising of the existing trees, poorly nurtured shrub beds and a fair grass cover characterizes the site.

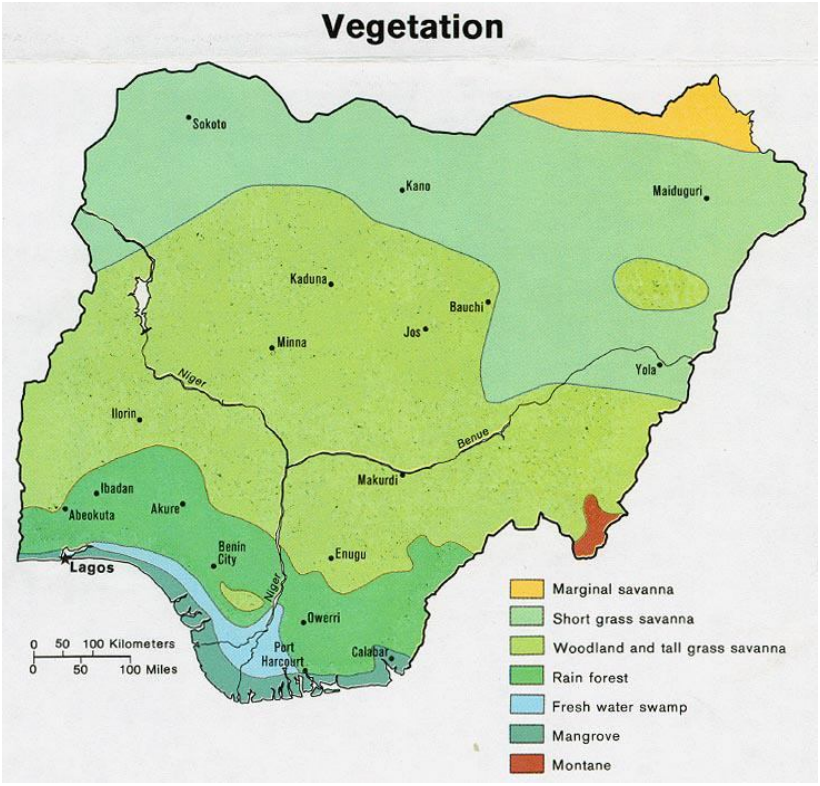


Plate LXVII: Map of Nigeria showing vegetative belts.

4.4.2 Geology:

The rocks underlying Kaduna State are classified into the following categories:

i. **Sedimentary Rock:** alluvium located in streambeds throughout the territory, consisting largely of sand with rare gravel beds and local deposits of clay.

ii. **Igneous Rock:** including Biotite Granite, large intrusive masses commonly elliptical in shape forming dissected zones of the Zuma-Bwari-Aso hills and outcrops of the Gwagwa plains.

iii. **Metamorphic Rock:** Biotite – Muscovite, schist, limited to four narrow outcrop bands along ridge tops at the eastern edge of the Barau Dikko Hospital, Kaduna site.

4.4.3 Topography

The project site is a relatively flat strip of land with 0.5% gradient sloping towards the south-west end of the site.

4.4.4 Surface water

A network of stream valleys and depressions covering the city site when observed vertically is a rough fan shape, draining the crescent of development area. The fan converged at the Usman River south of the airport. Thus the site of the capital can be divided into small continuous watersheds, all converging at one point.

4.4.5 Soils

The soils are generally typical reddish brown soils. These soils underlying the capital city are derived from granite gneiss and magmatite which underlie the Gwagwa plains. Their suitability for development varies with depth. Severe constraints for foundations, streets and underground utilities occur when soils are shallow, strong or poorly drained.

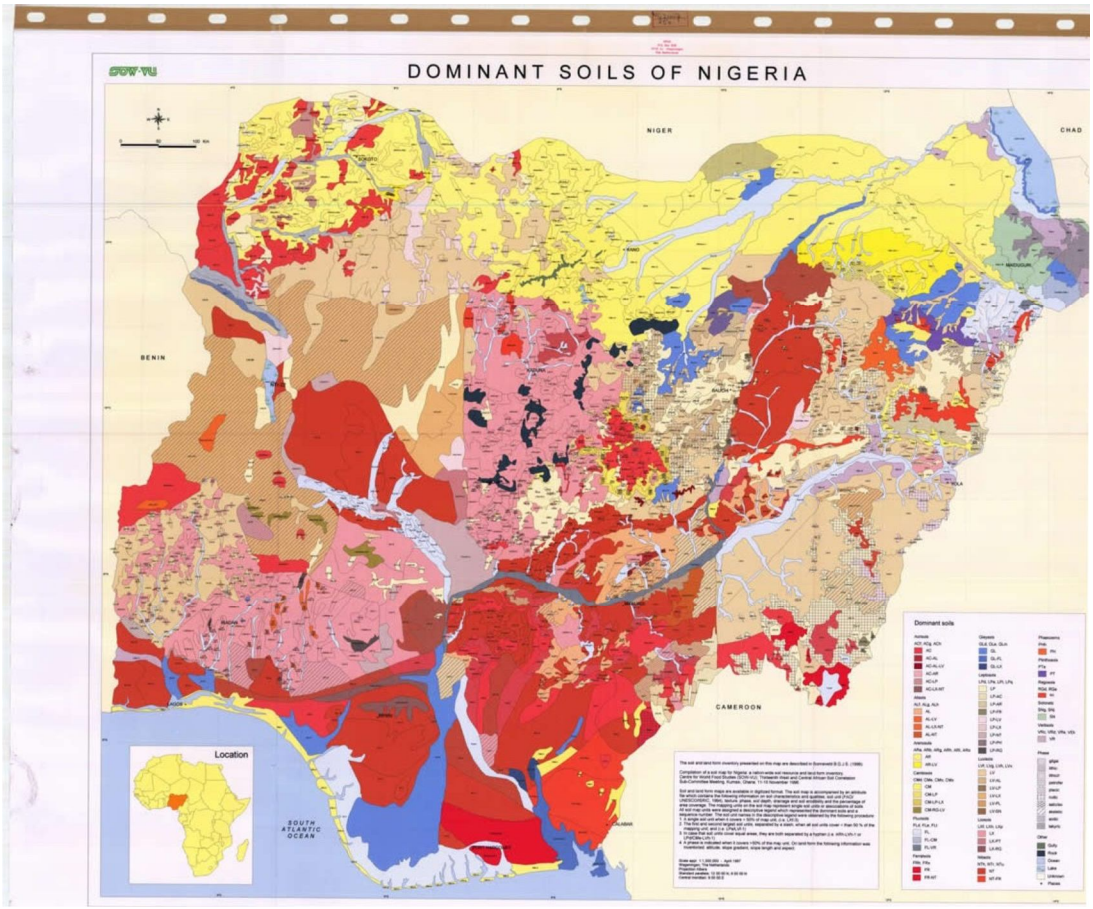


Plate LXVIII: Map of Nigeria showing soil stratification.

4.4.6 Climate

The climate of Kaduna is typical of the guinea savannah. The table below gives the mean monthly climatic conditions of Kaduna.

