THE NEXUS OF ARCHAEOLOGICAL HERITAGE TOURISM AND SITE CONSERVATION: A STUDY OF STONE TERRACES WITHIN SHAI HILLS RESOURCE RESERVE, GHANA.

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DECLARATION

I, Odarkor Ankrah-Addison, hereby declare that this work is the outcome of my research carried out in the Department of Archaeology and Heritage Studies, University of Ghana, under the supervision of William Narteh Gblerkpor (Ph.D). All references used in this work have fully been acknowledged and no part of this work has been written for me by any other person. Any shortcomings in this study are my sole responsibility. This work has not been presented in full or in part to any other institution for examination.

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ABSTRACT

This study examines the relationship between archaeological heritage tourism and site conservation in Ghana's Shai Hills Resource Reserve (SHRR), with a focus on the extensive dry-stone terraces and building foundations at Manya Hill and Hioweiyo ancient settlement sites. These terraces, built by the Se (Shai) people, are important cultural treasures that illustrate ancient agricultural innovation and environmental adaptation. These ancient stone features and their associated cultural materials constitute a major attraction in the heritage tourism portfolio of the park. The terraces also serve as indelible markers of the architectural and agricultural legacy of the ancestors of Se, who occupied the hills for several centuries before their abandonment in 1892. Despite their historical and cultural significance, these stone architectural features are threatened by natural factors and human activities (Ankrah-Addison, 2020). The study employs a mixed-methods approach that includes historical research, pedestrian field survey, archaeological observations, GIS mapping, photographic documentation, ethnographic observation, and interviews with stakeholders, including park officials, local community members, tour guides, and tourists. The study revealed critical threats to the terraces and assessed the connection between tourism and conservation and site management practices at Manya Hill and Hioweyo sites. The project also evaluated the adverse impact of natural factors such as erosion, vegetation encroachment, and root penetration on the stone terraces and walls. These natural and human factors have resulted in variable degrees of destruction of the features and other archaeological remains at both sites. Evaluation of the state of conservation of the terraces showed a considerable preservation disparity between the two sites. The study also demonstrated the unique challenge of tourism's dual function in conservation at the Shai Hills Resource Reserve, as it can fund preservation while posing a threat to the iconic stone terraces in the park. In conclusion, the study highlights the critical

need for proactive and collaborative conservation actions to ensure the long-term preservation of the SHRR stone terraces while increasing their cultural and economic worth.

DEDICATION

I dedicate this work to my Parent Mr. Douglas Gyasi and Mad. Emelia Turkson and my Godfather, HRM Drolor Bosso Adamtey I, for their support through my though times during the period of this research.

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CHAPTER ONE

1.0 INTRODUCTION

In this study, leverage archaeological survey data, field observations, interviews, published literature, and the Forestry Commission's reports, to elucidate the interplay between heritage tourism and the conservation of ancient dry-stone terraces at two archaeological hilltop settlement sites located inside the Shai Hills Resources Reserve (SHRR): Manya Hill and Hioweiyo. Hioweiyo site is the largest of the SHRR's old settlements, about 290 meters above sea level on the 1200-meter long trail from the reserve entrance. It consists of a high density of stone terraces, caves, and cultural artifacts such as pottery, grinding stones, and glass bottles. One of the notable features, "obonu tɛmpoɔm" cave, was a vantage point and hiding place site for battles. The terraces and the caves together reveal the dual function of the site as a fortified settlement and a residence.

Located opposite Hioweiyo, Manya Hill was the ancestral home of the Manya Jorpanya. Like Hioweiyo's in terraces and foundation remains, it has more squared and structured walls. The hill, which is not as high, featured settlements on a slope rather than a plain, indicating environmental adaptation in architecture and utilization of land. Like Hioweiyo, Manya Hill boasts numerous pottery sherds, grinding stones, and other cultural remains, which bear witness to everyday practices and religious activities of Se people in the early period.

By inventorying, categorizing, and mapping the dry-stone terraces, the state of preservation was recorded and assessed. How tourism and environmental elements like vegetation, slope, and climate affect the stone terraces' structural and historical integrity at various locations were examined.

Stone terraces, often constructed without mortar, are architectural features that date back centuries and have served multiple purposes in various societies (Malacrino, 2010; Davis, 2006). These terraces are typically built on sloped terrain, using carefully placed stones to create level surfaces that help manage soil erosion, water flow, and crop cultivation. In the case of the SHRR, the dry-stone terraces reflect an agricultural tradition and landscaping strategy with significant cultural and historical significance. These structures reveal insights into the settlement patterns, land-use strategies, and environmental adaptations of past communities within the region. The dry-stone terrace construction techniques, durability, and design suggest a deep understanding of landscape management, where local materials were skillfully employed to optimize the environment for human habitation and agriculture. Unfortunately, these unique landmarks are threatened by both human activities and natural forces, making their preservation a pressing concern in the context of heritage tourism (Ankrah-Addison, 2022).

The threats affecting the stone terraces or walls at both Manya Hill and Hioweiyo sites were identified. These threats include natural factors and human activities. These archaeological sites within the Shai Hills Resource Reserve face significant challenges as tourist attractions. Foot traffic from visitors contributes to soil erosion, while tree roots and vegetation growth exert pressure on the stone terraces, building foundations, and walls. Over time, penetrating roots and uncontrolled vegetation cause structural damage, threatening the integrity of these historical features.

The study revealed two types of stone terraces at both sites. A dry-stone terrace is a structure made entirely of stones, without any binding agents or mortar. Because of their method of construction, which is defined by the existence of a load-bearing wall of precisely chosen interlocking stones, dry stone constructions are stable (Seymour, 1984). Dry-stone terraces are

unique cultural monuments of the Shai (*Se*) people who inhabited the hills and inselbergs in the Accra Plains since precolonial times (Anquandah, 1992; Gblerkpor, 2005).

The dry-stone terraces, a hallmark of the Shai (*Se*) people's ingenuity, were integral to their everyday lives and survival in the rugged terrain of the Shai Hills. These terraces were multifunctional, serving not only as erosion-control mechanisms but also as critical components of agricultural and architectural practices.

In terms of erosion control, the terraces played a vital role in managing the surface runoff water on the steep hillsides, preventing soil loss, and maintaining the fertility of the land. The construction of these terraces helped to channel rainwater in ways that minimized the impact of runoff, thus preserving the landscape for subsistence farming. By creating leveled surfaces, the Se people were able to cultivate crops in an otherwise difficult environment. This adaptation was key to ensuring food security and efficient land use in an area characterized by rocky and uneven terrain.

In addition to their role in agriculture, these dry-stone structures were also employed in architectural construction. The Se people utilized the abundant natural stone resources to build walls that served as the foundations of their dwellings, contributing to the overall stability and durability of their homes. This architectural use of stone terraces speaks to a broader understanding of how the *Se* people harmonized their built environment with the natural landscape. The terraces were not simply functional; they were also part of the cultural and social fabric of the community, representing a sophisticated response to physical environmental challenges.

Some observations made during the survey process were that at Hioweiyo site, it was noticed that most of the stone walls that were identified were longer in height as compared to the ones identified at Manya Hill. It was also noticed that at Manya Hill there were a lot of squared walls as compared to that of Hioweiyo site.

Anquandah indicated in his work at the SHRR that three classes of stone terraces were identified. These were: a) terrace walls that served as building foundations; b) terraces that served as retaining walls to check erosion; and c) terraces that helped to level the steep sloping portions of the landscape to facilitate normal domestic activities and easy climbing (Anquandah 2006:7). The abundance of naturally occurring stone made stone-terracing the most logical response to the environment's demands. Today, these stone terraces are in the Shai Hills Resources Reserve and are protected by the law of the Republic of Ghana as part of the Wildlife Policy 2005.

Shai Hills Resource Reserve was originally established as a game production reserve under the aegis of the Ghana Wildlife Department. This was done to meet the ever-increasing demand for bushmeat. Unfortunately, due to a combination of circumstances, the reserve has not met its original objectives as the animal populations have not expanded (The SHRR Management Plan, 1992). It was declared a Forest Reserve in 1962 with an area of 46.7 square kilometers and was later made a resource reserve in 1973 with the area extended to 51 square kilometers. This extension was done to get more space for the stocking of game into the reserve.

The Shai Hills Resources Reserve has served as a tourist site in Ghana since its establishment in 1962 and is currently one of the most visited tourist sites in Ghana. This is because the forest reserve could not meet the initial objective of game production in the estimated animal population. It is one of the smallest protected areas in Ghana. SHRR is in the Shai Osudoku District of the Greater Accra Region.

The ruins of the precolonial Dangme-Shai settlements dated to between AD 1000 and 1892 sit in the SHRR (Anquandah, 1992, 1996, 2006; Gblerkpor, 2005; Andoh, 2019, Ankrah-Addison, 2020). Today, the Dangme-Shai settlers of Manya-Jorpanya, Kodiabe, Doryumu, and Dodowa consider these relic sites as their ancestral home. These contemporary people make annual pilgrimages to these sites in the SHRR. These contemporary settlers are the major divisions of the "*Se*" group who were forcibly moved out of the Shai Hills in 1892 by the British on claims that they practiced human sacrificial rituals (Anquandah 1992, Gblerkpor, 2005 p.157).

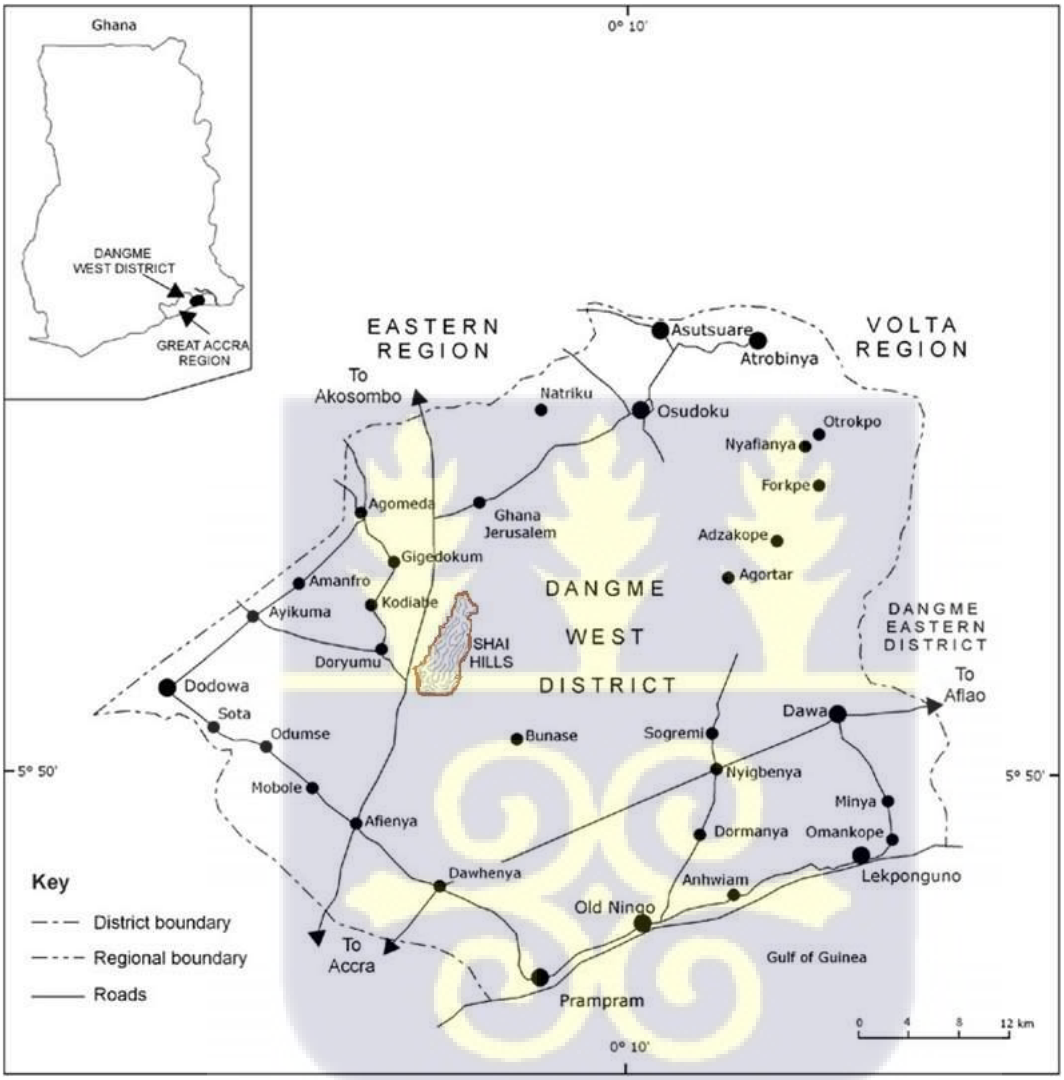
There are five sites in the Shai Hills Resource Reserve identified as ancestral home to the *Se* people. These sites are the Adwuku cave, the Sayo cave, the Manya hill, the Hioweiyo and the Mogo hill. Oral accounts by the Shai (*Se*) people assert that the Mogo hill served as a training ground for their rites of passage (Dipo); the Sayo cave served as a shelter for the traditional rulers during war times; the Adwuku cave served as a hiding place for the *Se* in war times.

The Manya Hill and the Hioweiyo sites are the two most significant settlement sites in the Shai Hills. As significant settlement sites, they contain a high density and complexity of dry-stone terraces. Apart from these stone terraces, other cultural materials like pots, bottles, and grinding stones, among others, are found at these sites. These cultural relics make these sites appealing to tourists interested in historic cultural landscapes.

Dry stone terraces are uncommon in Ghana's historical landscape and for this reason, they have received minimal attention in Ghanaian archaeology, and architectural landscape history. The Krobo Mountain archaeological site is a prime example of an archaeological study in which limited attention was given to the stone terraces of the Krobo (Gblerkpor, 2011).

In Ghana, stone terraces can mostly be found within some parts of the Upper East and Upper West regions. Fulo and Bekpong Catchments of the Upper West region are some places where stone terraces can be found. At these places, the stone terraces are purposely used for checking erosions in their farms. Another example from the Upper East region is the Tongo Tenzug

community where stone terraces are constructed to check erosions because of the hilly landscape.



MAP 1: A MAP OF GHANA SHOWING SHAI HILLS RESOURCE RESERVE AS THE SHADED PORTION BY THE LEFT OF DANGME WEST DISTRICT (SOURCE: SANITATION INVESTMENTS IN GHANA: AN ETHNOGRAPHIC INVESTIGATION OF THE ROLE OF TENURE SECURITY, LAND OWNERSHIP, AND LIVELIHOODS).

The SHRR holds cultural significance because the area contains archaeological sites and relics dating back to prehistoric times, including ancient settlements, tools, and pottery (cite). These artifacts provide valuable insights into the history and lifestyles of early inhabitants of the region. The reserve is an important pilgrimage site for the Se people. They visit the park and

their ancestral homes in the Hills to perform annual rituals and celebrate the Gmayemi festival. The descendant communities are also permitted to collect medicinal plants and fauna species required for this indigenous and traditional rituals. These practices reflect the cultural heritage and traditional knowledge passed down through generations. The rocky outcrops and caves within the reserve are believed to have spiritual significance for the local communities. These sites are often associated with myths, legends, and spiritual rituals, making them culturally important landmarks. Efforts to conserve the natural environment of the reserve also contribute to its cultural significance. By preserving the diverse flora and fauna, the reserve helps protect traditional ecological knowledge and supports environmental education initiatives for local communities and visitors alike. It was, therefore, crucial to study the stone terraces within the SHRR, this is because they are the most dominating evidence of human settlements within the site.

1.2 ABOUT THE MANYA HILL AND THE HIOWEIYO SITE AT THE SHAI HILLS RESOURCE RESERVE (SHRR).

1.2.1 Hioweiyo Site

Hioweiyo is located on a slope along the 1200m trail from the entrance of the SHRR. Hioweiyo Hill is the ancestral home of the Doryumu people. It is the highest hill, rising to 290m above sea level, about 600m, dotted with artefacts and relics depicting the cultural remains of the Shai tradition. It is also the largest ancient settlement site within the SHRR. Numerous artefacts such as pottery, glass bottle, grinding stone and querns among others can be seen on the surface of this site. Also, terraces and several caves can be found at the Hioweiyo site. For instance, one of the caves, the 'obonu tɛmpoɔm' cave, is located just beneath the rock platform at the highest hill in Hioweiyo.

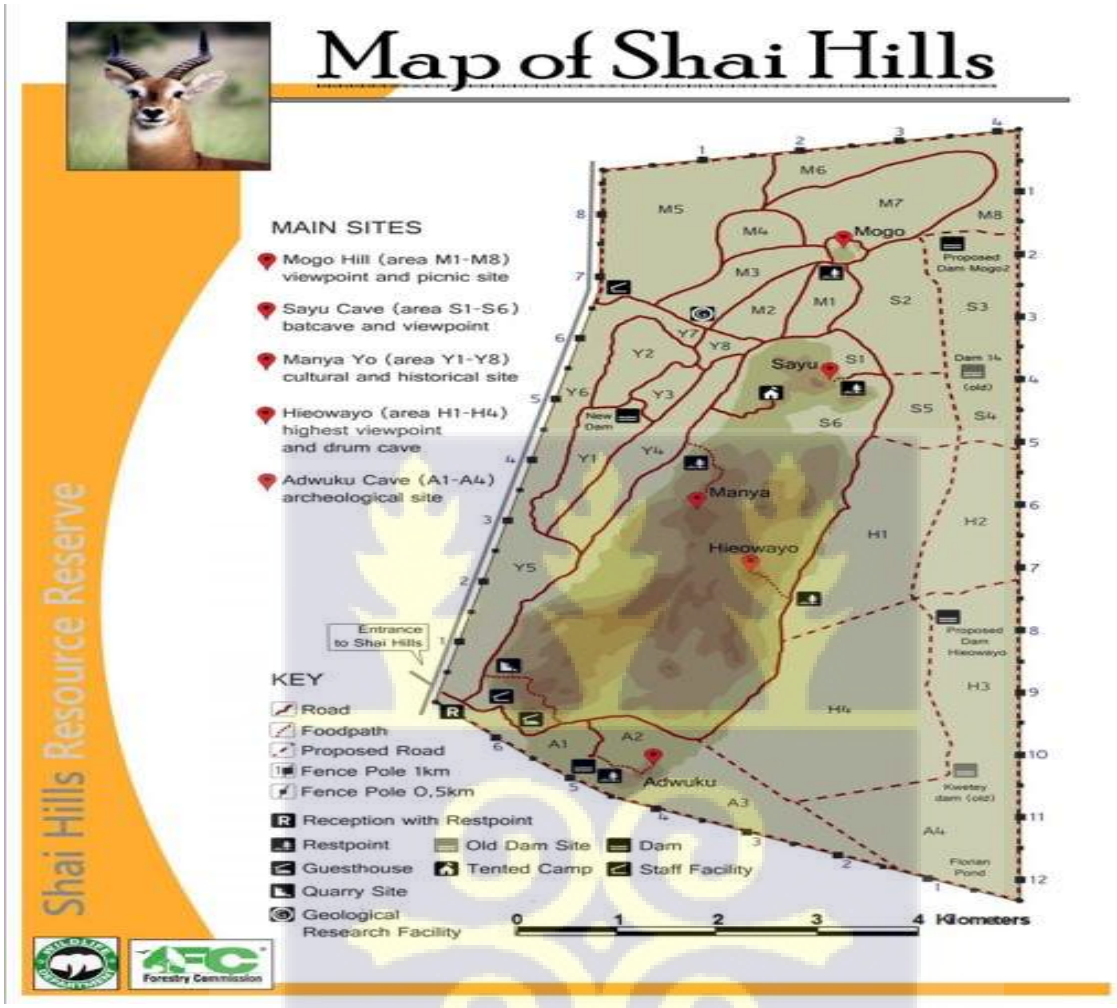
Visitors can try to enter the cave and reach the platform, much like the Shai people did centuries ago (using it as a spy point). It's a narrow yet thrilling space. The Se people claim that their people hid their drums in the cave and hence derived its name 'obonu tɛmpoɔm' cave which literally translates to English as the "hiding place". At the peak, is a giant rock platform which can be easily accessed by all visitors and has various beautiful panoramic views of the surrounding communities.

1.2.2 Manya Hill

Manya Hill on the other side is the ancestral home to the people of Manya Jorpanya. It is the second-largest relic settlement and the second-highest hill in the reserve (SHRR Management Plan,1992).

Manya Hill is adorned with artifacts that date back more than 150 years, giving tourists an insight into the Shai (*Se*) people's former way of life. Comparatively, the Manya Hill and the Hioweiyo site have a lot of features and materials in common. These two sites are the only sites with evidence of the stone terraces within the SHRR. But at the Manya Hill, the settlement is on a slope whilst at Hioweiyo site, the settlement site is located on a plain. The dry-stone terraces at these two sites within the SHRR make them stand out among the other three remaining sites.

SHAI HILLS RESOURCE RESERVE AND TOURISM IN THE ACCRA PLAINS



MAP 2: A MAP OF SHAI HILLS RESOURCE RESERVE WITH STUDY SITE INDICATED AS HIOWEYO (H1 - H4) AND MANYA HILL (Y1 - Y8). (SOURCE: POSTER AT MUSEUM OF CULTURAL AND NATURAL HERITAGE, SHAI HILLS, 2022).

The SHRR has served as a tourist site in Ghana since its establishment in 1962 and it is currently one of the most visited tourist sites in Ghana. On average, for the last decade, the Shai hills resource reserve receives about 20,040 people in a year making it an average of 1,670 people visiting the reserve every month (SHRR Yearly Tourism Report).

According to the administration body of the Shai hills resource reserve, out of the average number of visitors they receive each year, 40% of them visit the Manya Hill and Hioweiyo to see the cultural evidence of the early settlers in the area (SHRR Yearly Tourism Report). However, it is unsure the total number of people who visit each site respectively.

It is also to be noted that the average number of visitors received in the park within a year excludes the descendants of the ancient settlers who visit the park every year in September to pay homage to their ancestors (SHRR Yearly Tourism Report). During the time of pilgrimage, descendants come together from their various towns to perform rituals to thank their Ancestors. This pilgrimage brings all descendants both far and near together because it is an important season for them, a period where they ask for blessing, and seeking spiritual growth as well as protection. During this festive visit, they pour libation to their gods and make sacrifices by slaughtering sheep to them.

1.3 STATEMENT OF RESEARCH PROBLEM

Like other tourist attractions, the Shai Hills Resource Reserve faces the challenge of balancing tourism with heritage conservation in the park. Pedestrian traffic and an increasing number of pilgrims pose potential threats to the fragile ancient stone terraces within SHRR. The stone terraces in the Shai Hills Resources Reserve (SHRR) stand as the most prominent cultural monuments, yet they face significant threats from both natural and human-induced factors. The environmental conditions of the SHRR, including vegetation growth, the steep slope of the hills, and the region's climate, pose continuous risks to the structural integrity of the terraces. For example, the roots of trees and other plant life often penetrate the stone walls, gradually weakening them and causing portions of the terraces to collapse (Drewett, 2011). Erosion, driven by rainfall and the natural slope of the hills, further exacerbates the degradation, with water flow undercutting the foundations of the terraces and washing away the soil that

stabilizes the stones (Schiffer, 1983). Over time, these natural forces contribute to the slow but steady destruction of the archaeological site.

In addition to these natural threats, human activity is a significant source of damage. Since the SHRR serves as both a nature reserve and a tourist destination, the terraces are frequently exposed to visitors. Human factors such as discard behavior, wherein tourists or locals leave behind litter or disturb the site, contribute to the site's deterioration (Schiffer, 2010). Furthermore, frequent visitation causes physical stress on the terraces, as many tourists, unaware of the fragility of these structures, lean against or sit on them. The pressure exerted by these actions accelerates the wear and tear of the stones, leading to dislodgement and eventual collapse in some cases. According to tour guides, such behavior is common, particularly at points along trails where visitors stop to rest (Drewett, 2011).

Additionally, pilgrimage and other forms of cultural visitation can lead to unintentional damage. With more frequent human contact, the terraces are exposed to a higher degree of disturbance, not only through direct interaction but also through the changes in the surrounding environment caused by foot traffic. The paths formed by frequent visitors alter the natural landscape, which, in turn, may influence the patterns of erosion and water flow that affect the terraces (Schiffer, 2010).

These challenges highlight the need for both enhanced conservation efforts and public education about the importance of preserving such cultural monuments. Protective measures, such as restricting access to certain parts of the site or installing signage that encourages visitors to avoid physical contact with the terraces, could mitigate the damage caused by human activity. Similarly, ongoing monitoring and maintenance are essential to counteract the impacts of natural threats. By addressing these issues, the SHRR can ensure the long-term preservation of these culturally and historically significant structures.

To provide a more detailed and balanced discussion, it is essential to elaborate on how both human activities and natural dynamics such as slope, vegetation, and climate contribute equally to the vulnerability of the dry-stone terraces at Manya Hill and Hioweyo.

The dry-stone terraces at these sites are indeed under threat due to a combination of human and environmental factors. However, these threats are deeply intertwined with the physical and ecological characteristics of the landscape, which are just as crucial to the site's preservation as human interactions.

The steep slope on which the terraces are constructed is one of the key natural factors influencing their stability. The gravitational pull on the terraces increases the likelihood of stone dislodgement over time, especially when coupled with heavy rainfall, which accelerates the erosion of the soil supporting the stone structures (Schiffer, 1983). Rainwater runs down the slopes with force, carrying soil away from the base of the terraces, leading to weakening foundations. The terraces were originally designed to manage some of this water flow and prevent erosion, but over time, the natural wear on the terraces makes them more vulnerable. Vegetation growth, particularly tree roots that infiltrate the stone walls, compounds this problem by further destabilizing the structures (Drewett, 2011).

Equally important is the climate in the Shai Hills region, which has a significant impact on the preservation of the terraces. The weather patterns, particularly fluctuations between wet and dry seasons, affect the stones through processes like expansion and contraction, which can lead to cracking or loosening of the stones. Over time, this natural weathering weakens the terraces, making them more susceptible to collapse.

