

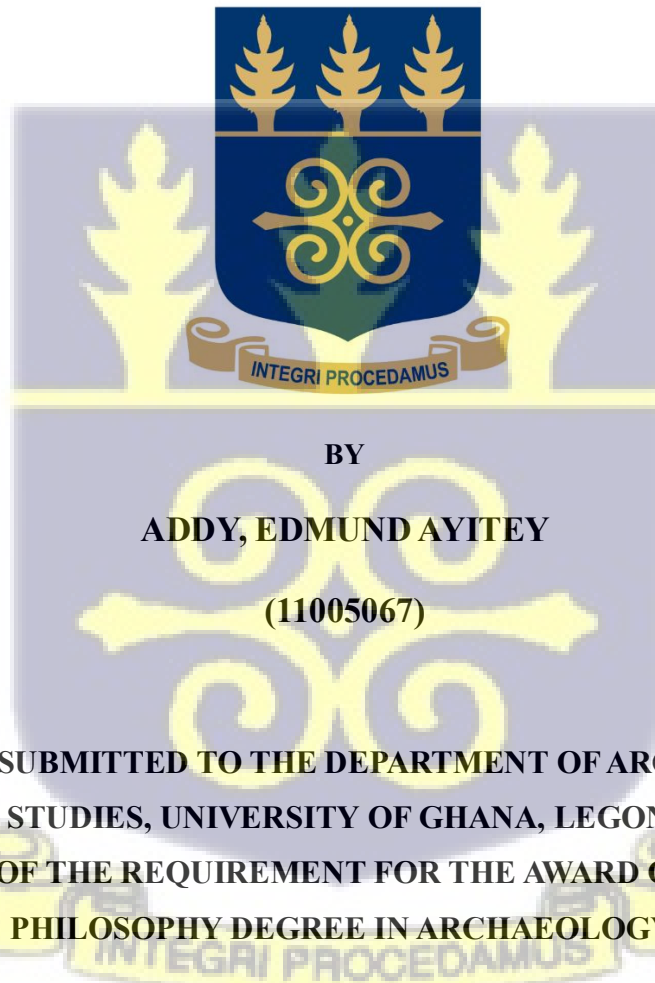
UNIVERSITY OF GHANA

COLLEGE OF HUMANITIES

SCHOOL OF ARTS

DEPARTMENT OF ARCHAEOLOGY AND HERITAGE STUDIES

**WEBSITES AS TOOLS FOR ARCHAEOLOGICAL DATA MANAGEMENT
AND INFORMATION DISSEMINATION IN GHANA**



BY

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**THIS THESIS IS SUBMITTED TO THE DEPARTMENT OF ARCHAEOLOGY AND
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FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A MASTER OF
PHILOSOPHY DEGREE IN ARCHAEOLOGY.**

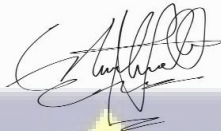
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DECLARATION

I hereby declare that this thesis is my own work under the guidance and supervision of Professor Kodzo Gavua and Dr. Daniel Kumah and that no part of this work has been submitted to any other institution for the award of a degree or qualification. I have cited and acknowledged all sources and references used in this work.

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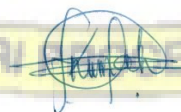
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28-10-2024

DEDICATION

This thesis is dedicated to God and my family. To God almighty who has made all things beautiful in its time, I dedicate this thesis to you for giving me the wisdom, knowledge, understanding and the humility to learn. To my parents Mr. Frank Nii Addy and Mrs. Agnes Addy, my uncle Professor Emmanuel Adjei and his wife Mrs. Augustina Adjei, thank you all for your care, sacrifices and support in all forms: physically, financially, spiritually and emotionally. This is for you! To my siblings Christiana and Andre Addy thank you all for your support, this is to us!



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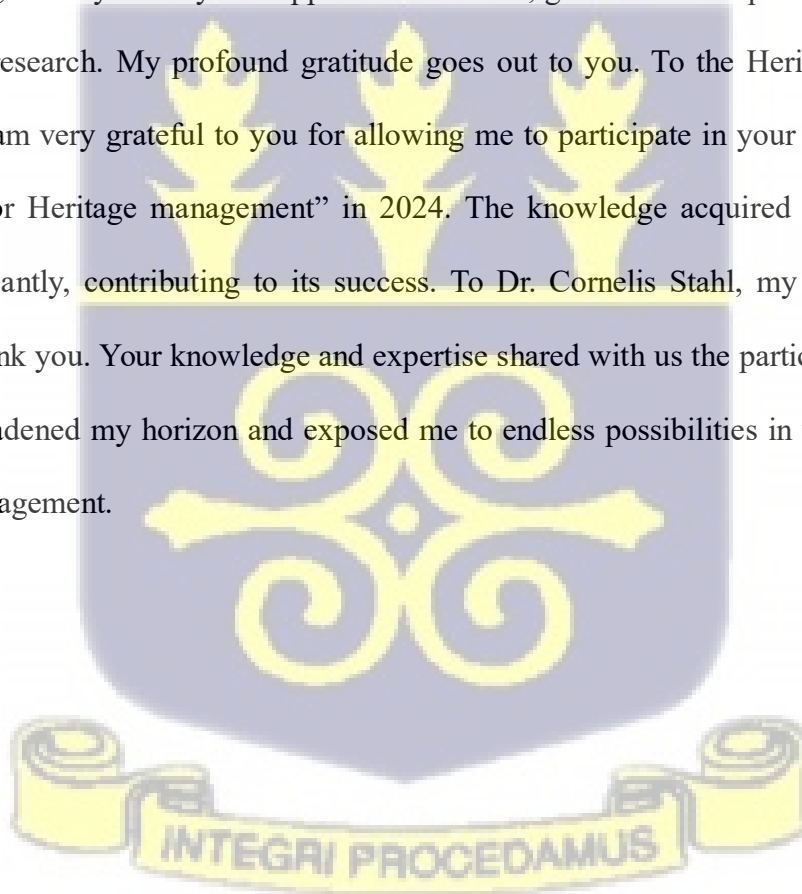


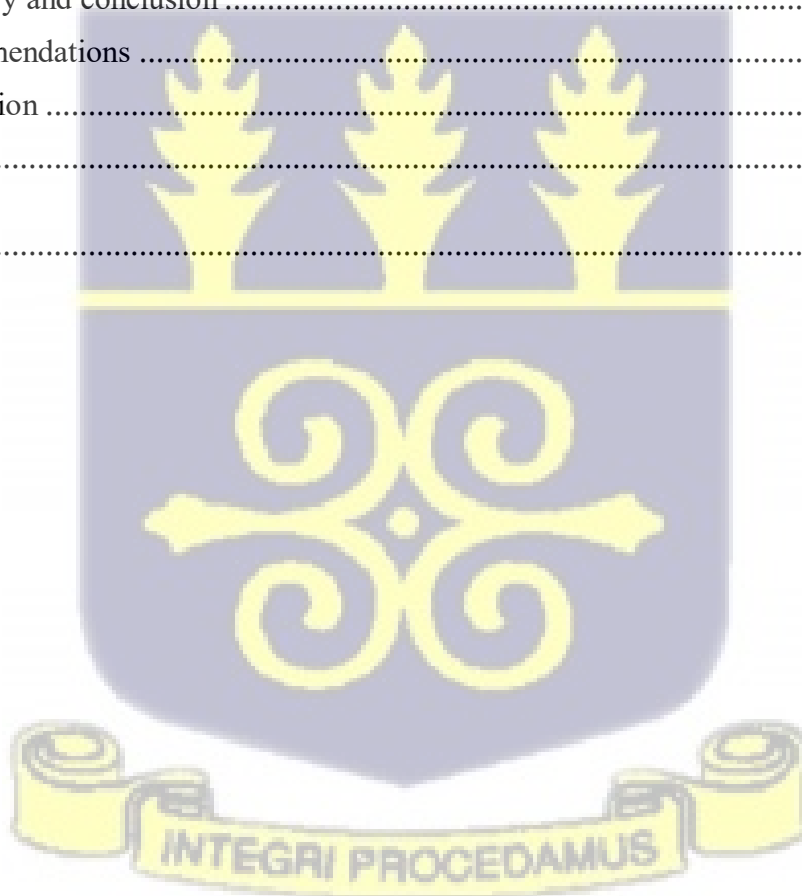
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ABSTRACT

Archaeological research in Ghana, dating back to the 1940s, has generated vast amount of data and insights into the country's past. In spite of its enormity, access to these resources remain limited, with much of the knowledge confined to academic circles. This exclusion marginalizes the Ghanaian public, whose heritage is the focus of these studies. This research explores the potential of digital platforms—specifically archaeological websites— in bridging this gap by providing open access to selected archaeological data as well as research findings from selected sites. Using the relational database model, the work organizes selected archaeological data from the Begho archives into a searchable database with a user-friendly interface for easy access. The work again utilizes the executive summary approach to re-communicate academic publications on Daboya, Dixcove and the Kintampo Complex to a cross-section of the public. The summaries were then presented in a blog format. The resulting database and blogs were integrated into a single website accessible at www.heritagequest24.com. This work is expected help bridge the gap between academia and the broader public, address storage constraints at archaeology institutions, facilitate project tracking and ensure long term curation of archaeological resources to aid use and reuse.



CHAPTER ONE

INTRODUCTION AND BACKGROUND INFORMATION

1.1 Introduction

This research explores the potential of archaeological websites in enhancing data management and information dissemination in Ghana. The research utilizes the relational database model in organizing, storing and querying data collected mainly from primary and secondary sources. A database is a system made up of organized and structured data that allows for easy access, management and efficient retrieval of data. According to Rolland (1998, p.1), a database system is any computer-based information system where the data that supports that system may be shared. Shared data is data that can be utilized by many different applications and is not organized in a way that can only serve one specific application.

Computers usually store and manage data in a file system based on the application used to create it. For instance, using Microsoft Office Excel or Access to store data, one can only retrieve and manage the data within the said application. With a database system, data files and their management are not tied to specific applications. Rather, they are ceded to a single underlying software called a ‘Database Management System’ (DBMS). This is done by integrating all the individual data files into a common set of files that allows various applications to have access to different aspects of it via the DBMS (Rolland, 1998).

Data management is the process of ingesting, storing, organizing and maintaining data created and collected by an organization (Stedman, n.d.). The main purpose of data management is to ensure easy access, retrieval, use, reuse and preservation over a period of time. It begins with the very first stage of the data life cycle and ends with the last stage of the cycle. Though there are

many definitions of the data life cycle, it mainly refers to the major stages and changes that data undergo as they progress from data acquisition planning to data recording, processing, analysis, interpretation, dissemination, curation, use and reuse (Heilen & Manney, 2023). Data management is a critical component essential for conducting effective research and analysis in the field of archaeology.

“The end result of archaeological projects should be an archive of material remains, field diaries and notes, material analysis and reports. The archive must be deposited in a properly curated institution, such as a museum, and the report published, with both being made freely accessible to the public” (Drewett, 2011). Archaeology as a field deals with reconstructing the past lifeways of people and their culture. This makes the discipline people-centred. For this reason, an archaeological project is not fully successful without the knowledge reaching the people whose past was the subject of the investigation. As a result, information dissemination and accessibility are critical when it comes to engaging audience. The people interested in the work of the archaeologist can be broadly categorized into two; those with archaeological background (archaeologists) and those without one. For this reason, archaeologists must factor in the interests of both sets of audiences when making information public.

As Drewett (2011; p.172) remarked,

One of the main problems in archaeological publishing is the need to provide for different audiences. A research student re-examining an excavated site probably needs more information than an archaeologist preparing an overview or synthetic article on a particular topic or region, while the wider interested public will want something accessible, well written and interesting (which many basic excavation reports are clearly not).

An open-access website addresses this issue by providing an online platform for archaeologists to meet the needs of their audiences. Researchers can use the front-end interface to publish summaries

of findings in a blog post format where they are relatively shorter and targeted at educating literate but non-academic audiences. At the same time, they will have a hyperlink in the front-end area that will guide interested audiences to a more extensive report published in the same database and helpful for academic purposes. With the database available online and open access, individuals proficient in computer use can access information from anywhere in the world via the internet. This gives the researcher access to a wider audience, thereby aiding information dissemination and maximizing reach.

1.2 Background to the Study

Ghanaian archaeology has come a long way in terms of its academic relevance and practical value to the Ghanaian society. Archaeology in Ghana was first introduced by the colonial administration and gained academic recognition in the 1940s with the establishment of the Department of Archaeology at the University College of Gold Coast, which later became the University of Ghana after the country gained independence (Anquandah *et al.* 2014). The Department of Archaeology was established as a research center with the focus at the time being on the country's prehistoric past, notably the Stone Age. Early scholars, such as Thurstan Shaw, played a pivotal role in laying a foundation for the discipline in Ghana. The discipline experienced significant transformation in the 1970s and 1980s, marked by the commencement of degree programs and a later shift towards heritage studies. These programs aimed to prepare students for roles in the heritage industry, fostering skills in museum work, historical scholarship, and teaching (see Anquandah *et al.* 2014).

Rigorous field schools were initiated to train students in archaeological and ethnographic field methods and techniques including excavations, laboratory analysis, conservation, and interpretation. A notable example was the West African Trade Project directed by Merrick

Posnansky in 1970. The result was a notable increase in archaeological publications in both local and foreign journals and books by both students and faculty. Government policies, particularly during the Economic Reforms of the early 1990s, emphasized Tourism as a key revenue source. This led to a new phase in Ghanaian archaeology where practitioners focused on leveraging Ghana's heritage resources for development purposes. Notable projects, such as "Crossroads of Trade, Crossroads of People" and "Images of Elmina across the centuries," demonstrated the practical application of archaeology (see Anquandah *et al.* 2014). The re-designation of the department in 2008 as, "Department of Archaeology and Heritage Studies" encapsulates the discipline's transformative journey, ensuring that the discipline stays relevant to Ghana's development.

