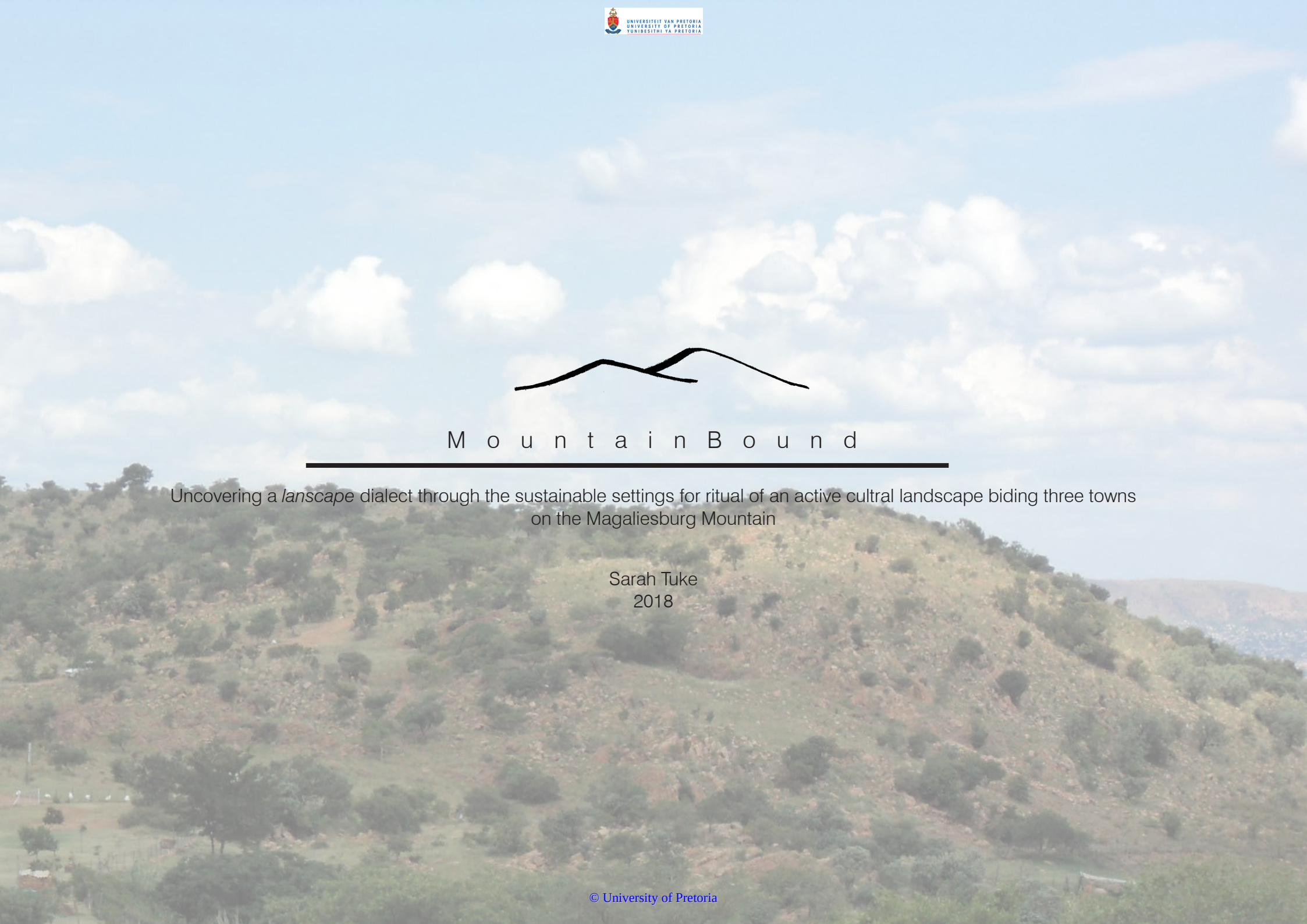
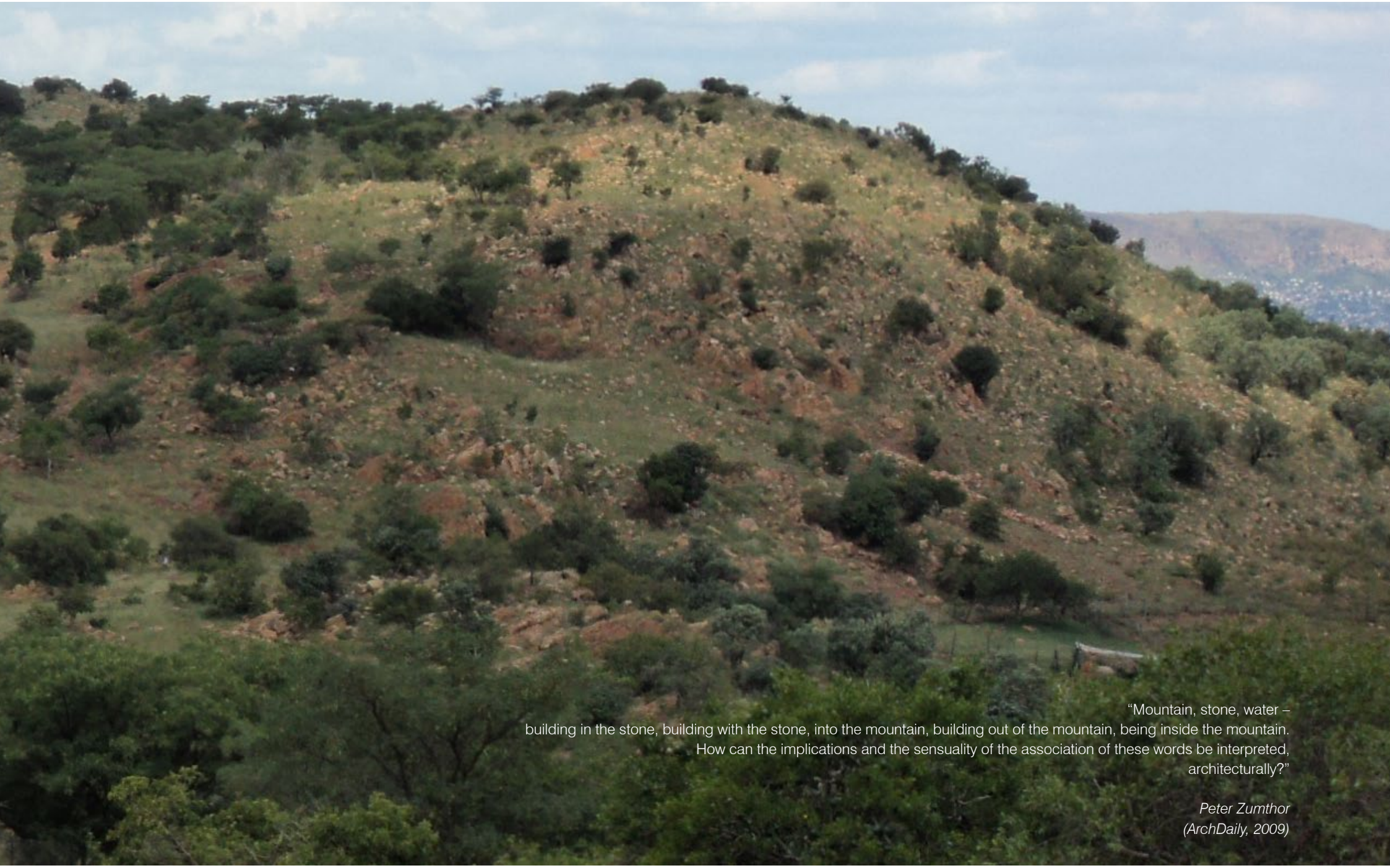


M o u n t a i n B o u n d

Uncovering a *lanscape* dialect through the sustainable settings for ritual of an active cultral landscape biding three towns on the Magaliesburg Mountain

Sarah Tuke
2018



"Mountain, stone, water –
building in the stone, building with the stone, into the mountain, building out of the mountain, being inside the mountain.
How can the implications and the sensuality of the association of these words be interpreted,
architecturally?"

Peter Zumthor
(ArchDaily, 2009)

MountainBound

Sarah Tuke

Study leader & Studio Master:
Johan N. Prinsloo

Course co-ordinator:
Dr Arthur Baker

Research fields:
Heritage and cultural landscapes, Human Urban Settlements

Submitted in fulfillment of the part of the requirements for the degree of Masters of Landscape Architecture (Professional)

Faculty of EBIT, Department of Architecture

2018

Thanks

To my parents, for all the sacrifices you made to get me here.

To *Ya* Mado, for your never-ending love and encouragement.

To ‘Monochromatic’ for your friendship, laughter and support.

To God, may my work always bring you honour.

Site Information

GPS Co-ordinates:
S 25° 42' 02"
E 28° 21' 40"

Site Description:
Magliesburg Mountain range between Bavianspoort, Mamelodi and Eersterust

Current Users:
Residents of Mamelodi West, Eersterust and Baviaanspoort

Project Client:
UNESCO

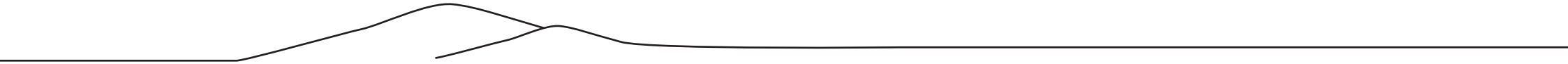
Key words:
Conservation, Cultural landscape, Magaliesburg, Mamelodi, Mountain

Abstract

This project aims to discover the role of landscape architecture in the conservation of landscapes in 2018.

The Magaliesberg mountain in The City Of Tshwane is currently an active cultural landscape on an urban edge. The survival of the area as a landscape dwindles in light of its denial for conservation status by city representatives. The fear is that the area, which has historically fallen under disrepute due to mass migration in the neighbouring towns, will fall back into this state soon after the generation of stakeholders upholding the sanctity of the mountain, can no longer take up this role.

As time treads on, traditions evolve and programs are added to the mountain — a new generation must carry the cultural landscape. This dissertation becomes an investigation into how the discipline of landscape architecture can spatially contribute to the continuation of culture and generational engraving onto a cultural landscape but still aid in the retention of sacredness on the mountain in this city context.



Terms of Reference

Indigenous Knowledge Systems
The body of knowledge relating to landscape systems, discovered by indigenous cultural groups and passed down through generations

Limitations

1. Access to the entire mountain range was restricted throughout the course of the dissertation. As a result, desktop study became a key research methods.

List of Abbreviations

CTMM
City of Tshwane Metropolitan Municipality

OSF
Open Space Framework

C-Plan
Gauteng Conservation Plan

/

Preface

01

Landscapes Lost

02

Fire On The Mountain

03

Earths Wisdom

04
Demarcation

05
Ordering

06
Poetics

07

Synthesis

08

Conclusion

/

Bibliography

Chapter 01

Chapter 02

Chapter 03

Chapter 04

Chapter 05

Chapter 06

Chapter 07

Chapter 07

Chapter 08

Figure 1.1: *'Trees in Landscape' (1945), by J.H Pierneef (1886–1957)*

"Africa may yet prove to be the spiritual conservatory of the world ...When the civilised nations in consequence of their wonderful material development, shall have had their spiritual susceptibilities blunted through the agency of a captivating and absorbing materialism, it may be that they have to resort to Africa to recover some of the simple elements of faith."
Edward Wilmot Blyden,1869.
(Anon, 2016)

01

LANDSCAPES LOST

1.1 Prologue

1.1.1 MY STORY

The African landscape is a marvel. My love for the field of landscape architecture is drawn from an admiration of the diverse landscapes throughout this continent. Here, in this notably diverse scenery, indigenous relationships with landscapes still exist and continue to develop in both bucolic and urban settings.

I count myself fortunate in having been raised in different parts of this continent. It was this exposure which granted me this appreciation of landscapes. Growing up in these parts has sharpened my awareness of the threat that architectural and urban development pose on landscapes.

Although I have been influenced by other cities, the three that have moulded my perception of public space and landscapes most are: Midrand (South Africa), Maputo (Mozambique) and Kinshasa (DRC, formerly Zaire). To this day, these three cities in which I was raised have one thing in common: they are all major metropolitan areas increasingly disconnected from cultural landscapes with the progression of urban development.

A common land development pattern observed in all three cities is that open landscapes are generally termed 'land parcels', hosting the potential for urban development, instead of the term 'landscapes', embedded with communal cultural significance. In these metropolitan areas, environmental conservation is often considered an obstacle to urban development and economic growth. In the instance that open spaces are void of urban development due to some natural feature, these 'land parcels' are cut off from public interaction entirely, for fear of vandalism and high municipal maintenance costs.

The common experience of land development schemes over the years is illustrated in figure 2.

Figure 1.2: *[Left] Graphic summary of development in the three Cities (Author, 2018)*
Figure 1.3: *[Right] Comparison of approach to open spaces dominating contemporary landscapes (Author, 2018)*

In experiencing this development, recollections from my personal memory serve as warnings against negating the importance of landscape.

In Midrand, I remember vast open rolling grasslands and subtle wetlands once dominating the landscape. Landscapes which now serve as concrete parking-lots for lucrative shopping centres.

I remember the wind blowing through the blades of grass - a subtle symphony played as the soundtrack to our daily activities animated by the sounds of birds and crickets, chirping and stridulating. A soundtrack now dulled by the hum of traffic from the highway crossing past my old neighbourhood.

These developments contributed vastly to the economic significance of Midrand to the Gauteng province, but made little effort to contribute to the conservation of character in these landscapes.

In Maputo, I remember the delta spilling into the Indian Ocean as the warm winds carried the smell of fresh sea water deep into our lungs. There was always a sense of community here - as a host of voyagers would gather every evening,

captivated by the vastness of the deep blue waterscapes at the eastern tip of Maputo. Waterscapes slowly turned brown with sediment runoff from urban streets and illegal waste disposal from nearby restaurants.

Soon, more natural landscapes became closed off from public interaction. Protected by preservation efforts or private lease, the loss of communal landscape began.

In Kinshasa, I remember my young frame lost inside a sugarcane forest growing in the backyard of a neighbour's home. I remember the sight of wetlands and loose beach sand running between neighbours like the large fruit-bearing trees dominating streets between towns. These fruit-bearing trees are now suffocated by the smog from vehicles in an overpopulated city. And those same tributaries, once familiar, are now regarded as a burden to urban inhabitants unsure of how to manage rising tides.

The overcrowded urban environment is still juxtaposed by the strikingly commanding 13 km wide Congo River. The landscape today tells the story of the city's turbulent history through both urban and environmental decay.

Each city taught me the impact of architecture and urban planning before I understood the disciplines. Over time, I have been privileged to experience communal celebrations of tradition and identify manifested through relationships to landscape, as well as the luxuries of property development and economic growth manifested through urban development. Simultaneously, I also witnessed power struggles between the two and experienced the resultant disassembly of cultural landscapes - I witnessed the loss of landscapes.

From this prologue, the reader is given a glimpse into my own personal experience of culture and cultural landscapes. These experiences stemmed mainly from my suburban living with only periodic exposure to pure expressions of culture in rural settings. These experiences have been enough to fuel a deep desire to understand and protect the cultural connections that community members still have to landscapes. This desire requires me to continuously search for answers about landscape in traditions and cultures that I may not inherently understand, but whose significance to the community – both rural and urban – I am able to recognise.

As a result, this dissertation becomes my own exploration of what my role as a young designer in developing urban cities is, where cultural connections to landscape still exist.

1.2 In search of landscape

1.2.1 DISSERTATION CRITERION

In an effort to align the dissertation to the author's explorations into landscape, a search for a site that offers the opportunity to ask questions orientated around the balance between cultural landscapes and urban conditions, was guided by a formulated criteria. From this stemmed my site criteria, summarised in figure 4.

Overall, the dissertation sought to investigate a site in which a community would be drawn together based on one communal entity whilst facing the development of urban growth.

The criteria was tested against different site options and the Magaliesberg

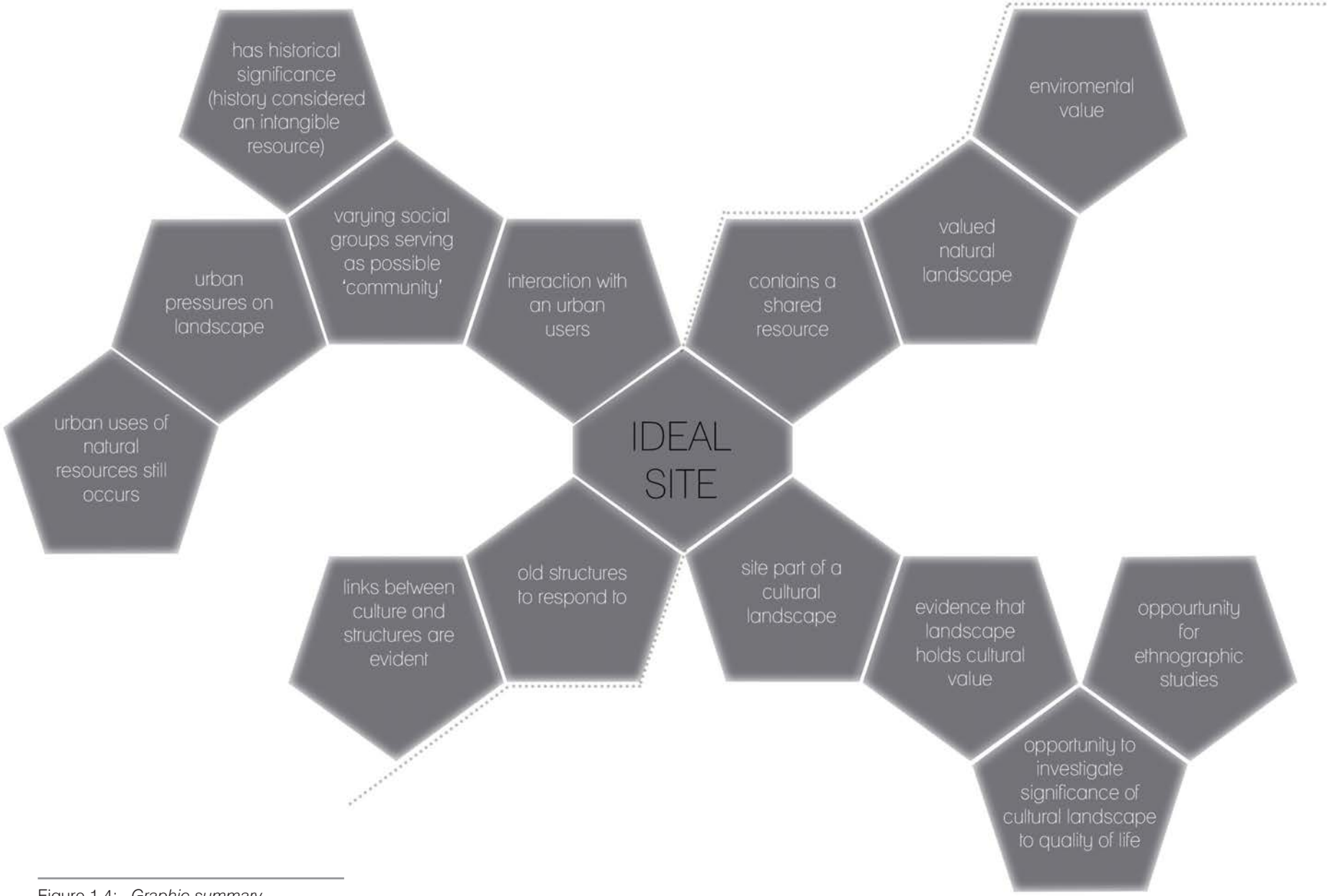


Figure 1.4: *Graphic summary of dissertation site criteria. (Author, 2018)*

mountain range in the City of Tshwane fit the criteria the best.

1.2.2 LINGERING LANDSCAPE

"Inyangas are caretakers of flora and fauna.
This land is an indigenous botanical garden
that God gave us.
We must preserve it."

Dr Ephraim Mabena,
local traditional healer and custodian of
indigenous plant nursery
(Ledwaba, 2018)

The Magaliesberg mountain

The site is located on top of the Magaliesberg mountain range located between three towns: Mamelodi, Baviaanspoort and Eersterust.

Since 1950, mass migration to this area brought a host of new residents from rural conditions to the urban settings surrounding this mountain. As a result, the rural customs and traditions assigned to varying cultural groups were conducted on the mountain range. However, with the 1957 housing shortage due to post-war job-seekers overpopulating the neighbouring southern townships, the sacredness of the mountain became subdued to the pragmatic demands for housing.

Since then, development has pushed up closer to the base of the mountain. As generational priorities shifted and fear of public space grew (due to political instability in the area), traditions associated with the mountain began to waiver with younger generations of community members, as generational tensions rose. By 2001, the mountain was in a state of disrepair where a handful of community members still used the 'sacred landscape' as a space to pray and conduct sacred rituals, whilst others turned it into a dumping zone.

An article published in the *Mail & Guardian* newspaper depicts how this section of the Magaliesberg Mountain range fell prey to gangsterism and reckless waste disposal. This horribly defiled the sacredness of the mountain, causing spiritual ailment to the southern townships and serious safety concerns for the northern town.

In the 1990's, a municipal development project was carried out on the site which included the construction of the water tower which still exists today. However, excavations into the mountain and concrete paths halted in mid-transit indicate that the project was meant to extend further across the mountain. After the abandonment of this project, a traditional connection to the landscape was lost, turning the area into a neglected dumping zone. The article describes a morbid scene of the disposal of both industrial and domestic waste, as well as human bodies and stripped vehicles. (Ledwaba, 2018).

According to Dr Mabena, a local traditional healer, this is when the ancestors had had enough. He received ancestral calling in the form of vivid visions and dreams to cleanse the mountain of its impurity after the abandonment of the municipal project in the late 1990's.

Finally, in 2001, the traditional healer heeded the calling and commenced the process of sanctifying the mountain by clearing away human rubble from the failed municipal development project and subsequent dumping hot-spot.

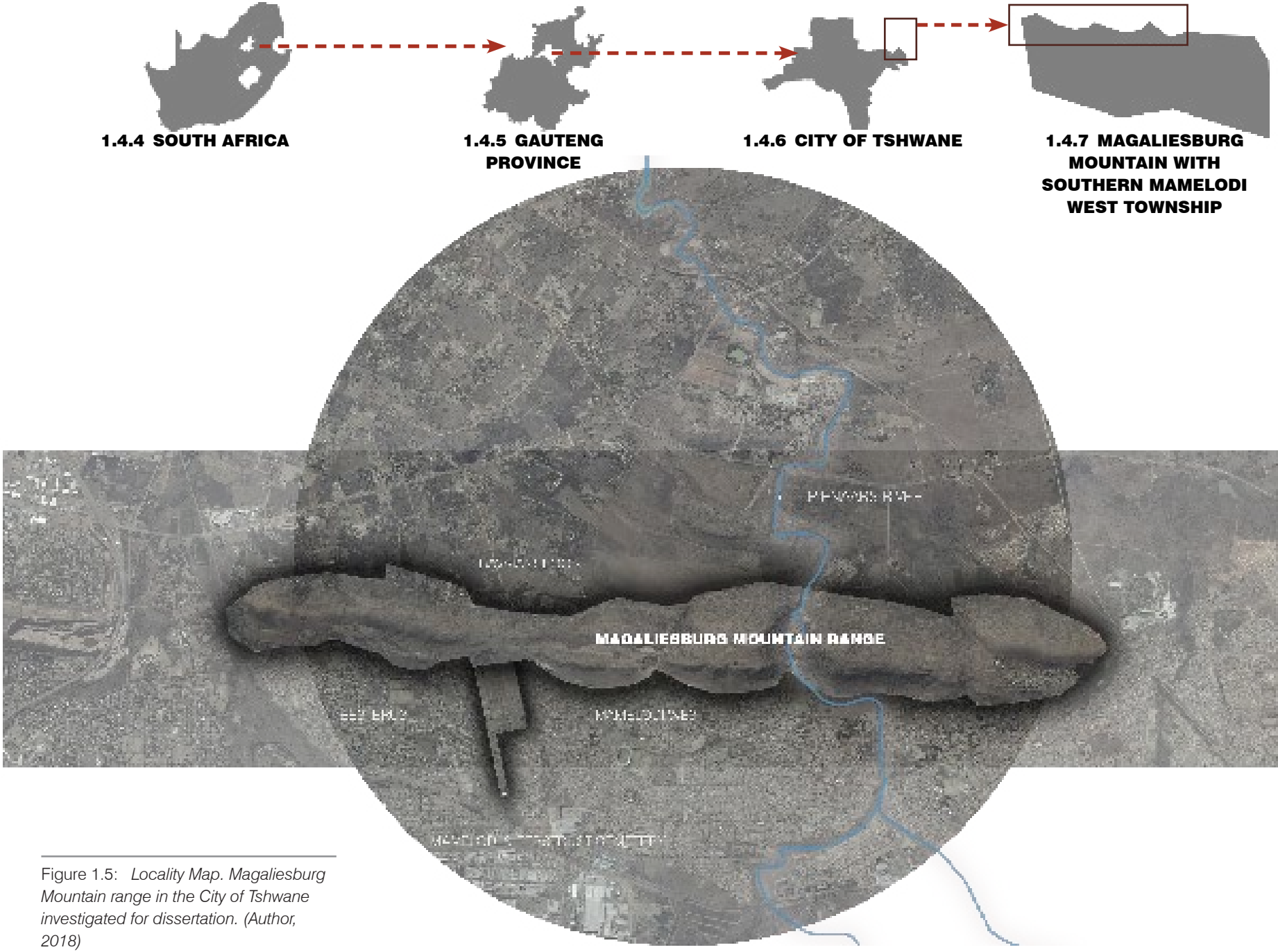


Figure 1.5: *Locality Map. Magaliesburg Mountain range in the City of Tshwane investigated for dissertation. (Author, 2018)*

Figure 1.6: *Fencing made of waste material at base of mountain (Author, 2018)*

He also implemented an indigenous planting nursery. This rehabilitated area, and the project it encompasses, is called 'Mothong Heritage Trust'.

Discovering the landscape complexity through time

In the southern townships, the mountain appears to enclose the entire neighbourhood from a horizon level perspective. On the rocky walls of this enclosure, the sunsets highlight the western mountain façade with a golden glow, whilst the early eastern morning sunrise renders the monument subtle in soft light lost in mist. As I grew increasingly captivated by the mountain-scape, I discovered more about its traditional value, particularly to the elders of the community.

The mountain has over the years become known as a place where sacred and secular practices meet in admiration of the landscape. This is shown in the range of sacred rituals and secular activities still encountered on the mountain. From the practices of male initiation conducted on the mountain peaks, while recreational sports are engaged in nearby, to the open sky being a canvas, used during the day to worship and at night to unveil a collection of stories passed along orally.

With such a diverse overlay of use, the author was at first perplexed by how little attention and national pride was being attributed to this cultural landscape.

It was only once the spatial, social and conservation tensions currently being experienced were uncovered, that the author discovered it was not for lack of valuing that more pride is not exhibited over the mountain-scape and these particular uses of space.

Rather, it was due to restrictions of land-use (due to legislative rigidities), miscommunication between neighbours and generational tensions in evolving culture. It became difficult for community members to take ownership of the landscape deemed sacred.

With amusement, old men recalled adventures heightened by the fearful mythical stories involving the mountain,

shared in their youth.

I was surprised that across generations, almost every person I spoke to who grew up around the mountain was familiar with the mythological 'giant snake' living near the valley bottom, capable of unimaginable terror if angered by misbehavior on the range.

In the same breath, these men would speak up with reverence for the mountain when remembering the lessons passed down from elders on the quiet solace of the mountaintop during the male initiation winters. Other men had fonder memories of being taught self-defense in the refuge of the mountain as meditative practice similar to the 1984 Hollywood film *Karate Kid.*

During my investigation, some residents encouraged my exploration of tradition through site visits. On site, residents would readily share stories of Sunday prayer sessions where the congregation migrated from the church building to the valley bottom to worship under open skies. I was made aware of the role this natural feature played in reminding worshippers of faithful provisions of God.

However, during my investigation I also found community groups discouraging me from site visits because of a host of *'unorthodox practices'* conducted on the mountain. With reference to the site's traditional uses, I was warned of the mismanagement of the initiation schools, extremist religions and *'strange'* religious sacrifices.

I found community members neighouring the site deeply afraid of some of the traditional practices and practitioners on the site. Several residents had reservations about the mountain because of associated stories of gangsterism and crime. Those afraid of traditional practices were often the younger generation or residents too afraid to question details of traditional practices. A sentiment of fear associated with the site's relationship with crime was shared across generations.

The reverence for the mountain was once gravely overshadowed by the illicit activities encountered when the area fell into disrepute. But the dark clouds cast by that stage in history are still being rolled aside by the elder members of the community, reclaiming the narrative of the landscape to re-instill the full sanctity of a landscape they once knew. This is a tall order, especially in light of the rate of urban development at the foot of the mountain.

But before this can be done, we must first uncover where the landscape was lost.

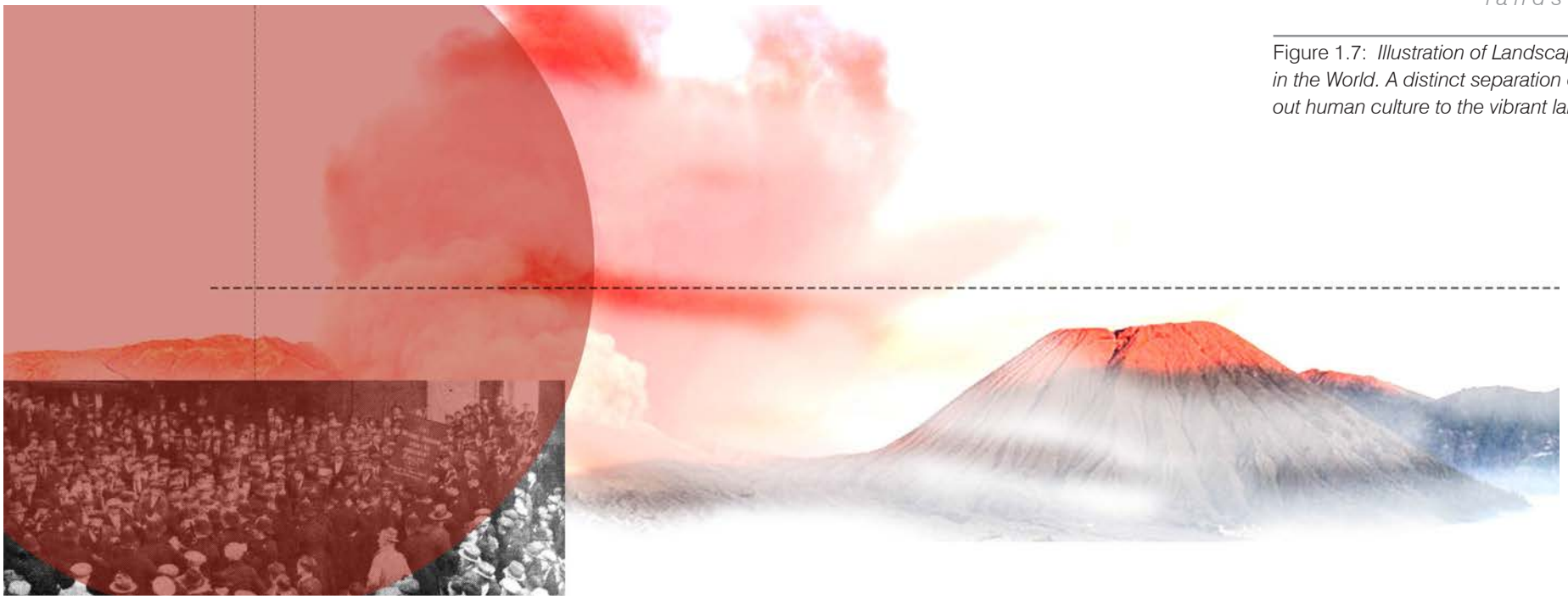


Figure 1.7: *Illustration of Landscapes Lost in the World. A distinct separation of dulled out human culture to the vibrant landscape.*

1.3 Where we lost the landscape

1.3.1 LANDSCAPE LOST TO THE WORLD

Statement
Urban living dilutes the riches of cultural landscapes.

Evident throughout the history of the Magaliesberg Mountain in the City of Tshwane, is the loss of cultural identify to the demands of sustaining an urban lifestyle. Since the 1950 mass migrations experienced by the three surrounding towns, this has included the loss of land and the loss of traditions associated with this land. Hybrid cultures were introduced, formed from troops of urban dwellers migrating from various backgrounds, initially seeking opportunities offered by urban living.

However, with urbanity and hybrid cultures becoming a permanent part of modern South Africa, a question that should be posed is:

Does the adaption of hybrid cultures, prominent in urban areas, dilute the reverence associated with landscapes?

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1.3.2 LANDSCAPE LOST TO URBANITY

Statement
Cultural landscapes are currently under threat in developing urban contexts.

Gauteng has overlooked the conservation of cultural landscapes. In property development schemes, landscapes are reduced to *'open spaces'* zoned for architectural development, which are expected to sustain the development project through the income gained during the life-cycle of the project. This in turn causes a shift in priorities associated with land, creating a shift from its perception of 'landscape' to 'open space'. These spaces are commodified and privatised

to meet development demands. In areas with existing cultural value, this shift would then stagger the growth of cultural landscape and discontinue the traditions dependent on the cultural landscape, now lost.

The City of Tshwane has taken issue with the impact of development. According to the Tshwane Open Space Framework of 2005 set by The City of Tshwane Metropolitan Municipality (CTMM):

> "Spurred on by developers' ideological and short term financial concerns, large tracks of valuable Open Space have been lost, fragmented and sterilised. This is especially evident in inappropriate development interventions found within sensitive Open Spaces such as ridges and watercourses, the unresponsive nature of development towards such resources, the alienation of such resources to private parties, as well as the historical granting of inappropriate residential, commercial and industrial rights on such resources."
> (CTMM, et al., 2005) with Author's emphasis.

The Open Space Framework suggests that the current development patterns in the City of Tshwane fragments and sterilises open spaces through developments and zoning schemes which overlook their context. If development continues at this rate, more sterile open spaces will be generated and further landscapes lost.

As far as projects by developers pose a threat to cultural landscapes, the CoT needs to refine it's conservation approaches to cultural landscapes. In 2011, a feasibility study was conducted on this mountain range within the CoT district. With concern over the potential impact of the urban development in close proximity to the natural area, CTMM commissioned *SSI Engineers and Environmental Consultants* to assess the current state of the feature and advise the city if the area was fit to form part of future municipal conservation schemes. Throughout their assessment, the consultants referred to various South African legislations and the Gauteng Conservation Plan (C-Plan Version 3.3).

They concluded that there had been too much human intervention for the site to still form part of any future conservation schemes, or to be offered conservation status under guidelines utilised by the CoT.

The human interventions identified by the study describe the use of space for an active cultural landscape. This includes practices stemming from heritage culture, traditional and recreational uses of landscape. The lack of legislation to defend the conservation of this active cultural landscape indicates a gap in the city's conservation manifesto. This gap was identified by UNESCO, as described in the dissertation.

This highlights an urban condition in which we are unable to detect cultural landscapes.

Rather, our urban planning approaches categorise open spaces as either 'urban development zones' or 'ecologically sensitive areas', with little room for the overlap between the two - the growth of an cultural landscape as part of the urban condition.

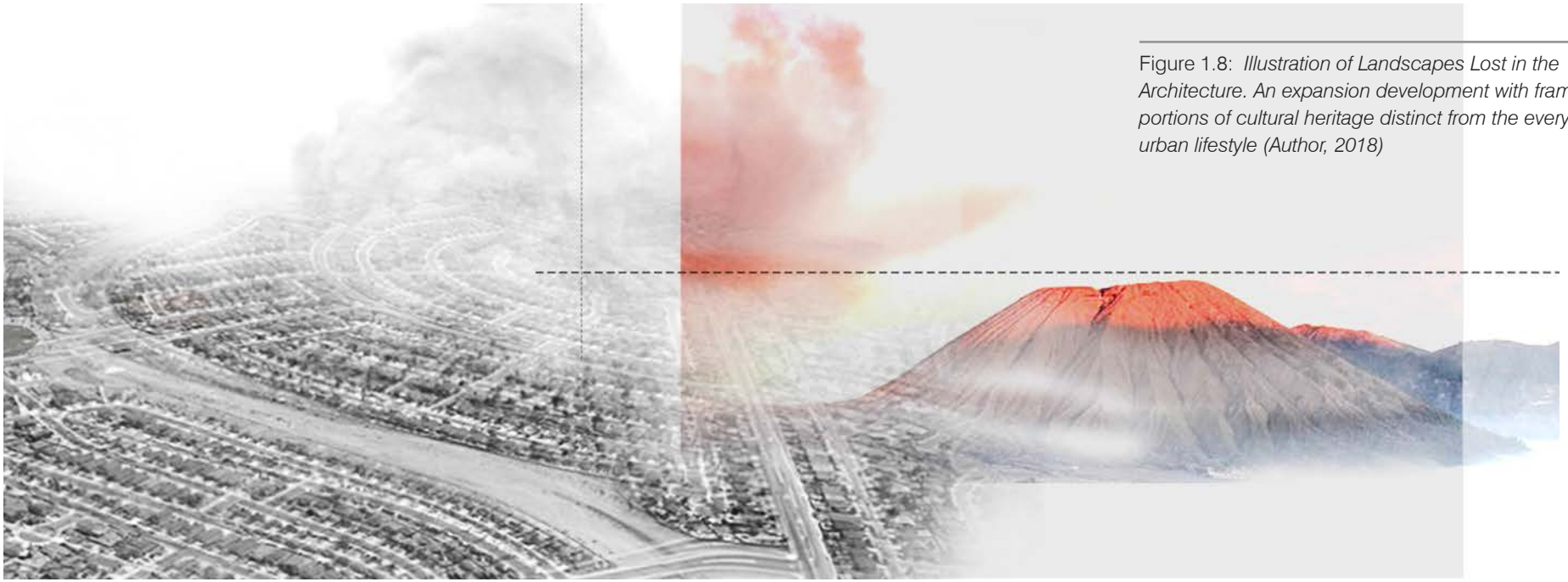


Figure 1.8: *Illustration of Landscapes Lost in the Architecture. An expansion development with framed portions of cultural heritage distinct from the everyday urban lifestyle (Author, 2018)*

1.3.3 LANDSCAPE LOST TO URBAN SPRAWL

Statement

In the conservation of an active cultural landscape, the evolution of traditions and continued ritualised use of space needs to be considered.

The Magaliesberg Mountain is currently host to an active cultural landscape. Maggie Roe describes a cultural landscape as a space where there is mutual moulding of human and landscape (Taylor & Roe, 2014). The site consists of ritualised and non-ritualised spaces surviving off the indigenous knowledge traditionally passed down through generations to the current participants of the cultural landscape.

Despite it not being recognised on an urban scale, this passage of knowledge holds meaning to the status of landscape in CoT. Although surrounded by urban development, an active landscape exists in the CoT, kept alive by active traditions and rituals.

These traditions and rituals are conducted in spatial settings with some structural and some metaphysical conditions, both depending heavily on the landscape. A general approach to culture in architecture is one based on cultural heritage. In this approach, a structure deemed as heritage due to its age or cultural significance is protected by law.

The role of the architect is to extend the functionality of the structure while maintaining the integrity of the heritage, referring to a particular period in history. This strategy cannot be adopted on this site.

Through continual communal interaction, an active cultural landscape should be expected to undergo changes and growth. It cannot be approached as a heritage project because the cultural significance lies in the ability of the landscape to change over time.

In changing, the sacredness of the landscape is not to be discarded, but rather passed on to the next generation

as called for by the nature of tradition. The changes may form part of traditional alterations of space or generational associations made to sacred space and ritual. Regardless, in its conservation, the essence of the cultural landscape needs to be protected to retain the sacredness of the landscape. Therefore, there should be a balance between what is changed and what is retained. As a result, the following design question is posed:

Design Question

In designing for the expected growth and traditional changes of landscape associated with an active cultural landscape in an urban neighborhood, how are existing settings for ritual treated? And how is the sacredness of cultural landscape retained?

Hypothesis

Active landscapes retain their sacredness due to the continued spiritual connection made through communal involvement with place and persons showcasing custodianship and participation. As the landscape changes over time, so do traditions and rituals. As a result, so should the built-forms (being non-specific to a particular paradigm or culture).

The responsibility of space is to provide means to engage with landscape. To allow for this, a search into the sacredness of landscape in urban conditions and a timelessness in built form is investigated.

From this, the following objectives need to be sought after:

1. Non-dogmatic Language

Often cultural heritage depends on the language forms drawn from particular cultural groups, religions or other denotation. However, in search of a language which responds to the sacredness of the landscape rather than a particular cultural group, a formal language responsive to landscape is rather sought.

2. Sacredness in Landscape

Traditionally, a key criterion for sacred spaces is discretion. One might see smoke emanating from the landscape. Questions may be asked, such as where the fire comes from, what constitutes the ritual being conducted and the exact location of the fire. Only those deemed fit by tradition are to have the answers. This ominous culture is part of a spatial configuration in cultural landscape. This stands in contrast to the philosophy of the urban condition, where every marking on the landscape should be accounted for.

1.4 Method of searching

To address the design research question in determining a response to the conservation of a cultural landscape, an action research methodology is used. The cyclical process: *plan - action - observe - reflect - revise plan* (and repeat), is used in this methodology.

1.4.1 EXISTING CONDITION OF CULTURAL LANDSCAPE

To understand the existing condition of the landscape, the site will be mapped from an urban scale down to a site specific scale. An analysis of the site will be discussed using the 'level of analysis' strategy. This strategy is a multi-level study method, which breaks down the analysis of complex systems by introspection through three scales: Macro, Micro and Meso.

This mapping method is used in social sciences to constantly keep track of research targets through varying scales.

This is done through a combination of observation and desk-top study. These terms locate the researcher's analytical focus relative to contextual phenomena and conditions (Barbour, 2017).

In this research, these scales are used to alternate between urban and social scales, to relate the significance of the cultural landscape on a wider urban scale.

1.4.2 A SEARCH FOR SACREDNESS OF MOUNTAIN

In searching for what inherently makes the mountain a sacred landscape, the active cultural conditions on the site will be studied. The author's narrative of site, adapted from experiences and conversations on-site, will be used to track the intangible value. The use of theologian theories will then be overlaid to theoretically understand the links between landscape and sacredness.

1.4.3 CYCLE OF DESIGN RESPONSE ENRICHMENT

From here, a cyclic process of refining the design approach will be pursued. This process will take the form of three essays discussing three different approaches to retaining sacredness in the landscape, throughout the changes experienced of a cultural landscape.

Each essay will take design information retained from the previous exploration, discuss a new approach relative to theory and produce a new design action. This design action will be observed through design development and criticised. The aim is that the subsequent critical reflection of each essay produces a progressively improved design response to the problem posed. In the end, the findings will be synthesised into a design response.

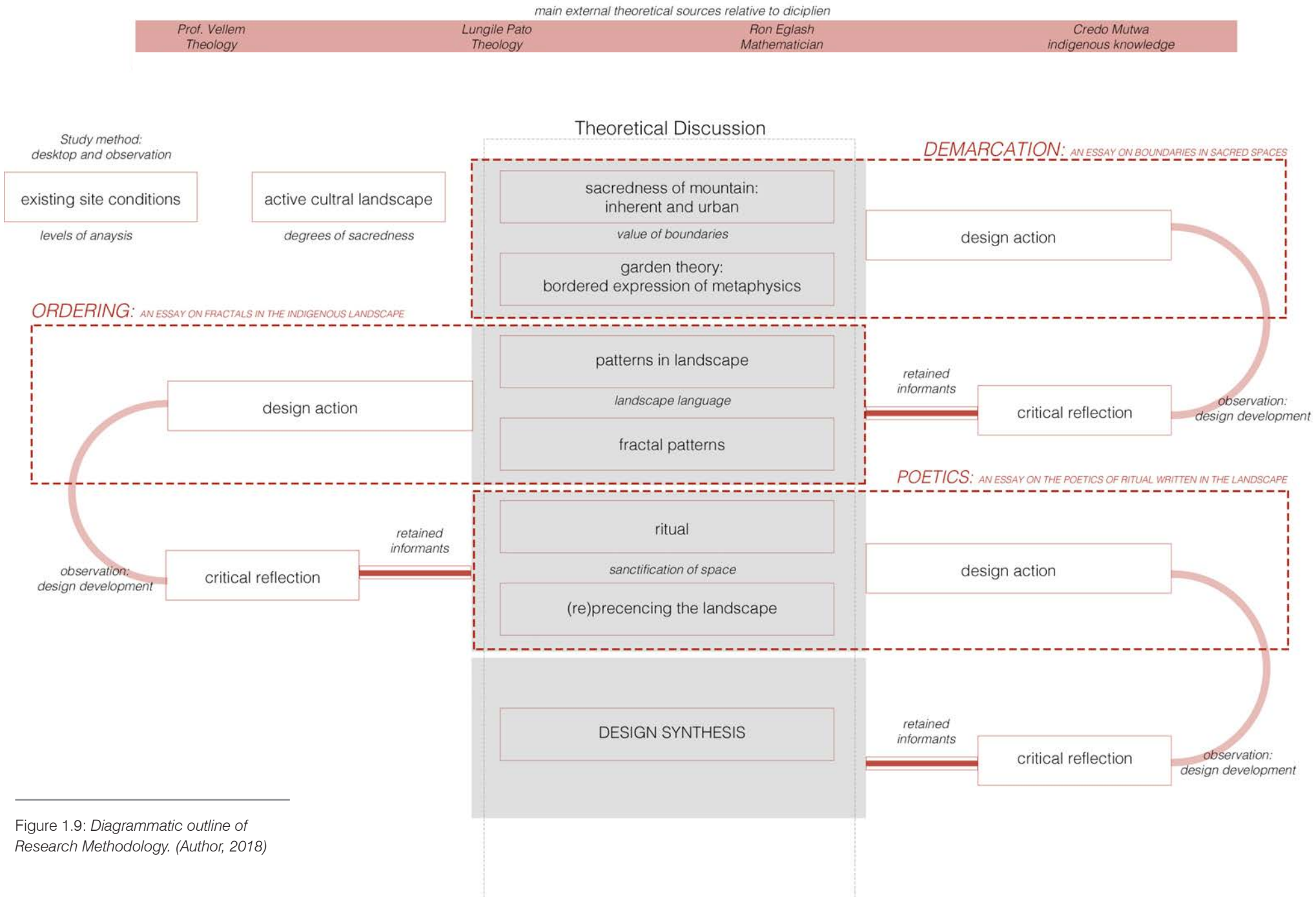


Figure 1.9: *Diagrammatic outline of Research Methodology. (Author, 2018)*

Figure 1.10: *A look back towards the Southern Township of Mamelodi from the mountain. (Author, 2018)*

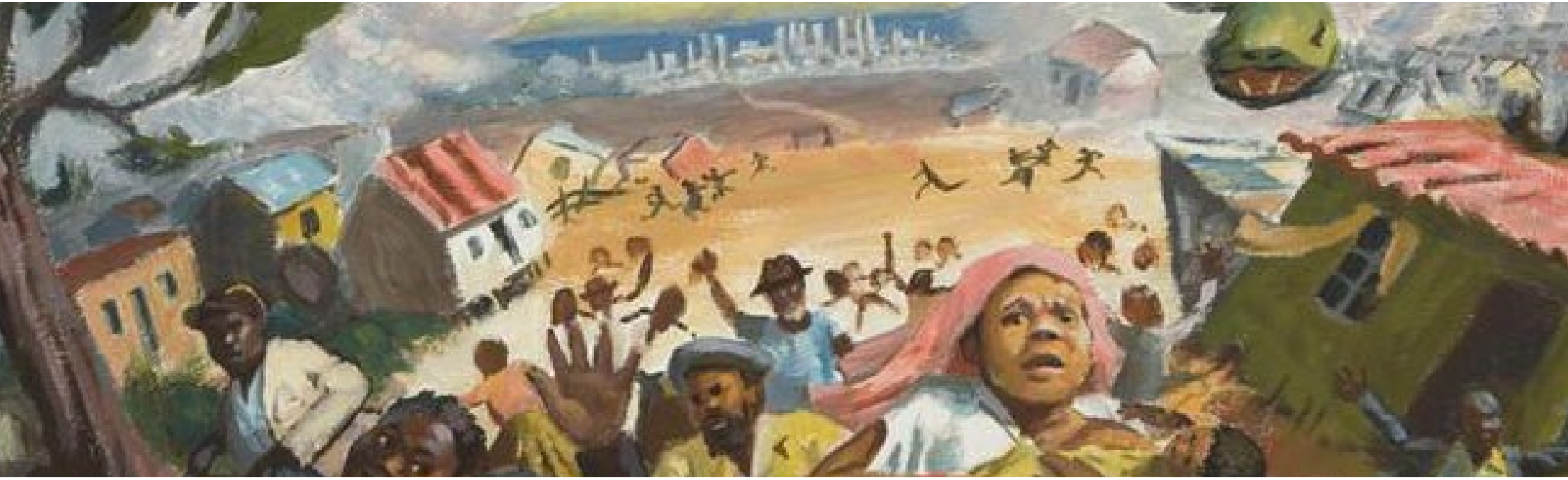


Figure 2.1: *"Inkanyamba" (1987), by G. Pemba (1912 – 2001)*

"There is fire on the mountain, and nobody seems to be on the run.
Oh there is fire on the mountain-top,
but no-one is running"
'Fire on the mountain'
(Asa, 2015)

02
FIRE ON THE MOUNTAIN

Urban Scale Site Discussion

Fire on the Mountain - The Magaliesberg Mountain in The City of Tswane District, Gauteng Province, South Africa

Mountains are still considered sacred landscapes in various active traditions.

However, research shows that in the urban context, the modern associations and interactions made in this particular natural resource continually threaten the continuation of tradition and evolution of the cultural landscape along the mountain range.

This chapter discusses the conditions on the site chosen for the dissertation investigation. Primarily, the environmental and cultural conditions of the site will be discussed as these seem to be at odds with one another on an urban scale. Thereafter, sub-tensions will be discussed.

It is the aim of this chapter to familiarise the reader with the site location, cultural uses of landscape, spatial tensions as well as the opportunities of intervention in order to address the urban issue discussed in the previous chapter:

Cultural landscapes are currently under threat in developing urban contexts.

The position taken in this dissertion is that Gauteng has overlooked the conservation of cultural landscapes in urban areas in a determined effort to protect natural environmental conditions. UNESCO, on the other hand, makes distinct efforts to conserve both cultural landscapes and ecological environments.

As presented in 3.4 Methodology, part of the above section, an analysis of the site will be discussed using the 'level of analysis' strategy. This is aimed at enabling the reader to identify the significance of cultural landscapes at different urban and social scales.

2.1 The Existing Cultural landscape

2.1.1 A ZONAL APPROACH

"When the winds of change finally blew across the country in 1990 with the unbanning of the ANC and other liberation movements, residents began turning the space into a wasteland, dumping everything from old car wrecks to dead animals, garden refuse and general waste. Some hacked down trees and muti peddlers harvested medicinal plants without following methods that would ensure their sustainability."

Dr Ephraim Mabena, local traditional healer, custodian of Mutong indigenous plant nursery
(Ledwaba, 2018)

The site is demarcated as Mamelodi-84385 by the municipality and borders the towns of Mamelodi, Eersterust and Baviaanspoort — standing as a shared natural resource between the three. The mountain-scape boasts rocky outcrops; a valley fed by a permanent river and smaller seasonal watercourses; heritage and cultural value, as well as close proximity to urban fabrics.

From the plateau of the range, to the cliffs and banks of valleys, the site hosts an assortment of activities carried out by residents of the adjacent towns. The more illustrious of these existing programmes on the site influencing circumstances from their neighbouring positions include:

Mutong heritage zone on the plateau of the western extent of the design site; the Eersterust and Mamelodi Cemeteries located on the south-western boundary of the design site; a waste-water treatment

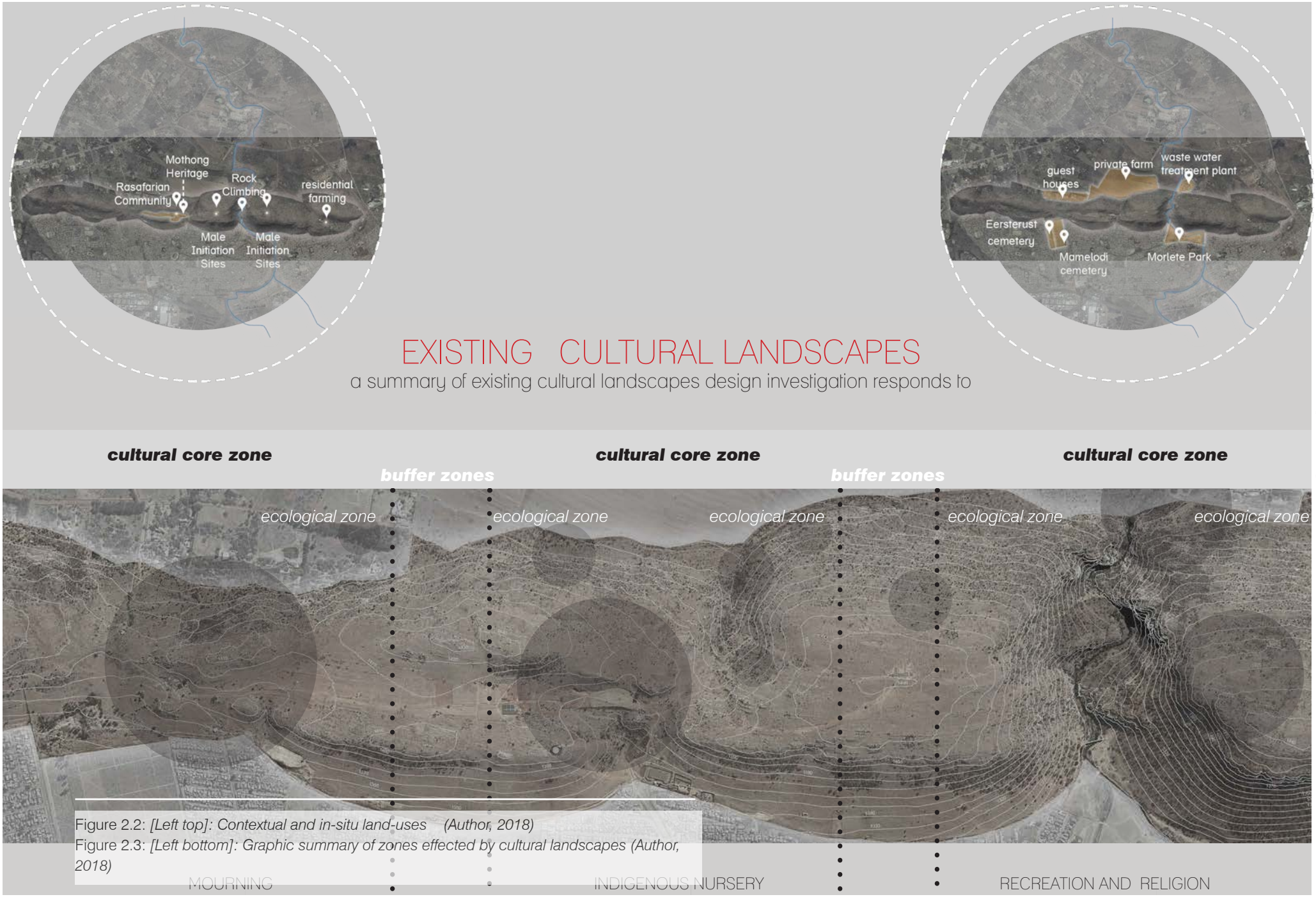


Figure 2.2: *[Left top]: Contextual and in-situ land-uses (Author, 2018)*
Figure 2.3: *[Left bottom]: Graphic summary of zones effected by cultural landscapes (Author, 2018)*

plant on the north-western boundary of the selected range; and Moreleta Park, a municipal public park and resort located on the south-eastern boundary of the range and at the mouth of the valley as summarised in Figure 13.

For the purpose of this dissertation, I have subdivided three section of the mountain on an urban scale by zones. Each zone is designated by the character attributed to it by a major in-situ or ex-situ activity which impacts the approach to landscape in that area.

The core cultural zone
These are areas where different cultural practices and recreational engagement with landscape are currently concentrated.

The ecological zone
These are areas where the ecological environment has traditionally remained undisturbed. Protected by myth and non-accessibility, these areas have no cultural practices occupying them.

The buffer zone
These are areas located between the cultural core and the ecological zone. They are characterised with existing cultural and recreational use of landscape which are the least ecologically damaging or fully depend on the engagement of the practice with the wilderness.

2.1.2 BREAKING DOWN THE CORE CULTURAL ZONES

Mourning zone
This zone is drawn mainly from the cemetery bordering the southern slopes of the mountain. The cemetery currently has reached its capacity but is still being utilized for further burial ceremonies, resulting in cramped mourning ceremonies at the foot of the mountain.

To further increase spatial frustrations, the reinforced palisade fence separating the cemetery from the mountain restricts the mutual molding of mourning ceremonies (being comprised of sacred rituals) and the mountain (being a sacred landscape), denying the establishment of a cultural landscape. As a result, illegal and uncontrolled rituals are being conducted on the barricaded side of the fence. Evidence of burning, erection of crosses and piling of stones in cross formations are found within this zone (despite the restriction on access).

Indigenous knowledge zone
This is mainly characterized by the presence of the indigenous planting nursery and initiation school camps on the mountain range.

Both these activities are based on the passing down of indigenous knowledge through traditional rituals. The initiation schools celebrate the changing phases of young boys of the community to men, through their exposure to lessons and traditional knowledge. The indigenous nursery stands as a traditional approach to custodianship taken by indigenous cultures and a storage center for traditional knowledge of cures for ailments and sustainable harvesting techniques, passed down through generations.

However, both have come under scrutiny by local environmental preservationists for the alterations on the landscape posed by each.

The initiation schools host over 300 boys per camp in every fourth winter, with activities ranging from harvesting wood for fire to burning the grassland.

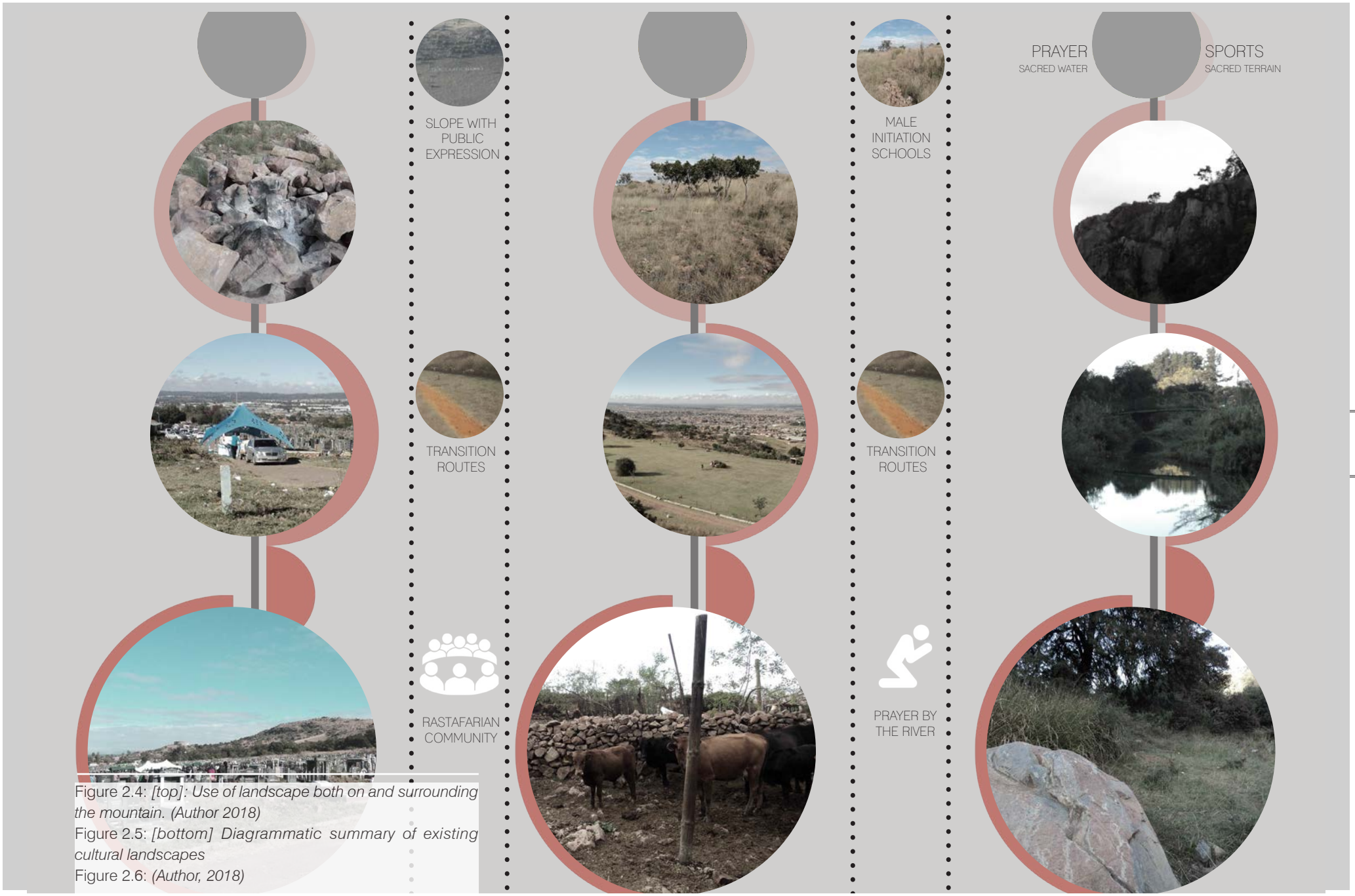


Figure 2.4: *[top]: Use of landscape both on and surrounding the mountain. (Author 2018)*
Figure 2.5: *[bottom] Diagrammatic summary of existing cultural landscapes*
Figure 2.6: *(Author, 2018)*

Recreation and religion

This node is characterized by the overlay of sports and religious activities existing in this valley. The water of the valley is most associated with the religious beliefs of a few religious groups found in Eersterust and Mamelodi who still believe the natural pools found in the center of the valley have a purifying power. The rocky outcrops in this node are prime locations for local rock-climbing clubs based in Baviaanspoort.

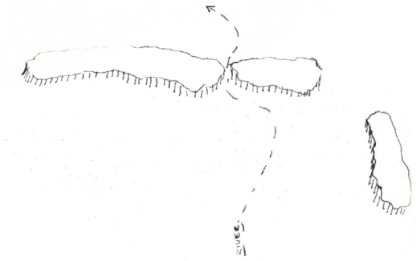
In theory the two appear at odds with one another, but due to the vast nature of this valley and the dense population by vegetation groups, the two seemingly opposing programmatic functions are said to have never clashed in the past. In fact, through experiences conveyed to the author, a degree of reverence for the landscape was identified in both functions. This was identified in the knowledge and care rock-climbers take towards the escarpments, aligned closely with the knowledge and care taken by the worshippers approaching the rivers.

Unfortunately, the harmony often seems short-lived as squatters have become residents along the valley river edge and base of the escarpments, claiming ownership to this public property and threatening harm to possible trespassers.

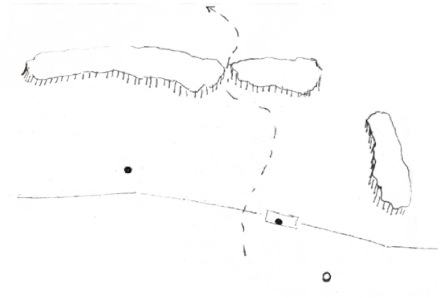
2.1.3 TIMELINE

Formed in the landscape long before there was any settlement, the mountain stands as a history textbook for the evolution of man of that area.