On the other hand, human factors, such as tourism and pilgrimage, contribute to the degradation in more immediate and visible ways. Visitors unknowingly exacerbate the damage by leaning

on or sitting on the terraces, causing the stones to shift or crumble under pressure (Drewett, 2011). Discard behavior, where visitors leave behind trash or disturb the site, can alter the landscape in subtle ways that contribute to erosion or damage to the vegetation that plays a role in stabilizing the soil. While the terraces themselves were designed to withstand natural processes like erosion, they are less resilient to the continuous pressure exerted by modern human interactions.

Thus, this research is critical in understanding how these dynamic factors—slope, vegetation, climate, and human activities—interact and collectively threaten the integrity of the dry-stone terraces. Each factor plays an integral role in the preservation or destruction of these monuments, and understanding their interplay is essential for developing effective conservation strategies. The terraces, being the most significant cultural and historical monuments at these sites, demand careful attention to both natural and human-induced threats if they are to be preserved for future generations.

1.4 AIMS AND OBJECTIVES

This project aims to document and assess the impact of tourism on the dry-stone terraces at Manya Hill and Hioweiyo in the Shai Hills Resources Reserve. The study focuses on identifying and documenting the threats posed by humans (visitors, pilgrims, descendant communities) and natural factors such as erosion and vegetation growth. Systematic identification, documentation, mapping, and analysis of the tourism-conservation dynamics on the hilltops are integral to developing sustainable tourism and site management and conservation strategies. In line with this aim, the study is guided by the following objectives:

1. To identify and record or inventorize the stone terraces at Manya Hill and Hioweiyo sites.

2. To classify the terraces based on their form and function.

3. document and assess the state of preservation of the terraces by analyzing the lateral displacement of the stone blocks from the terrace walls.

4. Enumerate and discuss the risks posed by human activities and natural factors to the stone terraces and the archaeological sites.

1.5 RESEARCH QUESTIONS

1. How many types of terraces or walls are there within Manya Hill and Hioweiyo site?
2. What factors affect the stone terraces and walls, and how do these factors influence their state of preservation?
3. How does archaeological heritage tourism, together with stakeholder engagement, influence conservation practices, tourism promotion, and site management strategies at Manya Hill and Hioweiyo in the Shai Hills Resource Reserve?
4. What are the functions of the various types of stone terraces and walls identified, and what is their cultural importance to the Shai communities?

1.6 APPROACHES TO THE STUDY

This work will be done basically by surveying both Manya Hill and Hioweiyo site as well as gathering information from the assigned communities through interviews.

- Surveys: this was done by walking across the site to identify stone terraces and other related cultural materials available at these sites. The identified stone terraces and landmarks were mapped. During this phase, the stone terraces identified were thoroughly assessed to know the integrity of the structures of these walls. The focus of the assessment was to know the material components that makes up the walls, and how well they have been preserved over the years of existence.

- Ethnography: interviews were conducted within the Doryumu and Manya Jorpanya communities to know how important the sites within Shai Hills Resorce Reserve are important to them. Also, information on the architectural style was collected from these communities. Similarly, park managers and tour guides were interviewed on the factors that causes the destructions of the dry-stone terraces at these sites. More of this section has been discussed in Chapter four of this study.

1.7 SIGNIFICANCE OF THE STUDY

This work will be of importance for the following stated reason:

- Cultural Preservation: this work provides the importance of preserving the cultural heritage embodied in the stone terraces, as the stones tell the story of the early settlers in the Shai Hills Resource Reserve. This ensures that future generations can learn about and appreciate the historical and cultural significance of these structures and also to promote continuity of cultural practices.
- Sustainable Tourism: The study can provide insights into how archaeological heritage tourism can be developed sustainably as this work seeks to propose ways through which the stone terraces can properly be conserved. It will also ensure that tourism activities do not degrade the sites but instead contribute to their maintenance and preservation.
- Economic Benefits: by linking tourism with site conservation, this study illustrates how local communities can contribute to benefit economically from tourism. This might include job creation for the local indigenes who understands the importance of their cultural materials and its relevance to their society, infrastructure development, and increased local revenue. This can be done when the traditional rulers are involved in

the preservation and conservation processes, as they hold the importance of their material culture.

- Educational Value: Both visitors and locals can benefit from the research's educational value, which can raise knowledge of the Shai Hills' significance in history and culture and encourage pride and stewardship.
- Conservation Strategies: The study will make recommendations for practical conservation tactics that strike a balance between the need to conserve and safeguard archaeological sites and tourism. This include controlling the impact of visitors, working with traditional rulers to produce conservation strategies, and working on restoration projects to revive already deteriorated stone terraces within the Manya Hill and Hioweiyo sites.
- Policy Development: Findings from the study will inform policymakers on the various destructions caused to the stone terraces at Manya Hill and Hioweiyo site and will also provide the rate of destruction. It will also inform policymakers on the best practices for integrating tourism with heritage conservation. This can lead to the development of guidelines and regulations that support both tourism and conservation goals.
- Interdisciplinary Approach: The research integrates archaeology, tourism studies, and conservation science in an interdisciplinary manner. This all-encompassing viewpoint can result in more thorough and efficient cultural site management strategies.
- Community Involvement: Because these two sites are significant to the communities' histories, which they aim to preserve for coming generations, this study will promote community empowerment and engagement in their protection. This could lead to an increase in local support for tourism-related initiatives and better conservation results.

1.8 Thesis Structure

The thesis is divided into parts, each addressing a different component of the research, which focusses on the interaction between archaeological heritage tourism and site conservation in the Shai Hills Resource Reserve (SHRR).

The study's first chapter provides an overview of the Manya Hill and Hioweiyo sites, including their cultural and historical value, as well as the difficulties faced by natural and human forces. It describes the research problem, as well as the goals, objectives, and research questions that will lead the investigation. Additionally, the chapter addresses the analytical techniques used and emphasizes the study's importance to cultural preservation, sustainable tourism, and economic growth.

In the second chapter, the literature review dives into the relationship between archaeological heritage tourism and site conservation, focusing on the historical and cultural settings of stone terraces. This contains a study of their formation, evolution, and relevance in diverse communities. The chapter also looks at the challenges that come with increased tourist activity, strategies for sustainable tourism practices, and the current state of archaeological heritage tourism in Ghana, with a focus on the economic impact on local communities and conservation challenges.

The third chapter discusses the research methodology, specifically the mixed-methods approach, which blends qualitative and quantitative methodologies. It describes the site selection criteria and sample tactics, as well as the data collecting methods, which include participant observation, interviews, mapping, GPS surveys, and photographic recording. This section also addresses ethical issues and the study's limitations.

The fourth chapter is on presenting, analysing, and interpreting the study results. It comprises an inventory and description of the stone terraces, comparisons of the preservation conditions of Manya Hill and Hioweiyo, and an investigation of the natural and human risks to these

monuments. The chapter also analyses cultural artefacts as stories of the Shai community's survival, workmanship, and relationship with their surroundings.

The study's last chapter summarizes the key results and makes recommendations for the protection of the stone terraces. It emphasizes the importance of combining sustainable tourism with heritage preservation techniques to preserve the long-term viability of these cultural sites. The chapter further suggests options for future study to increase understanding and improve management techniques.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This literature review examines the delicate balance between preserving these irreplaceable cultural monuments and sustainably engaging tourists and heritage resources. By exploring the historical background, present practices, and future initiatives for sustainable tourism, I shed light on how heritage managers may balance the requirements of tourism and that of preserving our common cultural legacy for future generations.

Archaeological heritage tourism and site conservation are intricately linked, resulting in an intriguing but difficult environment to manage sustainably, especially given the threat tourism poses to the stone terraces that tell stories of past human adaptation and innovation. These ancient structures reveal the lives of past inhabitants and their knowledge of landscape management and architectural skills. The architectural features also reflect the rich cultural history of the people who have created and conserved these heritage assets for centuries. However, as these destinations grow increasingly popular with tourists, they confront major threats such as environmental degradation and adverse cultural impacts, including commercialization.

2.1 The Interplay between Archaeological Heritage Tourism and Site Conservation

The overlap between archaeological heritage tourism and site conservation presents a complex yet fascinating dynamic that warrants thorough examination, particularly in the context of stone

terraces. These ancient structures, often found in hilly landscapes, serve as windows into past innovations, and highlight the tangible reminders of human resilience and adaptation to challenging physical environments in the past. However, the popularity of these sites as tourist destinations can lead to potential threats, including environmental degradation and cultural commodification. Exploring this intersection is essential, as it directly influences both the preservation strategies employed by heritage managers and the overall experiences of visitors seeking authentic engagement with history and heritage assets. The interplay between tourism and conservation can create a delicate balance. On the one hand, tourism generates funding and public interest that can drive conservation efforts, on the other, it may precipitate destruction it seeks to prevent (Dredge, 2010). As tens of thousands of visitors and pilgrims traverse these stone terraces each year, the impact of foot traffic, infrastructure development, and associated environmental stressors becomes apparent. In 2023, a total of 68,000 plus tourists were recorded at SHRR. Out of this number, many have visited the Manya Hill and Hioweiyo ancestral homes (personal communication with the Management at SHRR).

2.1.1 Definition of Archaeological Heritage Tourism

A comprehensive understanding of archaeological heritage tourism involves recognizing its dual focus on heritage preservation and visitor engagement. This form of tourism enables recreational experiences and fosters a deeper appreciation for cultural and historical contexts (Poria et al., 2001). It intertwines educational elements with the thrill of exploration, allowing visitors to connect with past civilizations through archaeological sites (Afkhami, 2021). As such, archaeological heritage tourism becomes a platform for highlighting the importance of conserving these fragile sites while enhancing local economies through sustainable practices (Ross et al., 2017). By engaging tourists in meaningful ways, stakeholders can raise awareness

about the significance of cultural heritage, ensuring that these sites are not merely viewed as commodities, but as vital components of our shared history (Bonet, 2013).

Protecting heritage tourism directly impacts the management of archaeological sites, and necessitates increased collaboration among various stakeholders, including local communities, policymakers, and heritage professionals (Dupeyron, 2020). The dynamic interplay of these entities can provide pathways for innovative and sustainable conservation strategies that respect both the sites' integrity and the local economy's needs. For instance, locally centered initiatives are critical for ensuring that resident community's benefit from heritage tourism while fostering a sense of ownership and stewardship toward archaeological resources (Ross et al., 2017). This dual approach encourages the sustainable management of sites, balancing tourists' expectations with preserving the archaeological integrity for future generations, as emphasized in the need for participatory planning for cultural landscapes (Dupeyron, 2020). This dualized management approach to heritage tourism is critical because it ensures that aesthetics and identity values in archaeological heritage tourism cannot be overlooked, as they significantly shape visitors' experiences and perceptions of a site (Poria et al., 2001).

The emotional connections formed through aesthetically appealing landscapes enhance the overall tourism experience by embedding cultural memories into the physical components of the environment (Bonet, 2013). Understanding these dimensions is crucial, as the identity tied to a location contributes to its appeal and relevance in the tourism market (Poria et al., 2001). In the context of archaeological heritage tourism, fostering these connections offers opportunities for storytelling that transcends mere observation, allowing visitors to engage with the heritage landscape on a deeper level (Ross et al., 2017). By acknowledging the entangled relationships between aesthetics and identity, heritage tourism can serve as a conduit for

cultural understanding and appreciation, highlighting the importance of both conservation and the promotion of archaeological sites (Dupeyron, 2020).

2.1.2 Importance of Site Conservation

The sustainability of archaeological sites, particularly those associated with distinctive cultural landscapes like stone terraces, directly influences both local communities and global heritage. These conservation efforts preserve not merely the physical remnants of history but also the intangible cultural identities that shape the narratives of these regions. Sites that successfully embody their heritage can enhance local tourism, fostering economic resilience within communities that rely on their historical significance (Butchart et al., 2012). The relationship between heritage character and local identity underscores the necessity of conservation practices that enhance socio-economic sustainability. This economic aspect is vital, illustrating how effective site conservation can generate tourism revenue while simultaneously encouraging the preservation of vernacular architecture and traditional landscapes that define these sites (Eken et al., 2004).

Moreover, effective management plans are essential in the preservation of archaeological sites and ensuring their sustainable use. Inadequate planning can lead to the degradation of the site and loss of its cultural significance (Ratcliffe, 2012). UNESCO's recognition of rural landscapes as cultural heritage sites highlights the importance of developing management systems that involve diverse stakeholders in decision-making processes. These systems must prioritize conservation strategies that mitigate environmental impacts while allowing for responsible tourism. By engaging community members, local authorities, and heritage organizations, balanced approaches to site governance can be achieved (Foster et al., 2003). This collaborative model not only reinforces the cultural significance of archaeological sites

but also cultivates a sense of ownership among the local populace, ensuring that these valuable assets are preserved for future generations (Eken et al., 2004).

Ultimately, the integration of site conservation with archaeological heritage tourism fosters a harmonious relationship between the past and present. Conservation efforts must adapt to emerging challenges, including climate change and increased visitor pressure, which threaten the integrity of these sites. The study of stone terraces, as a unique archaeological landscape, exemplifies the need for tailored conservation strategies that consider both historical preservation and modern usage (Foster et al., 2003; Butchart et al., 2012). This ongoing commitment to heritage conservation highlights the critical role of sustainable practices that recognize and uphold the universal value of these cultural treasures. By ensuring that archaeological sites maintain their integrity and relevance, we are not only safeguarding our history but also enriching the cultural fabric of societies globally (Butchart et al., 2012; Eken et al., 2004).

2.1.3 Overview of Stone Terraces

The significance of stone terraces in cultural landscapes lies in their historical value and their role in sustainable agricultural practices and environmental management. These structures exemplify a harmonious relationship between human activity and the natural environment, showing how ancient societies adapted their farming techniques to varying altitudes and topographies (Stavi et al., 2018). The remarkable engineering involved in the construction of these terraces illustrates an impressive understanding of local geography and ecological principles. As highlighted in recent studies, abandoned terraces present an opportunity for rehabilitation and revitalization, aligning with contemporary needs for sustainable land use and preservation of cultural heritage (Preti et al., 2018). The potential for eco-tourism and

agricultural practices rooted in preservation can invigorate local economies while respecting and protecting these invaluable heritage sites (Ferrarese et al., 2019).

Furthermore, the integration of archaeological heritage tourism within the realm of stone terraces represents a critical intersection between conservation initiatives and economic development. By showcasing these terraces, sites can engage visitors through educational programs while promoting local culture and customs (Preti et al., 2018). Recent trends have indicated that rural heritage tourism has socio-economic benefits, such as job creation and the revitalization of local industries (Ferrarese et al., 2019). The successful management of these tourism initiatives depends on developing operational frameworks that address both visitor experiences and conservation strategies (Stavi et al., 2018). Stakeholder collaboration, including local communities, governmental agencies, and conservation organizations, is essential to strike a balance between enjoying the rich history of stone terraces and ensuring their sustainability for future generations (Preti et al., 2018).

In analyzing the management practices of stone terrace sites, lessons can be drawn from existing successful models in rural areas recognized by UNESCO as World Heritage sites (Ferrarese et al., 2019). The complexity of managing these culturally significant landscapes necessitates the involvement of diverse stakeholders in decision-making processes to enhance sustainability while preserving their archaeological integrity (Stavi et al., 2018). Tailored management plans that focus on both conservation and community engagement can serve as a critical blueprint for similar sites grappling with abandonment and degradation (Preti et al., 2018). Through this multidisciplinary approach, not only can the historical significance of stone terraces be preserved, but they can also be transformed into vital economic assets that

contribute to local resilience, ensuring that heritage conservation and community development go hand in hand (Ferrarese et al., 2019).

2.2 Historical Context of Stone Terraces

The historical context of stone terraces reveals their profound significance in agricultural development and cultural heritage across various regions. These structures, often constructed on topographically challenging landscapes, facilitated farming by creating flat arable land in steep areas, thus transforming environmental limitations into productive agricultural spaces. The ingenuity behind stone terrace construction not only reflects the technical skills and resources of past societies but also their adaptation to local ecosystems (Ferrarese et al., 2019). This cultural resilience can be observed in places like the terraced fields in the Andes, where communities developed sophisticated irrigation systems that are still in use today. Such practices underscore a deep understanding of sustainability and land management that is pivotal to the survival of these communities over centuries (Ferro-Vázquez et al., 2017).

Moreover, understanding the historical narratives associated with stone terraces contributes to a broader discourse on heritage conservation and tourism. As UNESCO increasingly recognizes rural landscapes as cultural heritage sites, the role of management systems becomes crucial in ensuring their preservation. For instance, UNESCO's acknowledgment of rural landscapes has fostered a collaborative approach involving multiple stakeholders, including private and public authorities, archaeologists, and local communities to safeguard these heritage sites from degradation and abandonment—a common issue within rural contexts, as identified in Portugal. This highlights the need for integrated management plans that balance

tourism interests with conservation efforts, ensuring that the unique stories behind these terraces are preserved and appreciated (Ferrarese et al., 2019).

Linking the discussion of stone terraces to modern conservation efforts illustrates the relevance of archaeological heritage tourism in promoting sustainable practices. When managed correctly, tourism can act as a catalyst for the preservation of historical agricultural techniques and the communities that uphold them. The attention garnered from heritage tourism leads to increased funding and awareness, which is essential for the conservation and maintenance of stone terraces (Ferro-Vázquez et al., 2017). Effective management plans should not only focus on protecting these sites but also work towards revitalizing the associated cultural traditions that contribute to their universal value. As UNESCO emphasized, assessing sustainability in such environments is critical, and successful strategies can be drawn from comparative analyses of existing rural World Heritage Sites to inform future conservation efforts (Ferrarese et al., 2019).

2.2.1 Origins and development of stone terrace construction

The construction of stone terraces can be traced back to ancient civilizations that relied on effective agricultural practices to sustain their populations. Initially, these terraces emerged in response to the challenges posed by steep and uneven terrain, allowing communities to cultivate crops in otherwise unsuitable environments. Over time, advanced techniques developed that not only stabilized the soil but also enhanced irrigation and drainage systems. As a result, the process of terrace construction evolved into a vital method for land management and food production. This synergy between environmental adaptation and agricultural efficiency laid the groundwork for sophisticated stone structures, illustrating the critical link between human ingenuity and the landscape (Ferrarese et al., 2019; Itkin et al., 2022).

With the passage of time, the cultural significance of stone terraces shifted as they became emblematic of architectural heritage. In many regions, these terraces served not merely agricultural purposes but also reflected the social and economic status of communities. The aesthetic presentation of terraced landscapes frequently intertwined with urban planning, leading to the integration of these structures within burgeoning settlements. The relationship between stone terrace construction and cultural identity accentuates the role of these features in the history of human habitation, which can be further explored in the context of archaeological heritage tourism. As sites of historical interest, they provide a tangible connection to the past, fostering an appreciation of both the engineering skills and cultural practices of earlier societies (Ferro-Vázquez et al., 2017; Petit et al., 2012).

Currently, addressing the conservation of stone terraces is essential to preserve both their structural integrity and their historical significance. Conservation efforts, as described in recent literature, highlight the importance of maintaining these sites not only for their agricultural utility but also for their role in the cultural landscape. Sustainable management practices must take into account the diverse functions that these terraces serve within their ecosystems and communities (Ferrarese et al., 2019). Therefore, the nexus of archaeological heritage tourism and site conservation becomes increasingly relevant as it offers a platform for educating visitors while ensuring the longevity of these culturally and environmentally important structures. The dual focus on tourism and conservation can foster a sustainable approach that values the past while promoting awareness and respect for these remarkable feats of engineering (Itkin et al., 2022).

2.2.2 Evolution of archaeological interest in stone terraces

The evolution of archaeological interest in stone terraces has transitioned from mere curiosity about their existence to a comprehensive understanding of their socio-economic significance in ancient societies. Initially considered by many as simple agricultural features, recent studies have highlighted their intricate relationship with landscape management and community sustainability (Ferro-Vázquez et al., 2017). This shift in perspective has been largely driven by the recognition that terraced systems are not only remarkable engineering feats but also embodiments of cultural heritage that reflect the adaptive strategies of past populations (Tarolli et al., 2014). As scholars increasingly incorporate multidisciplinary approaches, including input from anthropology, geography, and environmental science, the narrative surrounding stone terraces has expanded, effectively repositioning them within the larger context of human development and ecological balance (Chen et al., 2022).

Archaeological research has underscored that stone terraces played a crucial role in shaping agricultural practices and managing natural resources, thereby sustaining populations in challenging topographical environments. Excavations and analyses have uncovered evidence of sophisticated land use that aligns with cultural rituals and societal organization, revealing how these structures facilitated not just food production, but also community cohesion (Varotto et al., 2018). Notably, studies in regions such as the Mediterranean and East Asia emphasize a duality in the significance of terraces: they served both practical agricultural functions and acted as cultural landscapes that carried deep historical narratives (Tarolli et al., 2014). As researchers continue to engage with these previously overlooked aspects, their findings contribute to the understanding that stone terraces are integral to the heritage narratives of the communities associated with them, as seen in ongoing projects examining diverse agricultural landscapes across continents (Chen et al., 2022).

The contemporary archaeological discourse surrounding stone terraces has increasingly embraced the implications of heritage conservation and tourism. This dual focus emphasizes that while the preservation of these structures is crucial for safeguarding cultural identity, their role as attractions can simultaneously generate economic benefits for local communities (Varotto et al., 2018). The intersection of archaeological heritage tourism with site conservation efforts presents challenges and opportunities for sustainable management practices. For instance, the rehabilitation of abandoned villages in Portugal highlights how cultural heritage, including terraced landscapes, can be effectively leveraged to foster socio-economic sustainability (Tarolli et al., 2014). By advocating for responsible tourism and integrated conservation practices, the archaeological community can ensure that the historical significance of stone terraces is enhanced, fostering a deeper appreciation of their role in cultural heritage while simultaneously supporting local economies (Ferro-Vázquez et al., 2017).

2.2.3 Cultural Significance of Stone Terraces in Various Societies

Stone terraces serve as a prominent example of how societies have historically interacted with their environments, demonstrating ingenuity in land use and agricultural practices. These structures, often labor-intensive to construct, reflect the adaptation of communities to diverse climatic and topographical challenges. For instance, the Incas expertly engineered terraced landscapes in the Andes, allowing for effective irrigation and cultivation of crops at various altitudes. This adaptation not only facilitated agricultural productivity but also played a crucial role in social organization and economic stability. By analyzing such historical contexts, we gain insight into how these terraces served both practical needs and cultural identity, fostering a sense of community and place (Wei et al., 2016).

Moreover, the preservation and recognition of stone terraces as cultural heritage sites highlight their significance within broader narratives of identity and history. In contemporary times, these structures are increasingly recognized not only for their agricultural value but also for their historical and archaeological importance. Their designation as UNESCO World Heritage Sites, as illustrated in the management approaches outlined by UNESCO in various contexts, underscores the need to balance conservation with tourism. This dual focus elevates the importance of stone terraces, enabling communities to engage with their past while facilitating economic opportunities through heritage tourism (Kladnik et al., 2017).

These initiatives raise awareness about the sustainable practices tied to these ancient structures, encouraging a dialogue on the relationship between cultural heritage and environmental stewardship (Jiao et al., 2012). The cultural significance of stone terraces extends beyond mere functionality; they symbolize the interaction between humans and their environments across time.

2.3 The Role of Tourism in Site Conservation

Tourism serves as a critical mechanism for raising awareness about archaeological heritage, particularly within the context of site conservation. By attracting visitors to significant cultural landscapes, tourism generates revenue that can be reinvested into preservation efforts (Burger, 2000; Orbaslı & Woodward, 2009). For instance, UNESCO's recognition of rural landscapes as cultural heritage sites has increased their visibility, prompting local governments and organizations to prioritize maintenance and protection (Liburd & Becken, 2020). In turn, such recognition brings with it a responsibility to balance visitor engagement with conservation needs, ensuring that the influx of tourists does not compromise the integrity of the sites

(Gilmore, Carson, & Ascenção, 2007). This duality of purpose harnesses tourism's potential as a catalyst for both local economies and sustainable practices in heritage management (Anup, 2018).

The interplay between tourism and site conservation can lead to innovative management approaches that emphasize participatory frameworks. Engaging stakeholders—ranging from local communities to researchers—enables inclusive decision-making processes that amplify the voices of those most affected by tourism (Rasoolimanesh et al., 2017). Evidence from various case studies indicates that incorporating archaeological knowledge enhances tourism experiences while fostering a sustainable approach to conservation (Buckley, 2008). By aligning tourism with conservation strategies, it becomes possible to transform visitor experiences into opportunities for education, which in turn cultivates a sense of stewardship (Orbaslı & Woodward, 2009). This paradigm shift not only conserves the sites but also instills pride and ownership within local populations, thereby promoting long-term engagement (Rasoolimanesh et al., 2017).

Ultimately, effective tourism management can create a symbiotic relationship between heritage sites and their visitors, benefiting both conservation initiatives and the local economy (Anup, 2018). The potential for archaeological heritage tourism to support site conservation relies heavily on the successful implementation of integrated management plans, as highlighted in comparative studies of rural landscapes (Gilmore, Carson, & Ascenção, 2007). By developing frameworks that prioritize sustainability, stakeholders can ensure that tourism promotes rather than detracts from conservation efforts (Buckley, 2008). As tourism continues to evolve, embracing transdisciplinary approaches is essential to navigate the complexities inherent in managing archaeological sites. By doing so, the conservation of stone terraces and similar sites

can flourish amidst growing global interest, ensuring their preservation for future generations (Liburd & Becken, 2020).

2.3.1 Economic benefits of archaeological heritage tourism

The revitalization of archaeological heritage tourism offers significant economic benefits to local communities, particularly in areas featuring unique cultural and historical landscapes, such as those characterized by stone terraces. By attracting tourists, these heritage sites can generate substantial revenue through entrance fees, guided tours, and associated services. More than mere visitors, tourists often engage with the local economy by purchasing goods and services from nearby businesses, thereby fostering a multiplier effect that can fuel broader economic development (Timothy, 2015; Burtenshaw, 2020). This is particularly evident in regions where abandoned villages have been rehabilitated and transformed into tourist destinations, as highlighted in studies pertaining to Portugal. These rehabilitated sites not only preserve local identity but can also support new products and services, providing a clear pathway to socio-economic sustainability (Gilmore, Carson, & Ascenção, 2007; Bonet, 2013).