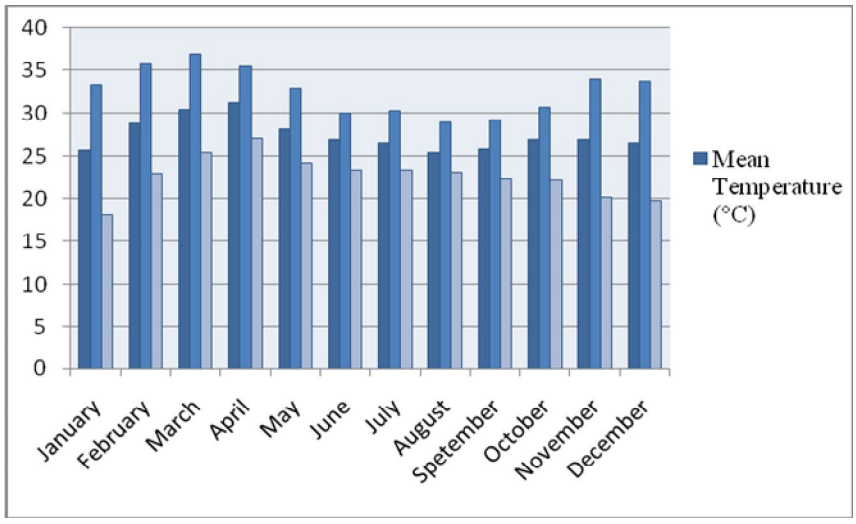


Figure V: Climatic data for Kaduna 1994, 2003-2008 *(Source: www.gaisma.com)*

i.) **Temperature:** The highest temperatures are recorded during the dry season. Diurnal temperature change of as much as 18° has been recorded. Lower temperatures abound during rainy season, especially the month of august due to dense cloud cover.

ii.) **Wind:** Two major air masses dominate Kaduna: the Tropical Maritime airmass and the Tropical Continental air mass. The tropical maritime airmass is formed over the Atlantic ocean of the south of the country and is therefore warm and moist. It blows from south-west to north-east while the tropical continental airmass which is developed over the Sahara desert is warm and dry and blows from north-east to south-west. The tropical continental airmass comes with the dry season while the tropical maritime airmass, the wet season.

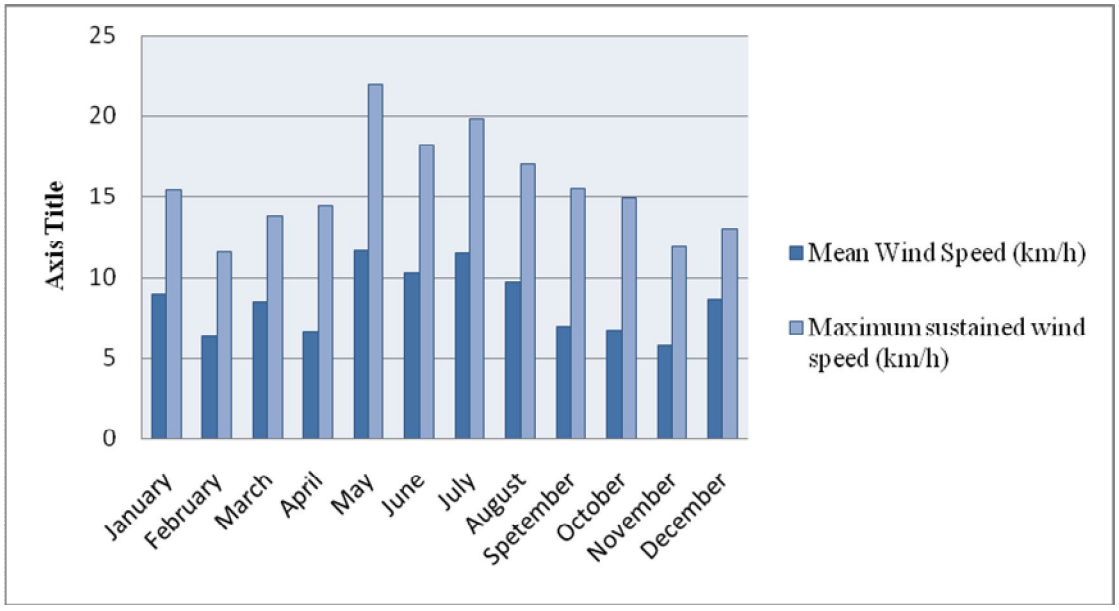


Figure VI: Wind speed data for Kaduna 1994, 2003-2008 *(Source: www.gaisma.com)*

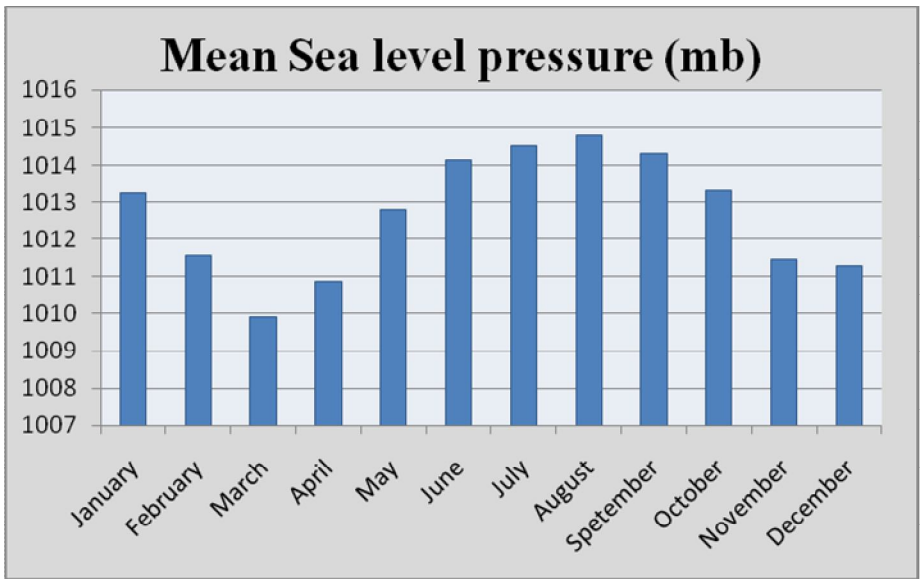


Figure VII: Pressure data for Kaduna 1994, 2003-2008 *(Source: www.gaisma.com)*

iii.) **Humidity:** High humidity levels are attained during the rainy season. However, humidity values generally drop during the dry season, from November – March.

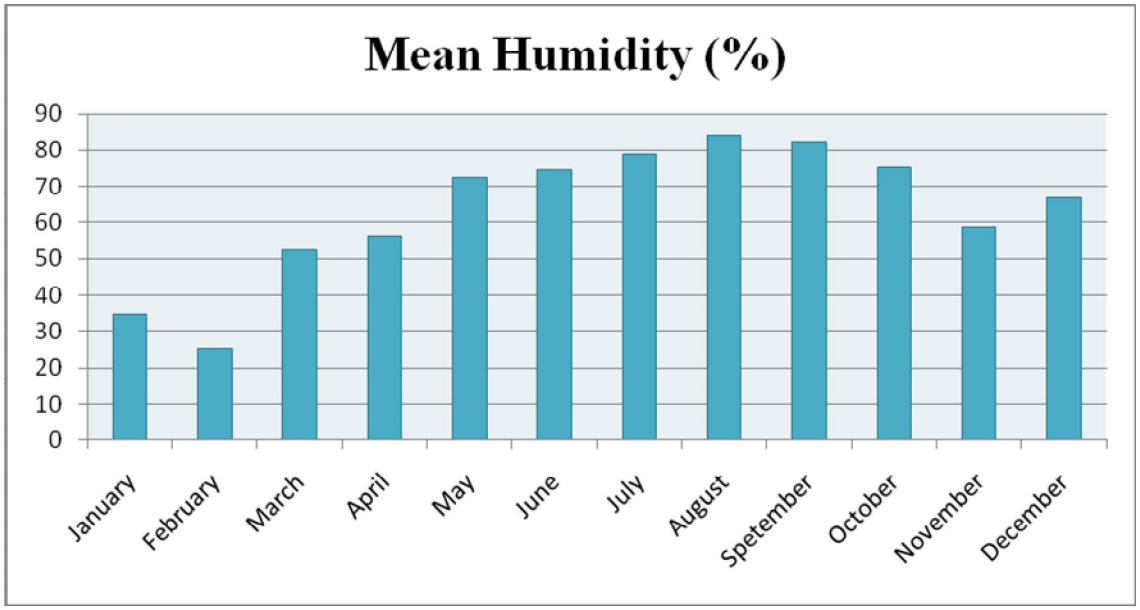


Figure VIII: Humidity data for Kaduna 1994, 2003-2008 *(Source: www.gaisma.com)*

iv.) **Sun and Cloud cover:** There is a general increase in the total hours of sunshine further north of the Atlantic coast. The sunshine ranges from a minimum of 1300 hours in the Niger delta to over 3200 hours in the extreme north-east of the country.

v.) **Rainfall:** Rainfall begins in April and rapidly tapers off after October. The rainy season lasts for an average of 185 days.