Technological advancements have played a crucial role in the evolution of archaeology in Ghana and in Africa as a whole. Today, methods such as photogrammetry make it possible to create three-dimensional photographs of artifacts (Kumah 2022), locations, and stratigraphy; computer software makes it easier to create digital sketches of artifacts. Again, the development of digital maps—a crucial tool in many academic fields, including planning, surveying, geography, and archaeology—has been revolutionized by the combination of satellite and drone technology with GIS software to produce maps of the highest quality (Appiah-Adu 2013; Asare, 2021; Kumah 2022). The rapid growth of the internet and its advantages over conventional communication channels in terms of flexibility, speed and reach has improved information dissemination across many fields including archaeology. Unlike the limitations of traditional media, the internet as a platform has blurred geopolitical boundaries, enabling information to travel worldwide in an instant and with just a click of the mouse. This has resulted in a more informed global community. The flexibility of the internet allows for information to take various forms—from text and images to

videos and interactive contents. Whether through social media, blogs or websites, the internet provides a dynamic canvas for expression and knowledge acquisition.

1.3 Problem Statement

The use of internet applications over the past three decades has revolutionized data management and information dissemination in archaeology. Leveraging on its global connectivity, archaeological institutions around the world have developed digital archives and repositories to promote easy access and long-term curation of archaeological data and information. Notable platforms include ARIADNEplus, Archaeology Data Service (ADS), Digital Archaeological Record (tDAR) and Open Context (McManamon *et al.* 2017; Heilen & Manney, 2023; Richards, 2017). As the sole academic institution in Ghana dedicated to archaeology, the Department of Archaeology and Heritage Studies at the University of Ghana is a major player in the production of archaeological data and information. Several decades of archaeological practice in Ghana (dating back to the 1940s) and the recent surge in research projects have yielded and continues to yield volumes of archaeological data and information. Despite the vast amount of data and information available, it is still challenging to access these resources. The department lacks a central digital repository needed to efficiently curate these resources for easy access. The department library remains a major archive for archaeological information. However, it requires information seeking individuals to show up in person in order to gain access to the resources. This has constrained the dissemination of archaeological resources, limiting its accessibility to academic circles, thereby leaving out the general public.

Over the years, efforts have been made to address this issue; the Department's Leventis Digital Resource Centre (LDRC) is the closest example of a digital repository at the department. The center was established in 2008 with the aim of developing a comprehensive digital repository

of Ghana's cultural heritage assets for the purpose of education and socio-economic development (<https://ugleventisrc.com/About%20Us.html#Our-History>). It is currently under the directorship of Professor Kodzo Gavua and is engaged in research, digital documentation and archiving of archaeological and ethnographic data for archival use. The center has its own website where information about its operations and projects can be found. It also utilizes third-party platforms for managing its collections. It recently switched from Omeka (an open-source collections management platform) to CollectiveAccess (another open-source collections management platform) due to technical challenges associated with using the Omeka software (Jacob Nii Marley¹, personal communication, 4th December 2024). In spite of the numerous strides made by the centre, the problem of access persists. The focus of the centre is on documenting and archiving raw data for archival use. This addresses the data management component of the problem to some extent . The other part that has to do with disseminating archaeological resources to members of the public remains a challenge. For instance, the center is not into the ethical re-dissemination² of already published archaeological information to members of the general public. The majority of archaeological information about Ghana's past remain available at a fee via academic channels such as books and journals, making access to them difficult for the general public. Only academics in institutions that pay these journal subscription fees have access to these information.

The most recent attempt to make archaeological information easily accessible was by Asare (2021) who used computer softwares such as ArchGIS and microsoft excell application, to profile and inventorize selected archaeological and cultural heritage sites in Ghana as well as assess the

¹ Jacob Nii Marley is a PhD candidate (Museum and Heritage Studies, University of Ghana) and a staff at the AG Leventis Digital Resource Centre (LDRC), Department of Archaeology and Heritage Studies, University of Ghana.

² Ethical re-dissemination involves the dissemination of already published information in a manner that does not misinform nor harm the copyright and intellectual property of the original authors.

current state of archaeological sites mentioned in the Oliver Davies Field Notes. At the end of his work, he came out with an excel spreadsheet inventory complimented by a digital map as a visual representation of his findings. The digital map remains remotely accessible online and whoever wishes to access the inventory, will have to see the author for the excel document or read his thesis. Asare (2021)'s effort yielded a template rather than a platform that addresses archaeological information dissemination. The template serves as a guide for researchers in the future when profiling and inventorizing archaeological and cultural heritage sites in Ghana.

It is against this backdrop that I seek to develop an open-access archaeological website that curate archaeological data and ethically re-disseminates archaeological information about sites in Ghana to promote easy accessibility. The platform will have three levels of access; the administrator level, contributor level and a user level. The user level will be the lowest in terms of privileges. Users will only be able to view information. The contributor level will have both viewership and upload privileges. The upload privilege will allow contributors to publish on the website. The admin level will have the privileges of both the user and contributor added to the administrative functions of the website. With this platform, access to archaeological resources will greatly improve. With a contributors' status, archaeologists will have the ability to directly contribute data to the database as well as share research results with their audience all on the same platform. This provides a one stop shop for archaeological resources where information seeking individuals can go and have access to archaeological resources. Because the website will be live on the internet, individuals can run a google search of the website and it will lead them straight to it. This will widen the reach of archaeological information and ensure easy access.

1.4 Aim

The aim of the research is to develop an open-access archaeological website for archaeological data management and information dissemination.

1.5 Research Objectives

The following are the various objectives that will help me achieve my aim;

- To gather and compile archaeological information and data from the Begho archives.
- To develop and implement a flexible database model that accommodates various data types, such as documents, pictures, field notes, stratigraphic information, geographic data and other contextual information.
- To Create a user-friendly interface with visualization tools, advanced search and filtering options, that allows easy access to the database.
- To explore ways in which archaeological research results can be communicated to a cross-section of the public.

1.6 Research Questions

- What are the key considerations in designing and implementing a schema capable of accommodating various archeological data types?
- How can the online platform be made accessible and user-friendly for those with different degrees of technological proficiency?

- How can the platform contribute to the dissemination and preservation of archaeological information, and what strategies can be employed to ensure sustainability?
- In what ways can archaeological knowledge or results from archaeological enquiries be communicated to ensure that non-academic audience understand them.

1.7 Research Methodology

The intricate nature of archaeological database design and website development requires a multifaceted approach to data collection and implementation that ensures accuracy, consistency and accessibility of information. The methods employed in this work include desk-based research, consultations, relational database modeling and the executive summary approach. The desk-based research was deployed primarily for the acquisition of data, while consultations helped in both data acquisition and processing. The relational database modeling technique was also deployed for data processing and the executive summary approach for transforming academic publications to reader-friendly pieces of information.

The primary data component of this work was sourced from the Begho Archives. The Archive's time span and content made it a preferred choice. The Begho archive is a collection of primary data in the form of files, documents, images and notes collected from Begho by researchers over the span of five (5) decades (1970-2024).

The Kintampo Complex and two archaeological sites, Daboya and Dixcove, were also selected for profiling with the aim of capturing two broad time periods: the Atlantic and pre-Atlantic era.

1. The Atlantic era: This period refers to European contact with the Guinea Coast via the Atlantic Ocean which is marked by numerous forts and castles. The site selected was Dixcove, in the Western Region of Ghana, which was a significant trade hub during the Atlantic trade era and highlights the less-explored regions of European interactions in Ghana.
2. Pre-Atlantic era: This period refers to the period before European interactions via the Atlantic Ocean. This is represented by the Kintampo Complex and Daboya, which mark the beginnings of sedentism and the development complex society respectively in the geographical location called Ghana.

1.7.1 Desk-based Research

Desk-based research was used in this work to gather information as well as to cross-reference previously collected data. With regards to site profiling, it was used to compile already published information on Kintampo complex, Daboya, and Dixcove. It was again used as a means of cross-referencing data from the Begho Archives with those used in publications. This is a way of filling in time induced gaps in the dataset caused by deterioration.

1.7.2 Consultations

The purpose of consultation in this research was to gain expert advice that would guide the design of the database schema, essential for organizing and structuring archaeological data. As an Archaeologist under training, consulting archaeologists, senior colleagues and members of faculty at the University of Ghana's Department of Archaeology and Heritage Studies helped to deepen my understanding of the nature of archaeological information. I also sought expert guidance from resource persons with practical experience in computer programming and database development to help determine the appropriate database model suitable for the kind of data I was working with.

The resource persons were from the university of Ghana's Department of Computer Science. The consultations were usually one-on-one and informal. Ultimately, consultations facilitated decision-making throughout the website development process and was critical for understanding the data I was working with.

1.7.3 Relational database modeling

The storage and organization of the acquired data was done using the relational database model. Relational database model is a model that uses two-dimensional tables with rows and columns to store and organize data (Conger, 2012; Rolland, 1998). The individual tables are then linked together based on their relationship with one another. This was the preferred model because it is consistent with the nature of archaeological data. Archaeological data is such that one site has different sets of data associated with it. The individual datasets are also related in one way or another. The Relational model allows data of this nature to be easily structured, understood and queried using straightforward computer programming command.

1.7.4 Executive Summary

The publications on the three (3) sites that were chosen were re-communicated using the executive summary approach, which entails reducing a report to its key elements in an understandable and succinct way. The primary objective of an executive summary is to help readers grasp a report's key ideas and supporting data without requiring them to read the entire document (see Guidelines for Writing an Executive Summary, 2002).

1.8 Significance of the research

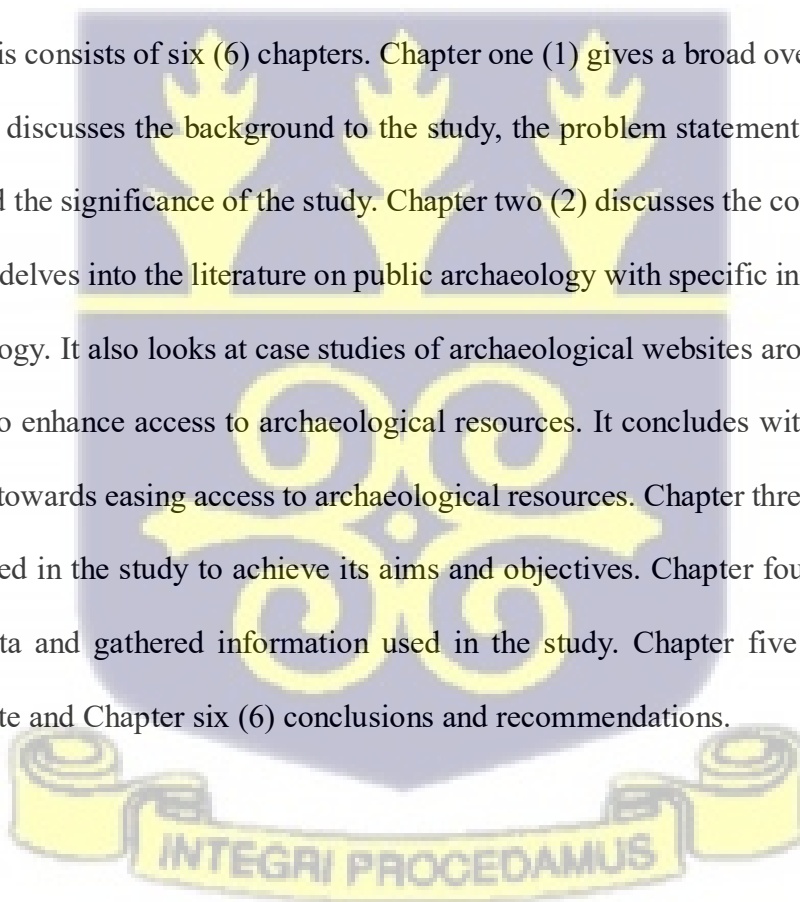
The significance of this research lies in its potential to address key challenges in archeological practice and outreach efforts in Ghana, including limited access to archaeological

resources and the disconnect between academia and the wider public. It is expected that the resulting website will enhance the preservation, use and reuse of archaeological data, augment storage management and facilitate project tracking to promote accountability in the practice of archaeology in Ghana.

Again, the website is expected to help bridge the gap between academia and the wider public through accessible blogs that simplify research findings, making them relatable and easy to understand. This will increase public accessibility to archaeological knowledge and inspire a deeper appreciation for Ghana's cultural heritage.

1.9 Organization of the study:

This thesis consists of six (6) chapters. Chapter one (1) gives a broad overview of what the work is about. It discusses the background to the study, the problem statement, aims, objectives, methodology and the significance of the study. Chapter two (2) discusses the concepts that shaped the study. It also delves into the literature on public archaeology with specific interest in Open and popular archaeology. It also looks at case studies of archaeological websites around the world and how they work to enhance access to archaeological resources. It concludes with an evaluation of efforts in Ghana towards easing access to archaeological resources. Chapter three (3) discusses the methods employed in the study to achieve its aims and objectives. Chapter four (4) presents and discusses the data and gathered information used in the study. Chapter five (5) discusses the developed website and Chapter six (6) conclusions and recommendations.



CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 Introduction

This chapter explores the key concepts that shaped this study, focusing on literature related to public archaeology, particularly open and popular archaeology. It also examines two case studies of digital archaeology repositories; The Digital Archaeological Record (tDAR) in the United States (US) and The Archaeology Data Services (ADS) in the United Kingdom (UK). The chapter analyzes how they function to enhance access to archaeological resources. These two represent some of the oldest and well-resourced repositories in the world, hence their use as case studies. The chapter concludes by evaluating efforts in Ghana to improve access to archaeological information.

2.2 Toward a definition of Public Archaeology

Public Archaeology as a concept is difficult to pin down and define, this is because of the many overlapping definitions resulting from the affiliation of scholars to different educational traditions worldwide (Moshenska, 2017). It is often the case that many scholars within the discipline of archaeology, consider community engagement and outreach efforts by archaeologists as synonymous with public archaeology. Though that holds true to some extent, it is however a narrower view of what public archaeology really is. Public Archaeology cuts across a variety of theoretical positions and practical applications, situated within a wide range of social and academic contexts (Matsuda & Okamura 2011; Skeates et al 2012). Some of these include the intersections of archaeology with politics and policy, cultural heritage management, indigenous rights, historical interpretation, reconstruction and re-enactment, education, public engagement, ethics and the law, journalism, popular culture, and the preservation of tangible and intangible heritage (Richardson,

2014). The lack of an agreed definition for public archaeology has been the source of confusion for students, scholars and professional (Moshenska, 2017).