The three surrounding towns around

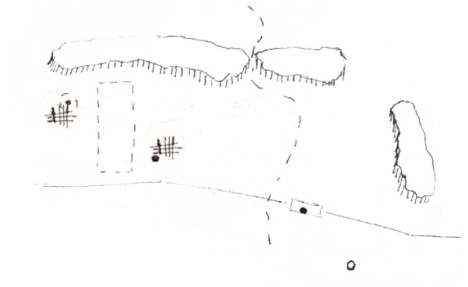


The unocupied mountain

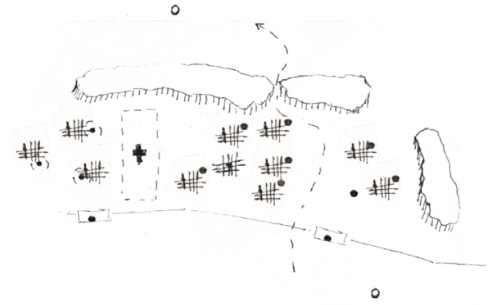


Housing built for workers of first the factory then the station north of the railway line

Sammy Marks home is south of the railway line



Group Areas Act bring a regulated demarcation of development.
The mountain, cemetery and railway line act as spatial divides between urban compounds of different racial groups



Mamelodi expands Eastwards in patterns of individually grouped neighborhood systems. Overcrowding leads to housing developments pushed against and onto the mountain

Eersterust develops eastwards

Baviaanspoort develops northwards with farms, prison development and wastewater treatments developing southwards towards the mountains

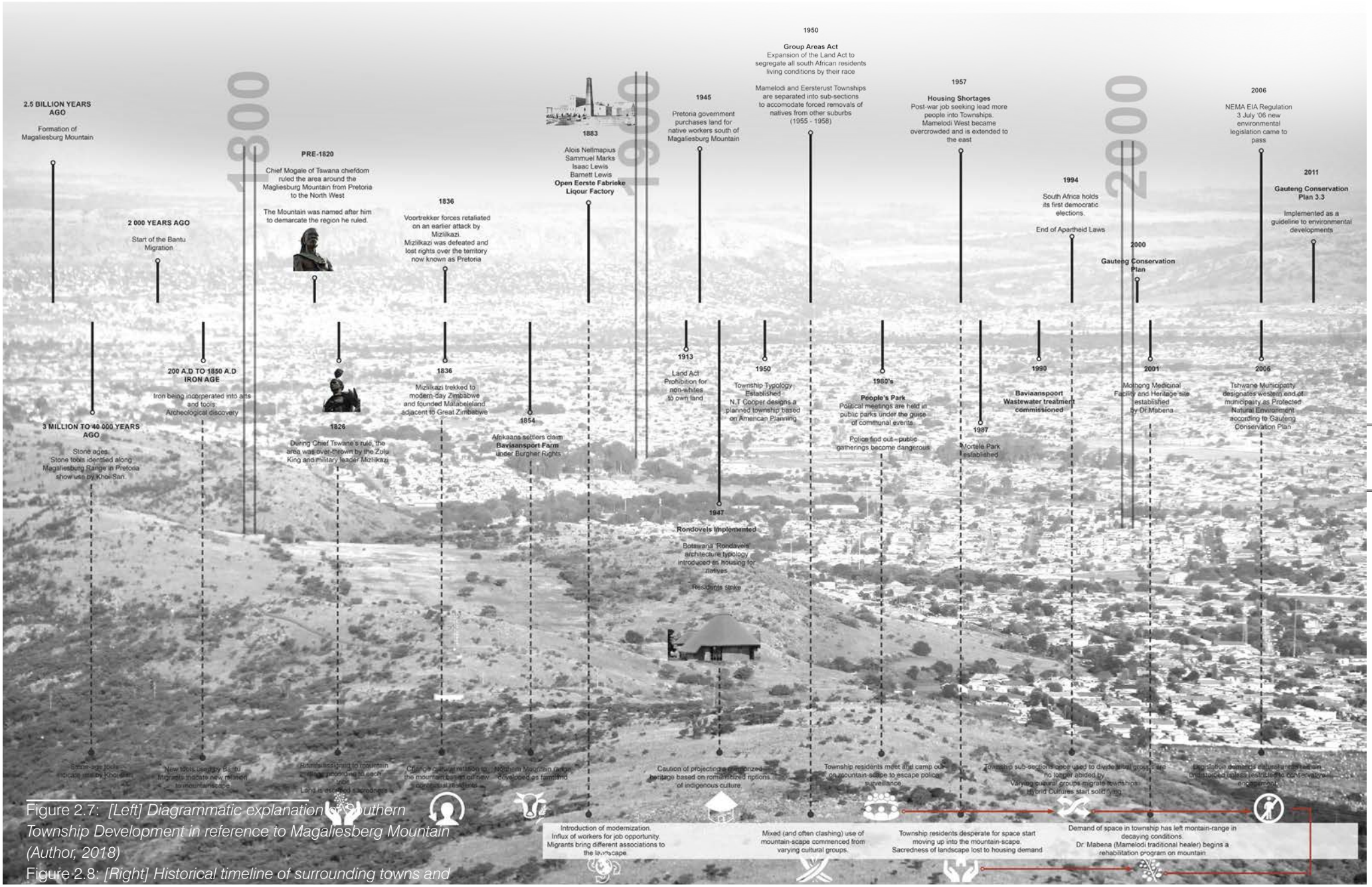


Figure 2.7: *[Left] Diagrammatic explanation of Southern Township Development in reference to Magaliesberg Mountain (Author, 2018)*
Figure 2.8: *[Right] Historical timeline of surrounding towns and*

the mountain developed after the establishment of the Eerste Fabrieke railway station. The resulting development granted residents the opportunity to depend on the escarpment as a spiritual and recreational escape over the years, beyond it standing as a boundary between towns.

The timeline explores the evolution of mans' relationship with the landscape based on key historical events, from the the stone age and iron age, ruling by Chief Tshwane, ruling by Mzilikazi and finally the establishment of the first Vlakvontein farm under the rule of Afrikaans settlers. The mountain stands as an expression of South African culture with residue from each era onwards, around or still associated with the mountain.

This diversity began to streamline with the introduction of the Eerste Fabrieke liquor factory in 1883, creating the first influx of workers from around the country seeking job opportunities and bringing their association with 'mountain as a sacred space' with them from the countryside.

It was only around the 1950's that serious cultural clashes were seen on the mountain. With the introduction of forced migration under the Group Areas Act, residents from different cultural groups were separated by race around the entire mountain but shared this as a resource. Clashing claims about what should be done on the mountain became a source of tension and 'othering'.

By this time, a culture of violence had erupted in the country and the mountain was no exception. Policemen of the apartheid museum based in townships and the northern suburb were known to hide in the mountain during the day in preparation for raids of the southern townships at night. A reverence for the mountain was replaced with fear.

By 1957, housing shortages led township dwellers closer to the foot of the mountain with far less reverance for it being a sacred space. This set the tone for the connections of urban sprawl up the base of the mountain found today.

2.1 Macro-anaysis

At this *'level of analysis'*, a contextualisation of the Magaliesberg mountain range will comprise conservation discussion of the national geographic feature, the large-scale hydrology study of the Pienaars River, and the urban conditions of the three towns and their interaction with the site.

2.1.1 THE MAGALIESBERG MOUNTAIN AND UNESCO GLOBAL CONSERVATION

The mountain range starts at the Bronkhorstspruit Dam in Pretoria, Gauteng Province and branches out to the Pilanesberg National Park in the Northwest Province (Magaliesberg, 2008).

According to the UNESCO Ecological Sciences for Sustainable Development, a portion of the mountain range has been considered a biosphere reserve since 2015.

This section is located between Johannesburg and Pretoria and expands to the Pilanesberg National Park. (UNESCO, 2017).

This section stops its conservation span before Magaliesberg reaches the City of Tshwane district. According to UNESCO, the reason this section is conserved under this status is due to

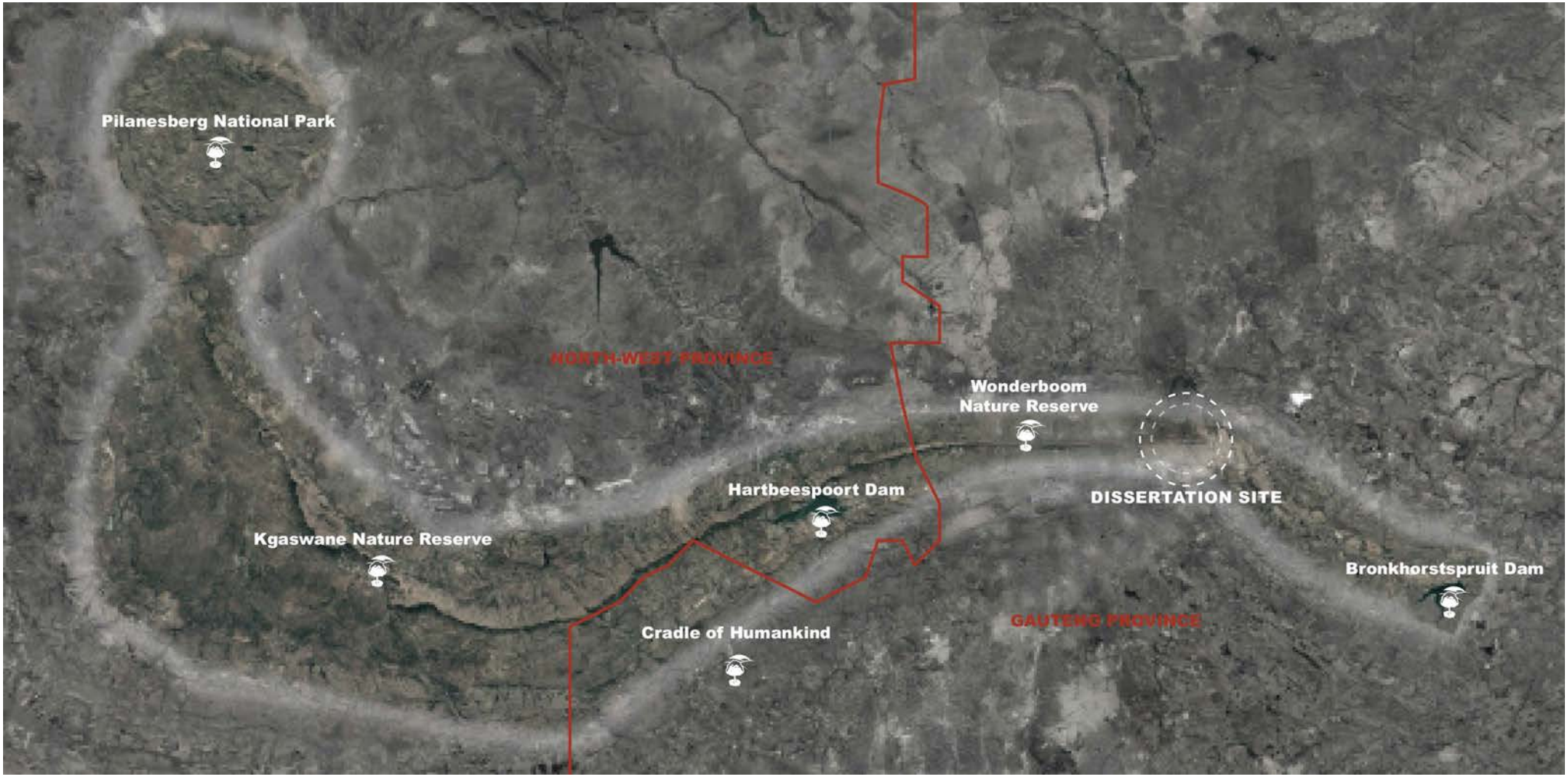


Figure 2.9: *Magaliesberg Mountain and protected reserves and parks along the range. (Author, 2018)*

the overlap of its 'social, ecological and cultural characteristics'. Significant of its ecological characteristics, the region is believed to host:

"[A] rich biodiversity includes floral species such as Aloe Peglerae and Frithia Pulchra, and faunal species such as the forest shrew (Myosorex Varius), sable antelope (Hippotragus Niger) and 443 bird species representing 46.6% of total bird species in the southern African sub-region [as well as] 90 indigenous mammal species".

For its cultural characteristic:

"The reserve also forms part of the Cradle of Humankind World Heritage site which encompasses cultural heritage and sites of archaeological interest dating back 4 million years."

Finally, for its social characteristics:

"The reserve has a total population of 196,728 inhabitants, significantly lower than that of the neighbouring cities of the metropolitan areas (Johannesburg and Pretoria) within whose boundaries it falls. The area has witnessed a melting pot of different cultural groups over the millennium, often at war with one another, resulting in a rich and varied cultural history representative of the larger South Africa."
(UNESCO, 2017)

Under UNESCO conservation protection, the biosphere is managed by a locally formed board named *'The Magaliesberg Management Board'*, with guidance provided by international advisory professionals recommended by UNESCO.

Benefits offered by this status include:

- *The provision of guidance for management from an international community of professionals.*
- *The acknowledgment of the significance of the site in comparison to global examples.*
- *With the above confirmed, a final benefit is the contribution made to tourism and eco-tourism.*

It is for this international recognition that reaching a UNESCO conservation status is held in high regard.

2.1.2 THE MAGALIESBERG MOUNTAIN RANGE AND LOCAL CONSERVATION STATUS

The Gauteng conservation plan

Implemented in the year 2000, the Gauteng Conservation Plan is a guideline commissioned by the National Department of Agriculture and Rural Development and aims to guide interventions affecting open space and natural resource conservation in Gauteng. The C-Plan is used to inform other conservation guidelines documents including the 'Gauteng Development Guidelines for Ridges' and the 'National Protected Areas Expansion Strategy (NPEAS)'.

According to the Gauteng Conservation Plan 2003, the mountain range is only considered an ecologically sensitive area which "contributes mainly towards the conservation of the more extensive vegetation types and species of Threatened and Near Threatened fauna that require extensive areas for their breeding and survival" . (Compaan, 2011).

In combination with this, the area should be protected under the Gauteng

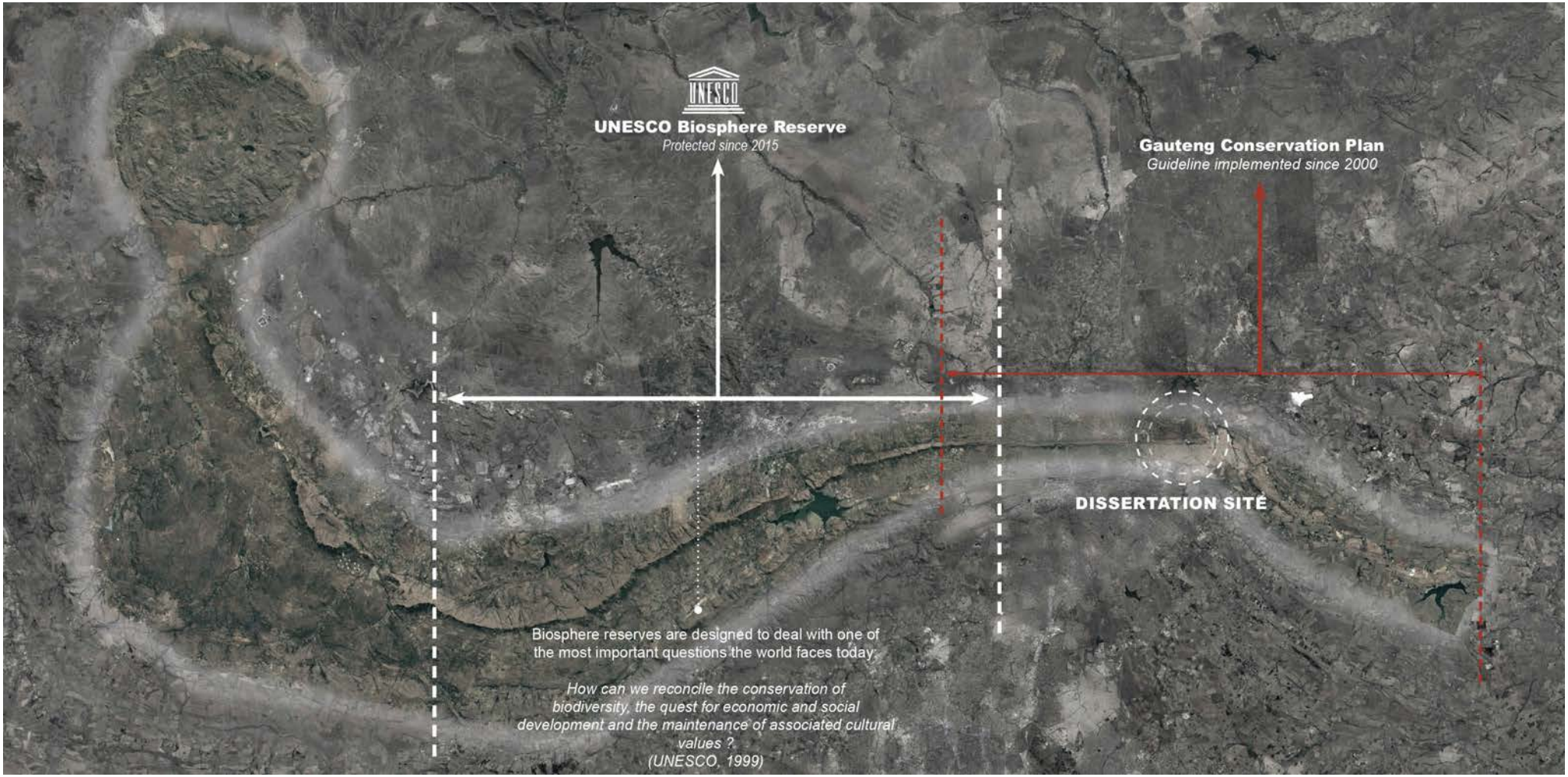


Figure 2.10: *Magaliesberg Mountain indicating conservation approaches (Author, 2018)*

Development Guidelines for Ridges which stipulates that there is no development permitted on ridges with a slope over 5%, which is far surpassed in the Tshwane district of the mountain. However, due to urban sprawl and arguments against existing cultural disturbances, development is being conducted and proposedly expanded on the escarpment. It is for this reason that the author argues for the protection of the range as a site of cultural-environmental significance based on the existing circumstances, rather than depending on existing legislative rule.

The Gauteng Conservation Plan (C-Plan) is an environmental conservation framework focusing on the ecological health of environments within the Gauteng province.

It is used as a guideline for municipalities and other provincial development strategists. The plan was commissioned by the South African Department of Agriculture and Rural Development: Directorate Nature Conservation Technological Services Section. The Gauteng C-Plan has undergone various upgrades since its implementation in 2000, as more information is captured on the Gauteng database. The information captured in the database is assembled by a team of SANBI and GDARD specialists with responsibilities including GIS analysis, habitat modelling, aquatics, floral studies, faunal studies and bio-regional planning. The team then produces a comprehensive environmental framework used by varying municipalities to distinguish between natural areas that are to be protected and areas that are safe for urban developments (Compaan, 2011).

Although few contextual activities targeted environmental conservation, not all these interactions have benefited the ecological health of the site over the years – yielding an eco-systemic imbalance in the current landscape.

Due to this imbalance, it is no surprise that when the site was assessed according to the Gauteng C-Plan environmental conservation framework, it had not met the criteria. In 2006, when the Tshwane municipality responded to the Gauteng C-plan, it was only the western end of the Magaliesberg mountain range (within its municipal district) which was identified as a Protected Natural Environment and thereafter received financial and managerial efforts to conserve this section appropriately (CTMM, et al., 2005).

The City of Tshwane metropolitan municipality

The City of Tshwane has a range of conservation statuses which grant open spaces protection, maintenance, regulation and subsidies by municipalities. CTMM allocates conservation status to open spaces based on guidelines stipulated from frameworks drafted from policies such as the Gauteng Ridge Policies and the Gauteng Conservation plans. From 2005 each status had to be declared by the Minister or MEC, and included:

Nature reserves
"Areas of significant natural features or biodiversity; of scientific, cultural, historical or archaeological interest; or in need of long-term protection for the maintenance of its biodiversity for the provision of environmental goods or services." (CTMM, et al., 2005)

Protected environments
"To regulate the area as a buffer zone for the protection of a special nature reserve… to protect the area if the area is sensitive to development due to its

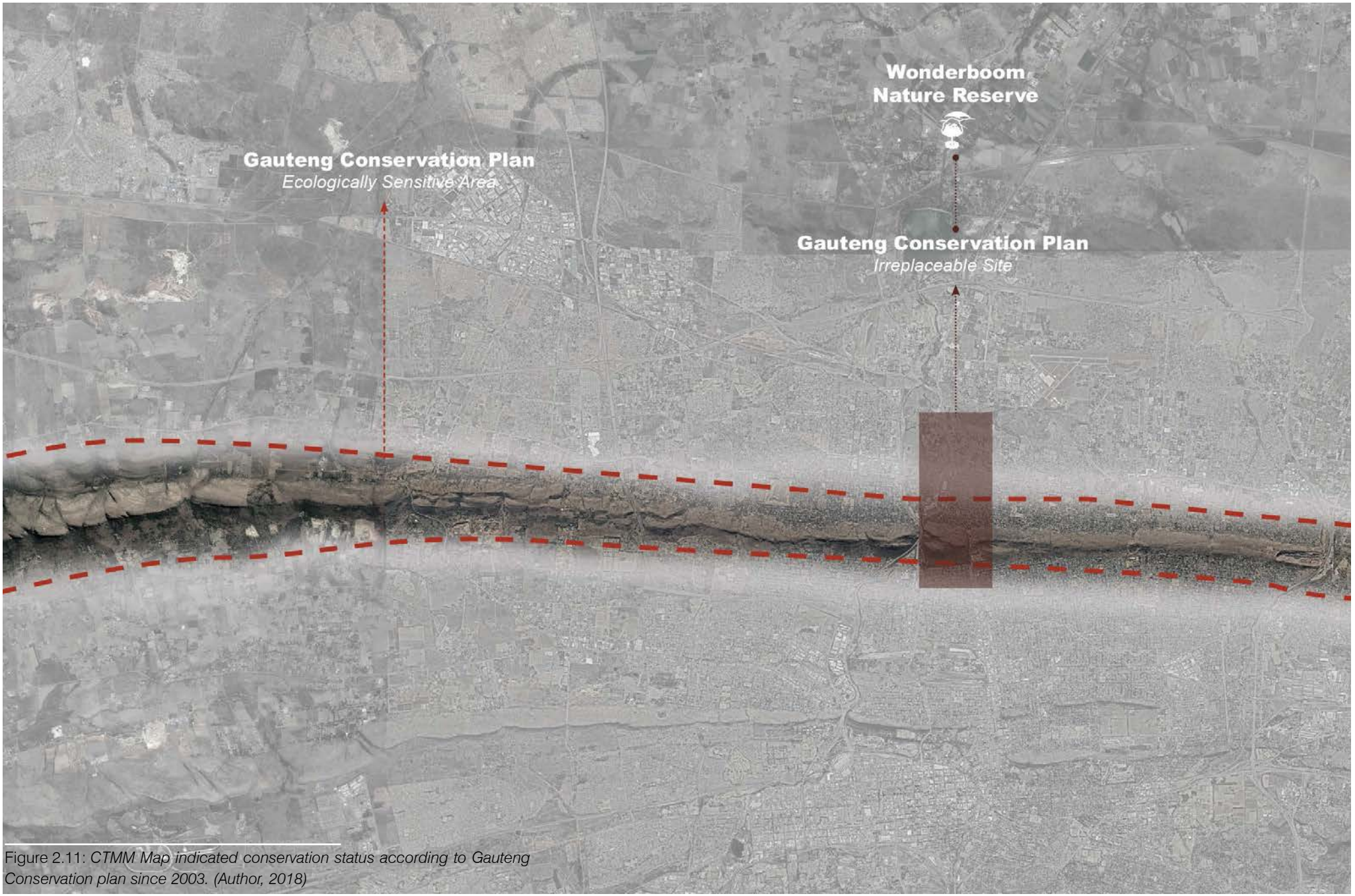


Figure 2.11: *CTMM Map indicated conservation status according to Gauteng Conservation plan since 2003. (Author, 2018)*

biological diversity." (CTMM, et al., 2005)

Bavaria (also known as a conservancy)
"A group of properties in which neighbours have pooled their resources for the purpose of conserving fauna and flora, as well as the adoption of friendly land use practices and of conserving wildlife on their combined properties." (CTMM, et al., 2005)

The Magaliesberg mountain range in the City of Tshwane district is only partially protected under the above status. According to the City of Tshwane Metropolitan Municipality (CTMM):

"The Protected Natural Environment (PNE) along the Magaliesberg Mountain range that occurs within the City of Tshwane stretches from the N1 national highway in the east across the width of Tshwane to its western boundary and beyond, physically linking the CTMM to the North West Province. This portion within Tshwane is just over 5 000 hectares in extent. The Wonderboom Nature Reserve occurs within this protected area. The PNE is understood as the jurisdictional responsibility of The Gauteng Department of Agriculture, Conservation and Environment (GDACE), but is supported by the daily management actions of the CTMM."
(CTMM, et al., 2005)

This means that along the Magaliesberg Mountain range under the Tshwane jurisdiction, protection under the status of a Protected Natural Environment (PNE) is not granted to areas of the range which reach Mamelodi West. Categorization of open space as a PNE grants it the benefits of protection from urban development and ecological maintenance prioritization under the Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA).

This act provides for "the effective protection and controlled utilization of the environment and for matters incidental thereto." (Acts, 2016).

With no categorization, this leaves the section shared between Mamelodi West, Eersterust and Baviaanspoort open to the vulnerabilities of urban sprawl due to lack of management or development control.

The author acknowledges the significant work carried out by the consecutive teams of the Gauteng C-Plan in the management and protection of natural environments and bio-regional conditions. However, the author also argues that indigenous conservation strategies, socio-economic interaction and human history all form part of a cultural landscape which should simultaneously be featured as a conservation criteria. This argument held by the author is already encapsulated by the international conservation body UNESCO under their protection of bio-regional reserves.

The national protected areas expansion strategy

In the feasibilty study conducted by SSI Engineers and Environmental Consultants, the purpose of the report was to determine if this section of the mountain would be appropriate for the expansion of the protected areas estate in Gauteng and North West provinces as per the Gauteng Conservation Plan (Gauteng C-Plan) and the National Protected Areas Expansion Strategy (NPEAS).

The report concluded the site was not fit for conservation status, but advised the following:

"A balance needs to be found between protection of biodiversity, recreational

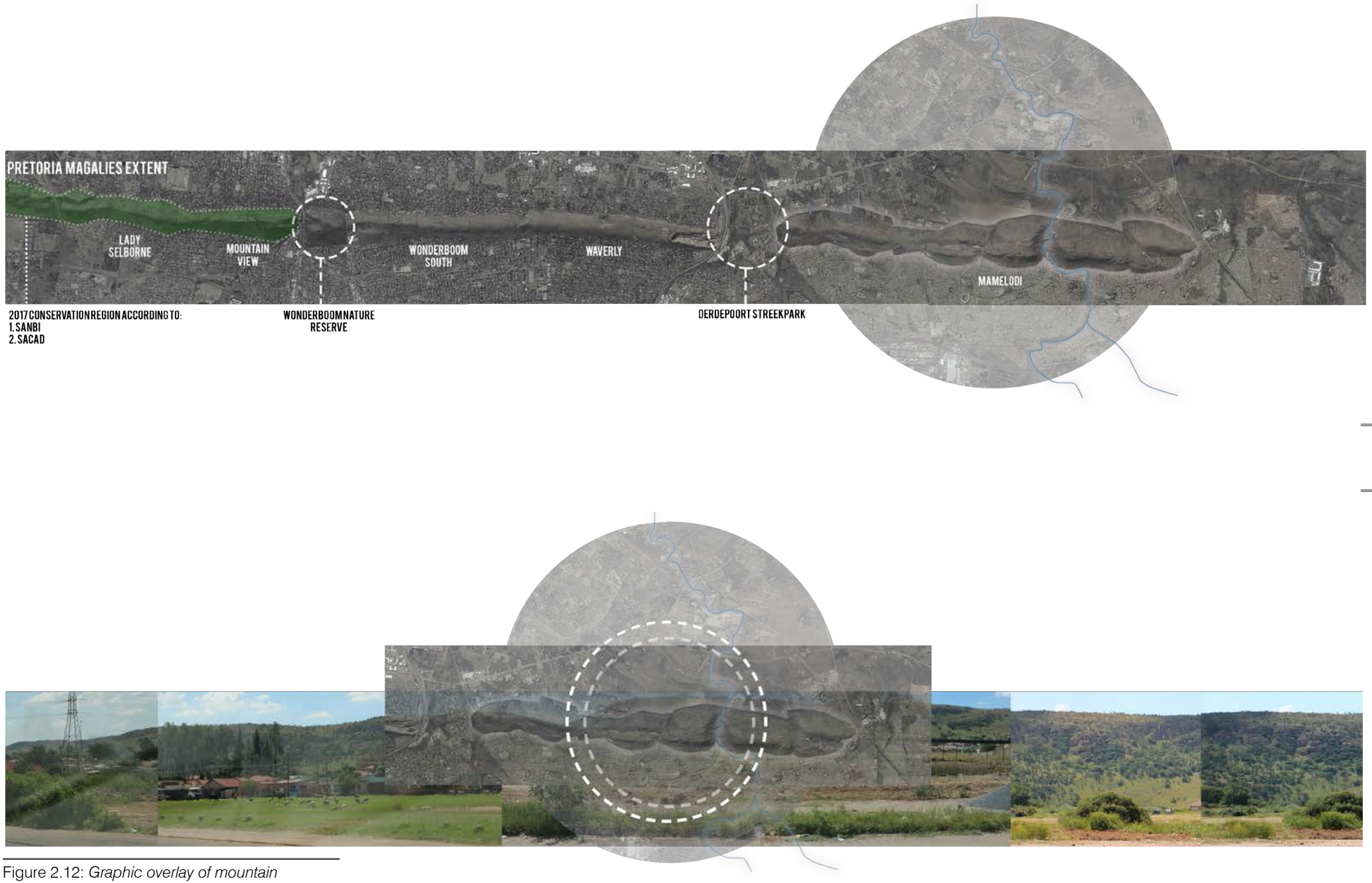


Figure 2.12: *Graphic overlay of mountain panorama and site location (Author, 2018)*

access, private and public development and socio-economic upliftment for the current residential areas in the region. This will require a full understanding of the ecological status as well as the social dynamics of the area.
Only then can a sustainable development plan be formed that takes into consideration all the requirements of the land."
(Maree, et al., 2012)

2.1.3 HYDROLOGY

The site falls within the catchment area which carries drinking water to the Roodeplaat Dam through the Pienaars River. The average rainfall in this area is 537mm per year (Pretoria Climate, 2017), which flows northwards towards the dam after being utilised on site. (CTMM, et al., 2005).

According to the Resource Management Plan (RMP) For Roodeplaat Dam report, written for the Department of Water Affairs and Forestry (DWAF), the quality of water transported from upstream has deteriorated over the years. In the February 2008 report the Authors, Vela VKE Consulting Engineers, concluded that the water quality at the dam is poor due to a calculated increase of: Cyanobacteria, Algae and Water Hyacinths (Eichhorinia Crassipes). The report categorised the increase in organic activity mainly as a consequence of eutrophication and siltation.

The report named upstream management as the main culprit for the increase of siltation and eutrophication. Namely:

- High nutrient-containing discharges from WWTWs (Zeekoegat and Baviaanspoort provide much of the inflow);
- Diverse land uses (including waste from intensive agricultural feedlots);
- Recirculation of nutrients from the bottom sediments and decaying plant material.

The practices currently on the mountain are generally all of an inorganic nature and contribute no excess nutrients which could intensify eutrophication upstream. However, having steep topography, there are areas easily susceptible to erosion once disturbed by human and animal activity or excessive rainfall. As a result, the site's contribution to siltation levels downstream must be considered.

Areas susceptible to erosion must have erosion control techniques implemented.

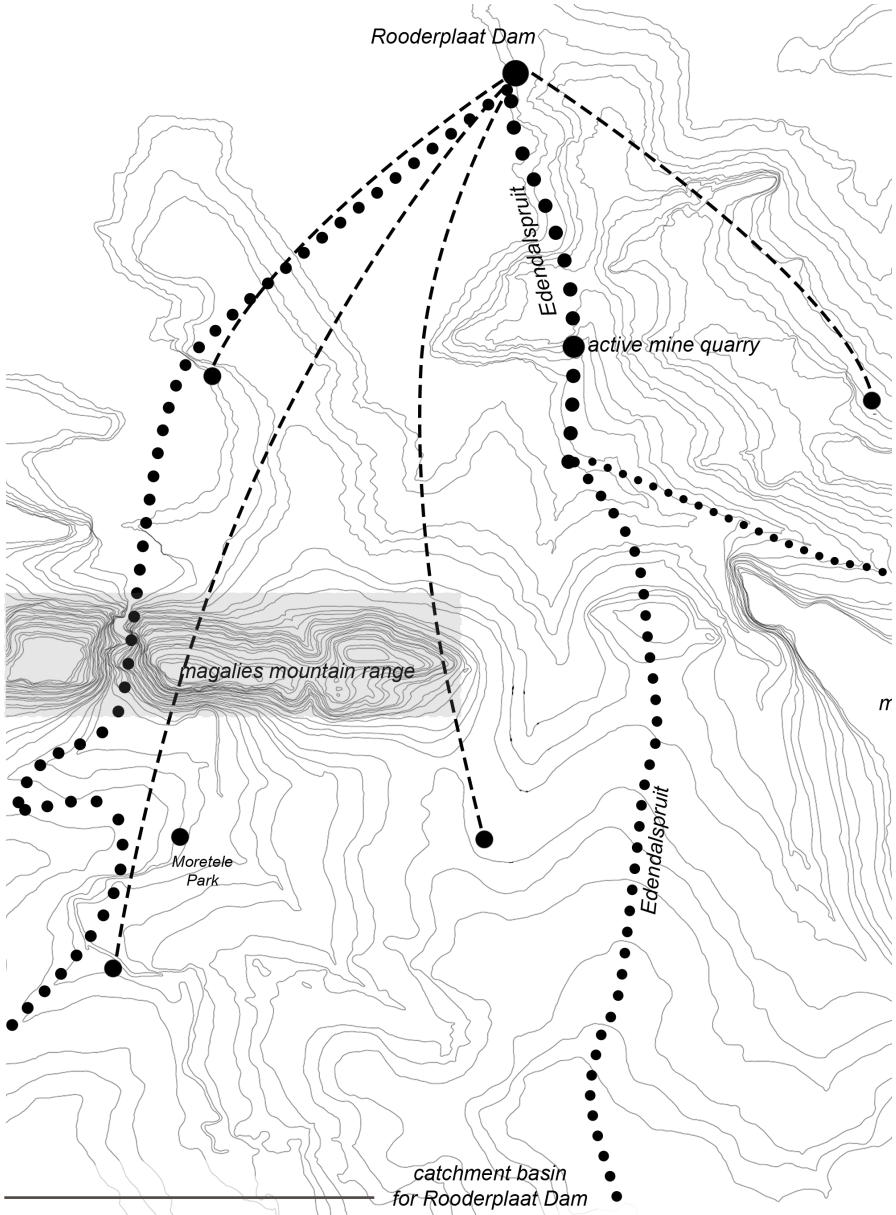
2.1 Meso-anaysis

This *'level of analysis'* focuses on the relations between phenomena and data that fall between macro- and micro, and often this level of data is what binds information identified in the two scales together.

2.1.1 GEOLOGY

The mountain range is found in the mesic Highveld grassland bio-region, with a northern aspect and southern aspect receiving varying degrees of solar energy and altering the rock types found.

According to the Council of Geoscience, the northern aspect consists mostly of dolerite igneous rock, the southern aspect of shale sedimentary rock and the mountain crests of arsenite quartz sedimentary rock. As a potential material to use in the design, the soil composition and common use of these rock types were studied and summarised in the adjacent figure to give an indication of



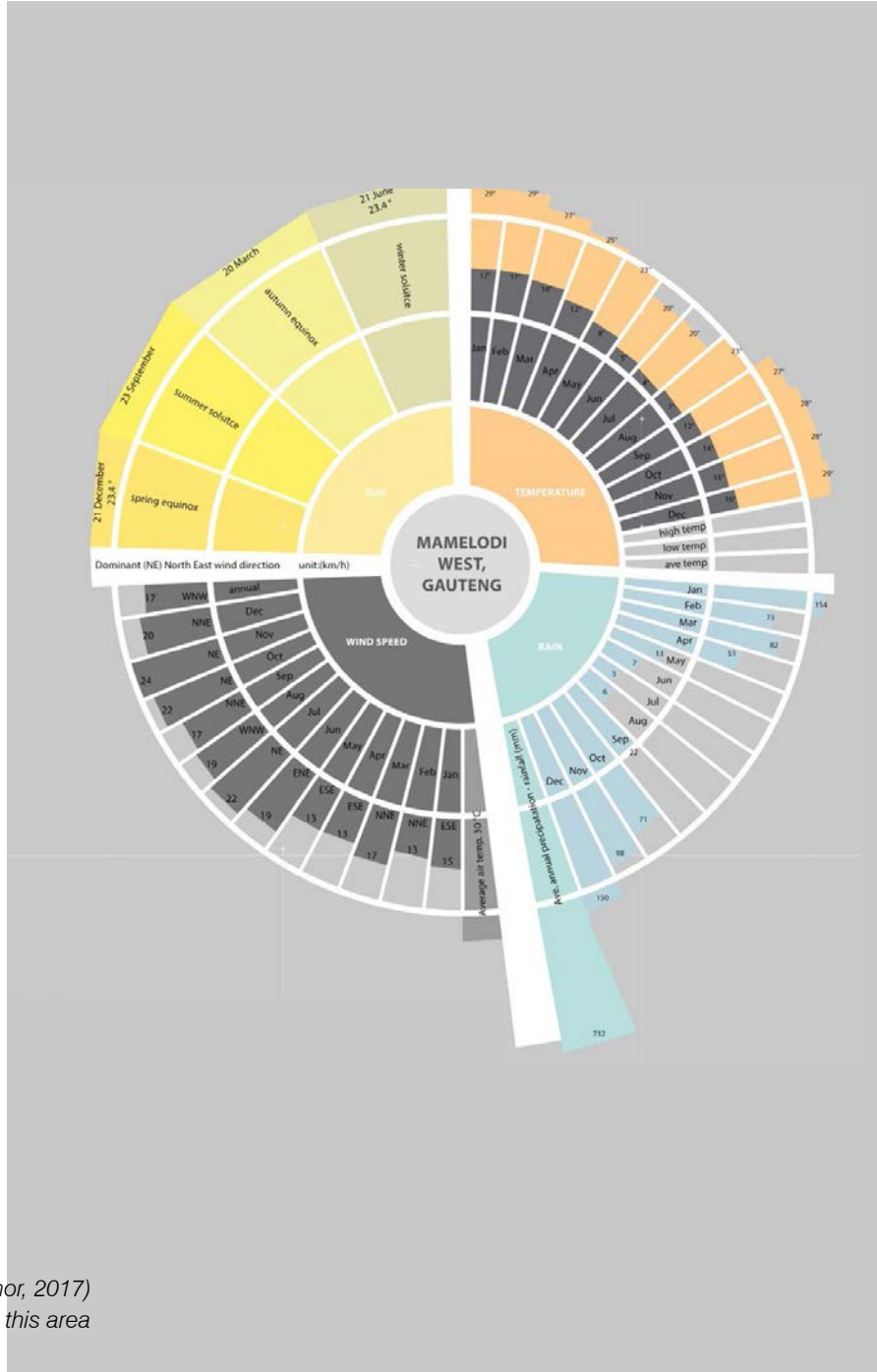


Figure 2.13: *[Left] Graphic overlay of watercourse on urban scale. From Pienaars River to Roodeplaat Dam (Author, 2017)*
Figure 2.14: *[Right] Diagrammatic summary of wind speeds, solar angles, temperatures and average rainfalls in this area (Urban Vision Group, 2018)*

the vitality of each rock type.

2.1.2 HYDROLOGY

The section of the mountain range selected for this investigation contains steep topography throughout the range, a permanent river at the valley bottom and a seasonal river at the foot of the mountain.

The permanent river is known as the Pienaars River. On the mountain range, the water predominantly drains towards the northern slope, spreading across the farmlands and bending into the Pienaars River. On the southern aspect, the steep topography causes heavy rainfall to flow into the township area and as a result, a natural channel has formed at the base of the mountain to carry the water into the Pienaars River. Consequently, natural wetlands and swales are common at the base of the mountain.

According to the 'Feasibility Study for Biodiversity Protection of the Magaliesberg Mountain above Mamelodi conducted for SANBI, introduced in the previous chapter, the run-off potential of the mountain range is categorised into three sections affected by the geological conditions:

The quartzitic tops: moderate to high run-off.

The talus slopes: medium run-off.

The colluvial plains: moderate to high run-off with varying conditions which alter run-off capability due to deeper soils.

In relation to the soil, authors further reported an existing equilibrium between the natural environment and the rate of erosion due to topographic influences on the hydrology (Maree, et al., 2012).

This means as far as the geology is concerned, the mountain area (on average)is in a healthy condition.

2.1.3 FLORA

In reference to the floral conditions of the investigation area, it is mentionable that the author identified a range of fruit bearing trees, medicinal plants and Red Data List species on site visits.

There is a stark contradiction between the floral composition on the mountain range and the neighbouring towns.

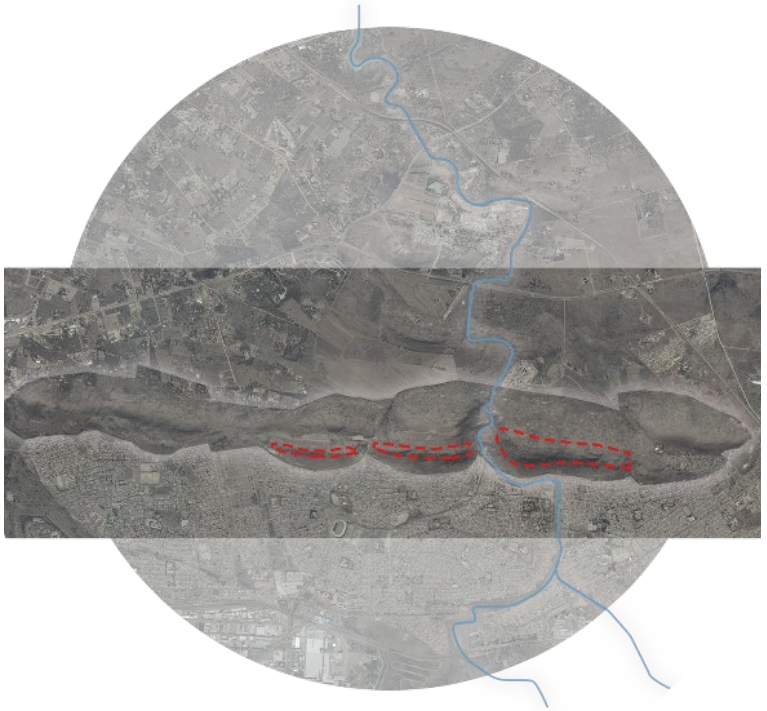


Figure 2.15: *Distribution of quartzite ridges host to red data list flora. (Author, 2018)*

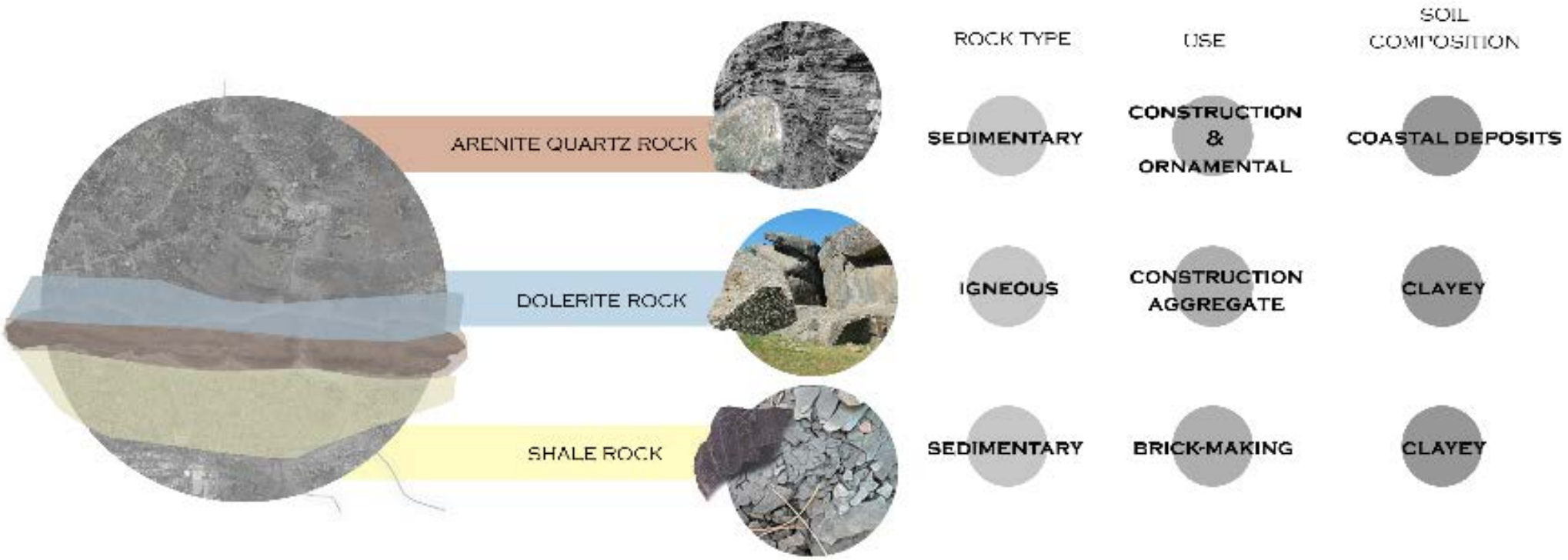


Figure 2.16: *Geological forms identified on site and their properties. (Author, 2018)*

Even areas of Mamelodi where vegetation is best kept and the farmlands of Baviaanspoort do not compare to the ecological diversity found on the mountain top, slopes and ridges.

The site is located in the SVcb 9 Gold Reef Mountain Bushveld, Central Bushveld Bio-region (Mucina & Rutherford, 2006). Although this bio-region is considered at the least threat due to 22% of its vegetation type being preserved in the Magaliesberg Biosphere reserve region (Mucina & Rutherford, 2006), the quartzite ridges of the site hosts Red Data flora which have to be protected.

The plant communities on the mountain range differ according to their position along the sloping aspect. The southern slope is dominated by Miicrophyllus woodlands species; the crests by Protea Caffra woodland/grassland; while the northern aspect is dominated by woody, deciduous and broad leaved species.

According to the Feasibility Study for Biodiversity Protection of the Magaliesberg Mountain above Mamelodi, due to urban development at the foot of the mountain and the low conservation status of the bioregion:

"It is not expected that any valuable Rand Highveld Grassland vegetation should remain". (Maree, et al., 2012).

Whilst according to the Gauteng Ridge Policy "The ridges of Gauteng form vital habitat for many threatened or Red Data plant species and the conservation of ridges in Gauteng will provide habitat for significantly high numbers of species allowing for their continued survival in a rapidly urbanizing province, a desirable long term conservation plan". (Forsyth, et al., 2001).

Although this was a conclusion of the feasibility report, the author takes the position that environmental conservation efforts should still be made to ensure the environment is in good condition through mutually beneficial interactions with community members – whilst preserving conditions along the ridges.

2.1.4 FAUNA

Due to the construction of the N1 cutting through the Magaliesberg Mountain, the ecological corridor has been split causing a decrease in the faunal biodiversity on the range in the Tswane District.

Regardless of that, there is still a presence of birds along the entire range, but none more prominently positioned than the Merops Bullockoides, commonly known as the White-fronted Bee-eater. The locally iconic whistle of this bird played a fundamental role in the renaming of the southern township of Mamelodi. It is believed the name of the area was changed from Vlakfontein to Mamelodi Farm for the ability of residents and President Paul Kruger to mimic the whistle of this particular bird, these parties being championed as 'Mother of Melodies', hence "Mame-lodi' . (Kuuikers, 2017)

The natural habitat of the birds is on bare cliffs in grassland and savanna in sub-Saharan Africa. On site, the birds have created a habitat out of an exposed cliff manufactured by a construction excavation cut into the wall of the mountain. According to residents around the area, the birds have inhabited this area since 2001.

Although the faunal biodiversity is less significant, there is still the presence of Grey Duiker, Red Rock Hare, Scrub Hare, Spring Hare, Porcupine, Namaqua Rock Mouse, Highveld Gerbil, Black-backed Jackal and Rock Hyrax.

Figure 2.17: *Bird Hide on-site. Formed after abandoned excations were taken over by White-fronted Bee-eaters. (Author, 2018)*

2.1 Micro-anaysis

This '*level of analysis'* investigates relationships identified through the smallest scale of introspecting the phenomena and data being analysed, looking at stakeholders, programmes and users.

2.1.1 STAKEHOLDERS

Dr Mabena
On site traditional leader at Mutong Heritage Site. Delegating tasks on site and managing the indigenous planting nursery.

The CSIR
The Built Environment and Natural Environment Departments are involved with strategies for development of the Muthong heritage site.

The University of Pretoria, Plant Sciences
The Department of Plant and Soil Sciences is involved with the medical gardens on the Mutong heritage site as an off-site harvesting garden. Research into cosmetic products and medicinal cures is currently underway in conjunction with the nursery gardens at Mutong.
The University of Pretoria is also currently involved with the development of a manufacturing plant for the processing of medicinal plants, as well as the implementation of mobile medicinal units processing plants harvested on the mountain and distributed throughout the surrounding communities, with the Mamelodi Campus as a base.

NRF/DST
Funding for research programmes involving plant health products from IKS .

Tshwane University of Technicality
The Department of Sciences is involved in research on medicinal plants with similar programmes to those of the University of Pretoria. The research in this institution, however, is more focused on cures for medical ailments.

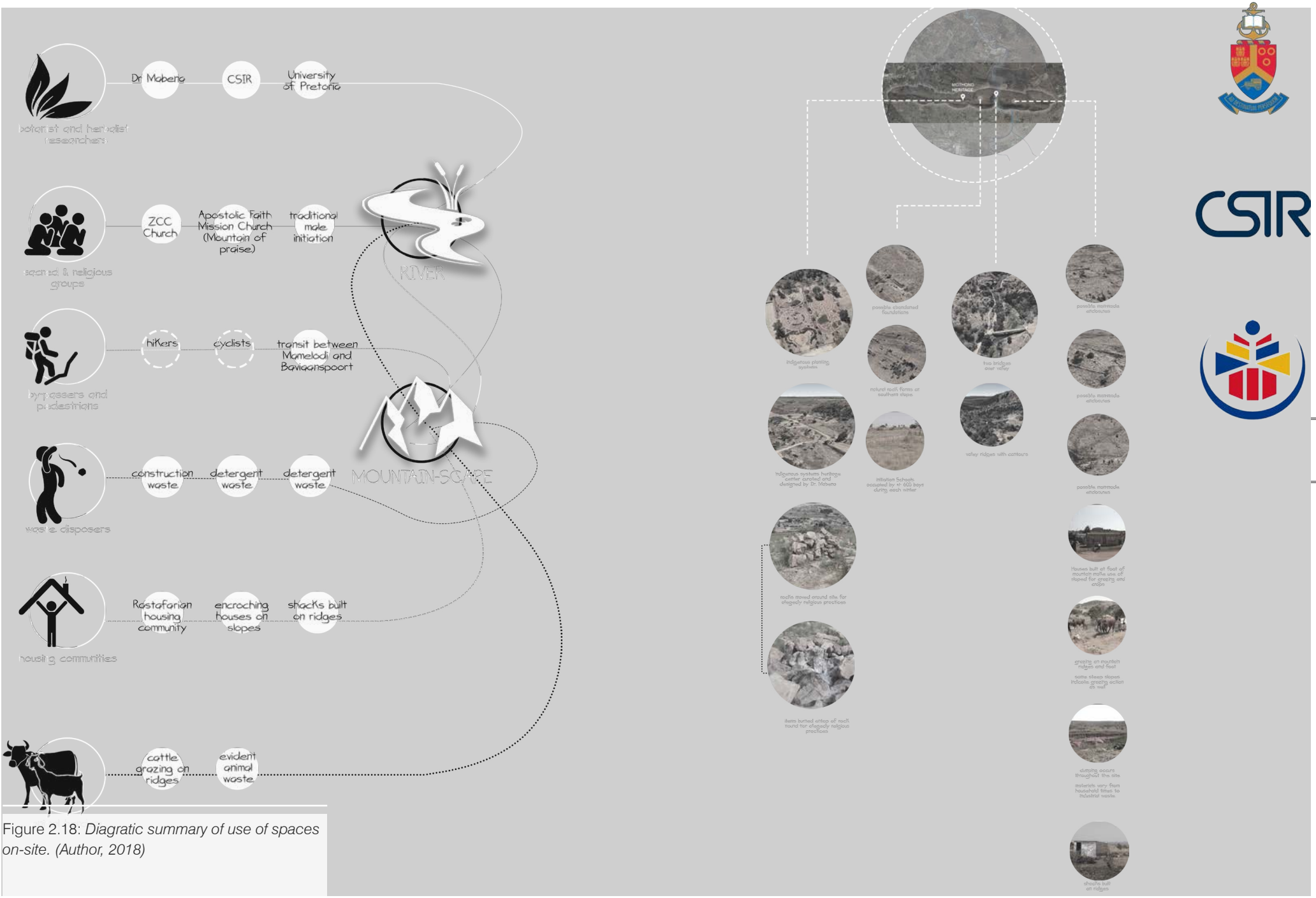


Figure 2.18: *Diagratic summary of use of spaces on-site. (Author, 2018)*

Urban Vision Framework

Fire on the Mountain - an active cultural landscape

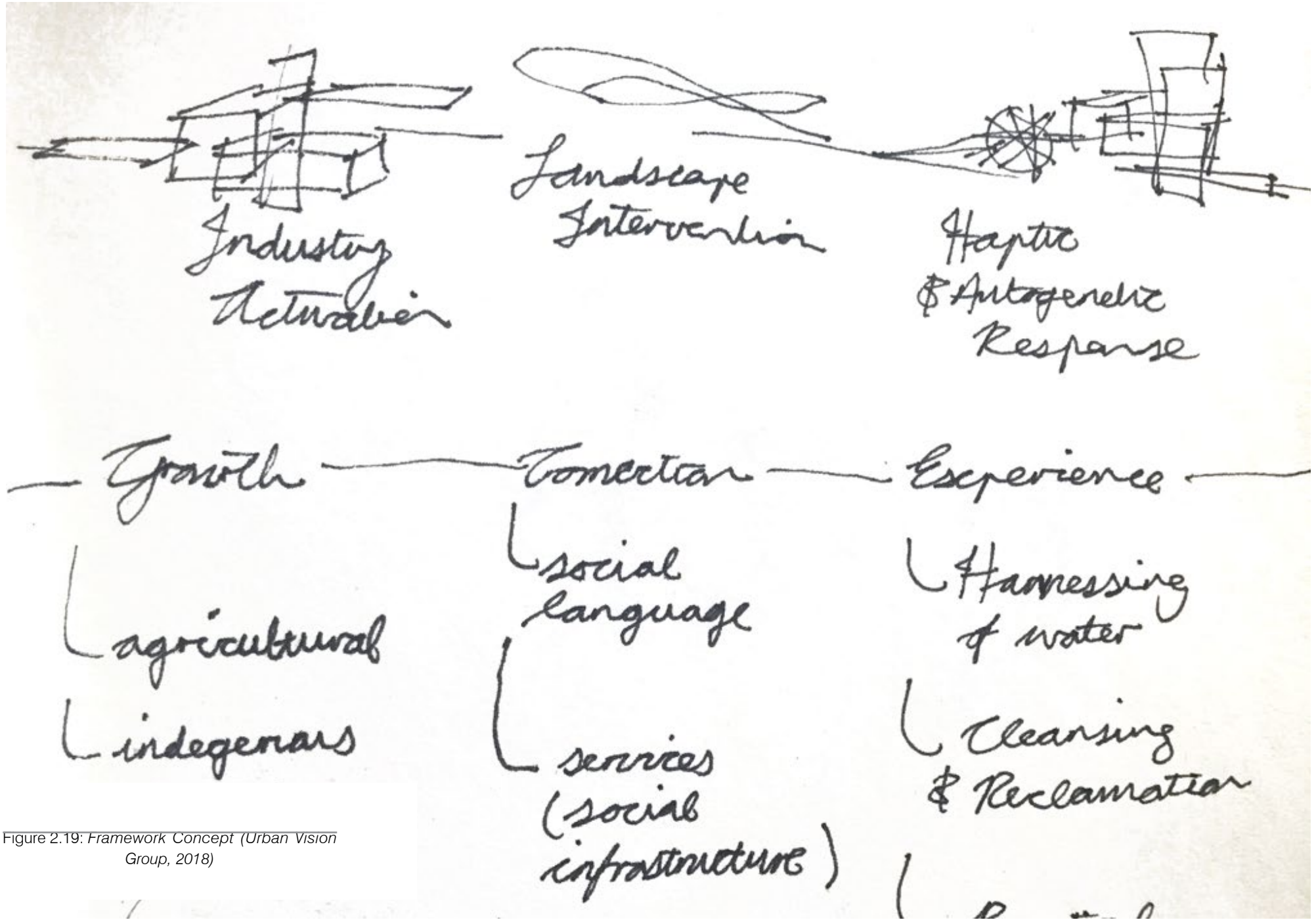


Figure 2.19: *Framework Concept (Urban Vision Group, 2018)*

2.1 Calling to UNESCO

2.1.1 UNESCO CONSERVATION CRITERION

From the above analysis, the author identified the gap in conservation councils targeting the protection of cultural landscapes. It appears that the local council aims mainly to conserve the ecological characteristics of the natural areas with little investigation into ways of conserving the social or cultural genius loci of place.

On the other hand, UNESCO has made it part of their mandate to protect the cultural and ecological characteristics of place through their understanding of the value that the overlay of the two has on identity of place.

According to UNESCO:

"The Biosphere reserves are designed to deal with one of the most important questions the world faces today: how can we reconcile the conservation of biodiversity, the quest for economic and social development and the maintenance of associated cultural values?"

According to UNESCO, the main characteristics of biosphere reserves are:

1. Achieving the three interconnected functions: conservation, development and logistic support;

2. Out-pacing traditional confined conservation zones, through appropriate zoning schemes that combine core protected areas with zones where sustainable development is fostered by local dwellers and enterprises with often highly innovative and participative governance systems;

3. Focusing on a multi-stakeholder approach with particular emphasis on the involvement of local communities in management;

4. Fostering dialogue for conflict resolution of natural resource use;

5. Integrating cultural and biological diversity, especially the role of traditional knowledge in ecosystem management;

6. Demonstrating sound sustainable development practices and policies based on research and monitoring;

7. Acting as sites of excellence for education and training;

8. Participating in the World Network.

(UNESCO, 2017)

Although there exists various national heritage bodies that could be considered, the reason the UNESCO conservation status is held in such high regard, and therefore used in this dissertation, is because it is an internationally respected and recognised body.

The author further argues that the reason this section of the Magaliesberg mountain range is still respected as a conservation area, in conjunction with the stamp of approval by UNESCO heritage (and the like) for the marvel of its natural features, is due to the amount of tourism generated by the natural features of the environment and the pleasures offered by the landscape.

As a result of this, the client for this project is therefore considered to be the UNESCO Biosphere Reserve Global Conservation Board .

It is important to note that not all interactions with site are environmentally conscious. However, the position taken by this dissertation is that Landscape Architecture can play a role in the management of cultural and environmental considerations of the cultural landscape.

On both a landscape planning and design scale, taking urban and experiential considerations into account, we can design spaces to the fullest expression of a communal eco-systemic identity.

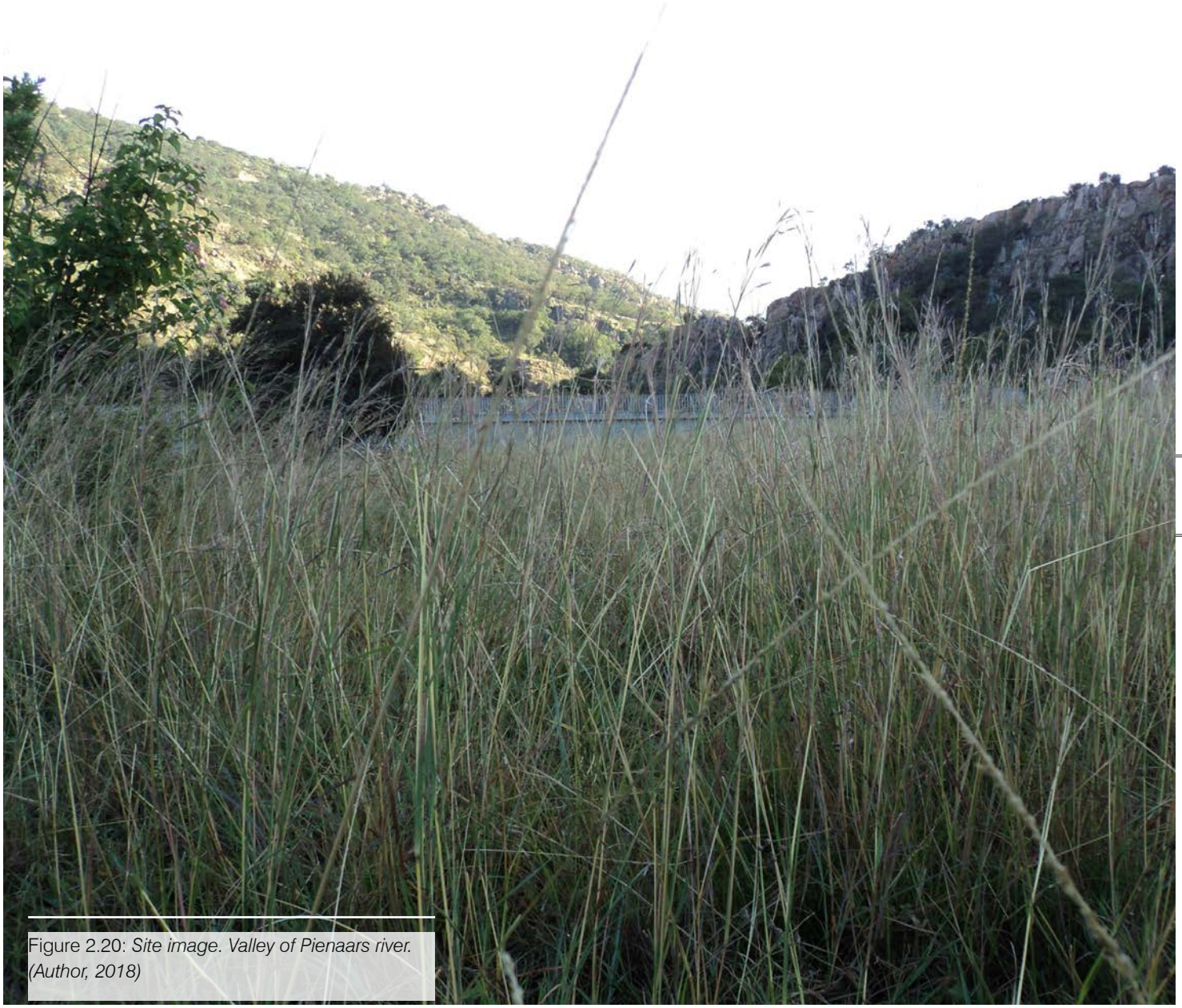


Figure 2.20: *Site image. Valley of Pienaars river. (Author, 2018)*

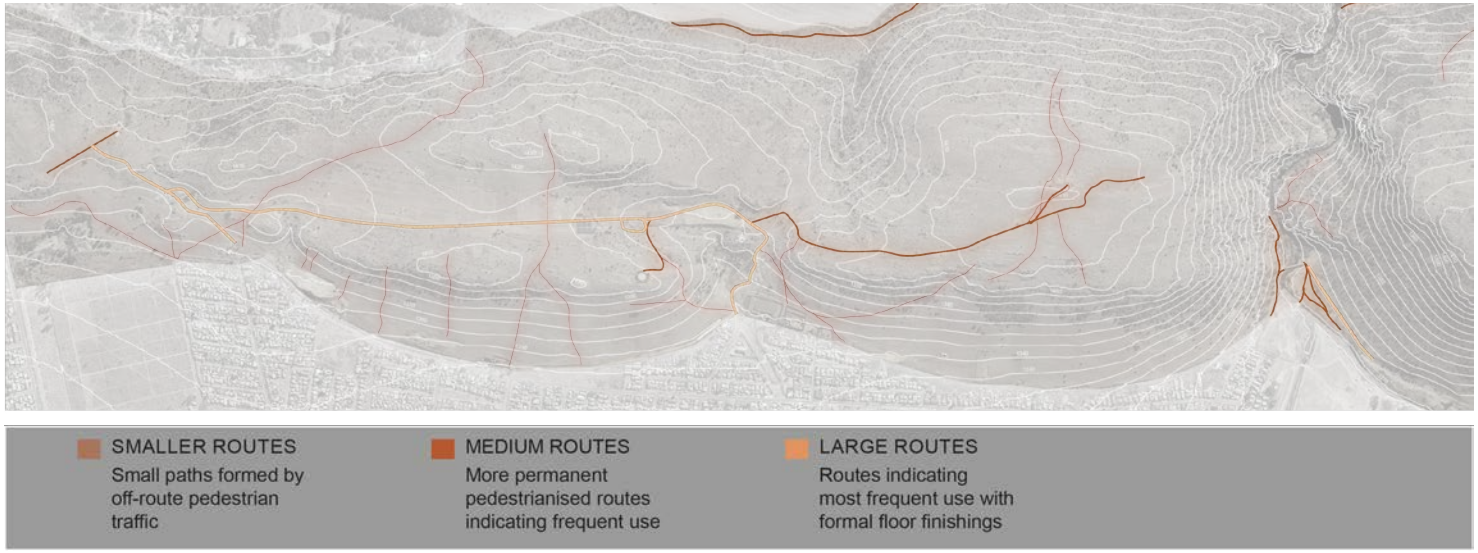
2.1.2 FRAMEWORK RESPONSE TO EXISTING URBAN CONDITIONS

Existing Routes

- Routes taken by resident indicate the range is used as a passage route to cross towns as well as routes to gain access to sections of the mountain with direct intent.

Framework response

- Routes deeply engraved into landscape indicating frequent use will be maintained.
- Smaller routes will be maintained if not corresponding with a preservation area.
- Key resting points will be considered in framework.
- Vehicular access to sections of site will be restricted.