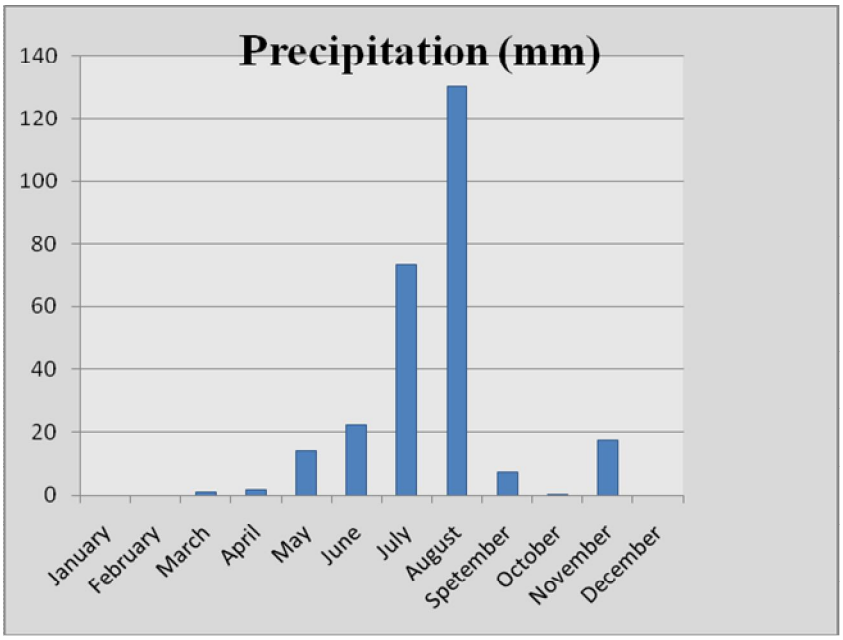


Figure IX: Rainfall data for Kaduna 1994, 2003-2008 *(Source: www.gaisma.com)*

4.5 PRESENTATION OF RESULTS AND DATA ANALYSIS OF ADMINISTERED QUUESTIONNAIRES

4.5.1 PERCEPTION OF THE USERS

A self-administered questionnaire was the only option available given these constraints. Recognizing that self-administered questionnaires have lower response rates than telephone and/or in-person interviews by trained interviewers, the researcher concentrated efforts of getting buy-in and cooperation from front-line Hospital staff for questionnaire distribution.

The Barau Dikko Specialist Hospital Satisfaction Questionnaire was distributed at the various wards and car parks in the hospital premises .Patients were provided a questionnaire and encouraged to complete it by front-line hospital staff. Completed questionnaires were returned to the Department where data entry, analysis and the final reports were completed.

Outcome of this questionnaire will form a base for subsequent project submittals and planning, reports.

A total of 300 Questionnaire were administered, 175 were returned. 160 respondents provided ratings for this questionnaire (n=160).

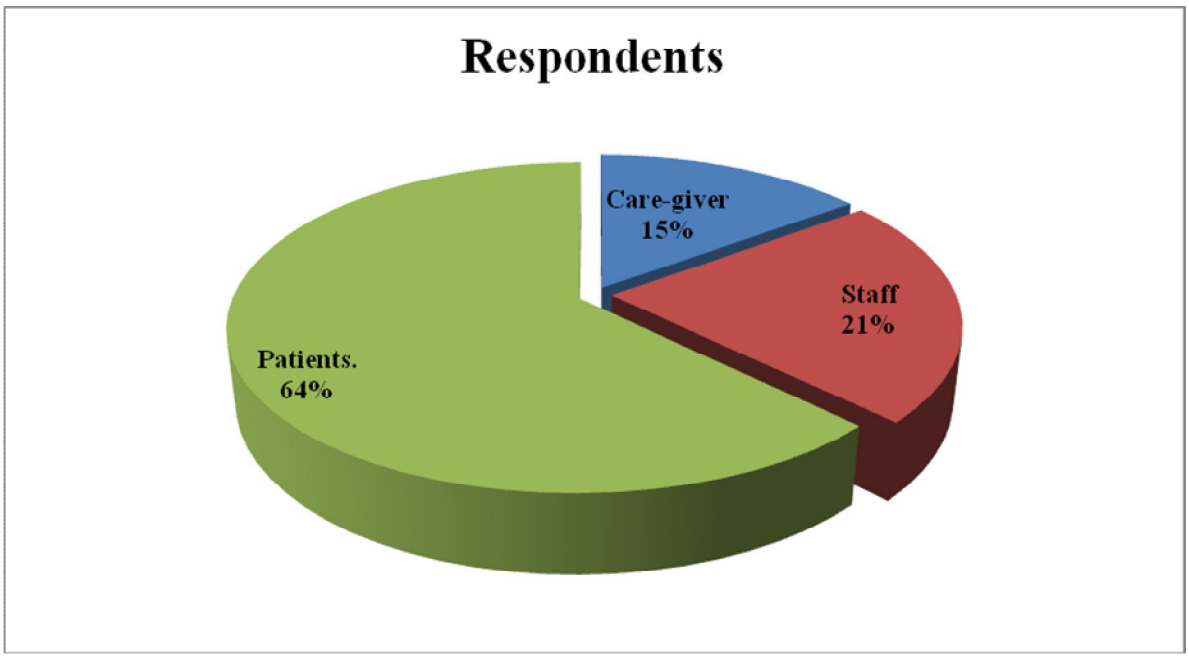


Figure I: Questionnaire Respondents

Figure I show that over 64% of respondents were patients, 15% of respondents were care-givers 21% of respondents were staff of the Barau Dikko Teaching Hospital, Kaduna.

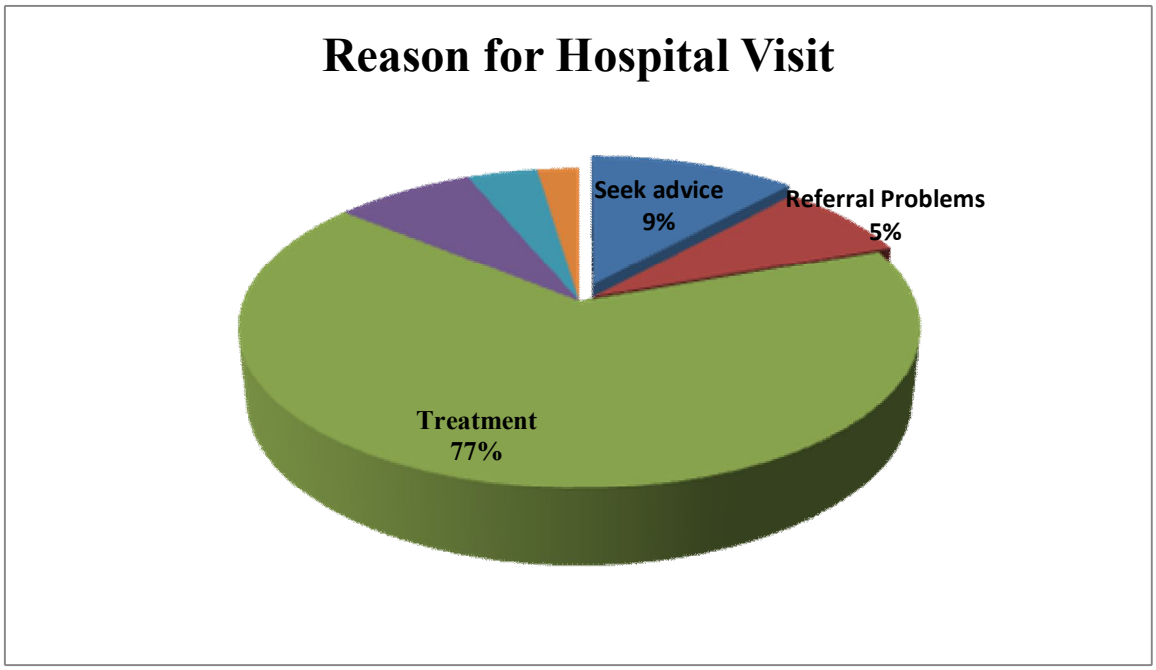


Figure II: Reason for Hospital visit

Figure II shows 77% of respondents say, they were at the hospital for medical treatment, 9% of respondents were at the hospital for medical advice, 5% of respondents were at the hospital for "referral problems", 3% of respondents were at the hospital for routine checkup, 5% of respondents were at the hospital for visitations, 1% of respondent were at the hospital for other reasons.