Another source of debate in public archaeology stems from the question of whether public archaeologists are interested in theory or practice (see Richardson 2014). Gabriel Moshenska defines public archaeology as “the practice and scholarship where archaeology meets the world” in a book edited by him called “Key Concepts in Public Archaeology”. His definition reconciles the two elements of public archaeology; as a theory and as a practice. Inherent in Moshenska (2017) definition is the notion that theory cannot be separated from practice (especially in the discipline of public archaeology). This is because practice is theory-laden, therefore the public archaeologist is as interested in theory and research as he/she is in the practice of public archaeology. The word “Public” in public archaeology is also a source of debate amongst scholars in terms of its definition and application. Who and who constitute the “public” in public archaeology? Is it only made up of local communities whose past is the subject of archaeological enquiry? Or the many organizations and individuals who are often at the receiving end of archaeological information dissemination?

Considering how important context is in both the theory and practice of public archaeology, having a generic and a one side fits all definition for public archaeology is not feasible. As Robinson (2014) remarks “It is essential to acknowledge the impossibility of considering a general, single, and homogeneous public archaeology, especially when the concept of ‘public’ and ‘archaeology’ are socially, culturally and geographically situated”.

In light of the issues discussed, I define public archaeology (within the context of this work) as the theory and practice of bringing archaeological knowledge or information to the general public via digital communication channels. By the general public, I am referring to non-

archaeologists or people with little or no background at all in the subject of archaeology. This includes local communities and information seeking individuals and organizations.

2.3 Types of Public Archaeology:

By way of typology, Moshenska (2017) comes out with a seven (7) part typology which broadly captures the various types of public archaeology. They include Archaeologists working with the public, Archaeology by the public, Public sector archaeology, Archaeological education, Open Archaeology, Popular Archaeology and Academic Public Archaeology as shown in figure 2.3-1 below.

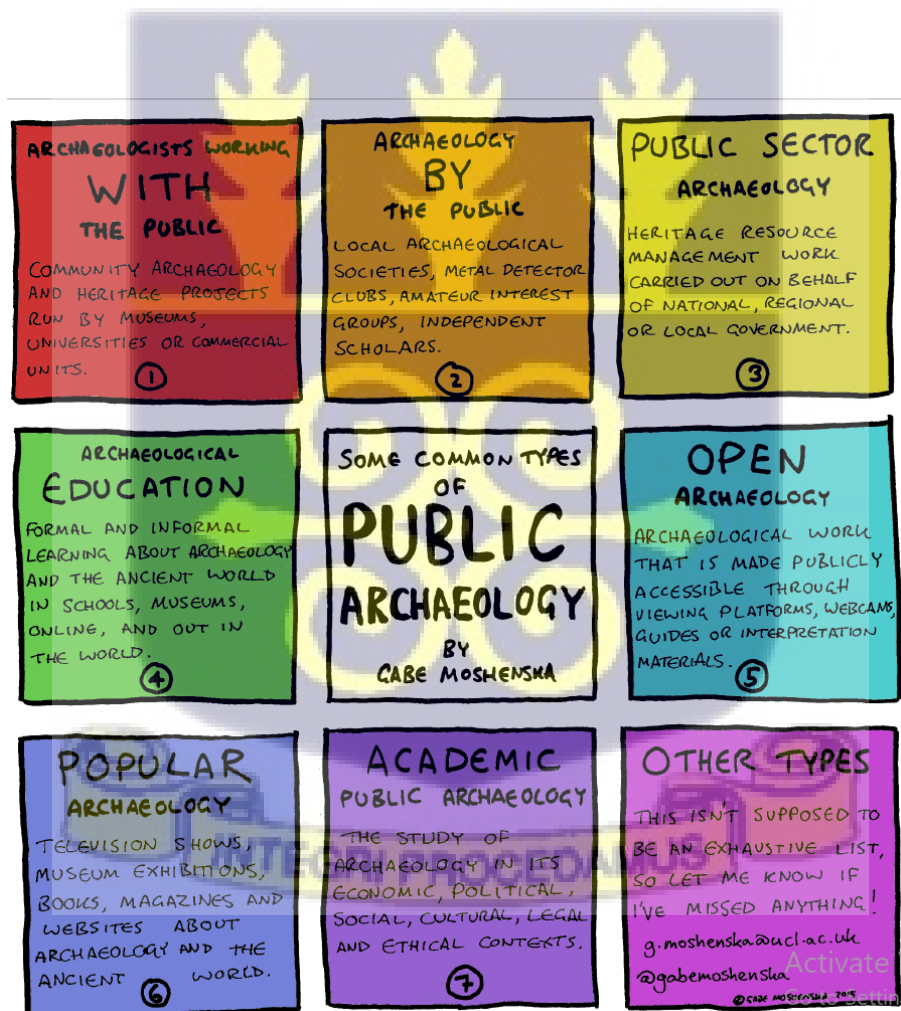


Figure 2.3- 1 Seven-part typology for public Archaeology (Moshenska & Bonacchi 2015).

Archaeologists working with the public is also known as community archaeology and it involves public participation and engagement, either as part of the research team or as the audience for outreach programs, led by professional archaeologists.

Amateur archaeology or archaeology by the public involves archaeology conducted by local societies and interest groups such as metal detector societies. This form of public archaeology is subject to varying regulations worldwide.

Public Sector archaeology or cultural resource management (CRM) usually refers to state-funded work on sites threatened by destruction, although some are funded by organizations whose operations pose threat to sites of cultural significance. This emphasizes the need for accountability on the part of archaeologists who work on such projects to share their work with the public.

Archaeological education includes formal and informal education through schools, museums, site visits and public lectures as means of engaging the general public.

Academic public archaeology focuses on the intersection of archaeology with real-world. These include the study of archaeology in economic, legal, political and socio-cultural contexts with the aim of addressing ethical and sustainability issues within the discipline.

Open archaeology on the other hand, aims for transparency in knowledge production by allowing public visibility into the knowledge production process of archaeology.

Lastly, popular archaeology looks at communicating research to non-academic audiences through accessible media such as social media, video documentaries and video games. This ensures the broadening of reach and support for archaeological heritage.

Theoretically speaking, these are mainly academic categorizations. In practice, they are closely interrelated and hard to separate.

2.4 Popular Archaeology (digital public archaeology)

Popular Archaeology is the branch of public archaeology that deals with the communication of archaeological research findings to the public through accessible and user-friendly media, rather than the more serious and detailed educational means used in academic institutions (Moshenska, 2017). Richardson (2014) refers to it as “Digital Public archaeology”. She defines it as the various online and digital strategies used to connect archaeology with the public as well as the understanding of the communicative processes through which such engagement is mediated online. Popular archaeology prioritizes the needs of non-academic audiences and adopts a more enjoyable and engaging approach to educating the public about the past. It utilizes alternative means of communication such as social media, websites, blogs, video games, movies, documentaries, Television shows, podcasts and gallery exhibitions to achieve its goal of public education.

2.4.1 The nexus between Popular Archaeology, the Internet and websites

In public archaeology, the question of audience is crucial, and knowing the audience well is even more important. Though the general public is just as intrigued about the past as archaeologists are, they are, however, not interested in the lengthy details, information, jargons and terminologies that come with academic publications (see Merriman 1991; Holtorf 2007; Moshenska 2017). Most of these people are looking for creative ways of learning about the past and they do so through television programmes, video documentaries, movies, museum exhibition

and digital media such websites, social media, video games and so on. As a result, in this day and age of digital information, they are not encouraged to spend endless hours reading books in libraries to get information.

The internet's explosive growth over the last three decades has fundamentally altered the landscape and format of human interaction (Richardson , 2013). Its global connectivity has blurred geopolitical lines, maximizing reach and enabling information to travel worldwide in an instant. The internet provides a dynamic canvas for knowledge expression and acquisition. Social media platforms enable people with similar interest to engage, interact, research and collaborate with one another irrespective of their academic status, location, age, gender, race and social status. The social media platforms have also fostered the democratization of knowledge production and dissemination. Through content creation, individuals are able to do their own independent research and come out with contents (including text, audio, videos and audiovisual) aimed at educating their subscribers and followers. As a result, archaeology now faces intense competition for the public's attention online. It is therefore important for archaeologists to invest time and effort into communicating archaeological information to the public in a creative and engaging manner that ensures that the public understands and stays interested in the work of the archaeologist. As Sir Mortimer Wheeler remarks, “It is the duty of the archaeologist, as of the scientist, to reach and impress the public, and to mould his words in the common clay of its forthright understanding” (Wheeler 1956, 234). Meaning, archaeologists have a duty of reaching and educating the public in a language and medium suitable to the public and not the archaeologist, thereby facilitating public understanding of the past.

Archaeologists have embraced this challenge by leveraging on recent improvement in technology to come up with creative and innovative ways of engaging and communicating with

the public on issues relating to the past. One of such ways is “Archaeo-blogging”, which involves the publishing of archaeological information (in textual, visual and audiovisual formats) on a website or webpage. Blogging simply involves the publishing of information on websites. The development of online publishing tools such as Wordpress, Drupal, Ceros among others have reduced the technical requirements needed for developing websites. With a tool like Wordpress, an entire website can be created without writing a single line of computer code and this has led to the growth of blogs (web logs) on the internet. Archaeological blogs differ in terms of purpose, audience and content. They range from personal blogs owned by established academics as a means of communicating new ideas and engaging a wider audience with their research. Others are also attached or dedicated to research projects. These are used to provide updates on the project and also offer team members an avenue for sharing their experiences while working on the project in the field. Additionally, some blogs are specifically created with public engagement in mind.

Guerilla Archaeology for instance is one of such blogs. The blog details how the team tries to involve people who would not normally be interested in archaeology and they do this by bringing the past to the public via music festivals and street demonstrations. This is followed by the publishing of posts written about the event on the website, enabling participants to relive the experience and reflect on what they learned (see Austin 2014). Archaeo-blogging presents a unique opportunity for archaeologists to get creative with their communication of archaeological information to the public.

In academic publication, archaeologists are required to meet certain standards set by journal publishers and editors, as outlined in journals’ editorial and author guidelines. These standards include the use of appropriate terminology, proper referencing and a comprehensive methodology among others. While these are appropriate for the academic community, they

inconvenience the non-academic community because they become difficult to read and understand. With a website, authors can craft their words in plain and simple language devoid of terminologies and jargons, making them easy for the public to understand the information being communicated. They can also decide to communicate information in audio format only, visual format only or audiovisual with minimal text. This makes the entire communication process more enjoyable and increases the public's interest in learning about archaeology. To promote engagement and maximize reach, websites are easily linked to social media platforms with millions of users. This allows the flow of online traffic from the social media platforms to the websites.

In essence, by embracing digital platforms (websites and social media) and adopting innovative communication strategies, archaeologists can fulfill their duty of reaching and impressing the public, ensuring that the wonders of archaeology are accessible to all, leaving a lasting impact on the public's understanding of its collective heritage.

2.5 Open Archaeology

Open archaeology is concerned with making the various processes of knowledge production in archaeology transparent and visible to the public. The production cycle for archaeological knowledge involves a number of processes which include archaeological data acquisition planning, acquisition of archaeological data, analysis and interpretation of data (transformation from data to information) and final publication. It has often been the case that only the publication stage of this lengthy cycle is visible. And even with that, access is sometimes difficult because of the medium of communication which are the journals within which articles are published. Only academics at institutions that pay the journal publishers' subscription fees can access the majority of journal articles (Marwick et.al., 2017).

In this age of information where access to information is vital to building trust between institutions and the public, archaeology as a discipline has embraced strategies to promote transparency in its knowledge production processes. Some of these strategies include the establishment of digital repositories such as ARIADNEplus, Archaeology Data Service (ADS), Digital Archaeological Record (tDAR) and Open Context (McManamon *et al.* 2017; Heilen & Manney, 2023; Richards, 2017). Others also include open access websites for publications where individuals can download publications for free such as Research gate, academia.edu and so on.

Archaeology's embrace of transparency is inspired for example by the open science movement, which aims to make scientific findings, data, and publications accessible to all members of the public and professional community who are interested in learning more. Open communities foster the unrestricted use, reuse, and dissemination of various types of content, including software (Open Software), scholarly publications (Open Access), scientific and other data (Open Data), and creative works like images, videos, and artwork (Open Content) (Lake, 2012). Much of the concept behind these open techniques is shared by open archaeology, which is based on encouraging open access to and redistribution of the information produced in the discipline of archaeology (see Beck & Neylon, 2012).

2.5.1 Open Archaeology and Public engagement

Central to the concept of open archaeology is the democratic model of engagement in public archaeology. Promoting self-realization, improving people's lives, and inspiring introspection and creativity are the aims of involving the public in archaeology (see Merriman 2004:7). The democratic model therefore suggests that “everyone be encouraged to develop their own enthusiasm and grassroots interest in archaeology,” irrespective of background, occupation, or training (Holtorf 2007: 119). In this regard, advocates of open archaeology argue for the public

(both archaeologists and non-archaeologists) to have access not only to publications (archaeological information) but also the data from which archaeological knowledge is produced and the entire workflow within the archaeological knowledge production process.

Archaeological data is frequently complex and heterogeneous, containing information acquired from a variety of sources and methodologies. They document the location, characteristics, disposition, and context of material remains observed during field and laboratory analysis. They also include data on ethnoarchaeological studies, historical contexts, administrative topics, legal records, and computational data from analyses, experiments, and simulations (Heilen & Manney, 2023). Archaeological data must first be transformed from data to information, and then to knowledge, as they do not by themselves reveal much about the past. The data must be arranged, contextualized, and interpreted during this transformation process. By sharing the Metadata that describes the methods of observation, collection and analysis, subsequent re-users can understand the archaeological knowledge production process. This fosters communication between archaeologists and non-archaeologists, as well as the sharing of ideas and research. It also ensures that everyone contributes to and benefits from the knowledge of archaeology, regardless of their academic background (see Lake, 2012).

2.5.2 Open data, Data management and databases:

Openness in archaeology enhances archaeological data management. The main purpose of archaeological data management is to ensure easy access, retrieval, use, reuse and preservation over a period of time. For the purpose of this discussion archaeological data reuse will be our primary focus. The data life cycle in archaeology is relatively shorter, compared to other fields of study. As Heilen & Manney (2023) remark, “After data collection, the data life cycle usually ends prematurely, in “data death,” with the completion of a project.” This is to say that once a project

is completed and the necessary publications made, the data becomes useful only for archival purposes. Compared to a discipline like statistics, where raw data collected over long periods are often used in time series analysis to aid prediction, archaeology seldom reuses raw data from one project for another. This is especially true when the initial project yielded insights derived from the analysis of the data. At best, the data becomes useful for reference and teaching purposes, either in a museum or classroom settings.