Existing infrastructure

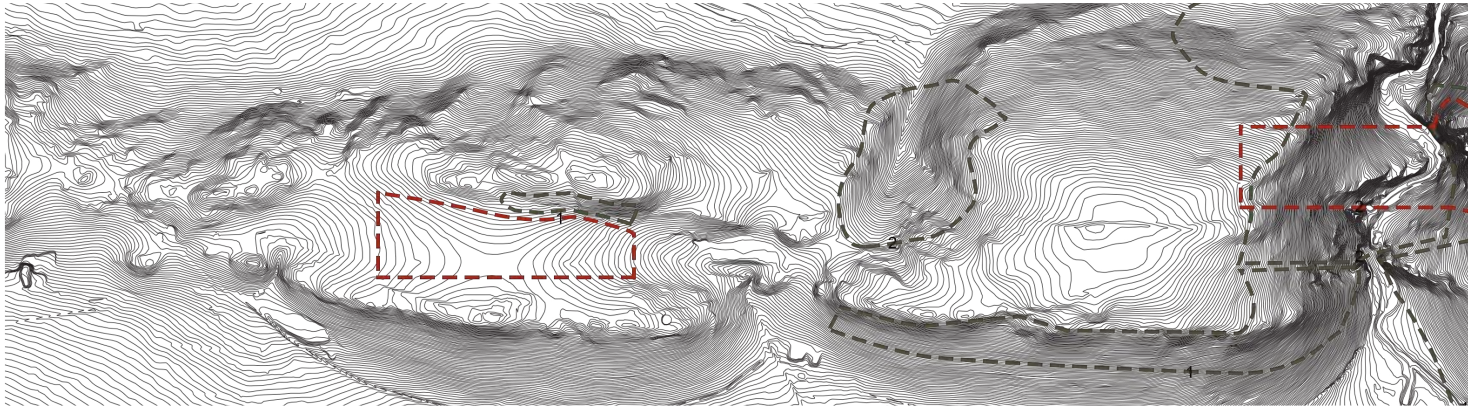
- Most infrastructure is a repercussion of cultural and agricultural use on site.
- Areas zoned under 'ownership' describe grounds claimed by a particular group who further restrict access to grounds by some form of physical boundary.
- 'Structure' reflects areas with some structural component with residents claiming no permanent ownership of land

Framework response

- Those interactions which do not hinder the health of the natural environment as per research will be maintained or further designed towards a mutually dependent landscape.

Existing preservation vs conservation

The site currently has areas respected by residents



PRESERVATION

1 Myth Technique
Residents stayed kept from this section in fear of Myths passed down by community elders

2 Topographic restraint
Difficulty gaining access to section restricted interference

CONSERVATION

1 Mabena Heritage Trust Nursery
In association with TUT, UP and the CSIR; indigenous vegetation is propagated for research (Ledwaba, 2018)

2 Controlled Use of Vegetation
Controlled harvesting for cultural practice and use

LEAST SENSITIVE
Areas encountering too much development to have further *conservation* value.
Design development encouraged here

LOW SENSITIVITY
Areas encountering development but has some *conservation* value.
Sensitive design development encouraged

MORE SENSITIVE
Areas containing vegetation with serious *conservation* value but can be developed very sensitively.

Most Sensitive
Areas containing serious vegetation *preservation* value.
Design development to be avoided.

for its natural conditions. It is vaguely understood for the importance of the ridge.

Site indicates areas used by residents with some ecological responsibility and areas left completely undisturbed either for its topographic challenge, myths associated with the area or for its known ecological value.

Framework response

- Conservation areas are to be developed to maximise mutual dependency. Undisturbed areas and those disturbed despite high ecological significance will be preserved.

Existing environmental sensitivity

- The site hosts areas with high levels of ecologically insensitive development and other disturbance.

F*ramework response*

- The areas of disturbance which fall within the zones of environmental significance will be will need to be preserved.

2.1 Framework Response to UNESCO Requirements

The main role of the urban framework is to communicate the effective ability of this cultural landscape to stand as fit for the UNESCO conservation status. In doing so, the main approach is to indicate the ability of this cultural landscape to stand as an active example of the South African cultural landscape and the necessary dependence on environmental, cultural and social harmony.

Listed below are UNESCO requirements and the dissertation's urban response.

"Achieving the three interconnected functions: conservation, development and logistic support."

The above interconnections are to be achieved through: the conservation of areas of the site considered most environmentally sensitive; the controlled expansion of existing development programmes which have a culturally significant connection to the mountaintop; and finally, logistical support maintained with the use of stakeholders and UNESCO global professionals.

Also by identifying ways that traditions evolving on the cultural landscape correspond with requirements of environmental management of the area.

"Expanding traditional confined conservation zones,..."

Protecting existing areas where sustainable practices are conducted, gives a sense of ownership to local dwellers involved. However, controlling the expansion of these areas by designating sustainable development zones and combining development spaces into unified cultural landscapes where rituals and practices might build on one another. This would include:

Indigenous Knowledge Zone

1. Indigenous nursery is expanded into a indigenous garden in an effort to foster more public interaction.

2. Placing the garden as the heart of the neighbouring cattle kraal, initiation school and prayer spaces, the herbs and trees grown and managed at the nursery can be used in traditional rituals on the other sites.

"Focusing on a multi-stakeholder approach with particular emphasis on the involvement of local communities in management."

In each zone, the relevant religious groups, traditional healers, cattle herders, initiation camp leaders and cemetery management staff would create a body of stakeholders voicing concerns and suggestions from a local level.

"Fostering dialogue for conflict resolution of natural resource use."

With the above multi-stakeholder approach, a platform is produced for dialogue between local leaders to resolve tensions. Existing spatial tensions should be resolved by designation of spaces, restrictions on expansion of practices and unification of separated settings of rituals by highlighting their interdependencies.

"Integrating cultural and biological diversity, especially the role of traditional knowledge in ecosystem management."

Using the traditional practices on-site to guide the harvesting and ecological conservation techniques adapted. Notable areas that this will be applied to include:

Recreation and religion

1. Areas protected by myth are to remain in preservation conditions. Areas permitted seasonal access to water for cleansing rituals remain permitted by these schedules.

Indigenous Knowledge Zone

1. Nursery expanded to a garden, publicly showcasing indigenous medical knowledge and harvesting techniques.

2. Traditional ways of harvesting and planting are retained as far as possible.

3. Initiation camp schedules are maintained as far as possible as there is correspondence between the time needed for burning veld and times

needed for burning during the ceremony.

4. Locations of initiation camps respected, as this is designated by generational location of the ritual or ancestral guidance.

Demonstrating sound sustainable development practices and policies based on research and monitoring.

By allowing this cultural landscape to be an active site with a mandate based on sustainable development practices, continuous research and monitoring is permitted. Notable areas this will be applied to include:

Indigenous Knowledge Zone

1. Indigenous nursery expands its facilitation with research stakeholders to contribute to research in indigenous knowledge systems.

This is suggested to be implemented by adaption of a small-scale herbarium in the proposed garden which works in association with the mobile medical units proposed by the University of Pretoria's Plant Sciences Department.

Acting as sites of excellence for education and training.

Exposing the community members of the three towns to different traditional practices encourages responsibility to the landscape and begins to facilitate cultural education amongst neighbours.

The aim is not to have a tour guide but to allow scars in the landscape that will stir curiosity amongst neighbours and foster dialogue about tradition. Notable areas this will be applied include:

Mourning zone

1. The use of fire in memorial rituals is evident in the landscape.

Indigenous Knowledge Zone

1. Fire grazing after initiation school session leaves mass charred landscape.

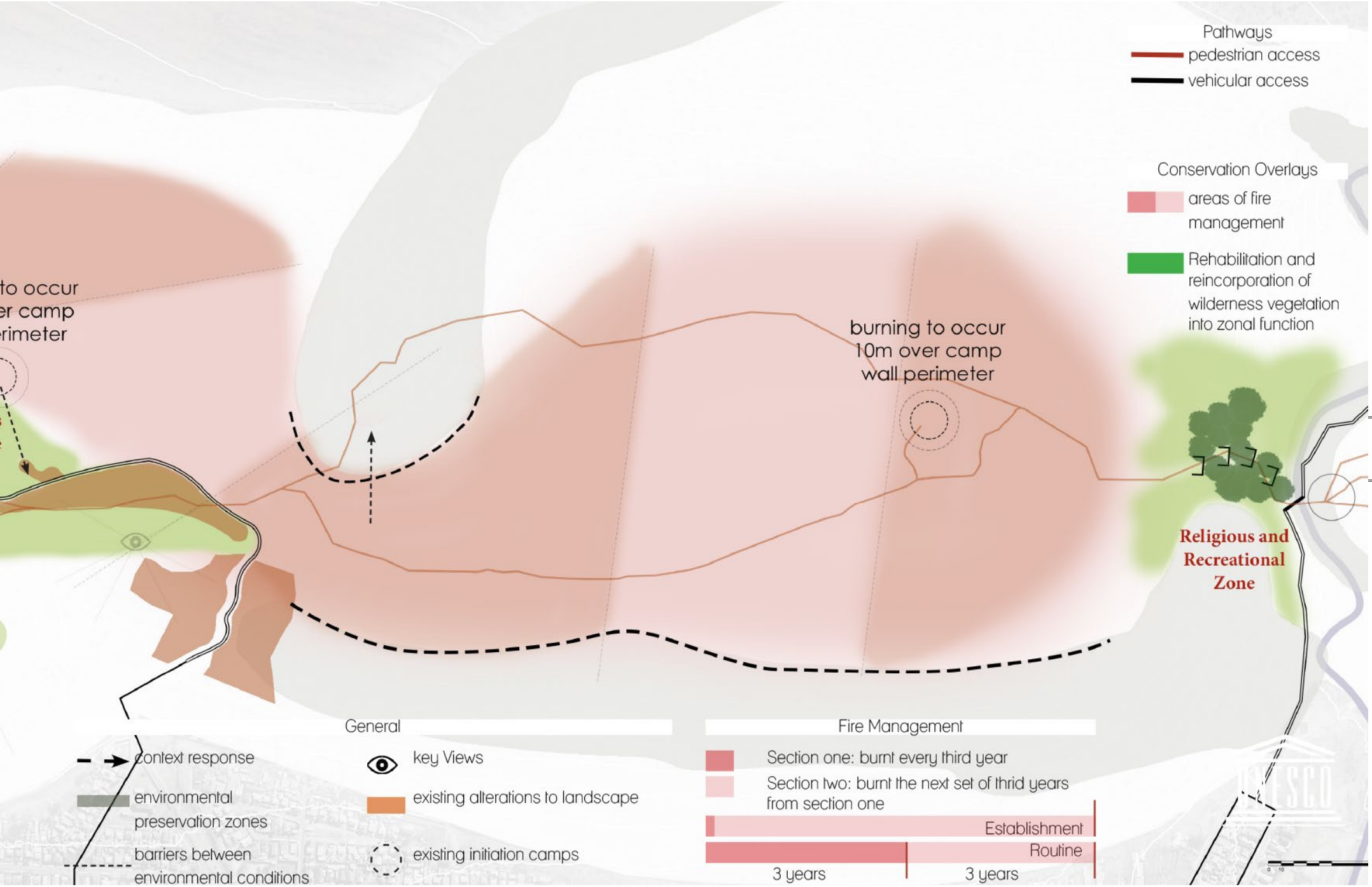
2. Expansion of indigenous garden and use of herbs and other vegetation during rituals or ailments conducted in spaces with clear view.

3. Herbarium storage set up as a public display with research shared on public platforms.

Participating in the world network

Once UNESCO status is achieved, each zone becomes part of a global network fostering dialogue on cultural conservation strategies and management systems, environmental management schemes and global development of indigenous knowledge systems.

Figure 2.21: *Conceptual approach to urban vision (Authour, 2018)*



2.6. FRAMEWORK DISCUSSION

Still aiming to meet the UNESCO mandate for a biosphere reserve region, this section breaks down how this space functions according to the framework by relating to the overlapping cultural conservation and environmental preservation.

2.1.1 INITIATION SCHOOL CAMPS

According to SANBI, veld fire management is required by law to encourage proper growth of veld grass and reduce the uncontrolled spread of wild fires. Therefore, proactive fire management plans are required to be approved by the local Fire Protection Association.

The National Veld and Forest Fire Act No. 101 of 1998, as well as the National Forest and Fire Laws Amendment Act No. 12 of 2001, directly aim to enforce management plans to combat fires on mountains and in the open countrysides of South Africa (CRR,2013).

Seemingly independent of this, veld grasses are burned in small sections of the mountain at the end of each initiation ceremony.

The dissertation intends to create an overlap of these two burning schedules to create a sustainable management system with cultural significance.

The Gm 11 Rand Highveld Grassland and the SVcb 9 Gold Reef Mountain Bushveld vegetation groups found in this area host a large variety of veld grasses. As a result, fire management plans would need to be drafted.

Some grass species identified on site included: Eragrostis Lehmanniana, Aristida Scabrivalvis, Aristida Junciformis, Melinis Nerviglumis and Themeda Triandra.

These grasses all fall within a category of dry grasses which need to be burnt in order to stimulate new grass growth and control the spread of wildfires.

According to regulation, implementation of

Initiation School Fires

The end of a phase in a man's life.

Every 3 years, at the end of winter initiation months on the mountain, areas where men camped are set alight to spiritually clean the sacred space.

Fire Management

The end of a phase in the veld grass

Every 3 to 4 years, grassland must be burnt for ecological diversity.
Case study: Crocodile River Reserve IMF (Integrated Management Fire Plan) (SANBI, 2015) (CRR, 2013)

Moving Stones gathering around a single

landscape element.

Rock piles identified on site used as a mount on which items are burnt and prayers are offered.

Stone Tower Habitat

stone towers inhabited by fauna

Rock habitat fauna identified, including: Rock Hyrax, Red Rock Hare, Short-Snouted Sand Snake as well as various small invertebrates.

a fire-break perimeter around the area of burning should be designated. To reduce an 'edge effect', the alteration of the natural environment by placing the firebreak in the same place every year, the framework proposes a dynamic burning schedule which changes locations bi-annually. Humidity should ideally remain between 50% - 65% to burn grasses.

Climatic considerations for burning include season and weather (wind, humidity, rainfall and air temperature). The best season in the region would be September (end of winter, start of spring). Wind speeds may not exceed 20km/hr and must always have the fire 'head' moving with the wind direction. And finally, the temperature may not exceed 20^{o} for a successful burn session.

In stopping the fires, an 'indirect method' is proposed. This technique is usually implemented for large fires only, but due to the terrain of the mountain, extreme measures will be taken.

The head of the fire will be suffocated by laying fire-retardant matter parallel to it which covers the veld grass being approached, thus depriving the grasses of fuel.

2.1.2 PRAYER ALTARS

As part of open-aired church ceremonies in the area conducted on the mountain top, a small group gathers a piled altar of stones and burns dried herbs and grasses as a form of worship.

During particular rituals, other flammable materials are added to the fire and the ash carried away to the church building for the continuation of the ritual.

The rocks are taken from around the site, predominantly quartzite rocks chosen for their low moisture levels and light weight. The stones are then piled onto one another into a triangular formation and the dried elements are set alight on top of the mound.

Prayers are said and songs are sung around the burning altar overlooking the Mamelodi skyline until the fire has died down.

The rock piles are then often left with residual ash on the top until the next session. Due to the number of piles found along the range, it is believed that different groups utilise different piles, or that a single pile is not strictly re-used by the same group. Either way, the result is that a range of rocks are displaced at a weekly rate. Quartzite rocks are displaced, burnt and allowed to stand in that formation permanently.

Besides concerns over the use of open fire in grassland region, the loss of habitat caused by misplacement of surface rocks poses a concern.

As a result, a system is proposed where stones are re-used, with existing piles left on the landscape and allowed to return to the

natural world as habitat for rock-inhabiting ecosystem animals.

Where surface rocks are used for further burnt offering rituals, a set number of rocks should be made available for usage in similar rituals. For re-use, the piles would be disassembled and returned to an area of extraction for the next group.

The burnt stains on the quartzite last a few weeks without rain. In the presence of rain or exposure to forms of water, the stains are removed within a few days.

This quality will be used during the design phase to create an aesthetic from the black stones.

2.1.3 INDIGENOUS NURSERY

The nursery is currently headed by Dr. Mabena, with the first set of research being conducted for the Department of Plant Sciences at the University of Pretoria. Today, it stands as an outdoor scientific research facility with research being conducted by the CSIR, TUT and UP.

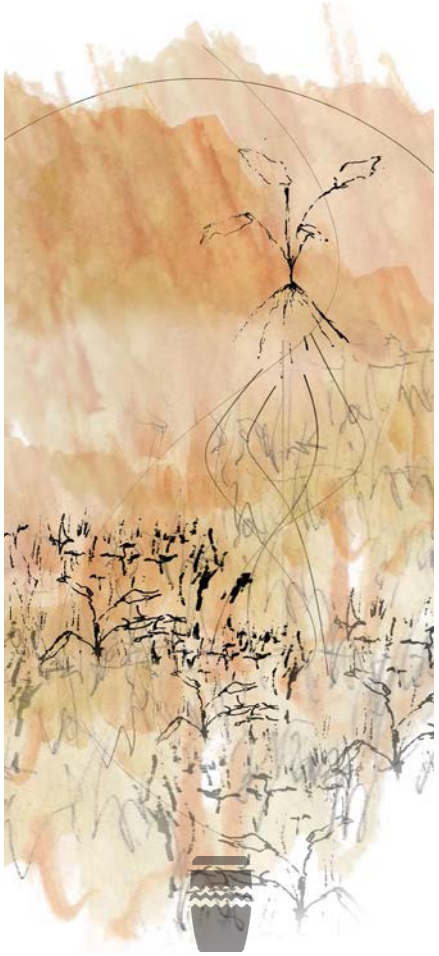
As most of the practices conducted on this site are governed by traditional processes, so is the planting technique.

It is traditionally believed that plants growing in the wilderness have more potent medicinal properties. As a result, the production of a medicinal planting nursery was established on a section of the ridge.

All plant species used on this site are indigenous. What distinguishes the rest of the mountain from the nursery are the pattern schemes used and the careful selection of planting palette, over the natural development of plant palette in the wilderness.

This intentional removal of particular vegetation standing has value towards sustainability as 'muti-peddlers' and innocent harvesters have no need to harvest from the wilderness. They can rather learn from indigenous traditions which medical plants cure ailments and how to properly harvest particular plants.

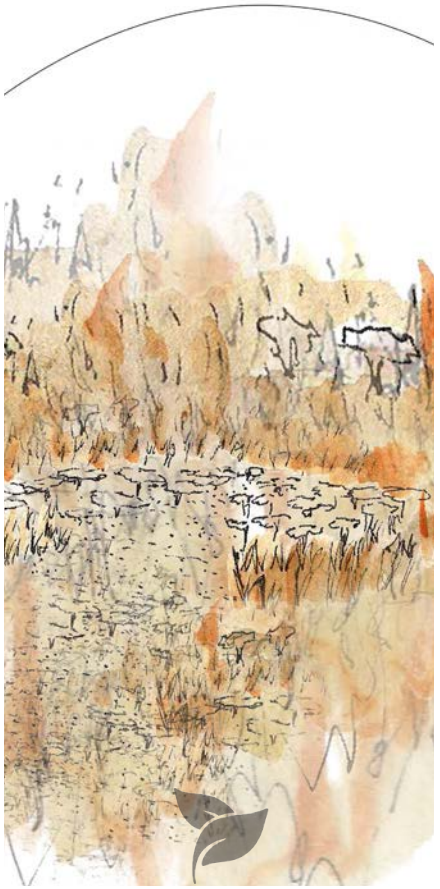
This approach is key as most of the neighbouring settings for rituals depend on harvesting of vegetation for rituals conducted. These include medicinal plants used during initiations as disinfectants, as well as the dried herbs burnt on alters during prayer.



Nursery Cultivation

Areas of frequent cultivation restricted

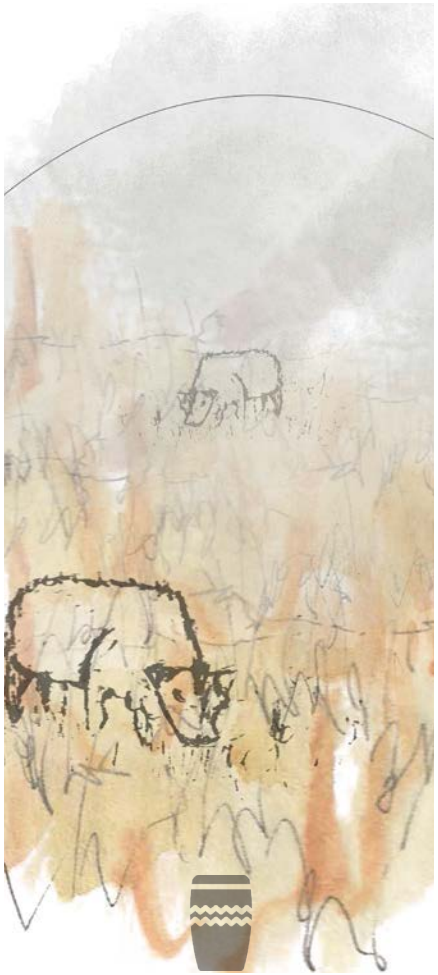
Potent traditional remedies are believed to grow in the wilderness. Wild nature of context signify an area cleansed of human and spiritual pollutants.
(Pato, 1997)



Controlled Harvest

Potent produce adjacent to wilderness

'Muti-peddlars' are the greatest threat to biodiversity on the ridge with inappropriate harvest techniques and strategies. Control and education is necessary.
(Ledwaba, 2018)



Symbiotic Relationship

Companions of man

"Where tradition holds sway, cattle are companions in every aspect of life, patient intermediaries between the world of the living and the dead."
(Poland, 2004)

Grazing and Biomass

Companions of landscape

Cattle are considered a bulk grazer, a more ecologically sustainable grazer.
They are less selective in what they eat and do not crop grass close to the ground for re-population.

2.1.4 CATTLE KRAALS

Traditionally, cattle are seen as spiritual intermediaries between man and the spiritual world. Here, the tradition belongs mainly to men of the Nguni tribe.

To this day, cattle have remained an economic and traditional asset to own. The presence of cattle along the base of the mountain range has sparked controversy amongst community members. As the base of the mountain gathers much water, cattle over-grazing can easily lead to soil erosion into private compounds.

The overgrazing of veld grass at the base of the mountain was a key concern for the feasibility study.

However, due to the cultural significance of cattle in this area, it would be difficult to motivate their removal. So this proposal rather argues for the incorporation of a grazing management plan by controlling sections that the cattle have access to for grazing.

Based on interactions with local cattle herders, the author speculates that this result comes from the inappropriate utilisation of an 'intensive grazing system' as defined by SANBI for this landscape. This system is utilised in areas with an abundance of landscape where grasses can be grazed between growing seasons. It is possible that with shifting from the rural luxury of large expanses of open land, cattle herders have not been made aware of the need or existence of less intensive grazing systems. It is therefore proposed that 'the conventional grazing system' is conducted as described by SANBI, where full growing seasons are reached between grazing schedules.

This would need to be managed on a local level. As per the UNESCO regulations, a local board of stakeholders would be formulated and work in association with the global professionals and municipal overseers to ensure that a sustainable plan is maintained.

In an effort to reach sustainability, cattle are used as grazers and producers of biomass compost for fertilizers in the nursery.

Figure 2.22: *Site image. Mountain crest overlooking southern townships (Author, 2018)*

Figure 3.1: *'Women in the fields' (1976), by G. M. Pemba (1912 – 2001)*

"Sacred sites are places that make evaporation, that make rain. If we don't protect the pools and waterfalls where [would] people get clean water to drink? Rituals aren't empty things. They are the earth's wisdom of hundreds of generations of wise people."

Mphathelani Makaulane
Mpumalanga-based traditional healer,
founder of 'Sacred Sites Conservation Initiative'
(Pinnock, 2011)

03

Earths Wisdom

3.1 Design Site Introduction

The history of the mountain range discussed in Chapter 2 illustrates a story of a natural feature having fallen into disrepute due to the shift in priorities by urban dwellers. The intention of the application for conservation status of this cultural landscape under UNESCO was to ensure that history does not repeat itself.

Under UNESCO, the cultural landscape will be conserved for its continual interplay between its in situ cultural and ecological conditions as well as the urban conditions bordering the mountain range.

However, this framework would be based on the existing site conditions. With the nature of an active cultural landscape being that it changes over time, based on the evolution of tradition, history of the site has shown that the reverence used to defend the site in the framework may possibly be lost to alterations of progressive traditions in the landscape.

This is where the design research question is applied in the investigation:

"In designing for the expected growth and traditional changes of landscape in an urban neighbourhood, how are existing settings for ritual treated to retain the sacredness of a cultural landscape?"

In order to answer this question, the analysis of a part of the cultural landscape spread across the mountain range will be assessed. The evolution of tradition on this part of the cultural landscape will be studied to understand how the traditions and their associated rituals have changed over time. This is done to determine what has enabled the mountain to retain its sacredness after all the changes experienced through history.

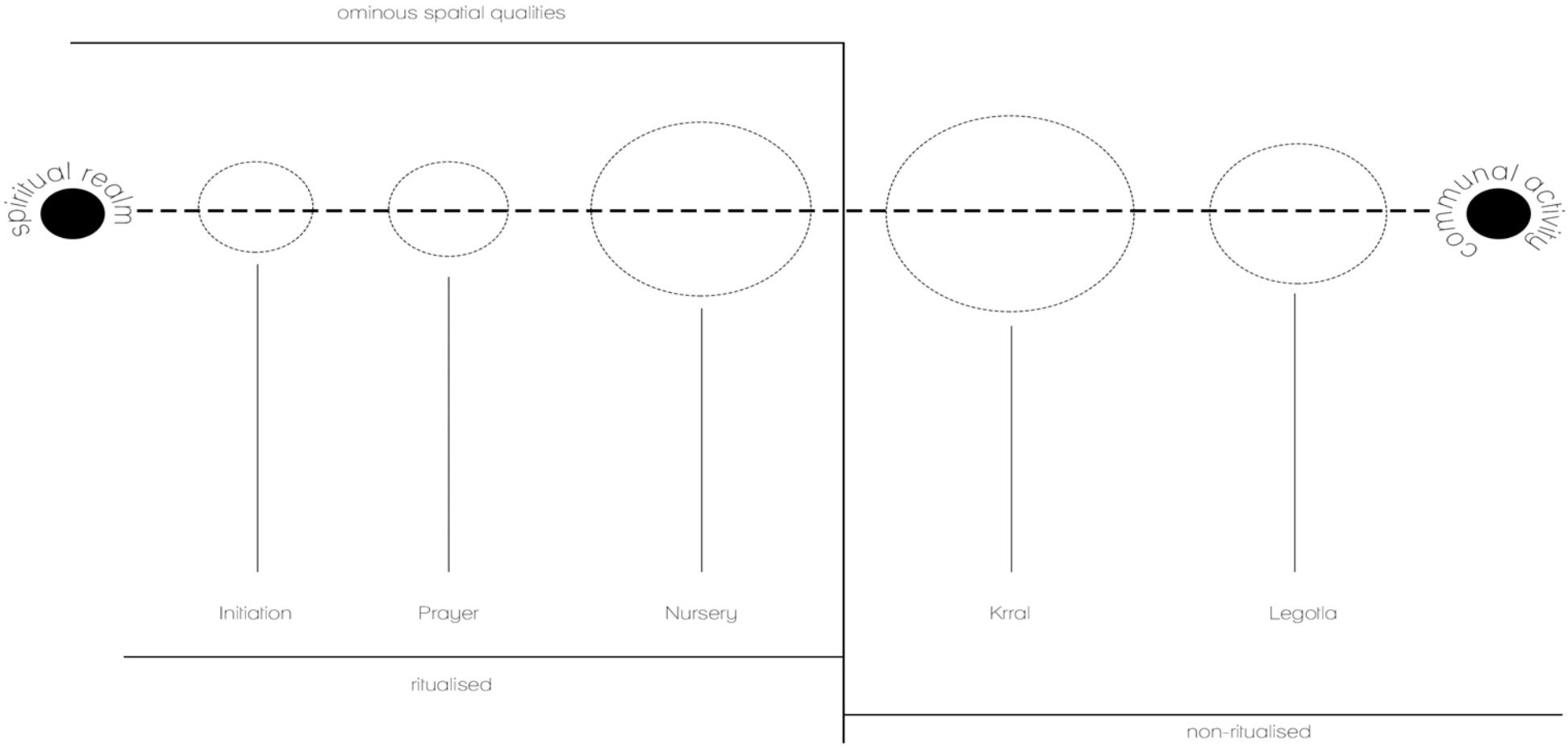


Figure 3.2: *Diagrammatic summary of degrees of sacredness encountered on-site. (Author, 2018)*

The focus area for this dissertation is found in the 'indigenous knowledge' zone of the urban vision framework discussed in Chapter 2. As described earlier, the core cultural zones are those in which existing cultural and recreational uses of landscape are concentrated.

In this particular zone, the existing activities are orientated around the passing down of indigenous knowledge through ritualised and non-ritualised practice.

To start off this assessment of the site, the sacredness of the area will be discussed .

3.1.1 AN INTRODUCTION TO SACREDNESS IN LANDSCAPE

According to Prof Vuynai Vellem, mountains are inherently sacred spaces in the southern African landscape. He argues that mountains are purified spaces where connection to the spiritual realm is possible and conducted through ritual (Vellem, 2018). Mbalazi Chrispin enriches this perspective by adding that rituals are used to sanctify spaces. He argues that it is through ritual that a sacred space is ordained and through continual practice of this ritual that sanctity is retained (Tobler, 2000).

This is echoed by Lilly Kong in her article on religious landscapes. She argues that in ritual, the role of the body becomes to:

> "Manipulate basic spatial distinctions between up and down, right and left, inside and outside, and so on, that necessarily revolve around the axis of the living body."
> (Duncun & Schein, 2004).

She argues that the processes of sacralisation can be conducted indoors and outdoors through ritual. In reference to the sacralisation of space in mainstream Hinduism, her research concluded that purification of the outdoor occurs "*through consecration of the land and planting of ritually significant plants",* while purification of the indoors occurs "*through lighting the sacred fire, anointing*

Figure 3.3: *Right: Dissertation site time lapse (Author, 2018)*

participants with ashes from the fire, and walking a cow through the rooms". (Duncun & Schein, 2004).

The discussion on the role of ritual in sanctification of space will be further broken down in Chapter 6: *Poetics - an essay on the poetics of ritual engraved in the landscape.*

With these arguments overlain, they become relevant to this chapter to illustrate the role of ritual in designating 'degrees of sacredness'. On the site, current practices can be divided based on a categorisation of ritualised and non-ritualised existing settings. When placed on a scale, it can be deduced from the site that the existing settings which harbour ritual are considered more sacred by the local community. In these spaces, a traditional or spiritual healer designated the space and a cyclical event is expected.

The sacred landscape on site consists of the following spaces:

Mothong

Beyond sacralisation, the Mothong project, through the plant nursery, has sought to:

- Halt unsustainable harvesting techniques conducted by 'muti-peddlers', by teaching sustainable harvesting techniques.
- Produce plants grown on a sacred landscape to produce indigenous medicines used by the traditional healer for community ailments and rituals conducted by community members.
- Study the medicinal properties of plants for contribution to scientific communities.

Beyond this, the workers on the project acted as eyes on the site for any further improper conduct. Following this establishment, it seems that the cultural activity associated with the sanctity of the mountain returned.

Cattle Kraals

Outside the designated gates of Mothong are various cattle kraals that have developed in that area since 2001. This development is not considered a part of Mothong and is frowned upon by the

traditional healer who does not agree with all the customs of the herders due to the unsustainable methods taken up by a few.

At their core, the cattle herders are made up of young farmers taught to raise cattle by their forefathers, who now making a living from this knowledge. Because techniques for passing down knowledge were set in traditional custom, the cultural associations to cattle have remained intact. As a result, the cattle are still treated as spiritual intermediaries, free to roam the southern townships and mountain-slopes, whilst being key figures in cultural celebrations.

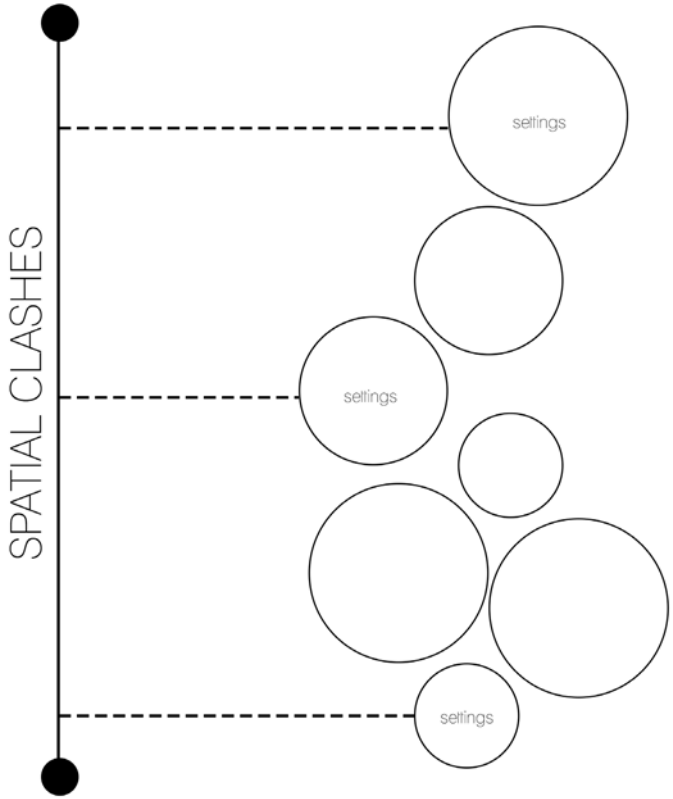
Male initiation

This cultural ritual has a component of communal celebration after the process is meant to 'initiate' the boy into manhood by exposure to life lessons that men are expected to understand. Also found outside the boundaries of Mothong, male initiation school camps are scattered throughout the landscape between the northern boarders of Mothong and the southern borders of the town of Baviaanspoort. Male initiation is a three-month process in which young boys of the local community are gathered to have lessons passed down to them by elders of the community. At the end of the process, the young boys are circumcised and the camp site is then purified by fire as the men make their way back to the community who eagerly await their return.

Open-air churches

Along the ridges of the mountain, rocks are painted or burnt to designate sacred spaces for open-air church ceremonies. On the mountain, these sites are found along the borders of Mothong. There is no physical fence to separate them but a constant distance is maintained so that they do not impose on the practices of the healer and maintain discretion during prayers. These practices are also frowned upon by the traditional healer, who worries that the constant movement of rocks required for the altars disturbs the ecology.

Forming part of AIC (African Indigenous Churches), there are several churches spread along the southern townships which have rituals conducted in the outdoors. These include ZCC (Zionist Christian Churches) and Apostolic Faith Mission churches (Mountain of Praise



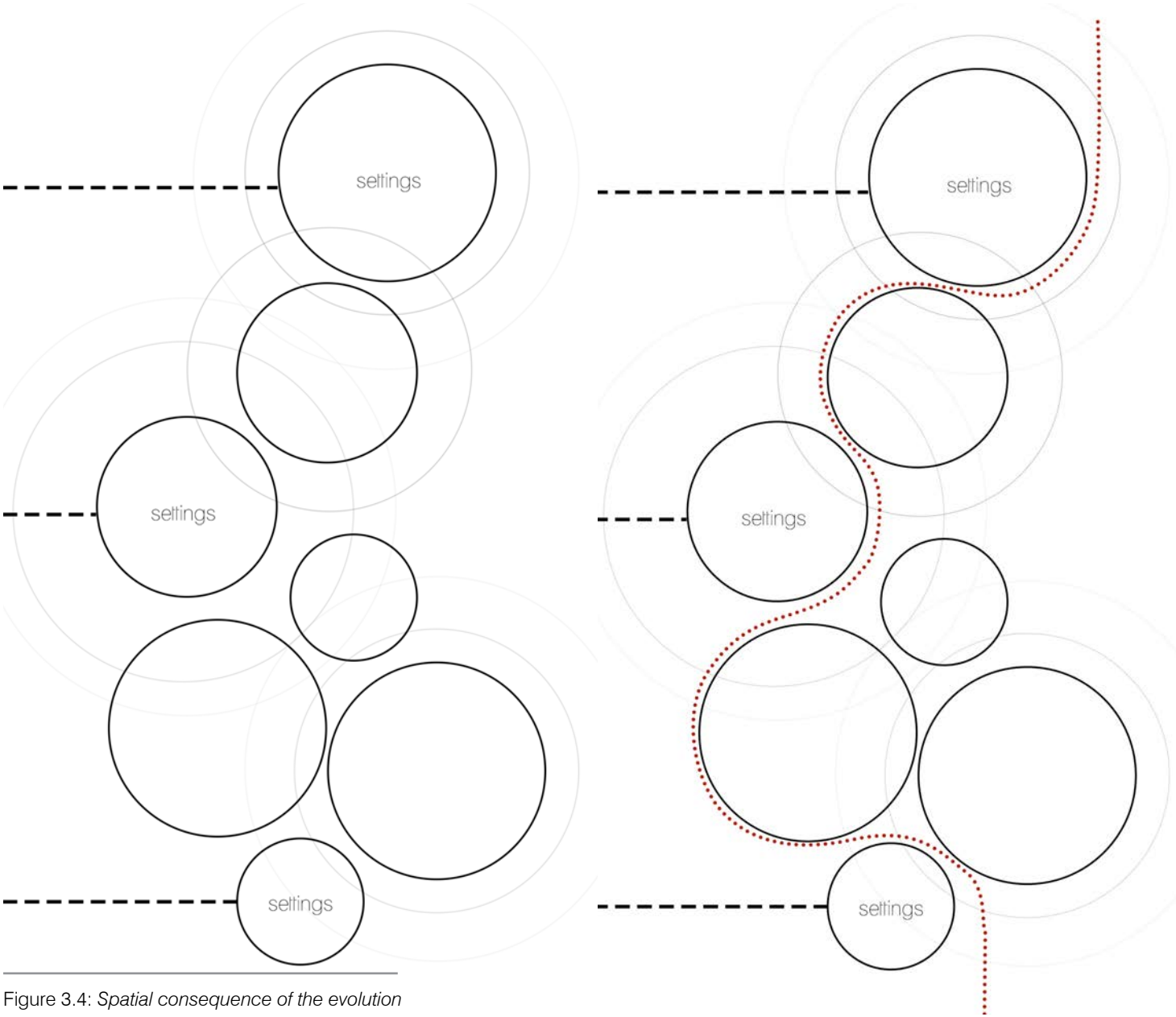


Figure 3.4: *Spatial consequence of the evolution of tradition and its pragmatic demands.*

Church). AIC's stem from the hybrid cultures found in urban contexts. They mix indigenous beliefs and Christianity. As a result, church rituals extend towards worship ceremonies under open skies in thankfulness to God for the gift of the landscape and the natural world. Rituals include short pilgrimages walked (+/- 50km) and long pilgrimages travelled by vehicle (over 100km), where devotion is expressed by both the task of a long journey and singing songs of worship.

These are heard in the busy streets of urban environments and quiet spaces on scared landscapes.

3.2 The evolution of tradition

Due to this being an active cultural landscape, the evolution of tradition is expected through continual communal interaction with space. The history of this mountain area shows that 'space' is often lost to pragmatic demands. As a consequence, the following is being experienced:

Spatial isolation

According to indigenous beliefs, an entire cultural landscape should be read as one united entity. It is within this communal interdependency that space becomes sacred. Isolation in cultural landscapes surrounding urban dwellings is a consequence of spatial compartmentalisation, stemming from modernism and being embedded into the spatial priorities of younger community

members.

In an isolated state, each of the above listed existing programmes continuously expand independently.

This creates a spatial tension between existing programmes taking up more space on the mountain.

Traditional use of landscape

In working as a whole, practices conducted in the landscape are traditionally built off one-another. When cows from the kraal are taken to the court for discussions on bride price, or young boys are taken to spaces in the wild to be taught the cultural significance of each plant, the landscape settings found on-site traditionally involve their practices being co-dependent. It is in this co-dependency that these traditional practices are able to tie the cultural landscape together. However, as spatial tensions rise, co-dependency is threatened.

The hybrid cultures and traditional use of space

Hybrid cultures have evolved as a consequence of the urban condition. These cultures are adapted by members of the younger generation and combine traditions from cultures found in all three towns.

The existing settings were historically formed in isolation. Now, as they expand independently, they clash with one another, creating further tensions. However, there is a thread of traditional uses of landscape that can be found to overlap between them, feeding off the co-dependency which makes the mountain a sacred landscape.

As necessary as the development of culture is, the history of the interaction of the communities neighbouring the mountain indicate that expansion typically comes from pragmatic demands with decreasing emphasis on the sacredness of space; a type of spatial demand prominent in the current paradigm of urban development.

A result of these developments on the existing programmes has already been evident:

Mothong

Since 2001, the project has expanded from a simple nursery for a local stakeholder, to a research hub for national scientific bodies such as the CSIR, TUT Plant Sciences Department and UP Plant Sciences Department. The plants taken from site are known traditionally to have medicinal properties and cultural value. Through these research bodies, the medicinal properties of these plants are being scientifically proven. This contributes greatly to the recognition of Indigenous Knowledge Systems (IKS) in scientific fields – a bill currently intended to be passed in parliament.

According to the article written in the Mail & Guardian, “Mabena hopes to build a plant where indigenous plants can be processed into cosmetic and medicinal products. But his biggest wish is that Mothong grows into a thriving centre of African indigenous knowledge systems.”

In 2016, a tender was sent out to expand the nursery into a manufacturing facility to process the plants into medicinal and cosmetic products on-site.

This expansion meets the demands of

how a new generation of urban dwellers conceptualise the interaction with the plants – through products. However, it threatens the spatial qualities which make this landscape retain it's sanctity – the relation that physical man has to both landscape and wilderness.

Initiation Camps

In 2018, the year of this dissertation, all initiation camps in the City of Tshwane were forced to discontinue for the year pending municipal investigations into abuse of power.

In the dormant seasons of the schools, men of the Mamelodi community are known to use the spaces around the mountain to train in karate. This appears to continue the relations of passing down knowledge to the next generation through physical activity.

3.3 Existing Residual Fabrics

The existing structures are expanding in tandem with one another. Traditionally, these settings which build off one another are owned by different stakeholders who all have visions for what the landscape should become.

Despite the pragmatic demands of urban influences on the site, the existing settings for both ritualised and non-ritualised practices encompass a poetic use of space. This is expressed through the existing spatial qualities, as explored in the following section.

The Nursery, Legotla (traditional meeting place), Kraal, Initiation Camp and Prayer Altar are five residual fabrics left in the landscape from traditional practices. The spatial qualities of the structures remaining is explored below.

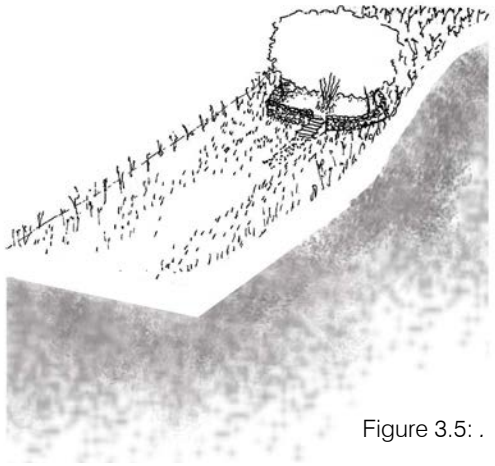


Figure 3.5: .

SOS
Statement of significance:

In a cultural landscape with communal gathering standing as a critical component to its sacredness, the 'gathering court' serves a traditional need for gathering in the landscape to discuss the particular issues of the time.

Diagrammatic break-down

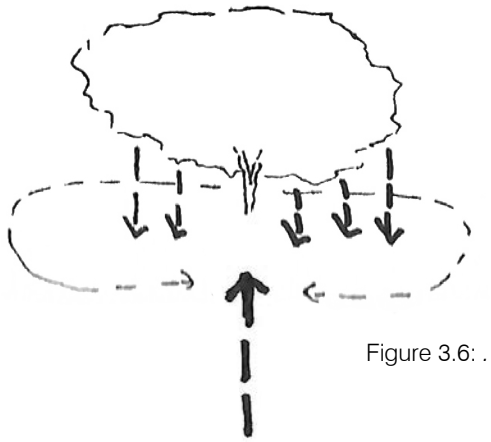


Figure 3.6: .

The tree:
Provides covering from the elements and lowers scale of vast landscape to man.

Stone seating:
Materials sourced from context; seating is circular so all are considered equal.

Context:
Dug into the mountain surrounded by wilderness.

Spatial Quality

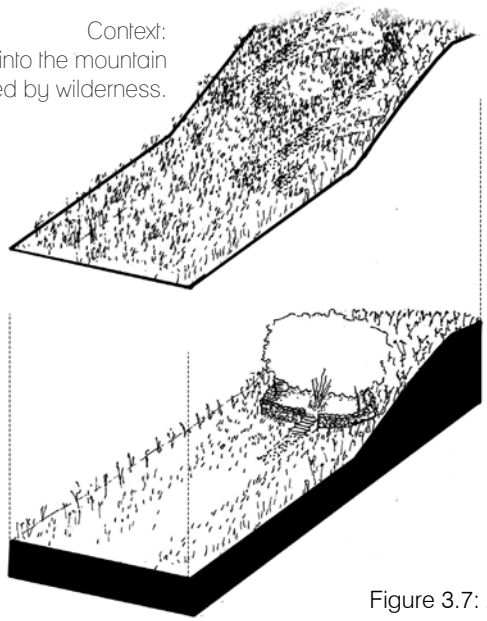


Figure 3.7: .

Figure 2.23: *[Left] Existing Lekgotla (Author, 2018)*
Figure 3.5, Figure 3.6 and Figure 3.7 and *Analysis diagrams (Author, 2018)*

THE LEKGOTLA

A TRADITIONAL MEETING PLACE

non-ritualised

"The men laughed. I had never seen them all so content. The elders of the community in joy-filled seriousness discussing affairs of an entire community. Underneath the cool shade of the over-arching tree, contrasted by the hot sunrays beaming off the stone and exposed earth around them. Gleaming off the vegetation that surrounded the court. Yes, this moment was important - I could feel it. Highlighted by the darkness of shade, this moment was ordained."

author's narrative

associated with space

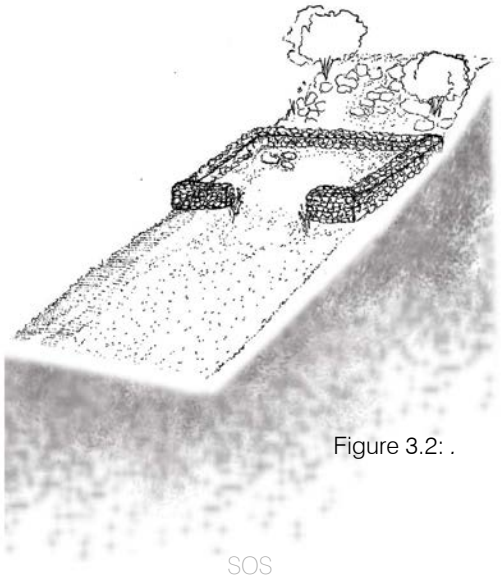


Figure 3.2: .

SOS
Statement of significance:

The cattle on site are seen by local herders both as spiritual intermediaries and economic investments. Cattle are vital to many traditional celebrations. The building technique of the kraals with rock cladding and organic formations relative to the terrain make reference to traditional building practices.

Diagrammatic break-down

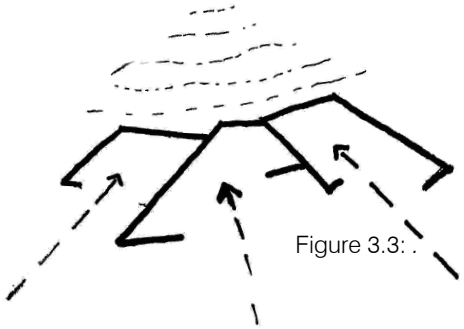
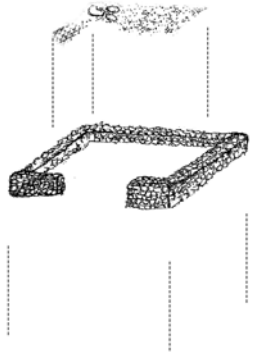


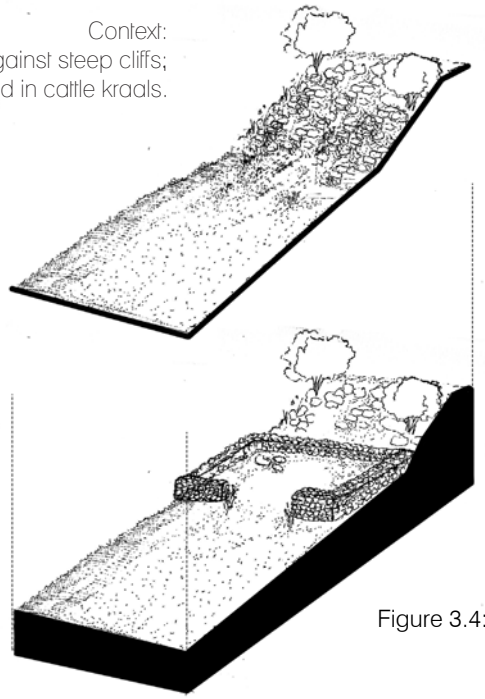
Figure 3.3: .

Soil quality:
Soil softened due to cow hooves and manure.

Kraal walls:
Made by contextually sourced rocks.



Context:
Built against steep cliffs; broken rocks from cliff used in cattle kraals.



Spatial Quality

Figure 3.4: .

THE CATTLE KRAAL

COW ENCLOSURE

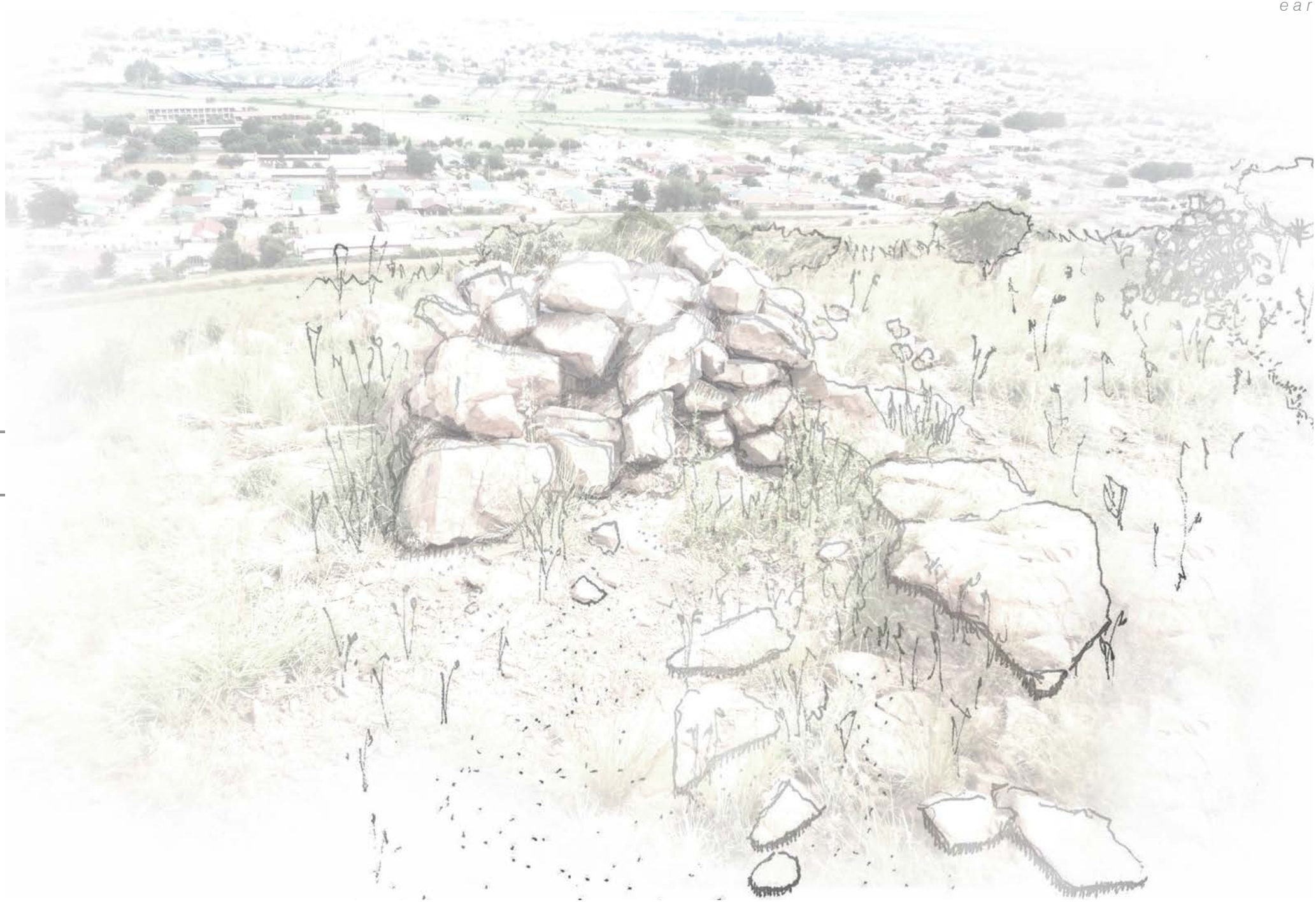
non-ritualised

"Why are we standing here staring at cows?" I asked after a long moment of silence. He smiled without looking at me. "Do you see how carefully that one moves? My mother once told me a story about this cow. This cow taught me to never envy another's clean shoes" he responded. "Shoes? How?" I asked, my mind trying to piece the animal to the lesson. He laughed, "Lets sit down, watch how she behaves, you will never envy again".

author's narrative

associated with space

Figure 3.1: *[Left] Existing cattle kraal with plan in left corner (Author, 2018)*
Figure 3.2, Figure 3.3 and Figure 3.6: *Analysis diagrams (Author, 2018)*



STONE PRAYER ALTAR

OPEN-AIR CHURCHES

ritualised

"They walked passed me in white robes with herbs, grasses, branches and leaves in hand. There was a quietness to them. Two men and three women. As they passed, I quietened my movements too. I watched them stop at the cliff of the mountain and assemble rocks. Each with their own duty. As a fire was lit and hymns were sung, I watched them move as one unit in worship, till they vanished back into the city"

author's narrative

associated with space

.

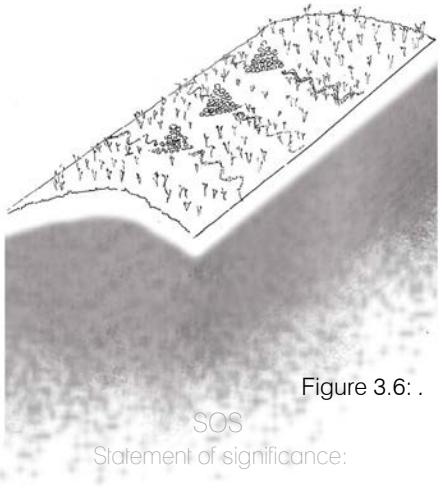


Figure 3.6: .

Open air church ceremonies form a fundamental part of rituals practiced in African Indigenous Churches (AIC). The prayer altars serve as platforms on which worship is conducted using no man-made structural forms as a sign of appreciation for the gift of earth given by God.

Diagrammatic break-down

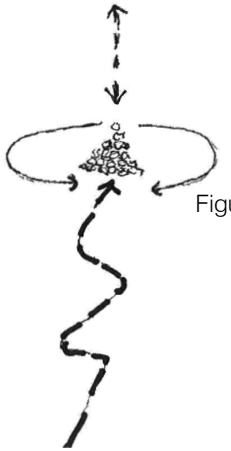


Figure 3.7: .

Spatial Quality

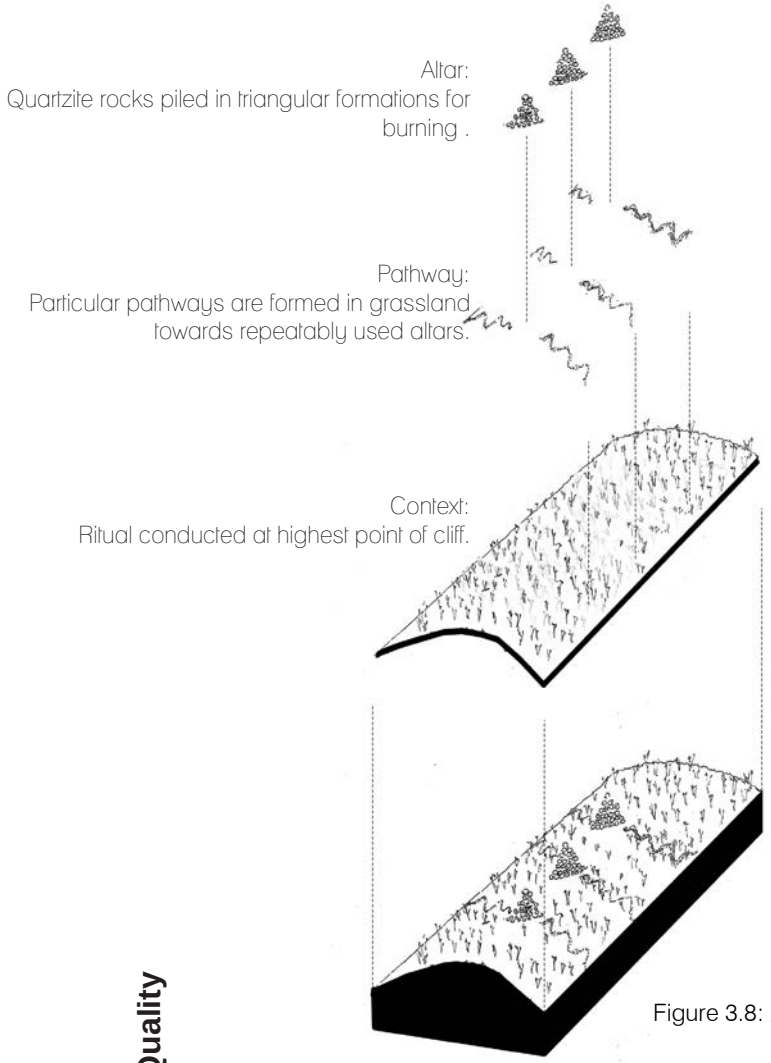


Figure 3.8: .

Figure 3.5: *[Left] Existing prayer altars (Author, 2018)*
Figure 3.6, Figure 3.7 and Figure 3.8: *Analysis diagrams. (Author, 2018)*

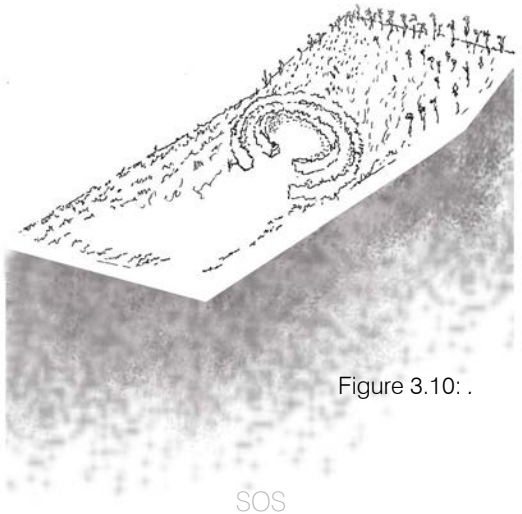


Figure 3.10: .

SOS
Statement of significance:

The first occurrence of sacralisation of a defiled landscape conducted by a local traditional healer. Still ongoing.

Diagrammatic break-down

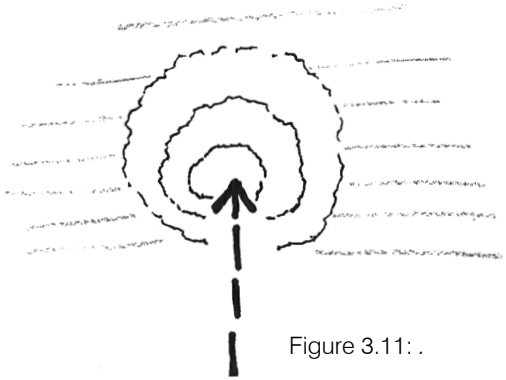


Figure 3.11: .

Spatial Quality

Planting:
Patterns placed in landscape in concentric circles.

Context:
At the foot of a steep cliff by responding to the flattest parts of that base.

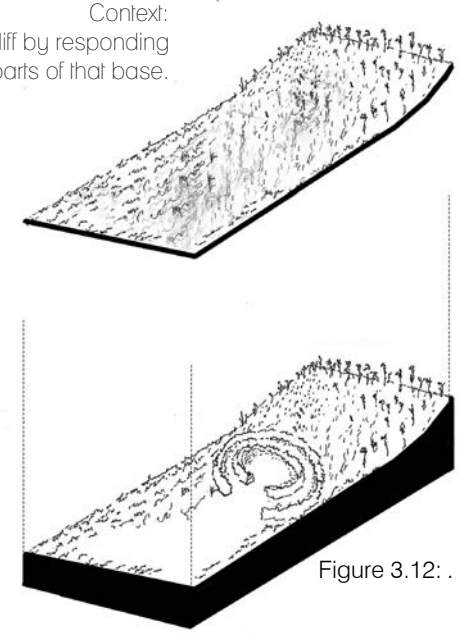


Figure 3.12: .

Figure 3.9: *[Left] Existing plant nursery (Author, 2018)*
Figure 3.10 Figure 3.11 and Figure 3.12: *Analysis diagrams (Author, 2018)*

MEDICINAL PLANTING

ritualised

"He dug his fingers into the soil and held it in a clenched fist. In his open palm he studied the composition in his hand as he chanted the same phrase. Having found answers to questions he hadn't verbally posed in his dirtied palm, in one slow motion, he returned the soil to the ground, knelt down and started planting plant cuttings harvested early that morning into the ground. The chanting got louder. With his eyes fixed on his task and his mind not in this present. It had been this way the entire morning. I stood, watching as he revived a defiled landscape with planting and payer."

author's narrative

associated with space

THE INITIATION CAMPS

RITUAL FOR MALE RIGHT OF PASSAGE CHANGING PHASES INTO MANHOOD

ritualised

"We were all gathered at the base of the mountain with the air filled with the odour of food. We had been cooking for the past 8 hours, a feast fit to welcome the brothers we had sent up to the mountain at the start of winter, who would now be men with a 3-month appetite. Suddenly a silence fell among us, a subtle line of smoke rose into the skyline and motion was sensed from it. Covered in robes, the men were returning. We all danced and sang for joy, grateful to have them home."

author's narrative

associated with space

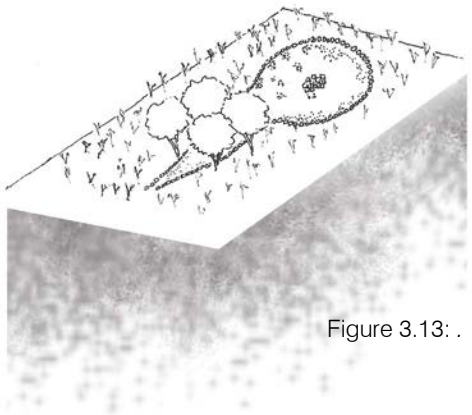


Figure 3.13: .

SOS
Statement of significance:

An ancient tradition where the young boys of a community are guided into manhood by community elders.
An ongoing practice still forming part of the cultural landscape today.

Diagrammatic break-down

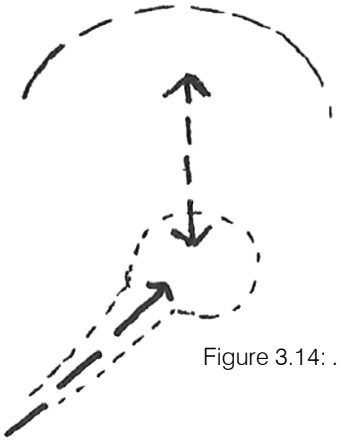


Figure 3.14: .