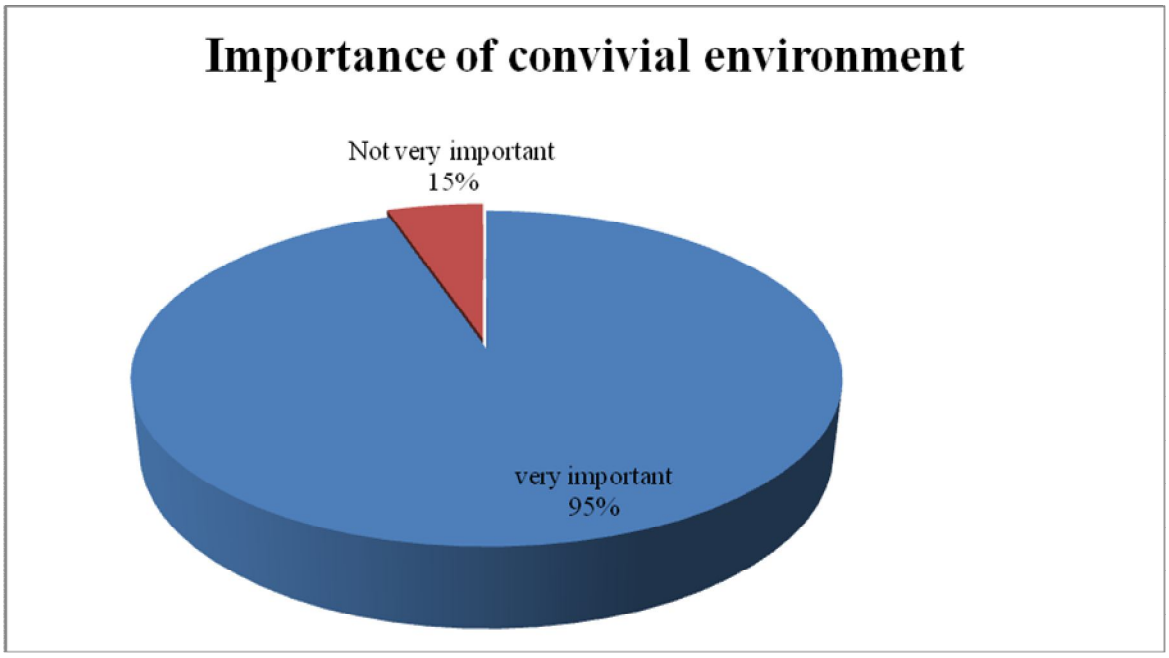


Figure III: Importance of convivial environment

95% of respondents say a convivial environment is very necessary for healing, 5% of respondents say a convivial environment in the hospital is not necessary for the process of healing.

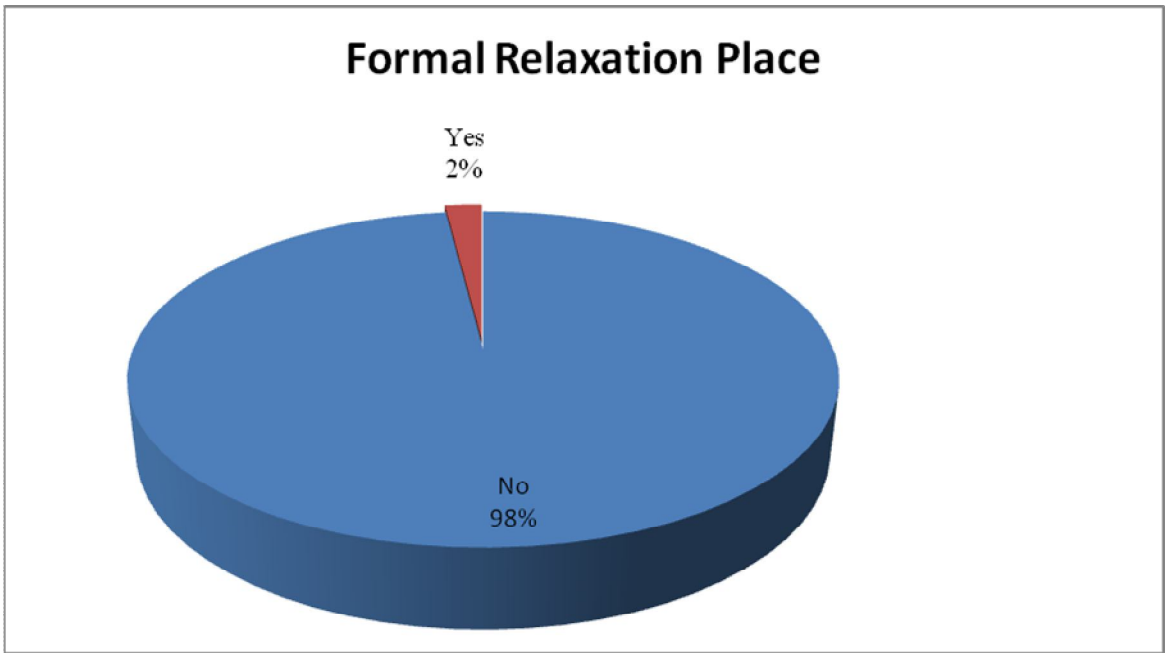


Figure IV: Formal Relaxation Place

From figure IV, 98% of respondents say there are no adequate sit-outs and relaxation spots for users while 2% say there is no need for such amenities.

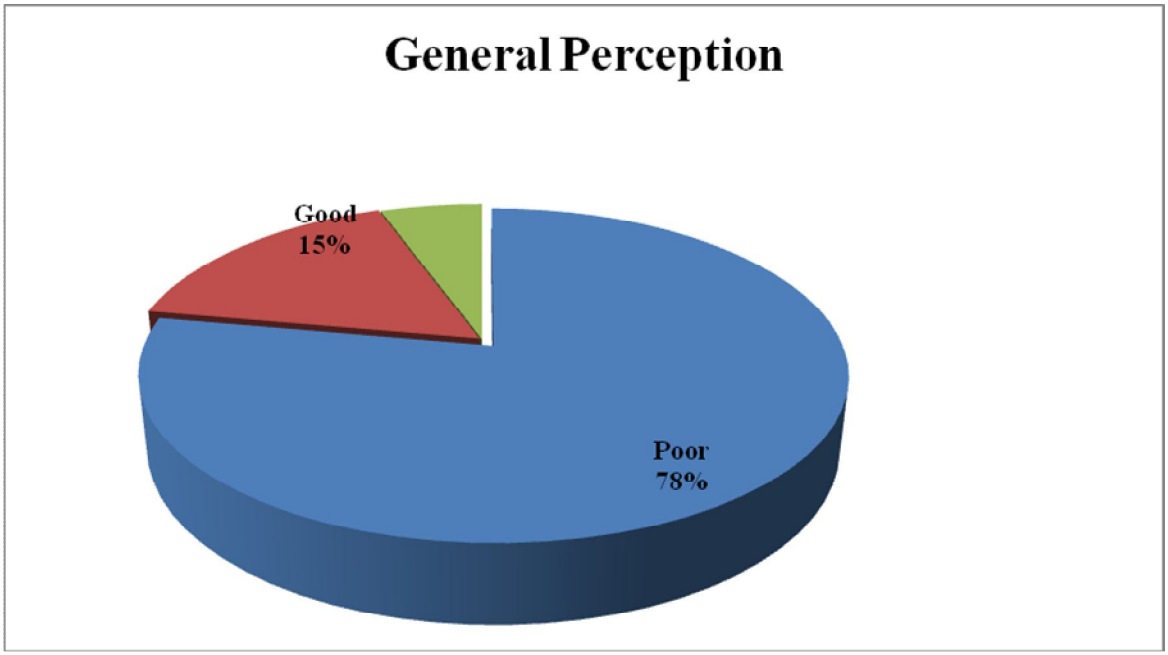


Figure v: General Perception

From figure v above, 78% of respondents say the environment is poor, 15% of the respondents recognize that the environment is good and needs some improvement, 7% of respondents say the environment is satisfactory.