Archaeological data however possess qualities, useful beyond the use required by the project for which they were collected. Secondary retrieval, which entails obtaining new information using novel tools or analytical methods, is one way of reusing primary data (see Wiley, 2016). Another reuse technique involves recontextualizing data, which involves analyzing existing data within new or broader frameworks to gain additional insights or challenge initial analyses. Realizing the potential of data reuse requires the development of digital databases.

Databases themselves are not new to the discipline of archaeology, the term became common in archaeology in the 1980s, replacing the earlier label “databanks” (Lohse, n.d; Moffet, 1985). Digital archaeological databases are digital collections of archaeological artifacts with their associated provenience information systematically organized and stored with the help of computer applications and programs that eases access and retrieval. They also include digitized first-hand information about an archaeological site collected by researchers working on a project. These can be likened to museum object collections and records stored in archives. The main goal of any digital archive or database aside long-term preservation, easy access and retrieval, is to promote data reuse (see Eitlejorg, 2000). For this goal to be realized, a number of issues must be resolved.

The first issue has to do with a mindset shift (on the part of Researchers after data collection) from data ownership to data stewardship. Considering the fact that the reward system

in academia is heavily dependent of the number of publications, researchers have traditionally viewed themselves as the sole proprietors of the dataset they work to collect. They therefore maintain exclusive access to the dataset for the purpose of publications. This data ownership mindset is viewed as obsolete in many fields today and they have been replaced by the mindset of data stewardship (Marwick & et.al., 2017; Hampton, et al. 2015). Data stewardship advocates argue that the data collected do not belong to the researcher, rather it belongs to the local communities and the greater society whose past is the subject of archaeological enquiries (Marwick & et.al., 2017). This makes the researcher a custodian or a steward rather than the owner of the data. Data stewardship mindset is the first step to ensuring that researchers are willing to share their data with digital archives or databases for the purpose of reusability, whose benefit can only accrue to the discipline.

The next thing is the issue of intellectual property, copyright issues and terms of use. Open access to data is more complicated compared to open access to publications, this is because data misuse or the disclosure of sensitive materials (such as personally identifiable information or comprehensive site information) can have a negative impact on individuals and cultural heritage (see Marwick & et.al., 2017). For this reason, digital repositories must have a clearly spelt out terms and conditions of use for archaeological data on their platform that ensures that laws on intellectual properties and copyright are not violated in the course of reusing these datasets. Creative Commons (CC) licenses for instance help in this regard because they allow copyright holders to retain their rights to the data while giving the public access to reuse and redistribute under certain conditions. These mechanisms ensure that credit is given where credit is due and that researchers are not harmed in the process contributing their data for the greater good of the public and the discipline at large.

Another area essential to making data reusable involves ensuring that re-users can understand and analyze the data at any time (now or in the future). This is where metadata is very important. It acts as the bridge between data use and reuse by providing information about the data in terms physical characteristics, provenience information and relevant details that give meaning to the dataset (see Cartney and Robertson 2000; Michener et al. 1997 as cited in Lohse, n.d; <https://ardc.edu.au/article/enabling-and-enhancing-the-discovery-and-reuse-of-data-with-metadata/>). This body of information about the data is critical because they inform re-users about the quality of the data. Before datasets could be reused, re-users must be sure that data collection processes conform to the discipline's standards, procedures and methodologies. This guarantees the quality of data and also the quality of insights derived from these datasets. The need for the creation or adoption of a standardized metadata structure that support data quality and longevity is one of the primary concerns of all digital repositories or databases (see Lohse, n.d).

In a nut shell, the journey towards establishing effective digital archives or databases for archaeological data involves addressing several critical issues to promote data reuse and ensure the integrity of the shared dataset. Transitioning from a mindset of data ownership to one of data stewardship is paramount, as it emphasizes the researcher's role as a custodian rather than sole proprietor of collected data. This shift enables greater willingness to share data, recognizing its broader societal and scholarly value beyond individual research projects. Addressing intellectual property, copyright, and terms of use is essential for safeguarding both the data and the rights of researchers. Establishing clear terms and conditions, potentially through mechanisms like Creative Commons licenses, balances accessibility with protection, ensuring proper attribution and preventing misuse. Furthermore, by offering vital contextual information about the dataset, metadata plays a critical role in promoting data reuse. Standardized metadata structures play a

critical role in guaranteeing data longevity, quality, and adherence to standards, which improves the dependability and usefulness of archived archeological data. Together, digital repositories can maximize the potential for data reuse, fostering collaboration, and advancing archaeological knowledge for the benefit of both present and future generations.

2.5.3 Benefits of open Archaeology and digital repositories

Openness in archaeological data management has great deal of benefits to researchers. Some of the benefits include easy access (for one's use and use of others), increased citation and visibility, increased collaboration and access to funding opportunities. By submitting one's data to digital repositories, researchers can be rest assured of the long-term curation of their dataset. This increases the extent to which the researcher and other researchers can use, extend and cite the dataset and its associated publications. Empirical evidence suggests higher citation advantage for papers with shared dataset compared to papers without shared dataset (see McKiernan, et al. 2016). This means the possibility of other researchers citing works with published datasets are higher than those works without published datasets. I surmise this to be down to the credibility such works possess as a result of the transparency that comes with open approaches. This ultimately results in other researchers having confidence in the works that result from research with shared datasets. The benefit can only accrue to the researchers behind these works and it manifests itself in their career advancement. The increased visibility that comes with open approaches, foster collaborations. Collaborations are essential in advancing knowledge, however getting people to collaborate with can prove to be an uphill task. By submitting their datasets to digital repositories, researchers can leverage on the ease with which other researchers can access their work. This could bring like-minded researchers together to work on projects that is of interest to them. Another area is funding opportunities. Funding agencies around the world are pursuing policies aimed at

encouraging data sharing. Some make it mandatory for researchers to provide a data management plans (which include data sharing for the purpose of reuse) that caters for the data life cycle before funding can be extended and reports accepted for publications (Baker and Duerr 2017; Heilen & Manney, 2023). Researchers are therefore encouraged to embrace open approaches in order to boost the chances of securing funding for their projects.

To sum up, embracing open approaches to archaeological data management offers numerous benefits for researchers, extending far beyond mere accessibility. By depositing data in digital repositories, researchers ensure the long-term curation of their datasets, fostering ease of access, extension, and citation by themselves and others. Empirical evidence underscores the significant citation advantage enjoyed by papers with shared datasets, highlighting the credibility and transparency inherent in open approaches. This not only enhances the visibility and impact of researchers' work but also contributes to career advancement. Moreover, open approaches facilitate increased collaboration opportunities, as the accessibility of shared datasets fosters connections between like-minded researchers and encourages joint projects. Additionally, with funding agencies increasingly emphasizing data sharing as a prerequisite for funding, embracing open approaches becomes imperative for researchers seeking to secure financial support for their projects.

2.6 Tying the concepts together

This research leverages on the concepts of popular and open archaeology to ease access to archaeological information in Ghana (see figure 2.6-1). The research does this first by using websites as avenues for communicating archaeological information to the general public. Websites afford archaeologists the opportunity to reach out to and target non-academic audiences when it comes to communicating archaeological information. By escaping the technicalities involved in

academic publications, archaeologists are able to tailor their communication to suit the expectations of non-academic audiences who are only looking creative and engaging ways of learning about the past. This guarantees that in communicating archaeological information, the general public who comprise the majority of the archaeologist's audience, is not left out.

Open Archaeology in the context of this research informs the decision to utilize online database systems as a means of managing archaeological data efficiently. Efficient Data management in this context refers to the management of archaeological data in a manner that eases access and ensures long term preservation. This has implication for collaboration, data reuse and storage management at the University of Ghana's Department of Archaeology and Heritage Studies. The department faces challenges with physical storage spaces for artifacts collected from multiple field projects, including those by faculty members, students and field schools. Online databases offer a solution by serving as digital storage units to supplement physical storage. This enables artifacts of no analytical value to be digitized and uploaded, freeing up space for new artifacts and helping the department manage the continuous influx of artifacts from projects especially field schools. Online databases also make it possible for researchers to easily access their uploaded datasets from anywhere and at any time with the help of the internet. This ensures that the researcher has unrestricted access to the datasets and could use and reuse it even after the completion of the project for which the datasets were collected. Other researchers can also have access to the datasets and subsequently team up with the custodians of the datasets for collaborations.

The research combines these two elements; websites and databases in an integrated manner to develop a single website that displays archaeological information about some selected archaeological sites (in a blog-post format) and at the same time provide access to archaeological

datasets from selected sites. This underscores the aim of this research which is to develop a web based, open-access archaeological database system that enhances data management (easy access, retrieval, preservation, use and reuse) and fosters information dissemination.

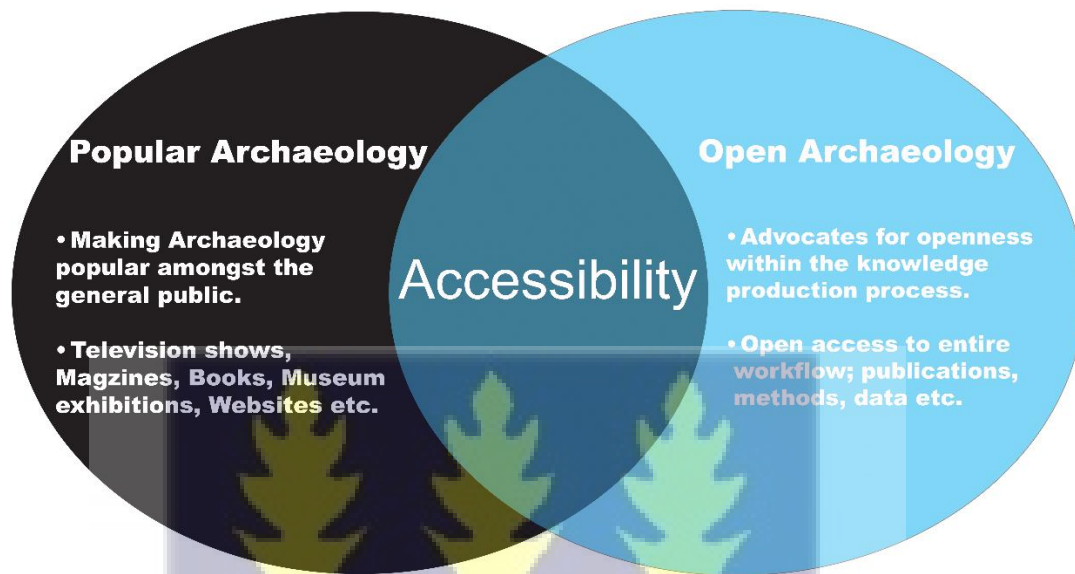


Figure 2.6- 1 Conceptual framework for the study

2.7 Case Studies of some digital repositories around the world

With advances in technology and the call for openness in research and knowledge production reaching a crescendo, digital archaeological repositories are becoming common in the world of archaeology. The repositories range from those dedicated to specific regions or jurisdictions, site types or specific topics. Others also focus on aggregating relevant information and data in databases that are hosted and accessible online. The Chaco Research Archive (CRA) is an example of a repository dedicated to a specific site called Chaco Canyon located in New Mexico, United States of America (US). Digital Archaeological Archive of Comparative Slavery (DAACS) is a repository dedicated to the topic of slavery. The repository is designed for the

purpose of carrying out comparative studies in slavery and the lives and experiences of enslaved people in the US and Caribbean.

OpenContext is a web-based repository that focuses on publishing archaeological as well as other science's datasets from all over the world. They focus more on archaeofaunal data (see McManamon et.al 2017). Others like the Digital Archaeological Record (tDAR), Archaeology Data Service (ADS) and ARIADNE portal are repositories dedicated to specific jurisdictions. The ADS is predominately United Kingdom (UK) based, tDAR on the other hand has a global scope but practically serve the needs of the North America (see McManamon et.al 2017). The ARIADNE portal (a europe based repository) is rather the more global repository because it integrates individual repositories across continents in an interoperable manner. They boast of providing access to over 3.5m rich data resources, encompassing the archaeology and heritage of 4 continents and over 40 countries (<https://www.ariadne-research-infrastructure.eu/what-is-the-ariadne-ri/>). The focus in this work will be on the Archaeology Data Service (ADS) and the Digital Archaeological Record (tDAR) as our case study.

2.7.1 The Archaeology Data Service (ADS)

The Archaeology Data Service (ADS) is the oldest archaeological data repository worldwide and the national digital data archive for archaeology and the historical environment in the United Kingdom (UK) (Richards, 2017). According to the ADS website, It was established on October 1st 1996 with the mission of preserving, cataloging and describing digital data generated in the course of archaeological research and to facilitate its reuse. To do this they follow a policy of active data management and curation to ensure the integrity, reliability and accessibility in perpetuity of all data entrusted to their care. The decision to create the ADS was made by a consortium of UK stakeholders dedicated to preserving the country's digital heritage data. Julian

Richard of the University of York led the collaboration, which included the Departments of Archaeology at the Universities of Birmingham, Bradford, Glasgow, Oxford, and Kent at Canterbury, Leicester, Newcastle, and other locations, as well as the Council for British Archaeology (figure 2.7-1).