Spatial Quality

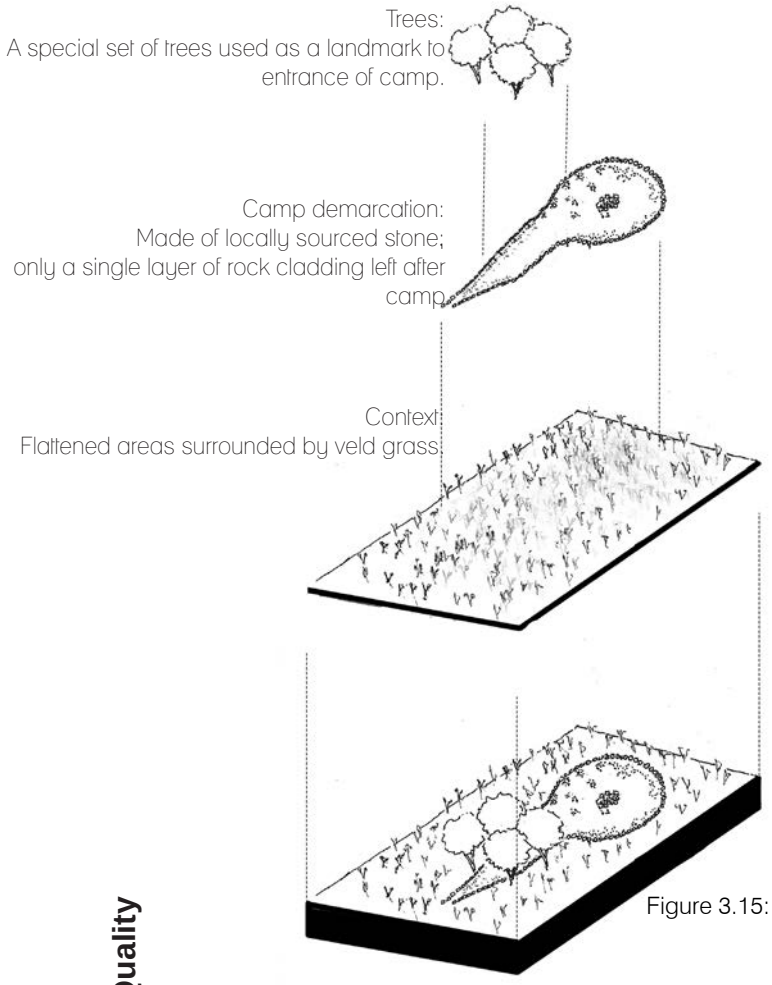


Figure 3.15: .

Figure 3.16: *[Left] Exisitng Intiation camp area (Author, 2018)*
Figure 3.13, Figure 3.14 and Figure 3.15: *Analysis diagrams (Author, 2018)*

Conclusion

The site under investigation is a cultural landscape in which traditional customs are still being practiced.

The condition of urbanisation has produced pragmatic demand for space which has left the landscape as an isolated setting where the rituals conducted overlap.

Despise the pragmatic demands for space, the existing settings have retained their poetics of space through the spatial qualities required to carry out the traditional customs.

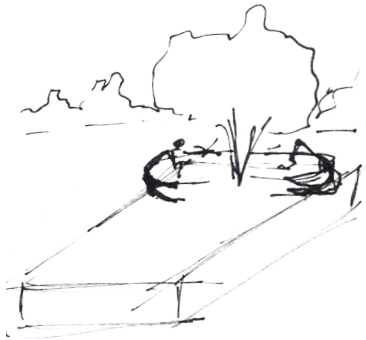
Due to efforts carried out by the stake-holders, the sanctity and traditional customs are being returned to the site. However, to ensure history does not repeat itself as consecutive generations take ownership of tradition in light of the social demands of their time, conservation efforts and further development in this area would have to learn from the spatial qualities of existing residual fabrics.

Summary

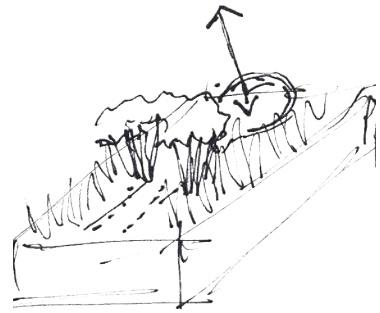
Legotla
Traditional Meeting Space

Initiation Camp
Rituals for male right of passage

Spatial Quality

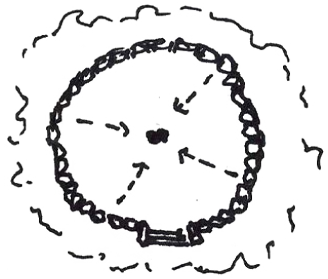


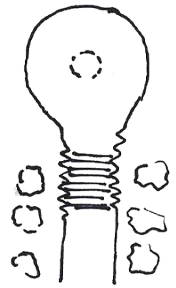
intimate meeting space



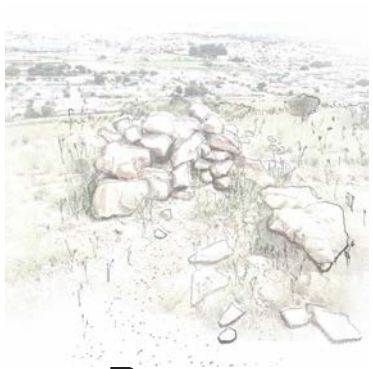
passage with blocked view of sky view

Metaphysical

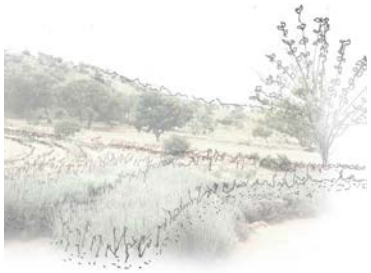




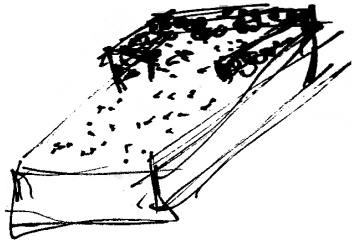
Cattle Kraal
Cow enclosure



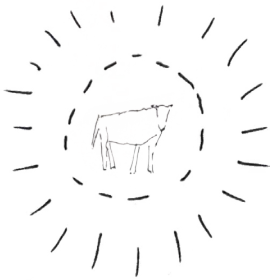
Prayer
Open air churches



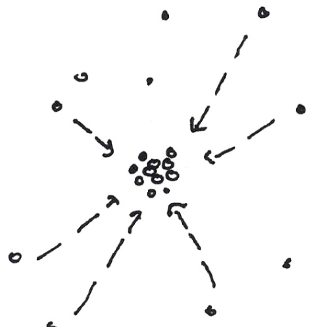
Planting Nursery
Indigenous medical plants

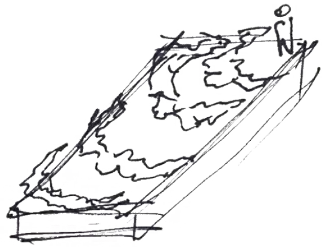


Enclosed soil conditions and rock walls from context



passage through wilderness





maze of concentric circles

Figure 3.17: *[Left] Image of grazed area next to indigenous nursery (Author, 2018)*

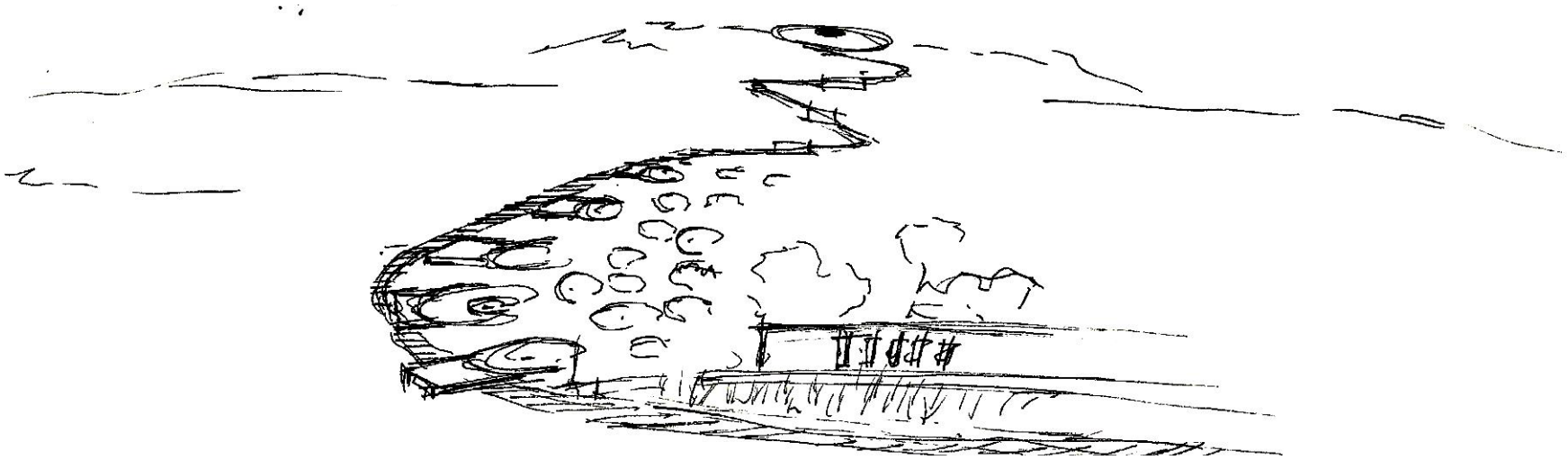


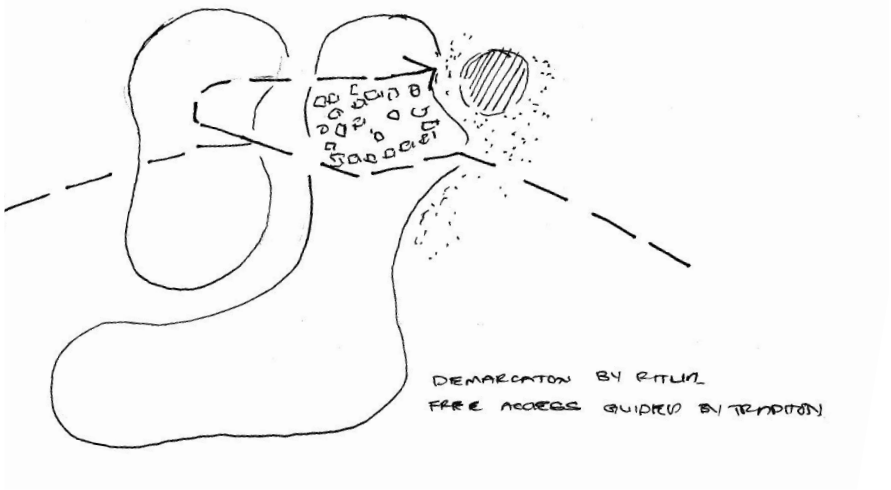
Figure 4.1: Journal Sketch (Author, 2018)

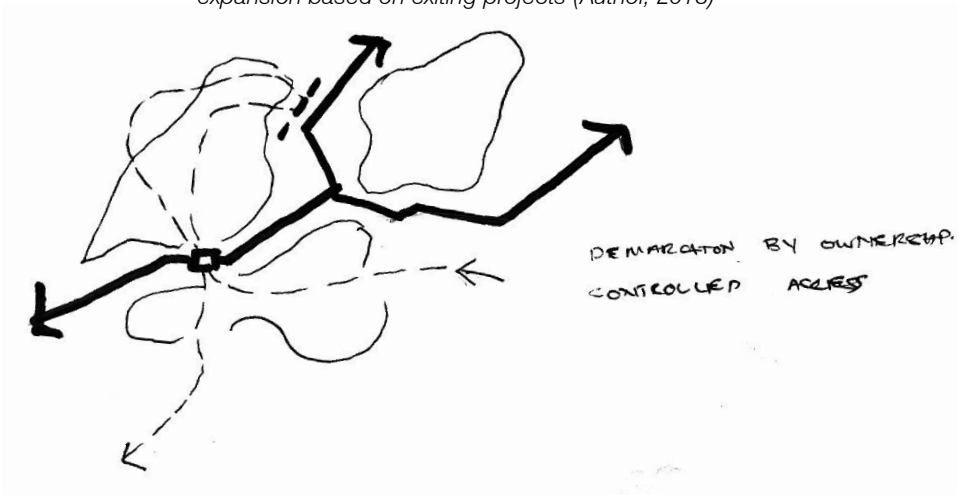
IV

DEMARCATION

AN ESSAY ON BOUNDARIES IN SACRED SPACES

Figure 4.2: *[Left] Diagramatic summary of two phenomena of demacation (Author, 2018)*
Figure 4.3: *[Right] Graphic summary separated spaces on site. Comparison of scales of expansion based on exiting projects (Author, 2018)*





4.1 Introduction

In this essay, the role of demarcation and hierarchy of sacred spaces is discussed. This phenomena is seen on site on two levels: firstly, in the manner in which certain ritualised spaces need to stand apart from others to retain privacy, and then secondly, in the separation of ritual spaces based on the stakeholders managing the practices.

While the former abides to tradition, the latter contradicts it. Demarcation is traditionally used to designate where one space is considered more sacred than another - where different behaviors from particular participants are expected.

In the wake of the 1950's mass migration to the areas surrounding the mountain, the battles for land ownership began to overshadow the concept of communal land. This was based on a deep desire for residents to gain the financial security of land ownership, however, the loss of reverence for culture with the introduction of contrasting cultural groups and the lack of trust it produced, directed the land ownership claims to be individualised rather than communal. As a result, demarcation took on a possessive nature around the site - today, this limits the interdependency possible on the cultural landscape and heightens spatial tensions.

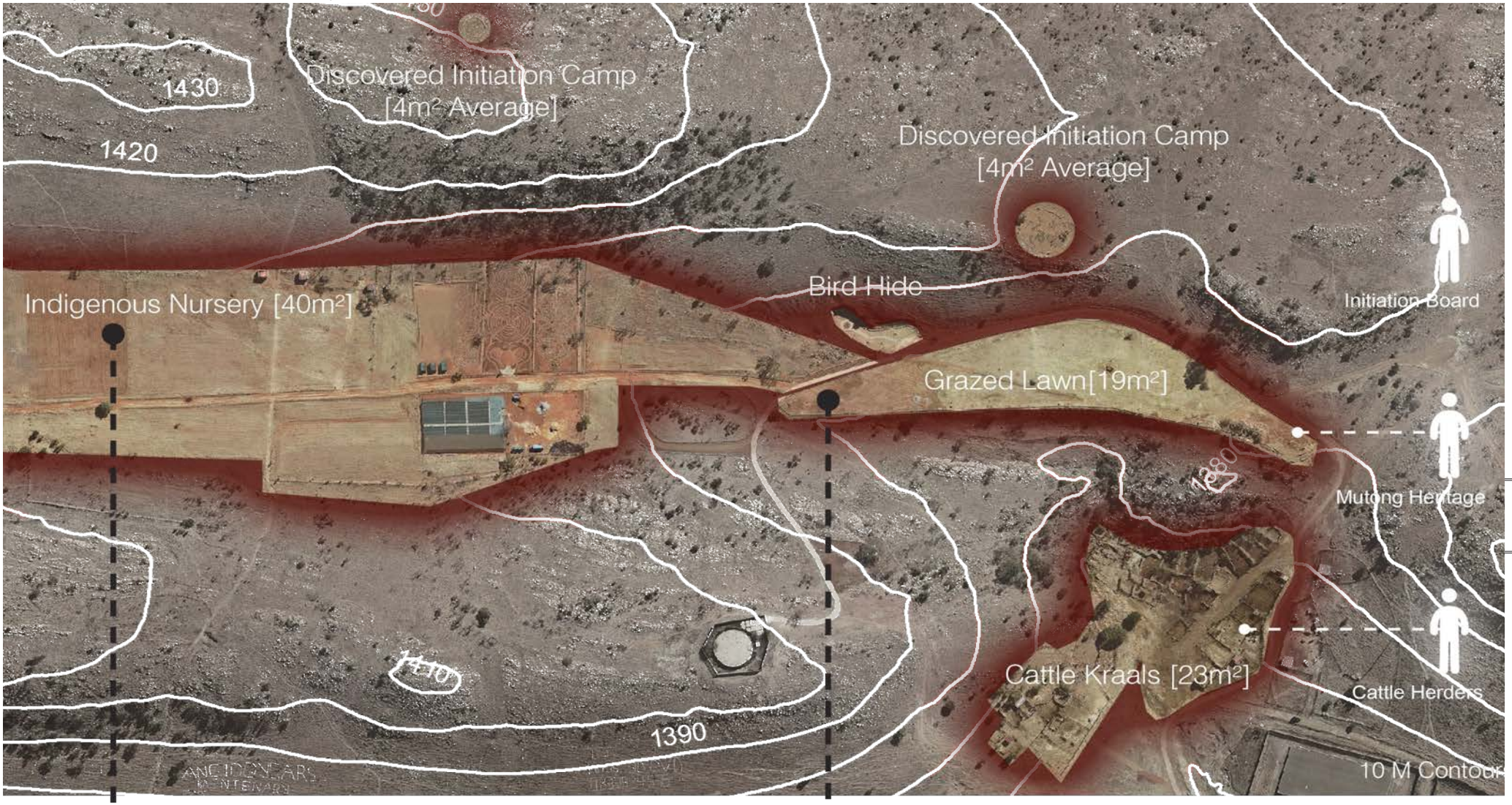
In this essay, we look at these two phenomena and their role in the retention of sacredness. The former a surviving part of tradition, while the latter, an urban condition.

4.1.1 SUB-QUESTION

In light of the two existing approaches to demarcation on site, how does demarcation still contribute to sacredness of landscape?

Statement:

Designation of sacred space through separation by degrees of sacredness contribute to continuation of sacredness of mountain.



40m² Amphitheater at Voortrekker Monument

19m² Amphitheater at Freedom Park

4.2 The sacredness of the mountain

4.2.1 DEMARCATION & MOUNTAIN

Mountains are seen as sacred to indigenous cultures. The large geographic formations standing tall and far removed from the normality of life as it humbles the individual on the horizontal plane below by sheer virtue of its scale. According to Professor Vuyani Vellem, in the southern African context, mountains are ordained with spirituality. The ordination stems from the location of the feature - being separated from everyday living conditions - as well as it's standing as a loud natural reminder of the role of man to act as a custodian to the landscape – a gift offered by God. This is echoed by the traditional healer on site, Dr. Mabena. In an article published by the Mail & Guardian, he is quoted saying:

"Inyangas are caretakers of flora and fauna. This land is an indigenous botanical garden that God gave to us. We must preserve it." (Ledwaba, 2017)

According to Prof. Vellem, in the southern African context, the mountain is a landscape separate from the everyday condition of communal living but sacredness cannot be experienced in isolation without interaction from an entire community. He argues that this interaction is defined under the principal of living known as *Ubuntu*. Ubuntu makes reference to the role bestowed by God onto man to be a custodian of the landscape and a brother to his neighbour. In this principle, inhabitants of the same community are seen as one family of landscape custodians. This family shares resources on an everyday scale, then together participate in special rituals and communal customs, in particular in the sacred landscape ascribed spiritual value, therefore ascribing blessings to the rituals being conducted (Vellem, 2018).

This means that the mountain is inherently considered a sacred landscape because of the rituals conducted in a space outside the normal constraints of a communal dwelling. Vellem goes on to argue that within this one sacred landscape, there exist degrees of sacredness associated to space.

A traditional or spiritual leader is believed to be gifted with the ability to distinguish the sacredness of space. These degrees stipulate what activity can be conducted on which part of a cultural landscape and what behaviour is expected of participants.

This parallels the conditions found on site. On the Magaliesberg Mountain, there are spaces designated by spiritual leaders, such as the location of the initiation camps and the indigenous nursery, both of these being considered more sacred spaces on the mountain. This paints the picture of one sacred landscape, made up of smaller sacred spaces designated to one particular location and separated from all else . There is a spiritual demarcation of space creating degrees of sacredness.

4.2.2 SITE CONDITIONS

Notice how on the site, what separates the initiation schools from the nursery is nothing but white stone and steep slope.

The lack of obvious separation between the two should create a subtle transition through space, but can get lost in the landscape.

On a site visit, in pursuit of taking photographs for this dissertation, I found

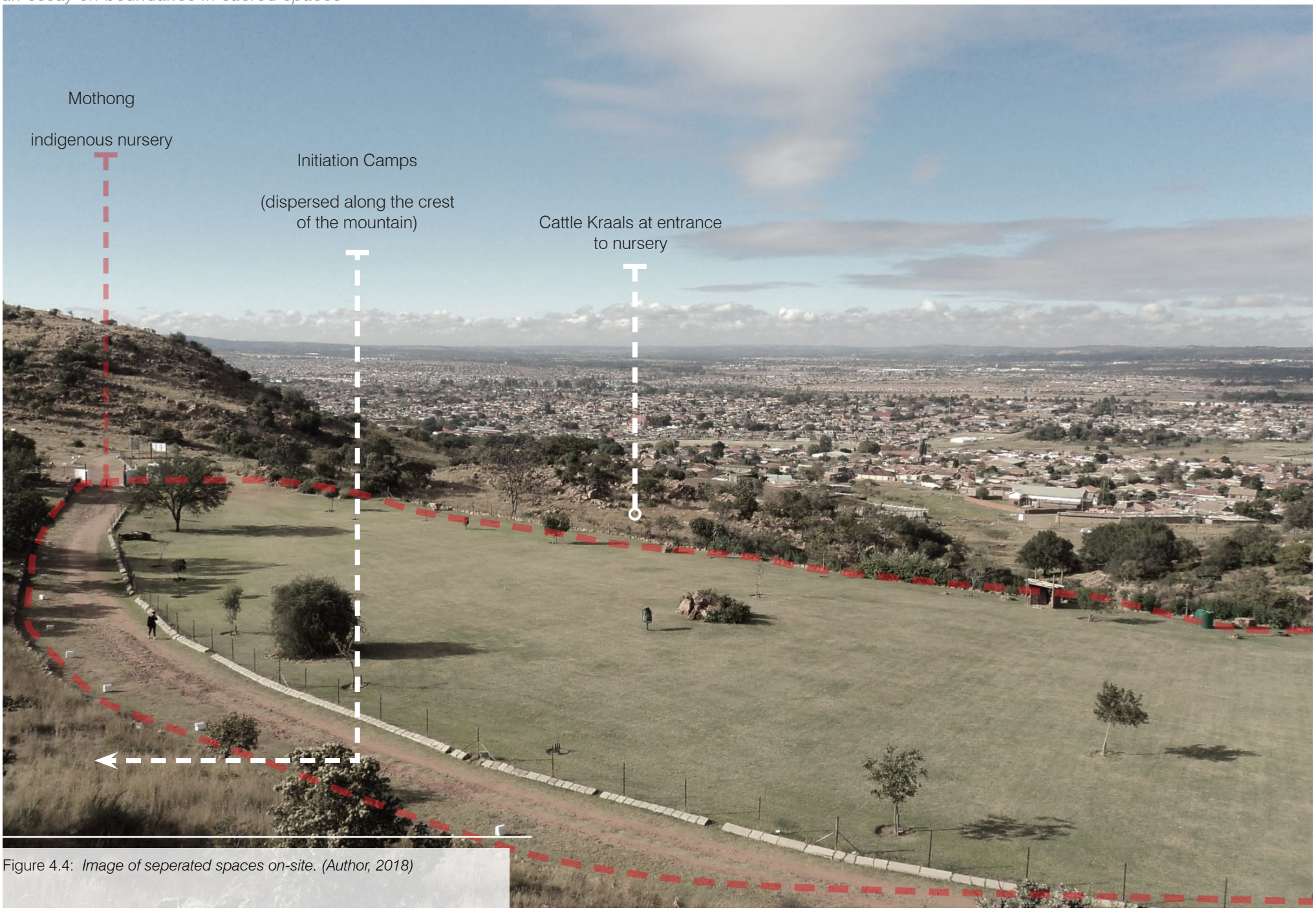


Figure 4.4: *Image of seperated spaces on-site. (Author, 2018)*

myself in the middle of an initiation camp. Feeling I might just have violated the sacredness of the male orientated space, I apologetically removed myself from the setting. It was only when walking back to the indigenous nursery that I noticed all the signs - a peculiar grouping of trees painted white at the bark, white stones in a ring lost in the grassland and boulders painted white at the entrance of the pathway directing the user.

4.2.3 DEMARCATION & URBANITY

Urban demand for sacred space

Thandi Sebake is an architectural theorist in South Africa. In her article *Where she lived, where he lived: A case of family homes connected by 'I Do's*, she writes on the ritual of marriage in the urban context versus that of a rural setting. The article stands as a personal memoir of her own experiences during her traditional wedding and the spatial responsibilities she learned that belong to architecture. From her urban dwelling in Witbank and her fiancés home in the rural village of Kromhoek in former Transvaal, she writes of the different experiences of sacred rituals encountered during the ceremony. (Sebake, 2011).

She explains that although she resided in an urban context, the rituals conducted during her ceremony were maintained. For instance, where a cow was to be slaughtered in a kraal, this was conducted in her backyard, where the discussion of the brides-price was to be discussed in a Legotla, this was conducted in her living room. Although this shows resilience of tradition, Sebake argues that the nature of the rituals were experienced as far less sacred and expressive of her beliefs in Witbank than in the rural conditions of her fiancé in Kromhoek. In his village, the discussions amongst the uncles were conducted in the local Legotla, the cattle acquired from a nearby kraal and the bride herself paraded through the village to be welcomed into the family.

Overall, Sebake argues that urban spaces are in need for sacred spaces able to conduct traditional customs.

In her reflection she argues that fundamental to success of sacred spaces in the urban context is access to public space where rituals can be conducted with the respective involvement of a community. As a female in her 20's at the time of her marriage, Sebake represents a long chain of young people who are still able to recognise the value of sacred spaces and settings for rituals in 2018 (Sebake, 2011).

However, this recognition, a contributing tension hindering the communal overlay is a clash of belief systems. In rituals this is mostly seen between members of different generations when tensions rise. After all, not all traditional customs are agreed on. For instance, the slaughtering of a cow has become a point of controversy for its association to ancestral worship - an off-putting venture to an increasingly Christian generation. This clash stems from opposing religious values of a family overcoming a shared traditional outlook. With the increase in community members holding opposing religious views, a study of religion as a landscape should be made.

Dangers of assigning a religion to traditional landscape in urban contexts

According to Lungile Pato, a South African theologian, a condition of the urban context is the dominating exposure of

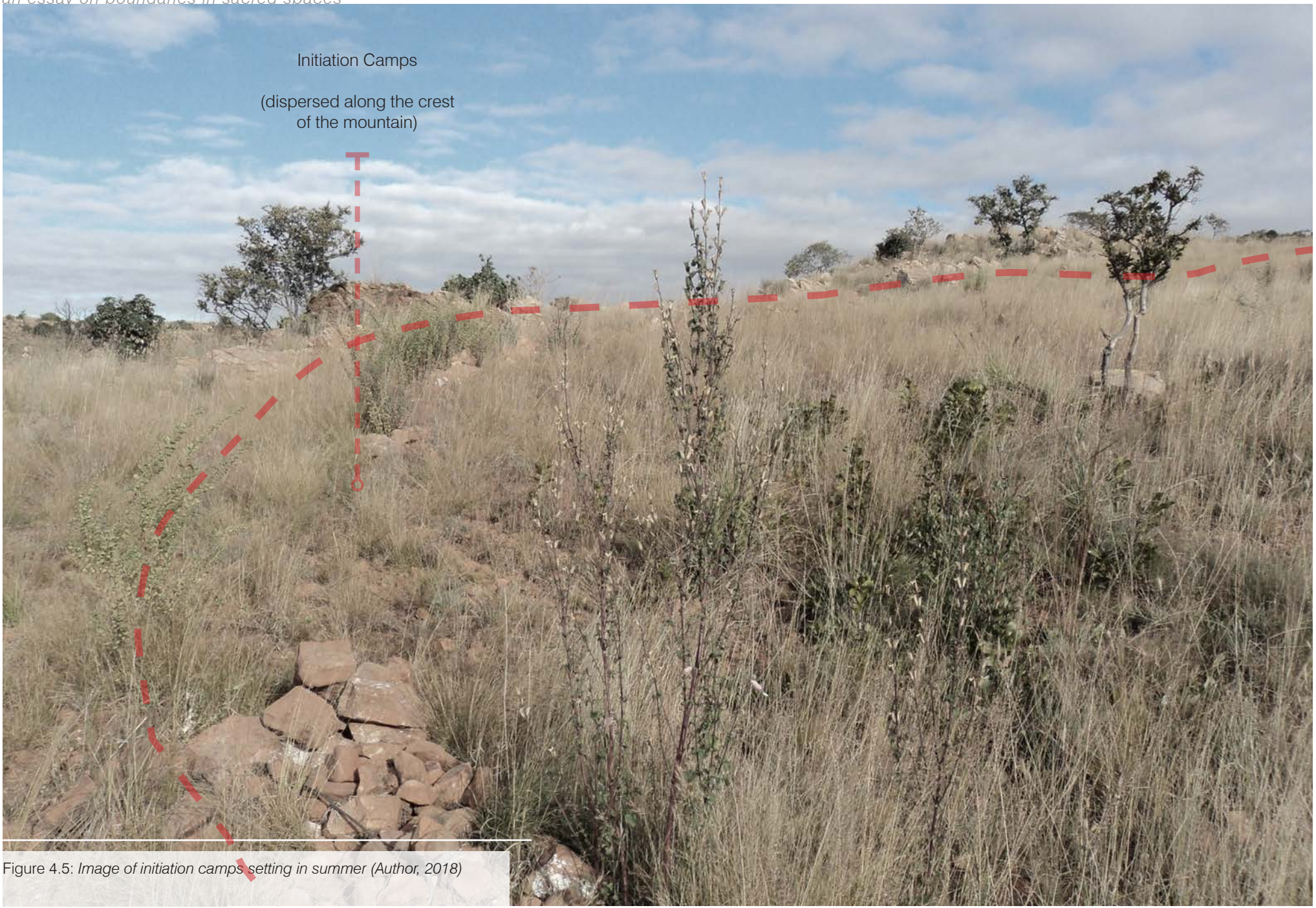


Figure 4.5: *Image of initiation camps setting in summer (Author, 2018)*

Figure 4.6: *Hermeneutic palmiest. The evolution of car associated with celebration is Southern Townships of Mamelodi. The communal celebrations oriented around The Volkswagen Beetle, now conducted in streets-capes dominated by Black to the 4X4. (Author, 2018)*

alternative cultural custom and religions.

As a result, more community members have taken on a hybrid culture which no longer relate to singular cultural traditions or religious beliefs.

This development of hybrid culture is the result of a shift from homogenous rural communities where single traditions and religion are widespread, to heterogeneous cultures in the urban context. Therefore, active cultural landscapes might experience an assortment of beliefs which may be seemingly opposed and traditional outlooks which clash even within the same generation.

A question that can be posed here is:

would the adaption of hybrid cultures not cause too many cultural clashes, leaving sacred spaces void? According to Pato, it would not. Pato argues that as the communities of urban contexts may be more diversified, traditions often remain in practice as dualism is adapted in a way to retain public engagement in ritual (Pato, 1997).

In this regard, by nature of the mountain catering to an urban context, there is no surprise in seeing dualism adapted to the degrees of sacred spaces discussed earlier. This can be identified in the way that young men who are part of their local churches still participate in initiation ceremonies. As the programmes for the site extend, further adaptions can be identified, such as the use of the indigenous medicines by church members or research bodies of no particular religious belief. This indicates there is an active evolution of tradition on site.

Overall, Pato argues:

"It is often said that the African has a sense of the wholeness of life. Indeed traditional African life is characterized by the motif of wholeness.
For instance, in African tradition there is no separate community of religious people, because everyone who participates in the life of community

automatically participates also in its [tradition]".
(Pato, 1997)

This echoes the approach taken by Prof. Vellem in the section on the mountain, bound by the sacred principle of Ubuntu. The motif of the wholeness of life means that on an active cultural landscape, despite varying beliefs, rituals will still be partaken of. However, the adaptions of dualism and hybrid cultures calls for non-dogmatic approaches to architectural form.

4.2.4 HERMENEUTICS: DEMARCATIONS OF ANCIENT MADE ANEW

"Ours is a landscape of estrangement", these are the words James Corner uses to describe the current state of our relation to landscape as humans in an urban world. In his article on hermeneutics, he argues that:

"while scientific attitude has led to a multitude of accomplishments in modern science, it has also underlain the emergence of a disembodied culture struggling to find access to a lived continuity of being and time".

(Corner, 1991)

In an effort to unveil the cultural schema of landscape, he argues that tradition is a continual human endeavour of which we are all a part, rather than a frozen recollection of the past, and can be used as a tool to retain a connection to landscape (Corner, 1991). However, he also notes that if tradition is used in this way, it would require continuous reinterpretation:

"The objective is to devise new meanings (futures) from a critical and yet imaginative reinterpretation of our traditions (past), thereby transcending the superficiality of pictorial image and historical style".

(Corner, 1991)

Corner conceptualises landscape as a filter through which human interaction with the natural environment can be understood and should continuously evolve.

He argues that the passage of time should allow landscapes of past generation to wither as new markings overlay the old, producing a "collagic and weathered" palimpsest encoded into landscapes as cultural conditions and our world shifts. The demarcation of space as it stands on site seems to stand as an old marking on the landscape. Influenced by the culture of estrangement, the boundaries identified on site are lost to residents in landscape and history. Demarcation reads as individual rather than sacred.

No longer can sacred sites be demarcated by homogenous cultural understanding by a new palimpsest of demarcation encoded in landscape.

4.2.5 CONCLUSION

The mountain is inherently considered a sacred landscape. On the mountain, there are different sacred spaces designated by a traditional or spiritual leader. In the entire cultural landscape, what retains the sacredness are the rituals conducted in the community.

In an urban setting, the need for this is still prevalent, however, the sanctity of space is not experienced to the same degree in an urban city.

As a result, the retention of sacredness

Figure 4.7: *Hermeneutic palmiest. An overlay of cultures continuously evolving and being engraved into landscape (Author, 2018)*

is of value to varying generations.

With the influx of hybrid cultures, sacred spaces can no longer depend only on homogenous considerations of sacred space.

In order to determine how the sanctity of space was maintained in an urban setting, we will now adapt lessons from an old form of cultural expression in landscape architecture - the garden.

4.3 Lessons of a garden: Bounded Metaphysics

4.3.1 INTRODUCTION

On-site metaphysics

In studying the nature of the cultural landscape on the site under investigation, its cultural diversity stands out. The active cultural landscape is made up of indigenous, urban and religious cultures and associated practices.

On a wider lens they stand together as a unique canvas reflective of the city's cultural geography; whilst close-up they stand as isolated cases of internal tensions between users over space and freedom of cultural expressions, which threatens the continuation of tradition and the unified canvas worth celebration.

In the previous section, emphasis was placed on the relations between landscape and sacredness. In this part of the section, emphasis is placed on the relationship between *man and sacredness*. This is done to determine the role of user experience in preserving sacredness and continuation of culture in an active cultural landscape.

Metaphysics is identified as the "branch of philosophy dealing with: the first principles of things, approaching to concepts of being, knowing, identity,

space and time" (Oxford, 2016).

On site, the active cultural landscape identified as being a physical manifestation of this branch of philosophy, places the user in spaces expressive of traditional beliefs.

As the metaphysical stands at the core of the complex local perspective of landscape, in conserving these diverse cultural spaces and representing them as one whole canvas, a theoretical discussion would need to address the approach to space from the metaphysical.

Metaphysics outdated in Landscape Architectural Theory

In the history of the landscape architectural discipline, there was once a typology that dealt extensively which the expression of metaphysical beliefs both in rural and urban neighbourhoods. This typology was the pre-1800 garden. Over the years, the concept of what constitutes a garden has evolved, however, the author takes the position that the definition outlined by John Dixon Hunt remains true:

> "Gardens are the condensed units in which the spatial complexities of Landscape are made to manifest."

(Swaffield, 2002)

Here, the architectural theoretical issue arising is that there is limited theory speaking of the complex local and contemporary perspective of landscape from a metaphysical standing. Contemporary landscape architectural theory has shifted its focus from the expression of spirituality and metaphysics in the pre-1800 gardens to expressions of the naturalistic and cultural urbanism expressed in contemporary theory.

However, in response to the role of metaphysics on site, a theoretical discussion on the metaphysical associations of space to architecture and the continuation of tradition in an urban world is necessary.

To do so, an investigation into the metaphysical expression in a garden is conducted.

4.3.2 THE METAPHYSICAL EXPRESSION OF THE ENCLOSED GARDEN

According to Rob Aben and Saskia De Wit:

> "Gardens are the most condensed unit in which the historical, functional and spatial complexities of the landscape are made manifest." (Aben & De Wit, 2001)

In their book, 'The Enclosed Garden', Aben and De Wit argue that gardens have in the past been condensed spatial expressions of the metaphysical relations man has had to cosmology. The authors describe the key ingredients of enclosed gardens as:

> "The palpable references enabling one to orientate themselves in space, time and society." (Aben & De Wit, 2001)

This is carried out firstly through cosmic orientation, described as the primitive experience of being on earth, expressed through the purposeful opposition between light and dark, high and low, earth and sky; with the sun's path and the night stars used for sense of direction.

Secondly, temporal orientation, gained from exposure to the rhythm of seasons, daily passage of time and juxtaposition of past and present experiences.

Finally, through territorial orientation, where from inside the walls of the garden the expansive far distance of the outside topography is visually accessed to heighten the experience of the dualities of centre and periphery (Aben & De Wit, 2001).

This tool of orientation and spatial ordering informed the approach to demarcation in the design. The rituals on site made use of human scale, an individual's orientation to space can be exaggerated to the demarcation of sacred space.

In pre-1800 Eurocentric gardens, specific approaches to designing with metaphysical expression was based on world-images, spatial orientations to cosmos and geometric accuracy, all describing particular rationalities. From Medieval gardens to the present day urban landscape, the expression of landscape relative to cosmos through space has dissipated as urban priorities have shifted. This has brought a change in the way modern landscape architectural theory relates to metaphysics and cosmological expression.

To start, an enclosed garden typology of interest for this article is *The hortus contemplationis*, the garden of contemplation. About this typology, Aben and De Wit write

> "Integrity or perfection can be found in the spatial completeness of the hortus contemplationis, the garden of reflection, which depicted the hierarchy of the Universe with God as its centre. This was a space surrounded by gallery and with sky for ceiling, the monastery was organised around it."
> (Aben & De Wit, 2001)

A garden focused on placing man in relation to the cosmos and divinity. The *imago mundi* is a world image reflected in the hortus contemplationis. The depiction, also used by Roman settlements, was used to demarcate spatial order where the horizon marked the boundary.

The hortus contemplationis of the Middle Age was considered a finite space in an infinite wilderness. Its planes were a restricted measurement representative of earth and linked to the sky by an *axis mundi* or world axis. The horizontal and vertical planes would in unison create an existential space as the vertical orientation illustrated the sacred and the horizontal plane represented the profane (Aben & De Wit, 2001). By the medieval age, the *hortus contemplationis* had adopted a cosmogram, formalising the relationship between heaven and earth through the spatial component of geometric harmony.

This component reflected a cosmic orientation reflective of divine convergence and the absolute rule of God (Aben & De Wit, 2001). This is highlighted in the study of the Cloister at St Gall Monastery. The Monastery shows how scripture is then expressed through symbolism overlain onto the *imago mundi* and the *axis mundi.*

Similar to the evolution of the Magaliesberg Mountain, the garden experienced a shift from homogenous community to a herterogenous urban living. The Cloisert shows how predominantly Christian values were exhibited through bound form, while the Spanish gardens of the Alhambra respond to the hybrid cultures of urbanity.

After the Middle Ages, the garden was brought from the rural landscape into the urban context. Therefore, another typology of interest is *The Garden City*. After the middle ages, the enclosed garden had opened up further into the

Figure 4.8: *Exploring the evolution of the garden: The Sacred and the Profane. (Author, 2018)*

The central part of the garden considered to be pure. In contrast to the wild, impure and unpredictable exterior. (Aben & De Wit, 2001)

4.6 Exploring the evolution

The Renaissance Garden marks a shift from emphasis on place on the vertical as gardens start to open to the wider landscape. Landscape is manipulated from inside the garden by vantage points and vistas. (Aben & De Wit, 2001)

Figure 4.9: *Exploring the evolution of the garden: Horizontal and Vertical. (Author, 2018)*

The Renaissance Gardens started making use of horizontal and vertical planes. Double volumes are introduced, the landscape beyond the walls is less wild, rather further seen as part of the garden. (Aben & De Wit, 2001)

horizon and was brought from open landscape into city context where it became part of urban space. The refuge of paradise sought after in the enclosed garden had now been translated into the city as a surprising transition from dark alleys to tranquil palace courtyards. The results were larger gardens opening up farther towards the horizon. Such an example is the Alhambra, a dualistic spatial manifestation of Islamic and classical tradition (Aben & De Wit, 2001).

The Patio de los Leones is built in a way reminiscent of the Islamic Charbagar layout with some Western influence identified by manipulation of the central circular form.

According to Aben, the Alhambra is situated to function as a bridge between landscapes and plains. (Aben & De Wit, 2001)

Figure 4.10: *Exploring the evolution of the garden: The Garden City (Author, 2018)*

Formations of large garden complexes containing smaller gardens within. Garden City is considered a container of finite enclosed gardens within a vast landscape.

(Aben & De Wit, 2001).

Figure 4.11: *Exploring the evolution of the garden: The application on framework level (Author, 2018)*

A connection to the heavens.

A grounding on Earth.
A path to the city below.

Response to the initiation camps, the Indigenous nursery and the urban city.

Figure 4.12: *[Right - top] Sketch of cloister enclosed by monastery corridors. (Author, 2018)*
Figure 4.13: *[Right-most-top] Plan of the Cloister at St Gall Monastrey Aben & De Wit, 2001).*
Figure 4.14: *[Right-bottom] Diagrams of Axis Mundi. (Author, 2018)*
Figure 4.15: *[Left] Diagrammatic explorations of courtyards influenced.*
Figure 4.16: *[Below] Sketches of influence on boundary exploration (Author, 2018)*

4.6.1 CLOISTER AT ST GALL MONASTERY

Cloister at St Gall Monastery, Switzerland c 820.

Built in the 9th century, it provides light, safety, clarity, organisation and fertile ground in the midst of an inhospitable nature. As the monasteries stood as symbols of a cosmic order, so did the enclosed garden at its center. The cloister still stands as the spatial manifestation of Christian faith with spatial elements making reference to biblical scripture. This scripture is then expressed through symbolism overlain onto *'he imago mundi* and the *axis mundi.*

This is seen in how the entire monastery is in cruciform, planned with the cloister at its center. The buildings around the cloister are two stories high with an unbroken ring of tall buildings on their outskirts. The cloister itself is an ideal plan as per the description of the Temple built by the Israelites, described in the book of Ezekiel in the Holy Bible:

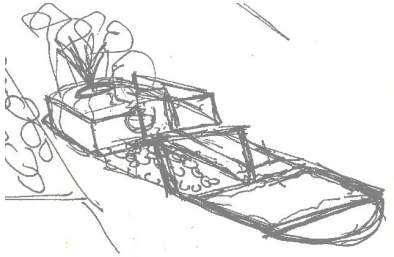
"So he measured the court, a hundred cubits long, and a hundred cubits broad, foursquare" (Aben & De Wit, 2001).

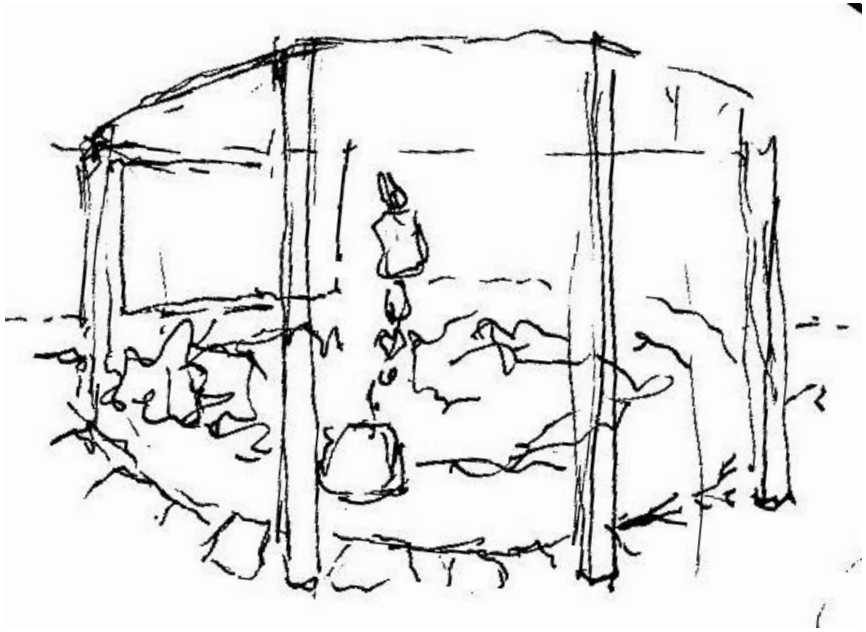
The enclosed garden shows how the sanctity of a space can be retained in a single bound element. The gardens stand as one space in which the impurity of the world are left outside the garden.

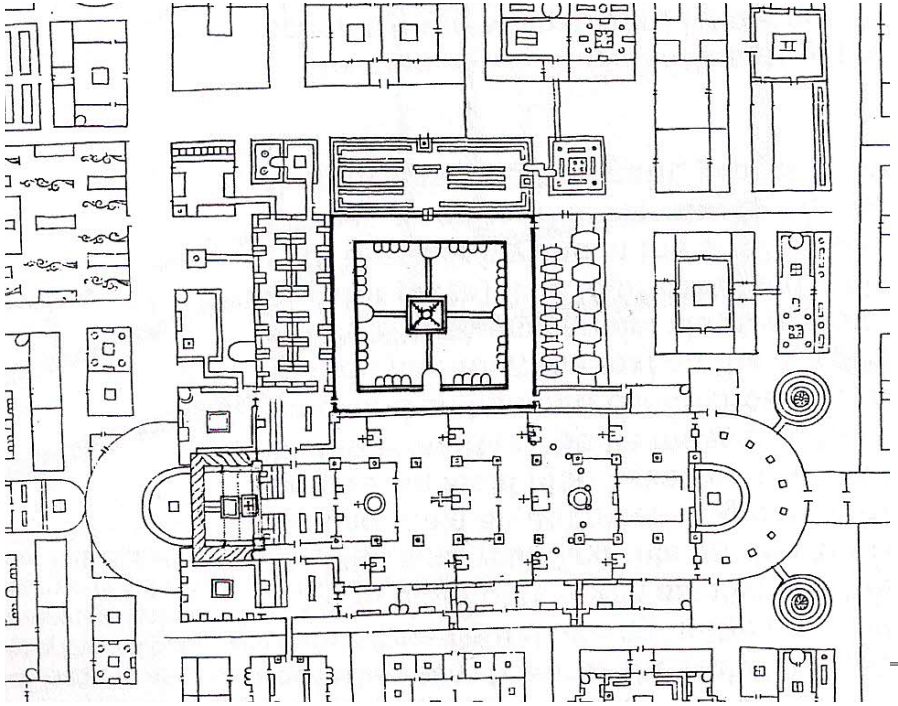
In the same way, the settings for rituals can stand as a singular space separated from the impurities of the world. Except, on site no physical wall is built around the space - a spiritual leader will be led to a place that provides this sense of separation.

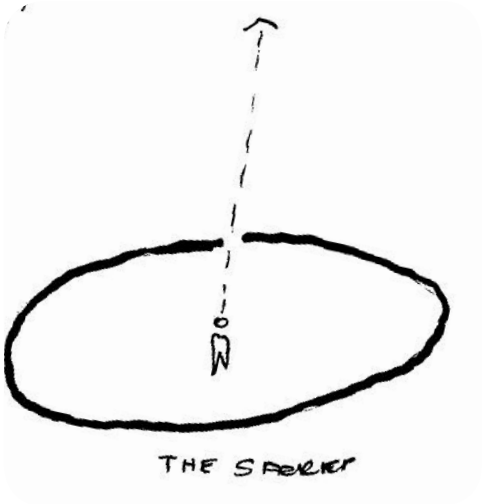
On site, in the initiation camp closest to the nursery, this separation is achieved through a group of trees in the landscape and the height of the crest.

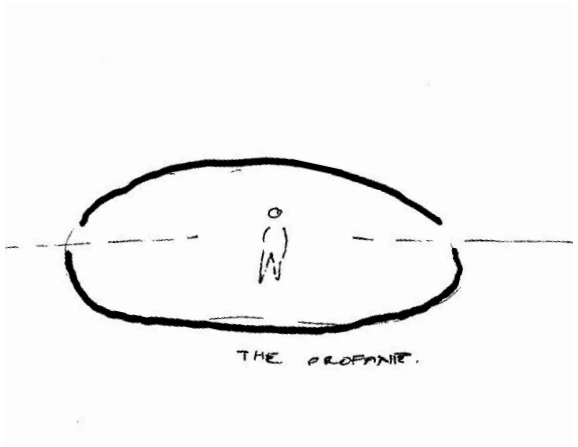
The *imago mundi* which is used in the cloister is replaced with a world view on site. This world view places man in a vast openness where the vastness of land is seen to contribute to sanctity of space.











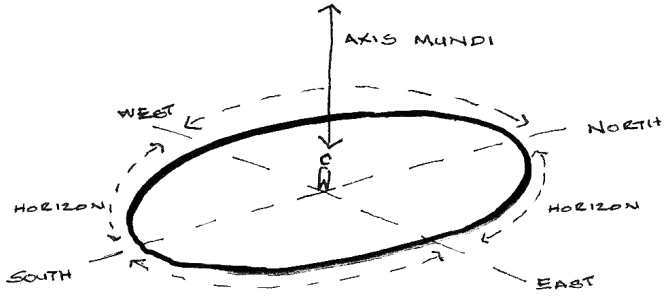


Figure 4.17: *[Right - top] Plan of the palace complex indicating the historic water supply system of the Alhambra, 1954 by Francisco Prieto Moreno. (De Klerk, 2001)*
Figure 4.18: *[Right-bottom] Sections through the Palace Complex, 1780, by Shanchez Sarabia, Antiguedadas Arabes de Espafia. (De Klerk, 2001)*

4.6.2 THE ALHAMBRA PALACE GARDEN

The Alhambra Palace Garden, Granada, Spain

Still standing as an important remnant of Islamic rule in the Iberian Peninsula, the palace gardens showcase a mixture of influences throughout Spanish history.

The designs of the gardens are a romantic interpretation of the Islamic productive landscapes recreated by Spanish architects. These modernist architects subscribed to the hybrid identity found in the Granadine gardens and its influence is still evident today. The hybrid gardens were produced through the spatial manifestation of design influence from different urban cultural groups, then expressed over the dramatic topography of site. (De Klerk, 2000)

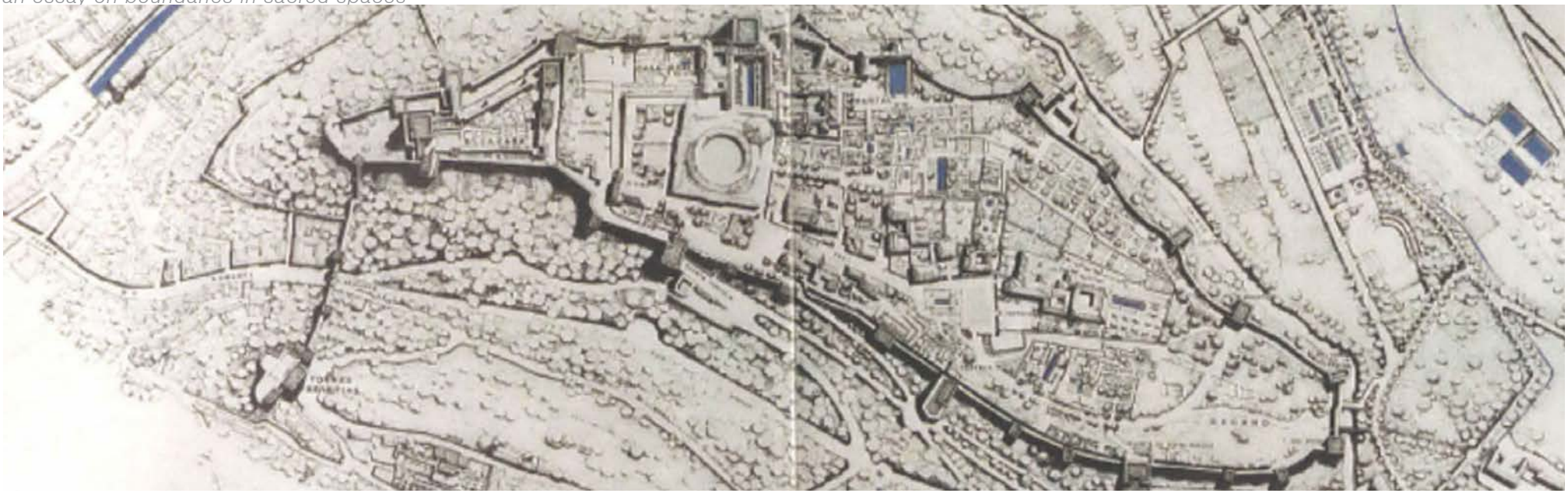
Despite evidence of hybrid cultures throughout the palace, metaphysical expression is still evident through orientation of space and use of symbolism. This includes influence from the Islamic Chahar Bagh garden.

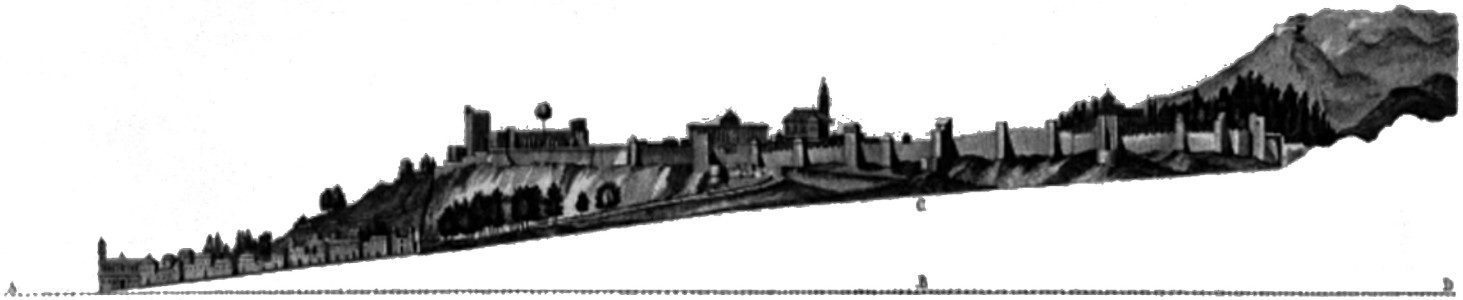
In relation to the mountain, the gardens stand as a constructed cultural landscape towering over the entire urban dwellings of Sierra Nevada. The connection to the landscape is made through a string of miradors, framing the landscape and unifying the palace visually.

The Alambra in Spain represents what the Magaliesberg mountain potentially could be to its surrounding cities. It stands as a unified cultural landscape with parts telling stories of times past in history.

On the Magaliesberg mountain, there stands one cultural landscape with smaller parts telling present stories of sacredness. It is in the unification of these parts as one cultural landscape where the Alhambra is able to stand as a cultural landscape representing the developed urban conditions.

This same notion can be adapted to the cultural landscape on the Magaliesberg mountain. In demarcation, the entire cultural landscape should read as one whole, representing the sanctity of different cultural groups over time.





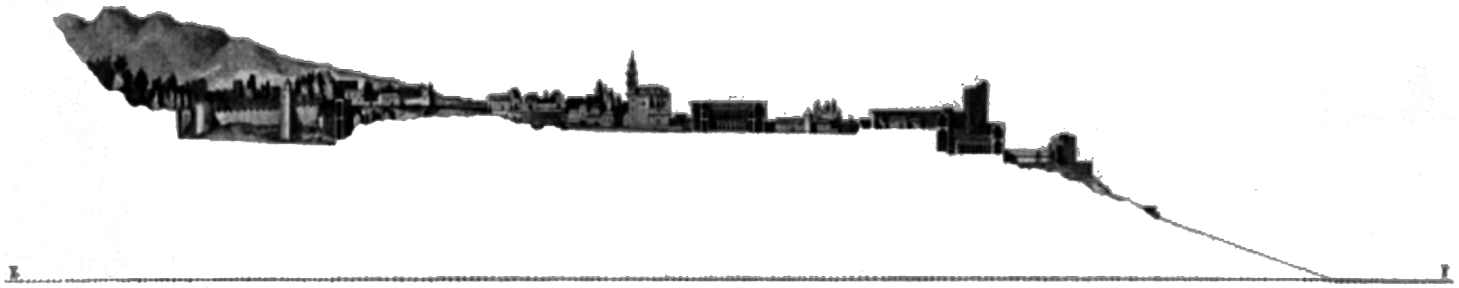


Figure 4.19: *[Right] Adding the cultural layer through a conceptual approach to framework. Based off of existing cultural connections made with to landscape through use or use of neighouring space. (Author, 2018)*
Figure 4.20: *[Left] Diagrammatic exploration of intervention at valley. Managing water quality and retaining activity. (Author, 2018)*

4.7 Design Influence

4.7.1 FRAMEWORK DEVELOPMENT

Similar to movement from the enclosed garden in the countryside to the '*The Garden City'*, in an urban context, the setting for ritualised and non-ritualised practice on the mountain were shifted from rural areas to urban areas in which they now stand from as early as 1854 in the northern town of Baviaanspoort.

The Alhambra stands as proof that 'the garden' can successfully reflect an overlay of changing cultures over time.

Whilst the enclosed garden shows how - in a confined space - the expression of metaphysics can be amplified.

At a framework scale, the intention was to create a 'garden city' on the Magaliesberg ridge. This garden would express the cultural overlay found on-site. It would also highlight the interdependency between cultural conservation and environmental preservation, reflecting the contextual principal of living and the indigenous metaphysical stance in an urban context, Ubuntu. In line with Professor Vellem's notion of the sacredness of a mountain as a reminder of the custodianship of man.

In order to achieve this, the environmental concerns for cultural practices posed by the City of Tshwane were addressed. Then an argument for the conservation of the entire cultural landscape according to UNESCO was made. This was done to motivate for the protection of both culture and environmental condition - an oversight by the city.

4.7.2 CULTURAL LAYER

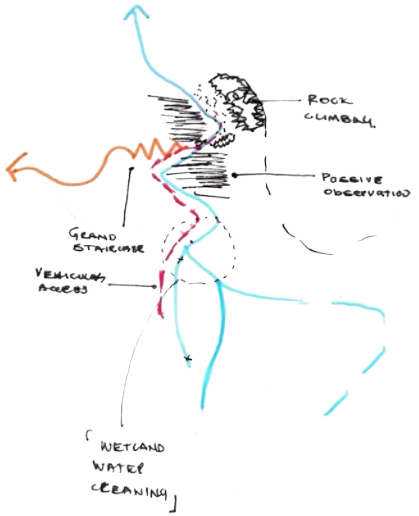
A conceptual approach was taken to respond to contextual uses of landscape in the surrounding neighborhood and those on the mountain. If they match, this area would be designated a particular zone which will be experienced by the user passing through that space

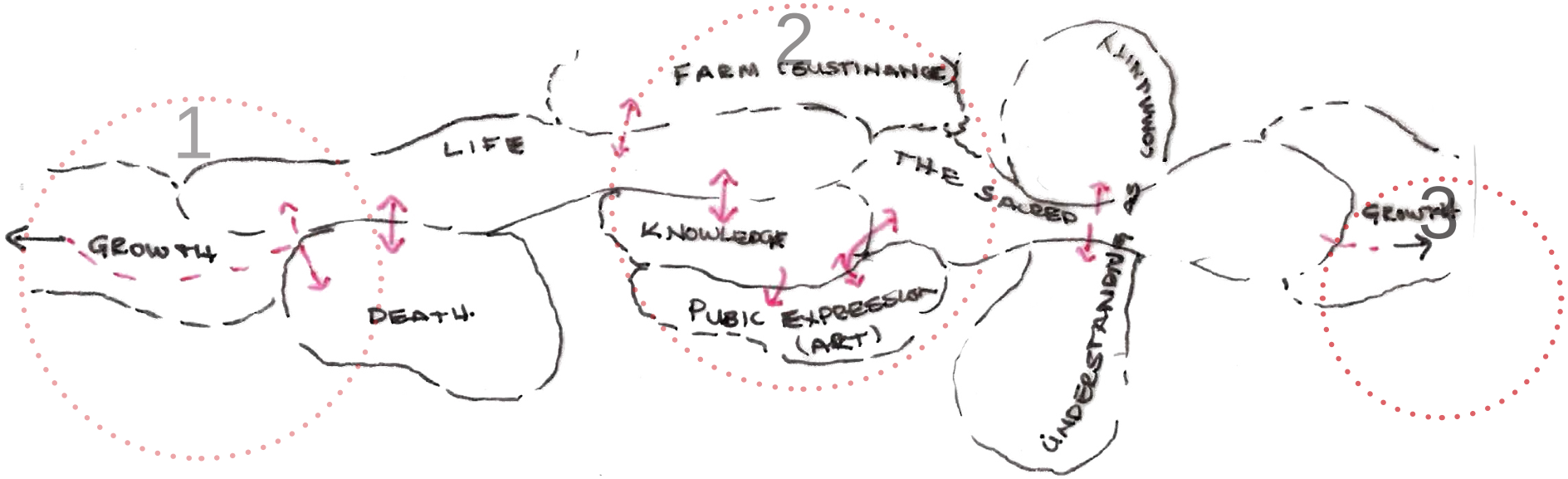
4.7.3 SENSITIVITY MAPPING

This was based off desktop study and site visits.

The sensitivity map took into consideration the flora, fauna, typography, geology and current use of the site.

Overlay of this information gathered in Chapter 2: Urban Vision, provides a guideline for locations with conservation opportunity and those that need environmental preservation.





4.4 Demarcation in The Southern African Landscape

4.4.1 THE SPATIAL ABILITY: THE USER'S ORIENTATION IN SPACE

In an article written by Rudolf Van Rensburg and Mary-Anne de Costa, it is argued that demarcation of space in the southern African context is independent of boundary due to a deeper connection with space beyond any physical boundary.

In arguing this, reference is made to the concept of spatial ability proposed by Labelle Prussin as a concept to understand the cultural quality of space and place in the African context. Prussin defines the concept of *spatial ability* as "the capacity to present knowledge about space and to organise spatial information". This defines a user's ability to orientate themselves in a space based on an inherent approach to the space they carry and the qualities of the space they find themselves in.

The authors then further categorise this spatial ability by a measure created by cross-cultural psychologist J. Berry, termed *'field dependence'* and '*field independence'*.

Field dependence is defined as:

"A reliance on external visual cues resulting in a stronger consciousness of boundary and limitation, and as a cognitive style, presents a literal interpretation of space".

Whilst field independence is defined as representative of:

"A deeper understanding of space beyond physical boundaries."

Van Rensenburg and Da Costa draw three main conclusions:

Firstly, from spaces configured from field independence, the concept of space is generated from a dynamic process. It is through this process that a deeper understanding of space is formulated. Whilst spaces are configured from field independence, space is more a static condition.

Secondly, they draw parallels between field independence and the *'highly developed spatial imagination typical of nomadic cultures',* whilst they connect field dependence to the '*highly structured urban world suppressing spatial complexity'.*

And finally, they then use the measure to highlight the perception of space in an indigenous context as being a*ll public,* except that which is defined by ritual as private space. Whilst the perception of space in a western context is predominantly *privately owned* until designated public through legal process and demarcated with physical boundary. (Van Rensburg & Da Costa, 2008)

The three points raised speak of the two approaches to demarcation on the Magaliesberg. While the urban context fixates on boundary being used to designate private space, in contrast, boundary is difficult to identify on the mountain because of the infinite nature of the spatial ability generated through a ritualized space. Infinite in ownership and infinite in orientation, in which the dynamic processes are traditionally ordered to call on a spiritual realm which in itself cannot be bound. In other words, the sanctity of the space may be demarcated but

the spatial ability of a ritualised setting is infinite.

This spatial ability can be categorised by aspects listed by Aben earlier: "cosmic orientation, temporal orientation and topographical orientation". Dynamic processes that render spaces finite depend on these qualities as gardens depend on them to express metaphysics. In search for a form which expresses this spatial ability, these criteria hold significance.

To see this in play, we will take a look at the southern African settlement and its approach to demarcation.

4.4.2 SETTLEMENTS AND THE DEMARCATION OF THE METAPHYSICAL

In his book about the significance of African patterns in landscape, Ron Eglash, an American mathematician, makes reference to a spatial ability manifested in landscape through fractals, throughout the continent.

"Traditional African settlements typically show 'self-similar' characteristics: Circles of circles of circular dwellings, rectangular walls enclosing ever-smaller rectangles, and streets where broad avenues branch down to tiny footpaths with striking geometric repetition. The fractal structure will be easily identified when we compare aerial views of these African villages and cities with corresponding fractal simulations."
(Eglash, 1999)

The studies of Ron Eglash are mainly for ethno-mathematical purposes, but his analysis of fractal patterns in African settlements speaks to the spatial qualities of field independence referred to by Van Rensburg.

In these African settlements, fractals are said to express cosmic order. The general world-view depicted by this rationality is one where, through concentric self-similar forms, the most sacred element in the settlement is located at the core of the concentric forms or the metaphysical element is located in the smallest part of the fractal.

Case Study: Cetshwayo Royal Quarters, KZN

In a description of the way of life of the Zulu in 1879, Marguerite Poland describes a settlement consisting of concentric circles, where each homestead expresses a similar 'status gradient' as experienced in the Ba-ila settlement. In the smallest part of the fractal, where typically the most sacred communal entity is stored, there stand the cattle. In this community, the cattle hold metaphysical as well as economic value, therefore, there would always be a particular section for them in a sacred location in the settlement – in the centre of the seed form.

Poland describes how as the homesteads graduated towards the back of the settlement, the biggest homestead is located the furthest from the center of the settlement.