Investment in archaeological heritage tourism further enhances local infrastructure and services, which can improve the overall quality of life for residents. As tourism increases, there is often a corresponding need for better roads, higher-quality accommodations, and enhanced public amenities. These improvements create jobs in construction, hospitality, and other service industries, thereby diversifying the local economy (Timothy, 2015). Not only do these developments benefit tourists, but they also provide enhanced living conditions for the local population, fostering community pride and engagement (Binoy, 2011). Moreover, funds generated through tourism can be reinvested into conservation efforts, ensuring that archaeological sites, such as the stone terraces, are preserved for future generations. This dual

focus on conservation and development can create a sustainable cycle that promotes both economic and cultural resilience (Orbaslı & Woodward, 2009).

Lastly, the economic vitality derived from archaeological heritage tourism is instrumental in fostering community connections and relationships with historical narratives. By engaging with their heritage, local communities cultivate a sense of ownership, which can translate into active participation in conservation efforts (Burtenshaw, 2020). The coupling of storytelling, tourism, and archaeological research not only enhances the visitor experience but also strengthens community bonds. It aids in educating both locals and tourists about the historical significance of sites, such as terraced landscapes, resulting in greater appreciation and willingness to preserve these legacies (Binoy, 2011). The economic benefits of tourism thus extend beyond mere financial gain; they encapsulate an investment in the cultural and environmental integrity of local areas. As such, the nexus of archaeological heritage tourism and site conservation presents a compelling model for sustainable economic growth and cultural stewardship (Bonet, 2013).

2.3.2 Challenges posed by increased tourist activity

Sustaining the delicate balance between archaeological heritage tourism and site conservation presents significant challenges, particularly in regions experiencing heightened tourist activity. Increased foot traffic not only accelerates the physical degradation of historical structures such as stone terraces but also threatens the very landscape that encapsulates cultural heritage. Such degradation can manifest in various forms, including erosion, damage to archaeological finds, and disturbances to the ecosystem surrounding these sites. For instance, in Central Dalmatia, tourist influx along the Adriatic Coast has exacerbated the environmental impact on culturally significant locations, leading to irreversible damage to age-old structures that hold intrinsic

value to local heritage (Kugiejko, 2021). Thus, without strategic interventions to mitigate tourist impact, the preservation of these historical resources is at risk (Tsaur, Lin, & Yen, 2020; Timothy, 2015).

Moreover, the economic pressures associated with high tourist activity often leads to over-commercialization of heritage sites, transforming unique cultural landscapes into mere commodities. In Elmina, Ghana, for example, the Elmina Cultural Heritage and Management Programme aimed to integrate heritage tourism with local community development. However, despite its initial successes, the program struggled with sustainability due to inadequate funding and weak stakeholder collaboration (Binoy, 2011). This scenario highlights a critical pitfall of increased tourist activity: the tendency to prioritize immediate economic gains over long-term conservation efforts. As communities become reliant on tourism revenue, the focus can shift away from heritage preservation, ultimately undermining the cultural significance of these sites (Orbaslı & Woodward, 2009).

Furthermore, the incorporation of community involvement remains a crucial yet challenging aspect of managing increased tourist activity. Engaging local stakeholders in the conservation process can foster a sense of ownership and responsibility towards heritage preservation (Burger, 2000). However, as observed in Elmina, low community involvement in tourism can inhibit effective management practices. When local voices are marginalized, the authenticity of the tourism experience diminishes, and conservation efforts suffer as a result (Timothy, 2015). Increased tourist activity can thus exacerbate tensions between preserving archaeological integrity and catering to visitor expectations. Therefore, successful heritage tourism models must prioritize authentic engagement with local communities to ensure that

archaeological sites, such as stone terraces, are not only preserved for future generations but also remain meaningful to those who inhabit and cherish them (Binoy, 2011; Burger, 2000).

2.3.3 Strategies for Sustainable Tourism Practices

Effective strategies for sustainable tourism practices often begin with the active involvement of local communities in the planning and management processes. This participation ensures that local perspectives and needs are considered and fosters a sense of ownership and pride among residents (Orbaslı & Woodward, 2009). Local stakeholders can contribute valuable insights regarding cultural and environmental assets, leading to more informed decision-making that aligns tourism initiatives with community values (Coroş et al., 2017). Engaging communities to co-create sustainable programs enhances the social fabric and encourages tourism that honors and preserves their unique heritage, particularly in regions with archaeological significance such as those characterized by stone terraces. Research indicates that the successful management of rural World Heritage Sites necessitates the inclusion of various stakeholders, emphasizing that collaborative governance is essential for conserving cultural landscapes (Laitamaki et al., 2016).

The adoption of integrated management plans is another vital component for promoting sustainable tourism around archaeological sites. Such plans should evaluate multiple parameters, including environmental sustainability, cultural preservation, and economic viability, creating a holistic framework (Budeanu et al., 2016). For example, implementing measures that prioritize local resources and minimize environmental impact can significantly enhance the long-term appeal of these destinations (Aall, 2014). Strategies may include responsible waste management, effective water use, and the encouragement of renewable energy sources among tourism businesses. Moreover, it is crucial to assess how tourism development can strengthen both economic stability and the preservation of cultural heritage,

as highlighted by the challenges faced in rehabilitating abandoned villages in Portugal (Coroş et al., 2017). Developing guidelines that harmonize tourism growth with conservation priorities is essential to ensure the sustainability of archaeological tourism.

Finally, successful marketing strategies that emphasize sustainable tourism practices can significantly enhance community engagement and visitor experience (Laitamaki et al., 2016). Promoting local traditions, culinary offerings, and craftsmanship can create authentic experiences while providing economic benefits to residents (Orbaslı & Woodward, 2009). Highlighting the interconnectedness of tourism and environmental stewardship encourages visitors to act responsibly, further advocating for the preservation of archaeological heritage (Budeanu et al., 2016). When tourists are informed about the importance of protecting cultural landscapes, they are more likely to support initiatives that contribute to conservation efforts. Thus, coupling education with tourism efforts serves not only the purpose of enhancing visitor enjoyment but also protects significant sites for future generations. Ultimately, the alignment of marketing with sustainability principles sets the groundwork for a tourism model that respects both the archaeological significance of destinations and the livelihoods of local communities (Aall, 2014).

2.4 Current State of Archaeological Heritage Tourism in Ghana

The landscape of archaeological heritage tourism has transformed considerably in recent years, driven by a growing global interest in cultural and historical narratives (Anquandah, 2014). This shift has encouraged attractions like Ghana's Shai Hills Resources Reserve (SHRR) to leverage their archaeological assets for economic purposes. However, balancing tourism development with site preservation is essential, as increased tourist activity puts pressure on these sites, raising issues such as environmental degradation, potential looting, and the risk of commodifying cultural heritage (Kankpeyeng & DeCorse, 2004). Addressing these concerns

requires the development of sustainable practices that both preserve archaeological integrity and enhance visitor engagement.

Within the African context, archaeological heritage tourism faces additional challenges due to climate change and socio-economic factors. Africa is especially vulnerable to climate impacts, which threaten the archaeological sites that draw tourists. Recent IPCC reports highlight how regions like Southern Africa could experience significant agricultural losses, affecting local communities that depend on tourism for income and livelihoods. This underscores the need for adaptive strategies that prioritize both the conservation of sites and community resilience. Engaging local populations in tourism initiatives fosters a sense of ownership and responsibility, contributing to archaeological preservation. Additionally, including local perspectives in tourism planning enriches the narrative for visitors, offering a more profound understanding of the cultural significance of these sites (Twumasi-Ampofo, Oppong, & Quagraine, 2020).

Currently, archaeological heritage tourism stands at a critical juncture of both opportunity and challenge. Research, such as in "Protected Area Governance and Management," suggests that when tourism aligns with conservation efforts, it can yield economic benefits and promote cultural preservation. In the case of SHRR, achieving this balance is essential and requires a cooperative framework involving government agencies, local communities, and researchers. A collaborative approach can ensure sustainable tourism practices that safeguard Ghana's cultural heritage for future generations. Properly managed, archaeological heritage tourism can serve not only as a revenue source but also as a catalyst for preserving Ghana’s rich history and cultural identity (Asare, 2021; Anquandah & Kankpeyeng, 2014).

2.4.1 Overview of Tourism Trends in Ghana

In recent years, Ghana has experienced a shift in tourism trends fueled by rising interest in its cultural heritage and natural attractions (Mensah-Ansah, Martin, & Egan, 2011). The country's rich historical heritage, highlighted by significant sites like Cape Coast and Elmina Castles, continues to attract international visitors. Additionally, eco-tourism initiatives, particularly in areas like the Shai Hills Resource Reserve, are becoming increasingly popular as tourists seek immersive experiences that blend archaeological heritage with natural exploration. This dual focus on historical and ecological tourism not only enriches visitor engagement but also fosters a comprehensive understanding of Ghana's socio-cultural landscape, positioning the nation as a growing tourism hub within Africa (Preko, 2020).

The economic and cultural impact of tourism on local communities in Ghana is substantial, fostering both development and cultural exchange. With the rise in tourism numbers, there is an increasing need for sustainable practices that protect archaeological and natural sites from degradation. The Shai Hills Resource Reserve, for example, is a focal point for conservation efforts, aiming to strike a balance between tourist access and ecological preservation. Engaging local stakeholders is crucial in this process, ensuring that tourism benefits permeate local communities while also safeguarding heritage sites for future generations (Deichmann & Frempong, 2016). Sustainable tourism has thus become a key aspect of Ghana's tourism strategy, aligning economic growth with the preservation of cultural and natural assets (Adu-Ampong, 2018).

The interconnectedness of tourism and conservation has been a major point in various studies on the region, including discussions from the Hindu Kush Himalaya Assessment, which emphasizes the importance of long-term planning and policy development for managing

tourism in environmentally sensitive areas. Ghana, too, can benefit from comprehensive strategies that bolster the resilience of its archaeological and natural reserves amidst growing tourism pressures (Akyeampong, 2006). Through innovative governance and collaborative conservation efforts, stakeholders can shape a tourism industry that respects the delicate balance between visitor enjoyment and site preservation. As Ghana continues to integrate sustainable practices into its tourism policies, embedding archaeological heritage within the broader tourism narrative promises both cultural enrichment and environmental stewardship (Addison, 2019).

2.4.2 Economic Impact of Tourism on Local Communities

The expansion of archaeological heritage tourism has a substantial impact on local economies, often acting as a vital driver of development in areas that may otherwise receive limited economic attention. For communities near archaeological sites, tourism can lead to increased income through visitor spending on services like hospitality, guided tours, and local crafts (Adu-Ampong, 2018). This influx of funds can generate new job opportunities, foster entrepreneurship among locals, and improve essential infrastructure such as roads and communication networks. However, as observed by Havi and Enu (2013), the economic benefits of tourism are not always evenly distributed, sometimes favoring external stakeholders over local residents. Ensuring that financial gains are shared equitably is therefore essential for local populations to fully benefit from tourism at heritage sites.

Moreover, sustainable tourism practices are crucial to managing the pressures that high visitation levels can place on archaeological sites and surrounding communities. The economic relationship between tourism and local economies must be carefully balanced to prevent the degradation of valuable archaeological resources, which could ultimately reduce the appeal of

these attractions (Frempong & Deichmann, 2017). As Preko (2020) emphasizes, successful adaptation strategies, especially in the context of climate change, underscore the need to preserve both environmental and cultural assets while maximizing economic benefits. Policies that actively include local voices in tourism planning tend to produce more sustainable outcomes, aligning with community values while promoting responsible economic growth (Mensah-Ansah, Martin, & Egan, 2011). This holistic approach allows for a beneficial interaction between tourism and local welfare, supporting heritage tourism without compromising archaeological integrity.

The societal benefits of tourism extend beyond financial gains, fostering cultural preservation and enhancing community pride. Increased tourism at archaeological sites often encourages local populations to rediscover and value their history, contributing to a shared commitment to preservation for future generations (Ahiawodzi, 2013). In this context, well-structured management and governance of protected sites can promote both conservation and active community participation. As highlighted by Akyeampong (2006), tourism offers locals a renewed connection to their heritage, supporting conservation efforts while providing the funds needed to protect these sites. By intertwining economic benefits with cultural appreciation, tourism has the potential to uplift communities, provided it is managed responsibly and inclusively.

2.5 Conservation Challenges in Ghana

The intersection of archaeological heritage tourism and conservation presents critical challenges, particularly in areas like the Shai Hills Resource Reserve (SHRR) in Ghana, where both natural and cultural resources are at risk. The stone terraces at SHRR are not only historical artifacts that reveal ancient agricultural practices but also hold cultural significance. However, as tourism grows, these structures face increasing threats of physical damage due to

foot traffic and other tourism activities. Dakwa and Yeboah (2009) emphasize that a balanced management approach is essential to safeguard these irreplaceable assets while still allowing for the economic benefits that heritage tourism can bring. This delicate balance requires a comprehensive strategy that integrates both sustainable tourism practices and stringent conservation measures.

Managing SHRR also involves navigating complex socio-political dynamics. Andoh (2019) highlights the importance of incorporating indigenous perspectives in the reserve's management plan, noting that local community interests and environmental conservation must work in harmony to ensure the area's long-term preservation. As stakeholders work to preserve the archaeological and natural heritage of the reserve, they must also address the broader and pressing issue of climate change. Environmental changes such as increased rainfall variability and rising temperatures further threaten the structural integrity of SHRR's stone terraces, as noted in climate adaptation discussions relevant to vulnerable regions like Ghana (Dowsett-Lemaire & Dowsett, 2011). Without climate-adaptive conservation strategies, both the heritage site and the surrounding communities face potentially severe repercussions.

Complicating matters further, land-use competition also poses a significant challenge. Urban expansion and agricultural encroachment frequently infringe upon the boundaries of SHRR, leading to habitat loss and fragmentation of the landscape (Attuaquayefio & Folib, 2005). Effective conservation, therefore, requires not only stringent site protection but also robust stakeholder engagement and land-use planning that prioritize both conservation and local livelihoods. Inclusive governance that involves local communities and respects their input is crucial to sustaining conservation efforts and preventing further degradation of heritage sites.

2.5.1 Environmental Threats to Stone Terraces

Stone terraces, fundamental to Ghana's agricultural heritage and landscape, are currently under significant environmental threat. These structures, essential to the agricultural practices of local communities, face pressures from both natural and human-induced erosion. Land use changes, including deforestation to expand agricultural areas, intensify soil degradation and destabilize the terraces, making them vulnerable to collapse. As climate change leads to more unpredictable rainfall patterns, the terraces are frequently exposed to intense weather events that can erode their foundation. This degradation not only threatens local food security but also erases a critical part of cultural heritage rooted in traditional farming methods (Dakwa & Yeboah, 2009). Sustainable conservation approaches are essential to address this escalating risk and preserve the historical value embedded within these terraces.

Invasive plant species represent another significant threat to the stone terraces. These species often overpower native vegetation, disturbing the ecological balance that supports terrace stability. This disruption can reduce soil health and undermine the interconnected ecological systems that have historically sustained the resilience of these terraces (Attuaquayefio & Folib, 2005). Effective conservation practices, such as promoting indigenous plants and applying integrated pest management strategies, can mitigate the effects of invasive species, thereby bolstering the structural integrity and ecological functionality of the terraces.

Moreover, balancing the preservation of these terraces with the demands of archaeological heritage tourism presents additional challenges. High tourist traffic often results in soil compaction, erosion, and litter, all of which accelerate the degradation of these historical structures (Andoh, 2019). Responsible tourism initiatives can address this by educating visitors on the terraces' significance and generating funds for their conservation and rehabilitation. Collaborative partnerships among local communities, governmental bodies, and tourism

stakeholders are vital for developing effective management plans. These plans should prioritize the ecological and cultural importance of the stone terraces within the Shai Hills Resource Reserve (SHRR), recognizing them as invaluable resources that sustain local identity and livelihood.

A holistic conservation framework that acknowledges both heritage and environmental factors is crucial for ensuring the long-term survival of these terraces. By addressing environmental challenges from erosion to invasive species and integrating sustainable tourism practices, SHRR's terraces can continue to serve as a testament to Ghana's cultural and agricultural history (Dowsett-Lemaire & Dowsett, 2011; Gblerkpor, 2009). Through this comprehensive approach, these terraces can be preserved not only as heritage sites but also as vibrant parts of the ecosystem that support community resilience and cultural pride.

2.5.2 Human-induced Pressures from Tourism

The increasing popularity of archaeological and heritage tourism in sensitive areas like the Shai Hills Resource Reserve (SHRR) in Ghana brings both opportunities and challenges. The influx of visitors, while beneficial to local economies, exerts significant pressure on these cultural heritage sites. Unregulated tourism can physically damage the stone terraces and nearby landscapes; excessive foot traffic accelerates erosion and weakens the structural integrity of these ancient formations. This delicate balance between preserving heritage and providing public access mirrors global discussions around sustainable management in protected areas. Thus, it is critical to implement sustainable tourism practices that minimize damage and emphasize educational and cultural engagement, ensuring the longevity of these sites for future generations (Gblerkpor, 2009; Edroma & Wangari, 2000).

Socio-political complexities also influence conservation efforts, as local economic pressures sometimes prompt communities to prioritize short-term gains from tourism over the long-term sustainability of heritage sites. This situation, seen in regions like the Himalayan Karakoram-Hindukush (HKH), resonates within SHRR, where financial incentives can encourage local inhabitants to exploit archaeological resources. Such pressures threaten the terraces, as the immediate allure of financial gain often overshadows environmentally conscious practices, resulting in resource over-extraction and unsustainable visitor numbers (Barrow, 2022). To address these issues, it is essential to align local economic interests with conservation objectives through stakeholder engagement, community education, and policies promoting responsible tourism, fostering a sustainable relationship between tourism and heritage preservation.

Mitigating the impact of tourism requires a multifaceted approach that integrates stringent conservation protocols with tourism strategies. Effective management plans should include monitoring and assessment frameworks to evaluate tourism's effects on SHRR's archaeological sites over time. Guidelines for visitors, limits on group sizes, and clearly designated areas for public access are necessary steps in safeguarding these sites. Additionally, as suggested in studies of protected area management, resilient governance structures that consider the socio-political context of tourism are vital. Collaborative frameworks involving local communities, governmental bodies, and conservation organizations can enhance the sustainability of SHRR's archaeological heritage while ensuring that tourism contributes responsibly to local economies (Boamah, 2020). Through these measures, SHRR can protect its invaluable archaeological resources while embracing tourism's economic potential.

2.5.3 Legal and Policy Frameworks for Site Protection

The development of effective legal and policy frameworks is crucial to conserving archaeological heritage sites, including the stone terraces in the Shai Hills Resource Reserve (SHRR) in Ghana. These frameworks integrate international, national, and local standards aimed at preserving cultural heritage while accommodating necessary development. Protected areas, as endorsed by the International Union for Conservation of Nature (IUCN), play a significant role in shielding these sites from the pressures of urban expansion and environmental shifts. By enforcing rigorous regulations, these frameworks offer a systematic approach for identifying, managing, and safeguarding archaeological sites, ensuring their preservation for future generations (Barrow, 2022; Gblerkpor, 2009). Effective legal mechanisms also incorporate public engagement strategies, fostering a sense of ownership and stewardship among local communities, which is essential for long-term conservation (Boamah, 2020).

In addition to legal mandates, adaptive policy frameworks are fundamental for site protection, as they provide clear guidelines for managing these sites in response to the dynamic interplay of tourism, environmental factors, and community needs. With climate change posing additional risks, policies around archaeological sites must emphasize environmental sustainability. Integrating climate resilience strategies into site management can protect the stone terraces from erosion caused by extreme weather events, thus preserving them for both research and tourism purposes (Ofori & Attuquayefio, 2012). Furthermore, policies that prioritize stakeholder collaboration—uniting government agencies, local communities, and tourism operators—bolster conservation efforts, promoting a well-rounded approach to managing these valuable resources (Andoh, 2019).

The intersection of legal and policy frameworks is particularly important for reinforcing archaeological site protection in the context of rising tourism. With increased interest in heritage tourism, regulatory frameworks must address the potential for visitor-induced site degradation. Legislation should focus not only on protective measures but also on promoting sustainable tourism practices that enrich visitor experiences without compromising site integrity. As indicated in the findings from Protected Area Governance and Management, achieving a balance between conservation and tourism involves establishing guidelines that regulate visitor flow and promote education on the cultural significance of these sites. Ultimately, implementing robust legal and policy frameworks is indispensable for preserving archaeological treasures like those in the SHRR, ensuring that these cultural landscapes continue to inform and engage future generations (Ofori & Attuquayefio, 2012).

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This study takes a mixed-methods approach to investigating the link between archaeological heritage tourism and conservation activities at Shai Hills Resource Reserve (SHRR). It uses qualitative and quantitative methodologies to understand the viewpoints of stakeholders' viewpoints in site conservation. The qualitative component consists of interviews and observations with SHRR management, local conservation professionals, visitors, and community members to learn about their perspectives on the influence of heritage tourism on conservation and the issues associated with site preservation. The quantitative component combines a surface survey, GPS survey, and a review of visitor numbers to monitor visitor demographics and the impact of foot traffic on terrace conditions. This extensive research provides contextual depth and systematic proof of tourism's influence on conservation, establishing the framework for SHRR's sustainable heritage tourism management strategy.

3.1. Research Design

This study used a mixed-methods research methodology, combining qualitative and quantitative methods to thoroughly understand the complex relationships between archaeological heritage tourism and site conservation at Shai Hills Resource Reserve (SHRR). The mixed-method methodology allowed the study to use the depth and subtlety supplied by qualitative insights while simultaneously drawing on quantitative data to provide empirical support and generalizability to the findings.

3.1.1 Qualitative Approach

The qualitative section of the study focuses on understanding stakeholders' experiences, perspectives, and motives in the preservation of stone terraces within SHRR. This technique allows for contextual analysis by conducting in-depth interviews and observations with key informants such as conservation personnel, visitors, community people, and SHRR management. The qualitative method collected varied viewpoints on how heritage tourism influences conservation practices, as well as the obstacles faced in reconciling these two goals by gathering thoughts and direct experiences. The adaptability of qualitative approaches, such as semi-structured interviews and participant observation, allowed for the examination of unexpected themes and concerns (Blandford, 2013).

3.1.2 Quantitative Approach

The quantitative component of the research provided data-driven insights into visitor patterns, terrace degradation rates, and conservation resource allocation (Zhang et al., 2024). Surveys administered to tourists were designed to gather quantitative data on visitor demographics, frequency of visits, perceptions of conservation efforts, and willingness to contribute to preservation initiatives. Additionally, quantitative analysis of GPS data allowed for a spatial examination of tourist foot traffic across different terrace sites, identifying patterns that may correlate with levels of terrace wear or degradation (Long & Nelson, 2013). The use of quantitative data complemented the qualitative findings by enabling a more systematic analysis of factors affecting conservation and by providing measurable evidence of tourism's impact on the site.

3.1.3 Rationale for Mixed-Method Design

The mixed-methods approach was crucial in obtaining a comprehensive understanding of the study topic (Curry, Nembhard & Bradley, 2009). While qualitative data gave depth and context, quantitative data enabled pattern generalization and objective assessment of specific conservation concerns. This combination was crucial in achieving the study's primary goal of determining how archaeological heritage tourism influences the conservation of stone terraces at the SHRR. By combining both methodologies, the study design enabled a thorough examination, balancing the breadth of qualitative insights with the generalizability and robustness of quantitative data.

The mixed-method approach enabled a thorough assessment of both the physical effects of tourism on SHRR's archaeological features and the larger cultural, social, and economic elements that influence conservation methods. The approach not only increased the validity of the data but also inspired recommendations for sustainable management techniques at SHRR that suit both heritage tourism and conservation goals.

3.2. Site Selection and Sampling

The Shai Hills Resource Reserve (SHRR) was chosen as the principal study site because of its uncommon combination of archaeological value, natural beauty, and renown as a Ghanaian historical tourist destination. SHRR, known for its historical artifacts, cultural materials, and remarkable stone terraces, is an ideal location for studying the relationship between archaeological heritage tourism and conservation efforts. The stone terraces at SHRR have significant cultural and historical importance, representing past human activities and traditional construction traditions that are part of the region's legacy. This makes SHRR an appropriate

case study for investigating the problems and opportunities associated with preserving such cultural sites while accommodating tourism activity.

3.2.1 Criteria for Site Selection within SHRR

The study selected specific sites within Shai Hills Resource Reserve (SHRR) that were directly related to its research aims, with a concentration on Manya Hill and Hioweiyo. These places were chosen based on many crucial characteristics, making them ideal for investigating the complicated link between historic tourism and conservation.

3.2.1.1 Concentration of Stone Terraces

The first requirement was the number of stone terraces. Manya Hill and Hioweiyo were chosen because they have a larger concentration of stone terraces than other regions of SHRR, resulting in a more plentiful and diverse dataset. This concentration of terraces, with buildings in varying levels of preservation and tourism exposure, offered an ideal location for assessing tourism's effects on conservation across diverse terrace conditions. The terraces' various preservation states allowed for a thorough examination of how regular exposure to tourists, environmental variables, and conservation efforts contribute to either the destruction or preservation of these places.

3.2.1.2 Accessibility

Accessibility was another important consideration in the site selection process. The study aims to include terraces with varying degrees of accessibility in order to better understand how tourist access influences conservation requirements and degradation rates (Stanchi et al., 2012). By choosing terraces that were widely accessible and so attracted a greater number of tourists, as well as more distant terraces with limited access, the study was able to identify significant

trends in conservation issues. Accessible terraces were likely to show more damage from foot activity, whereas isolated terraces provided insight into natural preservation states as well as the impacts of low tourism-related disturbance. This range provides a comprehensive understanding of how accessibility affects the preservation demands of ancient sites in a heritage tourism environment.