4.6 SUMMARY OF FINDINGS.

From the analysis above, it can be deduced from responses of users that the Hospital Environment needs a functional aesthetic landscape for enhancement of the hospital and improved therapeutic healing effects on the users of the hospital.

CHAPTER FIVE

CONCEPT AND DESIGN

5.1 DESIGN BRIEF

Since the opening of Barau Dikko Specialist Hospital, Kaduna medical care has enjoyed national attention on an unprecedented scale. Due to the human traffic and other environmental and physical factors the hospital landscape will be re-designed using the appropriate planting and landscape elements as detailed in the micro-space analysis to enhance the process of healing by integrating therapeutic effects.

5.2 PLANNING CONCEPT

The concept derived for this site is based on the concept of zoning the project site into micro spaces. The major criteria considered in evolving the micro spaces concept for the site are Circulation and Activity. This is shown in the appendix, figure AA6.

Circulation

This addresses the movement of human and vehicular traffic around the site. This is achieved by the use of adequate/functional driveways and walkways.

Activity

Activity determines the function of all the outdoor spaces on the site. Activities present on site are ancillary and passive traffic. The zoning of the site is particularly influenced by various activities present on site. Each zone is characterized by the function of the adjoining facility.

5.3 BRIEF DEVELOPMENT

The project site was zoned into the following micro spaces:



KEY

NO	Micro Space
1	Children's Play Area
2	Staff Parking Area
3	Emergency Entrance Port
5	Administrative Block
6	Central Transition Area
7	Mortuary Area

Plate LXIX: Satellite imagery of Barau Dikko Specialist Hospital, Kaduna showing the micro space delineation. *(Source: Google Earth 2010)*

5.3.1 Children's Play Area

The children's play area incorporates recreation area, fore court and concourse for patients, hospital staff, care-givers and visitors.

The Garden court entrance is 2 feet above grade and flows in to a small rectangular space offering an elevated view out over the entire play court. From this point , able-bodied visitors descend a flight of 3 stairs. The Garden court is accessible to "transport carts". Children using wheel chairs must use the ramp along the two sides of the stairs, separated fromm it by large elevated planters.

Park style benches nestle in among the greens for shade. For children with rare child flat on his/her back canopies of red bud trees provide sensory interest.

Tables with cafe style umbrellas allow the playground to be used under a hot sunny weather or light rain shower. (See Appendix A1).

5.3.2 Staff Parking Area

The staff parking area incorporates the parking area, the mosque and shop. Species were selected to provide colour, blooms and fragrance at different seasons and to attract humming beds and butterflies in to the area. (See Appendix A4).

5.3.3 Emergency Entry Port

The Emergency entry port is made up of the emergency entry and exit of the hospital and serves temporarily as an ambulance bay. It has a ramped curvi-linear entrance to enhance visual experience. Predominant planting in this area is the Eucalyptus spp and Mangifera indica. A sculpture has been designed and located in the centre of the court yard to create interest and a welcoming atmosphere. The courtyard is paved with different stone pavings to create a systematic feeling of warmth. The extensive court provides a large dose of “beauty and peacefulness”. (See Appendix A1).

5.3.4 Administrative Block

The administrative block consists of two floors, general administrative activities on the ground floor and specialized offices on the first floor.

The garden is located adjacent the entrance of the Administrative Block and behind-adjoining the 4 storey buildings with rows of sash windows looking over the therapeutic garden. The garden

adjacent the Administrative block is bounded on the west by a low fence, covered with vines and shrubs. Tree stumps have being arranged to border flower beds and an arbour has being created ,rocks have being places among the perennials adding to the colourful display. (See Appendix A4).

5.3.5 Central Transition Area

The staff parking area is the first point of entry and the connecting point of the G.O.P.D, General Wards, Mortuary and Paediatric wards. The Central transition area also serves as an informal waiting area for visitors.

The existing structural system of the transition area dictated that a series of terrace planters be designed to accommodate the varying function of parking, waiting and observation. Due to the over structure of the location *Licuana grandis* which can grow to thirty feet were planted in avenue planting style were a greater soil depth for the trees could be accommodated. (See Appendix A2).

5.3.6 Mortuary Area

This area consists of the Morgue and Generator house. It is an eerie part of the hospital environment. The design in this area was driven by a desire to create a mentally, physically and sound area and try as much as possible to remove the eerie feeling of loss. The mango trees were retained to connect the building to the regional environment and community. It has an extensive lawn dotted with colourful plant species (whistling pines, Ixora spp, Lantana camara, Petunia .spp etc). (See Appendix A6).

5.4 DESIGN REQUIREMENTS/CONSIDERATIONS

5.4.1 Plant Selection

Different plants are used in various gardens depending on the aim/purpose of such development i.e. Sit-out spaces will need canopy trees for shade and good micro space alienation.

Plants are selected according to their structural character, its structural roofing system, screening effects, greenery effects, and fragrances.

General Considerations:

i.) Plant materials were researched and selected based on special sacred or evocative meanings for the cultural and age groups being served.

ii.) Plants that have some medicinal value were included in the planting scheme.

iii.) Plants that engage all the senses, such as textures, scents, colours, as well as plants that make pleasant sounds as wind rustles their leaves, were selected. Also plants that provide seasonal interest which will allow people to connect with the cycle of nature were selected.

iv.) Thorny or toxic plants, especially in gardens used by children or people with certain psychological disorders were avoided.

v.) Elements that will attract wildlife including berry-producing shrubs, birdbaths and bird feeders were also incorporated. Plants that attract large numbers of bees or undesirable insects were also avoided.

5.4.2 Functionality

In a typical hospital garden design, the principles of design most be used to create unity within the healing garden and since functionality is imperative, the garden needs to accommodate the limitations of the users of the space. It is important for the garden design to be maintainable both

for physical safety and therapeutic benefits. Healing gardens are meant to provide pleasant surroundings to produce restorative effects for its users. The garden will not be successful if it isn't visually pleasing. However, hospital gardens that are poorly maintained or that is not environmentally sound, can be detrimental to the users of the space, especially those who are physically unwell. This can also make patients lose confidence in the hospital administration and their ability to cater for them. Another element of functionality is that the garden design should be cost effective and easy to maintain.

5.4.3 Simplicity

Simplicity is essential in designing healing gardens to keep the space easy to understand. Many of the people using healing gardens are dealing with stress; therefore it is important that the space should be simple and less complicated.

At the same time, the design should include a variety of form, texture, seasonal interest, and colour to provide sensory stimulation.

5.4.4 Balance and Symmetry

It is important to create balance, whether symmetrical or asymmetrical, so the space feels stable as a whole. Using key specimen group and mass plantings to create emphasis within the space. This provides focal points to help people orient themselves in the garden. Create sequence or smooth transitions from one area of the landscape to another. This is especially important to create a good transition from public gathering areas to more private areas for solitude.

5.4.5 Scale

It is also important to use the appropriate scale. If the healing garden is located by a high-rise building such as a hospital, use elements such as trees to bring the space down to a human scale.