As these homestead are located in a spatial orientation requiring passage through the intensification of the fractal, they also gain the responsibility to feed everyone who enters the city (Denyer, 1978).

Here, we see the dynamic process used to strength the spatial ability is non-ritualised but as passage through space, is still ascribed meaning.

Figure 4.21: *[Left] Diagramtic exploration of influence on user orientation in space (Author, 2018)*
Figure 4.22: *[Right] Spatial exploration of influence on user orientation in on-site: the propsed design of an open air-observatory (Author, 2018)*

4.4.3 CONCLUSION

The relation of man to sacredness is based on his metaphysical position of the world around him. His understandings of time, identity, being and space. Pre-1800 gardens were designed as spatial manifestations of this understanding which enabled man to orientate himself within his cosmos.

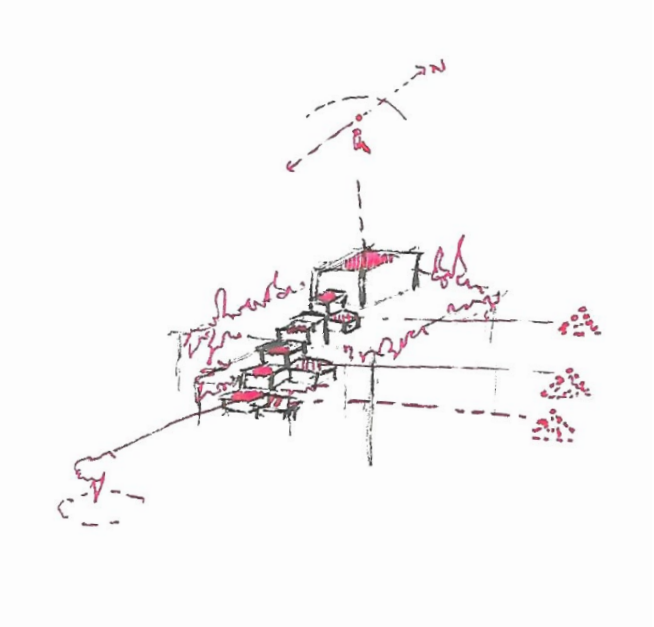
In southern Africa, orientation is experienced in cultural landscapes and settlements.

4.5 Reflection of discussion

The Magaliesberg mountain is considered a cultural landscape with varying degrees of sacredness. As a result, the sanctity of certain spaces needs to be demarcated, protected and retained but the orientation of the user should not be dependent on the boundaries used to demarcate spaces. Rather, the tools of cosmic orientation, temporal orientation and territorial orientation are also be applied here. Instead of using walls to carry out this technique, the dynamic process of a user in space is used.

Then, in the continuation of tradition, cultural landscape should read as one where the tradition of sacredness, history, traditions and culture is allowed to evolve.

In this way, it is not a constraint that urban dwellings are comprised of a different spatial ability. This only means that when the mountain is accessed, the user moves from a field dependent on spatial ability to one of field independence - creating a powerful experience of contrast.



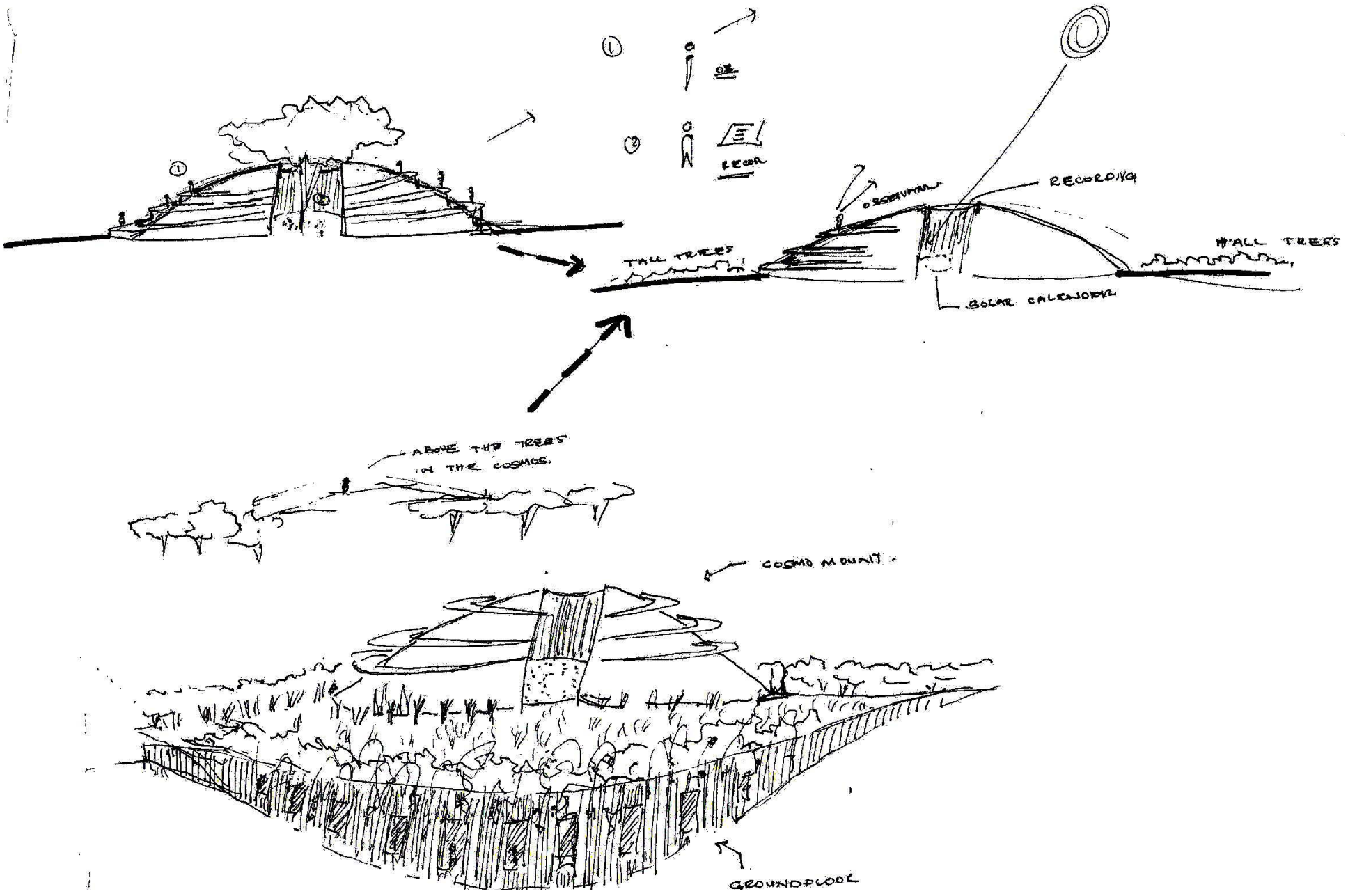


Figure 4.23: *[Right] Diagrammatic exploration of demarcated spaces sitting in landscape. In the passage though landscape, dmearcated sacred spaces are reached. (Author, 2018)*

4.8 Implication on space-making

4.8.1 INFORMANTS

On the mountain, the sacred spaces have already been demarcated by ritual. They now exist as active spaces where residents partake in traditional ritual.

As discussed in *Chapter 3: Earths Wisdom*, the rituliased spaces include:

1. The initiation camps

2. The nursery

3. The prayer alters

These spaces exist within traditionally or spirituality demarcated areas. While the non-ritualised spaces characteristically venture between being demarcated and spreading through landscape.

This can be seen when comparing the cattle kraals and the spaces for prayer altars:

The cattle kraals stand as an example of a indigenous structure that forms part of both categories. When read individually, each kraal is enclosed by walls meant to keep the cattle within. When read as a whole, the individual kraals stand in unison organically spread throughout the landscape.

Whilst in the spaces for prayer altars, the user moves through the landscape to get to a designated sacred space - passing the same sets of trees, perhaps orientating themselves around the same set of boulders and battling the same slope each time they journey towards the sacred space. Once in the space, the world around them fades as herbs are burnt and prayers are made around curls of smoke carrying messages to the heavens.

It is in the spread through the landscape that the dynamic process of the journey to the sacred space of the prayer altar and the everyday existence of the cattle kraal overlap. Then, moving through the landscape to demarcated spaces, a selected few spatial users meander into spaces demarcated as more sacred than from whence they came.

In the overlay between ‘sacred demarcation’ and ‘spread through landscape’, a spatial ability unique to the mountain is found. One which is argued in this essay to define the value of demarcation in retaining the sacredness of the mountain throughout the evolution of tradition.

This is discussed below under the two explorations conducted under the theme of demarcation. The overall design response becomes the contrast of demarcated sacred spaces to the rest of the landscape, highlighting the significance of these spaces and exaggerating the orientation qualities a user will experience.

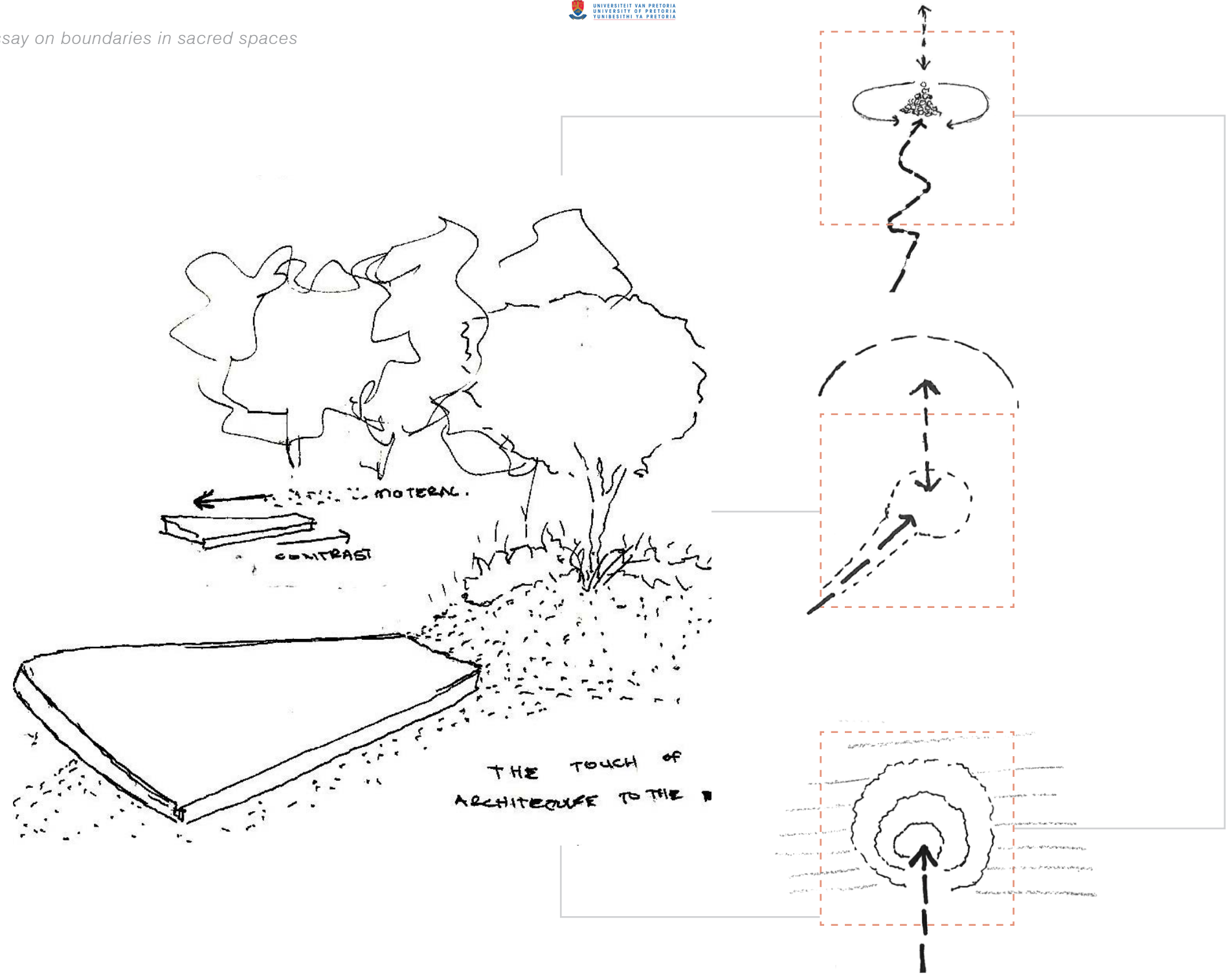
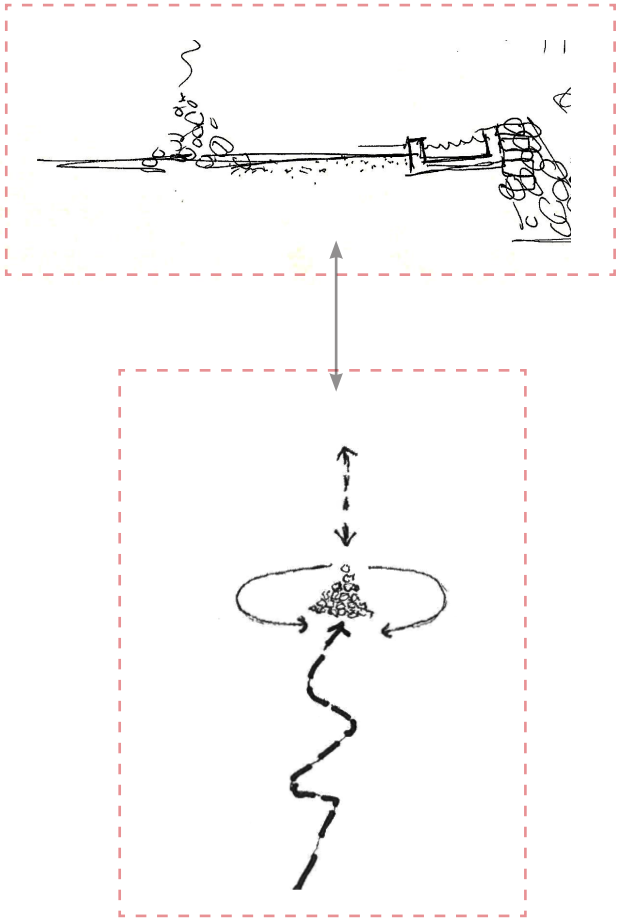


Figure 4.24: *[Right] Exploring a bounded prayer courtyard. (Author, 2018)*
Figure 4.25: *[Right-bottom] Exploring the functionality of the bounded setting for ritual: Prayer Altars. (Author, 2018)*



4.8.2 BOUNDED CONTRAST OF THE MOST SACRED

Rationale

In this approach, it is proposed that the most spaces - once designated - are set apart from the landscape by contrasting them to the existing landscape. Whilst the non-ritualised settings and any other extension of program is spread through the landscape.

The role of this use of demarcation is is twofold.

Firstly, in understanding the approach to demarcation in the urban setting versus those experienced on the mountain, a designer can create contrast in the transition from sacred urban spaces, to non-ritualised spaces on the mountain, to sacred spaces by ritual. In other words the approach to sacred spaces can be designed.

Secondly, in the demarcation of spaces, the non-ritualised spaces can be spread through the landscape in the same way the kraal was spread.

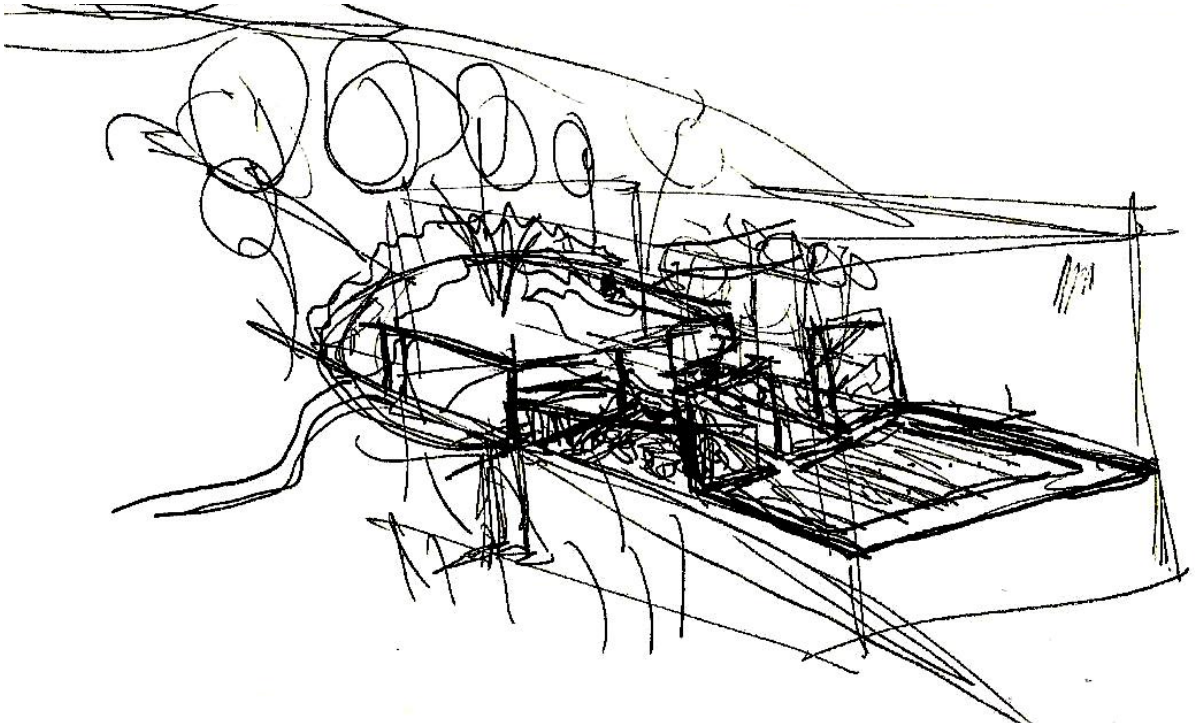
In overlaying these two, the cultural landscape fosters communal interaction between users of varying degrees of sacredness, who are all unified by their participation on one inherently sacred landscape. This communicates the rationale of custodianship spoken of earlier by Professor Vellem.

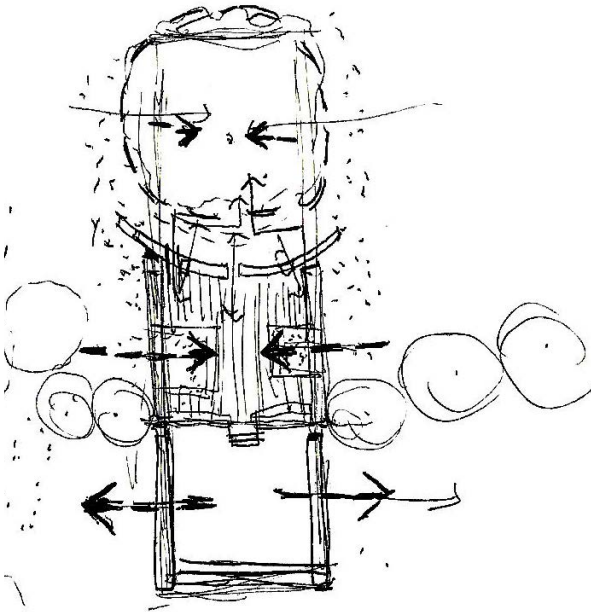
Design

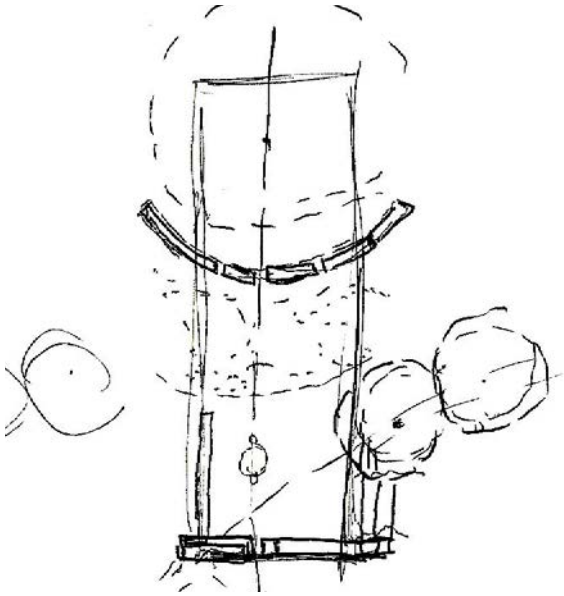
The mode of contrast used are platforms which merge, converge then project out of the landscape, intending to create areas where landscape and sacred ritual overlap, then where the two are separated.

Figure 4.24 hows the layout of the design intervention for the prayer later space.

From the left, the user moves through a public garden shared with the rest of the landscape into a courtyard. The courtyard transitions from most public to most sacred where at the tip of the courtyard opposite to the entrance, users are able to build altars and make prayers.







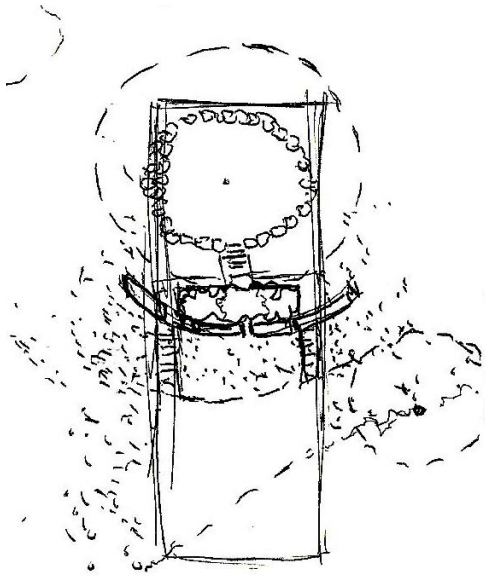


Figure 4.26: *[Right] Exporing the bounding the non-ritualised (Author, 2018)*

4.8.3 CONTRAST INVERSED

In reaction to the previous attempt, this approach sought to contrast the non-ritualised spaces to the sacred spaces 'hidden within the landscape'.

This is done to make less of a design influence on the manner in which ritual is carried out in the ritualised areas and to bring less public attention to them.

Design

In this approach, platforms are reserved for the non-ritualised spaces and the extension of new programmes.

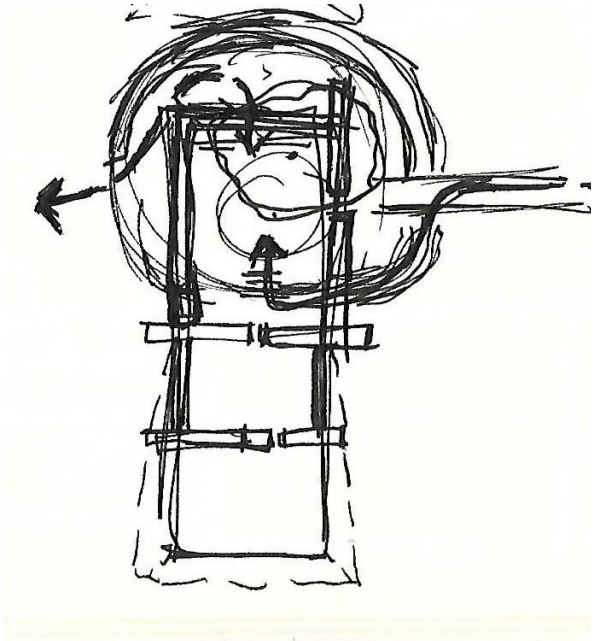
To this effect, this shows how the intiation camps, already invisible to users on the lower levels of site, are lost in landscape whilst a platform beneath it stretches across the landscape up to a public view point.

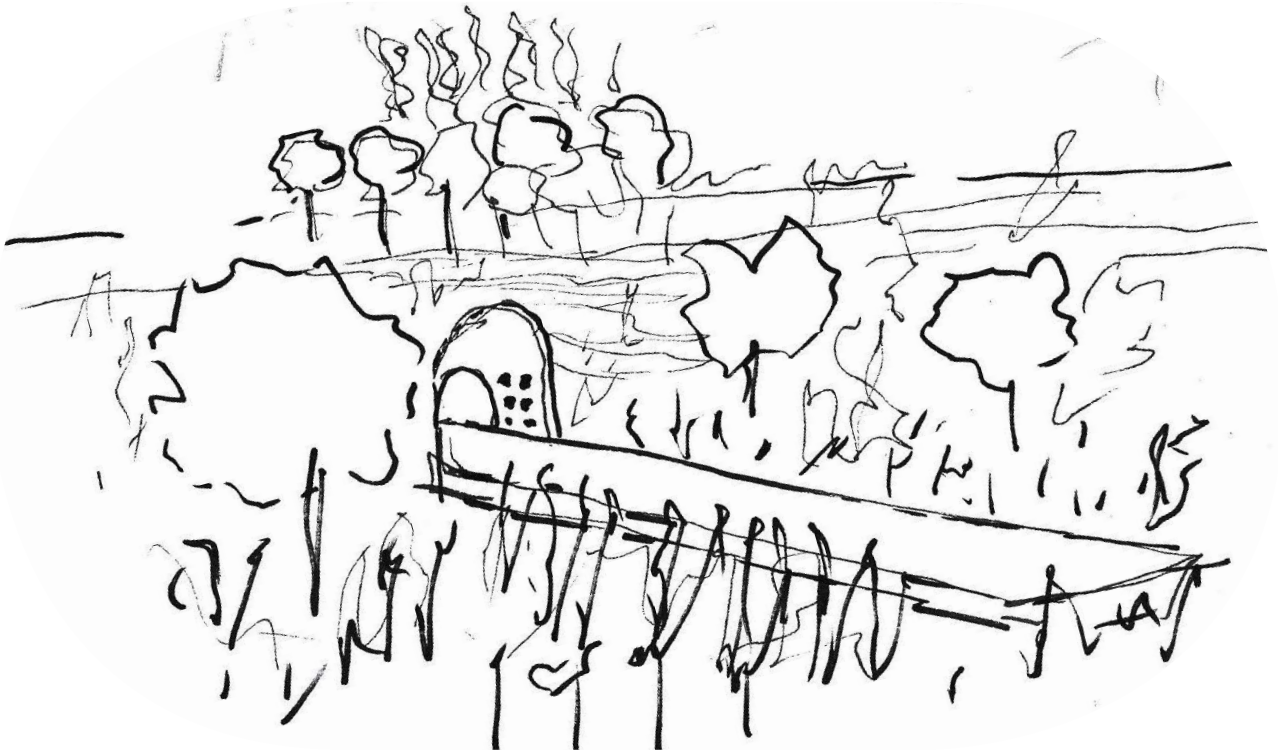
The platform makes reference to the intiation school based on its orientation, but that will never be known to an irregular visitor to the cultral landscape until the day the smoke rises from the initiation camps and men walk down the mountain at the end of the initiation period.

Through an extention of the programme, a herbarium is added to the site. The manner in which plants are displayed makes reference to the bird-hides found within the walls of an abandoned excavation on-site.

To see the plants, users must move through a space that is cut into the moutain. From a technical standing this is done to ensure the plants on display keep a cool temperature. Due to the compression of soil, the mountain's dense materiality increases its insulation capabilities. This is used as an feature in the design to create a cool environment for the plants on display.

While on an experiential standing, users move through this platform from a public viewing platform into an enclosed area to slow down the user and create a space of rest.





4.9 Precedent study

4.9.1 PIEDRA TOSCA PARK

Designer: [Architect] RCR Architects
Location: Catalunya, Spain

In this project, platforms are created when steel structures are used to retain rocks.

Spread through the Spanish landscape, this project aimed to clear land of the basaltic wash off from the Croscat Volcano for the establishment of a national park.

The concept was to take the wash off and create a sea of rocks cut through a portion of landscape. Its experiential aim was to showcase the unique landscape.

This project aimed to enhance the experience of space by looking at the materiality of the site, but use it in a way that stood out from how it is normally experienced. A raised bed of platforms highlights the value ascribed to the rocks by the designers of the space.

This approach is to be adapted in the design. To take materials and activity already engaged in on site and make it anew by how it stands in the landscape.

Figure 4.27: *Piedra Tosca Park (ArchDaily, 2016)*

4.10 Critical reflection

4.10.1 A RETROSPECTIVE ANALYSIS

Understanding demarcation in sacred spaces is of great value when designing cultural landscapes in the southern African context.

The approach to sacred spaces in landscape are unconventional to an urban dweller unaccustomed to the seemingly contradictory nature in which sacred spaces are independent from their physical boundary whilst still being carefully demarcated from the boundaries in which they are located.

The physical boundaries drawn in a demarcated sacred space in the cultural landscape may appear simplified, but this is due to the complex meanings assigned orientation. In designing spaces which build onto this spatial orientation - the sacredness of the cultural landscape can be preserved.

4.10.2 A MISSING LINK

Where the design explorations lose their potency is in the relationships between the platforms designed in the landscape.

In referring back to the pattens found in the southern African landscape by mathematician Ron Eglash, he makes reference to ordering systems in southern African settlements which generate pattern forms. Eglash found that these ordering system were a result of landscape typology and culture expressed into patterns generated by a vast generation of people. In other words, these patterns, unified the settlements and generation by spatial orientation systems harnessed by all residents.

In the next essay, we explore if that same unity can be achieved on the Magaliesberg.

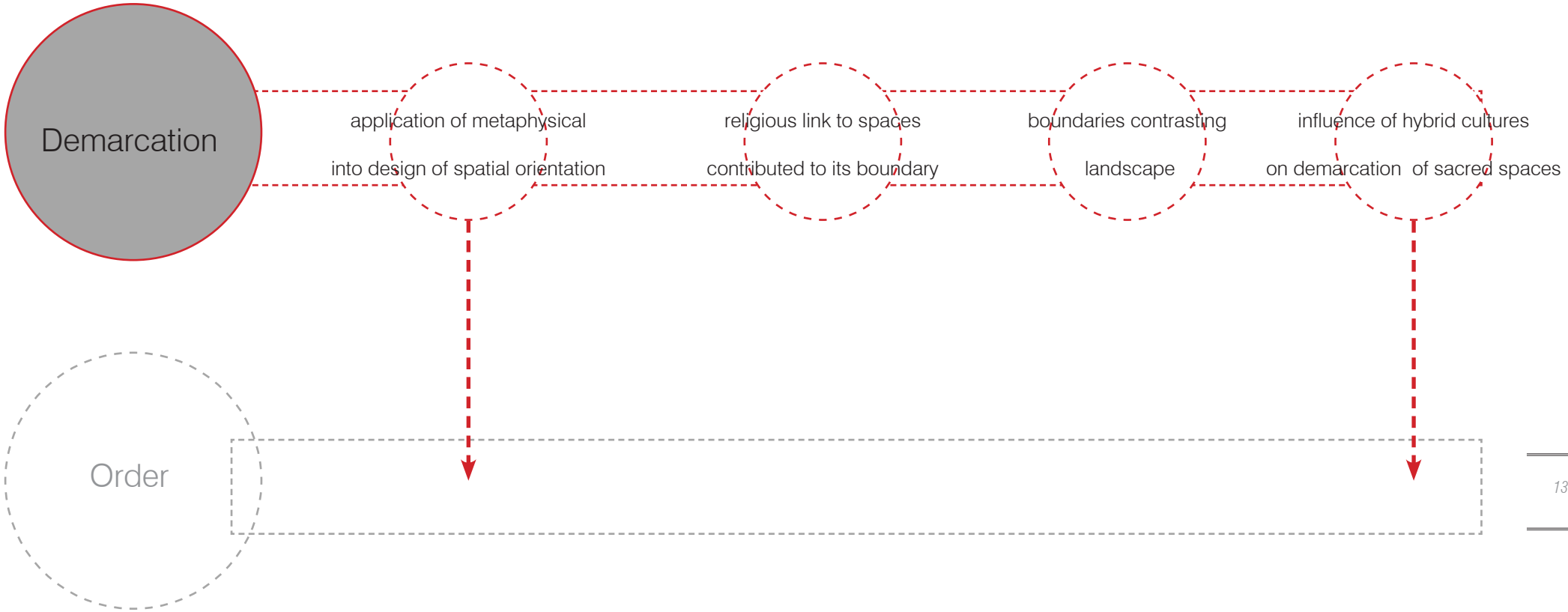


Figure 4.28: *Summary of informants gathered for en-richening the next essay (Author, 2018)*

Figure 4.29: *Close-up site image of bird hide. Individual holes create a united aesthetic (Author, 2018).*

Figure 5.1: *Journal sketch (Author, 2018)*

V

ORDERING

AN ESSAY ON THE CHAOTIC ORDER OF THE INDIGENOUS LANDSCAPE

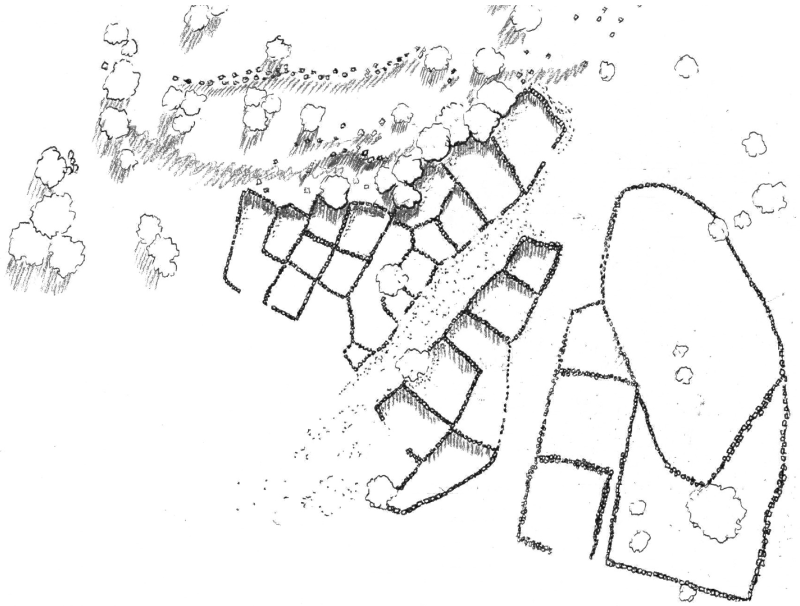


Figure 5.2: *[Left] Fractal Patterns identified by author in the formation of the cattle kraal (Author, 2018)*
Figure 5.3: *[Right] Image of kraal on-site (Author, 2018)*

5.1 Introduction

In this essay, the role of ordering parts in the indigenous landscape is discussed. In its organic nature, there appears an underlying system to the chaos. An assortment of rules which follow the natural world - merging indigenous architecture and landscape into one.

In the previous essay, through a study of the demarcation, we uncovered that the combination of spatial orientation and demarcation can be used to preserve the sanctity of spaces in particularly sacred spaces. But in seeing theses spaces as parts in the landscape, the quality of wholeness is lost.

As a response, this essay seeks to learn from the ordering of the indigenous landscape which have retained their character throughout evolution.

In the previous essay, fractal patterns were introduced as an ordering system used by southern African settlements to bring order. These fractal patterns will be further studied as tools for ordering an indigenous landscape.

5.1.1 SUB-QUESTION

How can a landscape be ordered to retain the sacredness in the unity of its parts?

5.1.2 5 STATEMENT

There is a wholeness to the indigenous way of life, this should not be lost to the ordering of sacred spaces in the landscape.

5.2 The Magaliesberg

The settings on site are separated by both tangible and intangible boundaries. In their separation, they function as isolated spaces located next to the other as coincidently as two neighbours in a quiet suburb.

However, in reality, it is by no coincidence that the existing settings for ritual and non-ritual practices adjoin. These practices are on the mountain because of their traditional placement. For instance, let's look at the initiation camps and the plant nursery. Initiation schools are placed on mountains for their proximity to river valleys, herbal dispensaries and refuge offered by the mountain. Whilst, the nursery stands as a method of sanctifying the once discarded mountain.

It is not a coincidence that these two exist as neighbours; their placement is a result of the wisdom of a passed down tradition. The nursery being perfectly located in proximity to service the initiation camps. Demarcated as separated elements, the two form part of a meaningfully unified landscape.

5.3 The sacredness of order

In looking for an ordering system which unifies a landscape made of sacred parts, case studies into the use of fractals to order the indigenous landscapes are discussed in this essay.

So, what are fractals? In both pure and applied mathematics, fractals are described as the repetitive geometric patterns produced when an algorithm relating to infinity is modeled (Eglash, 1999).

Due to the nature of indigenous architecture being built using an iterate process, fractal simulations are used throughout case studies to determine the local cultural meaning of architecture. It is through this iterative process that patterns are generated and indigenous architecture is made.

5.3.1 AN INTRODUCTION TO KEY RESEARCH INFORMANTS

In the 1980's, the American mathematician Ron Eglash was studying aerial imagery of north African villages. In the chaotically configured layout, he identified a particular mathematical order between individual compounds - from an aerial view, he recognised fractals in the landscape.

Thereafter, he acquired a Fullbright Scholarship to study the fractal patterns in various African cities. Traveling from eastern Africa down to southern Africa, he identified that:

> "While fractal geometry can indeed take us into the far reaches of high-tech science, its patterns are surprisingly common in traditional African design and some of its basic concepts are fundamental to African knowledge systems." (Eglash, 1999)

Susan Denyer, an American architect, traveled a similar route throughout the African continent. This was done to graphically record indigenous architecture in the 1980's in fear of this knowledge being lost. Denyer currently stands as a world heritage advisor for ICOMOS (The International Council on Monuments and Sites) in which she advises the UNESCO on world heritage property with cultural value.

In her book 'African Traditional Architecture', she documents similar findings as those of Eglash, making notes of repeated patterns and knowledge systems common across design schemes encountered (Rutgers, 2012).

The research conducted by these two authors will be most referred to in the discussion of fractals in indigenous design.

In ethnology-mathematics, a branch of mathematics studying the relation between mathematics and culture, Eglash identifies the presences of the geometric patterns in design as both conscious and implicit, depending on the case. Through case studies, he identified that the patterns are 'derived from explicit rules in African indigenous design.

5.3.2 A SACRED INFINITY

Fractals are evolutionary because of their link to the concept of infinity. Mathematically this allowed for the evolution of high-tech sciences, by indigenous cultures, to the orientation a user has in space. The value of architectural order making reference to infinity meant that the spiritual realm could be referred to in its infinite nature. Also, in the value placed on communal living, this meant that in the expansion of a city, it was possible to conceptualise the iterative additions of new units to one compound.

A case study of infinity in a city

In the study of the City of Logone-Birni, in Cameroon, recursive construction methods are used in the expansion of the city.

The result is a city made of a recursive set of rectangles which range in scale from city boundary, to compound, home to iconography. This case study shows the significance of the concept of infinity to this city, as what starts as an ordering system is embedded deep into culture.

Figure 5.4: *[Right] The City of Logone-Birni, Cameroon aerial view. (Eglash, 1999)*
Figure 5.5: *[Right-center] Simulation of fractal development in the city. (Author, 2018)*
Figure 5.6: *[Right-most] Diagrammatic breakdown of recursive forms in city layout repeated in floor plan of royal palace. Arrows indicate entrance route. (Author, 2018)*

5.4 Case study 01:

5.4.1 THE CITY OF LOGONE-BIRNI, CAMEROON

An aerial photograph shows the settlement architecture of the Kotoko people along the Logone River near Lake Chad. The fractal patterns observed is one of a self-similar nature.

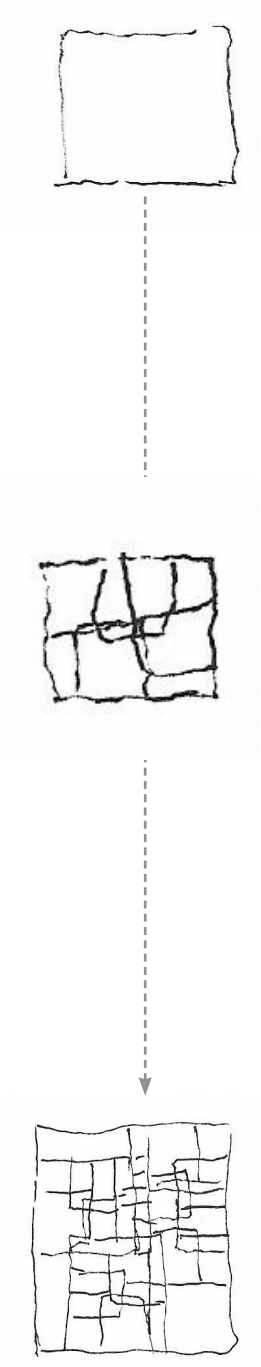
In this city, local clay is used to construct rectangular complexes by a process called 'architecture by accretion'. In this process, rectangular enclosures are added to pre-existing rectangles as the rectangles get larger the further away you are from the center. According to the Koto people, this architectural assembly is "a combination of patriarchal household expansion and a historic need for defense" (Eglash, 1999).

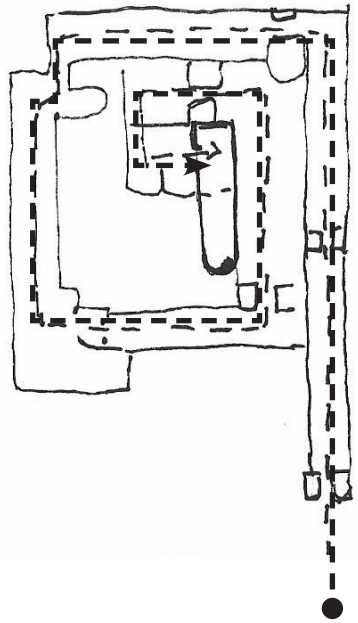
As a family expanded, sons would build expansions to their father's home by adding walls. Then as the threat of northern invaders loomed, larger defense walls were built around these expansions. And so the recursive construction began.

However, after some time, the assembly of the family would outgrow the need for a defense wall so instead this wall would be converted into housing with an even larger enclosure. This cycle would continue as families expanded and has as a result became the traditional custom of architectural assembly.

If this recursion is simulated, we get the model shown in Figure 5.5. What the simulation shows is a concentric addition of rectangles within rectangles, where the first rectangle was a single rectangular compound.

This assemblage became embedded in tradition and translated to royal insignia such as seen on the 'guti' of the royal palace as well as the corridors of the palace itself. The central motif is a set of rectangles within other rectangles. While the corridor of the palace is set as a rectangular spiral where each time a smaller scale is transitioned into, the user is required to act more politely, the throne is reached at the smallest scale and cultured formality and shoe-less attire is required. The social order thus follows the architectural order. (Eglash, 1999)





1 ITERATION

5.5 Design Influence

Inspired by the simulations, an exploration was undertaken to generate a simulation by box iteration to incorporate into a design on site.

Where the Koto people made use of an existing built-form, through recursion they added to it to generate the fractal patterns in their city layout. This exploration took a hypothetical seed form, the perfect square, and recursively added that to itself to generate a fractal pattern.

This exploration was conducted on the mountain peak, with the intention of creating the seed pattern on the highest point then proceeding to reiterate it down the mountain slopes - unifying the landscape.

The overlay of: contour, programme and fractal iteration, were used to unveil a design response within a fractal pattern.

Strict adherence to iteration
In maintaining mathematical proportions of the fractal system, the resultant form produced was one which expressed too much imposition of form foreign to the landscape.

Interpretation of iterations
Mathematical proportions were still maintained but with only slight reference to the integrity of the full form.

Matching the integrity of the proposed programme, this approach could blend more into the landscape as it broke the iterations into parts.

But it posed a challenge to read this part of the cultural landscape as a whole with the rest of the site, considering the steep contours of the site.

8 ITERATIONS

20 ITERATIONS

Figure 5.7: *Simulations to landscape: Box iteration laid on contours. (Author, 2018)*

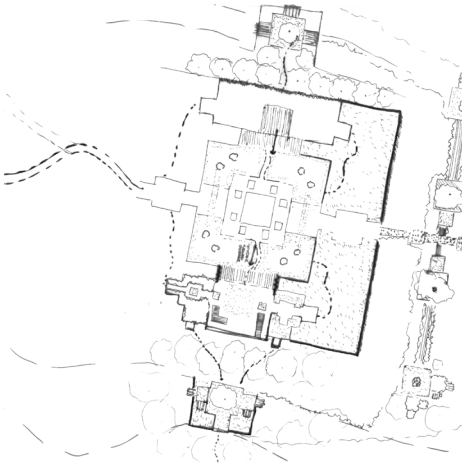


Figure 5.8: *Simulations to landscape: Strict adherence to iteration. Unveiling a strict order between landscape and imposition. (Author, 2018)*

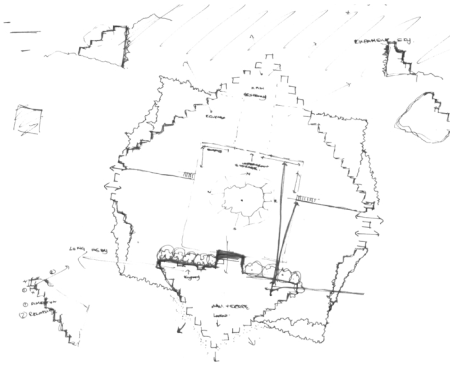


Figure 5.9: *Simulations to landscape: Interpretations of iterations. Interpreting a suggestive order between landscape and imposition. (Author, 2018)*

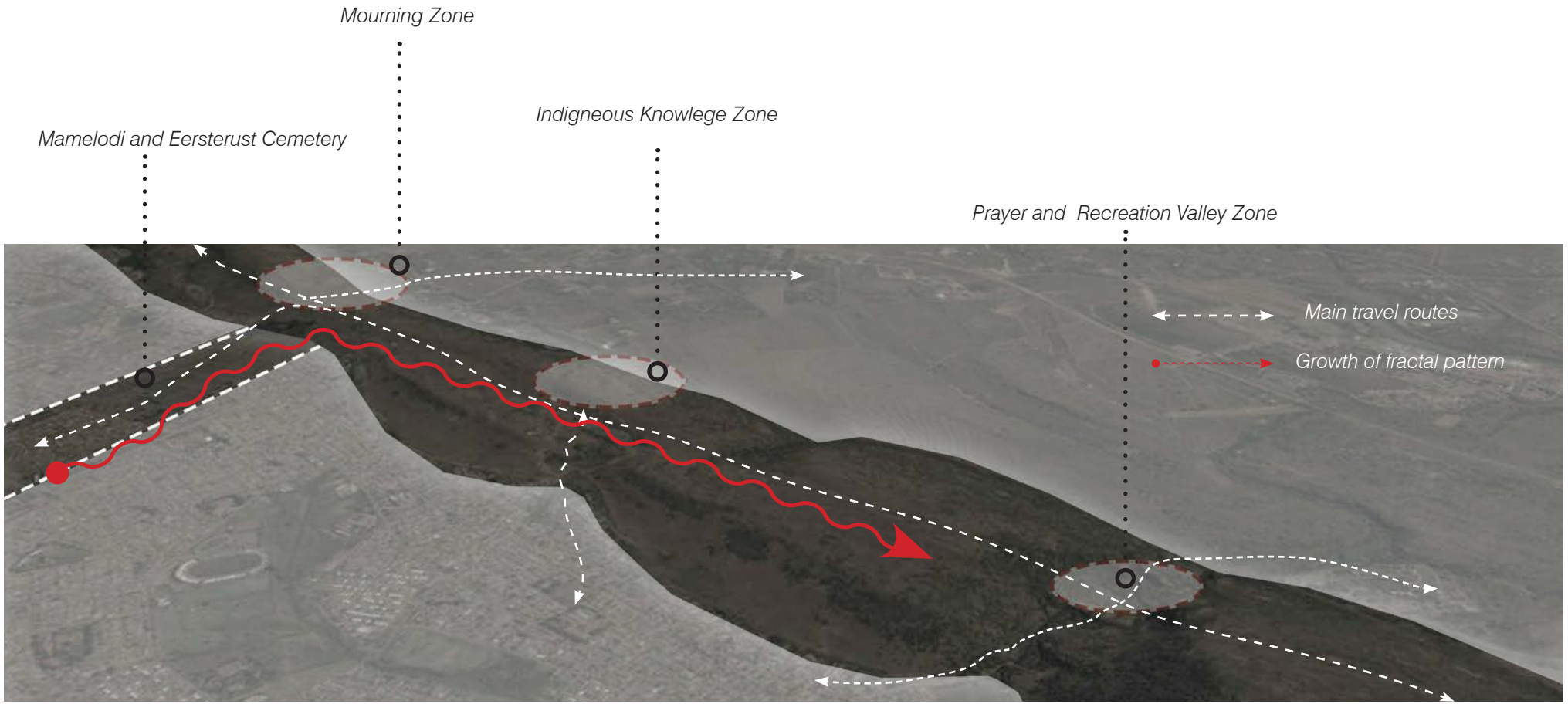


Figure 5.10: *Strategy to application of the fractal pattern on a framework scale. (Author, 2018)*

Figure 5.11: *Exploring a unity by fractal pattern: response to existing cemetery. (Author, 2018)*

Figure 5.12: *Exploring a unity by fractal pattern: response to indigenous knowledge zone - the heart of the cultural landscape. (Author, 2018)*

Figure 5.13: *Exploring a unity by fractal pattern: response to valley. (Author, 2018)*

5.6 Recursion in construction of architecture

Learning from examples

Apart from ordering, fractals are also used in construction techniques mentioned earlier. Recursion is often used as a construction style in indigenous architecture.

According to Susan Denyer, in architecture, indigenous design has for the most part of history made use of local materials.

Through case studies, she identifies the use of reserved construction methods and sculpting techniques to build an decorate architecture. In Western Africa, the predominate material was clay soils, such as those used by the Dogon of Mali; whilst in Southern Africa, there is an increase of the use of natural stone. (Denyer, 1978)

Although Denyer does not explicitly call the patterns 'fractals', she does refer to the recursive techniques used in generation of pattern. For the argument in this dissertation, the link between pattern and fractal was made.

On the Magaliesberg Mountain

On the site for this dissertation, the natural materials found include deep red sandy soils, rectangular and rounded brown quarzite rock and black sheets of slate rock. Clay soils are found at the base of the mountains spread across the towns.

In their abundance on the mountain these materials become mundane, however, in Denyer's studies, she has come across innovative application of mundane materials.

The rocks of Southern Africa

Great Zimbabwe stands as a testament to what is achievable through the mix of local materials. The massive rock walls made use of varying stones resulting in a mixture of dolerite, slate and sandstone. Based on the properties offered by each material, these were then aligned in different patterns producing well known masonry schedules known today such as: chevron, checked and herringbone. (Denyer, 1978)

In the Ghoya tribes, formerly inhabiting the Free State in South Africa and the hill-tops of Lesotho, settlements were made up of corbelled stone homes. The use of sandstone and dolerite boulders consists of laying out boulders in a scaling technique. Large boulders were placed at the base of the house, which offered the structure more stability whist the smaller stones were used as a lightweight material to construct the walls. In the door frames, a large flat stone was used as lintel - a supportive structure carrying the load of the mortar-less walls all around it. (Denyer, 1978)

Sands of Northern Africa

In Tanzania, the home is mainly constructed of bamboo and mud made from red soils. Inside the home, swirling patterns are sculpted from the mud while wet, then left to dry. (Denyer, 1978)

This use of patterned decoration on the home is reminiscent of the Ndebele of southern Africa. Where sand instead of mud is used in Tanzania, paint is used by the Ndebele, including the Ndebele hut found on the dissertation site shown in FFigure 5.37.

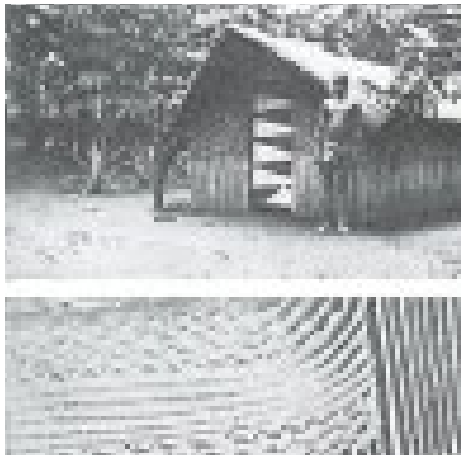


Figure 5.14: *Exploring recursion in material: Tanzania Nyakusa House 1900, Southern Tanzania.* (Denyer, 1978)

Figure 5.15: *E xploring recursion in material: Ndebele styled hut existing on dissertation site.* (Author, 2018)

Figure 5.16: *Exploring recursion in material: Ghoya Tribe stone walled home. (Denyer, 1978)*

Infinity in divination

Divination is known as:"the practice of seeking knowledge of the future or the unknown by supernatural means" (Oxford, 2018).

In his book, Eglash identifies direct links between mathematical modeling of infinity and that of indigenous culture. He uses this example to indicate the intentional spiritual connections made in indigenous knowledge systems to fractal modeling.

In mathematics, the significance of fractal modeling is in its ability to provide mathematicians and scientists with a technique to count to infinity. The question of being able to count till infinity has been dispelled by mathematicians since Aristotle and caused limitations on the numbers tracked in science and technology. As long as there was a limitation on the amount mathematicians could count, there would be a limit on how much data could be stored to process computers.

The mathematical model for counting this far was discovered in 1877 by the German mathematician Georg Cantor (1845 - 1918). The Cantor Set was a simple fractal model using subtraction of form to count to infinity and set the age of modern technology in motion. Starting with a straight line, the set works by repeatedly erasing the mid-section of a line to subdivide it into two separate lines and continuing this process with the next lines.

This is known as a recursive technique, a feedback loop system where the end product of one brings you to the starting point of the next. With recursion, Cantor was able to prove that as this construction continued forever, an infinite number of lines would be produced yet have a finite length. Eglash uncovers this phenomenon described by the Cantor as a traditional practice in west African tribes.

According to Eglash:

"The presence of doubling as a cultural theme occurs in many different number systems in which they count in many different social domains, connecting the sacredness of twins, spirit doubles and double vision with material objects" [of which] "the most mathematically significant aspect of doubling in African religion occurs in the divination techniques."
Eglash, 1999)

In a case study, Eglash was taken through the Cedena (Sand Divination) by local Islamic groups of Dakar, Senegal. The divination is a fortune-telling technique where lines are drawn in the sand and a recursive feedback loop is followed to determine the client's future based on the self-assembly of verses memorised and read in the recursive lines by the priest or 'diviner'. Eglash speaks of two prominent divination techniques, the Ifa divination and the Banama divination.

The Ifa divination shows strong linkages to the systems thinking behind binary code, whilst the Banama divination uses the interpretation conduction. The Ifa divination uses the recursive method systematised in the Cantor Set to interpret 65 536 possible verses.

What this parallel highlights is while modern technology makes use of these fractals as mathematical systems for the advancement of technology, indigenous knowledge systems have used these same mathematical systems as ethno-mathematical techniques to express culture through devotion and mysticism.

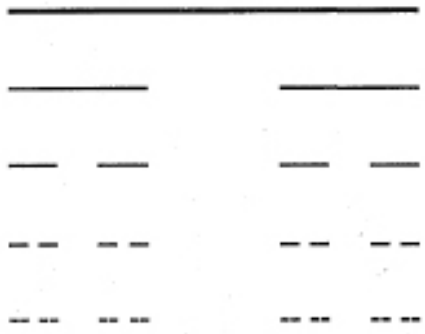


Figure 5.17: *Indigenous design and infinity: The Cantor Set. (Author, 2018)*

Each section of the line is consecutively removed

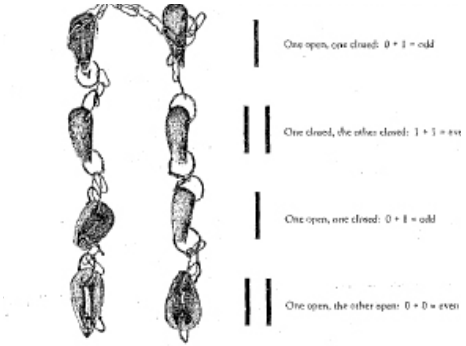


Figure 5.18: *Indigenous design and infinity: The Ifa Divination. (Author, 2018)*

In Ifa Divination, flat shells or seeds split in two are tossed and land either on an open side (0) or a closed side (1). The chain is used because it is believed the shells hold more significance when connected and read in pairs. B. The divination chain is read as pairs summing up odd (one stroke) and even (two strokes), this is then read by the priest.

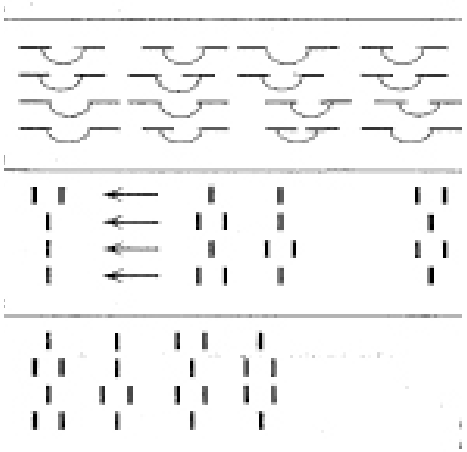
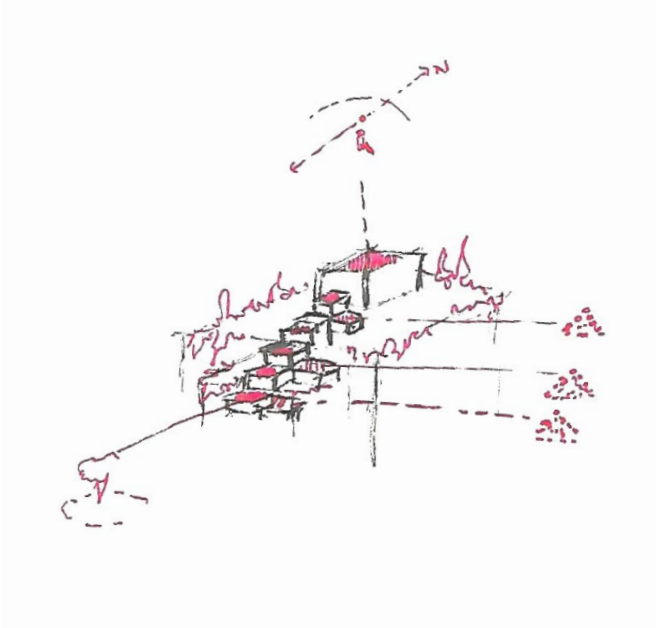


Figure 5.19: *Indigenous design and infinity: The Banama Divination. (Author, 2018)*

A. four sets of dashes are drawn in the sand by the priest. B. These dashes are then paired and a set of odd or even results are recorded as vertical dashed lines as found in the Ifa divination. C. The process is repeated four times to generate four separate symbols. D. The four symbols generate two new symbols which are paired to generate a seventh symbol. In the final step, two final symbols generate a new symbol read by the priest and expressive of the clients fortune.

Figure 5.20: .

Figure 19 - 20: Ordering the mountain by fractals: Each step on the slopes bring the user closer to the heavens. Infinity is represented by the infinite amount of iteration this form could have. (Author, 2018)
Figure 21: Ordering the mountain by fractals. Break-down by function. (Author, 2018)
Figure 22: Ordering the mountain by fractals. Break-down by everyday use. (Author, 2018)



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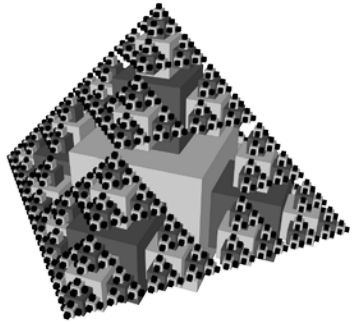
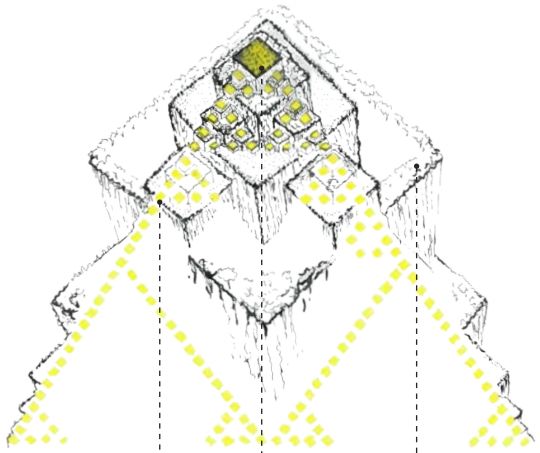


Figure 5.22: .

Figure 5.23: .



CULTURAL INTERVENTIONS
Restricted areas where traditional and recreational use of site occur.

PLANT COMMUNITIES
Sections of the site broken-down by plant groups

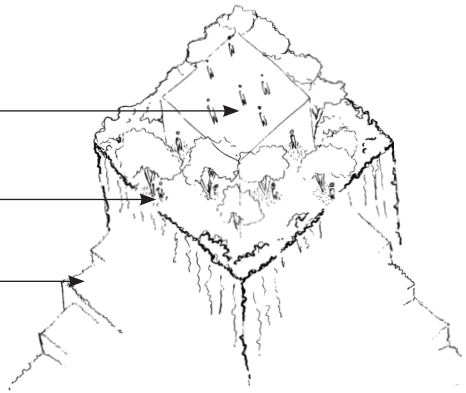
Gradual transition to next

APEX OF CULTURAL LANDSCAPE

self-similar fractal rational builds up to this section

Figure 5.24: .

5.6.1 EVERYDAY



Teaching and Discussions

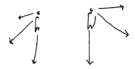
Prayer/Meditative

Recreation

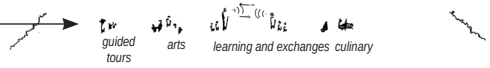
Tourists and Visitors

Exchange of knowledge from various academic backgrounds

Experience of conservation and panoramic views



Varying forms of traditional expression

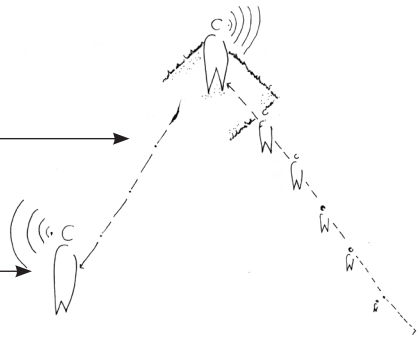


Existing annual cultural event

male initiation schools

Journey to manhood

Celebrations at end of school period



5.7 Fractals in Landscape Architecture Theory

In Landscape Architectural theory, the fractals are still a relatively new concept of design. Due to its predominance in the fields of mathematics, the discussion on fractals in design theory is still more geometrically inclined than discussed as a spatial tool or cultural informant.

According to Prof Filiz Celik, a Landscape Architecture professor at the Seluk University in Turkey, the approach to understanding fractal geometry in nature was first set by B. Mandelbrot. Mandelbrot was a mathematician in the 1900's who combined geometry and science necessary to tackle the broad range of natural shapes present in nature. From Mandelbrots discovery, fractal geometry has often been broken down into models explaining complex shapes found in nature and then applied onto design elements. Prof Celik, in an article about fractals in design, argues that the use of fractal form is the way forward in the design of landscapes. He states:

"The idea of landscape design in harmony with nature can be traced back to ancient times. As the language of nature, it is natural to assume that fractal geometry could play a role in developing new forms of landscape design." (Recep & Toth, 2016)

Fractal patterns are often deduced from natural phenomena such as lightning-bolts, root systems or tree-branches and are then incorporated into landscape design using mathematical simulations similar to those recorded by Mandelbrots. When fractals are used in this manner, Karen Mcloskey, from the Department of Landscape Architecture in the University of Pennsylvania, argues this would be the application of pattern on landscape.

She argues that patterns are seen everywhere in nature across scales, from the galaxy, clouds or leaf formations. She argues that these repetitive forms are the elements that help us make sense of the chaos of the natural world.

According to Mcloskey, in Landscape Arcitcture, when a design begins to replicate these natural forms, it is termed 'pattern generation', defined as:

> "Repeating geometries that aggregate to create an overall spatial organisation." (Mcloskey, 2013)

Although Mcloskey never makes direct reference to fractals in her article, the linkage between fractals and pattern generation is made in this dissertaion based on the aim of both to make sense of a chaotic natural world through mimicking natural forms.

However, there is a danger in terming fractal rationality a type of pattern, as this may over-simplify the implication of fractals on space whilst it induces the scepticism that comes with the term 'pattern'.

According to Mcloskey, these are a few reasons patterns are approached with scepticism in Landscape Architecture:

- Pattern is associated with uniform geometries and flat surfaces. As a result, patterns are often considered excessively visual and pictorial.
- The repetition of pattern implies monotony.
- The easy generation of certain patterns, therefore lacking originality.
- Geometric patterns are autonomous, making it harder to not impose pattern onto site.
- Patterns are controlling and come off as static.

These points are all fair criticism of pattern in contemporary architecture. When working with a particular geometric pattern, such as those with symbolic reference, or even a pattern inspired from nature, such as those adapted from natural systems such as lightning, constellations or river systems, caution of these five points should be taken.

However, when fractal geometry is not seen as an imminent product of fractal rationality, pattern does not need to be the most important spatial tool, rather spatial orientation and culture can be used. Celik alludes to this in arguing that:

> "Sustainable landscape design solutions must contain cultural systems and natural systems connections. So fractal geometry has a huge potential [in] landscape design. Fractal geometry is an example of a technology that reaches into the core of design composition, allowing the landscape architect designer to express a complex understanding of nature." (Recep & Toth, 2016)

As argued earlier in the article, contemporary theory lacks in the discussions on dealing with the cultural. As evidence of this, discussions on fractals make only quick reference to their cultural significance but focus on their ability to generate geometric pattern, natural systems or parametric architecture. Although all of this is valid, onto these could be added that in addition to the expression of nature, when cultural systems are overlaid with natural systems a deep expression of the traditional and metaphysical statements of communities can be voiced.