3.2.1.3 Relevance to Heritage Tourism

The third criterion was relatedness to heritage tourism. Manya Hill and Hioweiyo are prominent attractions that are regularly mentioned on tourist itineraries owing to their historical and cultural value. This made them suitable sites for investigating the influence of heritage tourism on archaeological conservation. Because these terraces were prominently featured in SHRR's tourism initiatives, I was able to directly monitor visitor behavior, interactions with the terraces, and the conservation implications that resulted. These locations also included visitor enhancement facilities such as pathways and signages to assist tourist access, allowing researchers to investigate how tourism-focused infrastructure affects terrace preservation. Observing these processes aided in understanding the balance that SHRR strives to strike between developing heritage tourism and safeguarding its archaeological sites. Manya Hill and Hioweiyo provide an ideal environment for investigating the complex interplay between heritage tourism and conservation, allowing the study to capture site-specific conservation challenges as well as the effects of tourist accessibility on the preservation of archaeological resources within SHRR.

3.2.2 Sampling Strategy

The study used a purposive sample technique to perform a thorough investigation of heritage tourism and conservation dynamics in the Shai Hills Resource Reserve (SHRR). This method was designed to capture a wide and representative range of perspectives, terrace conditions, and seasonal tourism patterns (Slehat, 2018).

3.2.2.1 Stakeholder Sampling

The first stage was stakeholder sampling, which selected persons and groups with direct or influential participation in heritage tourism and conservation initiatives within SHRR. This sample consisted of SHRR management, local conservation personnel, tour guides, visitors, and residents of the neighboring settlements. By including stakeholders with varying levels of connection and control over the stone terraces, the research obtained a more nuanced understanding of the advantages, difficulties, and constraints involved with preserving SHRR's cultural assets in the face of increased tourism activity. For example, SHRR management and conservation professionals gave information on site maintenance priorities and resource allocation for preservation, while local community members provided cultural context and understanding of the terraces' historical value. Tour guides, who engage with tourists regularly, presented insights on visitor behaviors that adversely impact the structure integrity of the terraces, while tourists provided first-hand accounts of their experiences and interactions with the terraces.

3.2.2.2 Site-Based Sampling

The study then used a Site-Based Sampling technique to represent terraces with varying features throughout SHRR. This stratified selection approach comprised terraces at Manya Hill and Hioweiyo, which were chosen based on their visibility, preservation quality, and tourist

accessibility. Including terraces in various states offered a thorough grasp of how tourism affects terraces at different degrees of deterioration and exposure. The sampled terraces reflect a range of visitor accessibility levels, from well visited to more distant. Observing these various situations enabled the study to determine conservation needs and comprehend how increased visitor access causes terrace wear and deterioration over time.

3.2.2.3 Temporal Sampling

To improve the data gathering process, Temporal Sampling was used, which involved monitoring and collecting data at various times of day and on different days of the week. This technique allowed the study to document the impact of tourism at both peak and off-peak times, revealing how variations in tourist numbers affect terrace preservation (Zhang, 2022). By analysing visitor patterns and tourism-related wear over time, the study provided significant insights into the timing and severity of tourist effect on the terraces, allowing for more accurate suggestions on how to manage tourism in ways that conserve the terraces.

By focusing on these significant locations and utilizing a strategic sample strategy, the study might provide a thorough understanding of how heritage tourism influences the conservation of stone terraces in SHRR. This methodology enabled a thorough evaluation of site-specific conservation difficulties, as well as educated suggestions for long-term management strategies that balance the objectives of heritage tourism and site preservation.

3.3. Data Collection Methods

Fieldwork in the Shai Hills Resource Reserve (SHRR) used an ethnographic and archaeological approach to collect complete data on the connection between heritage tourism and conservation. These data gathering methods were chosen to address the study issues

holistically, providing for a better understanding of both the material characteristics of the stone terraces and the social dynamics influencing their maintenance (Agnoletti, 2012).

Figure 1: Researcher and her team conducting field data collection, equipped with tools and instruments necessary for the surveys. (Field work 2023)

3.3.1 Participant Observation

Participant observation was one of the key methods employed, allowing the study team to see directly how tourists interact with the stone terraces. By studying tourist behavior at both frequently visited and distant terrace sites, the study could determine the direct influence of visitor activities on terrace wear and deterioration. Observational data covered how tourists accessed, used, or even changed the terraces, as well as general conservation behaviors (Tilliger et al., 2015). This technique provided useful insights into frequent conservation concerns, such as the frequency of direct contact with terrace surfaces or cases when tourists deviated from established trails, increasing erosion risks.

Figure 2: Interaction with some residents of Manya Jorpanya (Picture by Prince Tsekpoe 26/06/2023).

3.3.2 Participant Engagement

I conducted interviews and focus group discussion in the Doryumu and Manya Jorpanya communities. Participants were chosen based on their long-term presence in these places, as inhabitants with a longer history in the neighborhood typically provide significant insights into local historical sites and regularly attend SHRR-related festivals. The interviewees' ages ranged from 14 to 75. This selection criterion ensured a broad and representative group with extensive awareness of the cultural relevance of local landmarks.

Figure 3: Focus group discussion with some inhabitants of the Manya Jorpanya Community (Picture by Prince Tsekpoe 26/06/2023).

Figure 4: Focus group discussion with some community elders of the Manya Jorpanya Community (Picture by Prince Tsekpoe 26/06/2023).

In Doryumu and Manya Jorpanya, I spoke with locals who own or live in stone-walled dwellings. This technique gave insights into the architectural legacy and local narratives surrounding these sites. Furthermore, focus groups with community leaders allowed for

discussions about the historical and spiritual significance of landmarks like Manya Hill and Hioweiyo in each community.

A total of thirty (30) people were interviewed in these two communities. Out of the total number, eighteen (18) were males and twelve (12) were females.

Mr. Moses Anongura, the former Park Manager for SHRR, was also interviewed. He emphasized the cultural and spiritual significance of these places to the community, telling stories of local rulers lobbying for preservation efforts throughout his term. I also contacted Dr. William Narteh Gblerkpor, an archaeologist from the University of Ghana. He provided professional views regarding the robustness of the stone terraces at Manya Hill and Hioweiyo, emphasizing the relative scarcity of comparable structures in the Krobo Mountains due to natural and human-induced deterioration.

3.3.2.1 Socio-demographics Characteristics of Participants

Doryumu (15 Participants)

Participant ID	Age	Gender	Residence Location	Length of Residency (Years)	Role in Community	Occupation
1	15	M	Doryumu	10	Resident	Student
3	34	M	Doryumu	34	Resident	Farmer
5	19	M	Doryumu	19	Resident	Student
7	70	M	Doryumu	50	Elder	Retired
9	29	M	Doryumu	15	Resident	Artisan
11	21	F	Doryumu	21	Resident	Farmer
13	68	F	Doryumu	50	Elder	Retired
15	16	F	Doryumu	16	Resident	Student
17	72	F	Doryumu	60	Elder	Retired
19	27	F	Doryumu	27	Resident	Farmer

21	18	M	Doryumu	18	Resident	Student
23	35	M	Doryumu	10	Resident	Artisan
25	25	M	Doryumu	10	Resident	Trader
27	19	M	Doryumu	19	Resident	Student
29	65	M	Doryumu	45	Elder	Retired

Manya Jorpanya (15 Participants)

Participant ID	Age	Gender	Residence Location	Length of Residency (Years)	Role in Community	Occupation
2	20	F	Manya Jorpanya	20	Resident	Artisan
4	45	F	Manya Jorpanya	25	Community Leader	Trader
6	55	F	Manya Jorpanya	40	Community Leader	Farmer
8	62	F	Manya Jorpanya	55	Elder	Retired
10	44	M	Manya Jorpanya	25	Community Leader	Trader
12	75	M	Manya Jorpanya	60	Elder	Retired
14	50	M	Manya Jorpanya	45	Community Leader	Farmer
16	33	M	Manya Jorpanya	20	Resident	Trader
18	58	M	Manya Jorpanya	35	Community Leader	Artisan
20	41	M	Manya Jorpanya	30	Resident	Artisan
22	43	F	Manya Jorpanya	20	Resident	Trader

24	52	F	Manya Jorpanya	30	Community Leader	Farmer
26	67	F	Manya Jorpanya	55	Elder	Retired
28	29	M	Manya Jorpanya	15	Resident	Farmer
30	54	F	Manya Jorpanya	25	Resident	Trader

This table now reflects the total number of 30 participants, split between the two communities Doryumu and Manya Jorpanya showing gender, age, residence, role, and occupation.

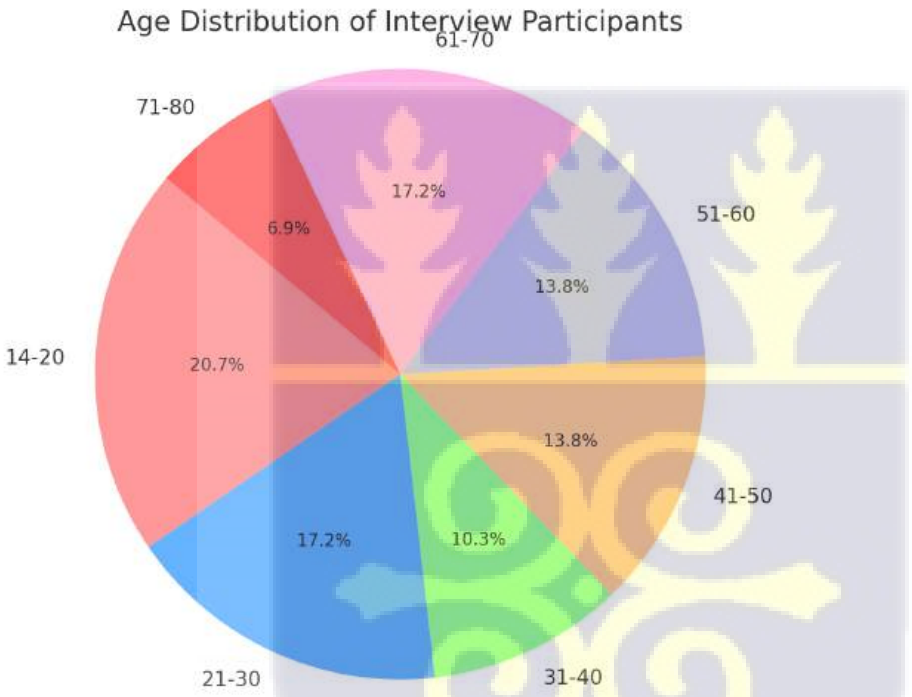


Figure 5: an age distribution chart of the 30 participants from Doryumu and Manya Jorpanya communities. chart breaks down the ages into seven groups: 14-20, 21-30, 31-40, 41-50, 51-60, 61-70, and 71-80. Each slice of the pie represents the proportion of participants in each group.

3.3.3 Structured and Semi-Structured Interviews

Structured and Semi-structured Interviews provided context by gathering the perspectives of people directly involved in SHRR's conservation and tourist efforts. Local conservation personnel and SHRR management exchanged views on the operational realities of site upkeep,

resource constraints, and the importance of tourism money in preservation efforts. Tour guides provided insights into guest expectations and regularly experienced difficulties when leading tourists through sensitive locations. Community stakeholders, many of whom have generations of links to the terraces, presented a cultural perspective on the necessity of maintaining these structures and emphasized community initiatives to support SHRR's conservation work. These interviews together provided a comprehensive knowledge of how stakeholders see the balance between tourism and conservation, as well as any challenges they face.

Figure 6: An interview conducted with a royal from the Manya Jorpanya community provided valuable insights (Picture by Prince Tsekpoe 26/06/2023).

3.3.4 Photography and Visual Documentation

Photography and visual documentation were also essential for recording the physical condition of the terraces and their surroundings (Ferro-Vázquez et al., 2017). Photographs were taken of each terrace's condition, including evident evidence of wear like cracks, dislocation of rubbles, corroded stones, and rubbish in high-traffic areas. Additionally, cultural objects discovered nearby, including as grinding stones, ceramic pieces, and bottles, were documented to better comprehend the terraces' larger cultural and historical contexts. This visual documentation enabled comparisons between terraces in more pristine, less-visited places and those subjected

to high visitor activity (Nofziger, 2012). Photos also acted as valuable references for future conservation monitoring.

Figure 7: An old, abandoned building at Agomeda (Picture by Odarkor Ankrah-Addison 28/06/2023).

3.3.5. Mapping and GPS Surveying

Mapping and GPS Surveying contributed a spatial dimension to the research by giving exact geographic data on terrace locations, visitor routes, and accompanying cultural items (Green et al., 2019). Mapping allowed the study team to plot terrace locations, identify access points, and assess how visitor mobility around SHRR affects specific sections. GPS data was particularly beneficial in developing a spatial model of terrace sites, tourist pathways, and erosion-prone locations, allowing for a more focused approach to identifying zones with greater conservation requirements. Furthermore, the mapping data enabled the identification of suitable conservation intervention places where tourist paths may be modified to limit terrace exposure to foot traffic (Gigović et al., 2016).

Using these alternative data gathering approaches, the study was able to provide a complete and comprehensive knowledge of how heritage tourism affects the stone terraces in SHRR.

Each technique provided unique insights into the physical and social aspects that influence the terraces' conservation status, allowing for evidence-based suggestions to encourage sustainable heritage tourism practices that are consistent with SHRR's long-term preservation aims.

3.4. Data Analysis

The data in this study was analyzed using a combination of thematic and spatial analytic approaches to offer a thorough knowledge of the dynamics of heritage tourism and conservation in the Shai Hills Resource Reserve (SHRR). The goal was to find patterns and connections that may enrich both scholarly knowledge of the site and practical recommendations for its long-term management.

3.4.1 Thematic Analysis

Thematic Analysis was used to examine the interview transcripts and field notes, focusing on repeating themes and patterns that emerged from the information. This investigation included organization of essential ideas and concepts about historic preservation, tourist impacts, community viewpoints, and conservation difficulties. The procedure began with going over the interview transcripts and field notes to acquire a general idea of the information. Then, specific issues were addressed, such as stakeholder perspectives on the efficacy of present conservation techniques, the difficulties they experience in balancing tourism and preservation efforts, and the perceived effects of rising visitor traffic on the terraces. These issues were categorized and analyzed to identify repeating trends in attitudes towards conservation techniques, the financial significance of tourism in supporting preservation, and the social and environmental difficulties that develop when tourism expands inside SHRR. This research was critical for understanding the various viewpoints of the parties involved and finding areas of agreement or disagreement,

particularly regarding the preservation of the stone terraces and the larger cultural landscape (Zhang et al., 2017).

3.4.2 Spatial Analysis

Spatial analysis complemented thematic analysis by focusing on geographic data obtained through GPS mapping (Bell et al., 2015). The study team used the coordinates of terraces, trails, and tourist hotspots to perform a spatial analysis to investigate the distribution of heritage characteristics in connection to visitor mobility and the impact of tourist traffic on the terraces. The investigation found possible links between rising visitor numbers and the deterioration of individual terraces by overlaying their mapped locations with regions classified as high-traffic zones. Areas exhibiting apparent symptoms of wear, such as erosion, broken stones, and trash, were correlated with tourist visit frequency and intensity, indicating which terraces were most prone to tourism-related damage. This geographical data gave vital insights into the larger landscape of SHRR, allowing for the identification of high-risk regions that needed immediate attention or intervention. The study also enabled the development of conservation methods customised to specific zones, such as rerouting tourist pathways, building protective barriers, or enforcing tougher visiting regulations in regions indicating significant degradation.

Thematic and geographical analyses enabled the study team to integrate human factors, stakeholder attitudes and behaviors with physical conditions of the terraces, offering a comprehensive understanding of SHRR's conservation problems. This dual approach guaranteed that the study was both informed by the local experiences and viewpoints of individuals directly involved in heritage tourism and conservation, as well as anchored in tangible, spatially referenced data that identified regions of highest need. The outcomes of these studies will help to provide evidence-based recommendations for maintaining the stone terraces while balancing the needs of heritage tourism.

3.5. Ethical Considerations

Ethical concerns were crucial throughout this project to ensure that the research was carried out ethically and with respect for both the people involved and the cultural history of the Shai Hills Resource Reserve (SHRR). Following established ethical guidelines, the study team prioritized transparency, respect for and protection of participants' rights, as well as the preservation of the terraces' archaeological and cultural integrity (Ermine, Sinclair & Jeffery, 2004).

3.5.1 Informed consent

Informed consent was a key component of the study's ethical framework (Pahuja, 2024). Prior to any interviews or participant participation, all participants were properly told about the nature of the research, its goals, and their role in it. The study team made sure that participants knew their rights, which included the right to voluntary participation, the ability to withdraw at any moment without penalty, and the guarantee that their replies would be kept secret. This procedure of gaining informed permission was carried out both in writing and verbally, with clear explanations provided in languages that participants were familiar with.

3.5.2. Confidentiality

To preserve participants' privacy and confidentiality, all personally identifying information was securely saved, and data was anonymized as needed (Petrova, Dewing & Camilleri, 2016). To avoid identifying individual replies, the study's findings were analyzed and reported using only aggregate data. This was especially crucial considering that certain respondents, such as local conservation personnel and community people, may be concerned about their perspectives being shared outside of the research environment, particularly on the delicate subject of balancing tourism and conservation.

3.5.3 Respect for the cultural value

The study was also very careful to include the cultural and historical relevance of the stone terraces and other heritage elements at SHRR. Respect for the terraces' cultural significance was a critical ethical concern, especially given their importance not just as archaeological treasures but also as cultural icons for local populations (Bahn, 2012). The study team made sure that their procedures did not include any invasive or harmful sampling of the terraces, such as removing stones or altering the structures in any manner. Rather, the team used non-invasive approaches such as visual recording, photography, and GPS mapping to acquire data without affecting the terraces' condition.

Furthermore, the study considered the local community's relationship to the land and its history. Given that many people of the surrounding communities have strong cultural links to SHRR, the research ensured that their opinions were heard and that the terraces' value was respected throughout the fieldwork process. Any contacts with local inhabitants, stakeholders, or visitors were undertaken with respect for their cultural practices and beliefs, especially when discussing the preservation of heritage places that carry symbolic value for them.

By following these ethical standards, the study not only safeguarded participants' rights but also secured the preservation of SHRR's cultural and archaeological riches for future generations. Thus, ethical issues served as the research's basis, guiding both the study's methodology and its larger goals of sustainable heritage tourism and conservation at SHRR.

3.6. Limitations

While the field methodology used in this study gave useful insights into the interaction between tourism and conservation at the Shai Hills Resource Reserve (SHRR), there were specific

limitations that may have influenced the extent and depth of the research findings. Recognizing these limitations is critical for contextualizing the findings and comprehending the limits under which the study was carried out.

One significant limitation was the **weather conditions** during the field visits. The Shai Hills area is subject to fluctuating weather patterns, including periods of heavy rainfall and extreme heat, which impacted the fieldwork schedule. For instance, heavy rains during certain times of the year made some areas of SHRR, particularly remote terraces, difficult and even unsafe to access. This limitation restricted the researcher's ability to collect data from all intended locations within the reserve, potentially resulting in an incomplete picture of the overall conditions of the stone terraces across the site. The weather also affected the behavior of tourists, as fewer visitors may have been present during inclement weather, which could have influenced the data collected on tourism impact and visitor interactions with the terraces.

Another limitation related to **restricted access** to some of the more remote terrace locations within SHRR. While Manya Hill and Hioweiyo were relatively accessible and provided rich datasets for the study, there were other terraces situated in less visited or difficult-to-reach areas that could not be adequately studied. These terraces may have been subject to different levels of tourism pressure or conservation challenges, and their exclusion from the study means that the full extent of the impact of tourism on the terraces at SHRR was not captured. This limited access also affected the ability to compare the effects of tourism on remote versus accessible terraces, which could have provided additional insights into how conservation efforts should be tailored based on the location and visibility of heritage features.

Response biases from participants, particularly those with vested interests in tourism, also posed a limitation in the data collection process. While the purposive sampling strategy was

designed to capture diverse perspectives from stakeholders involved in tourism and conservation, some interviewees such as local tour guides, SHRR management, and community leaders may have been inclined to offer responses that reflected their personal or professional interests in promoting tourism. This could have resulted in some bias, especially regarding the perceived benefits of tourism as a driver for conservation funding or the challenges associated with tourism impacts. While efforts were made to mitigate this bias by triangulating data from multiple sources, the potential for skewed responses remains a consideration when interpreting the findings.

Despite these limitations, the **field methodology** employed in the study provided a comprehensive and nuanced understanding of the complex dynamics between heritage tourism and conservation at SHRR. By using a combination of ethnographic observation, interviews, and spatial data collection, the research was able to shed light on the challenges and opportunities inherent in balancing the preservation of archaeological sites with the demands of tourism. The findings offer important insights into how conservation strategies can be adapted to account for varying levels of tourist traffic, as well as the broader social, economic, and cultural contexts of the Shai Hills region. While the limitations presented challenges, they also highlight areas for future research, particularly in accessing more remote sites and exploring further the responses of local communities and stakeholders to tourism's growing influence.

3.7 Delimitations

Delimitations refer to the boundaries that the researcher sets to narrow the scope of the study, helping focus the research on specific objectives. For this study on the intersection of tourism and conservation at the Shai Hills Resource Reserve (SHRR), several delimitations were

established to guide the research, define the boundaries, and clarify the research focus. These delimitations are outlined below:

Geographic Focus

The study was delimited to the Shai Hills Resource Reserve (SHRR), specifically focusing on two key areas, Manya Hill and Hioweiyo, which were selected due to their high concentration of stone terraces and accessibility to tourists. While SHRR encompasses a larger area with additional terraces and heritage features, the study did not extend to other parts of the reserve. This deliberate geographic narrowing ensured a focused investigation of the conservation and tourism dynamics at these two representative sites.

Weather Conditions and Fieldwork Timing

Given the fluctuating weather patterns in the region, the fieldwork was delimited to the periods when weather conditions allowed safe and feasible access to the terraces. Heavy rainfall and extreme temperatures during certain seasons restricted access to some areas of SHRR, particularly remote terraces, which could not be adequately studied. This limitation meant that the study's findings are primarily based on observations from accessible sites, potentially overlooking the impacts of tourism on less-visited terraces that may experience different conservation challenges.

Site Selection

The study focused on terraces located at Manya Hill and Hioweiyo, which are relatively more accessible to both tourists and researchers. Other terraces, particularly those in more remote or difficult-to-reach areas, were excluded due to access limitations. This delimitation focused the research on the more heavily trafficked and observable sites, providing a narrower view of the

overall impact of tourism on SHRR's stone terraces. The exclusion of remote sites meant that the study did not capture the full spectrum of tourism pressures across the entire reserve.

Tourism Impact Focus

The study's primary focus was on tourism impacts on the preservation of stone terraces, with particular attention given to the dynamics between tourism and conservation practices. While other aspects of heritage tourism, such as its economic or social impact on local communities, were acknowledged, they were outside the scope of the research. The study did not explore broader impacts of tourism, such as its effects on local employment, infrastructure, or the environmental consequences of increased visitor traffic, limiting the focus to conservation and heritage preservation.

Participant Selection

The purposive sampling strategy aimed to capture perspectives from a variety of stakeholders, including SHRR management, local conservation staff, tour guides, tourists, and members of the surrounding community. This selection was delimited to those directly involved in or impacted by heritage tourism and conservation at SHRR. The study did not extend to stakeholders outside this circle, such as national policymakers or regional tourism organizations, which may have provided a broader understanding of tourism's role in heritage conservation. This delimitation ensured that the focus remained on local dynamics within SHRR.

Methodological Approach

The study employed a qualitative research design combining ethnographic methods (such as participant observation and interviews) and spatial data collection (e.g., GPS mapping). This

approach did not include large-scale quantitative analyses or statistical evaluations, such as surveys of tourist numbers or visitor behavior at a broader scale. By focusing on qualitative data, the study provided rich, context-specific insights into the intersection of tourism and conservation but excluded more generalizable quantitative findings.

The fieldwork was conducted over a specific period within the year, which may not fully represent the full range of tourist activities across different seasons. This temporal delimitation means the research did not account for variations in tourism patterns throughout the year, particularly peak seasons versus off-peak visitation, which could have provided additional data on how tourism fluctuations impact the conservation of terraces.

These delimitations were established to ensure that the study remained focused on the central research questions concerning the impact of tourism on the conservation of stone terraces at SHRR. They helped narrow the scope of the research, concentrating on the most relevant aspects of tourism and conservation dynamics within the reserve. While these delimitations helped focus the study, they also highlight areas for future research, particularly in exploring remote sites and examining other broader aspects of tourism's influence on the reserve.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.0 INTRODUCTION

This chapter focuses on presenting, analyzing, and interpreting findings gathered from the examination of stone terraces within the Shai Hills Resource Reserve (SHRR). The study areas, Hioweiyo and Manya Hill offer unique insights into the stone terrace structures that reflect the historical and cultural heritage of the 'Se' people. The chapter documents the inventory of the terraces, classifies them based on their suspected functions, compares their preservation states, and cultural artifacts as narratives of subsistence, craft, and interaction within the Shai Hills Resources Reserve, and explores the natural and human factors that threaten their preservation.

MAP 3: MAP OF SHRR SHOWING THE APPROXIMATE AREA OF MANYA HILL AND HIOWEIYO SITES AND THE SURROUNDING SETTLEMENTS

4.1 INVENTORY OF STONE TERRACES

The first objective of this study is to identify and record the stone terraces within the SHRR. During fieldwork, terraces were surveyed, and their measurements were documented. A key

focus of this research has been to identify and catalog the stone terraces within the Shai Hills Resource Reserve (SHRR), an undertaking essential for understanding the spatial and functional layout of these historical sites. This inventory process was thorough and methodical, capturing details about each terrace's dimensions, shape, and physical condition. By systematically recording these features, the research aims to piece together insights into the daily lives, architectural practices, and social organization of the ancient occupants of Manya Hill and Hioweiyo.

During the fieldwork conducted at Manya Hill, a total of fifty-two distinct stone structures were identified and documented. These structures, with their predominantly rectangular or square shapes, appeared to serve as foundations for the dwellings of larger family units or potentially even communal gathering spaces. The distinct geometric shapes and orderly arrangement of these terraces suggest that the Se (Shai) people intentionally organized their spaces, likely creating clusters that could have marked neighborhood areas or zones connected by kinship ties within the larger settlement.