5.4.6 Arrangement of plants in the Master Plan

To provide therapeutic effects for users, planting was arranged in different aesthetic formations i.e. multiple level colour formation, single level formation. The plants were arranged to provide therapeutic effects, sense of place and direction with different plant structure, colour system and equi-distance plant arrangement.

Plants where arranged according to the supporting use of buildings. Examples of these plants include bedding plants, groundcovers, foliage plants, avenue plants etc.

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1 SUMMARY

This thesis began by identifying the problems of outdoor problems in Nigerian hospital designs and also establishing the phenomenon of 'healing' gardens and its relevance in landscape architecture, further discussing how this concept evolved over the years.

Review of relevant literature shows the significance of contemporary healing gardens in enhancing general human well being and further discussing typologies of gardens, functions and design considerations.

Review of case studies in Nigeria and other countries, the survey being biased towards the degree of application of therapeutic landscape in terms of expressiveness, landscape composition, technology and materials used. Case studies were analyzed using general variables and specific variables (directly related to the subject of therapeutic landscape). Findings from the case studies and literature review were thus used in generating design and planning concepts for the Barau Dikko Specialist Hospital, Kaduna.

A design proposal was conceptualized, with attention paid to the existing situation of the site, function and form of the buildings.

This thesis has demonstrated through empirical evidence the role of therapeutic landscape in transforming a hospital environment to a landscape architectural edifice for healing.

It is anticipated that the creation of a therapeutic landscape will create a trickle down effect to other hospitals not just in Kaduna but all over the country.

6.2 CONTRIBUTION TO KNOWLEDGE

The main focus of this thesis has been on the achievement of creating a therapeutic environment in hospital landscape through the introduction of therapeutic landscape design techniques and principles. This is achieved by taking into account climate, environmental conditions and space functions. By so doing, the environmental problems associated with the hospital landscape, un-organized and defined user spaces are identified and remedied.

6.3 AREA OF FURTHER RESEARCH

The challenges of this thesis, has been to provide therapeutic landscapes through landscape design means. For tropical regions, where the air temperature and relative humidity are generally high and also with the mass influx of patients to hospitals; the comfort of the outdoor hospital environment is questionable. Therefore, the investigation of outdoor spaces in hospitals (paediatric, psychiatric, orthopaedic etal), hospices, nursing homes in hot-humid climates is significant for providing guidance in subsequent hospital landscape design proposals.

Knowledge of this kind in this virgin area of study will enable architects and landscape architects form alliances in the design of such places in the country taking special consideration to the outdoor spaces.

6.4 RECOMMENDATIONS

Upon seeing the potentials inherent in therapeutic landscape architecture, the following recommendations are posited:

i.) Schools of architecture should encourage more research into therapeutic landscape architecture, and related areas.

ii.) Conceptual design for buildings should go beyond building of forms. There should be a sense of deeper meaning to architectural expression; landscape architecture remains a viable tool in this regard.

iii.) Hospital designs should integrate facilities for a much wider spectrum of users. Outdoor spaces should not only serve as parking areas but should serve recreational purposes, healing, educational and interactive purposes.

iv.) Hospitals in the country should integrate outdoor spaces for a much wider spectrum of users (patients). Hospital structures should not only serve as facilities for curing the sick but should serve as recreational places for physical and psychological healing.