Figure 5.25: *Self-similar branching fractal (Eglash, 1999)*

5.8 Fractals: an ordered culture from art to landscape

Many of the case-studies conducted by Eglash occur outside the boundaries of southern Africa and have been assessed here because they have some relation to a spatial condition or programmatic component on site.

However, this is not to say that all African traditions are the same, rather, that due to migration patterns there are some similarities to North, West and Eastern African traditions which can be learnt from to inform approaches to tradition and cultural landscapes on-site.

In his book 'African Fractals: Modern Computing and Indigenous Design', Eglash draws parallels between mathematics and culture in an effort to prove the existence of intentional use of fractal geometry in indigenous design.

The role of recursion in city layout and divination discussed above indicate the presence of fractal geometry in indigenous knowledge systems. In this section, we look at how fractals are generated and used in architecture and artifact.

5.8.1 THE FRACTAL GENERATION:

Different ways the ordering system is generated:

Recursion [non-descriptive]
Fractals generated by a feedback loop in which the output for one-stage is the input for the next:

Scaling [descriptive]
Fractals generated when there is the similar pattern at different scales within the range under consideration:

Self-similarity [descriptive]
This generation technique is separated into: *statistical self-similarity* and *exact self-similarity.* Scaling fractals can be considered statistically self-similar fractals. Exact self-similar fractals would have to contain the exact replica of the

whole in at least one of the part, which is not necessarily true for all fractals.

5.8.2 THE SPATIAL ORIENTATION:

Infinity
Although like previous mathematical modeling systems, fractals can be limited to a finite range, the power of the repetitive form is in its connection to the idea of an infinite dimension.

Fractal Dimension
The revolutionary property of fractals lay in the ability of an infinite length to exist in a finite boundary. This is revolutionary because as one is accustomed to think of dimensions in the finite length of whole numbers only (one dimensional plane, two dimensional plane, etc.) this means that the theory that governs fractals also allows for the division of dimension.

What Eglash comes to is a finding that in the same way that mathematicians use the generation techniques of fractals to relate to infinity, the cultural adoptions he has come across use the generation techniques as a ritual process accumulating to an apex which continues infinity

5.8.3 THE COLLECTION OF CASE STUDIES

This collection assesses art and architecture configured of different fractals. In this section, the meaning behind the process and the fractal itself is investigated.

Recursive Fractals Art
In Recursive Fractals, the metaphysical is mostly expressed through artefacts and ritual. This is seen in the way artefacts are made, patterns are developed and architecture is constructed, where the recursion technique is applied to the process of making or moving through space – involving continual input. In the same way that the scaling fractal shows mathematical phenomena linked to mythical concept, Eglash identified the use of recursive fractal mathematical phenomena to present the process of time.

In one case, Bemebe masks are used by the Bakwele people of Zaire during the male initiation phase. Shown in fFigure 5.26, the shells on the mask in which both the size and the curvature of the opening is made larger relative to the previous puncture with each interaction. Eglash interprets this as a metaphor mapping the knowledge gained at each stage of the initiation phases. During the part of the ritual the mask is used, the entire mask is firstly hidden by a screen then progressively exposed by the senior member of the ritual relative to the change of phase the young men are passing through.

A second example showcases the use of recursion to produce Ethiopian processional crosses, where a single process has the seed shape generating patterns through interactions.

The final output is a complex overlay of the initial pattern. This iteration is later adapted into construction of the church of St. George in its triple iteration of nested crosses.

Scaling Fractals in Artefact

In scaling fractals, it is important to recall that as mentioned above, not all fractals are exactly self-similar as scaling fractals are only considered statistically self-similar. Designs bases on Logarithmic spirals and adaptive scaling stand as examples of this type of generation technique. Logarithmic spirals are a non-linear scaling system typically occurring on two levels of natural phenomena: in organic growth such as a snail shell, sunflowers and the human ear; then also in fluid turbulence such as a tornado, hurricane or swirls on a riverbank. Eglash found adoptions of this into the manner in which West African civilisations created icons adapted from the logarithmic spirals into their written language where the symbolic vocabulary is comprised of small sets of symbols referring to entire social, religious or philosophical concepts. In West Africa, the Akan civilisation of Ghana adapted the logarithmic spirals for their relevance to the two natural phenomena and used as symbols for forces of 'life' and forces of 'Tanu' – the river god. The Figure 5.37 shows the spirals found in gold weights which link the spiritual forces, through metaphysical symbolism, with living systems, through reference to forces of nature, by designing with logarithmic spirals. A combination of the spiral with a three-dimensional curve is found in the discrete steps of the water buffalo artefact carved from iron. The water buffalo still makes reference to the metaphysical through reference of fluid turbulence found in the logarithmic spirals in the horn.

Self-similar Fractals in Landscape

In self-similar fractals, an example of settlement architecture encountered in Southern Africa is that of the Ba-ila settlement in southern Zambia. The settlement built 400m in diameter is set on the flat plains of the arid landscape.

The settlement made of a 'ring of rings', indicates a ordering system which strictly sticks to geometric form.

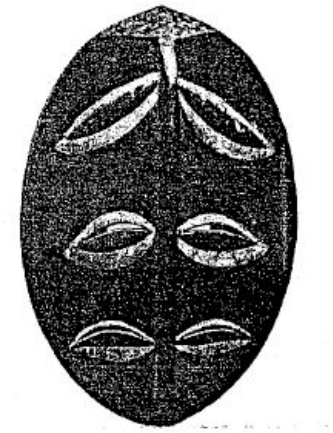


Figure 5.26: *Bembe Mask of initiation ceremony, Zaire. (Eglash, 1999)*

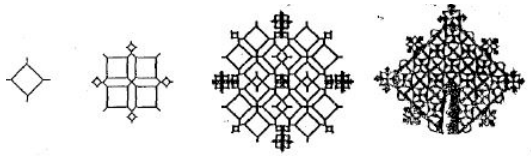


Figure 5.27: *Nested crosses of St. George Church at Lalibela, Ethiopia. (Eglash, 1999)*

Figure 5.28: *Tanu: River god of the Akan, West Africa. (Eglash, 1999)*

Figure 5.29: *[Right] Aerial image of settlement looking into separated homesteads. (Eglash, 1999)*
Figure 5.30: *[Right-most] Diagrammatic break-down of orientation system used to generate these patterns. Systems are religiously and socially based. [Author, 2018]*

5.9 Case study 02:

5.9.1 SETTLEMENT OF THE BA-ILA SETTLEMENT, SOUTHERN ZAMBIA, PRE-1944

Eglash writes that the settlement is set out as a self-similar scaling fractal (the seed form). Throughout the entire settlement, there is a repetition of this form which familiarizes each resident with the social order of the space they find themselves in. Throughout scales, the most sacred communal entity is found at the smallest part of the fractal repetition.

He broke down the settlement system as one huge ring, where the rings representing the family enclosures increase in size proceeding towards the back of the settlement, with the ring housing the chief detached from the larger ring of the settlement and his own immediate family positioned similarly around him in this ring. In the diagram adapted in a simulation by Eglash, the seed form is shown to be the house with the sacred altar in the centre, the second form is the 'house of houses' or simply the compound of the extended family with the cattle positioned in the centre, where the sacred scared alter would be positioned in the household. Then finally, there is the entire settlement as a whole seen as 'a ring of rings', with the chief's extended family compound situated in the centre (same position as the sacred altar in the seed form), while in the centre of the chiefs compound, there is positioned a tiny compound only about 1 meter in diameter which hosts an entire dimension of spiritual beings which are believed to have their own compounds made of smaller rings on an infinitely continous loop.

How this expresses the metaphysical beliefs of the people is in the way the larger shape starts with a livestock pen, with the entrance being associated with lower class or dirt. Then, towards the back of each pen there is found the start of the family living quarters, from there, the further away from the cattle pens – the more clean or higher in family status this family is. Within the compound of the richest family member, further back into their home where the fractal is the smallest, that is where the shrines were built to represent the endlessness of the spiritual realm.

This similar gradient of status is undertaken with passage from the entrance of the entire settlement to the shrines of the king and his homestead offset from the back of the settlement. The notion is that, as the shrine stands at the back of each homestead, it is approached with reverence. In this same way, the responsibility to protect the members of the settlement is being placed on the king as his homestead is placed in the same position as the shrines in the households. (Eglash, 1999)

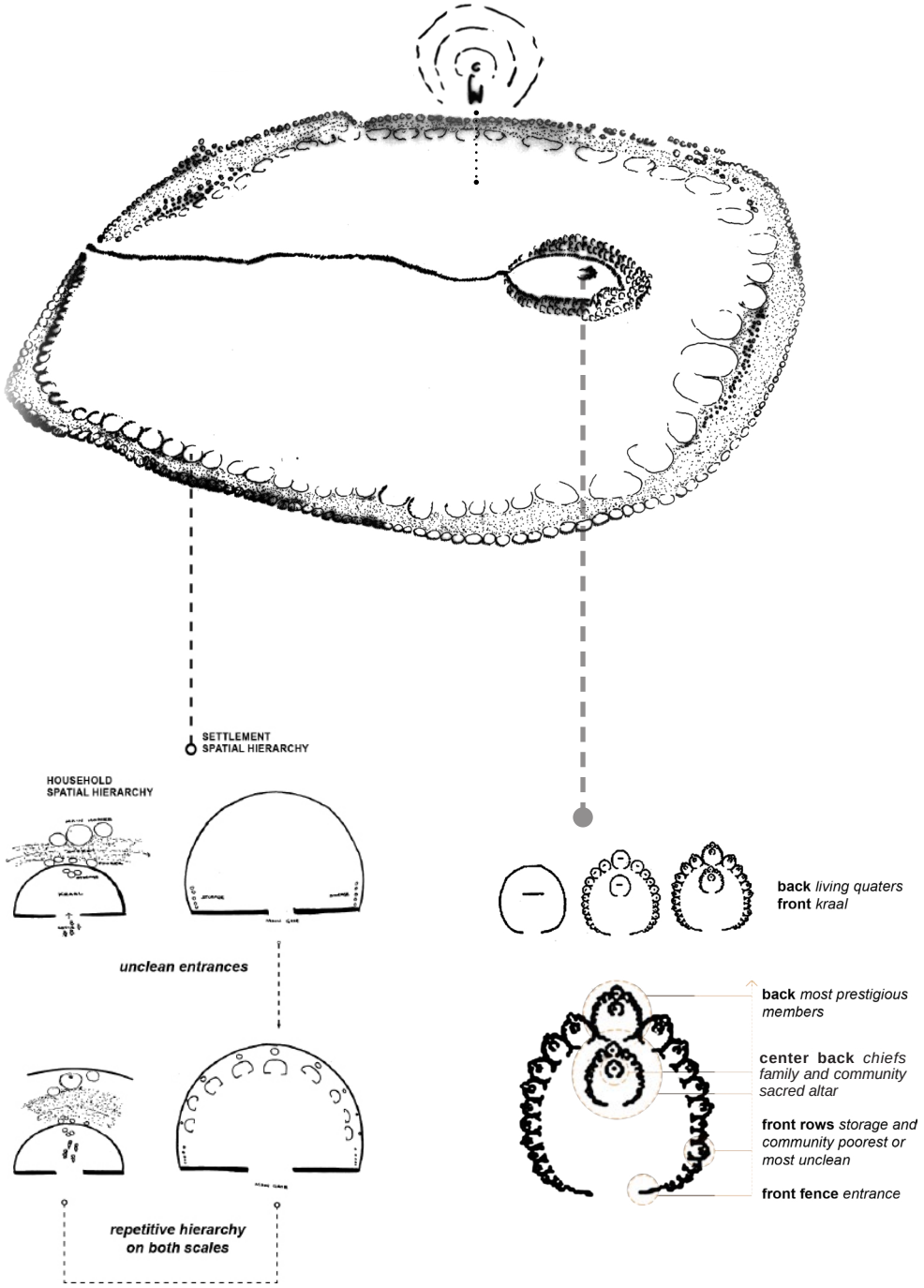


Figure 5.31: *Self-similar branching fractal*

5.10. Spatial intelligence and site topography

In reference to construction techniques found in the indigenous landscape, Susan Denyer highlights two main criteria to structure determinant: migration and settlement patterns as well as kinship.

She argues that migration and settlements patterns were never haphazard as each cultural group followed specific pattern and routes. She continues:

> "Their patterns were closely adapted to climatic conditions as well as to social cohesiveness and animal ownership, and almost every group had a pattern peculiar to themselves". Speaking about the role of cattle in pastoral nomad migration, Denyer notes that some migration and settlement patterns were based on the cattle the pastoralists community tended to, in this regard she elaborates that some groups "...moved only horizontally along the plains, while others moved up and down the hills". (Denyer, 1978)

The role of kinship as an important determinant was often expressed through physical nearness, "where all members of one clan would live in a single piece of territory". There exist cases where this was also aligned to the homestead of the king or leader of this settlement group, where she made notes of groups where the entire orientation of the settlement would be reshuffled or completely moved relative to the homestead of a new king.

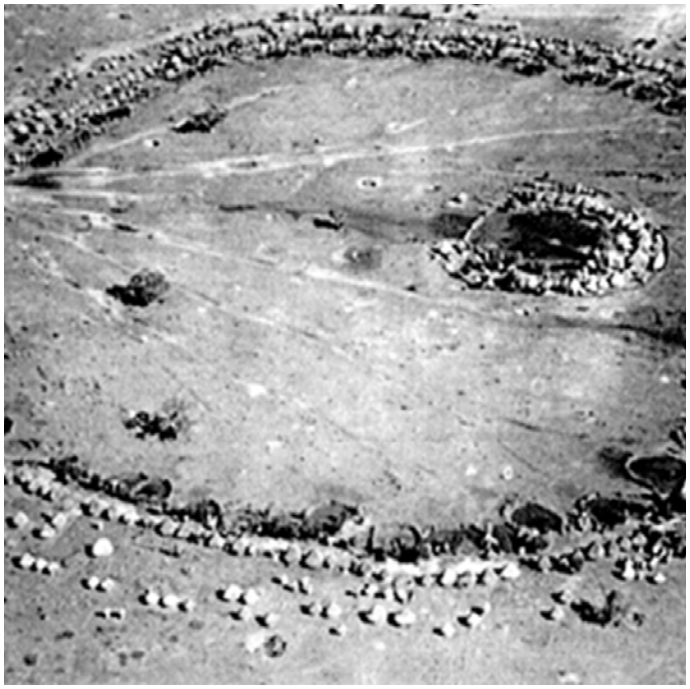
Similar to the findings in the City of Logone-Birni in Cameroon, the spatial manifestation of this criteria is expressed through fractal order. However, the outcome of the fractal pattern appears dependent on the topography of the site.

When comparing the Ba-ila settlement and the City of Logone-Birni, both are situated on a flat plain, and both fractal orders produce statistically server-similar fractal patterns in the landscape. However, if we are to compare the Ba-ila settlement to the Dogon settlement in Mali with its mountainous terrain, a clear distinction is seen in the fractal patterns produced.

To analyse the role of topography in fractal order, a comparative discussion between the two will be had.

In Southern Zambia, the Ba-ila settlement referred to above is located on a mainly flat site. Zambian settlers used this topography to their advantage by producing a 'ring of rings' to define the settlement and its use. As noted by Denyer, each cultural group had peculiar settlement patterns, closely adapted to their way of life. With cows as an important source of food and wealth, the Zambian pastoral way of life is shown in use of a flat topography.

The Dogon on the other hand live on the mountainous escarpments of Bandigara. With their location being a political move after their refusal to convert to Islam, the landscape became ordered to an expression of their own cosmological beliefs. Through recursion, more buildings homes were added to the landscape - but this addition to a mountainous topography creates a far more "chaotic" fractal form than that of the Ba-ila. This chaotic order is discussed in a case study on the Dogon settlement.



5.11 Case study 03:

5.11.1 SETTLEMENT OF THE DOGON PEOPLE, BANDIAGARA ESCARPMENT, SOUTH-WEST, MALI

In the mountainous terrain of Mali, the Dogon cultural group is found. Inhabiting the Bandiagara escarpment for over 500 years, the formation of the settlement is based more on the explicit expression of their cosmological beliefs which is the driver of the patterns listed above. According to Denyer, “Each is said to be representative of a man lying on his right side in the position adopted in the womb, while the component parts represent individual organs in the body”. (Denyer, 1978)

The entire settlement is made up of varying villages where each one is a twin to another village representing heaven and earth. According to Eglash, “For the Dogon, the human shape is not only a biological form, but maps meaning at all levels. The fact that the universe is projected in the same manner onto different scales – the cosmos, the village, the house, the individual – provides a profoundly unifying element in Dogon life.” (Eglash, 1999). Eglash notes that the projection is projected onto the interpretation of cosmology as a scaling fractal where iterations are manifested through nested loops.

How the Dogan approached the mountainous landscape was to place each house and granary on stone terraces. Goats were the main livestock, which could be tended to on a terraced terrain. Similar to the Ba-ila, by means of a transition through scaling, the shrine representing the spiritual realm is located in the depth of the home, on the smallest scale. However, dissimilar to the Ba-ila, the topography does not allow for as much of a straight-forward scaling system based on ‘rings of rings’. Instead, the Dogan nested loop scaling is expressed through the relation between each village and its twin, the scaling of the homes in each village relative to one another, the scaling of the ‘organs’ represented through the rooms of the house and finally by through the entire house, the relation to the scale of the shrine. (Denyer, 1978)(Eglash, 1999)

Figure 5.32 Image of settlements. (Denyer, 1978)

Figure 5.33 Plan of average household: Functions of rooms. (Denyer, 1978) (Adapted by Author, 2018)

Figure 5.34 Plan of average household: Cosmological link of rooms.(Denyer, 1978) (Adapted by Author, 2018)

Figure 5.35 Sketch of settlement. (Author, 2018)

Figure 5.32:

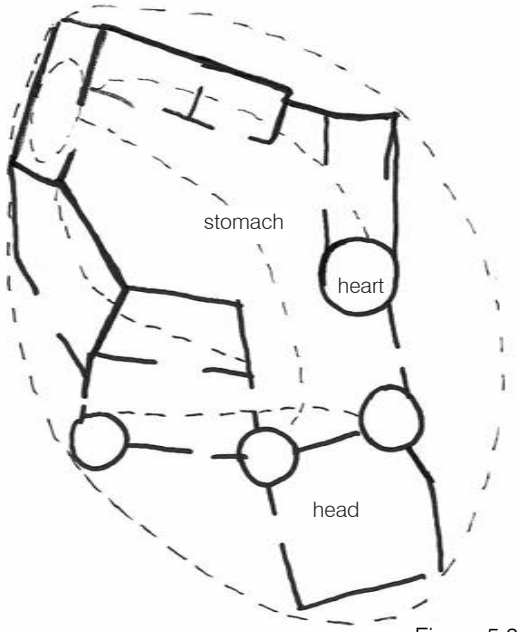


Figure 5.33: .

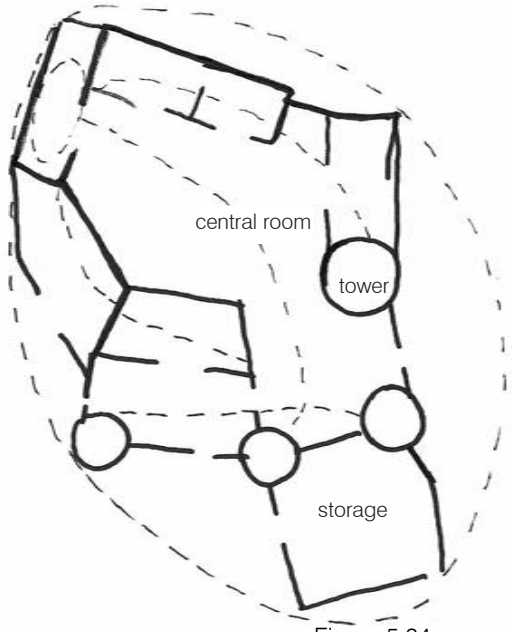


Figure 5.34: .

Figure 5.35: .

5.12 Design Influence

5.12.1 FRACTALS ON A MOUNTAIN

From the Dogan case study, it is seen that fractal orientation on steep slopes break the cultural landscape up into individual compartments. Although still connected by an orientation to the metaphysical, the physical layout of the buildings do manifest as the self-similar fractals studied in the previous case-studies.

Rather, the fractal orientation comes in the split of households to be scattered through the landscape. The uniformity in this settlement then stems from the repetitive nature of a single styled element. This meaning, the process is recursive but the fractal patterns are not as clearly seen as in the other examples.

In the design, a similar approach is taken. At this stage of the design, three key spaces as extensions of the existing programme included: The Open Air Observatory, the Herbarium and a public social space.

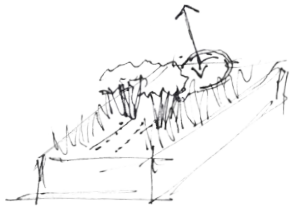
5.12.2 THE ORIENTATION CONCEPT

The programmes covered three levels on the mountainous topography. In an attempt to apply the knowledge on the fractal ordering gained form the case-studies, an orientation concept was drafted based on metaphysical interpretations of existing settings for ritual and non-ritual practice on site.

The concept to emphases a vertical ascent up the mountain and overlay that with getting closer to the heavens. This was based on the combination of terrain and metaphysical orientation to space characterized by current practices.

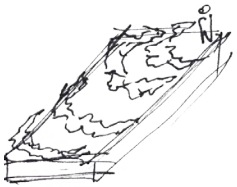
In response to the study of the Dogon, the design explored the application of a recursive process rather than a search for self-similarity as seen in the Ba-ila case study.

The three programmes were to be *physically separated* but *visually unified* by vertical forms cutting into the sky .As the user ascends towards the apex, the more intensified the vertical elements get surrounding them. Until at the top there was nothing but the horizon in sight - they had reached the tree tops.

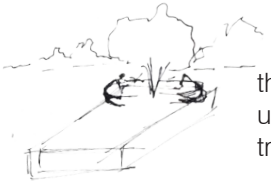


the initiation men under night sky

the altars: prayers with smoke to the skies



the nursery: earths produce opens up to sky



the lekgotla: underneath the tree

the kraal: the soil and cattle

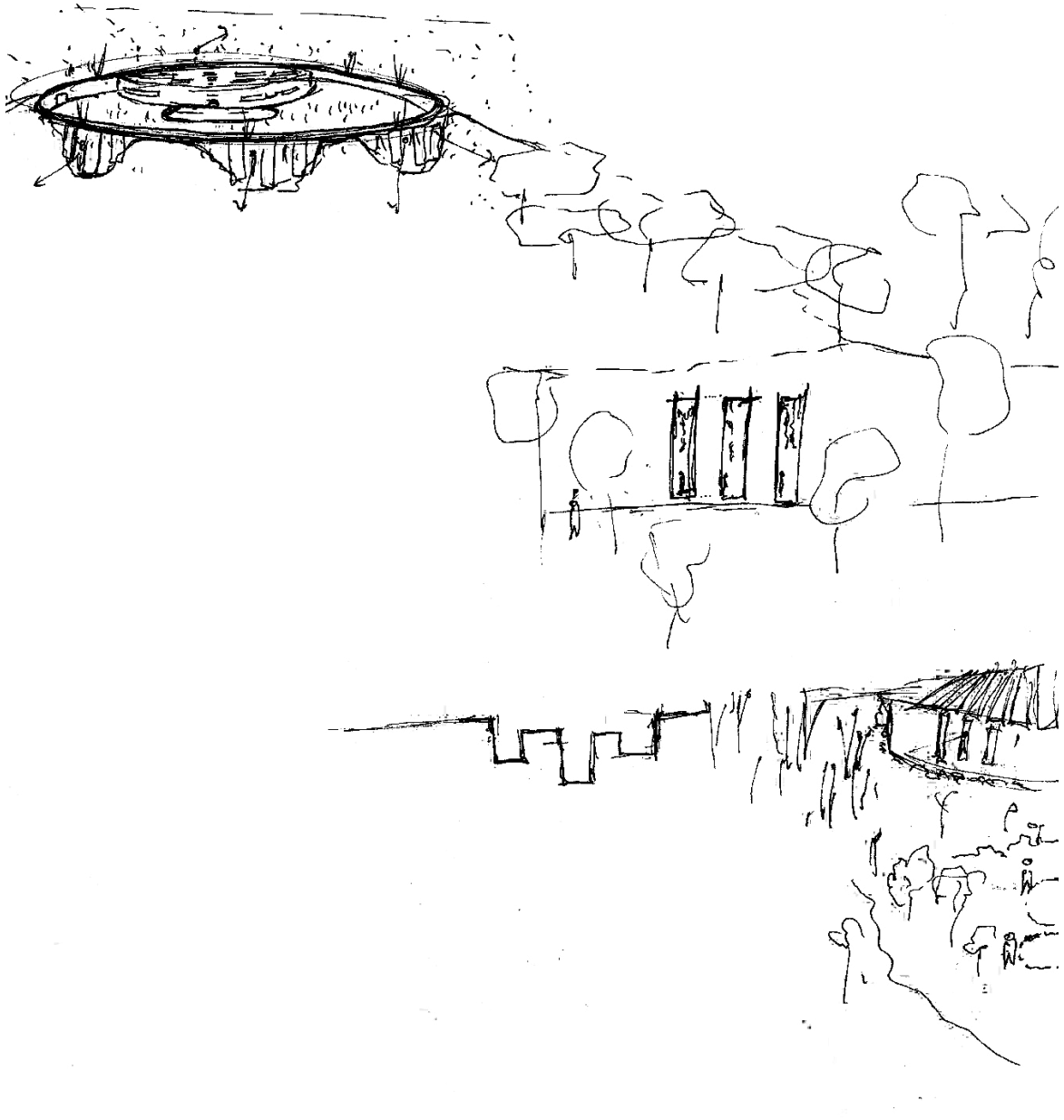


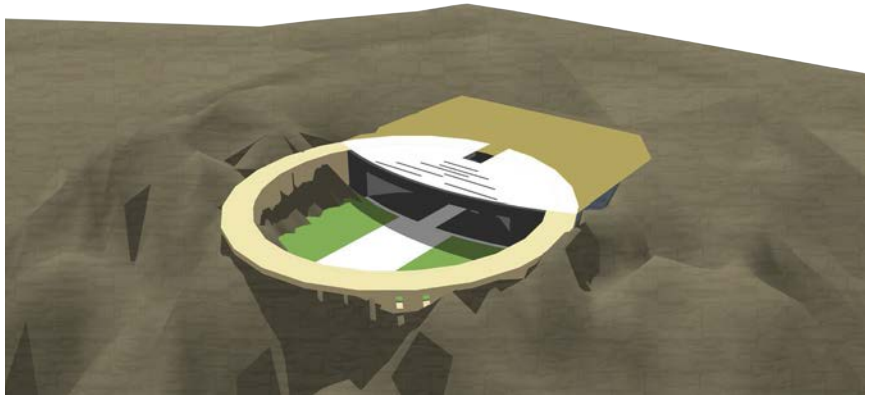
Figure 5.32 [Left-top] and [Left-bottom] Explorations of design based on recursive application of form: Apex, the open air observatory (Author, 2018)

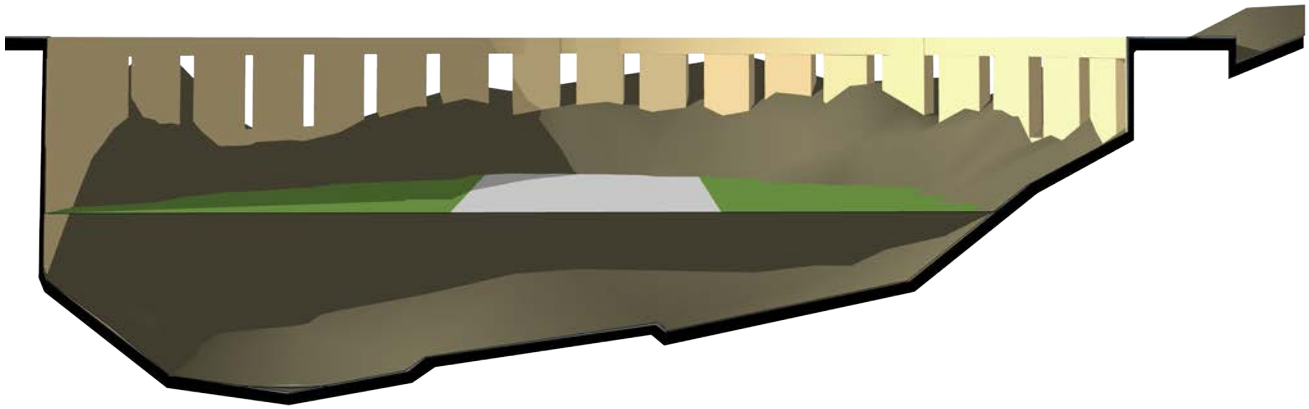
Figure 5.33[Right - top] and [Right-bottom] Explorations of design based on recursive application of form: perspective of design exploration, vertical members surrounding public space and herbarium. (Author, 2018)

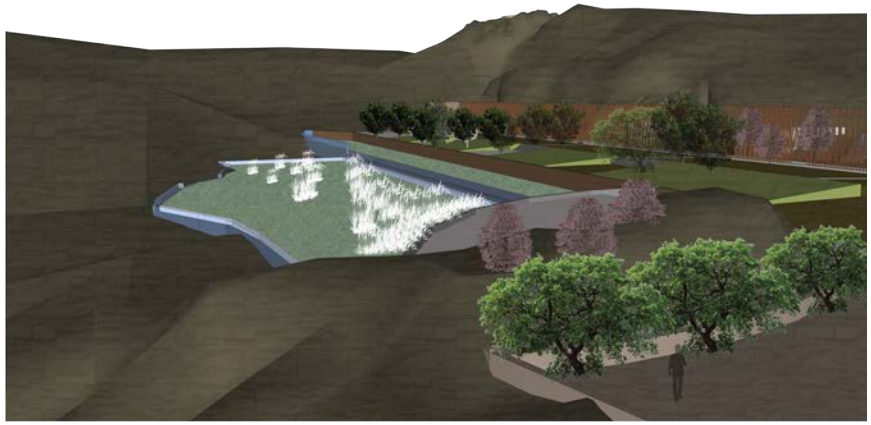
5.12.3 REFLECTION

When put through to design, the concept did not retain a unity sought from the fractal orientation.

The metaphysical interpretations of site did not respond strong enough to existing practices, it appeared the poetic nature of the landscape got lost when orientation was overly focused on.







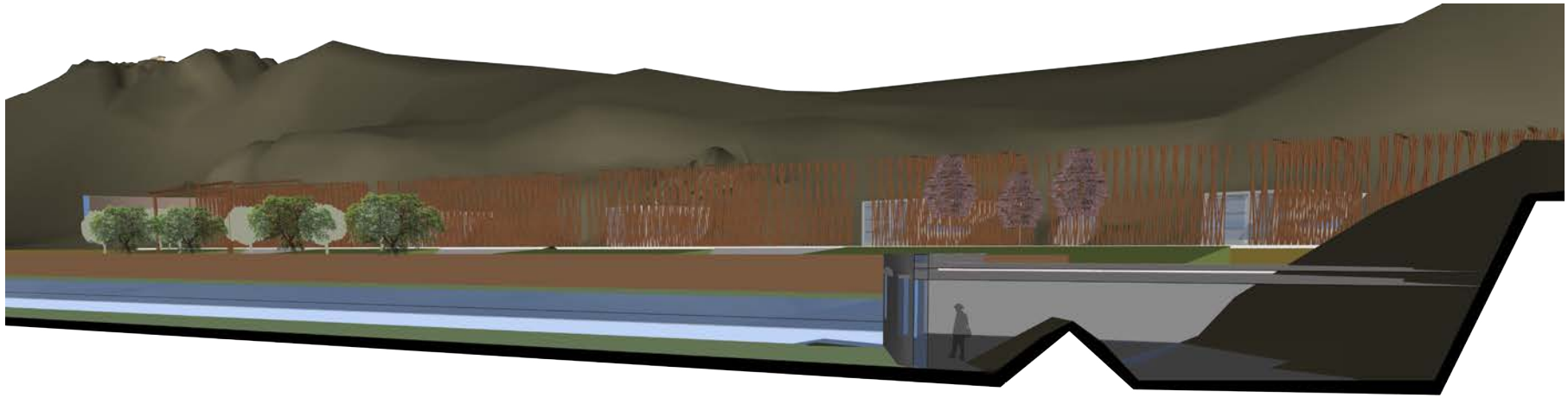


Figure 5.32 [Below] Searching Further: fractal diagram showing resonance from poetics of site (Author, 2018)

5.13 Critical reflection

5.13.1 A RETROSPECTIVE ANALYSIS

There does indeed exist a fractal ordering in the indigenous landscape. This ordering produces patterns which are organic mergers between topography and the culture.

In academia, their wholeness is identified. A wholeness understood by the mathematical formula which the patterns model. In practicality, this wholeness is generated after the cultural groups involved have had years of cultural evolution to generate them. These patterns are desconstructed to their seed form in academia in an effort to understand their cultural significance.

Studying the chaotic fractal order from a perceptive of academia informs the relevancy of order in the landscape. Understanding the generation of forms and their role in construction and artefact informs on the processes in which architecture is generated in response to an indigenous landscape.

The evidence of mathematical precision also points to ancient intelligence found in indigenous knowledge systems. However, in search of an ordering system to apply onto a landscape - fractal ordering will cannot generate this unity alone. This unity must stem from an understanding context and manipulation of contextual forms and textures to generate this unity.

Through investigation engaged in throughout this essay, it was discovered that the process by which the unity in the landscape is created is never an imposition of a whole pattern generated by iteration - no matter if the seed form is contextual. The unity in the fractal order stems from a palimpsest of processes, part of communal interaction with the poetics of site.

5.13.2 SEARCHING FURTHER

With reference to the retrospective analysis, in determining the unity harnessed through the landscape, all that has been learnt must be gathered and used to respond to the poetics of space. There seeking unity in spatial balance over wholeness in pattered form.

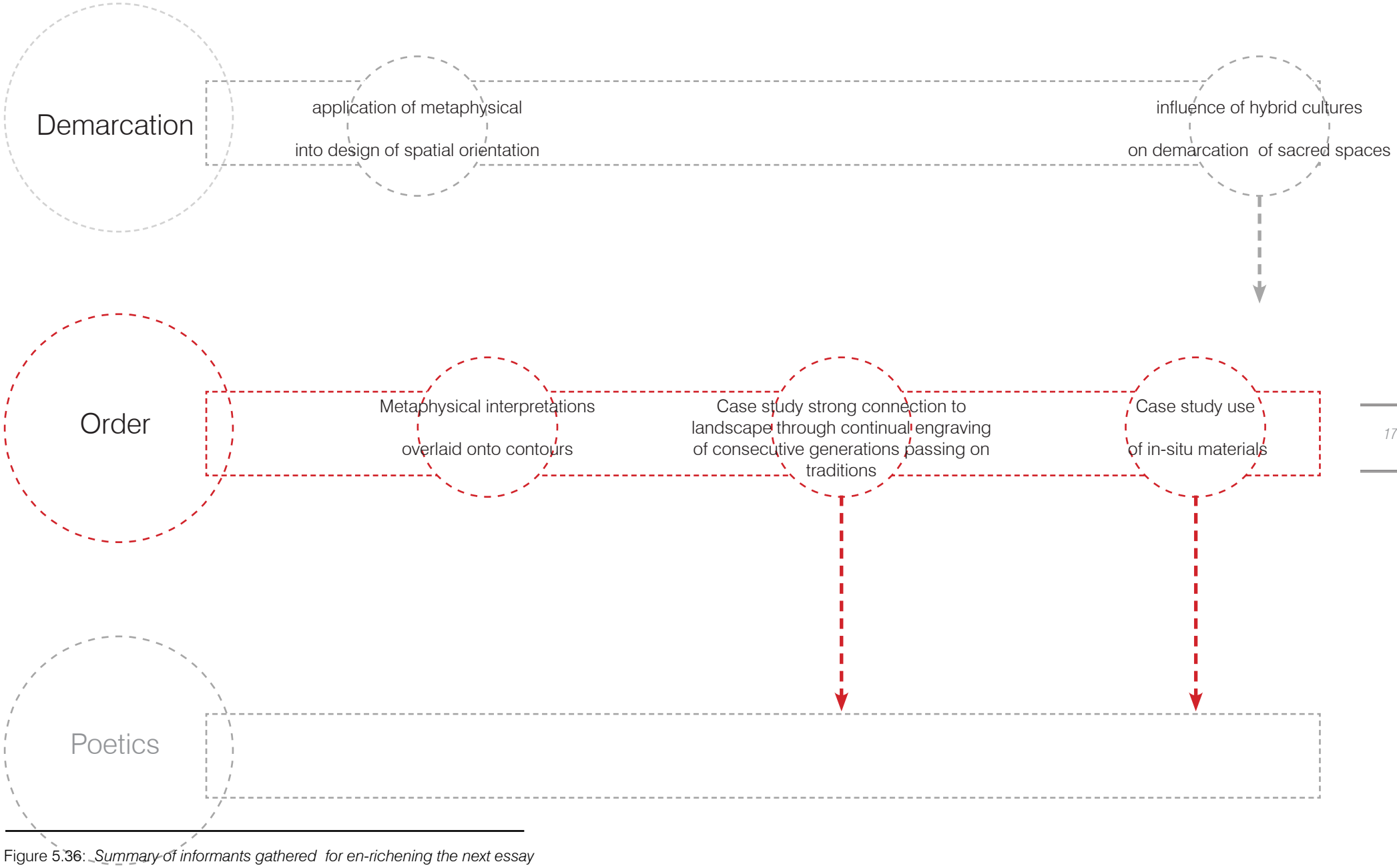


Figure 5.36: *Summary of informants gathered for en-richening the next essay (Author, 2018)*

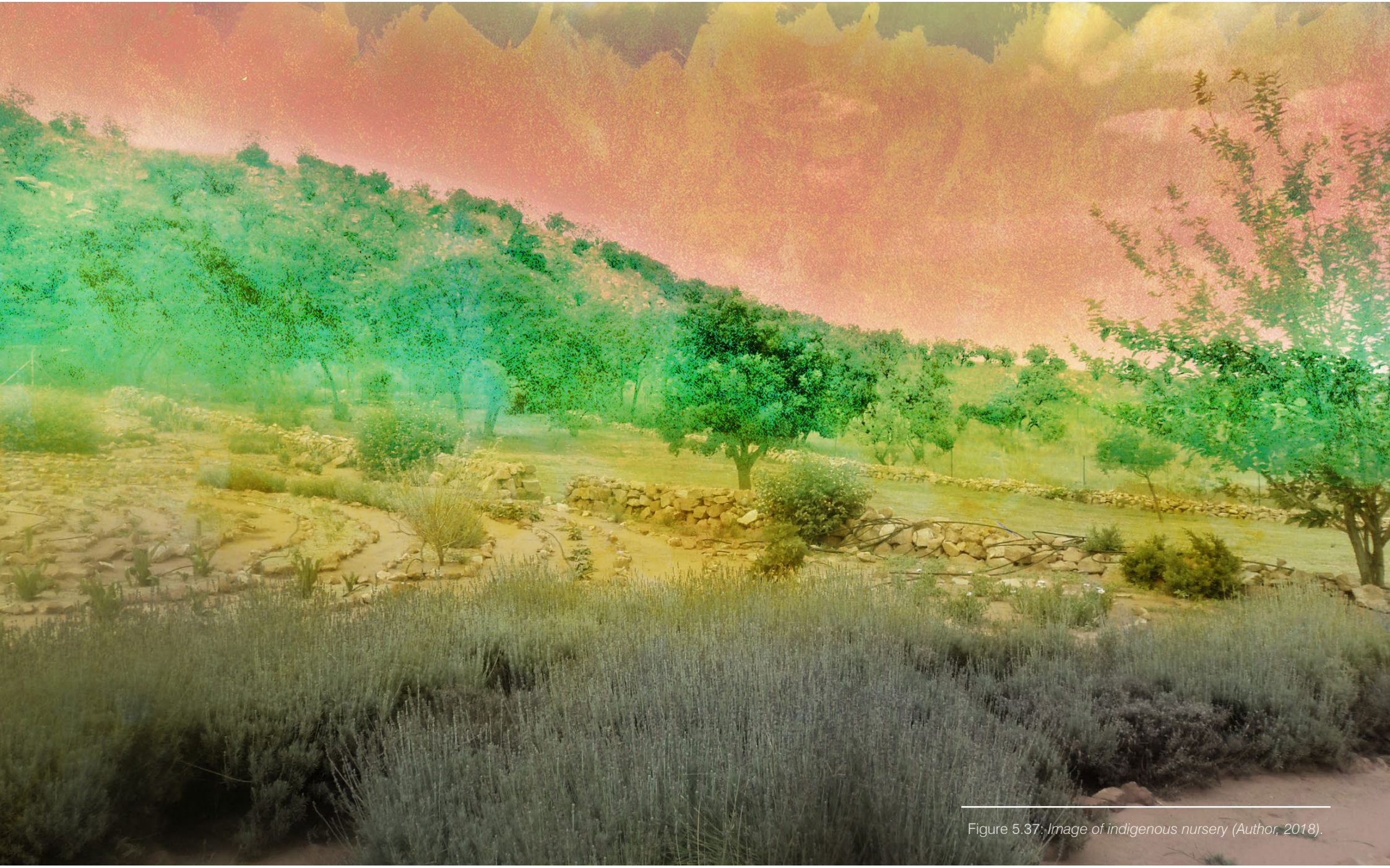


Figure 5.37: *Image of indigenous nursery (Author, 2018).*

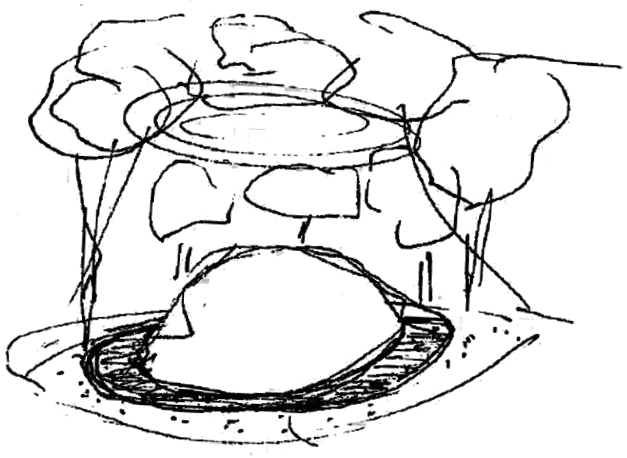


Figure 6.1: *Journal Sketch. (Authour 2018)*

VI

POETICS

AN ESSAY ON THE POETICS OF RITUAL ENGRAVED IN THE LANDSCAPE

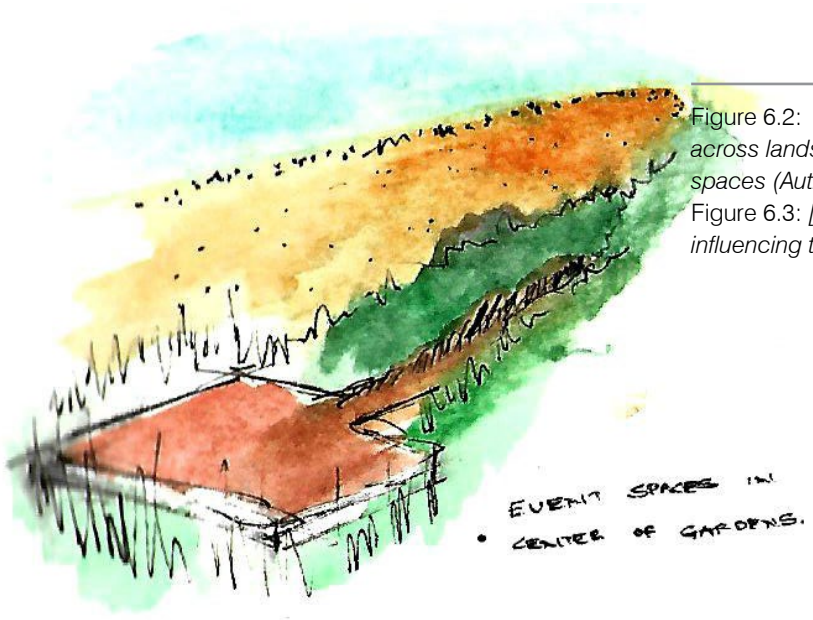


Figure 6.2: *[Left] Journal sketch. Public space stretched across landscape in between natural and vegetated spaces (Authour, 2018)*
Figure 6.3: *[Right] Conceptual graphic of an overlay of ritual influencing the landscape (Authour, 2018)*

6.1 Introduction

In this final essay, we turn our attention back to site to retrieve the poetics of the mountain.

A sense of freedom is taken from the landscape with the application of fractal pattern onto the site. As concluded in the previous essay, a study of fractal order in indigenous landscapes has enriched the investigation with an understanding of localised materials as well as cultural expression through art, architecture and ordering. But in order to achieve on site what the case studies discussed in the previous essay achieved on the indigenous landscape, an order must emerge from landscape and evolution of tradition.

The study in the previous essay showcased the value in the evolution of tradition through generational palimpsest of dynamic process moulding landscape over years – poetics of rituals engraved in landscape through time.

In this essay, it is this engraving that is sought to inform a landscape emergent order. This order may not seek the wholeness sought during the fractal investigations but rather a balance in the landscape. A balance free of formula and depending only on the poetics engraved in the landscape.

6.1.1 SUB-QUESTION:

How are the poetics of ritual engraved in the landscape extracted through design to retain its the sacredness throughout evolution of tradition?

6.1.2 STATEMENT

Due to the nature of the rituals to protect or convey the sacredness of the mountain, sacredness can be retained by allowing the spatial qualities and materiality of the site to alternate with the changes experienced in both contingent and seasonal ritual.

6.2 The Magaliesberg

In the mountains, the natural world is believed to be at its purest. From the waters of the valley considered sacred, to the traditional medicines considered most potent, the natural produce of the mountainous landscape is as sacred as the land on which it stands.

Even the journey to this natural world is considered an act of devotion. To local church groups, the climb to the top of the mountain is a form of worship through the endurance shown to battle steep slopes and long walks in search for spiritual purity.

With this belief, rituals are most orientated around these purified natural elements. Rituals such as male initiations; baptisms; prayer and the celebrations of blessings bestowed on the birth of a child. Each traditionally occuring in a sacred space where the natural world is at its purest.

6.3 Ritual and the Landscape

6.3.1 THE ROLE OF RITUAL

In context of the southern African landscape, ritual is to sacred space what landscape is to ritual. Meaning, as it is through ritual that sacred spaces are ordained, so it is that through landscape, ritual is given a spiritual platform.

In an article published by T*he Journal for Study of Religion*, Mbalazi Chrispin, a South African theologian, argues for the transferability of sacred space. He states:

> "Sacred space can be identified as ritual space, a location for formalised, repeatable symbolic performances. In other words, ritual is another defining characteristic of sacred space."
>
> (Tobler, 2000)

In his argument, Chrispin confirms that it is only through ritual under guidance by a spirtual leader that a ritualised sacred space can be moved. Therefore, it is never in the power of design to delegate where sacred spaces are to be placed or moved.

In this, Chrispin also places emphasis on the role of ritual to determine the sacredness of space. By extension, once a ritual is halted, the customs used to retain the sanctity of space are lost as well. Therefore to retain the sacredness of this landscape, ritual must be continued.

6.3.2 THE ROLE OF TRADITION

But what does this mean for the non-ritualised spaces on the mountain? The cattle kraal, the Lekgotla and any space in between is part of the landscape. The position taken in this essay is that they too form part of retaining the sacredness of the mountain by upholding a continuation of tradition. As argued by Professor Vellem before, the mountain is never removed from community, and this communal gathering continues to be space remaining sacred.

As graphically depicted in fFigure: 4, the rituals conducted on the mountain sit at the core of what makes the mountain sacred.

This is because they represent a cyclical interaction with the landscape which involves: purifying, sanctifying and demarcating spiritual dwellings, whilst the

non-ritualised spaces act as an extension of this cycle. The kraal: hosting cattle which are a symbol of wealth offered between communal members as gifts or prepared during a celebratory feast. The Lekgotla: standing as a courthouse for important discussions before interactions with public gatherings. The two non-ritualised spaces act as the extension of this and showcase the interdependency of the landscape.

As a result, although this essay focuses on the spatial qualities generated by the cyclical nature of the ritualised spaces, the spatial significance of the two spaces is not to be discarded in the final design.

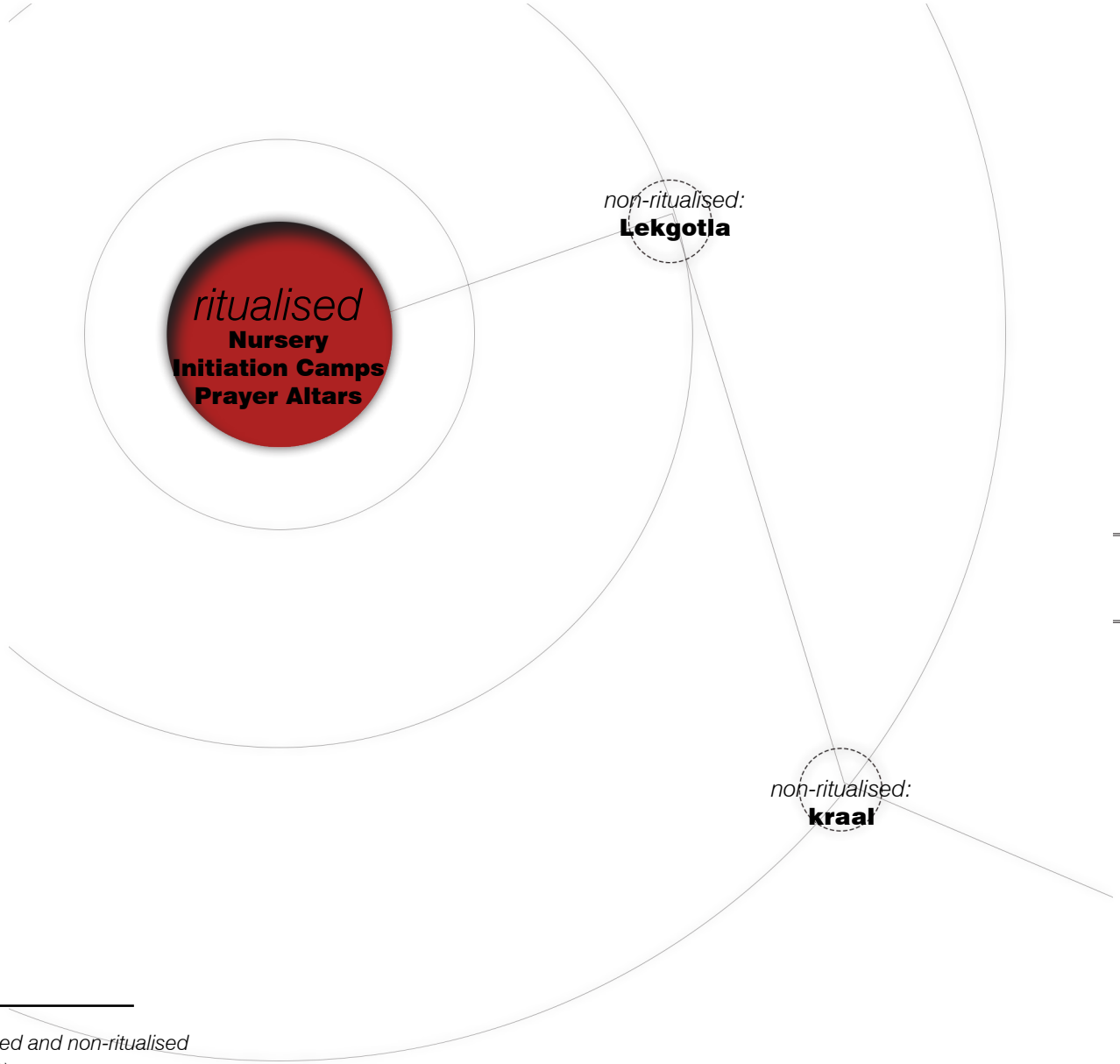
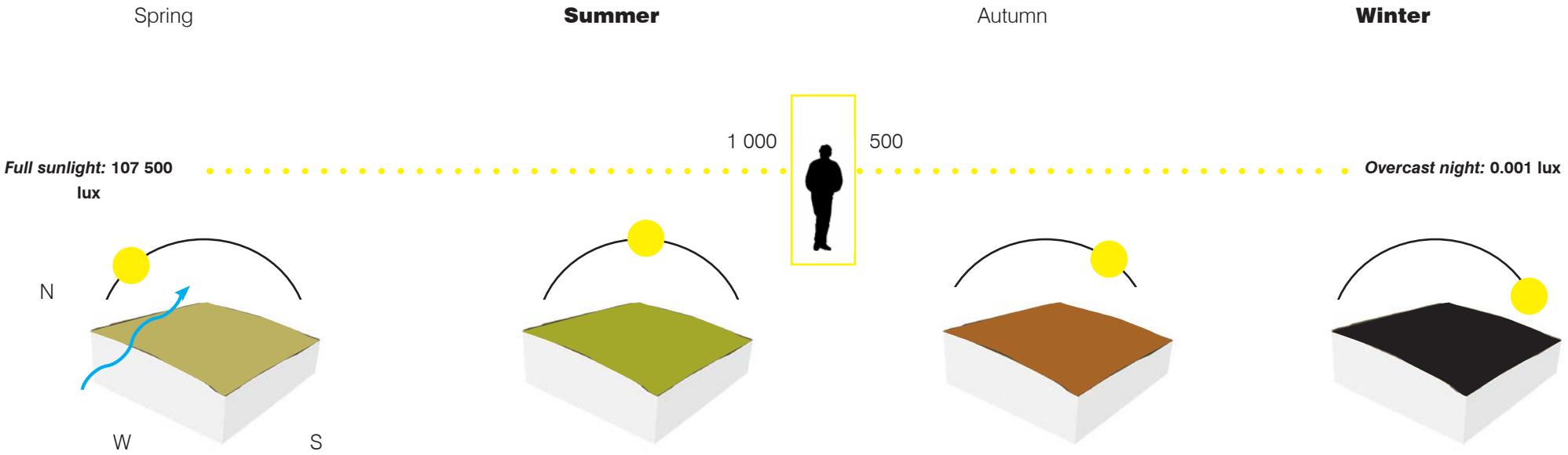


Figure 6.4: *Diagrammatic summary of interaction between ritualised and non-ritualised practices influencing interaction of spatial qualities. (Authour, 2018)*



6.4 The poetics of spatial qualities

But what is the significance of this finding, that ritual sits at the core of what makes landsapes sacred? Surely for a place to become significant, something meaningful must happen or exists there.

What Chrispin highlights in his article is not only that a repeated event happens to ordain a space as sacred. He argues that this one place becomes embedded into culture as one now engraved with meaning to an entire generation of people. A generation who come to identify its spiritual significance because of these 'repeated performances', passed down from generations before. This 'ritual' becomes more than just a repeated event, but a motioned connection to a people who stood there before and were able to recognise the significance of that very same space. These same motions now embedded into culture can be carried with a people across landscapes to ordain new spaces and continue the chain of connectedness. (Tobler, 2000)

This is echoed by the findings of David Chidester, a religious studies professor at the University of Cape Town, and Edward Linenthal, an American academic writer in religious studies. According to Chidester and Linenthal (1995), an integral part of a sacred space is the sanctifying rituals conducted in that space, this process is termed: 'sacralisation of space'.

In support of the conclusions drawn by Chrispin and Linenthal, they argue that sacred place is ritual place, a location for "formalized, repeatable symbolic performances".

Elaborating on the definition of ritual outlined above, Victor Turner, a British cultural anthropologist, bases his findings of ritual on studies conducted in southern Africa. In this study he identifies ritual as:

"A stereotyped sequence of activities involving gestures, words and objects, performed in a sequestered place, and designed to influence preternatural entities or forces on behalf of the

Figure 6.5: *Seasonal changes expected on site with the overarching light quality expected to be experienced and the optimum levels for humans. (NOAO, 2016)(Authour, 2018)*

actors' goals and interests. ***Rituals may be seasonal*** hallowing a culturally defined moment in the climatic cycle or the inauguration of an activity such as planting, harvesting, or moving from winter to summer pasture; or they may be contingent, held in response to an individual or collective crisis. ***Contingent rituals*** may be further subdivided into life-crisis ceremonies, which are performed at birth, puberty, marriage, death, and so on to demarcate the passage from one phase to another in the individual's life-cycle."

(Turner, 1973)(Authours emphasis)

Here, Turner highlights the practicality served by ritual. He distinguishes between seasonal and contingent rituals, then shows their overlap being the use of repeated human actions to 'define the moments'.

What is drawn from this is the role of repeated human activity and influence on landscape of both ritual types to define these moments culturally deemed fit for inauguration. In other words whether it be in a person's life or in a landscape cycle, rituals indeed ordain spaces but also celebrate the phenomena of change encountered in the landscape. (Turner, 1973)

6.4.1 NARRATIVE OF RITUAL

On this mountain, what do these rituals consist of and what are the qualities of the spaces recognised by each across landscapes?

To answer this we look at the narrative of an initiate during a male initiation ritual in South Africa. In his autobiography, former president Nelson Mandela speaks of his experience in an initiation school in Drakensburg, Eastern Cape.

Although due to the evolution of tradition, change in location and possible range of factors (not the purpose of investigation for this dissertation), the physical structures of the ritual on the mountain are slightly altered to that of the narrative below. Where the initiates in the Eastern Cape occupied a hut, the initiation camps of the mountain show no presence of overhead covering - and therefore, none are being responded to.

In his auto-bigraphy *Long Walk to Freedom,* Mandela writes:

"That first night, at midnight, an attendant, or khaukatha, crept around the hut, gently waking each of us. We were then instructed to leave the hut and go tramping through the night to bury our foreskins. The traditional reason for this practice was so that our foreskins would be hidden before wizards could use them for evil purposes, but, symbolically, we were also burying our youth. I did not want to leave the warm hut and wander through the bush in the darkness, but I walked into the trees and, after a few minutes, untied my foreskin and buried it in the earth. I felt as though I had now discarded the last remnant of my childhood.
We lived in our two huts, thirteen in each, while our wounds healed. When outside the huts, we were covered in blankets, for we were not allowed to be seen by women. It was a period of quietude, a kind of spiritual preparation for the trials of manhood that lay ahead. On the day of our re-emergence, we went down to the river early in the morning to wash away the white ocher in the waters of the Mbashe. Once we were clean and dry, we were coated inT

red ocher.
The tradition was that one should sleep with a woman, who later may become one's wife, and she rubs off the pigment with her body. In my case, however, the ocher was removed with a mixture of fat and lard.
At the end of our seclusion, the lodges and all their contents were burned, destroying our last links to childhood, and a great ceremony was held to welcome us as men to society. Our families, friends, and local chiefs gathered for speeches, songs, and gift-giving. I was given two heifers and four sheep, and felt far richer than I ever had before. I who had never owned anything suddenly possessed property. It was a heady feeling, even though my gifts were paltry next to those of Justice, who inherited an entire herd. I was not jealous of Justice's gifts. He was the son of a king; I was merely destined to be a counselor to a king. I felt strong and proud that day. I remember walking differently on that day, straighter, taller, firmer. I was hopeful, and thinking that I might someday have wealth, property, and status."
(Mandela, 1994)

The narrative shows the significance of the initiation ritual to community members. The inauguration of the change in phase in a young mans life. The role of the non-ritualised spaces on the mountain. The livestock pen, the gathering spaces in which the women welcome the men home - all these places are set to have overlapping spatial qualities.

The significance of the Mbashe river in close proximity, the earth in which their childhoods were buried, and the lands in which the huts were burned afterwards tells a story of the alteration of space and a resultant spatial quality stemming from this ritual.

6.4.2 (RE)PRESENCING LANDSCAPES

In looking at the influence these alterations have on the landscape, these will be considered the spatial qualities to conserve through the design. Each ritualised space will have a landscape feature or phenomena to highlight in this effort. This highlight is termed: (Re) presencing, making something once - or on the verge of being forgotten - anew.

In (re)presencing these landscape features and the spatial quality they produced when altered by the ritual, attention is brought to the sacredness of the landscape by its associated rituals. These rituals which overlay culture and landscape, and which are continuously passed down to the next generations through the evolution of tradition.

This is shown in the following sections depicting the (re)presencing of landscape features and the poetics of spatial qualities derived from each ritualised sacred space on the mountain.

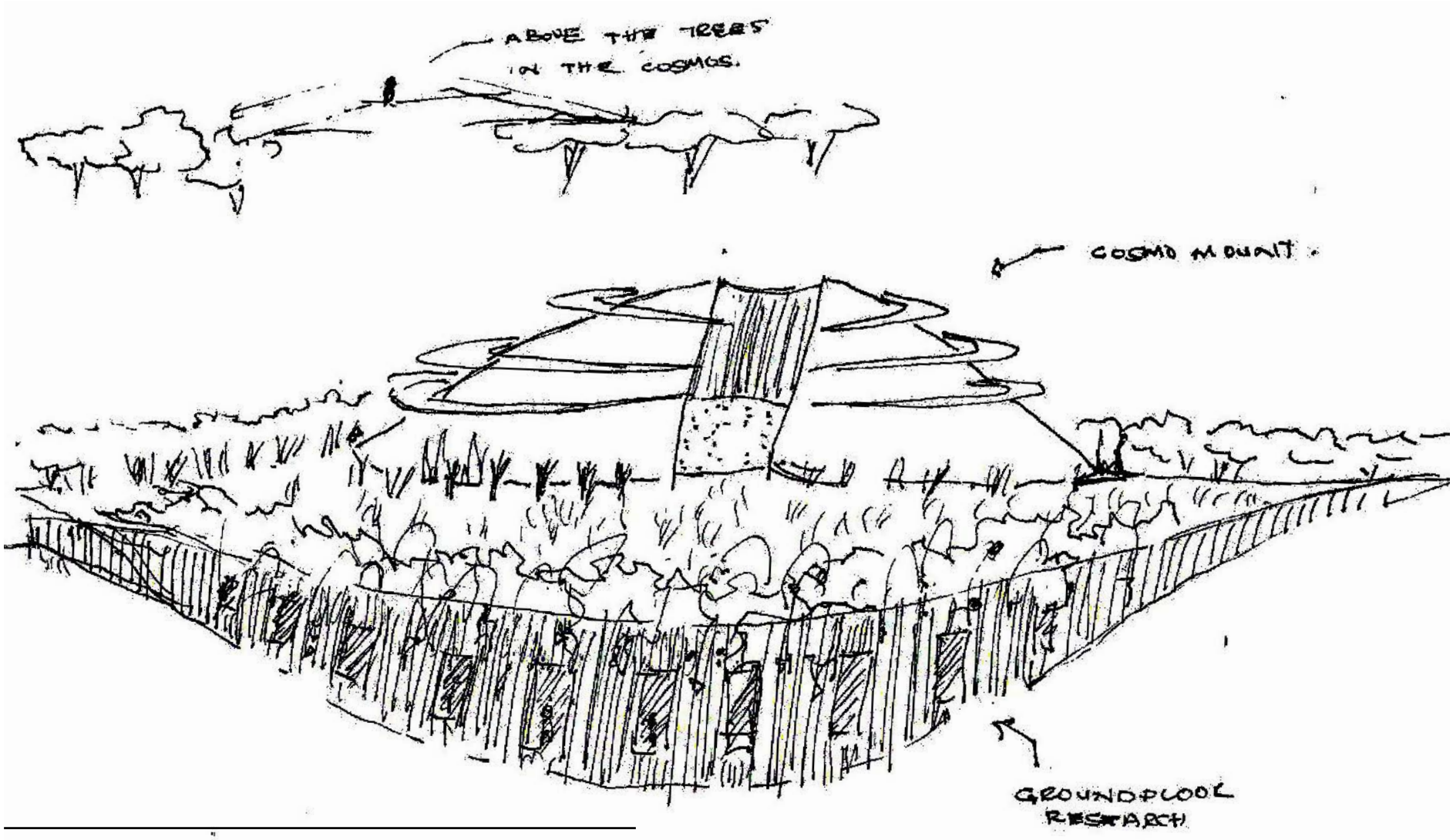


Figure 6.6: *Early Design attempt to (re)presence sky - the design of an open air observatory with a sculptural oculus and information storage-rooms at base. (Authour, 2018)*

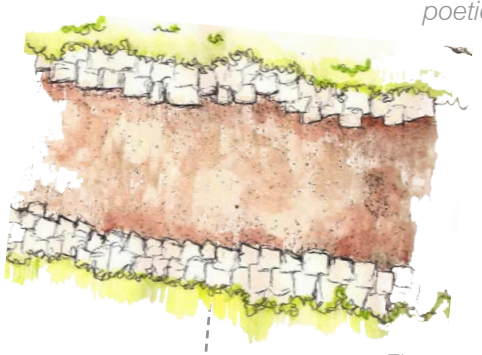


Figure 6.9: .