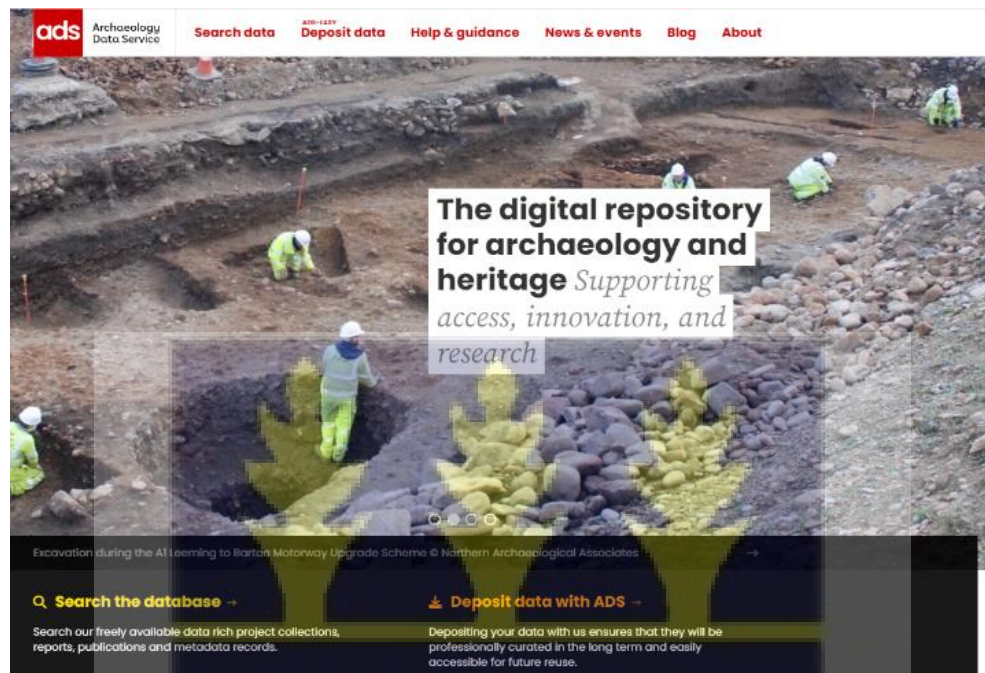


Figure 2.7- 1 Web interface for Archaeology Data Services (ADS) website.

The ADS currently host 1.4 million metadata records for the archaeology of the British Isles, over 65,000 unpublished fieldwork reports, and over 2500 data rich archives for research and fieldwork projects (<https://infraportal.org.uk/infrastructure/archaeology-data-service>). Access to these records are free, however, the terms and conditions for reuse are determined by the license that the data depositor has attached to the specific datasets. Each data collection page on their platform has a menu on the left that clearly displays the access license for each dataset as seen in the figure 2.7-2.

The ADS collections policy provide requirements for data depositors to meet before their datasets could be accepted. Archive level datasets must be deposited under the ADS Deposit License in order for them to be included in the ADS Collection. The ADS Deposit License which outlines the obligations and rights of data depositors, users, and the ADS itself, must be accepted by depositors in order for them to enter into a contract with the ADS. To ensure access and for the dataset's dissemination, the ADS works with depositors to agree on the terms and conditions of use. The deposited data is then subject to a non-exclusive license. Depositors are also given information regarding digital preservation, data management planning, and the deposit procedure which include the appropriate formats of the datasets. The ADS only accept (in exceptional circumstances) datasets with stringent restrictions. The ADS Collections Policy also establishes technical criteria, including acceptable file formats for the data they collect. Accepted file formats are often those that are widely acknowledged as appropriate for long-term digital preservation and accessibility including PDF, txt and rtf for text, Advanced Audio Coding (aac) and mp3 for audios, JPEG2000 and Portable Network Graphics (PNG) for images as well as Microsoft Excel, Microsoft Access and Structured Query Language (SQL) formats for databases. Aside the aforementioned, the ADS also accept data types such as 3D models, Virtual reality, GIS data, LIDAR and Satellite Imagery data among others (a detailed list can be found on their data requirement page at <https://archaeologydataservice.ac.uk/help-guidance/instructions-for-depositors/files-and-metadata/>).





Archaeology
Data Service

ADS Main Website

Back to Archives Search | Help

Digital Data from an Archaeological Evaluation and Open Area Excavation at Former Rolls Royce Light Alloy Foundry, Derby, 2023

Archaeological Research Services Ltd, 2024. <https://doi.org/10.5284/1118293>. [How to cite using this DOI](#)

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Resource identifiers

ADS Collection: 5714
DOI: <https://doi.org/10.5284/1118293>
[How to cite using this DOI](#)

Introduction

This collection comprises images, CAD, spreadsheet, and site records from a programme of archaeological work consisting of evaluation trenching and open area excavations by Archaeological Research Services Ltd (ARS) at the Former Rolls Royce Light Alloy Foundry, Derby, during January and February 2023.

The initial scheme of archaeological evaluation trenching was undertaken in January 2023, and the subsequent open area excavations which expanded on three of the trial trenches in January and February 2023. The purpose of the archaeological works was to record any archaeological remains that survived on the site in accordance with the Written Scheme of Investigation prepared for this work.

A Desk Based Assessment (DBA) was conducted of this site in 2022 in support of the planning application which revealed that this site had potential for demonstrating mid-19th century suburban development and growth alongside the iron foundry previously located on the site. Historic mapping shows that terraced housing, an inn, a pub and a chapel were located east of the iron foundry; such structures, if well preserved, would be of archaeological interest. As such, a condition was attached to the planning permission requiring submission of a Written Scheme of Investigation and the subsequent implementation of the archaeological works outlined.

The trial trenches had determined that much of the site was truncated and thus it was not necessary to further mitigate the inn, pub and chapel areas. However, a significant portion of the terraced housing remained and so Trenches 4, 9, and 12 were subject to further mitigation as Areas A, B, and C (respectively). Area A revealed a well-preserved 19th century midden privy but the northern part of area was significantly damaged by later 20th century development. Area B revealed two staircases associated with probable terraced houses and a 19th century sewer. Area C contained the footprint of five 19th century terraced houses.



South facing shot of Area B (2 x 2m scale)

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REGISTRY OF RESEARCH DATA REPOSITORIES

<http://doi.org/10.17616/R3MW23>

Archaeology Data Service



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CORE
TRUST
SEAL

Figure 2.7- 2 A sampled project archive on the ADS website.

(Retrieved from <https://archaeologydataservice.ac.uk/archives/view/1005714/>)

One important feature of the ADS is how they have dealt with the grey literature. The grey literature refers to the various literature produced or published outside traditional academic

publishing and distribution channels (<https://www.lib.sfu.ca/help/research-assistance/format-type/grey-literature>). They include CRM project reports, government reports, dissertations and theses. Due to archaeology's role in modern development as a pre-requisite for construction projects, the flow of grey literature has outpaced the capacity of traditional academic publication channels (Evans, 2013). This has resulted in an avalanche of unpublished fieldwork reports which are difficult to track down and access since copies are issued in limited quantities to clients (see Richards J. D., 2017; Bradley 2006). This has impacted the work of academics and made their teaching archaic because it does not take into account new discoveries trapped in the grey literature (see Bradley 2006 to be cited).

The ADS through its OASIS project have developed a mechanism for making grey literature available to researchers. OASIS is an online data collection form that allows for the recording of information about any fieldwork in accordance with approved standards. The form also allows users to upload copies of their reports with associated metadata. Once the forms are vetted and approved by the appropriate regional or national agencies, DOIs (Digital Object Identifiers) are assigned to the reports and the reports are subsequently published in the ADS library of unpublished fieldwork reports. As of February 2017, 40,816 records were available online offering a vital resource for archaeological research and this number is increasing at a rate of about 200 reports each month (Richards J. D., 2017). This mechanism has ensured that grey literature remain accessible and reusable to researchers and academics.

When it comes to funding and sustainability, ADS run a business model that ensures it generates enough revenue to sustain itself. The ADS generates funds from deposit fees, research and development, consultancy and curatorial services it provides to individuals and organizations. It does not receive external grant, aid or support and is entirely self-sufficient. The European

Commission and Historic England contribute significantly to the organization's yearly income of over 75% through project financing and research and development awards (Richards J. D., 2017). The ADS over the course of its existence has proved to be an invaluable resource to researchers.

A study by the JISC (Joint Information Systems Committee) and the Research Information Network (RIN 2011) to compare data reuse across various fields found that of all the archaeologists interviewed on the impact of ADS on their work: 94% said that the data held by ADS were important for their research, 84% said that ADS had an impact on data sharing, 79% said that ADS reduced the time required for data access and processing, 51% said that ADS provided new intellectual opportunities, and 56% said that ADS facilitated new types of research. The ADS outperformed rival repositories in various disciplines, including atmospheric research and social sciences (see Richards J. D., 2017 for details). This underscores the significance of the ADS in United Kingdom archaeology.

2.7.2 The Digital Archaeological Record (tDAR)

tDAR is a United States (US) based digital repository for storing, accessing and reusing archaeological datasets and research resources produced by researchers worldwide. According to (McManamon et.al 2017), it was born from a National Science Foundation (NSF) funded workshop recommendation in 2004, that sought to develop a prototype information infrastructure that facilitated synthetic and comparative research. The Andrew W. Mellon Foundation funded the entire development process (from proposal planning to actual implementation) of tDAR. The project had Keith Kintigh (Arizona State University), Tim Kohler (Washington State University), Fred Limp (University of Arkansas), Dean Snow (Pennsylvania State University), Jeff Altschul (SRI Foundation), John Howard (ASU Associate University Librarian), and Julian Richards (ADS and University of York) as Principal Investigators who helped develop the proposal which

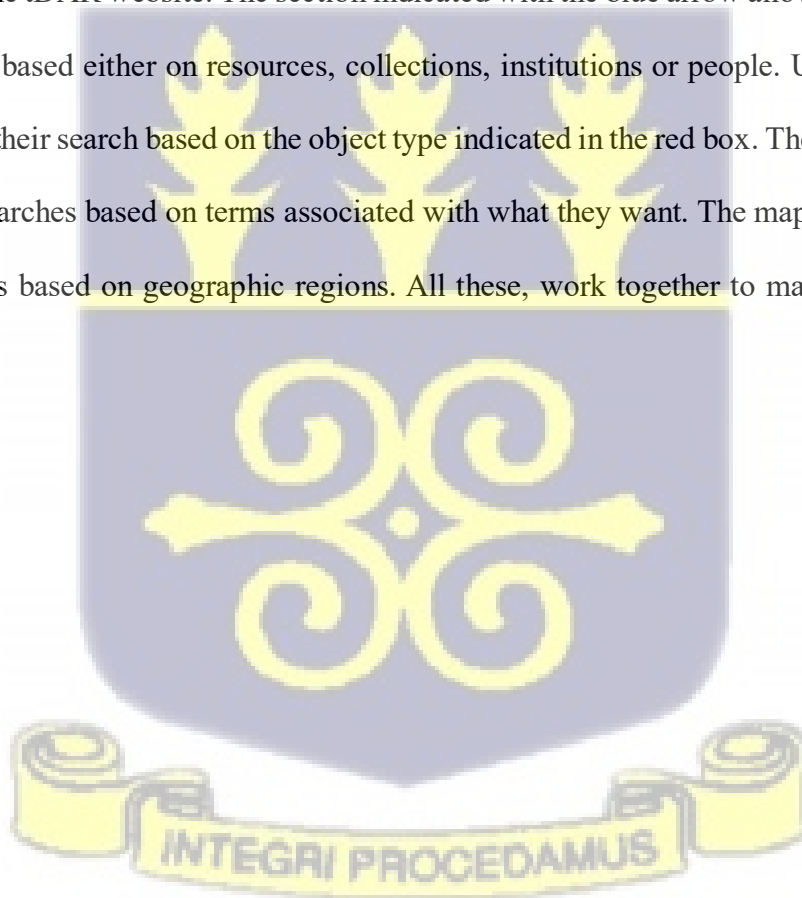
included the repository and an organization to support it in 2007. The Mellon foundation grant supported the establishment of Digital Antiquity at Arizona State University (ASU) to oversee the development and management of tDAR. tDAR became an operational repository in 2010 (McManamon et.al 2017). Figure 2.7-3 below shows the homepage of tDAR's website.

The data in tDAR come from a variety of contributors, including archaeologists, research institutions, universities, government agencies, cultural resource management firms, and other organizations involved in archaeological and historical research. The scope of the repository is international, though most of the data are from North America. Digital Antiquity, the organization behind tDAR, has established agreements with entities outside the United States, such as the Field Acquired Information Management Systems Project of Australia, to enhance its global reach (McManamon et.al 2017).



Figure 2.7- 3 tDAR home page. (retrieved from <https://core.tdar.org/>)

As of December 2016, tDAR held more than 383,000 records of archaeological reports and other documents (of which over 9,800 included a digital full text file), 20,000 photographs, 1,100 data sets, 450 geographical data sets, and 150 landscape (lidar) or 3D object scan files (McManamon et.al 2017). tDAR now houses 411,000 resources, with 17,500 documents, 20,500 image, 2000 datasets, and 470 GIS files (<https://shesc.asu.edu/centers/digital-antiquity>). The tDAR platform offers access to its content through a user-friendly web interface, featuring both basic and advanced search capabilities, including spatial search options. Figure 2.7-4 shows the search page on the tDAR website. The section indicated with the blue arrow allows users to browse their collections based either on resources, collections, institutions or people. Users are also able to narrow down their search based on the object type indicated in the red box. The black box allows users to make searches based on terms associated with what they want. The map area allows users to make searches based on geographic regions. All these, work together to make searching easy for users.



tDAR The Digital Archaeological Record
A SERVICE OF DIGITAL ANTIQUITY

LOG IN OR SIGN UP

Search...

ABOUT SEARCH USING TDAR UPLOAD NEWS SHA SAA GIVE MY ACCOUNT

Search tDAR

Resource Collection Institution **Person** Search

Choose Search Terms

All Fields

Narrow Your Search

Object Type

☐ Document	☐ Collection	☐ GIS	☐ Data Integration
☒ Dataset	☐ Coding Sheet	☐ 3D & Sensory Data	
☐ Project	☐ Image	☐ Ontology	

Limit by geographic region:

UNITED STATES

Sorting Options and Submit

Sort: Relevance

Figure 2.7- 4 The search page on tDAR website. (Retrieved from <https://core.tdar.org/>)

The content is indexed by major search engines, enhancing its discoverability. According to (McManamon et.al 2017), with the exception of legally protected confidential data and temporarily embargoed data, all content is freely accessible to registered tDAR users. Metadata records are publicly available without requiring registration. Site locations that are legally protected are obscured in tDAR's geographical search and display. Data not labeled as confidential

or embargoed by their contributors can be reused, redistributed, or modified, provided appropriate credit is given to the author(s) or data creator(s), proper citation is provided, and any modifications are indicated (under the Creative Commons Attribution 3.0 Unported License). Additionally, all data downloads include suggested citation information, facilitating proper attribution (McManamon et.al 2017). Users must first register before enjoying the privileges of downloading, bookmarking and contributing resources to the platform.