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APPENDIX

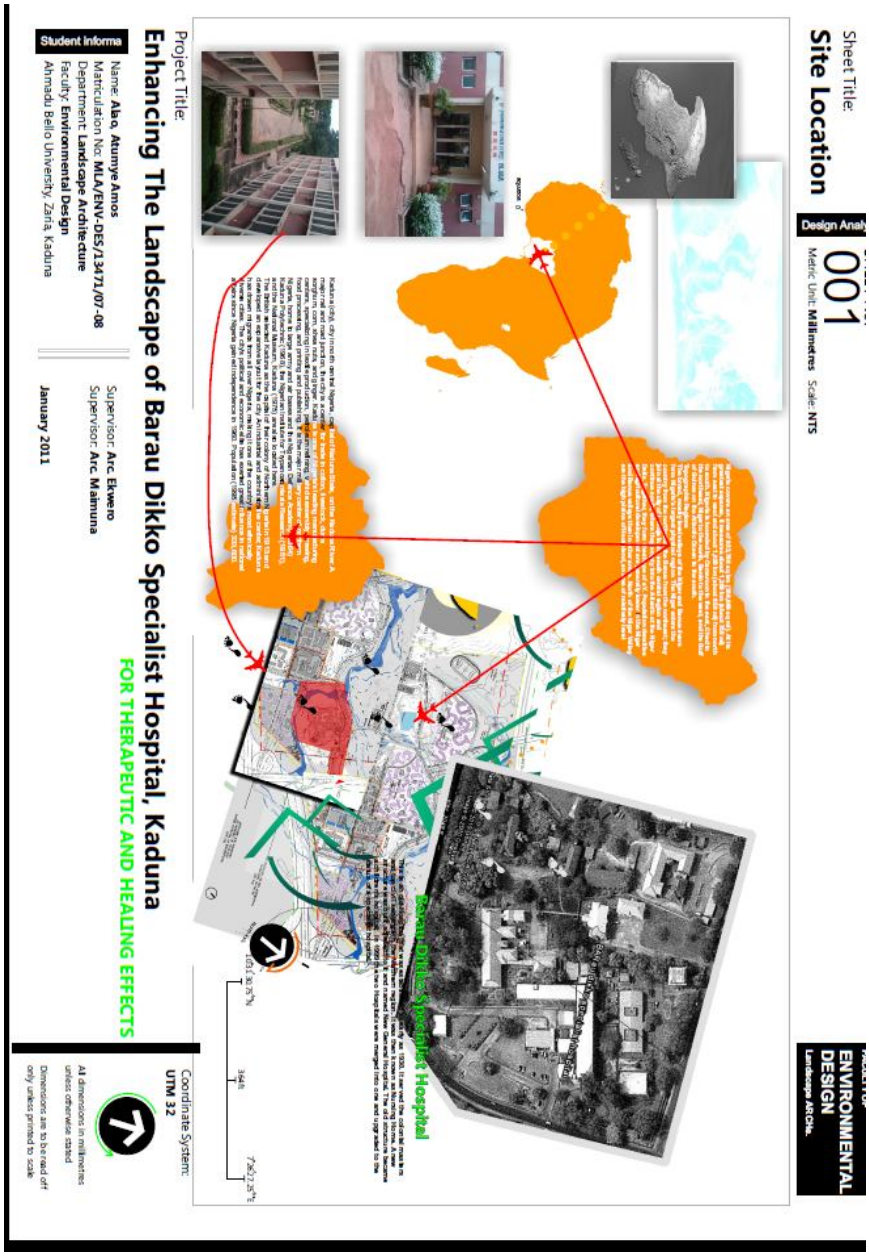


Figure AA1: Site Location Map of Barau Dikko Specialist Hospital

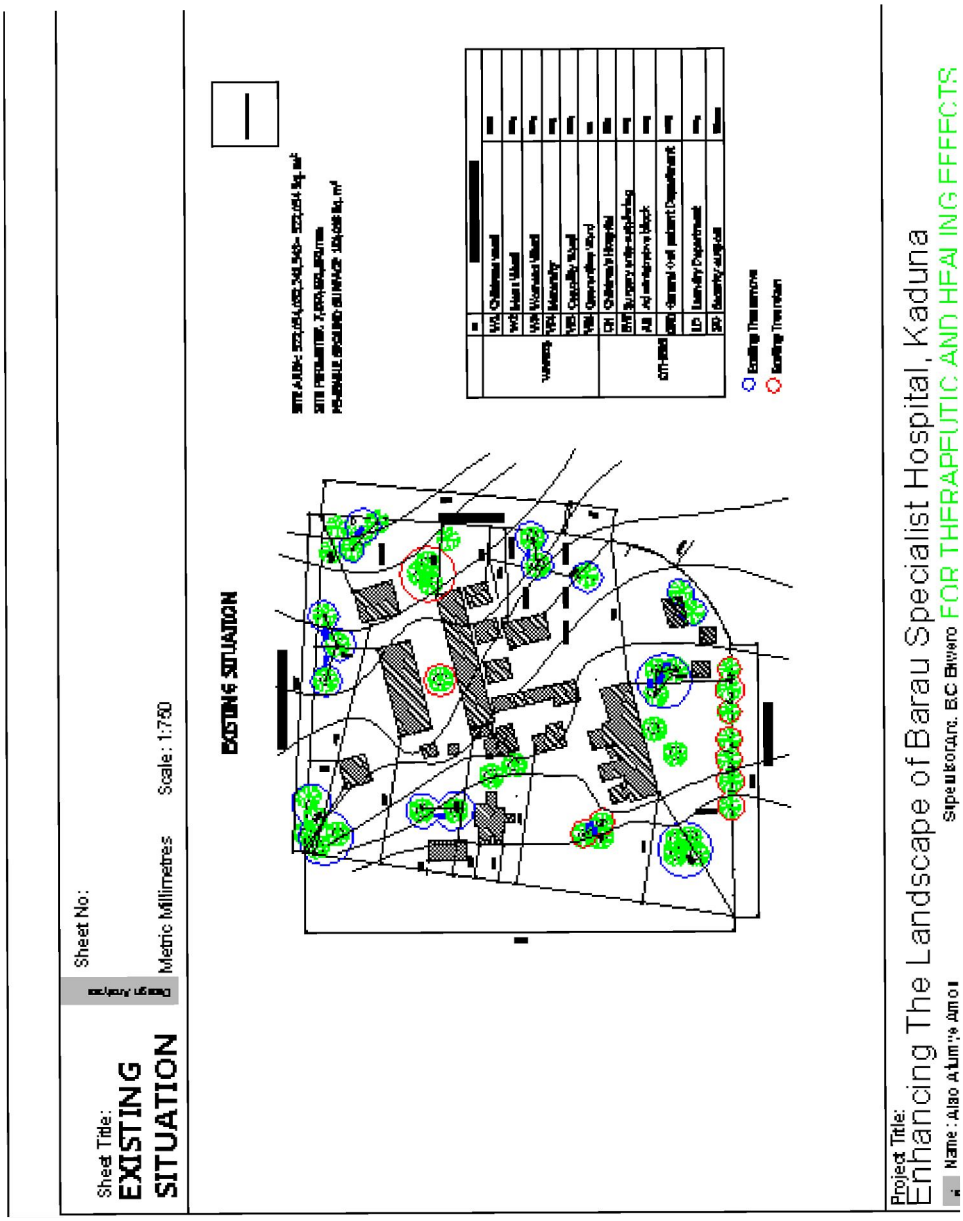


Figure AA2: Existing Situation of Barau Dikko Specialist Hospital, Kaduna

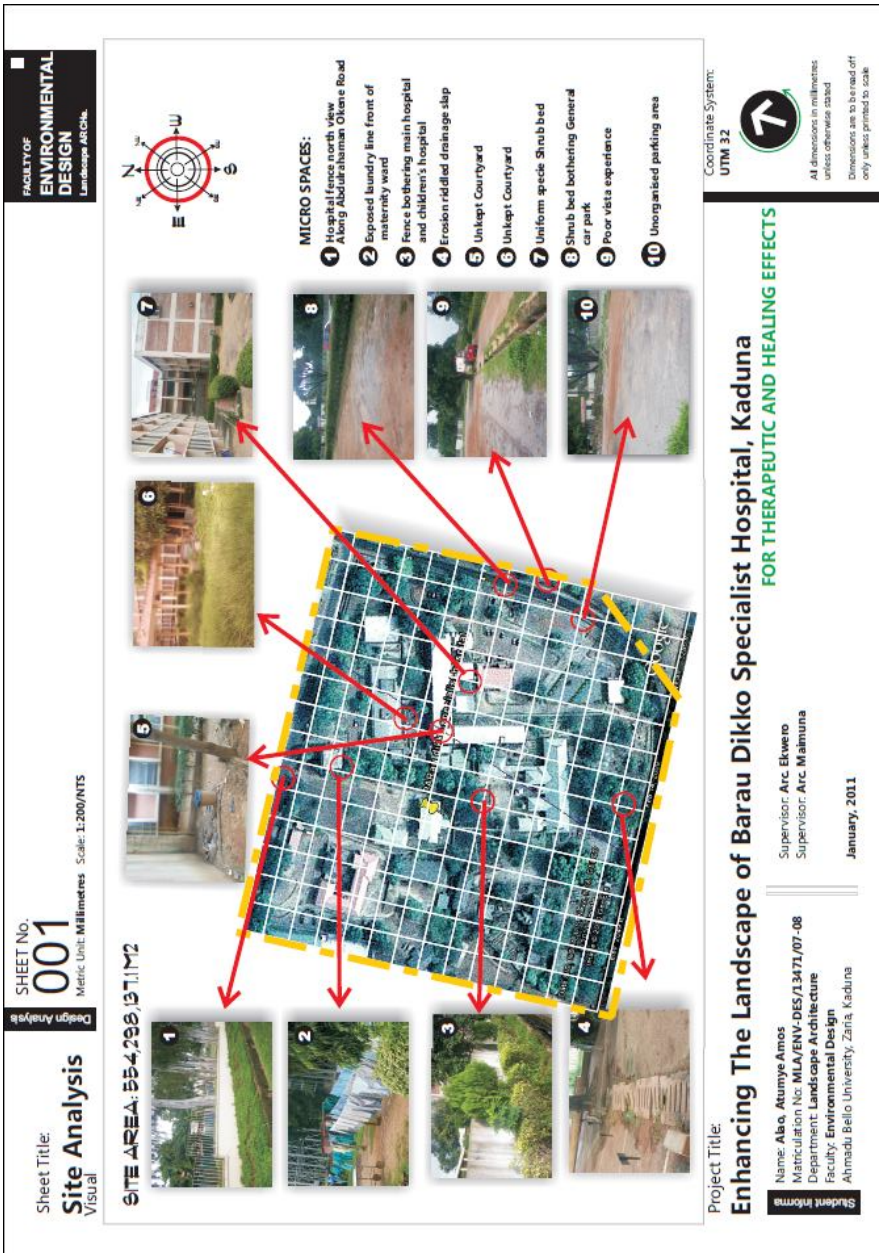


Figure AA3: Visual Site Analysis of Barau Dikko Specialist Hospital, Kaduna.

DEPARTMENT OF ARCHITECTURE, AHMADU BELLO UNIVERSITY, ZARIA.
HOSPITAL ENVIRONMENT ASSESSMENT SURVEY

- The purpose of this exercise is to provide the Researcher with information about their work through the eyes of the patients, care-givers, workers and visitors. It is intended to help create a basis further development and research.
- Please do not write your name on this questionnaire.
- Please base your answers only on your personal perception.
- `Please mark the box like this ☐ with a ball point pen. If you change your mind just cross out your old response and make your new choice.

Please write today's date here: ☐☐ / ☐☐ / ☐☐☐☐

1. Are you filling in this questionnaire for:

☐ Yourself ☐ Care Giver ☐ Staff ☐ Patient

If you are filling this in for someone else, please answer the following questions from the patient's point of view.

2. Which of the following best describes the reason you visited the Hospital today? (Please tick all the boxes that apply)

☐ To ask for advice ☐ Because of an ongoing problem ☐ for treatment

☐ For Check up ☐ Visitation ☐ Other

3. on a scale of 1 to 5, rate the importance of a convivial landscape environment for the Barau Dikko Specialist Hospital, Kaduna.