In addition to being building foundations, these terraces likely served multiple purposes, including functioning as retaining walls, defense structures, or security walls. These structures might have stabilized the sloping terrain, provided physical barriers against external threats, or delineated secure living spaces within the community. This multifaceted use underscores the sophisticated planning and adaptability of the Se (Shai) people in constructing their built environment.

During this research's documentation phase, a survey at Manya Hill was conducted to identify, record, and evaluate the stone walls and terraces at the site. Out of the fifty-two stone structures recorded, thirty-eight terraces, comprising 73% of the total, were identified as building foundations. These foundations were generally rectangular or square.

Four of the structures, representing 8%, appeared to function as defense walls. These walls were aligned in straight lines, likely forming boundaries around the settlement. Another seven walls, accounting for 13%, served as retaining walls, while three walls, or 6% of the total, were identified as security walls. This breakdown highlights the diverse functionality of the stone structures within Manya Hill, reflecting a blend of residential, defensive, and practical uses in the landscape.

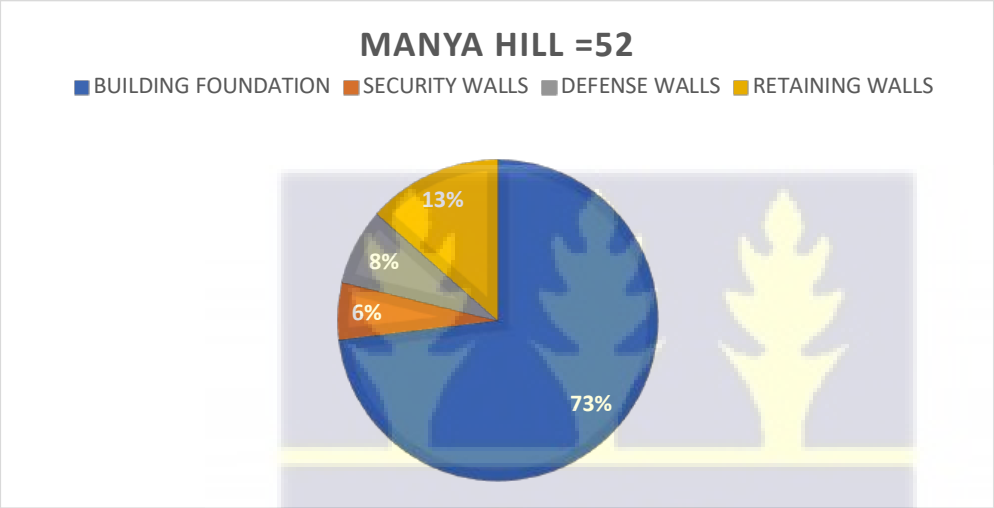


Figure 8: A chart showing the distribution of the distinct types of walls and terraces at Manya Hill Site.

However, despite identifying fifty-two structures, only forty of these were intact enough to allow for precise measurements. Over time, some terraces and walls have suffered significant destruction due to natural erosion, vegetation growth, and possibly human disturbances. This loss of structural integrity in certain terraces has made it impossible to assess them fully. For the remaining forty structures, careful measurements were taken, noting the height, length, and breadth of each wall and terrace.

Below is a detailed table documenting the measurements from the Manya Hill site, providing insights into the original scale and spatial layout envisioned by the early builders. These

measurements serve as essential data points for understanding both the architectural style and the social organization of the Manya Hill settlement.

TERRACE WALL	LENGTH	BREADTH	HEIGHT	SHAPE
TW 1	10m	6.3m	0.25m	Rectangle
TW 2	5.5m	4m	0.20m	Rectangle
TW 3	8.6m	5.1m	0.20m	Rectangle
TW 4	8m	5m	0.30m	Rectangle
TW 5	10m	6.3m	0.30m	Rectangle
TW 6	4m	4m	0.50m	Square
TW 7	5.2m	5.2m	0.50m	Square
TW 8	7.2m	5m	0.40m	Rectangle
TW 9	4m	4m	0.60m	Square
TW 10	13m	11.6m	0.20m	Rectangle
TW 11	7.5m	6m	1.40m	Rectangle
TW 12	12m	5.4m	1.20m	Rectangle
TW 13	10.5m	4m	0.60m	Rectangle
TW 14	6m	3.7m	0.40m	Rectangle
TW 15	15m	7.8m	1.00m	Rectangle
TW 16	7m	7m	1.10m	Square
TW 17	7.2m	4.7m	0.80m	Rectangle
TW 18	9m	9m	1.00m	Square
TW 19	4.6m	4.6m	0.30m	Square
TW 20	8.7m	4.8m	0.60m	Rectangle

TW 21	8m	3m	0.60m	Rectangle
TW 22	10m	7m	1.50m	Rectangle
TW 23	12.6m	5m	0.80m	Rectangle
TW 24	17m	13.4m	2.0m	Rectangle
TW 25	7.5m	4m	1.10m	Rectangle
TW 26	7m	5m	1.10m	Rectangle
TW 27	10m	6.4m	0.60m	Rectangle
TW 28	18m	16.3m	180m	Rectangle
TW 29	8m	5m	0.70cm	Rectangle
TW 30	10.2m	7.1m	1.00m	Rectangle
TW 31	5m	5m	0.80m	Square
TW 32	12.2m	6.1m	0.40m	Rectangle
TW 33	10.2m	5m	1.00m	Rectangle
TW 34	9m	4.3m	0.80m	Rectangle
TW 35	5.5m	5.5m	0.60m	Square
TW 36	7.8m	3.8m	1.20m	Rectangle
TW 37	4m	4m	0.60m	Square
TW 38	5.3m	5.3m	1.00m	Square
TW 39	9m	6m	0.70m	Rectangle
TW 40	6m	6m	0.80m	Square

Table 1: A table of measurements for terraces and walls at Manya Hill

To achieve an accurate record of each terrace at Manya Hill, GPS technology was utilized to capture precise coordinates for every stone structure. This approach allowed not only for meticulous documentation of each terrace's exact location but also for the creation of a detailed map, reflecting the terraces' spatial distribution across the landscape. Three primary geographic

parameters latitude, longitude, and elevation were recorded for each terrace, each contributing a distinct layer of insight into the layout and design of the ancient settlement.

Latitude values captured each terrace's north-south positioning in relation to the equator, providing a clear sense of the terraces' alignment within the broader Shai Hills region. By examining the northern latitude measurements, the terraces' relative positions and their spatial alignment within the Manya Hill settlement became evident, offering a contextual view of the ancient community's layout.

Longitude readings added another dimension, documenting the east-west placement of each terrace. This longitudinal data was instrumental in mapping the terraces' horizontal distribution across Manya Hill, highlighting patterns of clustering or spacing among structures. Such detailed mapping helped visualize the layout and organization within the settlement, revealing insights into potential design choices or communal zoning within the ancient community.

Elevation measurements, recorded in meters above sea level, were also integral to understanding the terraces' relationship with the landscape. Given that Manya Hill is situated on a slope, the elevation data indicated how the terraces were positioned at various heights, showcasing the ancient builders' strategies for adapting to the natural contours. This elevation information also provided clues regarding which terraces might have been more vulnerable to erosion, rainwater runoff, and other elevation-related environmental factors, underscoring the Se people's adaptive use of topography in their construction techniques.

MANYA HILL			
IDENTIFICATION	**LATITUDE (N)**	**LONGITUDE (E)**	**ELEVATION (M)**

Terrace wall 1	05°54'56.0"	000°03'53.2"	214
Terrace wall 2	05°54'56.2"	000°03'52.9"	215
Terrace wall 3	05°54'55.9"	000°03'53.7"	204
Terrace wall 4	05°54'56.3"	000°03'54.0"	203
Terrace wall 5	05°54'56.3"	000°03'53.7"	204
Terrace wall 6	05°54'55.2"	000°03'53.8"	201
Terrace wall 7	05°54'54.8"	000°03'53.5"	212
Terrace wall 8	05°54'54.7"	000°03'53.5"	213
Terrace wall 9	05°54'54.8"	000°03'53.3"	212
Terrace wall 10	05°54'54.2"	000°03'53.0"	217
Terrace wall 11	05°54'55.1"	000°03'53.9"	196
Terrace wall 12	05°54'56.1"	000°03'54.1"	193
Terrace wall 13	05°54'56.1"	000°03'54.3"	193
Terrace wall 14	05°54'56.6"	000°03'54.4"	192
Terrace wall 15	05°54'57.0"	000°03'54.0"	197
Terrace wall 16	05°54'55.5"	000°03'56.5"	192
Terrace wall 17	05°54'54.2"	000°03'56.1"	192
Terrace wall 18	05°54'54.5"	000°03'55.8"	196
Terrace wall 19	05°54'55.1"	000°03'55.2"	198
Terrace wall 20	05°54'55.5"	000°03'55.4"	198
Shrine 1	05°54'56.2"	000°03'53.2"	206
Shrine 2	05°54'56.0"	000°03'55.9"	194
Defense wall 1	05°54'52.7"	000°03'52.6"	75
Defense wall 2	05°54'54.7"	000°03'52.6"	196

Defense wall 3	05°54'55.2"	000°03'54.0"	194
Terrace wall 21	05°54'56.7"	000°03'52.6"	191
Terrace wall 22	05°54'55.7"	000°03'52.8"	195
Terrace wall 23	05°54'56.9"	000°03'52.7"	194
Terrace wall 24	05°54'56.11"	000°03'52.6"	196
Terrace wall 25	05°54'56.15"	000°03'52.8"	198
Sitohe kekele (Rest stop 1)	05°54'55.2"	000°03'50.8"	175
Sitohe enyo (rest stop 2)	05°54'55.15"	000°03'51.21"	198
Cave	05°54'58.1"	000°03'52.6"	196
Twin baobab tree	05°54'56.30"	000°03'52.6"	187
Terrace wall 26	05°54'56.16"	000°03'52.15"	201
Terrace wall 27	05°54'57.1"	000°03'52.6"	204
Terrace wall 28	05°54'57.5"	000°03'52.7"	202
Terrace wall 29	05°54'56.18"	000°03'52.6"	205
Terrace wall 30	05°54'57.20"	000°03'52.11"	205
Terrace wall 31	05°54'57.30"	000°03'52.6"	214
Terrace wall 32	05°54'57.35"	000°03'52.7"	209
Terrace wall 33	05°54'57.37"	000°03'52.8"	211
Terrace wall 34	05°54'57.41"	000°03'52.11"	208
Terrace wall 35	05°54'57.39"	000°03'53.1"	206
Terrace wall 36	05°54'57.44"	000°03'53.3"	208
Maternity ward	05°54'54.3"	000°03'56.7"	209

Dipo site	05°54'56.4"	000°03'56.6"	216
Terrace wall 37	05°54'56.6"	000°03'56.8"	218
Retaining wall 1	05°54'54.9"	000°03'54"	228
Retaining 2	05°54'56.9"	000°03'57.6"	200
Retaining wall 3	05°54'54.25"	000°03'55.6"	206

Table 2: Table of Geographic Coordinates and Elevations at Manya Hill.

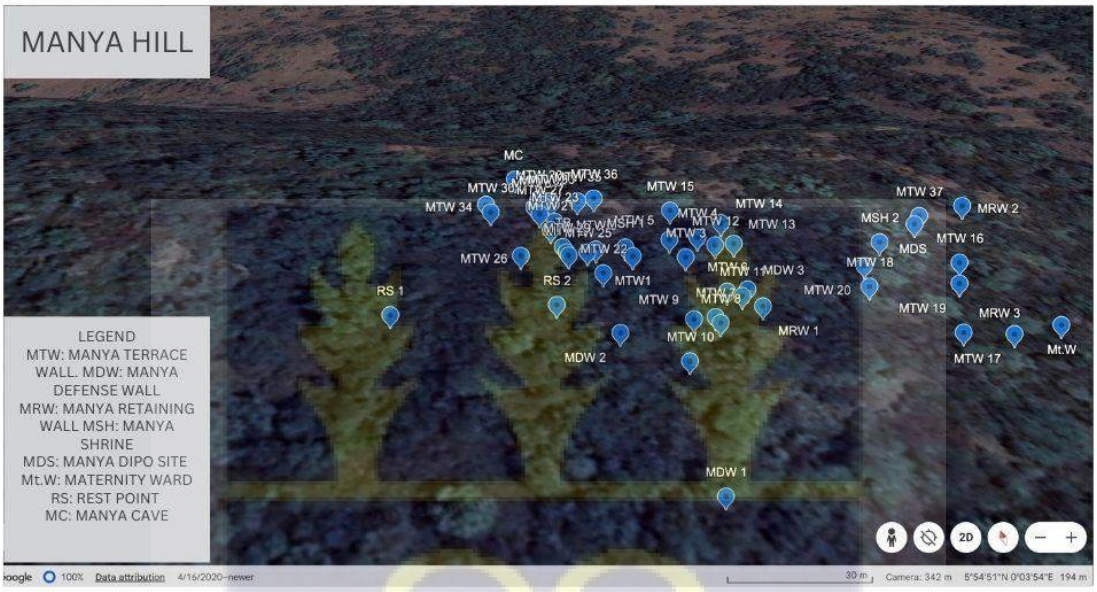


Figure 9:Map of Manya Site based on the GPS Coordinates Presented in Table 2, showing the pattern of settlement.

At the Hioweiyo site, thirty-five terraces were recorded, displaying a notable range in both size and layout. Unlike the more uniform rectangular and square shapes seen at Manya Hill, Hioweiyo's terraces showed greater structural diversity. The spatial organization here suggested that the terraces may have been arranged to serve specific functional zones, with each section of the settlement fulfilling unique roles. These varied arrangements likely represent different areas within the community, perhaps reflecting distinct household groups or specialized functions, such as storage or craft areas.

Hioweiyo is one of the primary settlement sites within the Shai Hills Resource Reserve (SHRR), accessible along a 1200-meter trail from the main entrance of the reserve. This trail leads visitors through the natural landscape, ultimately reaching Hioweiyo, the largest known settlement site in the SHRR. Situated amidst the rolling hills, Hioweiyo is notable for its expansive layout, which appears to be divided into two sections. These sections may represent ancient subdivisions within the community, suggesting the possibility of a larger settlement divided into distinct quarters or suburbs.

This work focuses primarily on Hioweiyo's settlement area, a remarkable site where remnants of the ancient Se (Shai) people's community structures are still visible and continue to attract archaeological interest. The Hioweiyo settlement offers a diverse array of dry-stone constructions, which shed light on the organization, daily life, and defensive strategies of the people who once thrived in this area.

During the survey, thirty-five (35) distinct stone walls and terraces were recorded at the Hioweiyo site. Each of these structures appears to have served a unique purpose, reflecting the multifaceted nature of the settlement. Out of these, twenty (20) were identified as building foundations, indicating where individual dwellings or communal spaces once stood. Additionally, seven (7) terraces functioned as retaining walls, strategically placed to counter soil erosion on the sloped terrain and support the overall integrity of the settlement. Five (5) structures were classified as defense walls, likely serving to protect the inhabitants from external threats. Finally, three (3) structures were determined to be security walls, potentially marking restricted or highly significant areas within the community.

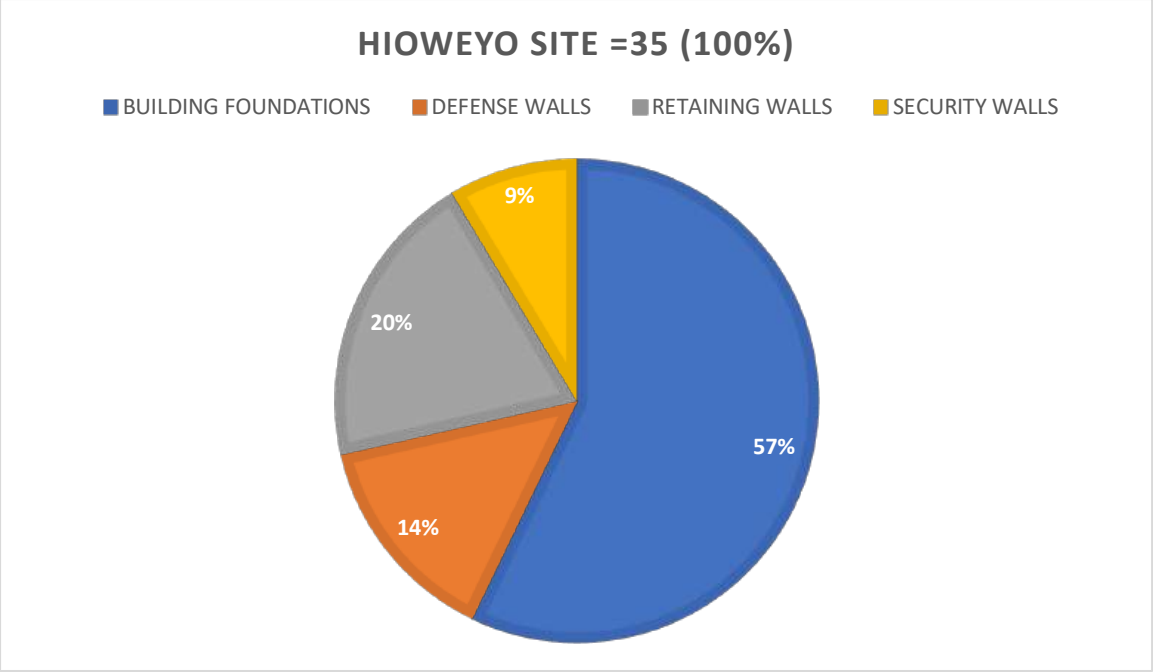


Figure 10: A chart showing the distribution of the distinct types of walls and terraces at Hioweiyo site.

While these findings illuminate much about Hioweiyo's design and structure, the realities of time and natural forces have affected the site. Although thirty-five stone structures were identified, only twenty-six (26) remained intact enough to allow for precise measurement. The remaining structures have experienced varying levels of destruction due to erosion, vegetation overgrowth, and other natural forces, making detailed assessment impossible for some sections.

For the structures that could be measured, a careful record was taken, noting each terrace's height, length, breadth and shape. This data offers invaluable insight into the original scale and design choices of the settlement, preserving a glimpse into the architectural vision and social organization that shaped Hioweiyo. Below is a detailed table documenting the measurements from the Hioweiyo site, capturing a snapshot of the intricate planning that went into this ancient community.

TERRACE WALL	LENGTH	BREADTH	HEIGHT	SHAPE
TW 1	10m	6.3m	0.25m	Rectangle
TW 2	5.5m	4m	0.2m	Rectangle
TW 3	8.6m	5.1m	0.2m	Rectangle
TW 4	8m	5m	0.3m	Rectangle
TW 5	10m	6.3m	0.3m	Rectangle
TW 6	4m	4m	0.5m	Square
TW 7	5.2m	5.2m	0.5m	Square
TW 8	7.2m	5m	0.4m	Rectangle
TW 9	4m	4m	0.6m	Square
TW 10	13m	11.6m	0.2m	Rectangle
TW 11	7.5m	6m	1.4m	Rectangle
TW 12	12m	5.4m	1.2m	Rectangle
TW 13	10.5m	4m	0.6m	Rectangle
TW 14	6m	3.7m	0.4m	Rectangle
TW 15	15m	7.8m	1m	Rectangle
TW 16	7m	7m	1.1m	Square
TW 17	7.2m	4.7m	0.8m	Rectangle
TW 18	9m	9m	1m	Square
TW 19	4.6m	4.6m	0.3m	Square
TW 20	8.7m	4.8m	0.6m	Rectangle
TW 21	8m	3m	0.6m	Rectangle
TW 22	10m	7m	1.5m	Rectangle

TW 23	12.6m	5m	0.8m	Rectangle
TW 24	17m	13.4m	2m	Rectangle
TW 25	7.5m	4m	1.1m	Rectangle
TW 26	6m	4.2m	1m	Rectangle

Table 3: A table of measurements for terraces and walls at Hioweiyo site.

Hioweiyo Site

To meticulously document the terraces at Hioweiyo Hill, GPS technology was used to record coordinates for each stone structure, enabling a detailed and precise mapping of their distribution across the landscape. This process involved three fundamental geographic measurements to ensure accurate positioning: latitude, longitude, and elevation. Each of these measurements contributed unique insights into the layout and structural adaptation of the terraces on Hioweiyo Hill.

Latitude measurements provided the north-south positioning of each terrace in relation to the equator, helping to determine how the terraces were arranged within the broader landscape. This data allowed for a clearer understanding of the spatial organization, shedding light on any directional patterns in the way the ancient Se (Shai) people structured their community.

Longitude data gave the east-west coordinates, which were crucial for visualizing the horizontal distribution of the terraces across Hioweiyo Hill. Capturing the terraces' longitudinal placement revealed how these structures were distributed along the hill's width, offering insights into the spatial layout and arrangement across the settlement.

Elevation, recorded in meters above sea level, was also a vital factor, as Hioweiyo Hill features varied slopes and contours. Elevation data provided an understanding of how terraces were positioned at different heights, highlighting the Se people's adaptation to the hillside

environment. Terraces at higher elevations may have been constructed with different considerations, such as increased exposure to erosion or rainwater runoff, compared to those at lower levels. This elevation information helped in assessing how environmental factors could have influenced the design and durability of each terrace.

IDENTIFICATION	**LATITUDE (N)**	**LONGITUDE (E/W)**	**ELEVATION (M)**
HIOWEIYO			
Defense wall 1	05°54'07.0"	000°04'12.0" E	90
Terrace wall 1	05°54'08.0"	000°04'11.4" E	100
Defense wall 2	05°54'08.2"	000°04'11.0" E	100
Baobab 1	05°54'08.0"	000°04'11.0" E	100
Baobab 2	05°54'09.0"	000°04'08.0" E	120
Terrace wall 2	05°54'09.1"	000°04'11.2" E	110
Baobab 3	05°54'09.0"	000°04'12.0" E	114
Defense wall 3	05°54'07.0"	000°04'04.0" E	160
Terrace wall 3	05°54'05.6"	000°04'00.0" E	210
Terrace wall 4	05°54'05.6"	000°04'00.0" E	210
Terrace wall 5	05°54'06.0"	000°04'60.0" E	260
Terrace wall 6	05°54'06.6"	000°03'60.0" E	220
Terrace wall 7	05°54'07.0"	000°03'59.0" E	220
Terrace wall 8-14	05°54'07.6"	000°04'58.0" E	230
Shrine	05°54'08.2"	000°04'57.0" E	230
Retaining wall 1	05°54'09.3"	000°03'59.7" E	182
Cave / Rock shelter	05°54'09.2"	000°04'01.2" E	176

Supposed kitchen	05°54'09.3"	000°04'01.1" E	178

Table 4: Location Coordinates and Elevations at Hioweiyo Site.

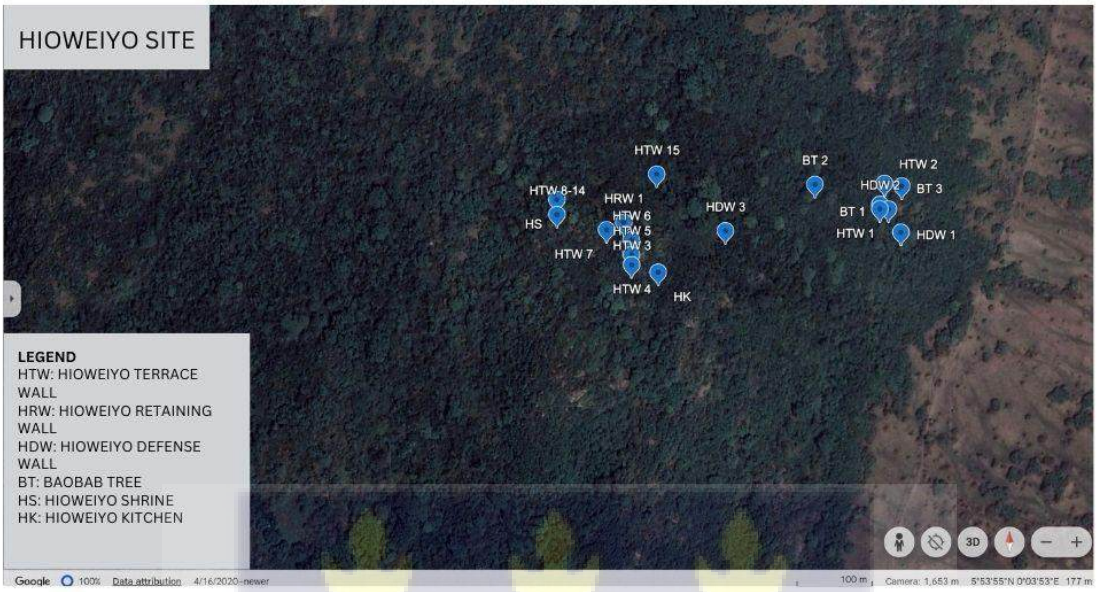


Figure 11: Map of Hioweiyo Site based on the GPS Coordinates Presented in Table 4 showing the distribution of the Stone Terraces at the site.

4.2 CLASSIFICATION OF STONE TERRACES BY FUNCTION

The classification of stone terraces within the Shai Hills Resource Reserve (SHRR) provided key insights into the lives of the people who built and used them. This classification was informed by the terraces' shapes, placements within the landscape, and oral histories from local inhabitants. The stone terrace enclosures at both Manya Hill and Hioweiyo are composed of circular and, in some cases, triangular arrangements of dry-stone walls. Each of these enclosures varies in dimensions, with wall thicknesses generally ranging from approximately 0.6 to 1 meter, depending on the site-specific construction style. The enclosures' circumferences vary but typically measure between 1.5 to 2.5 meters, providing enough space for an individual or a small group to stand or crouch within them.

These enclosures are strategically positioned on the hillside at various elevations, possibly to provide advantageous vantage points over surrounding areas. Two enclosures are situated at Manya Hill, and four are located at Hioweiyo. The positioning of each enclosure suggests intentional placement for visibility across key areas, which would have facilitated observation of both approaching individuals and activities within the vicinity.

During focus group discussions with local participants, differing interpretations were provided regarding the original purpose of these enclosures. Some participants reported oral traditions indicating that their ancestors used these structures as observational posts during times of conflict, allowing warriors to hide and serve as spies within the walls. This aligns with the enclosures' discreet size and strategic placement, making them ideal for surveillance without drawing attention.