When it comes to data deposition, tDAR accepts data in the form of documents, datasets, geospatial data, and images in both 2D and 3D formats. tDAR also accepts both newly generated and legacy data, providing templates that guides contributors through the upload process. The platform uses technical, descriptive, administrative, and semantic metadata to guarantee complete documentation of digital files. Data preservation, discovery, and scientific reuse all depend on the information captured by metadata standards like Dublin Core, MODS, and PREMIS used on the platform (see McManamon et.al 2017). Furthermore, tDAR assigns Digital Object Identifiers (DOIs) and persistent URLs to all records, ensuring their permanent citation and location. This allows credit to be given to contributors of the records.

Funding and sustainability are critical to the management of digital repositories. Digital antiquity relies on a combination of funding sources including service fees, grants, and partnerships to support tDAR. Users are charged for uploading and storing data, as well as for various curatorial services provided by Digital Antiquity. Grants from institutions and funding agencies, which are often aimed at specific projects or initiatives, also contribute to operational funding. Additionally, partnerships with other institutions or governmental agencies may include financial support for the management and preservation of digital records within tDAR. These different streams of income help to sustain tDAR (McManamon et al., 2017).

Throughout its existence, users have reportedly found tDAR to be useful for a variety of purposes, such as conducting background research, managing access to information, and preserving data. tDAR has also been beneficial to nonspecialists, who have used the repository for personal research on family and local histories, locating researchers, and gathering documents. Additionally, the repository facilitates ease of data entry and organization through its project and collection features. The feedback from users suggests that tDAR is a robust resource for both the professional community and the public in managing and accessing archaeological data (see McManamon et al., 2017).

2.7.3 The Case of Ghana:

Over the years, the Department of Archaeology and Heritage Studies has strived to reorient itself in a bid to keep up with current trends in the practice of archaeology worldwide. The area of digital repositories is one where the department has made great strides. The establishment of the Leventis Digital Resource Centre (LDRC) by Professor Kodzo Gavua in 2008, at the department is a testament to the department's commitment in the area of digitization for the purpose of improving access to archaeological resources. The Centre's work encompasses research, documentation and the digitization of cultural heritage to support archival preservation and enhance accessibility. The Centre has its own website where information about its operations and projects can be found. In managing its collections, the Centre utilizes both physical means (primarily computer hard-drives) and cloud-based platforms (including CollectiveAccess, Imagine futures Archives and so on). Majority of the Centre's collections are stored and managed via computer hard-drives with total storage capacity in excess of ten (10) terabyte. The format for the collection ranges from images, videos, audio records, scanned documents among others. As far as access is concerned the Centre has robust metadata schema that is fine-tuned based on the demands

of every project and guarantees that depositors' intellectual property rights are not violated (Jacob Nii Marley, personal communication, 4th December 2024).

Individual members of the department have also contributed to the course of making archaeological resources easily accessible over the years. The very first attempt can be traced all the way to the 1960s and 1970s when Oliver Davies's Ghana field notes were published. The books which are in four parts highlight in an alphabetical order, information about various archaeological sites surveyed by Oliver Davies over the course of his stay in Ghana (1951-1966). Part one covers sites from the Volta Region, referred to as Togoland, spanning 80 pages. Part two encompasses sites from Northern Ghana, formerly the Northern Territories, across 178 pages. Part three focuses on sites from the Ashanti Region, covering the area of Ashanti pre-Independence, in 110 pages. Lastly, part four delves into sites from southern Ghana, including coastal areas and the eastern region, across 229 pages (see Asare, 2021).

Davies was part of a team of archaeologists who worked on the Volta River Basin Project to salvage archaeological materials from archaeological sites set to be destroyed by the Akosombo Dam construction. Forty-eight (48) sites were excavated in all from the northern and volta regions of Ghana. Davies extended this by traveling across the length and breadth of the country, surveying and making notes of surface materials on sites he encountered (see Anquandah et. al 2014; Asare, 2021). The notes were compiled together with surveys by other researchers and published in 1970 (Asare, 2021). The various information include the site's discription, location, coordinates, artifacts found and year of dicoverly.

The books have proven to be an invaluable asset to the department, it continues to serve the needs of students and faculty members looking for confirmation of sites mentioned in other

texts (Asare, 2021). It acts as a one stop shop for information about almost all archaeological sites found in Ghana.

Benard Eugene Akuamoah took this endeavor a step further in 2008 when he integrated computer systems to make archaeological knowledge easily accessible. Akuamoah unlike Davies focused on artifact information rather than archaeological site information. The main goal of his work was to design a pottery database using the Anna Craven Pottery Collection as a sample of study. The Anna Craven³ pottery collection is an ethnographic collection of different types of pots collected from the then three northern regions of Ghana (Upper East, Upper West and the Northern Region) in 1964 and 2007 (Akuamoah, 2008). In the end, Akuamoah designed three separate interfaces; the Log-in interface with text-fields for credentials such as username and password. This was the first compartment one sees when the database is opened for the first time. The next interface was the Administrative interface which comprise of text-fields for a pot's background information and an image-box for uploading an image of the said pot. The background information includes Pot ID, Name of Pot, Region Collected, Year Collected, Ethnicity of Pot, Description of Pot and the function of the pot. The User interface was similar in design to the Administrative interface except for editability. The Administrative interface was editable so it allowed for admins to input information, the user interface on the other hand was not editable so users could only view information. The database interfaces were designed using Microsoft Visual Basic 6.0 which is a microsoft programming language designed to help users develop Graphic User Interface (GUI) based desktop applications, mobile applications and web services (<https://www.shiksha.com/online-courses/what-is-visual-basic-st619-tg409>). Akuamoah's work

³ Ann Craven is an anthropologist and an independent researcher who toured Northern Ghana to collect Pottery in 1964 and 2007. Her pottery collection is currently on display at the Museum of Archaeology at the Department of Archaeology and Heritage Studies, University of Ghana.

serves as a model for how computer programs could be used in the area of data management to ensure easy access to archaeological data.

Asare (2021) has also contributed to this endeavour with his work on Inventorizing selected archaeological and cultural heritage sites in Ghana. Kelvin Asare in 2021 used computer softwares such as ArchGIS, Microsoft Word and Excel to document, annotate, profile, graphically represent and develop an inventory of selected archaeological and cultural heritage sites in Ghana. The archaeological sites included Kormantse, Osu Marine Drive, Begho, Banda and Koma Land. The cultural heritage sites included Old Elmina and Elmina Castle, Shai Hills Resource Reserve, The Tongo-Tengzug Cultural Landscape and the Larabanga Mosque. The work also includes a digital profile of 288 sites from the Ghana Field Notes presented in Microsoft Excel spreadsheet and a GIS map (Asare, 2021).

Additionally, Asare (2021) extends this effort by evaluating the present condition of these sites, ranging from being either destroyed or intact. This represents the first attempt at bringing the Ghana Field Notes back to life in the 21st century since it was published in 1960s and 1970s. In the end, Asare (2021) came out with a Microsoft Excel spreadsheet containing information that profiles the archaeological and cultural heritage sites mentioned earlier. This is complimented by a digital map as visual representation. The map is accessible via <https://www.google.com/maps/d/edit?mid=1c7BN92xNXRIW05KU3drMrYqb53qJfud&usp=sharing>. The spreadsheet serves as a template to guide future researchers in profiling and inventorizing archaeological and cultural heritage sites in Ghana.

Other efforts outside of the literature include efforts by researchers who have worked on sites in Ghana and have uploaded information about the sites onto websites to facilitate access. “Banda Thru Time” is a repository dedicated to the Banda area in Ghana and was put together by

Ann Stahl of the University of Victoria, British Columbia, Canada. The resources in the repository include texts of oral history and documents pertaining to the history of people in the Banda area. Others include picture and video footages from the archives of scholars who have worked in the area.

The Frederikssted Plantation Archaeology (FP Archaeology) website is one dedicated to the Frederikssted Plantation site at Dodowa, Accra and was put together by David Akwasi Mensah Abrampah of the University of Ghana. The website provides information about the Danish plantation system in Dodowa and its ramifications. It also provides information about key findings from the research and their implications to life on the plantation. The website serves as an abridged version of his thesis entitled “Frederikssted: Archaeology of Danish Plantation in Dodowa, Ghana”⁴, and is written in plain and simple language, complimented by adequate images to enhance readability and understandability of the general public. Aside this, the site has a section dedicated to the methodologies employed by researchers during the research which is essential for other researchers working in the area.

These efforts underscore a collective commitment to enhancing the accessibility of archaeological information in Ghana. Overall, the disparate efforts do not seem to be in harmony with each other, with the exception of Asare's (2021) contribution, which expands and enhances the Oliver Davies field notes. This research ties it all together by incorporating and drawing on inspirations from the ideas behind the efforts of David Abrampah, Ann Stahl, Oliver Davies, Asare (2021) and Akuamoah (2008)'s efforts, in a way that leads to the development of a prototype website that can serve as a repository for archaeological resources in Ghana. This can then be

⁴ Abrampah, D. A. M. (2017). *Frederikssted: Archaeology of Danish Plantation in Dodowa, Ghana* (Unpublished Ph.D. dissertation, La Trobe University).

expanded by the department and relevant stakeholders on a larger scale to reflect and stand as a national repository for Ghanaian archaeology.

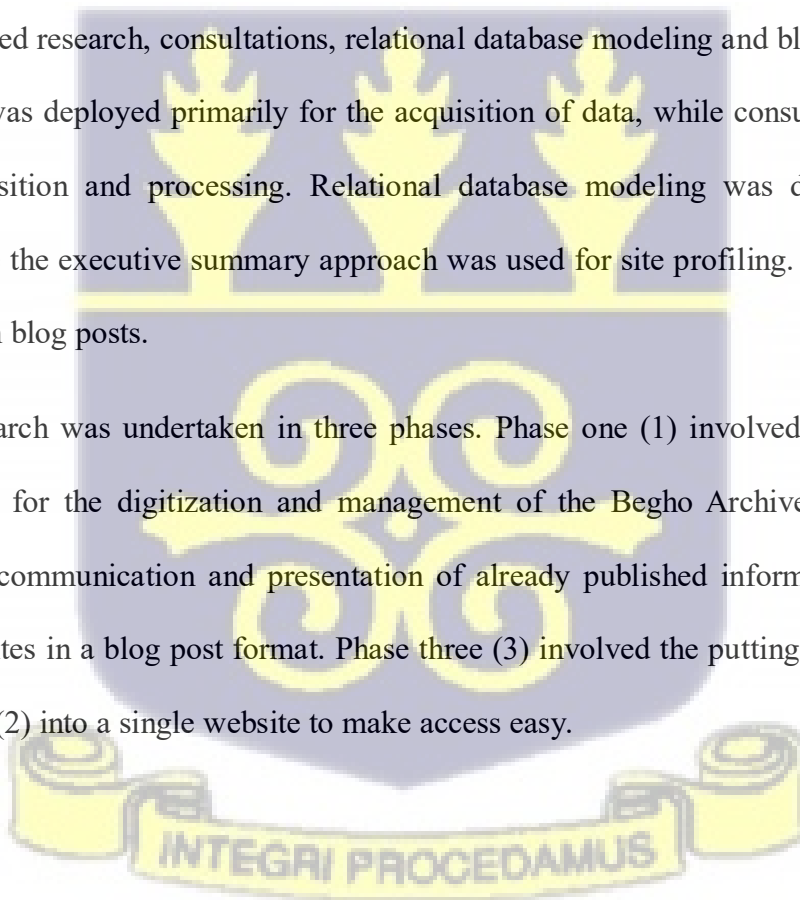
CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter discusses the various methods and techniques used in the acquisition, processing and presentation of archaeological data and information for this work. The methods include desk-based research, consultations, relational database modeling and blogging. The desk-based research was deployed primarily for the acquisition of data, while consultations helped in both data acquisition and processing. Relational database modeling was deployed for data processing while the executive summary approach was used for site profiling. Site profiles were then presented in blog posts.

The research was undertaken in three phases. Phase one (1) involved the creation of a database system for the digitization and management of the Begho Archives. Phase two (2) involved the re-communication and presentation of already published information on selected archaeological sites in a blog post format. Phase three (3) involved the putting together of phase one (1) and two (2) into a single website to make access easy.



3.2 Sample sites and Selection Criteria

In all, two (2) archaeological sites and a culture complex⁵ were selected for profiling. They included Kintampo Complex, Daboya in Northern Ghana and Dixcove in the Western Region. The idea is to have a sample that reflects the two broad periods in Ghana's archaeology, namely pre-Atlantic and Atlantic periods. The pre-Atlantic period in Ghana refers to the period before European contact via the Atlantic Ocean.

In the context of this work, the pre-Atlantic period was conveniently broken into two; Stone Age and Iron Age. The late Stone Age is characterized by the early stages of sedentism in Ghana and the site selected was the Kintampo Complex. The Iron Age is characterized by the emergence of complex societies in Ghana and the site selected is Daboya.

The historical sites in this context refer to the period of European contact with the Guinea Coast. The southern part of Ghana is mainly the areas that European contact is most evident. These areas are characterized by many forts and castles dotted around the landscape from the east to the west. When it comes to European interactions in Ghana, the central regions have frequently been the focus of attention (see Apoh, 2020). The eastern and western regions are always found on the fringes of the conversation, and the desire to bring sites in these regions to the mainstream, influenced the choosing of Dixcove as a site to profile. The Dixcove site was a key commercial site during the Atlantic trade era, where the British and Dutch engaged in trade with the local people (see Biveridge, 2014).

⁵ In the context of this work, a culture complex is defined as a recurring pattern of material culture or assemblages that characterizes a group of people in time and space (see Johnson, 2020; Human Relations Area Files, Inc. , 2001).

3.3 Desk-based Research:

Desk-based research involves finding data via indirect sources, often via the internet, without having direct contact with people (Bassot, 2022). Desk-based research involves the review of existing publications and literature for the purpose of data collection, in relation to a specific topic. It also includes the review of websites and audiovisuals such as Television programs, web log (blogs) and video logs (vlogs) for the purpose of data collection.

One of the main advantages of this type of research is that it helps researchers to collect data which otherwise would have been practically impossible to collect. In the course of data collection, physical conditions such as pandemics (Covid-19), topic sensitivity, lack of funding, lack of corporation on the part of respondents and time constraints, may hinder the collection of data.