Not very important Very important

☐

☐ 1 ☐ 2 ☐ 3 4 ☐ 5

4. If you are not in the Hospital Building, is there a formal place for relaxation out-door? (Please tick one box in each line)

☐ Yes ☐ No

5. Does the Hospital Environment provide a place for healing and interaction with nature? (Please tick one box in each line)

☐ Yes ☐ No

6. Rate the Hospital Landscape	**Poor**	**Good**	**Very Good**
a. Plants and Flower	☐	☐	☐
b. Waste Disposal	☐	☐	☐
c. Walk ways	☐	☐	☐
d. Vistas	☐	☐	☐
e. Parking	☐	☐	☐

7. Please decide how strongly you agree or disagree with the following statements by ticking one box in each line.

	Disagree	**Agree**	**strongly agree**
a.) Hospital is well landscaped	☐	☐	☐
b.) Environment is therapeutic	☐	☐	☐
c.) No improvement required	☐	☐	☐

7. What factors influenced your choice of this Hospital?

☐ Referral by another patient ☐ Telephone ☐ Directory Referral by friend/family

☐ Phone message ☐ Close to home or work ☐ Expertise ☐ Environment

☐ Proximity of support services e.g x-ray, laboratory, pharmacy, physiotherapy etc

Other (specify …….)

Thank you for completing our Questionnaire.



Figure AA10: 3 D View of the proposed Mortuary Area



Figure AA11: 3 D View of the rear of the Children's Ward.



Figure AA12: 3 D View of the Proposed Children's Play Area



Figure AA13: 3 D View of the proposed Children's Play area showing Topiary Planting



Figure AA14: 3 D Ariel View of the Proposed Children's Play Area



Figure AA15: 3D View of Proposed Exit of the children's Ward.

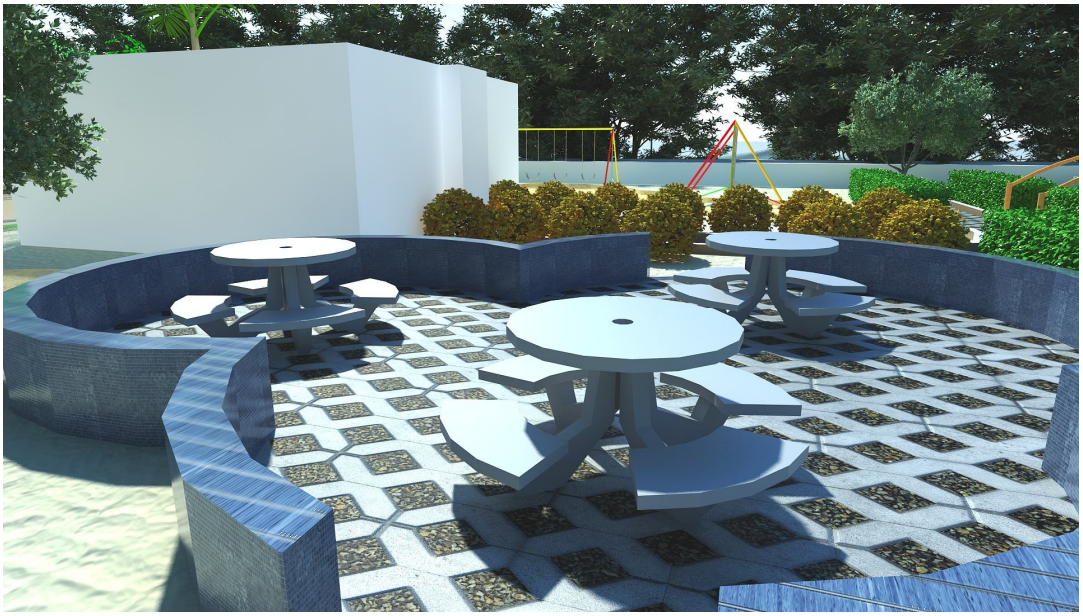


Figure AA16: 3 D View of the proposed Sitting furniture in the children's court



Figure AA17: 3 D View of the proposed entrance Court Yard.



Figure AA18: 3 D Aerial View of the proposed Site Layout.



Figure AA19: 3 D Aerial View of the proposed Mortuary Site Layout.

APPENDIX B
PLANT SCHEDULE

	TAG	BOTANICAL NAME	COMMON NAME	QUANTITY	HEIGHT (M2)	FORM
Tree	T5	Syzygium guinis	Black Berry	6	3.2	Dome
	T4	Mangifera indica	Mango Tree	5	4.2	Globular
Palm	C7	Neodypsis decaryi	Traveller's Palm	4	3.5	Fan-like
	C9	Roystonea regia	Royal Palm	7	4.0	
	C8	Licuana grandis	Ruffled fan Palm	4	4.8	Informal
Shrubs	CX	Lagestoma .spp		2	2.7	
	CY	Bougainvillea .spp	Bougainvilla	40	0.6	Globular
	SO	Ixora lutea	Ixora	17	0.9	Cube
	S7	Museanda .spp	Museanda	1	0.4	Globular
	S4	Lantana Camara	Lantana Gold	32	0.3	Dome-like
	S2	Petunia Bonanza	Petunia	24	0.9	Dome-like
	H2	Xalabra	Bougainvillea	40	0.6	Dome-like
	V0	Allamanda Cathartica	Golden Trumpet			
		Carpet Grass			0.02	Mat-like
		P/H Grass			0.03	Mat-like

Table AB1: Plant schedule of the Paediatric wing

	TAG	BOTANICAL NAME	COMMON NAME	QUANTITY	HEIGHT (M2)	FORM
Tree	T5	Syzygium guinis	Black Berry	6	3.2	Dome
	T4	Mangifera indica	Mango Tree	5	4.2	Globular
	C7	Neodypsis decaryi	Traveller's Palm	4	3.5	Fan-like
Palm	S1	Neodypsis decaryi	Traveller\s Palm	1	6.2	Columnar
	C8	Licuana grandis	Ruffled fan Palm	4	4.8	Informal
Shrub	SX	Agave tequila	Agave	1	1.5	
	SO	Acalypha wikensenia	Acalypha	22	0.9	Umbrella
	S7	Cordyline terminialis	Camouflage plant	7	0.3	Umbrella
	S4	Gardenia florida	Gardenia	34	1.2	Dome
	S2	Petunia bonanza	Petunia	59	0.5	Bell-like
	H2					
	HX		Yellow Bamboo	32	0.7	

	AX	Agave Americas	Agave	2	0.9	
Creeper			Clippe			Mat-like
Ground			Carpet Grass			Mat-like
Cover			P/H Grass			Mat-like

Table AB2: Plant schedule of the Entrance court

	TAG	**BOTANICAL NAME**	**COMMON NAME**
Trees	T1	Azardiratcha Indica	Nymph Tree
	T2	Delonixregia	Flamboyant Tree
	T3	Khaya Grandifolia	Teak Tree
	T4	Mangifera Indica	Mango Tree
	T5	Syzygium Guinis	Black Berry
	T6	Araucaria Excelsia	Norfolk Island
	T7	Taminalia Colli	Satellite Tree
	C7	Neodypsis Decaryi	Traveller's Palm
Palms	C8	Licuana Grandis	Ruffled fan Palm
	C9	Roystonea Regia	Royal Palm
	C0	Cycas-Revoluta	Cycas Palm
Shrubs	H1	Adenium Obesum	Desert Rose
	H2	Durantha Ripens	Yellow Bush
	H3	Petunia Bonanza	Petunia
	H4	Dodonaea Viscosa	Dodonaea Viscosa
	H5	Petunia Bonanza	Petunia
Hepses	S1	Ixora Lutea	Ixora
	S2	Bougainvillea Glabra	Bougainvillea
	S3	Thuja Orientalis	Thuja
	S4	Lantana Camara	Lantana Gold
	S5	Ficus Revoluta	Revoluta
	S6	Cassia Fistila	Podonea Viscosa
	S7	Museanda .spp	Museanda
	S8	Osimum Basilicum	Basil
	S9	Rosa Rigosa	Rose Flower
	S0	Ixora Chinensis	Ixora
	S01	Candinerum Vargata	Crotons
	S02	Acalypha .spp	
	S03	Irene Herbesti	
	S04	Datura .spp	Ixora
	S05	Rhoeo Spatacea	
	S06	Zebrina .spp	

Table AB3: Plant schedule of the Mortuary area