Alternatively, other respondents believed these enclosures served a utilitarian function as temporary storage spaces for travelers. According to this account, individuals traversing the rugged terrain would place their luggage within these walls to prevent their belongings from rolling or shifting on the steep and uneven ground, as setting items on the bare ground often led to difficulties in retrieval.

Both perspectives reflect how the local communities have interpreted and ascribed meaning to these historical structures. The ambiguity in purpose highlights the multifunctional potential of these stone terrace enclosures and the rich cultural heritage associated with them. Further archaeological analysis and more precise measurements of the diameter, wall thickness, and positioning relative to the terrain could provide additional insights into their original construction purpose and usage.

These structures reflect the different functions they served in the daily lives, social organization, and defense strategies of the ancient communities that once occupied these sites.

Through careful examination, four primary types of terraces were identified: Building Foundations, Defense Walls, Retaining Walls, and Security/Spy Walls.

Building Foundations

The most observed terraces were those believed to serve as building foundations. These terraces, typically rectangular or square in shape, were constructed to provide stable bases for dwellings. The rectangular foundations, often larger, suggest they may have supported multi-family houses or homes for extended family groups. In contrast, the square foundations, typically smaller, were likely intended for individual families or smaller household units.

Figure 12: A terrace wall which is believed to have been a building foundation (Photo by: Odarkor Ankrah-Addison, 13/04/2023).

An interesting feature of many building foundation terraces was the presence of clay daub fragments scattered across their surfaces. This detail supports oral accounts indicating that houses in these communities were constructed with clay or mud walls, applied onto a framework of wooden posts and sticks a construction technique known as wattle and daub. The clay fragments serve as remnants of these structures, preserving evidence of the building materials and techniques used by the community. These daub-covered terraces reflect a

lifestyle in which family structures were central, with houses clustered closely to foster communal living and mutual support.

Figure 13: Another picture of a building foundation (Photo by: Odarkor Ankrah-Addison, 13-04/2023).

Figure 14: Another picture of a building foundation (photo by: Odarkor Ankrah-Addison, 13/04/2023).

Defense Walls

During the survey, I noticed that before the entry to each of the settlements are exceptionally long walls which were identified as defense walls. These walls on the average measured 43m in length, 1.8m in height, and 1m in thickness. These supposed defense walls at the entrance to each of the settlement sites were mostly built against a naturally occurring boulders.

Another distinct type of terrace was identified as defense walls, strategically placed to protect the community from external threats. These walls were typically arranged in linear formations or in an "L" shape at key entry points into the settlement. Their strategic placement suggests they were built to defend against intrusions, forming barriers along the most accessible or vulnerable routes into the settlements.

Figure 15: A picture of a boundary/ defense wall (photo by Odarkor Ankrah-Addison, 13/04/2023)

Oral histories corroborate this defensive purpose, explaining that these walls not only served as physical barriers but also marked off important areas within the settlement, such as sacred spaces or shrines. These spaces, essential to the community's cultural and spiritual life, were safeguarded by defense walls to ensure that only authorized individuals could enter. The walls served a dual role: defense from potential outside attackers and preservation of the sanctity of specific internal areas. Their sturdy construction often reinforced by naturally occurring boulders highlights the significance placed on both protection and the delineation of sacred spaces.

Oral accounts provided by Mr. Odoi, a tour guide of the SHRR and my assistant indicated that the defense walls were usually used by the Se people to create boundaries within the settlement sites. They were mostly used to separate the significant structures from the rest of the communities. For instance, the shrine was separated from the entire community using defense walls, and the Chiefs' palaces were also separated from the rest of the community with the help of a defense wall.

I located a total of nine (9) defense walls during the survey at both Manya and Hioweiyo Hill sites. Out of the nine (9) walls recorded, four (4) were found at Manya Hill, whereas five (5) at Hioweiyo. At Hioweiyo, one out of the five defense walls found was an entrance defense wall, and the remaining four being boundary defense walls within the settlement. The entrance defense wall at Hioweiyo measured 48m in length, 2.2m in height and 1.2m in thickness with an elevation of 90m above sea level. Also, at Manya Hill, a total of four defense walls were recorded. Out of the four, one entrance defense wall was recorded, and three boundary defense walls within the settlement were also identified.

Retaining Walls

Retaining walls were frequently observed along the slopes surrounding the settlements. These terraces were designed to address the challenges posed by the hilly terrain. Unlike defense

walls, which were often taller and reinforced, retaining walls were shorter and served a practical function: preventing soil erosion and creating level spaces that could be used for subsistence farming, gardening, or communal activities. This design choice highlights the community's awareness of the landscape's challenges and their efforts to adapt to it sustainably.

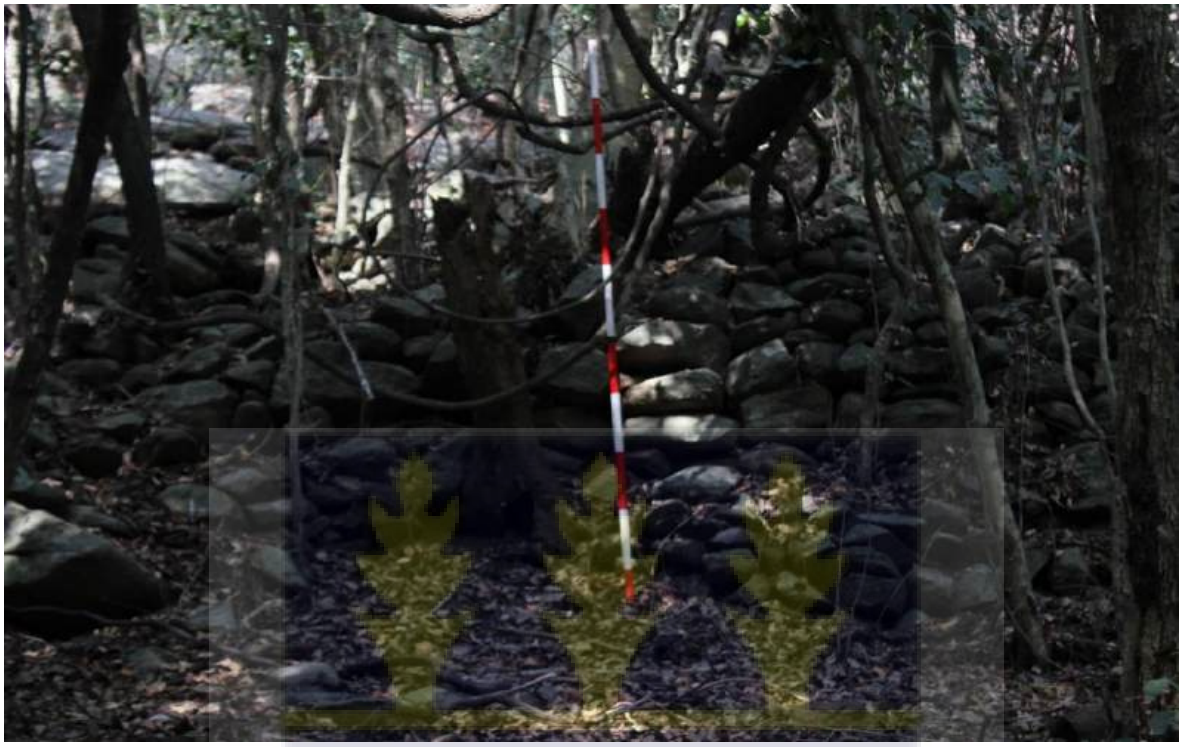


Figure 16: A partly destroyed retaining wall at Hioweiyo site (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 17: A Damaged retaining wall at Manya Hill (photo by Odarkor Ankrah-Addison, 14/04/2023).

The placement of these retaining walls on sloped areas shows how the community maximized their land use while protecting the integrity of the soil. Oral accounts suggest that some of these terraces may have also served as backyard gardens or shared spaces for household activities. By constructing terraces that effectively held back the soil, the community could better manage their environment, preventing erosion and making the land more usable for generations.

These types of walls were mostly found either along or across slope areas within these two research sites. These retaining walls were likely erosion-checking mechanism. They are pervasive along the slopes with very high gradient. Oral account indicates that the forebears at Shai Hills used these walls to check erosion whilst others accounted that the retaining walls built were done to get a flat surface for either backyard gardening or communal spaces.

The retaining walls, though similar to the defense walls in shape, have been severely damaged. Some of the retaining walls were also built to check erosion.

In my previous study at the Manya Hill site (Ankrah-Addison 2022), it was indicated that the retaining walls were built in a rectangular shape. Though this claim was made by a tour guide who was part of my research team in 2020, the people of the community disapprove of this claim. The people in an interview session further indicated that the retaining walls were constructed horizontally. During the survey, fourteen (14) retaining walls were recorded. It was observed that most of the rubbles used in constructing this retaining wall are displaced from their original position.

Security/Spy Walls

A unique type of terrace identified was the security or "spy" walls, small, circular enclosures scattered discreetly across the landscape. Unlike the larger, more visible defense walls, these terraces were compact and often hidden, designed as lookout points or shelters for warriors during times of conflict. Oral traditions reveal that these sites were used strategically during times of threat, allowing warriors to hide and keep watch over the settlement without being easily detected.

These security walls reflect an element of tactical thinking in the community's defense strategy. Positioned in less obvious locations, these terraces provided a concealed vantage point from which individuals could monitor incoming threats or observe activities across the settlement. The design of these walls was small, often circular, and positioned in locations with good visibility underscores their role as protective structures that offered security without intruding on the more open and communal areas of the settlement.

Figure 18: A picture of a spying/ security post at Hioweiyo site (photo by Odarkor Ankrah-Addison, 13/04/2023).

This classification of stone terraces sheds light on the functional diversity within the SHRR. Each terrace type reveals how the community adapted their architectural practices to meet a range of needs, from providing secure foundations for dwellings and protecting sacred spaces to managing the land's natural slope and establishing strategic vantage points for defense. This complex arrangement of terraces speaks to a community that was resourceful, socially organized, and attuned to the demands of their environment. By understanding the functional roles of these terraces, we gain a deeper appreciation of the intricate social and practical systems that defined these ancient settlements.

4.3 State of Preservation: Comparing Manya Hill and Hioweiyo

One of the critical objectives of this study was to evaluate and compare the preservation states of the stone terraces at Manya Hill and Hioweiyo within the Shai Hills Resource Reserve (SHRR). The terraces were assessed based on three preservation criteria: intact, partially

destroyed, and wholly destroyed. This comparative assessment highlights how different levels of accessibility and environmental exposure affect the preservation of these structures over time. While Manya Hill, which is more open to visitors, shows significant signs of deterioration, Hioweiyo's terraces—shielded from frequent human contact—exhibit a comparatively better state of preservation.

4.3.1 Manya Hill

Manya Hill's terraces present a mixed picture, with many in various states of degradation. As one of the more accessible sites within the SHRR, Manya Hill draws a steady flow of tourists, which, although beneficial for cultural exposure, poses substantial preservation challenges. A single, well-trodden trail provides access to the terraces, leading to high levels of foot traffic across certain areas. Visitors often walk or sit on the terraces, and this repeated contact gradually destabilizes the stone structures. The constant trampling wears down the stones, displaces them, and, over time, loosens the entire arrangement of the terraces.

In addition to the effects of human activity, Manya Hill's terraces are subjected to natural elements that contribute to their deterioration. The area's tropical climate brings seasonal heavy rains that erode the soil around the terraces. This erosion gradually undermines the stability of the terraces, causing stones to become dislodged or even washed away in some cases. The combination of human-induced wear and weather-related erosion has left many terraces at Manya Hill in poor condition.

Out of the fifty-two terraces recorded at Manya Hill, only six are classified as fully intact, with the rest in varying stages of partial or complete destruction. Defense and retaining walls show significant wear, as they are both structurally exposed and frequently interacted with by visitors. The partially destroyed terraces are characterized by stones that have been displaced from their original arrangement, leaving gaps in the structure and reducing their overall

stability. Fully destroyed terraces, on the other hand, have lost so many stones that their intended shapes and arrangements are barely recognizable, making it challenging to determine their original purposes.

Figure 19: A partially destroyed defense wall. This is a defense wall at the entrance of Manya Hill. As I indicated that the entrance defense walls were built against a naturally protruding rock giving its height the same as that of the rock. (photo by Odarkor Ankrah-Addison, 13/04/2023).

It was observed during the survey that most of the stone terraces and walls that were identified and recorded were not well preserved. They are either partially destroyed (had some of the pellets or rubbles fallen of from the whole structure either by action of nature or humans) or wholly destroyed (all pellets or rubbles fallen off completely). Stone terraces and walls at this location were measured and recorded using three criteria: partially destroyed, wholly destroyed, and whole/preserved. The words "wholly destroyed" and "partially destroyed" denoted walls and terraces that were completely destroyed, along with the rubbles that were left all around. On the other hand, the words "whole" designated walls that were still intact. A table detailing the stone walls' and terraces' current condition of preservation may be found below.

TYPE OF WALL	PARTIALLY DESTROYED	WHOLLY DESTROYED	WHOLE/ PRESERVED	TOTAL
Building Foundation	23	10	5	**38**
Defense Wall	4	—	—	**4**
Retaining Wall	4	2	1	**7**
Security/Spy Walls	—	3	—	**3**
TOTAL	**31**	**15**	**6**	**52**

Table 5: Table showing the quantity of walls and terraces with their state of preservation.

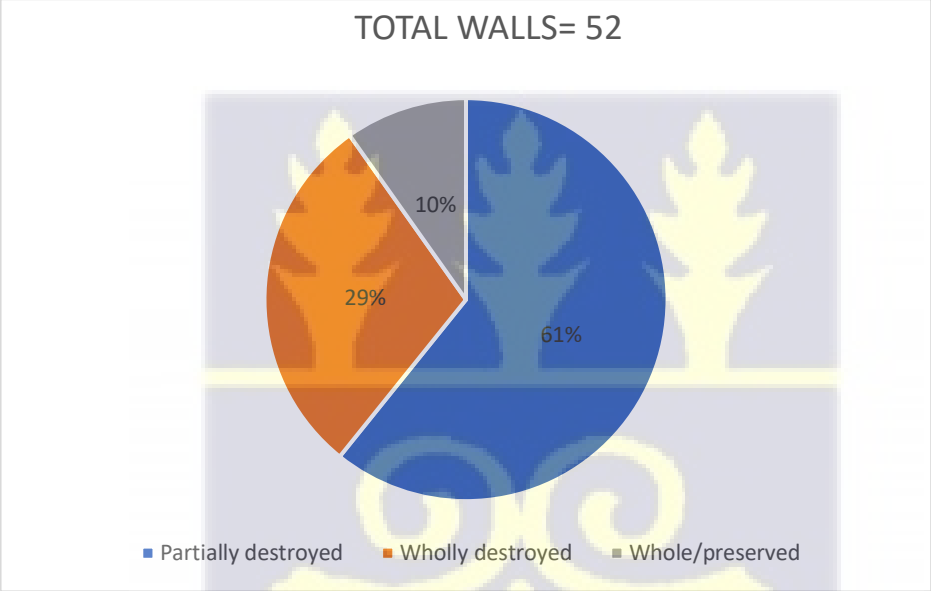


Figure 20: A chart showing the distribution of the preserved states of walls at the Manya Hill site

From the table above, the total number of walls that were recorded to be partially destroyed sum up to thirty-one (31) representing 61% of the total walls recorded. This means that 31 out of the total identified walls within Manya hills have lost parts of its fabrics due to either a natural or human-caused factor. Also, fifteen (15) which amount to 29% have been wholly destroyed. This indicates that, out the total number of the walls recorded at Manya Hill,15 of them have been destroyed completely. To add up, six (6) recorded walls representing10% of

the total were identified as whole or preserved. This indicates that out of the total recorded and identified walls, only 6 were seen to be in good shape.

Figure 21: A partially destroyed building foundation at Manya Hill (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 21 is an image of a partially destroyed building foundation, where the rubble underneath the remaining standing walls consists of stones that appear to have become displaced from the original structure. The accumulation of these stones at the base of the wall.

Firstly, natural environmental conditions such as rainfall, fluctuating temperatures, and plant growth could have contributed significantly to the wall's deterioration. The roots of vegetation growing near or within the structure can exert pressure on the stones, eventually causing some to loosen and fall. Furthermore, climatic factors, including seasonal rains and temperature shifts, can erode the structural integrity of the walls, leading to gradual dislodgement of stones over time.

Alternatively, human activities, including increased foot traffic and handling by visitors, may also play a role in the structural degradation. Tourism, while beneficial for cultural heritage awareness, often exerts pressure on these sites, as visitors may inadvertently touch, lean on, or even climb parts of the walls, accelerating the disintegration process.

The rubble present under the standing wall serves as an indicator of these impacts, and closer examination could help determine whether the damage is predominantly due to environmental exposure or human interaction. Understanding these factors is crucial for developing conservation strategies to preserve such historical structures.

Figure 22: A partially destroyed defense wall (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 22 shows a segment of the defense wall, which exhibits signs of partial destruction. In the image, sections of the wall are visibly lower or entirely missing, suggesting that stones have either collapsed or been removed from the structure. The upper portion of the wall appears uneven, with an inconsistent height that deviates from the likely original, more uniform structure.

Evidence of deterioration is also visible in the form of scattered rubble at the base of the wall, comprised of stones that have seemingly fallen from their original positions. This rubble accumulation indicates that the wall has likely sustained damage over time, possibly due to a combination of natural and human factors. Environmental conditions, such as weathering from rain, wind, and temperature fluctuations, could have weakened the wall, causing gradual

disintegration. Additionally, human activities, including inadvertent handling by visitors or nearby vegetation clearing, may have contributed to the wall's deterioration.

Figure 23: A partially destroyed retaining wall. The rubbles that make up the wall are scattered around. (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 23 displays a retaining wall in a partially destroyed state, as evidenced by scattered rubble surrounding the remaining structure. Portions of the wall appear to be missing or significantly lower, suggesting that stones have detached from their original positions over time. The uneven height and gaps in the wall indicate areas where stones have fallen or been removed, resulting in an incomplete structure.

The displaced stones scattered around the wall likely originated from these gaps, reflecting gradual degradation. Potential causes of this damage include environmental factors, such as weathering from rain, wind, and seasonal temperature changes, which can erode the wall's stability. Additionally, the growth of vegetation around the wall may disrupt the structure, as roots exert pressure on the stones, causing them to loosen and fall.

Human activity may also have influenced the damage. Foot traffic from visitors, along with any inadvertent handling or climbing on the wall, could contribute to the dislodgement of stones over time. This caption highlights the scattered rubble and visible gaps in the structure, providing a clear context for the wall's partially destroyed state.

Figure 24: A partially destroyed retaining wall. The tree growth within the wall has caused most of the pellets to move from their original position. (photo by Odarkor Ankrah-Addison, 13/04/2023)

Figure 24 captures a retaining wall that is partially destroyed, with stones that once formed the wall now scattered around the base. The remaining sections of the wall, though still standing, exhibit noticeable gaps and irregularities, suggesting that over time, parts of the structure have collapsed or been dislodged. The rubble surrounding the wall consists of stones that have likely fallen from these gaps, indicating a gradual process of erosion or damage.

The disintegration of the wall could be attributed to several factors. Natural elements, such as heavy rains, temperature fluctuations, and wind, likely played a role in loosening the stones, especially if the wall has been exposed to these conditions for an extended period. The impact

of plant roots growing around and within the structure may also have contributed to the damage, as roots exert pressure on the stones, causing them to shift or fall.

Additionally, human activity, particularly from tourists, could have accelerated the deterioration of the wall. Foot traffic, touching, or leaning on the structure might have contributed to the displacement of the stones, further destabilizing the retaining wall.

Figure 25: A destroyed building foundation (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 25 shows a destroyed building foundation, with significant collapse and disintegration of the original structure. The foundation is no longer intact, and large sections of the wall have been entirely reduced to rubble, leaving only scattered stones and debris in the surrounding area. The complete destruction of the structure indicates that it has likely been subjected to considerable natural and human-induced forces over time.

Environmental factors, such as prolonged exposure to harsh weather conditions (e.g., heavy rainfall, flooding, and temperature fluctuations), may have contributed to the foundation's

degradation, causing the stones to loosen and dislodge. Additionally, the growth of vegetation, particularly plant roots, could have put pressure on the walls, further weakening the structure and leading to its eventual collapse.

Human activity, including tourism, may have also played a role in the destruction. Frequent foot traffic or direct interaction with the site could have accelerated the deterioration of the foundation. This image illustrates the devastating impact of both natural forces and human interference on the preservation of historical structures, highlighting the need for effective conservation strategies to protect remaining sites.

Figure 26: A preserved building foundation (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 27: A preserved building foundation (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figures 26 and 27 show a preserved section of a building foundation, illustrating the careful maintenance and conservation efforts made to protect the stone terraces. Unlike the partially destroyed sections observed in other parts of the site, this foundation remains intact, with the stones carefully arranged and well-supported in their original positions. The preservation of this foundation highlights the successful conservation strategies employed, which include preventing further erosion from environmental factors and minimizing human impact through restricted access or guided visits.

Conservation efforts likely involved the stabilization of loose stones, ensuring their proper alignment to maintain the structural integrity of the foundation. Additionally, efforts to control vegetation growth around the terraces may have been undertaken, as plant roots can often disrupt the stone structure. Regular inspections and maintenance work, such as reinforcing weakened sections and addressing potential threats from both climate and tourism, have been crucial in ensuring the continued preservation of this historical site.

This preserved foundation serves as an example of the successful integration of conservation practices to protect cultural heritage sites from the vagaries of climate, vegetation, and human interaction, thereby maintaining their historical and architectural significance for future generations.

4.3.2 Hioweiyo

In contrast to Manya Hill, Hioweiyo's terraces are better preserved, owing largely to the site's limited accessibility. With restricted access for visitors, the terraces here experience far less human interference. This reduced foot traffic allows the terraces to maintain a greater degree of structural integrity compared to Manya Hill. However, even with fewer human disturbances, Hioweiyo's terraces are not immune to natural threats that affect their condition over time.

Hioweiyo's environment subjects the terraces to **natural factors** such as root growth from surrounding vegetation, soil erosion, and disturbance by local wildlife. Trees and other vegetation in the area grow close to, and sometimes within, the stone terraces. Over time, the roots from these plants penetrate the stone structures, dislodging stones and compromising the terraces' stability. Additionally, erosion from rainfall impacts the terraces, though to a lesser extent than at Manya Hill due to the relatively lower volume of foot traffic loosening the soil. Wildlife, such as baboons and smaller mammals, also contribute to the minor wear on the terraces, as these animals dig or burrow near the stones, occasionally disrupting the structures.

Among the **thirty-five terraces** recorded at Hioweiyo, a notable portion remains intact, with only minor displacements observed in some areas. The limited human access here has been instrumental in preserving the terraces, highlighting how reduced exposure to human activity can extend the lifespan of these historical structures. Many of Hioweiyo's defense walls and building foundations show little to no damage, with the stones remaining firmly interlocked

and stable. Even the retaining walls, though exposed to rain and occasional animal activity, are in comparatively good condition, with minimal signs of erosion or structural failure.

During the survey at Hioweiyo settlement site, it was observed that even though most of the walls could be easily identified through their suspected functions, they were either partially or wholly destroyed. The walls were checked to know their condition. This assessment was done using three assessment definitions. These are partially damaged, damaged, or preserved. The partially damage was used to identify walls which had part of it destroyed or parts of the fabrics absent, damaged was used to describe walls which were fully destroyed, whereas preserved was ascribe to walls that were whole.

Below is a table showing the various walls within Hioweiyo settlement site and the rate of destruction based on the three assessment levels.

TYPE OF WALL	PARTIALLY DAMAGED	WHOLLY DAMAGED	PRESERVED	TOTAL
Building Foundation	16	2	2	**20**
Defense Walls	5		—	**5**
Retaining Walls	4	3	—	**7**
Security/ Spy Walls	—	2	1	**3**
TOTAL	**25**	**7**	**3**	**35**

Table 6: Table showing the quantity of walls with their rate of destruction within Hioweiyo settlement site.

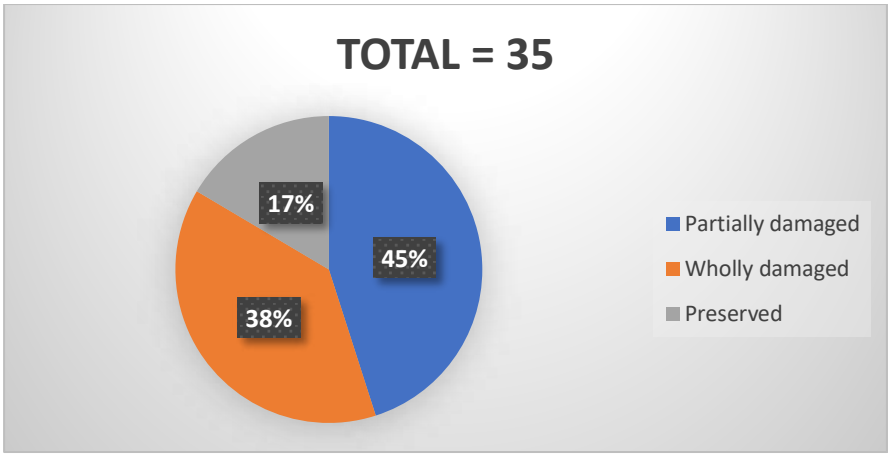


Figure 28: A chart showing the distribution of the rate of destruction of walls within the Hioweiyo settlement site.

From the above representation on the table, out of the total thirty-five (35) walls that were recorded within the Hioweiyo settlement site, twenty-five (25) representing 45% were identified to be partially damaged. Seven (7) marking 38% identified to be damaged, whereas three (3) representing 17% of the total walls were found to be preserved.

Below are some pictures taken from Hioweiyo settlement site that give pictorial evidence of the state of walls within the hills.

Figure 29: A damaged building foundation at Hioweiyo site (photo by Odarkor Ankrah-Addison, 12/04/2023).