Desk-based research allows researchers to overcome these challenges enroute to finding the answers they seek. One significant feature of data is its potential for secondary usage, in that, datasets collected for one study may be useful in another study when it is reconceptualized and looked at from a different perspective. This helps researchers to reshape and re-evaluate past research to arrive at new and deeper conclusions on a subject matter (see Bassot, 2022; Wylie, 2016).

The primary drawback of this kind of research is data quality. Desk-based research exposes the study to problems with quality. The entire research suffers if the data in question is of low quality because of the substantial reliance on secondary applications of the data.

In the context of this work, desk-based research was deployed for both primary data collection and cross-referencing of already gathered data and published information. For primary

data collection, it was used to gather already published information on Kintampo complex, Daboya, and Dixcove. This data was then transformed, recommunicated and re-presented in a blog post format and published on the developed website. It was imperative to use already published works rather than beginning a fresh study due to time constraints and the work's fourth objective of recommunicating scholarly articles into easily understood information intended at piquing the attention of non-academic audiences. This approach helped in narrowing the focus of the research on the techniques involved in the information transformation process.

Working with the Begho archives, this approach was deployed as a means of cross-referencing the datasets sampled from the archive with published information. As previously explained, the Begho archives contain a variety of data collected during a five-decade period (1970-2024) by many scholars. Some of the datasets have lost their contextual information due to the length of time, particularly those gathered as part of the West Africa Trade Project ⁶(1970–1979) and therefore secondary usage becomes difficult. In this case a review of publications done by Merrick Posnansky (1972, 1979, 2010 and 2015), Leonard B. Crossland (1973), Emmanuel Agorsah (1973 and 1976), and James Anquandah (1993 and 1981) was essential in filling in gaps caused by time lapse. This is because the publications made use of the contextual information gathered at the time.

Also, with respect to the data collected in 2020 by Daniel Kumah, his doctoral thesis was reviewed as a way of filling in gaps arising from time induced data loss. In the absence of these

⁶ The West African Trade Project (WATP) was a project initiated by Merrick Posnansky in 1970 at the Department of Archaeology, University of Ghana, Legon. The main purpose of the project was to investigate activities of early trade in Ghana. Begho was the site that was selected for this research as it had evidence of early trade with the Niger Bend area during the Trans Saharan trade era. Secondly, it was stated that the department needed a site where archaeological field schools could be organized in order to train students (Posnansky and Walz 2010).

publications, working with the Begho archives would have been difficult. To sum up, desk-based research was significant to this research because it was not only a means of data acquisition but also a way of cross-referencing and filling in gaps in datasets created by years of deterioration.

3.4. Consultation:

In the context of this work, consultation is defined as the act of exchanging information and opinions with experts about a subject matter in order to reach a better understanding to aid decision making (see Caplan, 1970). Consultation played a key role in this research especially with regards to the design of the database schema.

A database schema refers to a conceptual framework that explains how various datasets are organized, structured, and related within a database system. The schema is essential because it acts as the blueprint based on which the database will be designed and built. Through consultation, expert advice was sought with regard to selecting the appropriate database model suitable for modelling archaeological data and information.

As an archaeologist under training, I have a fair idea of the nature of archaeological information and how they relate with one another, however, this endeavour demanded a comprehensive understanding of the aforementioned theme hence the need to consult. I engaged colleagues and faculty members from the University of Ghana's Department of Archaeology and Heritage Studies. Some of these engagements took place in an informal forum where I had about five graduate student colleagues share their opinion on the nuances of the aforementioned themes.

Others involved one-on-one discussions with archaeologists including Daniel Kumah⁷ (Ph.D), Albert Larbi⁸ and Mr. Kelvin Asare⁹ just to mention a few. The nature of these engagements was largely informal and impromptu. The impromptu and informal nature did not affect the quality of feedback I got since the participants demonstrated command and mastery over the subject matter.

The next phase of consultation was in relation to the appropriate database model suitable for modelling the archaeological information for the work. There are several database models available for designing and building databases. Some of these include, hierarchic, network, relational and object-oriented database models. These individual models have their own pros and cons as well as their requirements, for this reason, choosing a suitable model required expert advice. I therefore consulted two experts; a fellow from the University of Ghana's Computer Science Department called Mr. Prince Ofori (a Teaching Assistant) and a friend of mine called Alexander Larrey who is a computer programmer (Freelance). Based on their recommendations, I made the decision to adopt the relational database model for the implementation of this work.

To sum up, Consultation as a method proved invaluable to this research because it helped in enhancing my understanding of the nature of archaeological data and information and in making technical decisions required in carrying out this research.

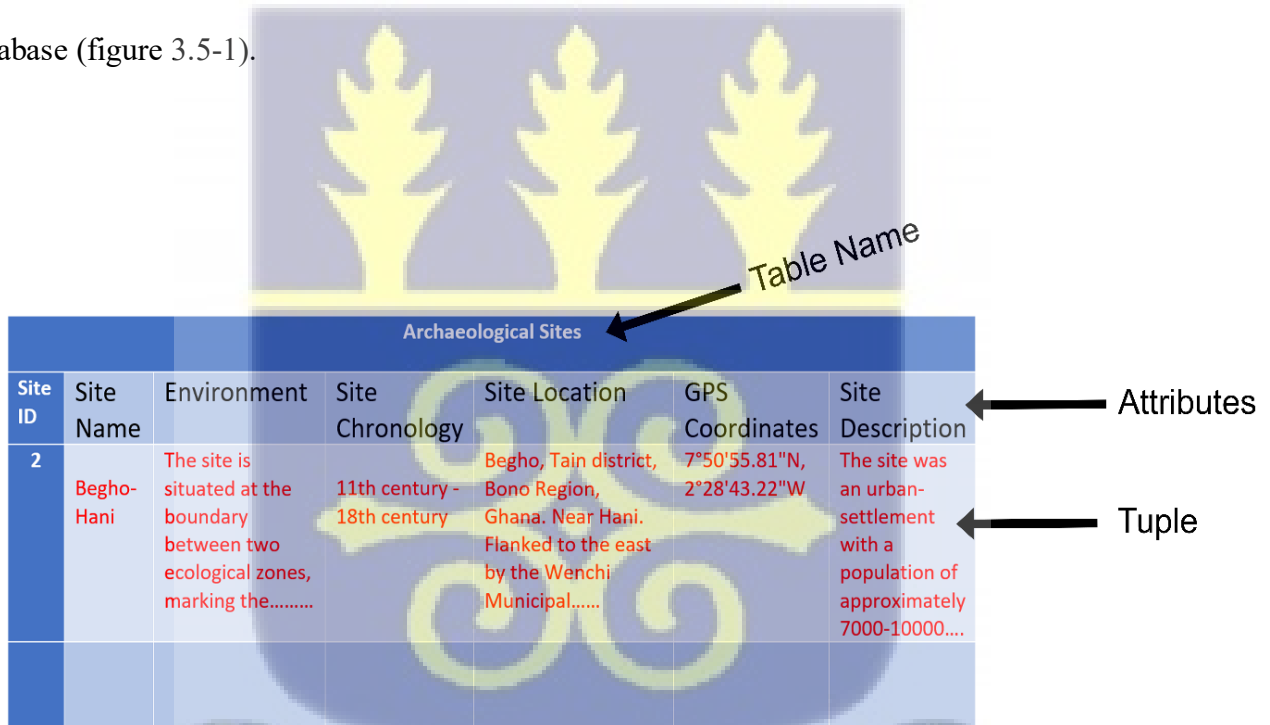
⁷ Dr. Daniel Kumah is a lecturer of Archaeology at the Department of Archaeology and Heritage Studies, University of Ghana.

⁸ Mr Albert Larbi is a PhD candidate in Year 2 of the Museums and Heritage Studies Programme at the Department of Archaeology and Heritage Studies, University of Ghana.

⁹ Mr Kelvin Asare is PhD Candidate at the University of Louisiana. He worked on using GIS as a tool in inventorizing cultural and Archaeological sites in Ghana for his Master's Degree.

3.5 Relational Database Model:

The relational database model was chosen as the ideal model for implementing the designed database schema. This approach was developed by Ted Codd in the 1970s and it became the most commonly used approach to database modelling by the 1990s (Garcia-Molina, Ullman, & Widom, 2009). The relational database model is a model that uses two-dimensional tables with rows and columns to store and organize data (Conger, 2012; Rolland, 1998). The individual tables are then linked together based on their relationships with one another. The columns within the tables are called attributes and they are the parameters that characterizes each table. The rows on the other hand are called tuples and they are the actual data or information captured within the database (figure 3.5-1).



Archaeological Sites						
Site ID	Site Name	Environment	Site Chronology	Site Location	GPS Coordinates	Site Description
2	Begho-Hani	The site is situated at the boundary between two ecological zones, marking the.....	11th century - 18th century	Begho, Tain district, Bono Region, Ghana. Near Hani. Flanked to the east by the Wenchi Municipal.....	7°50'55.81"N, 2°28'43.22"W	The site was an urban-settlement with a population of approximately 7000-10000....

Figure 3.5- 1 Table for storing Archaeological site information.

The rationale behind choosing this model is that it is consistent with the nature of archaeological site information. Archaeological site information is such that one site has different sets of information associated with it (for instance, archival information, ethnographic information, archaeological information and so on). These sets of information are also related in such a way

that they combine well together to provide a comprehensive understanding of the said archaeological site. The Relational model makes it possible to capture and model these series of relationships within a database system and allows such a body of information to be easily stored, structured, understood and queried using straightforward programming command. Aside this, the Relational database model offers more control over redundancy; a situation where the same data is stored multiple times, eliminates duplications and inconsistencies within information stored (Escobar, 2013).

The research was undertaken in three main phases; phase one (1), phase two (2) and phase three (3).

3.6 Phase one (1): Database design and implementation

In completing the task for this Phase, the work was segmented into four stages; Gathering and processing contextual information, Database schema design/modelling, schema implementation and Data preparation and uploads.

3.6.1 Stage one (1): Gathering and processing contextual information

This stage involved the planning and determination of the various contextual information needed to develop the database. Through consultations, I was able to outline some contextual information required by the database and with that, I examined the Begho archives to assess its nature, current condition and how best to model them within the database system.

This stage presented the first big challenge of the entire project. The Begho archives was made up solely of data collected under the West Africa Trade Project (WATP) which lasted for about a decade (1970-1979). A time gap of about fifty (50) years had led to the deterioration of the data and some of its underlying information. Other factors such as scarce publications coupled

together with the scatter of project data across Europe, America and Africa made it difficult to work with the archive in its present condition (Kumah 2022). This is because getting underlying information about the site that gives context and meaning to the data would have been difficult due to the over Fifty (50) years gap. To resolve this, I extended the archive to include datasets collected by Daniel Kumah during his research in the area for his Doctoral studies (2018-2022). The underlying information gathered as part of the research are more current and up to date compared to those collected under the WATP. This move ensured that the Begho archive is not static but dynamic in terms of it being furnished with newer datasets from recent works, including field schools the Department of Archaeology and Heritage Studies organize annually.

At the end of this stage, I had worked out three levels of information needed for the database and they include; Archaeological site level information, Sub-site level Information and Project level Information. The Archaeological site level information encompass relevant information about Begho in general. It includes site name, site location, the nature of environment, site description, chronology and so on. The sub-site level information included information about the various quarters (loci) within the Begho archaeological site where excavations actually took place.

The project level information on the other hand describes everything there is to know about the projects that have taken place within the site. They include information such as project name, duration, methodologies, researchers, findings and the data collected. To gather this information, I reviewed survey and excavation reports of Daniel Kumah in 2018 and 2020 respectively. I also developed forms to help me collect data during the review process. These can be seen in the figures below (figures 3.6-1 – 3.6-3).

2018 Survey information about archaeological sites in Begho

Year:

Researcher:

Methodology:

Survey technique:

Surface configurations:

Findings/Comments:

Site Name:

Site Description:

Site Location:

Site type:

Dates:

GPS coordinates:

Project name:

NB:
The GPS coordinates for the temporary benchmark (TBM) should be taken as the coordinate for the site.

Figure 3.6- 1 Survey form

Metadata for Artifacts

Figure 1

- **Object Name:**
- **Object Description:**
- **Typology:**
- **Chronology:**
- **Site of origin:**
- **Excavator's Name:**
- **Excavation Year:**
- **Comments:**

Figure 3.6- 2 Artifact form

Excavation Information

- **Excavation Date:** |
- **Excavation Duration:**
- **Excavation Location:**
- **Excavation GPS Coordinates:**
- **Excavation Procedure:**
- **Artifacts Recovered:**



Figure 3.6- 3 Excavation form

All these levels of information are interconnected and work together to provide a comprehensive profiling and understanding of any archaeological site. Armed with these requirements, I moved on to designing the database Schema (blueprint).

3.6.2 Stage two (2): Database Schema Design

This stage involved the designing of the database schema which can be thought of as the blueprint upon which the database will be built. It is a simple conceptual map of the internal structure of a database and it tells us the way in which data is organized and stored within the database. This can be seen in the diagram below (figure 3.6-4).