6.4.3 NURSING LANDSCAPE
Role of ritual to landscape:

Sanctify through planting

Residual spatial quality of ritual:

A continued greenery up to waist high with mountainous backdrop.

In retention of this spatial quality an interplay between rock, herb and exposed soil must be continued.

(Re)presencing:

The vegetation of earth

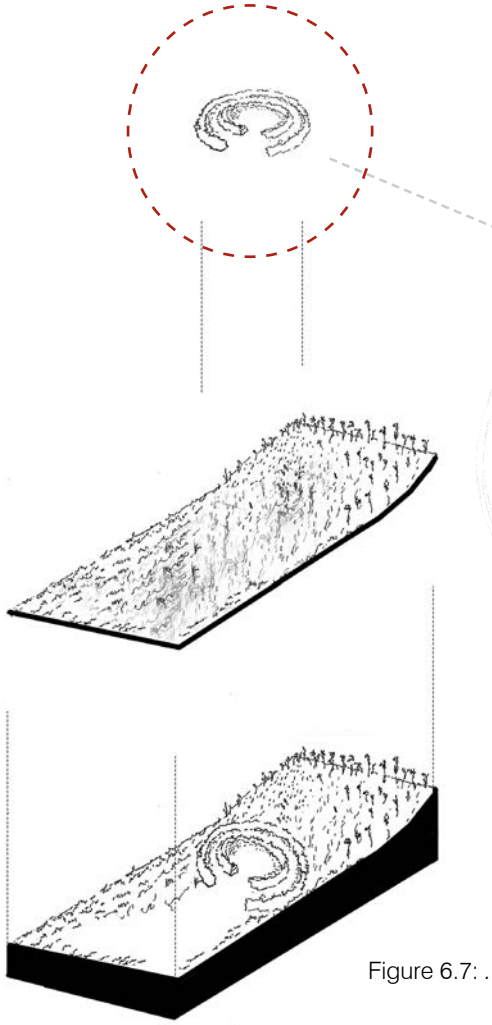


Figure 6.7: .

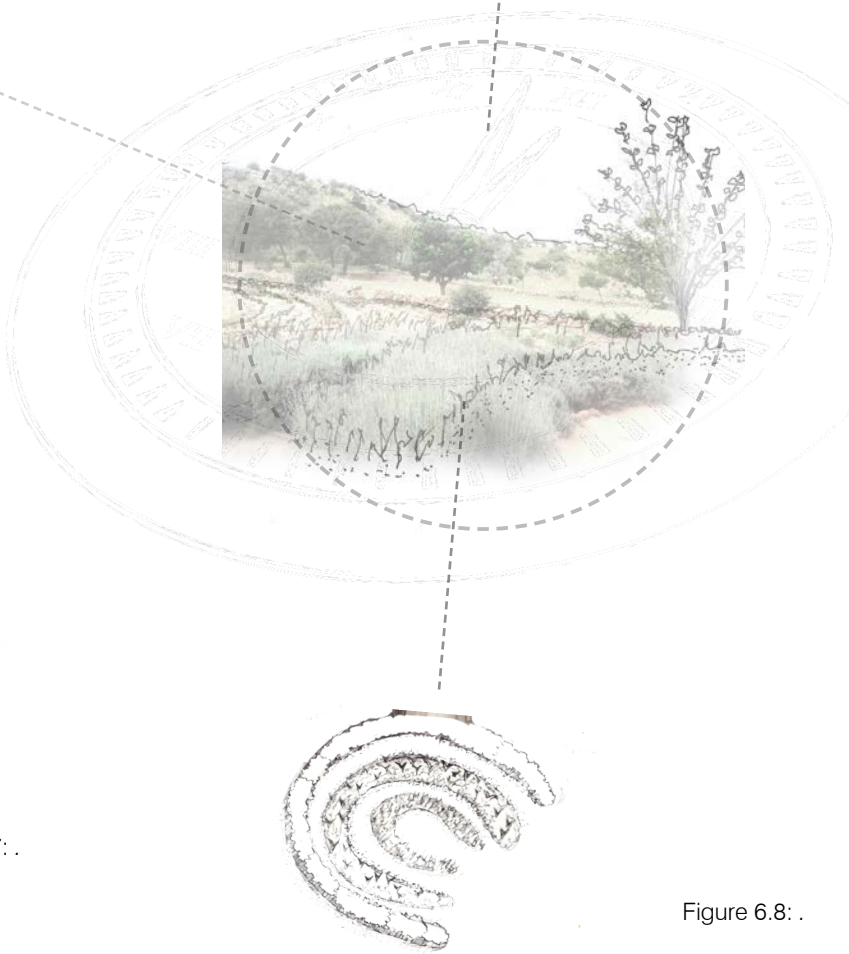
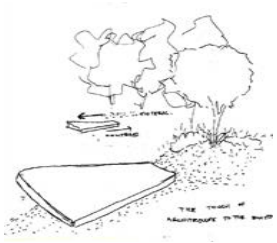


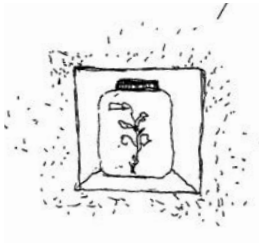
Figure 6.8: .

The ritual conducted at the nursery is one where the entire mountain is sanctified.

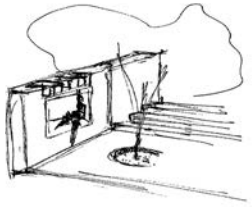
By replanting the area, the on-site traditional healer spiritually cleansed the mountain from the ailments of its past.



herbal plants to contrast natural vegetation



herbarium display area



highlighting the experience of particular plants

Figure 6.9 and Figure 6.8 Alterations of materials and spatial textures from ritual (Author, 2018)

Figure 6.10: *[Above] Perspective of spatial qualities being conserved and strategies to do so (Author, 2018)*

6.4.4 INITIATING LANDSCAPES

Role of ritual to landscape:

Cleanse by fire

Residual spatial quality of ritual:

Charred landscape at the end of seclusion period

Stones painted white used to demarcate the boundary of sacred spaces

(Re)presencing:

Of the sky and seasonally charred land

Initiation periods are contingent rituals celebrating the new phase of male life.

The contribution made to the landscape in this design is to coincide veld fire maintenance with cleansing of landscape carried out by ritual.

Figure 6.11: .

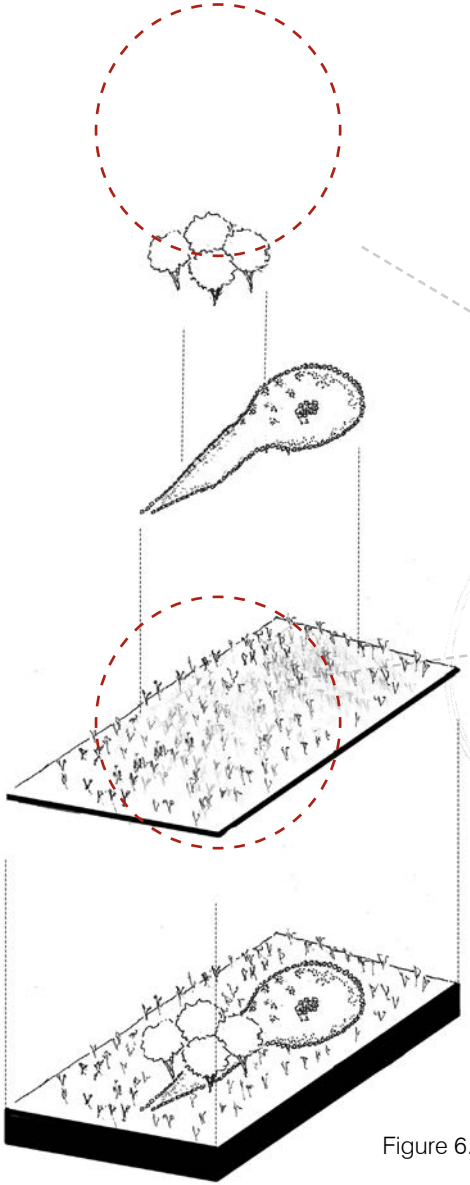


Figure 6.13: .

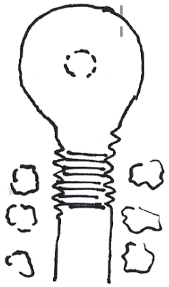
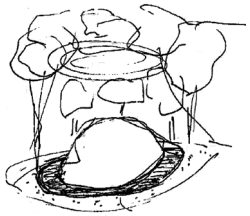
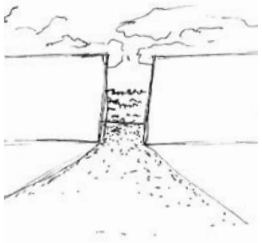


Figure 6.12: .

concealing the sky for long periods to make its sight revealed again



highlighting the light beams from the sky



designed are orientated towards framing the sky in the horizon at key points

Figure 6.11 and FFigure 6.12 Alterations of materials and spatial textures from ritual. (Authour, 2018)

Figure 6.14: *[Above] Perspective of spatial qualities being conserved and strategies to do so. (Authour, 2018)*

6.4.5 AL(TAR)ING LANDSCAPES

Role of ritual to landscape:

Ordained by ash on the altar

Residual spatial quality of ritual:

Scattered built up stone altars across the ridge

Burnt stone on scatted along ridge

(Re)presencing:

The rocks of the mountain

The prayers on the mountain are religious rituals conduct by different church groups in the surrounding community.

By continuation of these rituals, the ridge is religiously considered ordained. This status requests respectful conduct by all who direct believe or respect religions of others.

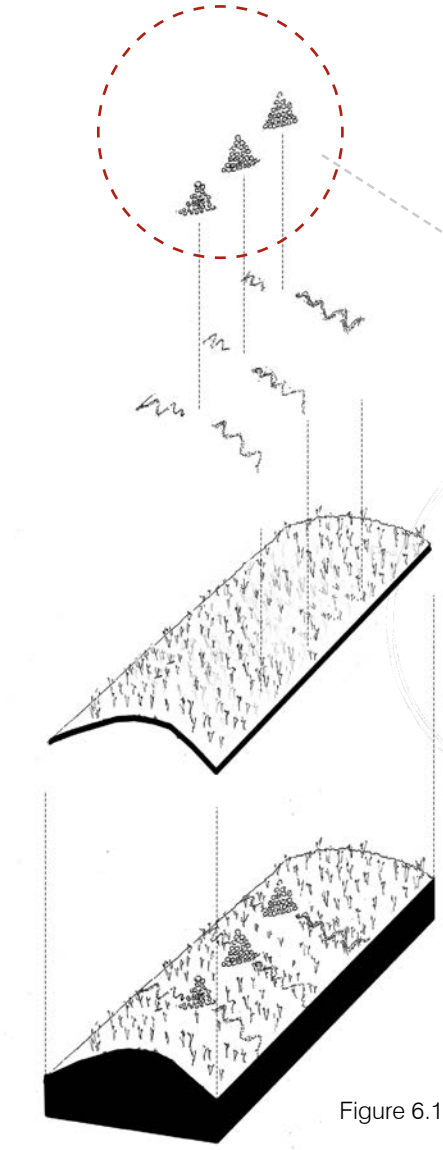
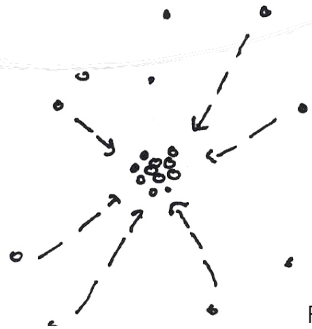


Figure 6.17: .

ash stained rocks
after prayer

Figure 6.15: .



meditative collections of stones

Figure 6.16: .

black ash staining rock

scattered rocks specifically gathered in sections

scattered rocks introducing natural areas

Figure 6.15 & Figure 6.16 Alterations of materials and spatial textures from ritual .(Authour, 2018)

Figure 6.18: *[Above] Perspective of spatial qualities being conserved and strategies to do so. (Authour, 2018)*

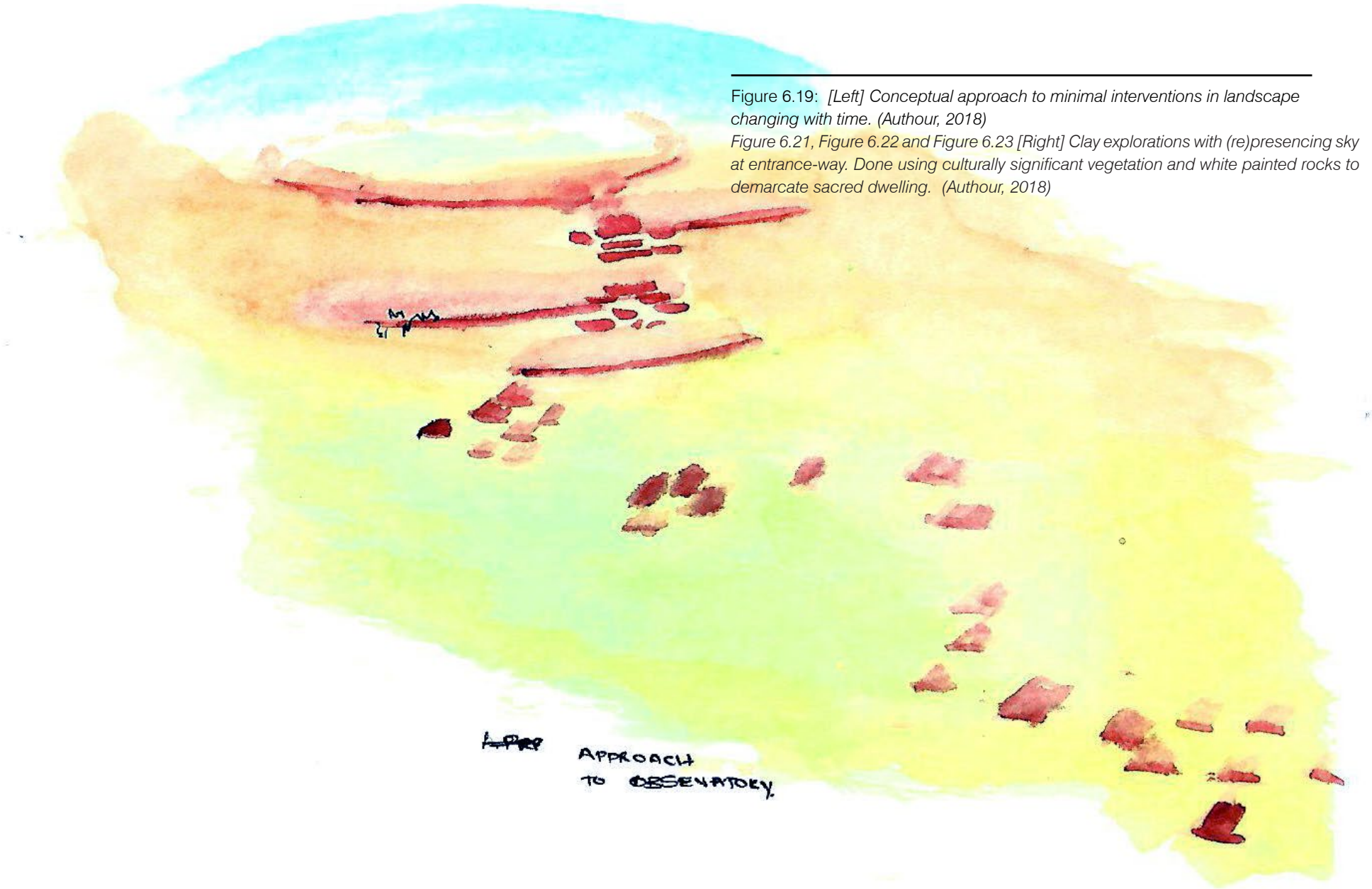


Figure 6.19: *[Left] Conceptual approach to minimal interventions in landscape changing with time. (Authour, 2018)*
Figure 6.21, Figure 6.22 and Figure 6.23 [Right] Clay explorations with (re)presencing sky at entrance-way. Done using culturally significant vegetation and white painted rocks to demarcate sacred dwelling. (Authour, 2018)

Figure 6.20: *Explorations with entrance way to initiation camps ahead and Mothong nursery on right and rest of mountain range trails on left. (Authour, 2018)*

Figure 6.21: .

Figure 6.22: .

Figure 6.23: .

6.5 Predecend study 01: Marula Game Lodge

Designer: [Landscape Architecture Firm] GREENinc Location: Dordabis, Khomas Region, Namibia

The design is set in the Marula Game Ranch gardens overlooking the Schaap River. The design strategy along the gardens was to created a linear navigation route linking the residence to the river.

The route was conceptualized to metaphorically represent a charm bracelet passing through the landscape with secondary elements (jewels) along the route for the user to experience.

The charms include arched walkways, courtyards, deep rock pools and terraced spaces. The courtyards of the project are created of concrete enclosures in the vast landscape, broken down into smaller parts. In these courtyards the spaces are contained and the spatial experiences restrained in direct contrast to the wider landscape. Whilst, the terraces overlook the wider landscape and control its vast scale with a linear layout of the terrace similarly stretched across the horizon.

The material selection for the project replicated the textures found on site. The thread through the garden is the narrative told by the water which moves through the space with the user, used to connect the visitor to each sequential space.

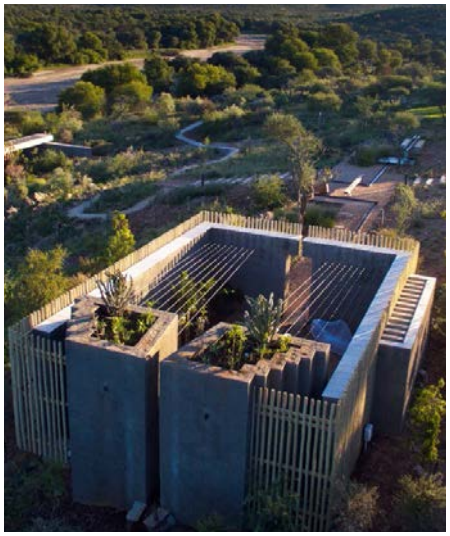


Figure 6.24: *[Top-left] Courtyard boxed (Greeninc, 2016)*
Figure 6.25: *[Left-bottom] Petics created whwn cast of shadow breaks concrete Naoshima, 2016)*
Figure 6.26: *[Right-bottom] Pavillion lawn terrace terrace (Naoshima, 2016)*

6.6 Predecend study 02:
Lee Ufan Museum

Designer: [Architect] Tadao Ando
Location: Naoshima Island, Kagawa, Japan

The building functions as a museum for the art works of minimalist artist Lee Ufan.

According to the architect, the main theme of the building was to design for: “The unity with nature and the merging into the landscape”. (Jodido, 2012)

The promenade and exhibition courtyards are of interest for this dissertation.

The architecture meets the slopes of the steep terrain with slight incisions. This meeting at a datum creates a seamless merger of architecture and landscape, where the two contrasting elements become one at specific points.

In creating a merger with the landscape, Ando uses materials which stand apart from the seasonal changes experienced by the landscape. This way the distinction between landscape and architecture is made clear aesthetically as the two merge and separate at key points.

The poetics of the space is further enhanced by the play with shadows falling on the constructed and natural materials on site. A play on shadow is created by angular forms in the architecture, casting sharp shadows into a softened Pensacola.

Finally, rocks found on site are scattered around the courtyards to have a part of the natural setting spread through the architecture. The rocks stand as natural artworks of their own in this contrasting backdrop of linear architecture forms.

Figure 6.27: *[Top-left] Triangular Courtyard (Naoshima, 2016)*
Figure 6.28: *[Bottom-left] Promendande netrnacr in winter (ArchDaily, 2015)*
Figure 6.29: *[Top-right] Main entrance courtyards (Naoshima, 2016)*
Figure 6.30: *[Right-bottom] Compasrison between promendade entrance differetnn times of year - summer and winter (Naoshima, 2016)*

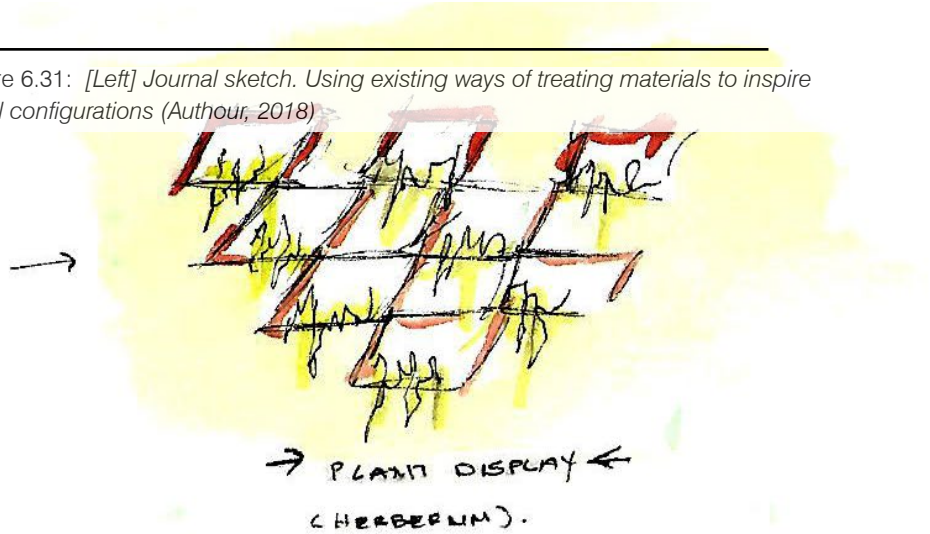


Figure 6.31: *[Left] Journal sketch. Using existing ways of treating materials to inspire detail configurations (Authour, 2018)*

6.7 The poetics of material manipulation

Lilly Kong, an academic writer for religious studies, argues in her article 'religious landscapes', that sacred spaces are ordained through ritual by way of a process called 'sacralisation'.

According to Kong, the processes of sacralisation can be conducted indoors and outdoors through ritual.

In reference to the sacralisation of space in mainstream Hinduism, her research concluded that purification of the outdoor occurs:

"Through consecration of the land and planting of ritually significant plants", whilst purification of the indoors occurs "through lighting the sacred fire, anointing participants with ashes from the fire, and walking a cow through the rooms".

(Duncun & Schein, 2004).

She argues that the knowledge on how to conduct these sacralisation rituals is passed down traditionally.

This is echoed by Chrispian, who argues for the value placed on oral tradition in ritual. Most often, rituals would be conducted around particular trees, stones, geographic feature or even constellations. Over time, repetitions became symbolic and engrained in traditional knowledge passed down to ensure the act is correctly conducted (Tobler, 2000).

In other words, the ritual characterizes sacred spaces because of the orientation around and subsequent manipulation of space through these 'symbolic and repetitive performances'.

In her writing about religious landscapes, Lily Kong elaborates the focus on the human body during sacrilisations:

"[The human body] manipulates basic spatial distinctions between up and down, right and left, inside and outside, and so on, that necessarily revolve around the axis of the living body."

(Duncun & Schein, 2004).
This is to say, in the production and maintenance of sacred space, the poetics of space plays a role with the orientation of the human body and the impact of space on it. She gives the following examples:

"The processes of sacralisation involves moments of quiet meditation prior to casting a circle, setting up the altar, laying out the witch's tools [or] ringing a bell to signal the commencement of the rite".
(Duncun & Schein, 2004).

The process of spatial alteration relative to the orientation of the human body she describes as a recollection in this dissertation of the recursive process described by Denyer in the previous essay: *Ordering*. Denyer described the recursive patterns layed in the Nyakusa house, leaving a patterned decoration on the house walls. The patterns similar to those of the Ndebele paintings on the exterior of their homes. Both recursive processes considered meditative practices leaving imprints on forms.

Another example given by Dneyer was the rock-wall construction techniques of Great Zimbabwe and the Ghoya of

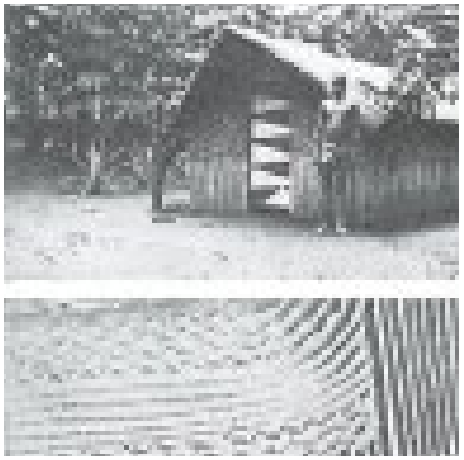


Figure 6.32: *Exploring recursion in material: Tanzania Nyakusa house 1900, Southern Tanzania* (Denyer, 1978)

Figure 6.33: *Exploring recursion in material: Ndelbe styled hut existing on dissertation site* (Authour, 2018)

Figure 6.34: *Exploring recursion in material: Ghoya Tribe stone walled home (Denyer, 1978)*

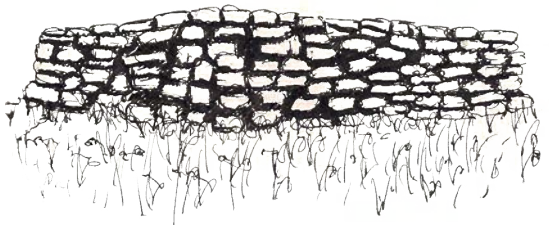
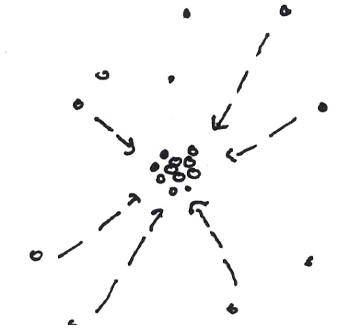


Figure 6.35: *Exploring recursion in material: Skectch of rock walls built on site for cattle kraals* (Authour, 2018)

Lesotho. Both involving the excavation of nearby soils to retrieve localised building materials. The rock-stacking technique is a recursive process of re-laying boulders in particular formations so as to have the rocks remain in place by friction alone. This technique is found on site in the construction of cattle kraal walls.

In the same way that the recursive technique is repetitive, the rituals are considered 'repeatable symbolic performances'. What we see here is the culture of repetition on both a local and a human scale manifested through both process of construction and processes of sacralisation.

As a result, in this dissertation it is argued that the poetics of material manipulation would be in the allowance of materials to change phases with the landscape and the contingent ritual cycles.



meditative collections of stones

burning of dried herbs on the altar

scared stones used throughout the landscape

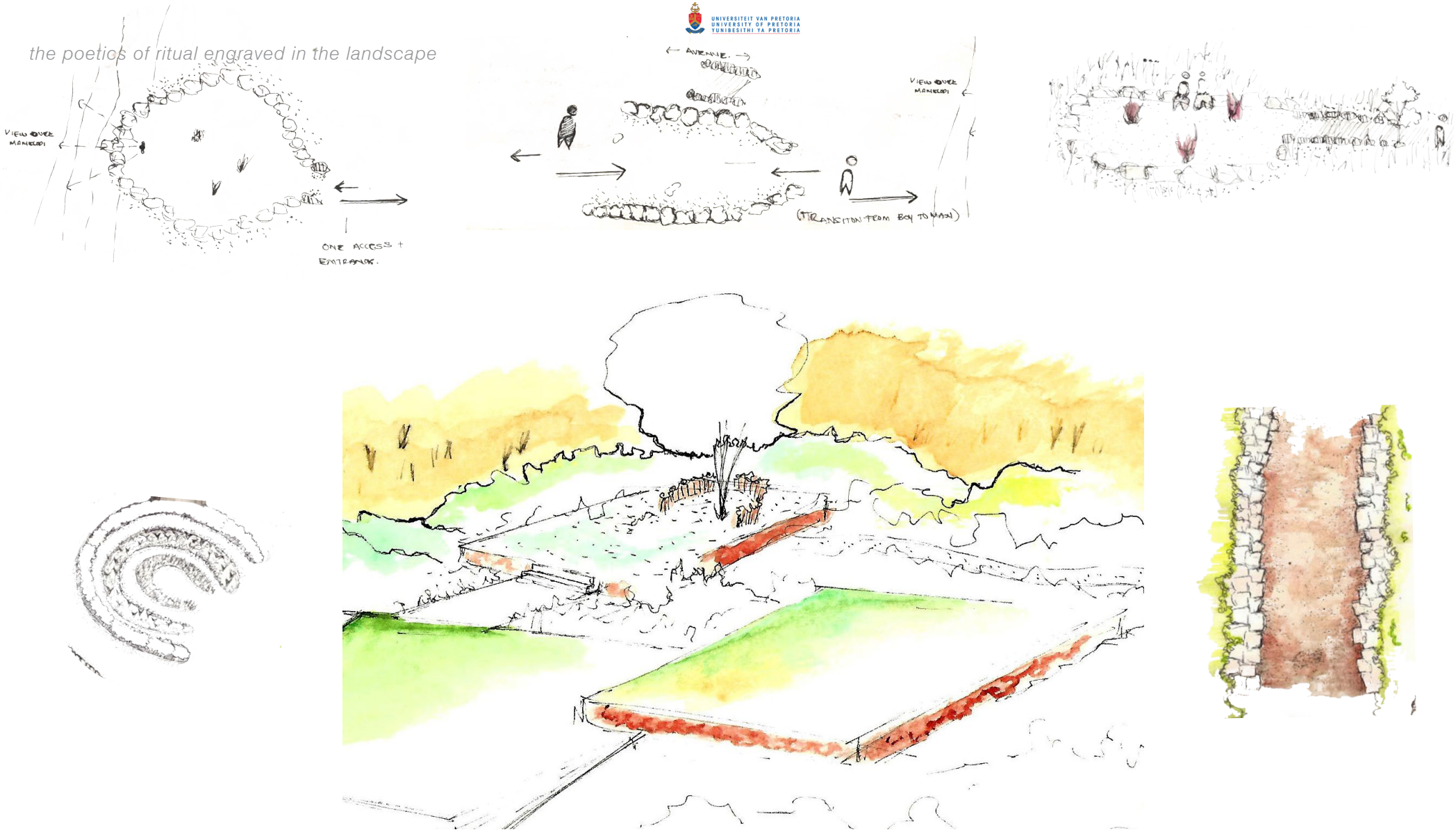


Figure 6.36: *[Left] The prayer altar ritual being conducted and the altered stones left behind. (Authour, 2018)*
Figure 6.37: *[Above] Conceptual approach to social spaces being layered with the landscape materials altered during ritual. (Authour, 2018)*

6.8 Pre cedent 03: Firegrazer Project

Designer: [Artist and Animal Scientist] Hannelie Coetzee and Sally Archibald
Location: Khatlhampi Private Reserve, bordering the Nirox Sculpture Park

This project formed part of Prof Archibald's research into the relationship between landscape and grazing animals - arguing that small, managed fires can impact the way animals use landscape. The research aims to contribute to the improvement of grassland conversation schemes in producing more diverse and productive grasslands. Cotzee saw the opportunity to artistically include humans into this research into animal and landscape.

Kirchoff Professional Surveyors managed the fire-break burning for the project. Coetzee provided the Surveyors with an A4-sized sketch of the artwork: Eland and the Boy, which the surveyors coverted to digital fomat. This digital copy was then overlaid onto a Google Earth image of the selected site, then using virtual reality, was positioned onto the land covering an area of approximately 500 x 800m.

What was necessary for this project was that the artwork was projected onto a slope of a valley in which the surveyor could be positioned on the other side of the embankment during the projection.

The total areas covered by the artwerk in the end was 5ha, needing to plot 1500 points on a GPS measurement tool.

After the edge was set out by the surveyors, a *Working on Fire* team from the Cradle of Humankind, a government-funded programme focusing on integrated fire management in South Afirca, burned the firebreak along the projection edge at 1m wide. From there, the veld grass was burnt and the artwork showcased to an audience of 200 people.

To continue the research for the project, the exhibtion was repeated, as a reult, 'The locust and the grasshopper' fire grazer project was conducted soon after.

(Kirchhoff, 2015)

Figure 6.38: *[Top-left] Locuus and the grasshopper artwork (Coetzee, 2015)*
Figure 6.39: *[Bottom-left] Final burnt project of 'Eland and the boy' (Coetzee, 2015)*
Figure 6.40: *[Right] one meter fire-break for 'Eland and the boy' (Coetzee, 2015)*

6.9 Pre cedent 04: BruderKlaus Kappel

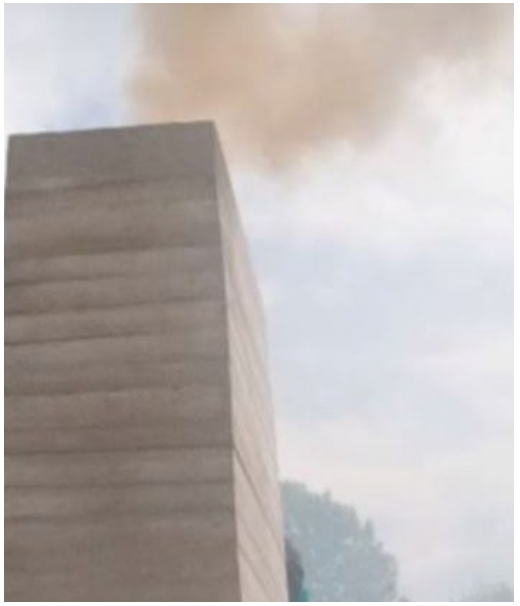
Designer: Peter Zumthor
Location: Mechernich, Germany

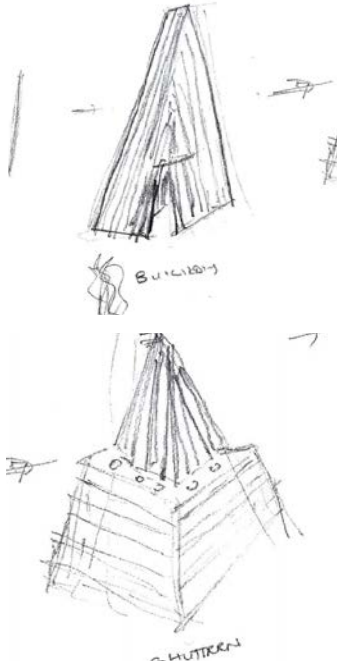
The project is the renovation of an old church. The architect proposed the construction of a cement church with the inside texture created by burnt wood.

A total of 112 wigwam tree trunks were used to construct a frame for the building. Once completed, layers of concrete were poured and rammed over the frame - each layer approximately 50cm thick. The total of 24 layers of concrete set against the wooden frame - then the frame was set alight from the enclosure of the dried concrete.

When the fire subsided, there remained a blackened cavity in the concrete enclosure with charred walls.

"To me, buildings can have a beautiful silence that I associate with attributes such as composure, self-evidence, durability, presence, and integrity, and with warmth and sensuousness as well; a building that is being itself, being a building, not representing anything, just being."
Peter Zumthor (ArchDaily, 2011)





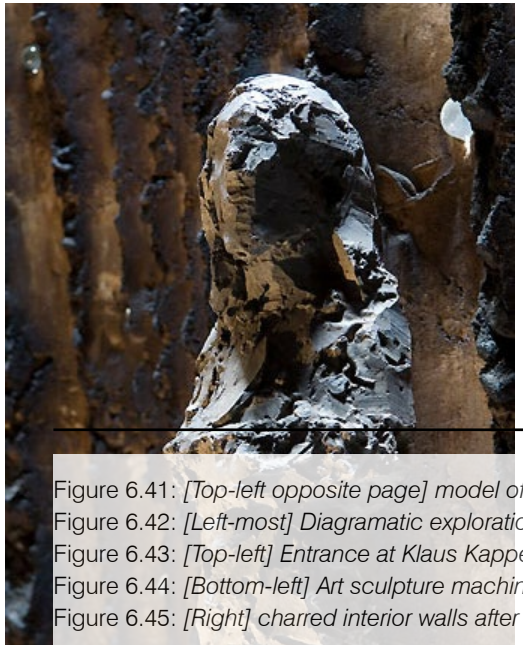


Figure 6.41: *[Top-left opposite page] model of chappel being burnt. (FightBack,2012)*
Figure 6.42: *[Left-most] Diagramatic exploration of method behinf burning (Authour, 2018)*
Figure 6.43: *[Top-left] Entrance at Klaus Kappel (ArchDaily,2011)*
Figure 6.44: *[Bottom-left] Art sculpture maching tone of burnt walls (ArchDaily,2011)*
Figure 6.45: *[Right] charred interior walls after burning of wooden beams (ArchDaily, 2011)*

6.10 Critical reflection

6.10.1 A RETROSPECTIVE ANALYSIS

The return to the site with the added information gained in the other essays has generated an overlay of responses to the conservation of sacredness on an active landscape.

An assessment of poetics of site provides a designer with the opportunity to recognize what makes the cultural landscape unique and celebrate this alone.

As the nature of ritual entails the passage of information through tradition, it is the conclusion of this essay that the retention of poetics of space and ritual would resonate with the same generation traditions are passed onto.

As the rituals continue being conducted and the site continues to reflect the celebrations of events inaugurated through both contingent and seasonal rituals, the sacredness of the mountain would be retained with the passage of traditions to consecutive generations.

6.10.2 THE APPLICATION

Through design synthesis, the information gathered in each essay will be overlayed to inform the technical resolve of the design approach.

This will be done in the next chapter: Design Synthesis

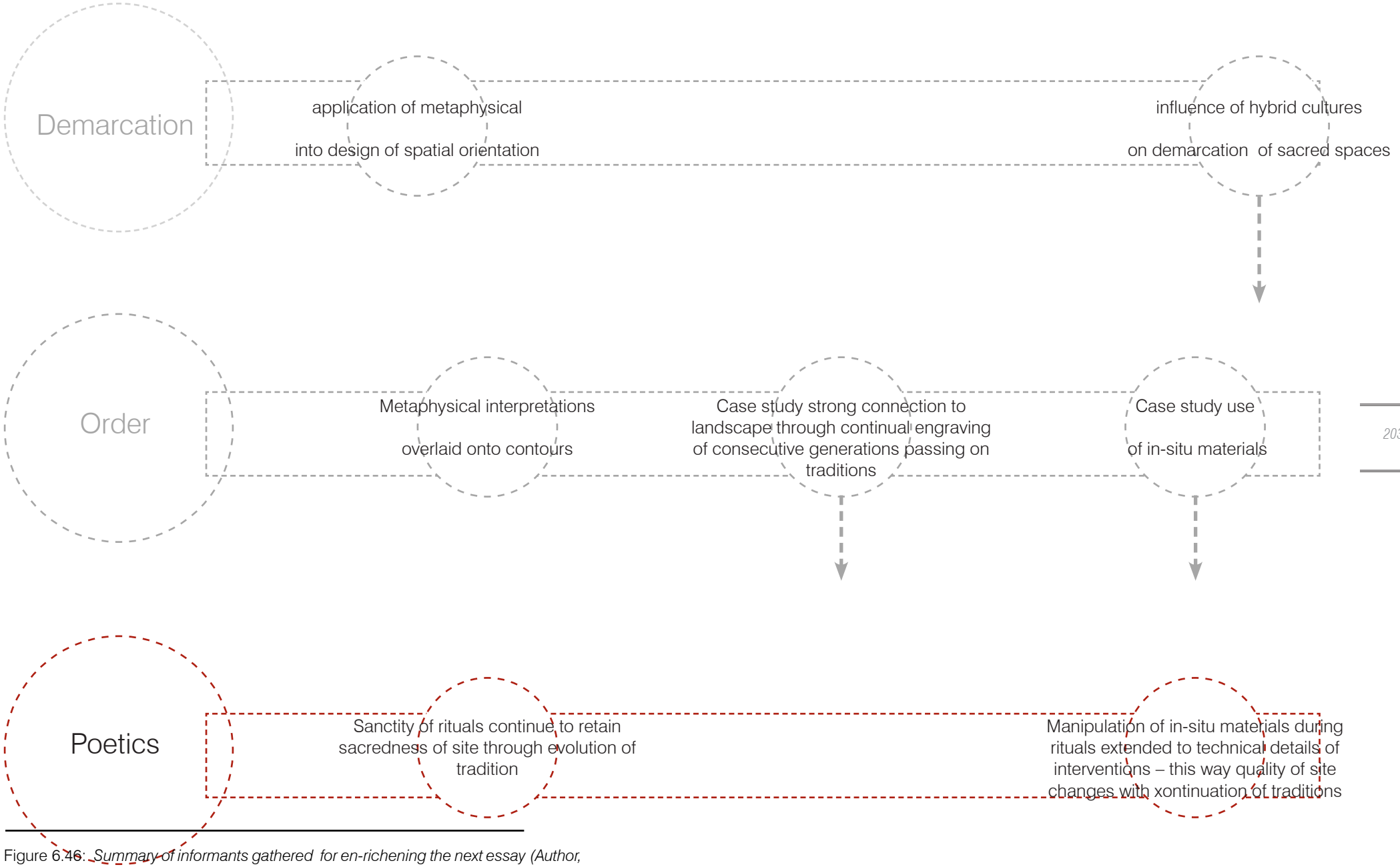


Figure 6.46: *Summary of informants gathered for en-richening the next essay (Author, 2018)*

Figure 6.47: *Image of a pathway in the cattle kraal going up the mountain (Author, 2018).*

Figure 3.18: *'Rondebosch Common Morning' (2013), by J. Parsons (1967 - Present)*

"In Africa you have space…there is a profound sense of space here, space and sky"
Thabo Mbeki,1999
(Theys, 2015)

07

Design Synthesis

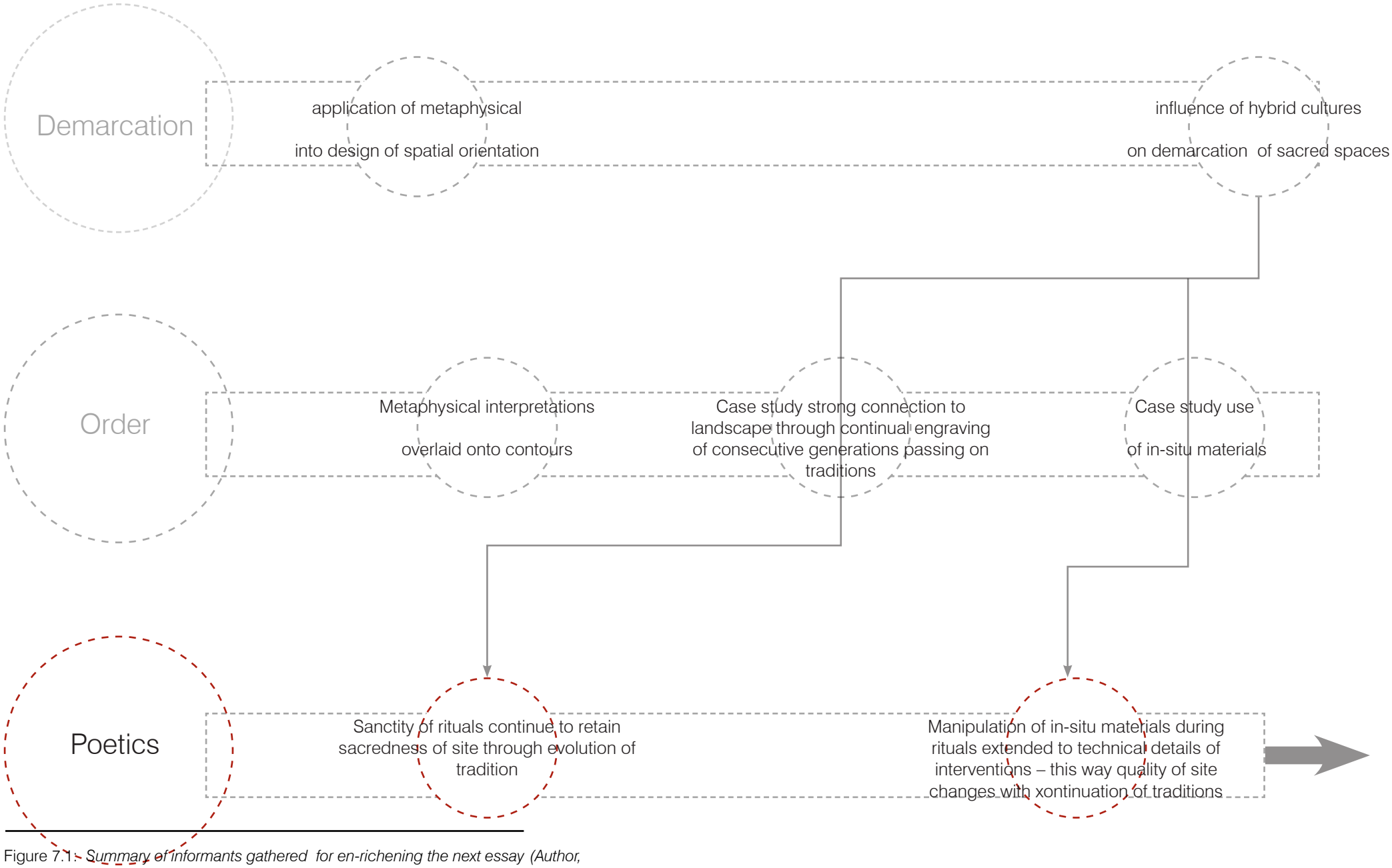


Figure 7.1: *Summary of informants gathered for en-richening the next essay (Author, 2018)*

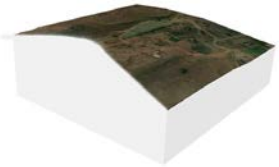


Figure 7.4: *Synthesis: on-site conditions (Author, 2018)*

Site is the only informant. Its textures, rituals and seasonal changes

The metaphysical expressions of the users are expressed through adoptions of poetics of site

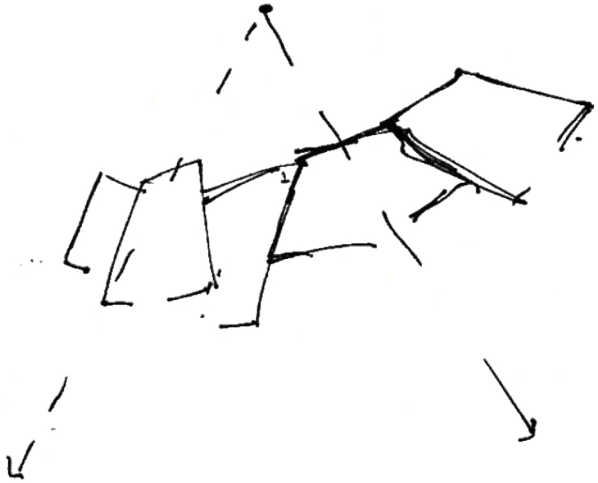


Figure 7.2: *Synthesis: order emulated from site (Author, 2018)*

Existing physical patterns are identified and responded to contextually as an informant

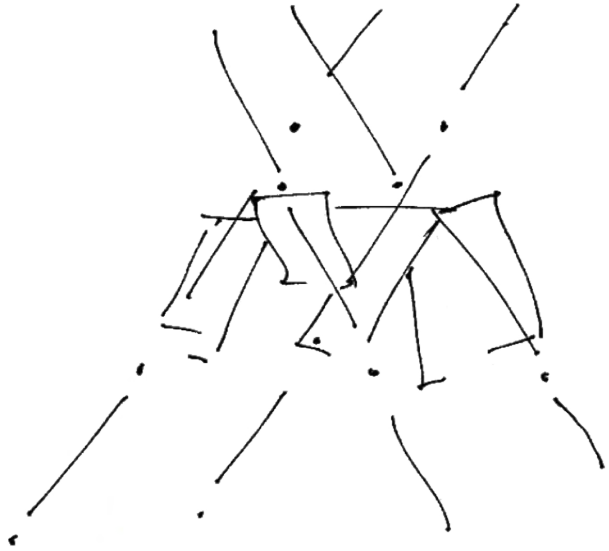
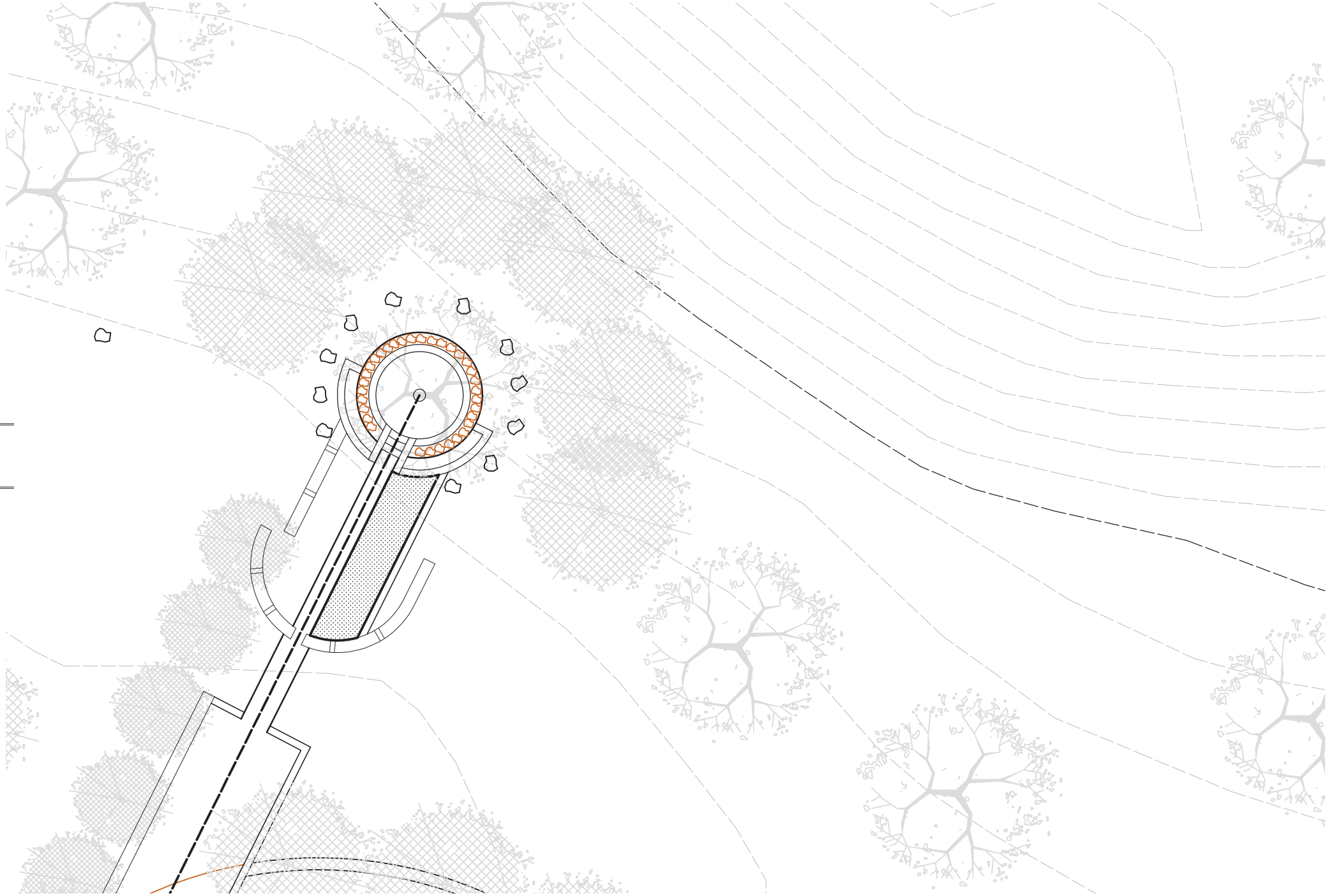
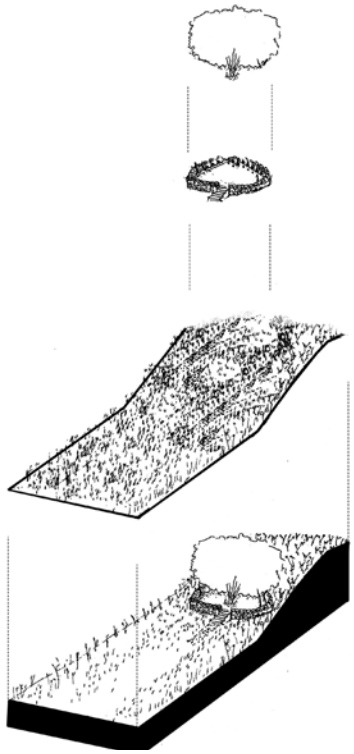


Figure 7.3: *Synthesis: Poetics of site learn from order (Author, 2018)*

A response to poetics of site breaks rigidity of any rules of order and generates a fluid order changing with site conditions.





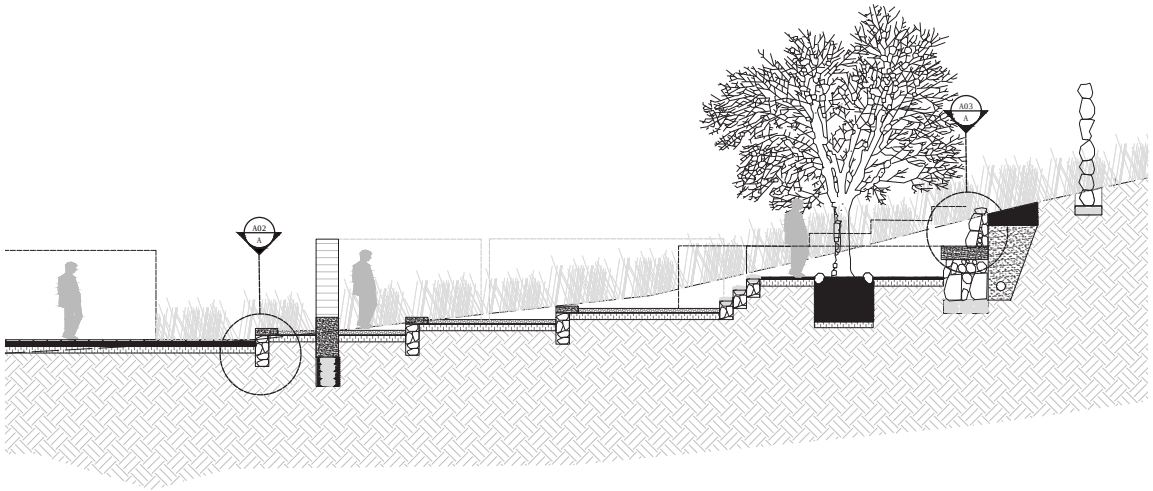
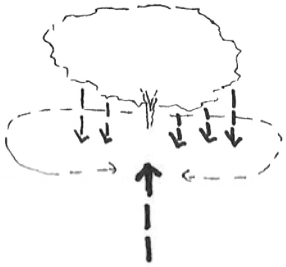
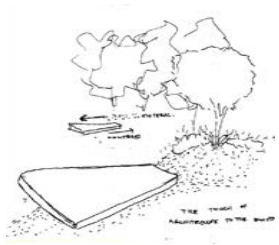


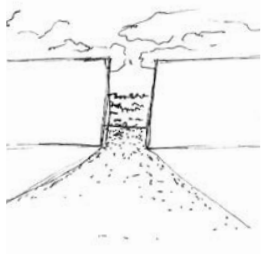
Figure 7.5: *Design Response: A response to the existing Lekgotla (Author, 2018)*



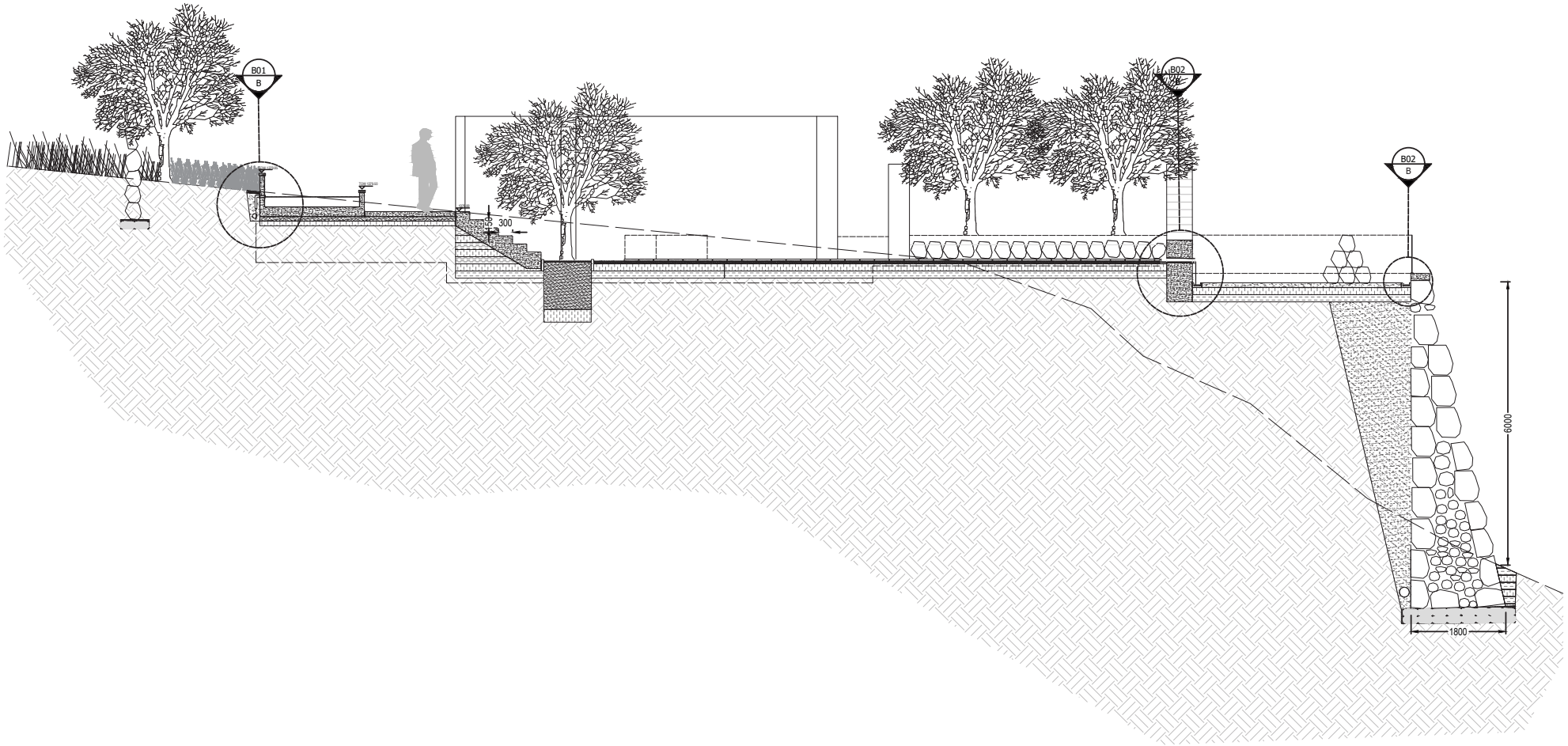
play on shade provided by trees and contrast to pathway



herbal plants to contrast natural vegetation



designed are orientated towards framing the sky in the horizon at key points



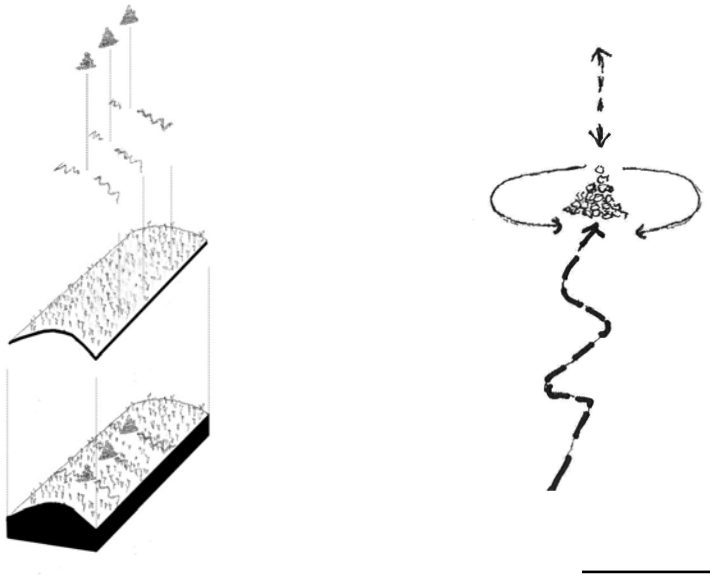
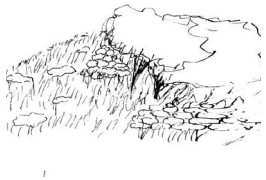
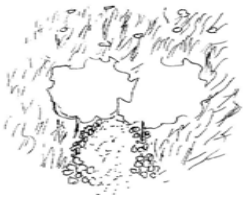


Figure 7.6: *Design Response: A the prayer altars (Author, 2018)*

black ash staining rock

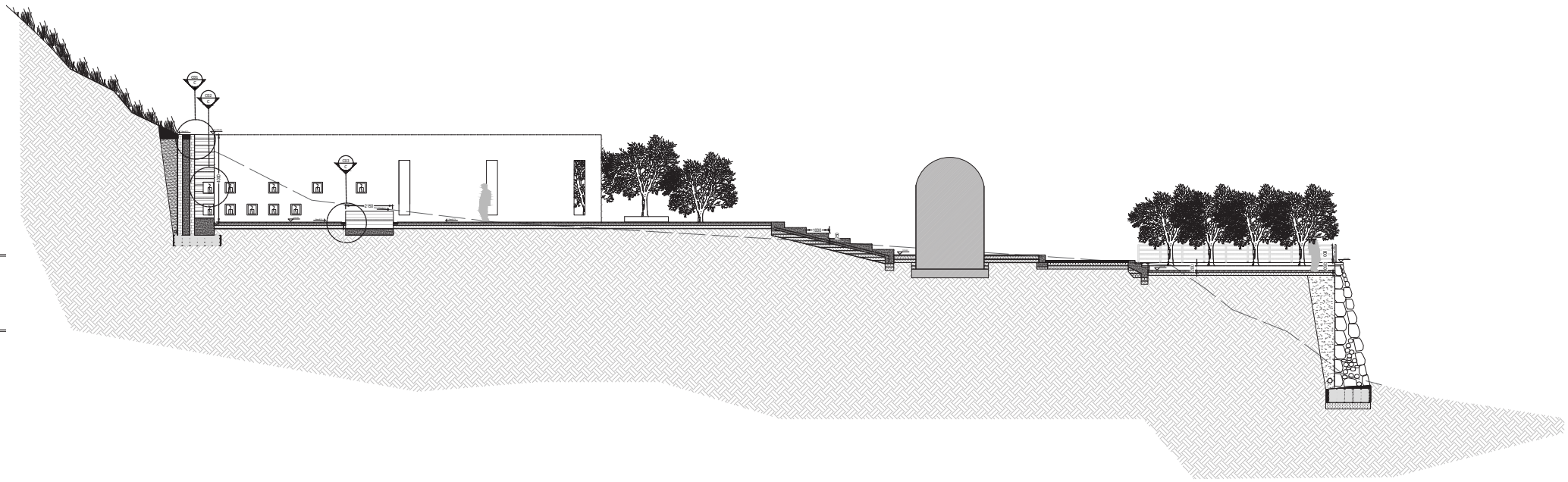


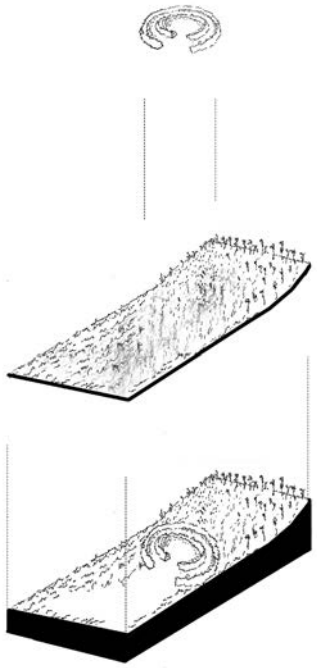
scattered rocks specifically gathered in sections



scattered rocks introducing natural areas

Figure 1.11: *Fencing made of waste material at base of mountain (Author, 2018)*





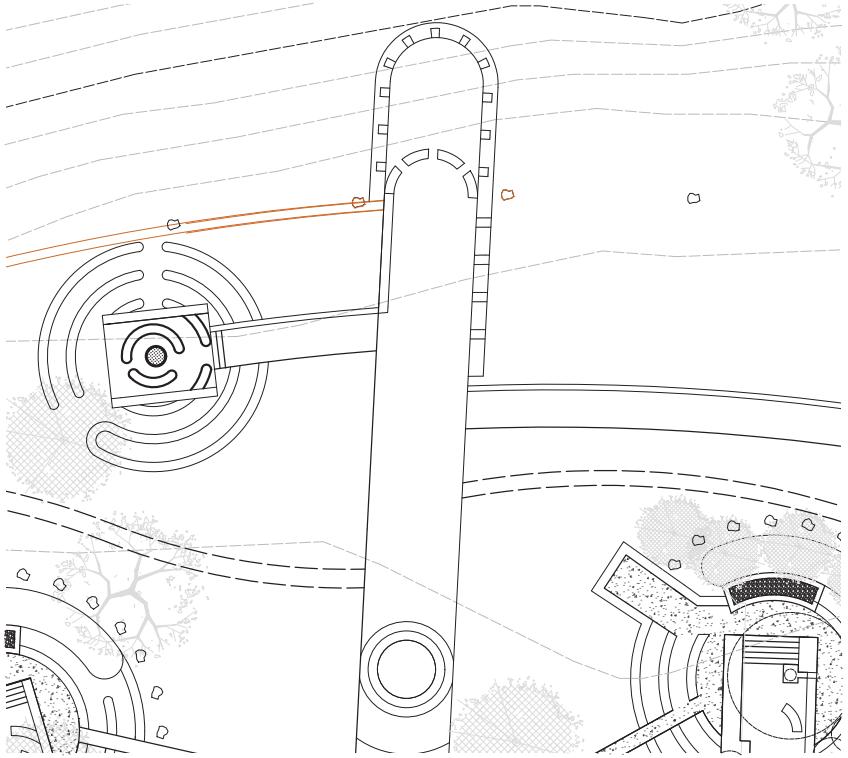
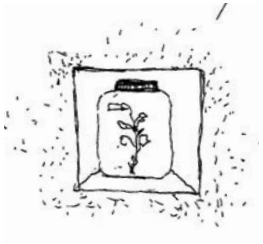
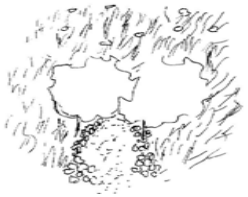


Figure 7.1: *Design Response: An insert of the herbarium, a response to the nursery and intation schools (Author, 2018)*



herbarium
display area

concealing the sky for
long periods to make its
sight revealed again



scattered rocks
introducing natural
areas

Figure 7.2: *Existing Rock vegetation on site adjacent to Kraals - inspiration for ascent up the mountain. Author, 2018)*

7.1 Introduction to Technical Investigation

7.1.1 STATEMENT

In the retention of the sacredness of the mountain area, the manipulation of in-situ material and planting will be continued to technical detail.