This image “Figure 29” depicts a damaged building foundation at the Hioweyo site, showcasing significant structural degradation. The foundation, once a stable base for a building, now shows clear signs of disrepair. The walls are partially collapsed, with stones dislodged and scattered around the site. Some sections of the foundation have completely lost their original form, while others remain partially intact, though significantly weakened.

The damage to the foundation is likely the result of multiple contributing factors. Natural elements such as weathering from consistent rainfall, extreme temperature fluctuations, and erosion over time could have played a major role in the foundation’s deterioration. Heavy rains may have washed away supporting soil or seeped into cracks in the structure, exacerbating the damage. The growth of vegetation, particularly the roots of plants and trees, can also compromise the integrity of stone foundations by exerting pressure on the stones, causing them to shift or dislodge.

Furthermore, human activity might have contributed to the damage. In sites like Hioweyo, where the historical significance of the foundation might not always be fully understood, foot traffic or construction in the surrounding area can add stress to already weakened structures. Though this specific site is not always actively maintained, the lack of proper preservation measures may have left the foundation more vulnerable to these natural and human-induced forces.

This image is a vivid representation of how cultural heritage can deteriorate over time when subjected to environmental pressures and the absence of protective efforts. It also serves as a reminder of the importance of ongoing preservation work to safeguard such sites for future generations

Figure 30: A completely damaged building foundation (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 30 captures a building foundation that has suffered extensive damage, with nearly all of its structure collapsed or severely deteriorated. The stones that once made up the foundation are either completely dislodged or scattered, leaving behind a fragmented and uneven site. Where the foundation once stood firm, only remnants of the original structure remain, now in a state of ruin.

The complete damage to this foundation is likely the result of a combination of long-term environmental and human factors. Natural forces, such as continuous rainfall, flooding, and the effects of temperature fluctuations, may have contributed significantly to the degradation of the foundation. Over time, water could have seeped into the cracks in the stones, loosening them and causing them to fall apart. Additionally, the expansion and contraction of the material due to changing temperatures might have exacerbated the damage, causing the structure to weaken and eventually collapse.

Soil erosion, particularly in areas with heavy rainfall or inadequate drainage, may also have contributed to the foundation's collapse by undermining the stability of the soil around the structure. The foundation may have been further weakened by the growth of vegetation, with roots infiltrating the stones and applying pressure to loosen them.

Human factors could also have played a role in the accelerated destruction. If the site has been subject to human activity, such as increased foot traffic, construction, or even intentional damage, these actions could have hastened the foundation's collapse. Without adequate protective measures or conservation practices, the foundation has likely succumbed to these various pressures.

This image serves as a stark reminder of how vulnerable historical and cultural sites can be to both natural and human-induced damage. The complete destruction of the foundation highlights the need for urgent conservation and preservation efforts to protect these invaluable structures and ensure their survival for future generations.

Figure 31: A completely damaged retaining wall (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 32: A completely damaged retaining wall (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figures 31 and 32 depict retaining walls that have suffered significant damage, with visible signs of structural weakening and disintegration. The wall, which was once a solid and stable barrier, now shows large gaps where stones have fallen or shifted, creating an uneven surface. Sections of the wall have collapsed, and rubble from the dislodged stones is scattered at the base of the structure. This damage indicates that the wall has been subjected to forces that have gradually compromised its integrity.

Several factors may have contributed to the wall's deterioration. Natural elements, particularly the effects of heavy rainfall, soil erosion, and fluctuating temperatures, could have slowly weakened the foundation of the wall over time. Water infiltration may have caused the stones to loosen, while wind and temperature changes may have exacerbated the erosion of the surrounding soil, further destabilizing the structure. Additionally, the growth of vegetation, such as plant roots, may have infiltrated the wall, putting pressure on the stones and contributing to their displacement.

Human factors, such as foot traffic, construction activities, or even vandalism, could have played a role in the accelerated damage of the retaining wall. In areas where walls are accessible to the public or exposed to tourism, unintentional handling or interaction with the structure can increase the risk of further degradation.

This image serves as a reminder of how the combination of environmental forces and human activity can lead to the gradual but significant damage of heritage structures. It highlights the importance of conservation efforts to prevent further damage and protect these valuable sites from further erosion or collapse.

Figure 33: A partially destroyed defense wall (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 34: A partially damaged defense wall (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 33 and Figure 34 show defense walls that are in a partially destroyed state, with noticeable sections either collapsed or severely weakened. The remaining parts of the wall are standing, but they appear unstable, with large gaps and irregularities in structure. Stones that once formed the solid foundation of the wall are now displaced or missing, leaving behind a fragmented and incomplete barrier.

The damage to this defense wall can be attributed to several factors. Over time, natural forces such as rain, wind, and temperature fluctuations may have eroded the structure, loosened the stones and weakening its overall integrity. The impact of vegetation growth, with plant roots pushing against the stones, could have further compromised the wall, causing additional stones to fall or become misaligned. These environmental elements, combined with the passage of time, have likely contributed to the gradual collapse of sections of the wall.

Furthermore, human activity may have played a role in the damage. The wall, being a heritage site, might be exposed to tourism or accidental interaction, such as visitors climbing on the wall or touching the stones, which could have accelerated the deterioration of the structure. In

some cases, natural wear and tear from the environment may be worsened by increased human contact.

This image highlights the vulnerable state of cultural heritage when subjected to both natural and human-induced pressures. It serves as a reminder of the importance of preservation efforts to safeguard these sites, ensuring that they are protected from further damage and can continue to provide insight into the history and culture of the area.

Figure 35: A damaged retaining wall (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 35 captures a retaining wall that has sustained significant damage, with portions of the structure visibly eroded or collapsed. The wall, which was once a key support feature, is now incomplete in some areas, with several stones displaced or missing entirely. These gaps in the structure are a clear indication that the retaining wall has been subjected to forces that have weakened its integrity over time.

The damage can be attributed to a combination of natural and human-induced factors. Natural forces such as heavy rainfall, flooding, and temperature fluctuations could have caused the wall

to deteriorate. Water, for instance, might have infiltrated cracks in the wall, loosening the stones and gradually eroding the foundation. Similarly, fluctuating temperatures may have expanded and contracted the materials, weakening the structure over time. The growth of vegetation, particularly tree and plant roots, could also have contributed to the displacement of stones, as roots grow into cracks, exerting pressure and causing further instability.

Human activity may have further exacerbated the wall's deterioration. In areas frequented by tourists or locals, the presence of foot traffic, accidental contact, or even deliberate actions like climbing on the wall could have played a role in the wall's damage. Over time, such actions can lead to a gradual loosening of the stones, hastening the breakdown of the structure.

This image serves as a poignant reminder of how both environmental conditions and human interaction can impact the preservation of heritage structures. The damage to the retaining wall underscores the importance of proactive conservation efforts to ensure the protection of such sites, preventing further degradation and loss of historical value.

Figure 36: A partially damaged building foundation (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 37: A partially damaged building foundation (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 38: A partially damaged building foundation (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 36, Figure 37, and Figure 38 depict building foundations that have sustained significant but partial damage. In both images, sections of the foundation show clear signs of deterioration, with some parts still standing while others have collapsed or shifted. The stones that once formed the solid base of the structure have been displaced, creating visible gaps and irregularities in the foundation's integrity.

The damage to the foundation is likely the result of a combination of natural and human factors. Over time, environmental conditions such as rainfall, erosion, and temperature fluctuations have likely contributed to the weakening of the structure. Water may have seeped into cracks in the stones, loosening them, while wind and extreme temperatures could have exacerbated the degradation of the surrounding soil, leading to the displacement of stones. Additionally, the growth of vegetation, such as plant roots pushing against the stones, may have further disrupted the foundation's stability.

Human activity, particularly from visitors or locals, could also have played a role in the foundation's deterioration. The area may have been subject to foot traffic, which can disturb already weakened structures, or even unintentional interference with the site. Without adequate preservation efforts or protection, such human interactions could accelerate the damage over time.

These images illustrate the fragility of historical structures when subjected to both environmental forces and human activity. The partial damage to the foundation highlights the need for careful conservation practices to prevent further deterioration and to protect the historical and cultural significance of these sites for future generations.

Figure 39: a preserved building foundation (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 40: A preserved building foundation (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 39 and Figure 40 show a well-preserved building foundation, offering a glimpse into the resilience of historical structures that have withstood the test of time. Unlike other foundations that have suffered from disrepair, these sections remain mostly intact, with the stones still tightly arranged and the structure's integrity largely maintained. The foundation

appears stable, with minimal signs of erosion or displacement, suggesting that it has been protected from significant external forces.

The preservation of this foundation can be attributed to several key factors. First, the foundation may have been constructed with durable materials and a design that naturally withstands the effects of weathering, such as frequent rainfall or temperature fluctuations. The stonework is likely solid and well-fitted, providing a stable base that has held up over the years. Additionally, the location of the foundation may have been less prone to erosion or environmental damage due to its positioning on the landscape, perhaps away from areas of heavy rainfall or soil instability.

Human intervention likely played a role in ensuring the preservation of this foundation as well. Whether through formal conservation efforts or local practices, the foundation may have been protected from the damaging effects of tourism or the natural decay that can result from prolonged exposure to the elements. Proper maintenance and the absence of significant foot traffic or disturbances from vegetation growth could have helped maintain the foundation's stability over time.

These images highlight the importance of both natural and human factors in the preservation of historical sites. While environmental conditions can naturally deteriorate structures, proactive conservation efforts can extend the lifespan of these sites, safeguarding their cultural and historical value for future generations.

4.4 THREATS TO PRESERVATION: NATURAL AND HUMAN FACTORS

The stone terraces at Manya Hill and Hioweiyo within the Shai Hills Resource Reserve (SHRR) are subject to a variety of preservation challenges, both natural and human-induced. These

threats, arising from the interplay of environmental and anthropogenic factors, significantly impact the longevity and stability of these important heritage structures. A deeper understanding of these threats is crucial for developing targeted preservation strategies to safeguard these historically and culturally valuable sites.

4.4.1 Natural Threats

The Shai Hills Resource Reserve is home to a range of natural elements that exert ongoing pressure on the stone terraces. From the growth of vegetation to the actions of wildlife and the region's tropical climate, each natural factor plays a significant role in the gradual degradation of the terraces.

Vegetation Growth

The Shai Hills area, situated within the Shai Hills Resource Reserve, is home to an array of drought-resistant plants, including iconic species such as acacia and baobab trees, as well as dense grasses. These plants are well-adapted to the harsh conditions of the region, where water availability fluctuates significantly, and they play a vital role in maintaining the ecological balance of the area. However, while these plants are crucial to the local environment, their presence also poses a substantial threat to the preservation of the stone terraces at Manya Hill and Hioweiyo.

One of the primary risks posed by vegetation growth is the impact of plant root systems. The deep and expansive roots of trees and shrubs are capable of infiltrating the stone terraces, where they grow both around and sometimes even through the stonework. The roots exert considerable pressure as they spread, gradually displacing the stones and pushing them out of their original alignment. Over time, this force causes gaps to form between the stones, weakening the overall stability of the terraces. As the roots continue to grow, they further

destabilize the structure, leading to a progressive deterioration in the terrace walls and the potential for larger sections to collapse.

In addition to the direct pressure exerted by the roots, the dry season introduces further complications. During this period, the vegetation in the Shai Hills sheds its leaves and branches as a natural adaptation to the lack of water. The fallen debris, consisting of leaves, twigs, and branches, accumulates on the terraces. This organic matter adds weight to the stonework, and over time, the build-up of debris can create additional pressure on the stones, leading to minor collapses or displacements. The fallen branches may even block the natural flow of water, which can exacerbate the effects of erosion and further destabilize the terraces. Additionally, as the trees shed their leaves, the organic material can harbor moisture, contributing to the decay of the stone structures when combined with the humid tropical conditions.

The cumulative effect of vegetation growth is a slow but persistent process. With each growing season, the interaction between the plants and the terraces becomes more pronounced, gradually increasing the risk of structural damage. The plant'' root systems continue to expand, the fallen debris accumulates, and the overall stability of the terraces weakens bit by bit. Over the years, the gradual but steady pressure from vegetation growth can cause irreparable damage to these heritage structures, threatening their long-term preservation and stability.

Wildlife Interactions

The Shai Hills Resource Reserve is not only an important cultural and historical site but also a diverse ecological area that supports various species of wildlife, including baboons, monkeys, and antelopes. These animals, while integral to the ecosystem, present considerable challenges to the preservation of the stone terraces at Manya Hill and Hioweiyo. The frequent interaction between wildlife and the terraces, particularly the activities of baboons, antelopes, and other species, plays a significant role in the gradual deterioration of these ancient structures.

Baboons, in particular, are one of the most notable wildlife threats to the terraces. As highly mobile animals, baboons regularly traverse the terraces in search of food or shelter. Their movements, often across delicate stone structures, can dislodge stones and cause misalignment, leading to structural damage. The force with which they navigate these areas, combined with their weight, creates a significant impact on the stability of the terraces. In some cases, their movements may even push large stones out of place, causing gaps or openings in the terrace walls. This kind of disruption can weaken the overall integrity of the stonework, setting the stage for more serious forms of damage over time.

In addition to their direct movement across the terraces, baboons occasionally engage in digging and burrowing activities near the stone structures. These behaviors, often driven by a need to forage for food or create shelter, further compromise the stability of the terraces. By burrowing into the soil around the stone structures, baboons may loosen the surrounding earth, destabilizing the stones and allowing them to shift more easily. Over time, this activity can result in the partial collapse of certain sections of the terraces, as the once tightly packed stonework becomes less secure due to the disturbance caused by the animals.

Antelopes also contribute to the degradation of the terraces, albeit in a slightly different manner. These herbivores create small paths as they move across the reserve, which often intersect with the terraces. The repeated passage of antelopes along these paths causes the ground to compact and the surrounding stones to shift. In some cases, antelopes dig small burrows along the terraces, further disturbing the alignment of the stones. While their impact may not be as pronounced as that of baboons, the cumulative effect of constant animal movement along the terraces still contributes to the gradual weakening of the structures.

The cumulative impact of constant wildlife activity on the terraces is significant. As animals continue to move across the site, the stones are repeatedly shifted or dislodged, further

destabilizing the stonework. Over time, this continuous disturbance leads to the slow but steady degradation of the terraces, as the once stable stone walls become increasingly vulnerable to collapse. The repetitive movement of animals across the terraces, combined with their digging and burrowing activities, creates an environment in which the stone structures are constantly under threat. This interaction between wildlife and the heritage site undermines the structural integrity of the terraces, making them less resilient to other environmental and human-induced factors.

Climatic Conditions

The tropical climate of the Shai Hills Resource Reserve plays a significant role in the ongoing degradation of the stone terraces at Manya Hill and Hioweiyo. The region's climate is characterized by distinct wet and dry seasons, each of which brings its own set of challenges that directly affect the structural integrity of these ancient terraces. The interplay between heavy rainfall, soil erosion, and temperature fluctuations contributes to a range of natural threats that undermine the preservation of the terraces over time.

The wet season, which spans from April to October, is particularly impactful due to the heavy rainfall that characterizes this period. During this season, rainfall is often intense, leading to increased water runoff across the reserve. This runoff has a significant effect on the terraces, as it causes soil erosion around the stone structures. The erosion process gradually washes away the material that holds the stones in place, such as compacted earth and smaller rocks. As the soil is eroded, the foundation that supports the terraces weakens, leaving the stones more exposed and less stable. Without the soil to anchor them, the stones become more prone to shifting and dislodging, which in turn weakens the overall structure of the terraces. Over time,

this erosion, if left unchecked, can lead to the partial collapse of terrace walls, further threatening the long-term preservation of the site.

In addition to the direct impact of rainfall, the fluctuating temperatures and humidity levels throughout the year also play a crucial role in the degradation of the stone terraces. The tropical climate in the Shai Hills is subject to seasonal shifts in temperature and moisture levels, with significant variations between the wet and dry seasons. During the wet season, higher humidity levels saturate the stone material, while the dry season leads to a drop in moisture, causing the stones to dry out. These repeated cycles of expansion and contraction, driven by the fluctuations in temperature and moisture, place considerable stress on the stones. Over time, this stress can lead to the gradual weakening of the stone structure, as the materials may begin to crack or break under the pressure of thermal and moisture-induced changes. As the stones expand and contract with each cycle, their bonds to the surrounding materials weaken, making them more vulnerable to dislodgement and further damage.

The combination of soil erosion during the wet season and the thermal fluctuations throughout the year compounds the natural threats to the preservation of the terraces. While the heavy rainfall creates immediate physical damage by washing away supporting soil, the temperature-induced stress subtly but persistently weakens the stones over time. The cumulative effect of these climatic conditions makes it increasingly difficult for the terraces to maintain their stability. As soil erosion and temperature fluctuations continue to exert their influence year after year, the terraces gradually lose their structural integrity, making them more susceptible to other natural and human-induced threats.

4.4.2 Human Threats

While the natural environment presents numerous challenges to the preservation of the terraces at Manya Hill and Hioweiyo, human activity also plays a significant role in accelerating their degradation. Increased access to the Shai Hills Resource Reserve (SHRR) and the ongoing cultural practices within the region have led to both direct and indirect impacts on the stability and integrity of these ancient structures. Human interactions with the terraces, particularly through tourism and local gatherings, place considerable strain on these fragile heritage sites.

Tourism Impact

Manya Hill, situated within the Shai Hills Resource Reserve (SHRR), has become a popular destination for tourists, researchers, and individuals seeking to explore the cultural and historical significance of the terraces. As an important site for both educational and recreational purposes, tourism plays a central role in raising awareness about the terraces and their historical value. However, the increasing flow of visitors to Manya Hill also brings about unintended consequences for the preservation of these ancient stone structures. While tourism can be beneficial in promoting cultural heritage and stimulating local economies, it also places considerable pressure on the terraces, leading to significant wear and tear over time.

One of the primary concerns related to tourism is the physical interaction that tourists have with the terraces. Visitors often walk directly on the stone structures, sit on their edges, or use the terraces as convenient resting spots during their exploration of the site. Although such activities may seem harmless in the short term, the cumulative effect of repeated physical contact with the stone surfaces can be damaging. Every time a tourist steps on or leans against the terraces, they introduce stress to the stones, loosening them and pushing them out of

alignment. These minor displacements, though small on their own, accumulate over time, leading to a gradual destabilization of the terraces.

The impact of foot traffic is most pronounced in the areas that are most frequently accessed, typically near the edges of the terraces or along the central pathways. These sections of the site bear the brunt of the visitors' movements, which can cause significant wear and tear. Over time, the constant pressure from foot traffic results in the loosening of stones, making them more prone to shifting or displacement. As the terraces were not originally designed to withstand heavy foot traffic or sustained pressure, the continued exposure to such activity accelerates the degradation of the structures. The cumulative effect of this damage is a gradual erosion of the terraces' integrity, ultimately making them more vulnerable to collapse or further disrepair.

Furthermore, the impact of tourism extends beyond the direct physical damage caused by foot traffic. The concentration of visitors in specific areas leads to the compaction of soil around the terraces. This compaction reduces the soil's ability to absorb water, which exacerbates erosion, particularly during the rainy season. Erosion around the terraces can wash away the material that helps to hold the stones in place, leaving the structures increasingly unstable. As the soil erodes, the terraces become more susceptible to further damage from both natural and human factors. The presence of large numbers of tourists also increases the potential for invasive plant species to spread. Visitors, unknowingly, can carry seeds or plant matter on their footwear, clothing, or equipment, introducing non-native species into the area. These invasive plants can disrupt the local ecosystem, competing with native vegetation and further stressing the terraces by increasing root growth around the stone structures.

Although tourism provides an important avenue for the public to engage with cultural heritage and can generate economic benefits for local communities, the lack of proper regulation and sustainable tourism practices poses a significant threat to the long-term preservation of the

terraces. Without adequate measures to manage and control visitor access, tourism could lead to irreversible damage to the site. If the terraces continue to suffer from the combined pressures of foot traffic, erosion, and invasive species, they may not be able to withstand the effects of further degradation.

Local Gatherings

In addition to tourism, local cultural practices and gatherings play a significant role in the wear and tear of the terraces at Manya Hill and Hioweiyo. These stone structures are not only important from a historical and archaeological standpoint, but they are also deeply embedded in the cultural and ritual activities of the surrounding communities. The terraces have long served as spaces for communal engagement during traditional festivals, rituals, and other social events, and continue to hold spiritual and cultural significance. As such, they are regularly used by local people for various ceremonial and social purposes, which, while meaningful, can also place considerable strain on their preservation.

During these cultural gatherings, the influx of people around or on the terraces increases the physical pressure on the stone structures. Large groups congregate on the terraces, sometimes sitting or standing on the stones, using them as platforms for rituals, or even leaning against them. The high volume of foot traffic and physical interactions during these events adds wear to the terraces, especially in the areas most frequently used. These actions, though deeply rooted in cultural tradition, unintentionally contribute to the degradation of the terraces over time. The concentrated activity that occurs during these events places significant strain on the stonework, particularly in the more accessible or central areas, where the terraces are often used for communal gatherings.

Although these events tend to be periodic, they contribute to a cumulative effect on the terraces. The repetition of gatherings and rituals, especially in the same areas, accelerates the deterioration of the stone structures. The repeated weight and pressure exerted on the terraces from sitting, standing, or leaning against them may cause stones to shift or become displaced. In the most frequently used sections, the continued physical stress can lead to cracks, misalignment, and minor collapses in the stonework. The periodic but regular nature of these events, combined with the added pressure of large crowds, significantly impacts the preservation of the terraces, leaving them vulnerable to long-term damage.

Moreover, the cultural and spiritual significance of the terraces sometimes leads to more intensive use of certain sections of the site. In some instances, the terraces may be treated as sacred or ceremonial spaces, which can result in even greater pressure on specific areas of the site. Certain rituals or practices may require the use of heavy objects or the setting up of structures on or near the terraces, further compromising the stability of the stonework. Without sufficient awareness of the terraces' delicate condition, individuals may unknowingly cause further harm by placing heavy ceremonial objects or creating additional weight on the stones. Such actions can destabilize the stone structures, causing them to shift or misalign over time.

The lack of widespread understanding about the fragility of the terraces among some members of the local community can exacerbate these issues. While many people may appreciate the cultural and historical significance of the terraces, there may be a lack of awareness regarding their preservation needs. Community members, particularly those unfamiliar with the fragility of the stonework, may inadvertently contribute to damage by using the terraces as platforms for various activities, such as dances or ritual performances, or even by resting heavy items on the stones. In such cases, the actions are often unintentional, but the cumulative effects can significantly weaken the structural integrity of the terraces.

4.4.3 The Complex Interaction Between Natural and Human Threats

The preservation of the terraces at the Shai Hills Resource Reserve (SHRR) is a multi-layered challenge, shaped by the interplay between natural forces and human activities. These threats, both natural and human-induced, do not act in isolation but instead combine to exacerbate the vulnerability of the terraces, creating a complex situation that requires coordinated management efforts.

Natural Threats

The natural factors influencing the preservation of the terraces are numerous and varied. Vegetation growth, particularly from drought-resistant plants such as acacia and baobab trees, plays a significant role in destabilizing the stone structures. The deep and expansive root systems of these plants infiltrate the terraces, pushing stones out of alignment and causing gaps that weaken the structure over time. Additionally, the Shai Hills' tropical climate, characterized by both wet and dry seasons, contributes to soil erosion, further compromising the structural integrity of the terraces. The wet season's heavy rainfall washes away soil that holds the stones in place, leaving them more exposed and vulnerable to shifting. Temperature fluctuations also add stress to the stone material, causing subtle expansions and contractions that, over time, degrade the terraces. Wildlife, such as baboons and antelopes, further exacerbates these natural threats, with their movement across the terraces displacing stones and causing shifts in alignment. These cumulative effects of natural threats steadily degrade the terraces, undermining their stability.

Human-Induced Threats

Alongside these natural factors, human activities particularly tourism and local cultural gatherings accelerate the deterioration of the terraces. Manya Hill, as a popular tourist destination within the SHRR, faces the constant pressure of foot traffic from visitors, researchers, and local community members. Tourists often walk directly on the terraces, sit on their edges, or use them as resting spots, all of which contribute to loosening and displacing stones. These actions, though well-intentioned, have a significant cumulative impact. The more frequently tourists and locals engage with the terraces, the greater the physical wear and tear, which compromises the structure over time. Without controlled access or proper management, this constant physical interaction with the terraces leads to incremental damage that can accumulate into more serious structural instability.

Moreover, local cultural practices and gatherings further contribute to the degradation. The terraces at Manya Hill and Hioweiyo are used for various traditional festivals, rituals, and social activities, often involving large groups of people who congregate around or on the stone structures. The increased foot traffic during these events, combined with the potential for physical interaction with the stones—such as sitting on them or using them as platforms for rituals places additional strain on the terraces. These activities, while vital for cultural expression, can unintentionally cause stones to shift, destabilize, or crack, leading to further deterioration.

4.5 ARTIFACTS AS NARRATIVES OF SUBSISTENCE, CRAFT, AND INTERACTION WITHIN THE SHAI HILLS RESOURCES RESERVE

The Shai Hills Resources Reserve (SHRR) stands as a dynamic archaeological site where a variety of cultural artifacts like grinding stones, ceramic pots, bottles, and broken bottle fragments serve as windows into the historical lifeways of Ghanaian communities. These artifacts not only reveal distinct aspects of daily life but also create a broader narrative about subsistence practices, craftsmanship, and intercultural exchanges that defined the area over centuries. As physical representations of past human activity, these objects play a critical role in supporting heritage tourism by providing visitors with tangible connections to the past while underscoring the importance of site conservation. Together, they contribute to a multi-layered history that encompasses indigenous traditions, colonial influences, and cultural resilience.

Each artifact category represents a different facet of historical life at SHRR, forming a nexus between cultural heritage tourism and conservation. By preserving these artifacts, SHRR can bridge Ghana's historical legacy with its future, offering tourists an immersive experience that enhances their understanding of the country's complex cultural heritage while ensuring that these archaeological treasures remain intact for future generations.

Grinding Stones: Insights into Subsistence and Settlement Patterns

The grinding stones at SHRR are more than just remnants of daily activities; they are symbolic of the subsistence strategies and settlement patterns that characterized ancient Ghanaian communities. Used primarily for grinding grains and other foodstuffs, these stones provide insight into the agricultural practices that sustained early settlements within the reserve. Their presence indicates a lifestyle deeply connected to food processing and local crop cultivation, reflecting dietary patterns that relied on grains such as millet, sorghum, or maize. The durability of these stones—many of which have survived environmental and human changes over

centuries—establishes a tangible link between present-day visitors and the past inhabitants who relied on these tools to meet their nutritional needs.

For heritage tourism, the grinding stones serve as powerful storytelling tools, allowing visitors to engage with the practical aspects of ancient life. Touching and observing the wear patterns left on these stones by repeated use offers a sensory connection to the routines of past communities. From a conservation perspective, these artifacts are invaluable; they not only provide historical data on subsistence but also serve as focal points for preservation. Protecting grinding stones within the reserve ensures that future visitors can continue to experience this tangible connection to Ghana's agricultural heritage.

Grinding stones are among the most culturally significant artifacts at Shai Hills Resources Reserve, symbolizing historical subsistence practices and settlement patterns. These stones were used to grind grains and other substances, highlighting food processing techniques of past societies. The grinding stones indicate not only dietary preferences but also agricultural practices that sustained communities within the reserve. Their durability and persistence in the landscape connect the present with the historical routines of these communities, offering visitors a tangible piece of Ghana's agricultural heritage. For heritage tourism, these stones serve as essential storytelling tools, revealing the rhythm of everyday life for past inhabitants while giving conservationists a focal point for preservation efforts.

Figure 41: a picture of grinding stone at Hioweiyo site. (photo by Odarkor Ankrah-Addison, 12/04/2023).

Figure 42: a picture of grinding stone at Manya Hill. (photo by Odarkor Ankrah-Addison, 13/04/2023).

Ceramic Pots: Craftsmanship, Domestic Life, and Cultural Expression

The ceramic pots found at SHRR offer a glimpse into the domestic lives and cultural expressions of past communities. These pots, used for a variety of purposes—including cooking, storage, and potentially ritualistic activities—reflect the technological skills and artistic traditions of the area's pottery artisans. The materials, shapes, and decorative designs on these pots reveal the cultural and functional aspects of pottery within the community,

pointing to the role of craft in everyday life. Each fragment of pottery tells a story about the technology, creativity, and cultural knowledge that defined pottery-making in the region, as well as the intergenerational transmission of these skills.

For visitors, these ceramic pots provide a sensory experience of Ghanaian culture, allowing them to connect with traditional crafting techniques that persist to this day. The design elements and craftsmanship tell stories of creativity, resourcefulness, and resilience, illustrating how communities expressed their identity through material culture. In the realm of conservation, these pottery pieces are invaluable due to their role in preserving the artistic identity and cultural knowledge of the past. Their preservation is essential not only for the educational insights they offer but also for their ability to represent the aesthetic sensibilities and craftsmanship that form part of Ghana's cultural heritage.

Ceramic pots, whether intact or fragmented, add depth to the understanding of daily life in the region. Historically, these pots served multiple purposes: cooking, storage, and possibly ritualistic activities. Each fragment tells a story about the technological skills and creative expressions of the community's pottery artisans. The materials and designs of these pots provide evidence of the crafting techniques that were passed down through generations. For tourists, these artifacts offer a sensory experience of Ghanaian culture by showcasing traditional pottery. In a conservation framework, the preservation of these pottery pieces is essential not only for their educational value but also for their role in representing the artistic identity and cultural knowledge of the past.

Figure 43: a picture of a clay pot turned upside-down found at Manya Hill. (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 44: a picture of a clay storage pot at Hioweiyo site. (photo by Odarkor Ankrah-Addison, 12/04/2023).

Bottles and Broken Bottles: Colonial Influence and Cultural Interaction

The discovery of bottles and broken bottle fragments at SHRR highlights the influence of colonial interactions and trade within the region. These artifacts, likely introduced through European colonial contact, reflect an era when foreign goods began to permeate local life, leaving a lasting impact on material culture. Intact bottles may have been used in trade

exchanges, reflecting the adoption of foreign materials into local economies, while broken bottle fragments serve as evidence of how these objects were integrated into daily practices or possibly repurposed within the community. The presence of these items underscores a time of cultural adaptation and exchange, where indigenous practices and colonial influences intersected to form a blended material culture.

For heritage tourism, these bottles offer a physical connection to a transformative period in Ghana's history, a time when local communities encountered and integrated foreign influences. This mingling of indigenous and colonial artifacts creates a compelling narrative, revealing social dynamics, economic shifts, and cultural adaptation processes. Conservation efforts within SHRR must balance these narratives, ensuring that both colonial and indigenous perspectives are preserved, thereby allowing visitors to explore a holistic story of resilience, adaptation, and coexistence within the cultural landscape.

The presence of bottles and broken bottles at the site hints at the layers of colonial history interwoven with local life in Shai Hills. Many of these bottles may have been remnants from trade interactions or colonial influence, introducing new materials and goods into the local economy. Intact bottles might reflect exchanges with European traders, while the broken fragments provide insight into how these foreign goods were integrated into local culture. This mingling of indigenous and colonial artifacts creates a narrative that reveals social dynamics, economic changes, and cultural adaptation. For heritage tourism, these bottles offer a physical connection to a time when global and local histories intersected. Conservation efforts must balance these narratives, ensuring that both the colonial and indigenous perspectives are preserved within the site's heritage.

Figure 45: a sacred place (shrine) at Manya Hill with Schnapp bottles and clay pot. (photo by Odarkor Ankrah-Addison, 13/04/2023).

Figure 46: fragment of Schnapp bottle found at Hioweiyo site. (photo by Odarkor Ankrah-Addison, 12/04/2023).

Together, the grinding stones, pots, bottles, and dry-stone terraces within SHRR encapsulate the "nexus" of heritage tourism and conservation. These artifacts and structures reveal a multifaceted history, one where indigenous practices, environmental adaptation, and colonial interactions converge. Conservation efforts at Shai Hills face the dual responsibility of protecting these cultural resources and fostering an engaging educational experience for tourists. By preserving these items, the SHRR can bridge Ghana's past with its future, enriching

visitors' understanding of the country's heritage while ensuring that these archaeological treasures remain accessible and intact for generations to come.

4.6 Summary

This chapter has documented the stone terraces at Manya Hill and Hioweiyo, classifying them based on function, assessing their preservation state, and identifying threats to their longevity. Through systematic inventory, measurement, and classification, a clearer picture of the terraces' roles within these ancient communities have emerged. The study reveals that, while Hioweiyo benefits from limited human interference, natural threats persist, underlining the challenges of preserving stone structures in exposed natural settings.

CHAPTER FIVE

CONCLUSION

5.1 SUMMARY OF THE STUDY

The study emphasizes the complex connection between heritage tourism and dry-stone terrace conservation in Ghana's Shai Hills Resource Reserve (SHRR). The project investigates how heritage tourism and conservation strategies interact and influence the preservation and safeguarding of historic dry-stone architectural features and structures at Manya Hill and Hioweiyo. The data and insight derived from this study provide a basis to help with the long-term management of these cultural assets.

The study focuses on the dry-stone terraces at Manya Hill and Hioweiyo, two important SHRR sites, to better understand the interaction between heritage tourism and conservation. These terraces which, are crucial to local agricultural methods, construction, and erosion management, highlight the Se (Shai) people's unique cultural past. These terraces are notable for their practical applications, for demonstrating the community's cultural innovation and historical adaptation.

The study's major findings highlight the risks to these structures faced by both natural and human-caused factors. Natural hazards such as erosion and tree root growth endanger the terraces' stability, while human activities, particularly those associated with tourism, exacerbate the situation. The study's goal is to identify, classify, and quantify the risks to the preservation of these terraces, as well as to determine the conservation needs required to protect them for future generations.

The literature review investigates the relationship between historical tourism and conservation, highlighting the dual nature of tourism's impact. On the one hand, heritage tourism generates

cash and improves awareness, thereby promoting the value of cultural places. However, increased visitor activity might cause overuse and physical deterioration to these sites. The study investigates the historical relevance of the stone terraces, which are seen not only as agricultural adaptations but also as an important part of the Se people's cultural heritage. The review highlights the importance of enacting suitable conservation regulations to maintain these terraces while preserving tourism benefits.

In Ghana, the literature indicates a number of conservation problems, including natural hazards and human-induced pressures. These challenges include both the physical destruction of the terraces caused by tourism and broader environmental problems like climate change. The assessment advocates for more sustainable tourism practices, legislative protections for heritage sites, and increased community involvement in conservation activities. One of the major weaknesses noted is the limited involvement of local people in the planning and implementation of conservation policies, emphasizing the need for a more inclusive approach to cultural property management.

The methodology chapter explains the mixed-methods technique used in this study. It combines qualitative techniques like interviews and focus group discussions with quantitative technique like surveys and GPS mapping. The study centers on Manya Hill and Hioweiyo, which were chosen for their cultural value and varying levels of accessibility, providing unique perspectives on tourism and conservation.

The study also surveyed a group of stakeholders, including SHRR management, tourists, and members of the local community. This diversity of viewpoints ensures that the study presents a complete picture of the situation. Data was gathered through ethnography approaches such as participant observation and in-depth interviews, as well as technical ones such as mapping

the stone terraces. This enabled a comprehensive examination of both the physical and social aspects of the conservation problems.

The data analysis chapter investigates the influence of tourism on the terraces, identifying patterns of degradation associated with tourist behaviors such as physical contact with the terraces, as well as natural circumstances such as weathering and erosion. The terraces' preservation condition varied across sites, depending on factors such as visitor exposure and the intensity of current conservation efforts.

Furthermore, the method highlights the importance of community involvement in conservation. Local partners, particularly the Shai people, highlighted the terraces' cultural and spiritual significance, emphasizing their role as symbols of local identity and legacy. This chapter proposes for a more comprehensive approach that considers both the terraces' cultural significance and the practical requirement for care.

Finally, the study underlines the significance of creating a balance between tourism development and conservation activities at SHRR in order to ensure the dry-stone terraces' long-term existence. The paper recommends a number of essential solutions to the problems identified. These include advocating sustainable tourism practices that prevent environmental harm, increasing public awareness of the terraces' worth, and adopting strong conservation policies that involve local communities. Recognizing the terraces' cultural, environmental, and economic significance, the study calls for a more comprehensive approach to heritage management that ensures these ancient structures are protected for future generations while also benefiting the local community and visitors.

5.2 KEY FINDINGS

5.2.1 INVENTORY OF STONE TERRACES

This study aims to identify and record the stone terraces within the Shai Hills Resource Reserve (SHRR) to understand the spatial and functional layout of historical sites. The survey process was thorough, capturing details about each terrace's dimensions, shape, and physical condition, as well as documenting the arrangement of the stone structures. The research aims to piece together insights into the daily lives, architectural practices, and social organization of the ancient occupants of Manya Hill and Hioweiyo.

During the fieldwork at Manya Hill, fifty-two distinct stone structures were initially identified and documented. These structures, predominantly rectangular or square shapes, appeared to serve as foundations for larger family units or communal gathering spaces. The distinct geometric shapes and orderly arrangement suggest that the Se (Shai) people intentionally organized their spaces, likely creating clusters that could have marked neighborhood areas or zones connected by kinship ties within the larger settlement.

These terraces likely served multiple purposes, including functioning as retaining walls, defense structures, or security walls. This multifaceted use underscores the sophisticated planning and adaptability of the Se (Shai) people in constructing their built environment. GPS technology was used to capture precise coordinates for every stone structure, allowing for meticulous documentation of each terrace's exact location and the creation of a detailed map reflecting the terraces' spatial distribution across the landscape.

At the Hioweiyo site, thirty-five terraces were recorded, displaying greater structural diversity than those at Manya Hill. The spatial organization suggested that the terraces may have been arranged to serve specific functional zones, with each section fulfilling unique roles. This work focuses primarily on Hioweiyo's settlement area, where remnants of the ancient Se (Shai) people's community structures are still visible and continue to attract archaeological interest.

5.2.2 CLASSIFICATION OF STONE TERRACES BY FUNCTION

The Shai Hills Resource Reserve (SHRR) is home to a variety of stone terraces, which have been classified based on their shapes, placements within the landscape, and oral histories from local inhabitants. These terraces are composed of circular and triangular arrangements of dry-stone walls, with wall thicknesses ranging from approximately 60 to 100 centimeters, depending on the site-specific construction style. They are strategically positioned on the hillside at various elevations, possibly to provide advantageous vantage points over surrounding areas.

During focus group discussions with local participants, differing interpretations were provided regarding the original purpose of these terraces. Some participants reported that their ancestors used these structures as observational posts during times of conflict, allowing warriors to hide and serve as spies within the walls. This aligns with the enclosures' discreet size and strategic placement, making them ideal for surveillance without drawing attention.

Other respondents believed these enclosures served a utilitarian function as temporary storage spaces for travelers. According to this account, individuals traversing the rugged terrain would place their luggage within these walls to prevent their belongings from rolling or shifting on the steep and uneven ground. Both perspectives reflect how the local communities have

interpreted and ascribed meaning to these historical structures. The ambiguity in purpose highlights the multifunctional potential of these stone terrace enclosures and the rich cultural heritage associated with them. Further archaeological analysis and more precise measurements of the diameter, wall thickness, and positioning relative to the terrain could provide additional insights into their original construction purpose and usage.

Three primary types of terraces were identified: Building Foundations, Defense Walls, Retaining Walls, and Security/Spy Walls. Building foundations were the most observed terraces, typically rectangular or square in shape, constructed to provide stable bases for dwellings. Defense walls were another distinct type of terrace, strategically placed to protect the community from external threats. Retaining walls were designed to address the challenges posed by hilly terrain, serving a practical function of preventing soil erosion and creating level spaces for subsistence farming, gardening, or communal activities.

Security/spy walls were small, circular enclosures scattered discreetly across the landscape, designed as lookout points or shelters for warriors during times of conflict. Oral traditions reveal that these sites were used strategically during times of threat, allowing warriors to hide and keep watch over the settlement without being easily detected.

5.2.3 STATE OF PRESERVATION: COMPARING MANYA HILL AND HIOWEYO

This study aimed to evaluate and compare the preservation states of stone terraces at Manya Hill and Hioweiyo within the Shai Hills Resource Reserve (SHRR). The terraces were assessed based on three preservation criteria: intact, partially destroyed, and wholly destroyed. This comparative assessment highlights how different levels of accessibility and environmental

exposure affect the preservation of these structures over time. Manya Hill, which is more open to visitors, presents a mixed picture, with many in various states of degradation.

Manya Hill's terraces present a mixed picture, with many in various states of degradation. As one of the more accessible sites within the SHRR, Manya Hill draws a steady flow of tourists, which, although beneficial for cultural exposure, poses substantial preservation challenges. A single, well-trodden trail provides access to the terraces, leading to high levels of foot traffic across certain areas. Visitors often walk or sit on the terraces, and this repeated contact gradually destabilizes the stone structures. The constant trampling wears down the stones, displaces them, and, over time, loosens the entire arrangement of the terraces.

In addition to the effects of human activity, the area's tropical climate brings seasonal heavy rains that erode the soil around the terraces, gradually undermining the stability of the terraces, causing stones to become dislodged or even washed away in some cases. The combination of human-induced wear and weather-related erosion has left many terraces at Manya Hill in poor condition. Out of the fifty-two terraces recorded at Manya Hill, only six are classified as fully intact, with the rest in varying stages of partial or complete destruction. The total number of walls recorded at Manya Hill was measured and recorded using three criteria: partially destroyed, wholly destroyed, and whole/preserved.

The rubble present under the standing wall serves as an indicator of these impacts, and closer examination could help determine whether the damage is predominantly due to environmental exposure or human interaction. Understanding these factors is crucial for developing conservation strategies to preserve such historical structures.

In contrast to Manya Hill, Hioweiyo's terraces are better preserved due to the site's limited accessibility. With restricted access for visitors, the terraces here experience far less human interference, allowing the terraces to maintain a greater degree of structural integrity compared to Manya Hill. However, even with fewer human disturbances, Hioweiyo's terraces are not immune to natural threats that affect their condition over time.

Among the thirty-five terraces recorded at Hioweiyo, a notable portion remains intact, with only minor displacements observed in some areas. The limited human access here has been instrumental in preserving the terraces, highlighting how reduced exposure to human activity can extend the lifespan of these historical structures. Many of Hioweiyo's defense walls and building foundations show little to no damage, with the stones remaining firmly interlocked and stable. Even the retaining walls, though exposed to rain and occasional animal activity, are in comparatively good condition, with minimal signs of erosion or structural failure. During the survey at Hioweiyo settlement site, it was observed that even though most of the walls could be easily identified through their suspected functions, they were either partially damaged, damaged, or preserved. The damage to a foundation, retaining wall, and defense wall can be attributed to various factors.

5.2.4 THREATS TO PRESERVATION: NATURAL AND HUMAN FACTORS

The stone terraces at Manya Hill and Hioweiyo within the Shai Hills Resource Reserve (SHRR) are facing various preservation challenges due to both natural and human-induced factors. These threats, arising from the interplay of environmental and anthropogenic factors, significantly impact the longevity and stability of these heritage structures.

Natural threats include the growth of drought-resistant plants, such as acacia and baobab trees,

and dense grasses. These plants are well-adapted to the harsh conditions of the region, where water availability fluctuates significantly. However, their presence also poses a substantial threat to the preservation of the stone terraces.

Vegetation growth is a primary risk posed by plant root systems, which can infiltrate the stone terraces, displace stones and pushing them out of their original alignment. Over time, this force causes gaps to form between the stones, weakening the overall stability of the terraces. As the roots continue to grow, they further destabilize the structure, leading to a progressive deterioration in the terrace walls and the potential for larger sections to collapse.

The dry season introduces further complications, as vegetation sheds its leaves and branches as a natural adaptation to the lack of water. The fallen debris accumulates on the terraces, adding weight to the stonework and increasing the risk of structural damage. The cumulative effect of vegetation growth is a slow but persistent process, gradually increasing the risk of structural damage over the years.

Wildlife interactions, such as baboons, monkeys, and antelopes, also present considerable challenges to the preservation of the stone terraces at Manya Hill and Hioweiyo. Baboons, being highly mobile animals, regularly traverse the terraces in search of food or shelter, dislodging stones and causing misalignment, leading to structural damage. Their movements, combined with their digging and burrowing activities, further compromise the stability of the stonework.

Climatic conditions also play a significant role in the ongoing degradation of the stone terraces at Manya Hill and Hioweiyo. The region's tropical climate, characterized by distinct wet and dry seasons, contributes to a range of natural threats that undermine the preservation of the

terraces over time. Understanding these threats is crucial for developing targeted preservation strategies to safeguard these historically and culturally valuable sites.

The wet season, from April to October, is particularly impactful due to heavy rainfall, which leads to soil erosion around the stone structures. This erosion gradually washes away the material that holds the stones in place, such as compacted earth and smaller rocks. As the soil is eroded, the foundation that supports the terraces weakens, leaving the stones more exposed and less stable. Over time, this erosion can lead to the partial collapse of terrace walls, further threatening the long-term preservation of the site.

In addition to the direct impact of rainfall, fluctuating temperatures and humidity levels throughout the year also play a crucial role in the degradation of the stone terraces. The tropical climate in the Shai Hills is subject to seasonal shifts in temperature and moisture levels, with significant variations between the wet and dry seasons. These repeated cycles of expansion and contraction, driven by the fluctuations in temperature and moisture, place considerable stress on the stones. Over time, this stress can lead to the gradual weakening of the stone structure, as the materials may begin to crack or break under the pressure of thermal and moisture-induced changes.

Human activity also plays a significant role in accelerating the degradation of the terraces at Manya Hill and Hioweiyo. Increased access to the Shai Hills Resource Reserve (SHRR) and ongoing cultural practices within the region have led to both direct and indirect impacts on the stability and integrity of these ancient structures. Tourists, researchers, and individuals seeking to explore the cultural and historical significance of the terraces, play a central role in raising awareness about the terraces and their historical value. However, the lack of proper regulation and sustainable tourism practices poses a significant threat to the long-term preservation of the terraces.

5.2.5 CULTURAL ARTIFACTS AS NARRATIVES OF SUBSISTENCE, CRAFT, AND INTERACTION WITHIN THE SHAI HILLS RESOURCES RESERVE

The Shai Hills Resources Reserve (SHRR) is a dynamic archaeological site that houses a variety of cultural artifacts, including grinding stones, ceramic pots, bottles, and broken bottle fragments. These artifacts serve as windows into the historical lifeways of Ghanaian communities, providing visitors with tangible connections to the past while underscoring the importance of site conservation. They contribute to a multi-layered history that encompasses indigenous traditions, colonial influences, and cultural resilience.

Grinding stones at SHRR are more than just remnants of daily activities; they are symbolic of the subsistence strategies and settlement patterns that characterized ancient Ghanaian communities. Used primarily for grinding grains and other substances, these stones provide insight into the agricultural practices that sustained early settlements within the reserve. Their durability and persistence in the landscape establish a tangible link between present-day visitors and the past inhabitants who relied on these tools to meet their nutritional needs.

For heritage tourism, the grinding stones serve as powerful storytelling tools, allowing visitors to engage with the practical aspects of ancient life. Touching and observing the wear patterns left on these stones by repeated use offers a sensory connection to the routines of past communities. From a conservation perspective, these artifacts are invaluable; they not only provide historical data on subsistence but also serve as focal points for preservation. Protecting grinding stones within the reserve ensures that future visitors can continue to experience this tangible connection to Ghana's agricultural heritage.

Ceramic pots found at SHRR offer a glimpse into the domestic lives and cultural expressions of past communities. These pots, used for a variety of purposes—including cooking, storage,

and potentially ritualistic activities—reflect the technological skills and artistic traditions of the area's pottery artisans. The materials, shapes, and decorative designs on these pots reveal the cultural and functional aspects of pottery within the community, pointing to the role of craft in everyday life. Each fragment of pottery tells a story about the technology, creativity, and cultural knowledge that defined pottery-making in the region, as well as the intergenerational transmission of these skills.

The discovery of bottles and broken bottle fragments at SHRR highlights the influence of colonial interactions and trade within the region. These artifacts, likely introduced through European colonial contact, reflect an era when foreign goods began to permeate local life, leaving a lasting impact on material culture. Intact bottles may have been used in trade exchanges, reflecting the adoption of foreign materials into local economies, while broken bottle fragments serve as evidence of how these objects were integrated into daily practices or possibly repurposed within the community. The presence of these items underscores a time of cultural adaptation and exchange, where indigenous practices and colonial influences intersected to form a blended material culture.

For heritage tourism, these bottles offer a physical connection to a transformative period in Ghana's history, a time when local communities encountered and integrated foreign influences. This mingling of indigenous and colonial artifacts creates a compelling narrative, revealing social dynamics, economic shifts, and cultural adaptation processes. Conservation efforts within SHRR must balance these narratives, ensuring that both colonial and indigenous perspectives are preserved within the site's heritage.

Together, the grinding stones, pots, bottles, and dry-stone terraces within SHRR encapsulate the "nexus" of heritage tourism and conservation. By preserving these artifacts, SHRR can bridge Ghana's historical legacy with its future, offering tourists an immersive experience that

enhances their understanding of the country's complex cultural heritage while ensuring that these archaeological treasures remain intact for future generations.

5.3 RECOMMENDATIONS OF THE STUDY

Enhanced Conservation Strategies: Given the multiple natural and human-caused threats to stone terraces, it is necessary to develop and implement comprehensive conservation strategies. This entails conducting frequent inspections of the terraces to assess their condition and identify any threats. Conservation efforts should focus on minimizing vegetation growth, particularly invasive species that undermine structures. To reduce root invasion, specific plants may need to be removed on a regular basis and buffer zones established.

Sustainable Tourism Practices: The study highlights the necessity of increased visitor access in sustaining the terraces, particularly on Manya Hill. To solve this, it is necessary to create sustainable tourism plans that balance tourist involvement with conservation goals. This could include creating designated walkways to reduce foot traffic in sensitive areas, launching visitor education programs about the importance of preservation, and possibly limiting the number of visitors during peak hours to reduce wear on the structures.

Community Involvement and Education: Involving local communities in preservation efforts is crucial. Educational programs that inform communities about the terraces' historical significance and the importance of their upkeep can foster a sense of ownership and responsibility. Involving community members in conservation initiatives can also result in economic opportunities through heritage tourism, which aligns their interests with the preservation of cultural assets.

Interdisciplinary Research Approaches: The study emphasizes the value of interdisciplinary approaches to cultural protection. Collaboration between ecologists, archaeologists, and

cultural historians can result in a more complete understanding of the terraces' influences. This collaboration has the potential to result in novel conservation techniques that consider both environmental and cultural concerns.

5.4 SUGGESTIONS FOR FURTHER STUDY

Longitudinal Studies on Structural Integrity: Future research should focus on longitudinal studies that monitor the structural integrity of terraces over time. This could include using advanced technologies such as 3D scanning and GIS analysis to track changes in the physical status of the terraces. Such investigations would provide critical information regarding the efficacy of conservation measures and aid in the development of preservation strategies.

Cultural Practice Exploration: Additional research may be performed to go deeper into the cultural practices associated with terrace use. Investigating the social and cultural significance of these buildings in Se (Shai) may help us better understand their historical context. An ethnographic investigation that includes interviews with local elders and community members may reveal oral histories and practices related to the terraces.

Impact of Climate Change: Given the study's environmental concerns, it would be beneficial to research the impact of climate change on terrace preservation. Researchers could investigate how changing weather patterns, such as increased rainfall or prolonged droughts, affect the structural stability of the terraces. This could help to create adaptive management strategies for future climatic scenarios.

Comparative Studies of Other historic Sites: Researching other historic sites with similar preservation difficulties may provide broader insights into effective conservation strategies. By analysing diverse techniques and outcomes, researchers can identify best practices for the SHRR. Preserving the stone terraces at Manya Hill and Hioweiyo is a complex challenge that

requires collaboration among researchers, conservationists, local communities, and governments. By implementing the recommendations and undertaking additional study, we may increase our understanding of these historical sites and ensure their preservation for future generations.

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