Manipulation of in situ material used during ritualized and non-ritualized practice will be used in the construction.

The interplay between topography and planting seen in the natural areas will be continued through into the design on steeper slopes.

7.1.2 CRITICAL PROBLEMS

Being situated on a mountain, steep topography of the site call for sensitive approach to construction.

The main problem faced is the threat of erosion if programme or construction technique encourage destabilisation of soil or disturbance of healthy plant communities.

In an effort to continue the argument for the coherence between conservation and preservation approaches on site, natural management systems on site need to be overlain with human use of space. As a result, the following need to be adhered managed:

- Fire Grazing
- Controlled Harvesting
- Water retention
- Erosion control

7.1.3 TECHNICAL APPROACH

A low-tech approach to technification will be taken. In this approach, local material will be used to create contemporary technical resolutions. In this approach, in-situ materials will be used as experienced on site and further manipulated.

A predominantly mono-material aesthetic is sought after to make reference to the natural conditions that the current cultural landscape aims to blend into.

The use of contrasting materials will be used to create highlights in the landscape.

7.1.4 INVESTIGATIONS

How to respond to steep slopes?

These are to be technically investigated:

- Platforms
- Terraces
- Materials: rammed earth, gabions, dry packed stone walls
- Technique: Cut and Fill

How can contextual materials be used to create a low-tech design approach?

On the flatter section of the earth as a material will predominantly be used to make reference to soils found on this section of site. These soils range from loose to compacted soils.

On steeper slopes, the on-site materials are the quartzite rocks broken off from the mountain façade.

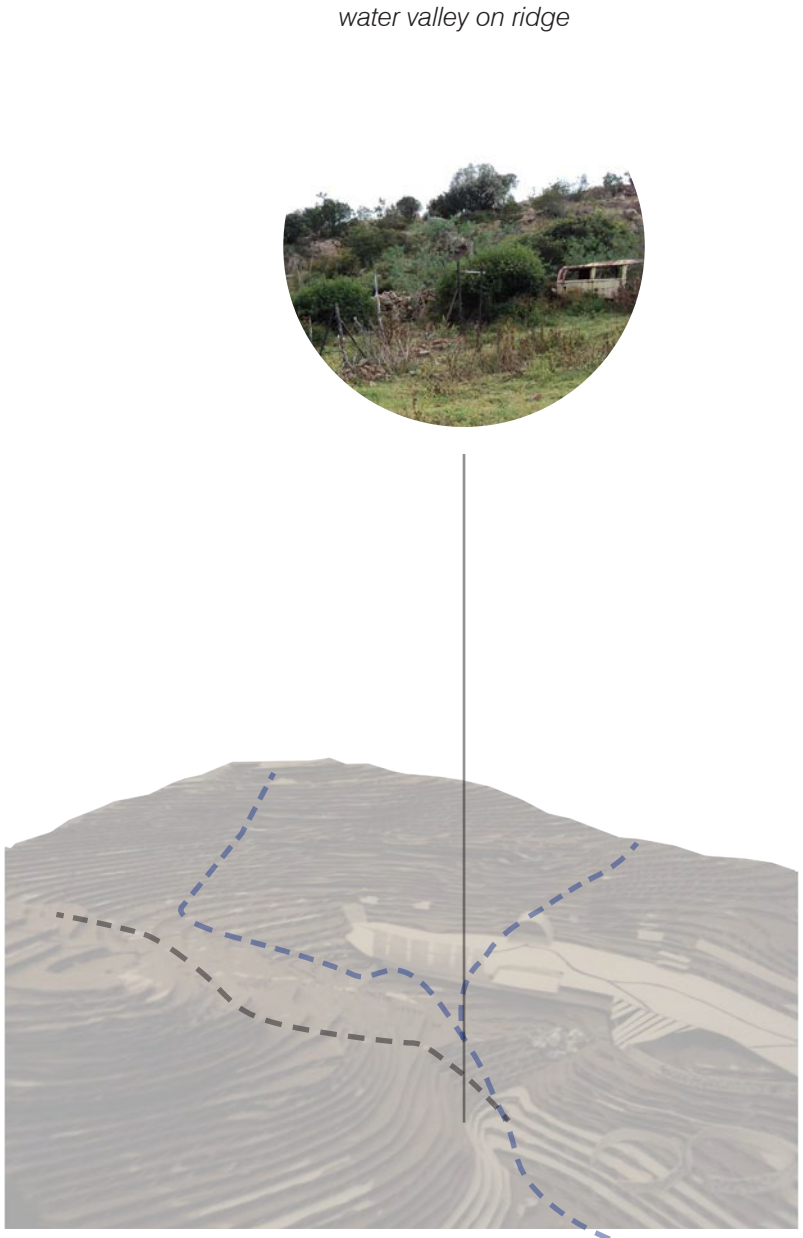


Figure 7.3: *water movement through site overlain on a 1 M contour model with an earlier design exploration*

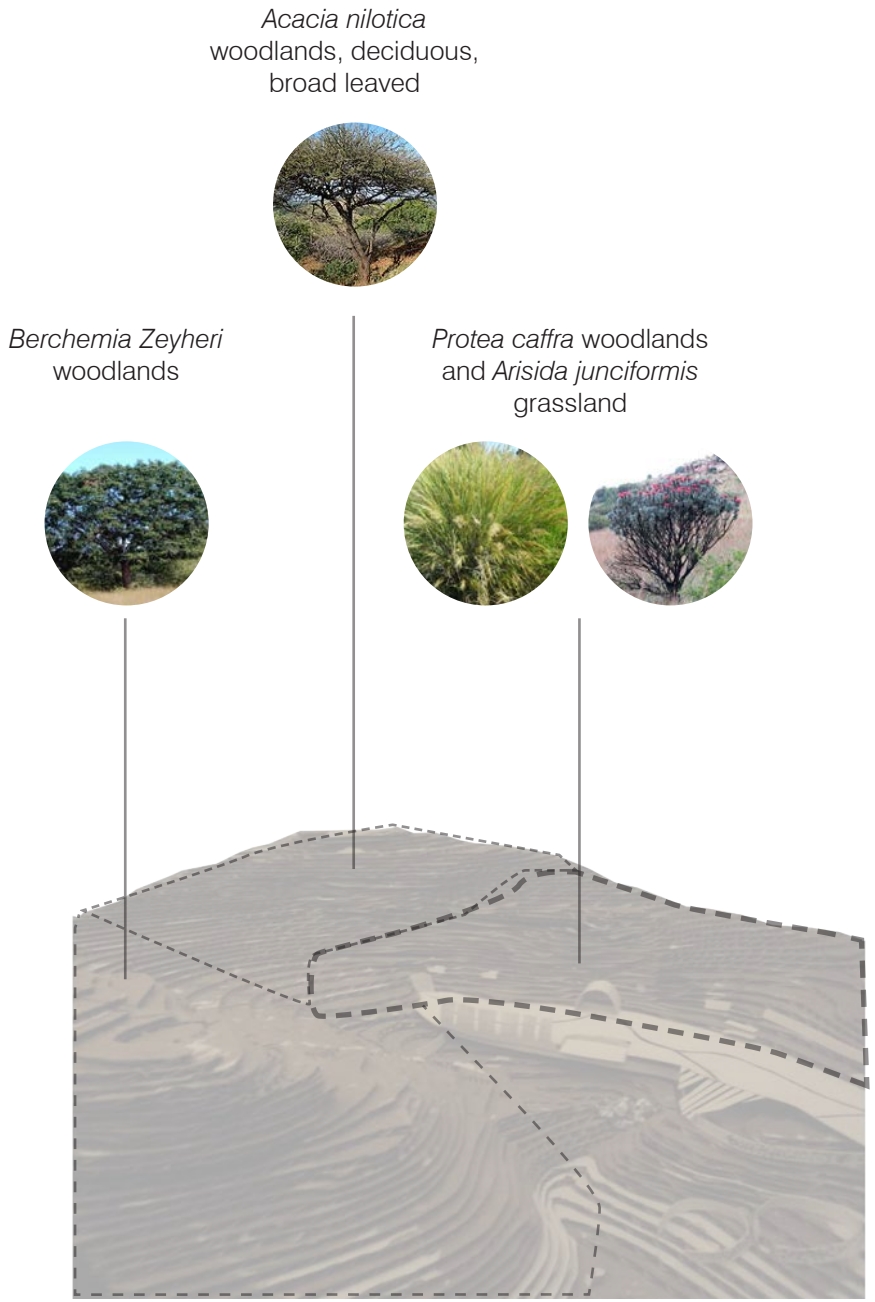


Figure 7.4: *plant communities overlain on 1 M contour model with an earlier design exploration*

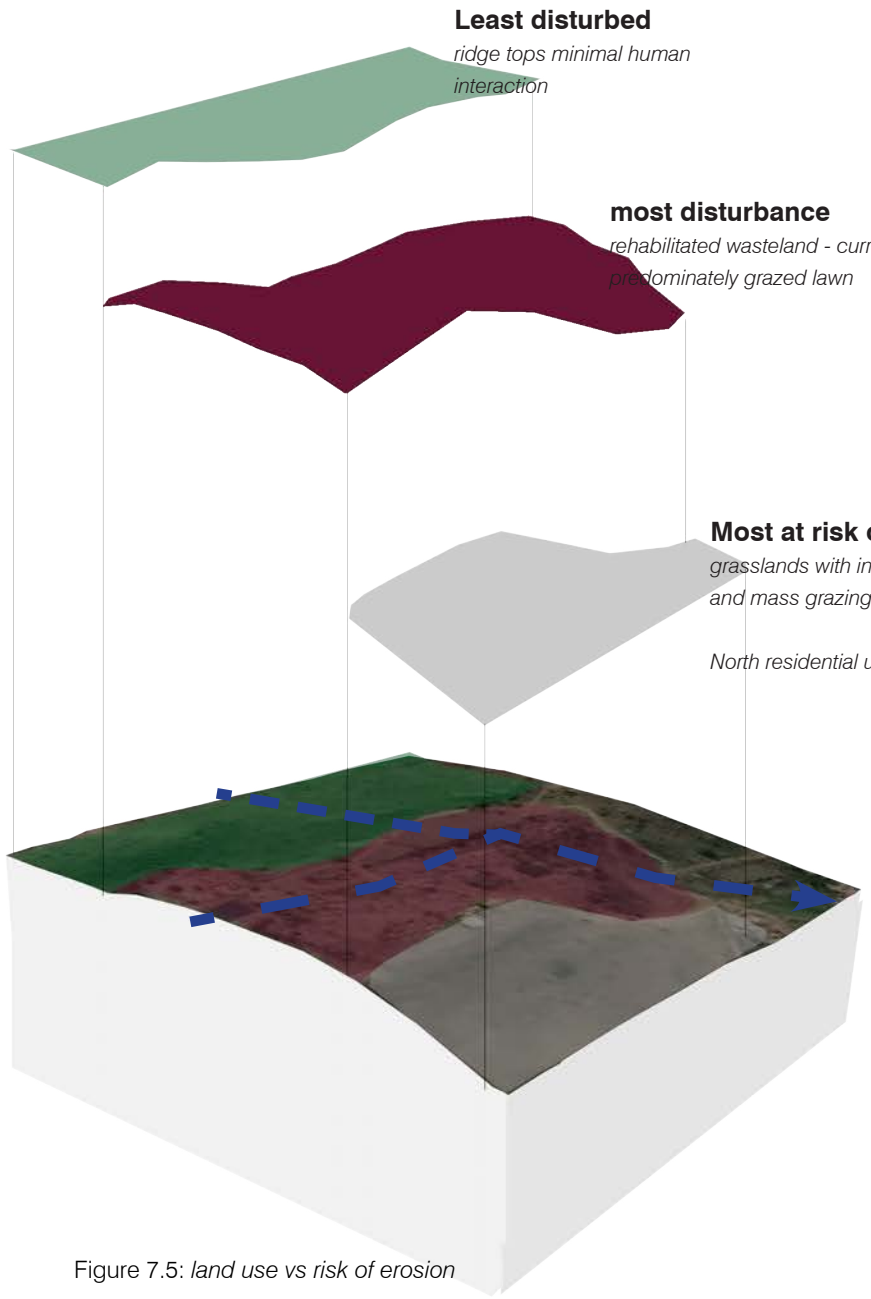


Figure 7.5: *land use vs risk of erosion*

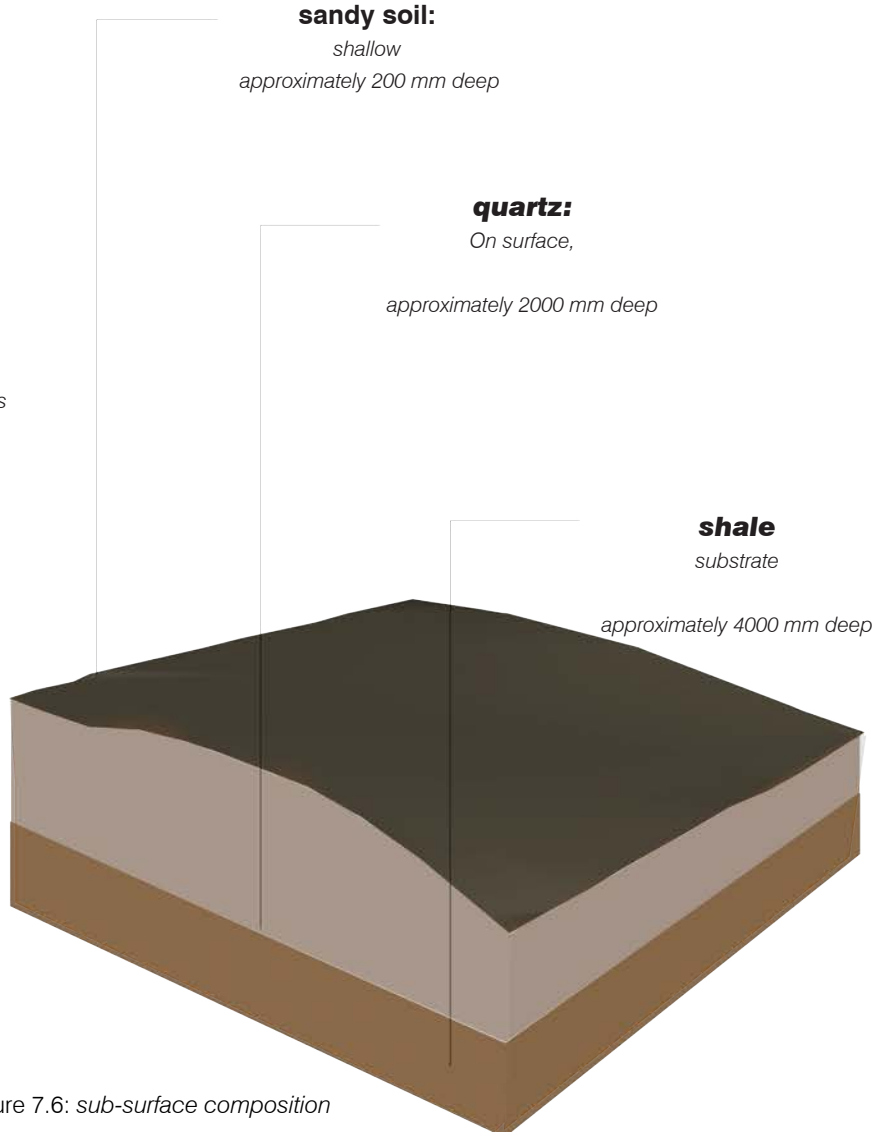


Figure 7.6: *sub-surface composition*

Figure 7.7: *[Right] Summary of exiting uses of materials on site. (Author, 2018)*

7.2 Use of material on site

7.2.1 SOIL

The soil on site is predominantly a deep red sandy soil

Brown clayey soils will be harvested from southern base of mountain dominate by tis soil type.

The soil predominantly used as an exposed floor finish on flatter slopes of the site. Although not ideal as a floor finish because when it rains the spaces became muddy and difficult to access. This quality can be retained in areas not deemed for human use.

Another use is on the walls of the exisiting bird-hide. Formed by an abandoend excavation, the walls create spatial definition and create habitat.

The quality will be emulated but by using concrete to stabilise the in situ soil as a building material. To this degree, rammed earth walls reinforced with concrete will be used to define vertical planes and SoilCrete® soil stabilization to create stabilised soil finises to the flooring.

7.2.2 STONE

The Average size of stone moved is 0.3M X 0.2M X 0.15M which would weight 0.3 kg.

The stones on site are used as construction material and designation of sacred space.

During prayers, the stones are turned black from the ash of burnt dried herbs. While they are also painted white to designate the proper living conditions for spiritual beings.

Used as a type of sineage written in the tongue if the landscape, the quality of existing site condition can be emulated where white stones can be used to designate sacred spaces as, whilst burnt stones designate the passage of a significance period,

7.3 Approach

Use low-tech construction techniques and as much in-situ material as possible. With materials making a visual connection to the spatial qualities of settings for rituliased and non-ritualised practice. This referral includes the visual connections made to the mountain itself.

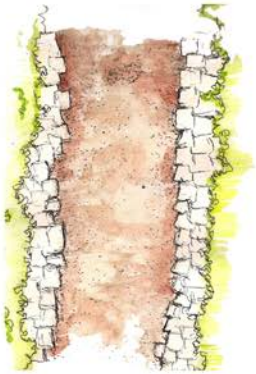
For instance, soil will be used as a finished building materials by using rammed earth walls. This technique is chosen because the layers in the rammed earth walls replicate the layers of quartzite and shale rocks exposed on cliffs of the mountain seen.

The quartizte rocks are used in the construction of rock walls making visual reference to the natural rock terraces found along the cliff-faces.

From this visual connection made to the mountain, the quality and construction details of the materials are manipulated to materials the spatial qualities of the materials used during ritulaed practice on site.

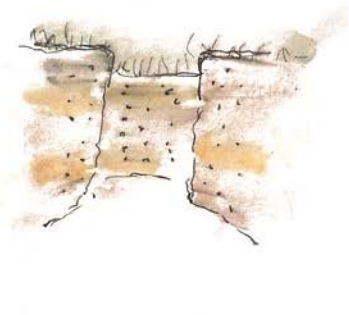
EARTH
Maintain Healthy Soils for Nursery

Composting by cow manure and plant cut-off. Exposure of soil



EARTH
Repetition of exposure of natural earth

Cattle Kraal and Nursery. To Legotla.



EARTH
Layers seen in cliffs of the mountain

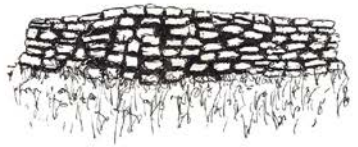
Cattle Kraal and Nursery. To Legotla.

STONE
Designation of Sacred Spaces

painted white - the colour of purity and spiritual divinity

STONE
Platforms for Burning during Prayer

Herbs burnt on stone during ceremonies by open-air churches



STONE
Use of steep slopes as a walled terrace system

Cattle Kraal Construction

Figure 7.8: *[Right] Image of rammed eathwall being installed by Rammtek (Author, 2018)*

7.3.1 RAMMED EARTH

The use of rammed earth on site will be to make reference to the exposed layers of stratum found on the sections of site where geology is exposed.

Benefits of this as a material include:

- All materials sourced in close proximity and dependent on in-situ soil
- Rammed earth walls are 20 percent thicker than most concrete walls so it is better insulating against heat and cold for enclosed structures.
- Because of the nature of exposed rammed earth as a finish, the walls need no toxic finishes.
- Rammed earth walls are so solid that they boast superb acoustics and rank with the best in terms of fire resistance.
- Because rammed earth walls don't rely on wood the structure will never rot, nor will it be host to carpenter ants or termites.
- Naturally water resistance is enhanced with infused with organic materials or concrete

7.3.2 CONTEXTUAL STUDY

The following is based on the interaction had with rammed earth specialists RAMMTEK®, a company based Johannesburg. I was permitted to attend construction projects and monitor the construction of rammed earth walls.

- For structural stability, ratio of 1:10 for width of wall to height of wall must be maintained.
- A wall made of rammed earth and reinforced with cement by a 5:1 cement: fine sand ratio.
- Then for every 4m3 of sand, 100L of water is added.
- The above would allow a rammed earth wall to be exposed to moisture and heavy rainfall without damaging the wall, rather furthering the curing process of the concrete; strengthening the material. In this regard, unless used in a water feature, no waterproofing is needed
- Rammed Earth Tiles are available as a floor finish with dimensions 300 X 300 X 20
- Can be used as a feature wall fixed to a solid brick wall for support
- Can be used as a stand-alone wall
- Manual-Compaction with a stump-tool is preferred to get into corners
- Due to reinforcing by concrete, there is no need for a coping - simply needs a slope
- Dries to a lighter shade than when being compacted

Figure 7.9: *[Top-Right] Image dry-rock terrace wall being installed (Crawford, 2018)*
Figure 7.10: *[Right-most] Section of dry-rock wall, interior application. (Crawford, 2018)*
Figure 7.11: *[Righ-bottom] Section of dry-rock wall, constructed. (Crawford, 2018)*

7.3.3 DRY-PACKED ROCK

This wall building system is a contextual approach to creating walls as it uses materials found site.

Following the building technique found on-site, this technique allows for the construction of large feature and retaining walls, whilst continuing the language of the site.

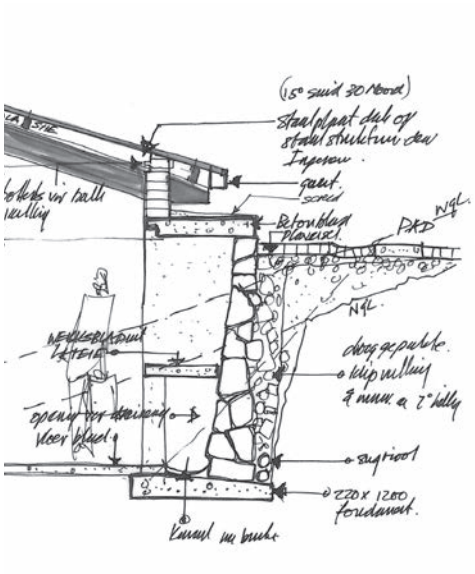
Beneficial application to site design include:

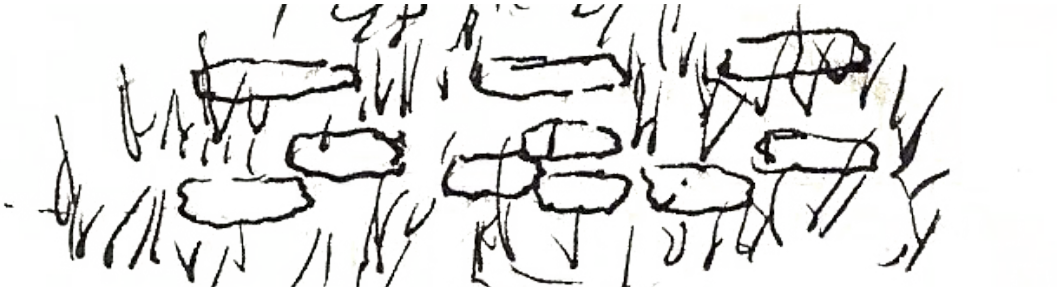
- Allowance for passage of water through wall - sensitivity to ecosystem at foot
- Ability to function as a retaining wall structure
- In rocky area, foundations can be made from low-strength gravel and in-situ rock to keep out rising water levels
- In the Pretoria area, a 2M dig will provide construction workers with shale rock.

7.3.4 CONTEXTUAL STUDY

The study of dry-stacked rocks was conducted by through consultation with local architects, engineers and desk-top studies. The hands-on interaction with the constrcution technique came from discussions had with an archiect from Crawford & Crawford Archiects, a company specilaiseng in low-tech construction techniques. The following was devised about the application of this construction method on site:

- Rock sub-base of mountain means concrete foundations can be supplemented with compacted Aggregate and in-situ rocks
- General Rule of thumb is the bottom of rock wall must be minimum 1/3 the height of the wall
- The stones are most kept in place by friction so mortar often is not necessary
- In cases mortar is needed, there will be a layer applied only to the horizontal surface ensuring a continual through-flow of water through the wall.
- The tallest wall constructed by the firm using this method was 6M hight





Weight of stone carried during prayer rituals

0.3M X 0.2M X 0.15M

approx. 0.3 KG

Comfortable Size picked up

by average man

Rock 200 x 400 = 24kg

Average stone type

Quartzite and Shale

Figure 7.12: *Idea pallet for manipulation of rammed earth*
Figure 7.13: *Soil caluclations from ramp construction. (Author, 2018)*

Figure 7.14: *carving into rammed earth (Anon, 2017)*

Figure 7.15: *Wall withering over time (ArtHub, 2017)*

Figure 7.16: *Wall as a sculptural element (Anon, 2017)*

Figure 7.17: *Concrete wall burnt (ArchDaily, 2016)*

7.3.5 MATERIAL MANIPULATION

Rammed Earth

On its own rammed earth is building material which retians its natural look and feel. With added concrete this look is retained whilst the material is strengthened,

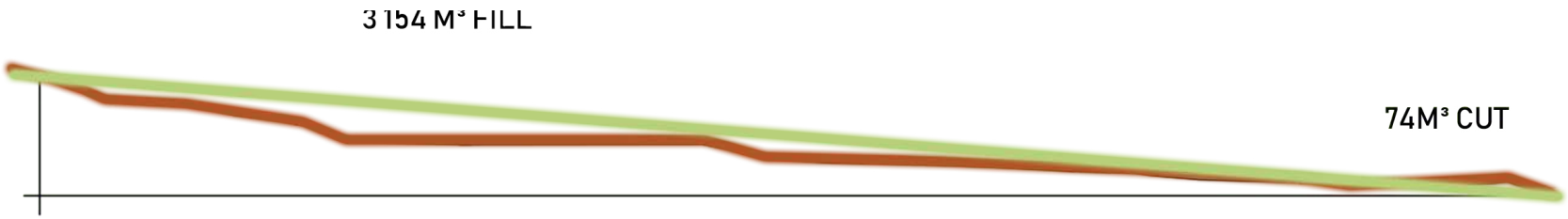
To create more intimate details, rammed earth walls can be carved and sculpted as seen in the above figures.

In areas where the passage of time is to be exaggerated or expressed throug materials, no concrete reinforcement will be added and the walls will be permitted to disintegrate into the landscape.

A benefit to adding concrete to the mix is the material can form part of the burning ritual practices conducted on site such as those seen in the above figures. However, because earth is added to the mix with its fire retardant qualities, the material will take longer to disintegrate.

1:12 RAMP

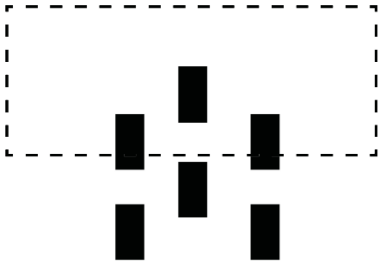
30M HEIGHT
360M LENGTH

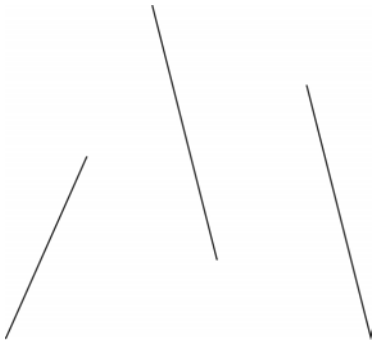


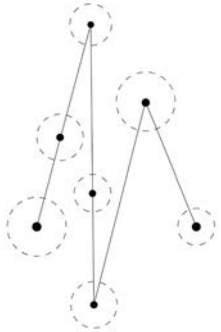
3 080M3 AVAILABLE

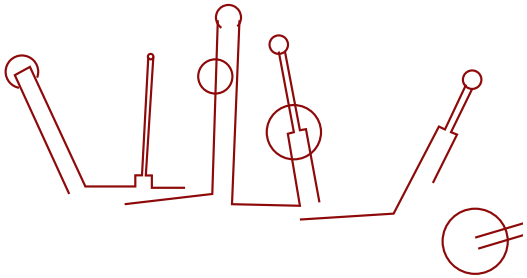
CAN USED TO FILL

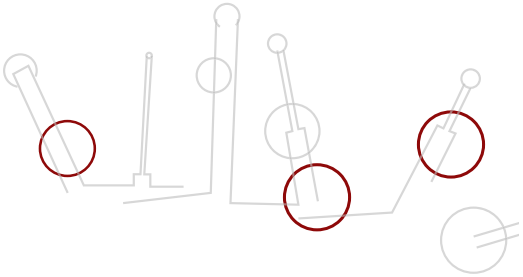
TERRACE FROM CUT RAMP

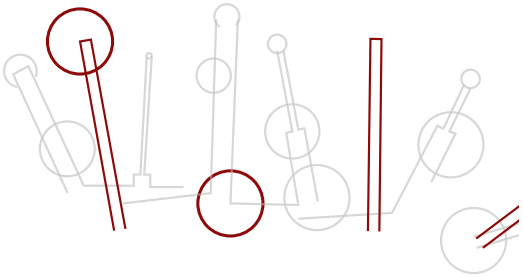












7.4 Design Output

7.4.1 DEVELOPMENT

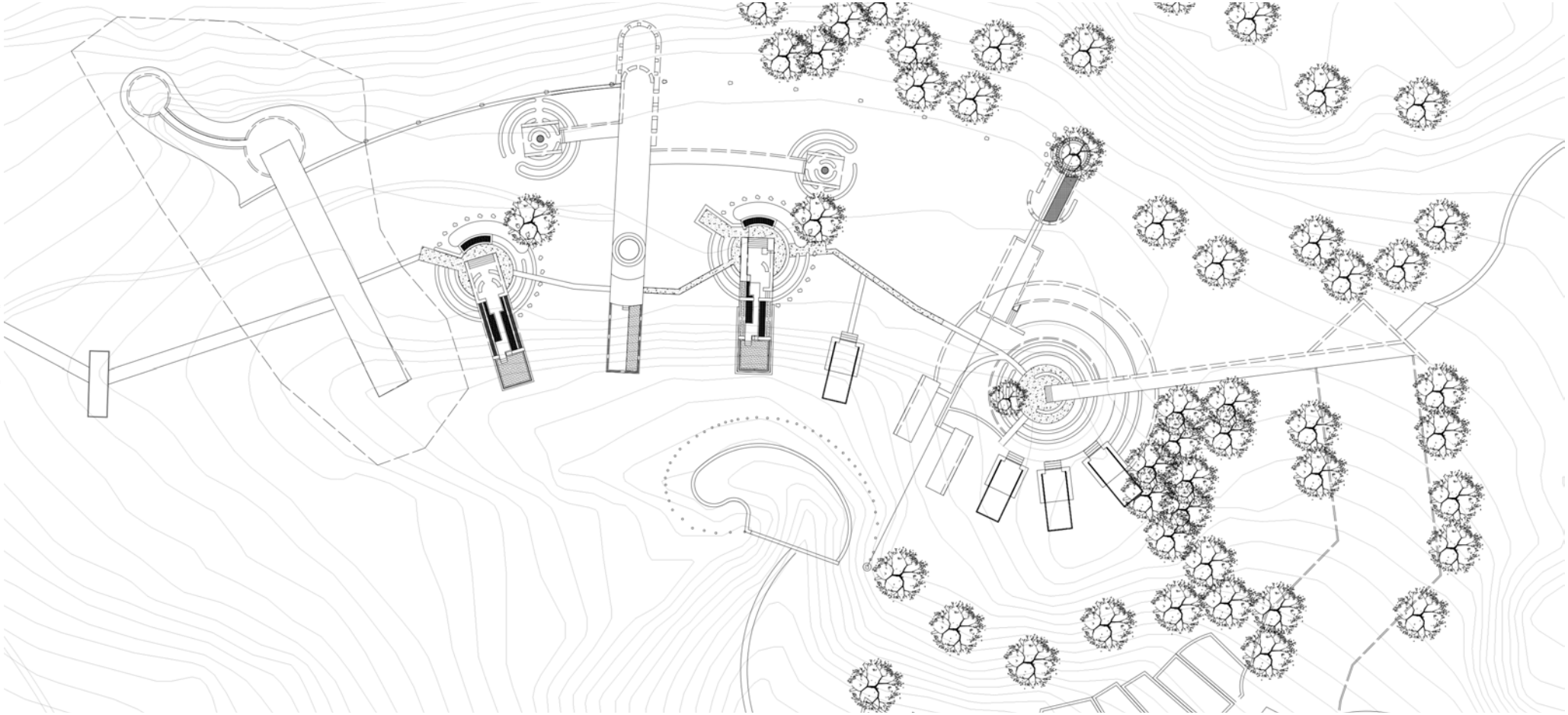
With the themes of 'demarcation', 'order', and 'poetics' overlapped, the design developed into a series of platforms in the landscape emulating the balance found between the three themes.

Each platforms bound a particular practice which is an extension of an existing practice. These ordered extensions through materiality allowed the platforms to change over-time by exposure to the natural cycles of the site - mainly, the grazing of veld grass by fire.

7.4.2 FUTURE

In finding an order in the landscape, inspired by the topography on site, the natural cycles and the cattle kraal on the southern edge of the sketch-plan, a projection for future development is identified.

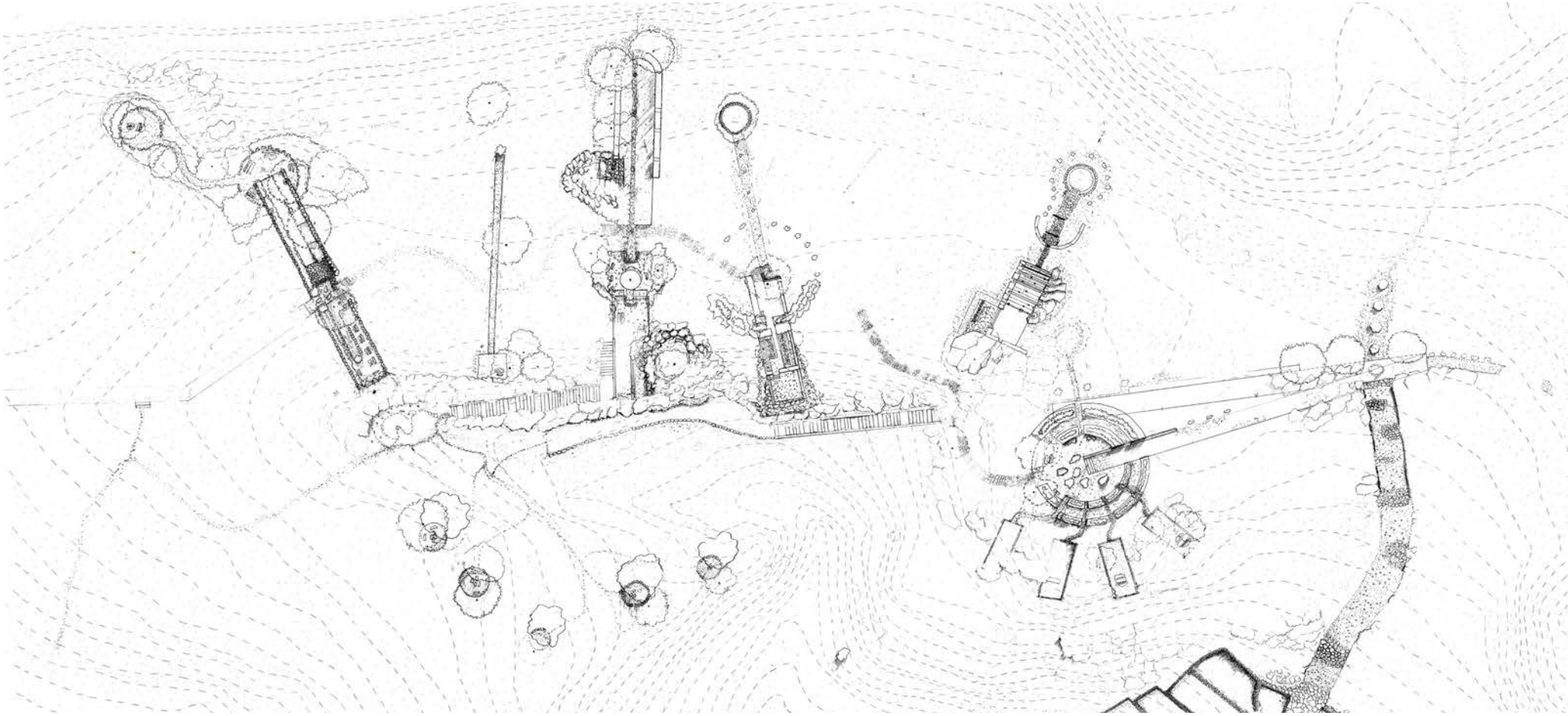
Over the course of years, the platforms act as modular units to which future expansions are able to respond to. In-time, the fractal growth identified in the kraal becomes the design growth as consequence of the evolution of tradition in the cultural landscape.



Sketch Plan
Iteration 01

N

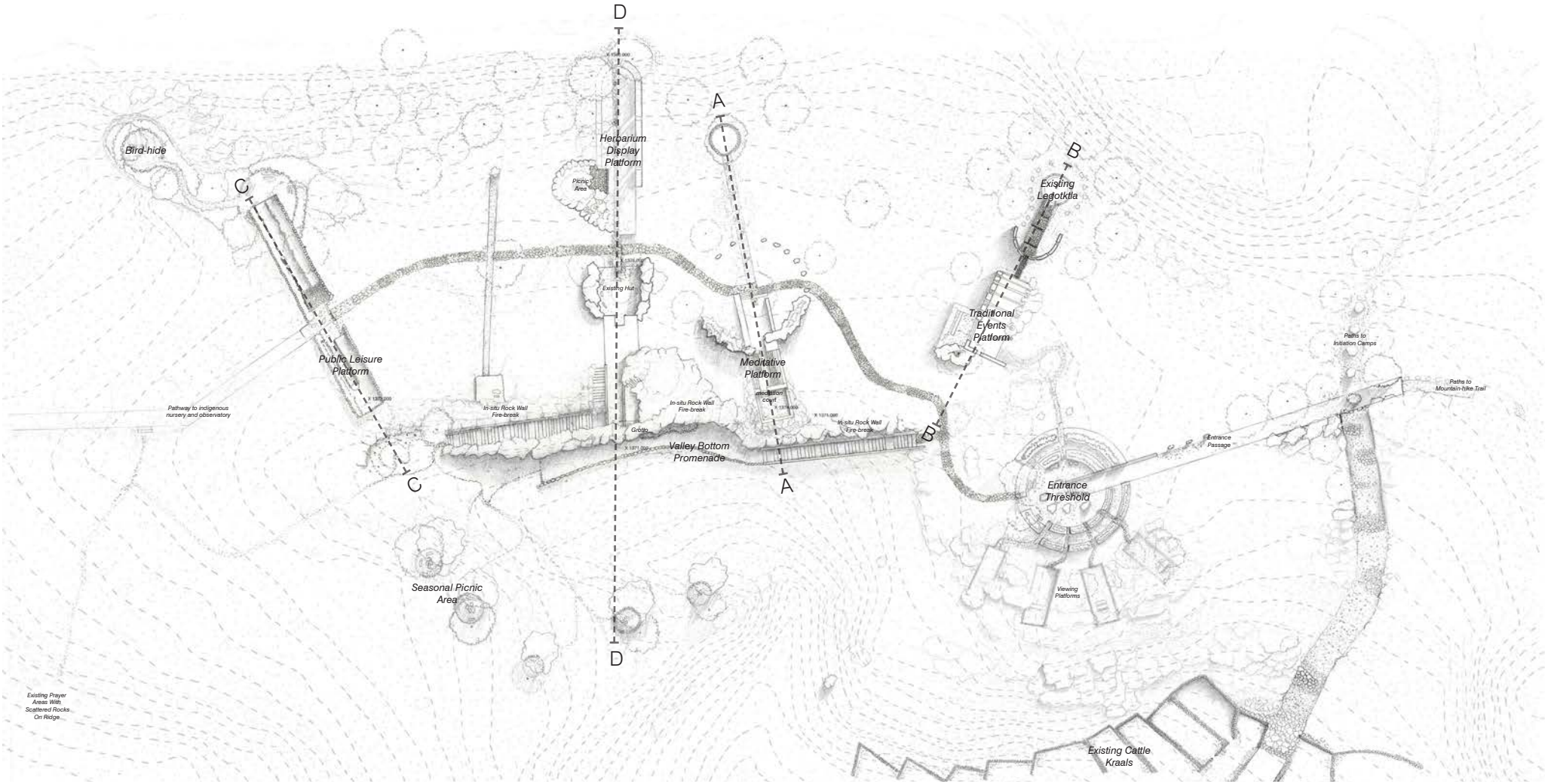
Computer Generated Plan
There exists lost connection between the site and the design



Sketch Plan
Iteration 02

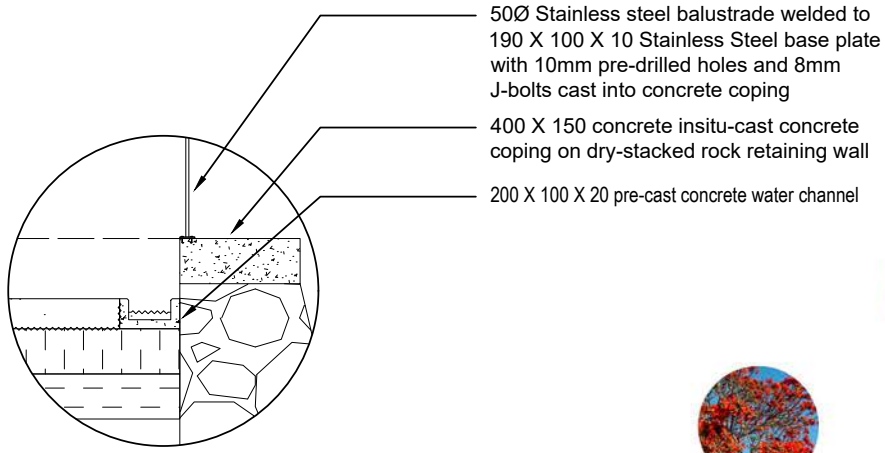
N

Hand-drawn Plan
A connection with each natural element is made, through this a design ingrained in the poetics of the site is created



Final Sketch Plan

N



Detail 01:
Platform Water
Channel

Combretum molle

Erythrina lysistemon

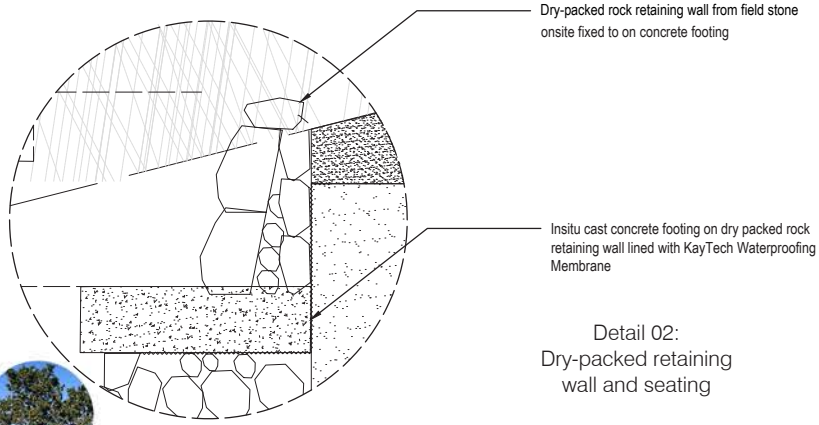
Combretum microphyllum
Aloe ferox

Cussonia paniculata

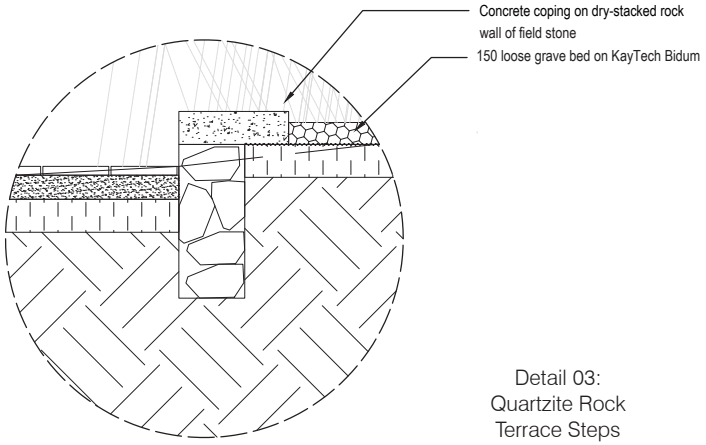
Detail 01:
Platform Water
Channel

Aloe ciliaris

Sectiont AA



Detail 02:
Dry-packed retaining wall and seating



Detail 03:
Quartzite Rock Terrace Steps

Combretum imberbe

Combretum molle

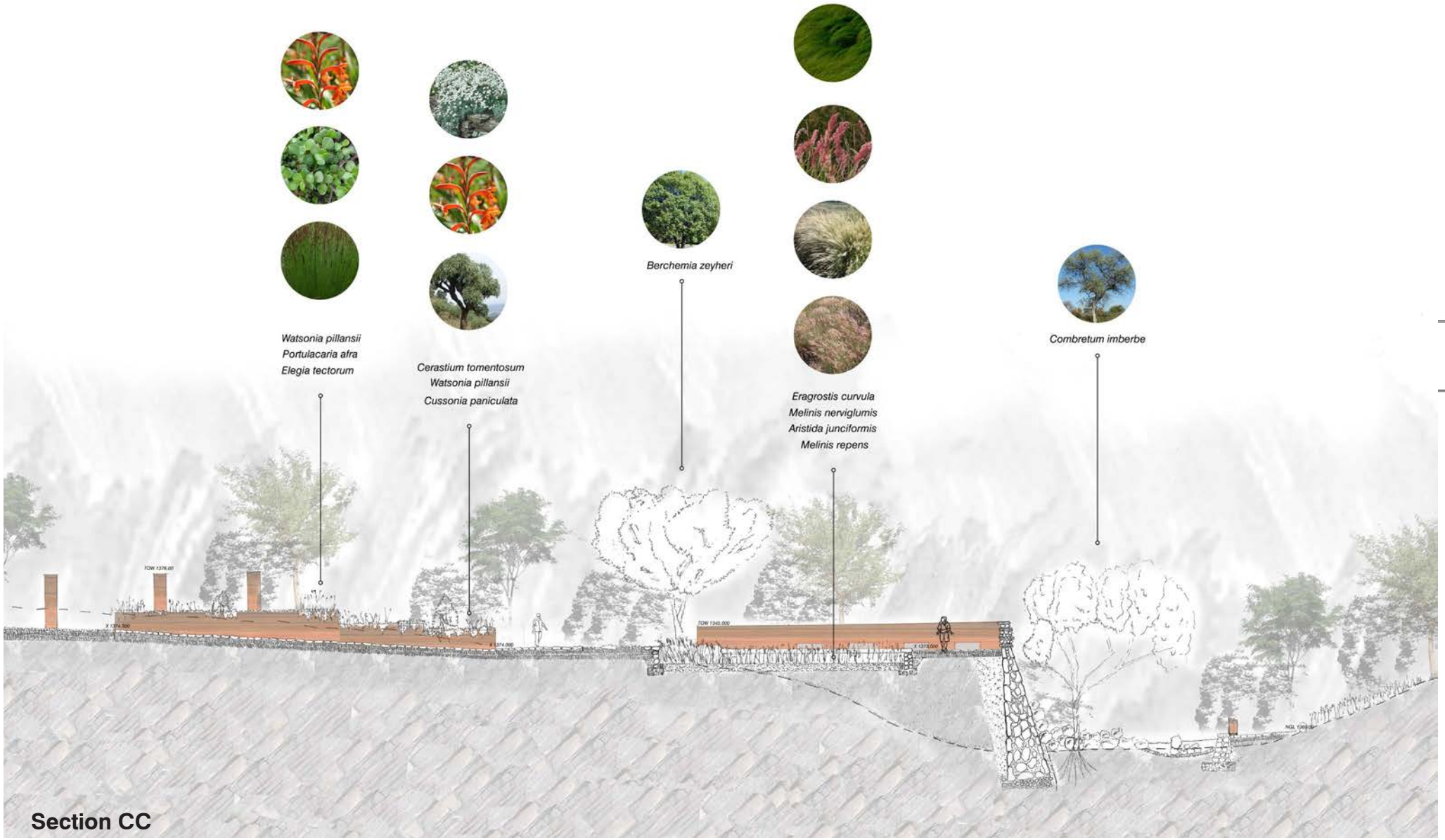
Cordia caffra

Erythrina lysistemon

Cussonia spicata

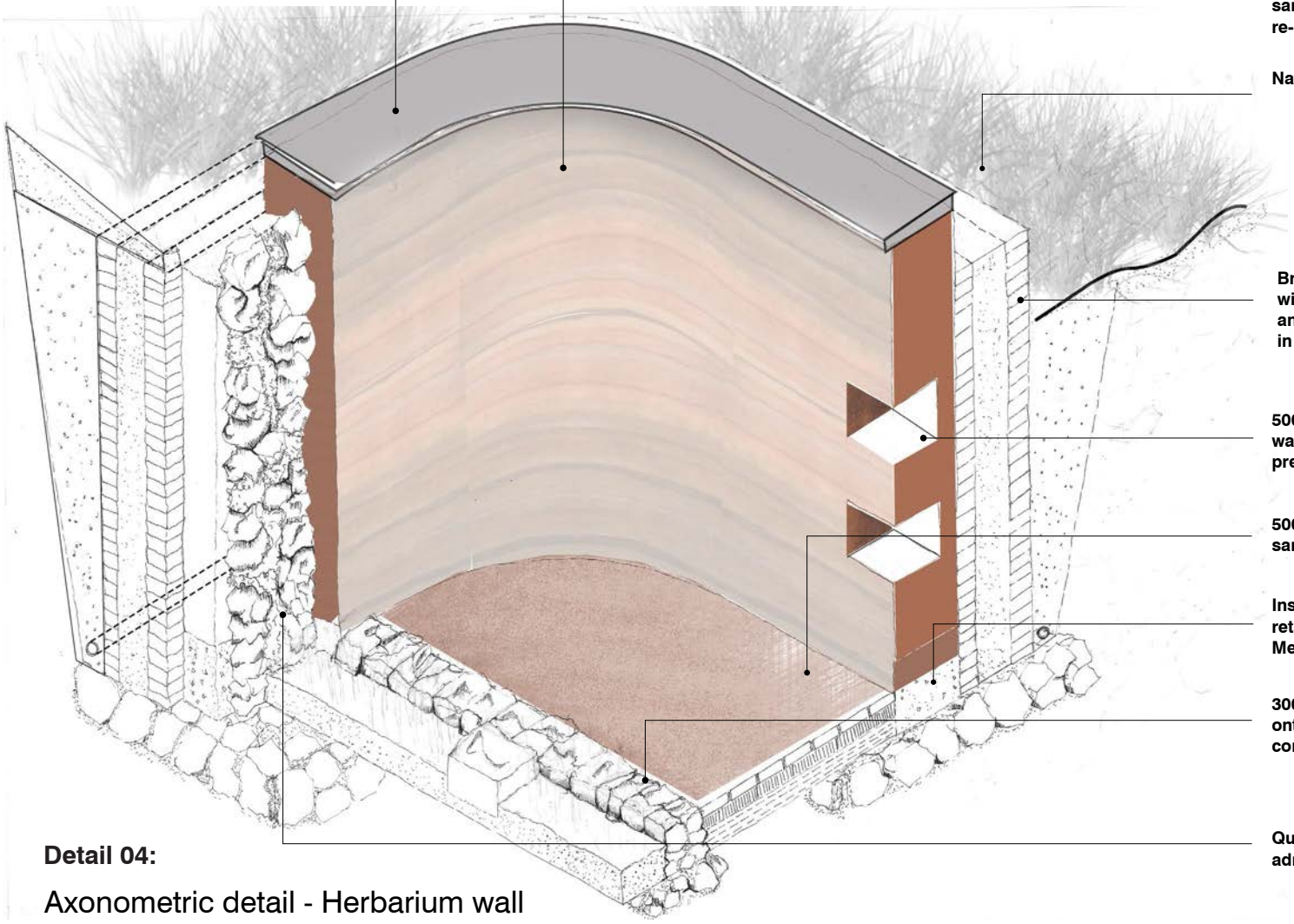
Strelitzia reginae

Section BB



Section CC

Section DD



In citu concrete coping

RAMMTEK® rammed earth wall of 5:1 sand to cement ratio with horizontal steel re-bar eery 800mm

Natuarl veld grass to be seasonaly burnt every three years

Brick Cavity Wall with concrete infill lined with KayTech® waterproofing membrane and 20 dia. mild steel re-bars at 500 CL topped with in situ concrete coping

500 x 500 recess formed in rammed earth wall during compaction shaped by pre-formed plywood

500x300x20 RAMMTEK rammed earth RC floor tile on 20mm sandbinding on 100mm caompacted soil fill.

Insitu cast concrete footing on dry packed rock retaining wall lined with KayTech Waterproofing Membrane

300x200 In situ Quartz rock edging to rammed earth floor onto a base made of in situ rock approx. 500x200 with compacted G4 glazed layer to 50% Mod aashto.

Quartz rock wall cladding with charcoal and organic admixture infill between quartz rock spacing.

Detail 04:

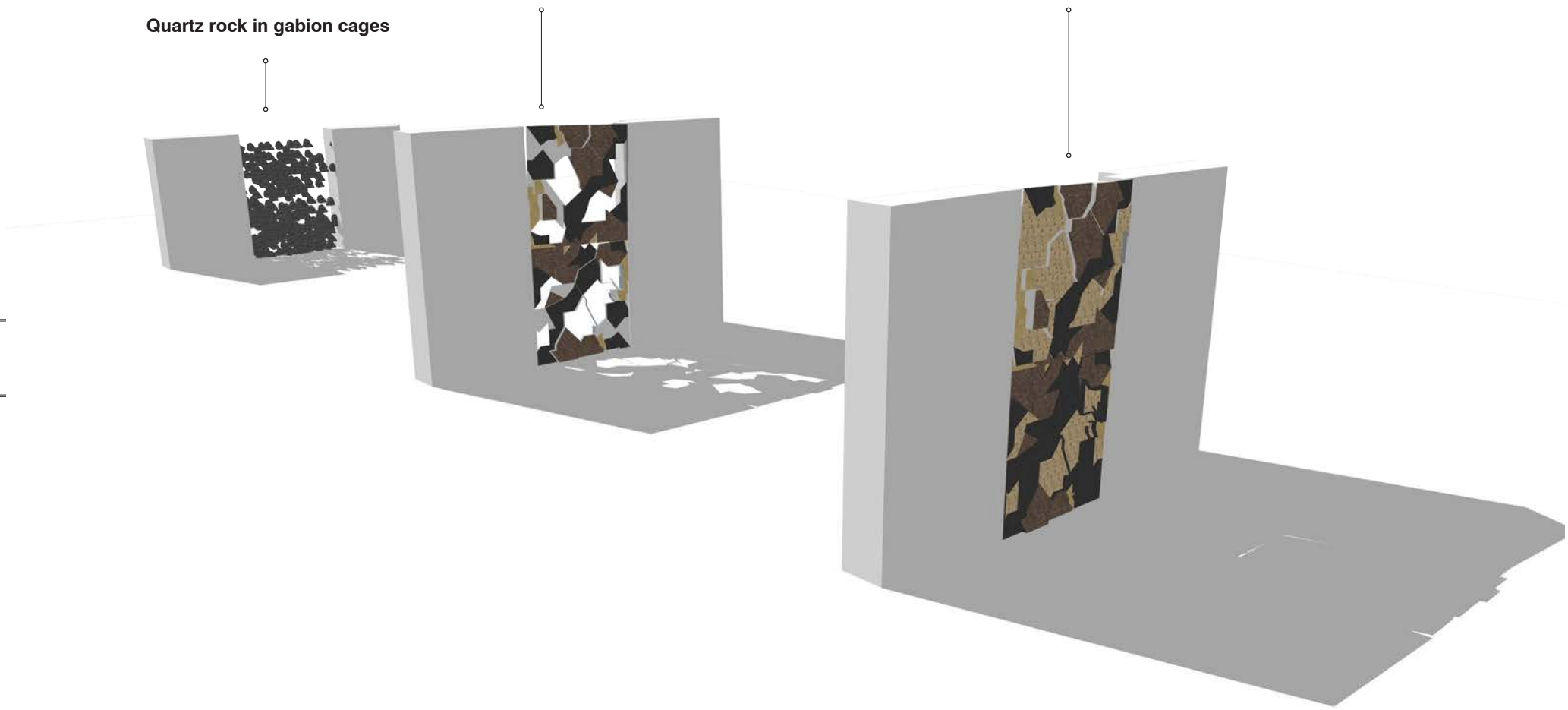
Axonometric detail - Herbarium wall

Quartz cladding with a cobb mixture of dried grass and charcoal

Quartz keeps mixtures in place as charcoal and dried grass combust when exposed to veld fire.

Quartz cladding with openings bewteen rocks

Quartz rock in gabion cages



Wall Explorations

Grassland

Melinis repens

Full sun aspect

Sandy, loam Soils

Well-drained soils

Disturbed areas (pioneer species). Attracts honeybees, birds, and is medicinal.

Melinis nerviglumis

Full sun aspect

Shallow Stony, clay and loam soils, Slopes

Well-drained soils

Disturbed areas. Birds use as nest building material. Not good for fodder.

Aristida junciformis

Full sun aspect

Loamy soil

Well-drained soils

Soil Stabilizer. Dominate in overgrazed areas. Inedible to cattle. Provides habitat for grasslands and wetland wildelife.

Eragrostis curvula

Full sun aspect

Shallow soils

Well-drained soils

Fibrous root system - good root stabilizer

Eragrostis lehmanniana

Full sun aspect

Shallow, sandy soils

Well-drained

Can hybridize with E. curvula. Can impact fire regimes - but no information on how.

Eragrostis superba

Full sun aspect

Sandy Soils

Well-drained soils

Drought resistant, as well as erosion control and re-vegetation projects.

Eragrostis gummiflua

Full

Sandy, damp soils

Well-drained soils

Bewsia biflora

Full

Sandy Loam

Well-drained soils

Brachiaria serrata

Full

Sandy soil

Well-drained soils

Indicates good veld conditions, good foraging grass. Ruderal in disturbed areas.

Aristida congesta

Full

Clay, stony slopes

Rock Faces

Rhoicissus tridenta subsp. cuneifolia

Full and half sun

Sandy Soils

Well-drained soils

Works as screen, on pergola and trellis, and hanging baskets. Not evergreen. Berries are enjoyed by birds and people. Tradtional medicine for pregnancy, bladder and kidney complaints.

Jasminium multipartum

Half sun

Loam Soils

Well-drained soils

Could be groundcover, trellis, or shrub border. Needs support to climb. Great for birds. Can make herbal tea and potpourri.

Carissa edulis

Full sun

Sandy Loam

Well-drained soils

Is fragrant, attracting birds. It can be used as a screen, and the berries are edible. Traditionally used as painkillers and to treat malaria, indigestion, chest complaints, and Herpes.

Asparagus plumosus

Semi-Shade

Loam

Well-drained soils

Tender climber, very hardy.

Bauhinia galpinii

Full sun

Sandy and llc soils (tolerate poor soils)

Well-drained

Attracts butterlies, drou as a screen/hedge plar space.

Senecio tamoides

Full sun, semi-shade

Sandy, Clay, Loam Soils

Thunbergia alata

Full sun, semi-shade

Sandy, Clay, Loam Soils

Valley Bottom Promenade

Philenoptera violacea

Full sun, semi-shade

Sandy Soils

Well-drained soils

Droght resistant, medical, pioneer plant. The wood is used for household tools. The tree can treat diarrhaea, colds, and snakebites.

Ptaeroxylon obliquum

Full sun, semi-shade

Sandy, Rocky Soils

Well-drained soils

Attracts butterflies, medicinal. Used in construction, for cultural rituals.

Halleria lucida

Full, semi-shade

Sandy Loam

Well-drained soils

Used in Zulu traditional rituals, and used to treat ear and skin complaints. Drought resistant and hardy to frost.

Cassia abbreviata

Full

Sandy Loam

Moist soils

Attracts birds, medicinal, fragrant, ornamental in gardens.

Erythrina lysistemon

Full

Sandy Loam

Moist soils

Attracts birds, feature tree, medicinal. Provides habitat for many birds, insects, and animals. Were planted around kraals.

Combretum molle

Full sun

Sandy Soils

Well-drained soils

Used in tradtional medicine, and can be used for fence posts and hardy household tools and handles.

Albizia gummifera

Full

Sandy Soils

Well-drained soils

Improves soil structure, preventing erosion, medicinal, has ceremonial uses for leadership assemblies.

Dovyalis zeyheri

Full

Sandy, Clay, Loam Loam

Well-drained soils

Attracts birds, drought resistant, edible plant, can be potted. The fruit is sour but refreshing.

Kiggelaria africana

Full and semi-shade

Sandy, Clay, Loam

Well-drained soils

Attracts birds, drought resistant, can be used as a hedge or screen. Used in construction.

Mimusops zeyheri

Full, semi-shade

Sandy Loam

Well-drained soils

Attracts birds, fragrant, edible. Butterflies breed on this tree, and animals and people enjoy the fruits.

Figure 8.1: *'Trees in Landscape' (1945), by J.H Pierneef (1886–1957)*

"Mountain, stone, water –
building in the stone, building with the stone, into the mountain, building out of the mountain, being inside the mountain.
How can the implications and the sensuality of the association of these words be interpreted, architecturally?"
Peter Zumthor
(ArchDaily, 2009)

08

CONCLUSION

1.1 Synthesis Conclusion

This dissertation took on the task of questioning the role of landscape architecture in conserving landscapes in a developing urban world.

The Magaliesberg mountain in the City of Tshwane stands as an active South African cultural landscape in 2018. Unique this landscape, considered sacred to the adjacent communities, is the continuous cultural, traditional and recreational practices existing on the mountain.

In the conservation of landscapes, the first role identified for the discipline, was the arguing for the protection of landscapes from an urban sale. This was done in this dissertation by arguing for the conservation of the area under the UNESCO Biosphere reserve status.

However, due to the Magaliesberg being considered a sacred cultural landscape, it became apparent that in its conservation, the sanctity of the area would need to be retained throughout the evolution of traditions associated with the site and the influence of urbanity and the mountain base. This has already has began to pose threat to the landscape as neighouring stake-holders are in tension with one-another over spatial expansion. Stakeholders which should be in unison on such a landscape.

In search for the manner to retain its sanctity, the dissertation took three approaches to arguing for the spatial conservation of sacredness on the mountain based on tensions experiences on site. These considerations are explored in the three essays: *Demarcation, Order and Poetics*.

Each essay was aimed to stand as a solution its own but came short in achieving the goal. In the end, an overlay of the three guided an approach which considered the site as the main informant.

1.1.1 THE ESSAYS

The *demarcation essay* hypothesised that it was in demarcating landscape by the spatial orientation reflective of the spatial orientations identified in indigenous landscapes.

However, the result left the landscape separated into parts.

The ordering essay hypothesised that it was through fractal ordering that the unity on the site could be retained to retain reflect the principle of wholeness known in the indigenous landscape.

However the final resolve was found ti be too imposed. It seemed in a search for order in the indigenous landscape, not enough about he current landscape was carried though.

In the end, through returning the site and understanding the poetics of the landscape that the information gartered from the other essays seemed to better align to the retention of the sanctity of the mountain

It is argued that in the retention of sanctity on the Magaliesberg mountains, the ritualised practices winch aim to sanctify the mountain should continue to influence the changes of landscape. This should extend through the continuation of sacred and non-sacred program expected on the mountain.

1.1.2 REFLECTION OF MISSION

It is concluded that in the conservation of landscapes in the developing urban world. It is the role of the landscape architect to understand what makes the particular landscape of value to its practitioners and to seek to retain the essence of that through the evolution of its timespan.

The End

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