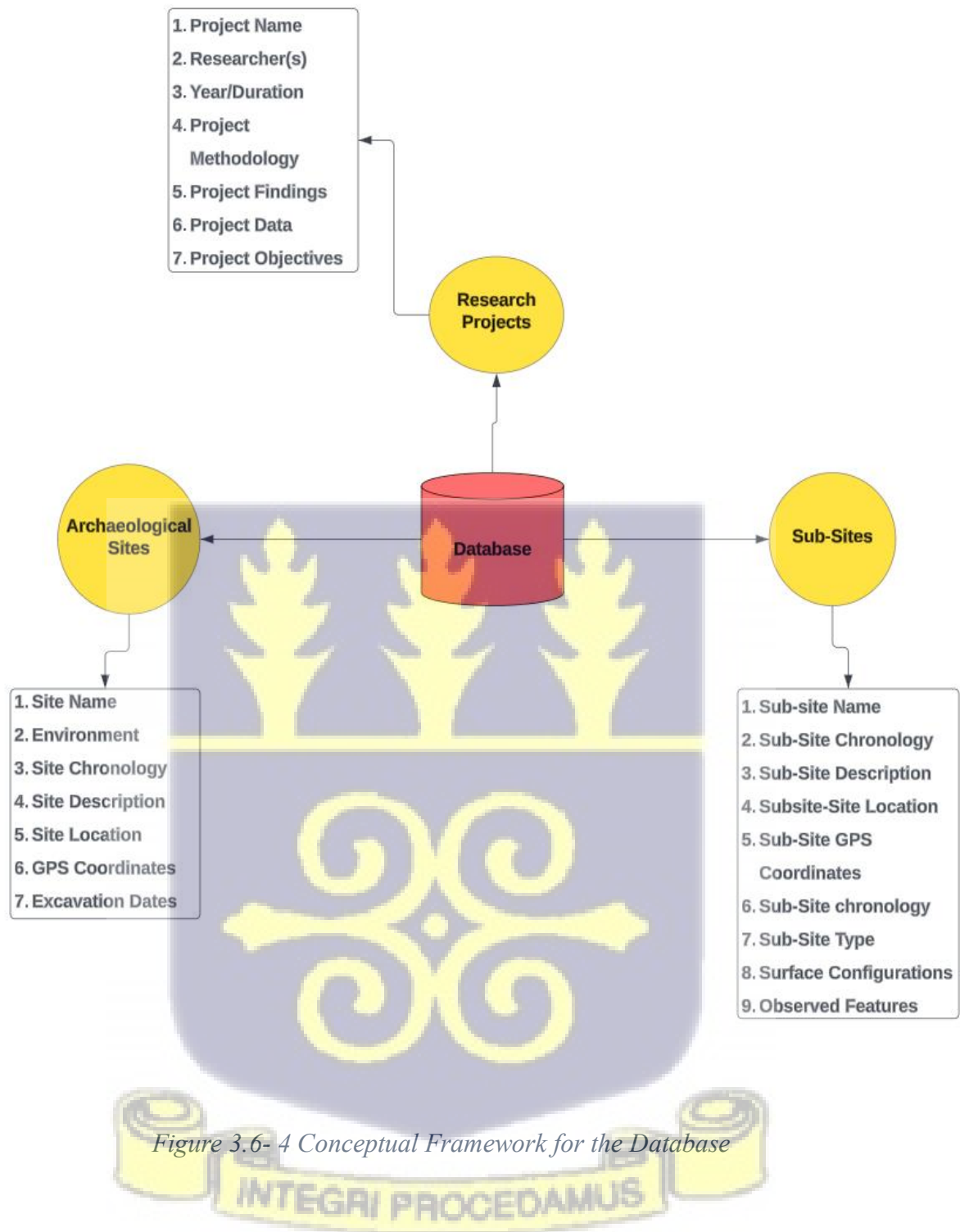


Figure 3.6- 4 Conceptual Framework for the Database

Since the Relational database model was adopted for this research, the data and its underlying information was to be stored in a series of two-dimensional (2D) tables. The tables are

then linked together via computer programming based on their relationships with one another. The conceptual map above (figure 3.6-4) does not show the nature of the relationship that exist between tables, hence the need to probe further. This presented the biggest challenge in the entire research because relational database modeling has its own rules and restrictions and whichever real-world phenomenon one wishes to capture must conform to these rules and restrictions governing relational database modelling.

The first challenge was dealing with what is known as “Many-to-Many” relationships. A “many-to-many” relationship is a situation where records in one table (A) have many related records in another table (B) and vice versa (see Conger 2012, p.68; Rolland 1998, p.24). An example of this is the relationship between Research projects and research methodologies. This relationship is such that a research method can be used by numerous research projects and at the same time one research project can have numerous methodologies. Relational Database Models are unable to capture “many-to-many” relationships due to the cross-relationships between entities. This often leads to redundancy where the same piece of information is stored in multiple places within the database.

The ideal relationship is what is known as “One-to-One”¹⁰. For example, one human is entitled to a brain. The problem is, “Many-to-Many” relationships are very common in the real-world, whiles “One-to-One” relationships are rare. To overcome this, all “Many-to-Many” relationships are to be broken down into two (2) “One-to-Many”¹¹ relationships. An example of

¹⁰ A “one-to-one” relationship is a scenario where one record in a table (A) has one and only one associated record in another table (B) (see Conger 2012, p.66; Rolland 1998, p.24).

¹¹ A “one-to-many” relationship is a scenario where one record in a table (A) has many related records in another table (B) (see Conger 2012, p.67; Rolland 1998, p.24).

“One-to-Many” relationship is the kind that exists between an archaeological site and its Locus. This relationship is such that an archaeological site can have multiple Loci, however, a Locus cannot belong to multiple archaeological sites. What this means in practical terms is to dedicate a table to each entity and then link them together via another table called “a linking table”. In the example cited earlier with Research Project vs Research Methodology, we dedicate a table to each entity and then link them up via another table called a linking table as shown in the figure below.

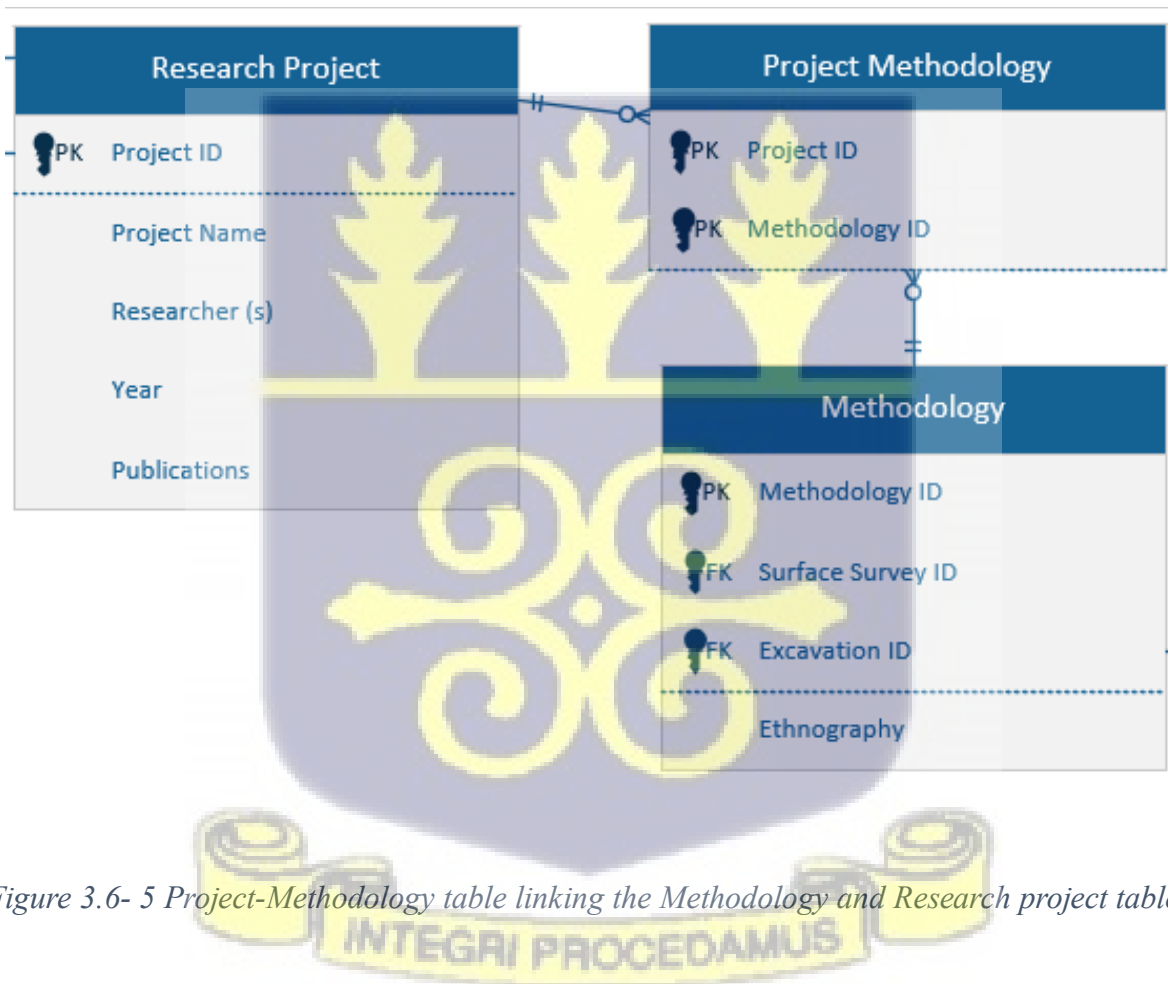


Figure 3.6- 5 Project-Methodology table linking the Methodology and Research project tables.

From the above figure (3.6-5), the linking table is the table designated as “Project Methodology” and it links the Research Project table to the Methodology table. The job of the

“Project Methodology” table is to store the relationship that exists between the two (2) entities. This move eliminates the cross-relationship that existed earlier and ensures that information is not stored multiple times.

The next challenge was dealing with data fields’ inability to store multiple values or integers. In other words, if an archaeological site has multiple excavation dates, they all cannot be grouped under the same category such as “Excavation Dates” within the same table dedicated to archaeological sites as seen in the figure 3.6-6 below.



SITE_NAME		QUARTER	COORDINATES	ELEVATION	CURRENT STATE	RESEARCHER	YEAR	FINDS/ARTIFACTS
Nyarko			-2.469917 w, 7.804111 n			Merrick Posnansky	1975	Locally made Tobacco pipes
Brong			-2.469722, 7.842167		Farming, new building structure	Merrick Posnansky	1970, 1972, 1975	Ivory bracelets, Drawn blue bead, burials bombs and trumpet, locally made tobacco pipes
Dwunfor			7°50'57.23"N, 2°28'18.14"W		Farming			Clay crucibles, brass rings, earrings, bracelets, leglets, imported and locally made pottery discs
Kramo			-2.475667 7.841472		Clinic, houses, school	Merrick Posnansky	1971, 1972, 1975	Human Burials
Dapaa					Farming	Merrick Posnansky	1971, 1979	Smelting furnaces, tuyeres, pottery, tobacco pipe, iron made rings, arrowheads and knives

Figure 3.6- 6 Excel inventory spreadsheet. Source Asare (2021)

From the figure above, it can be seen under the column named ‘Year’ that multiple dates are stored within the same data field (for example 1971, 1972, 1975). While this is possible in Microsoft Excel, it is not possible using database management systems. In a database management system, each date must have its own field and to do this, a table must be dedicated to storing excavation dates. This new table is then linked to the archaeological site table via a linking table as shown in figure 3.6-7.



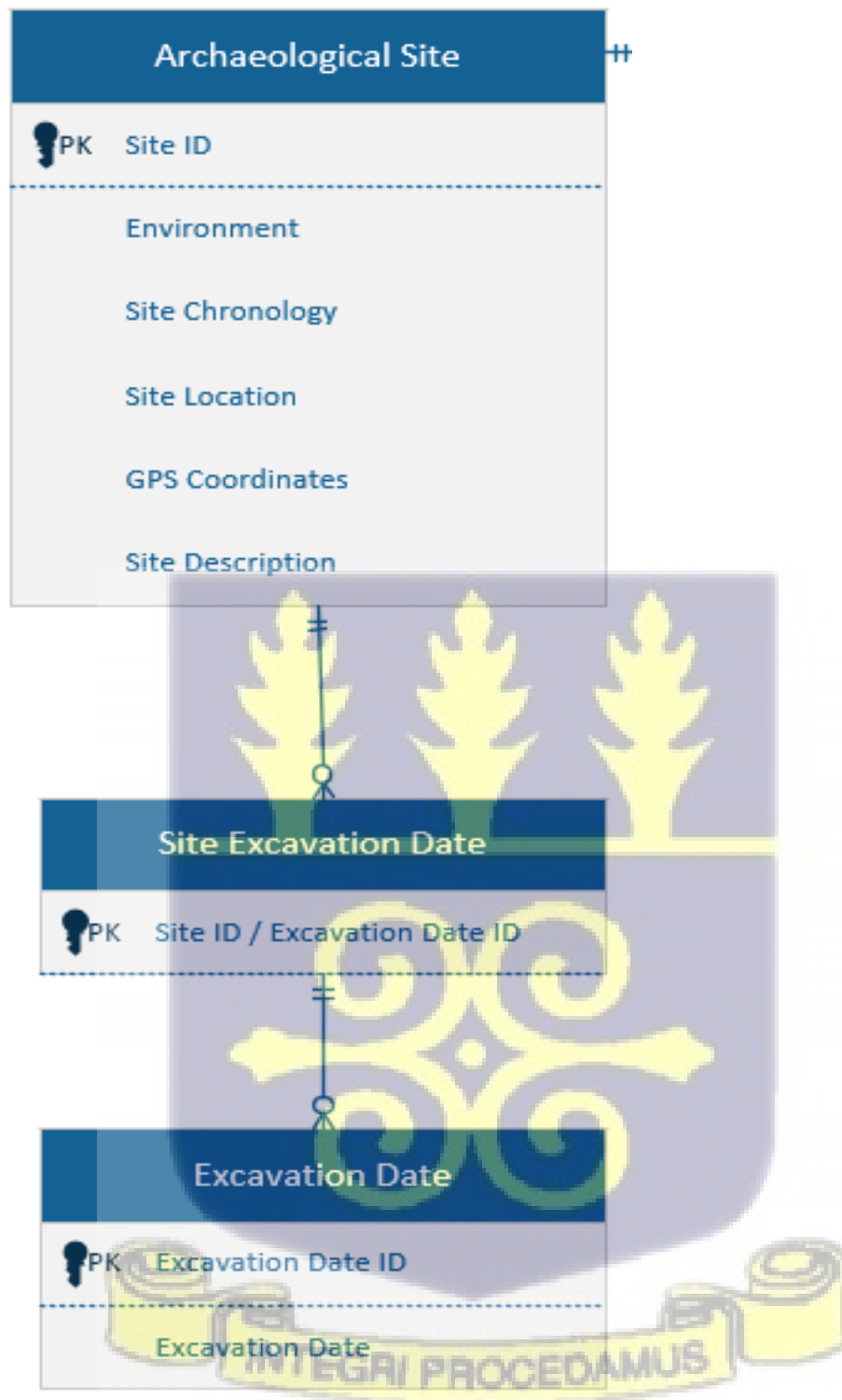


Figure 3.6- 7 Excavation Date table, linked to Archaeological site table via a linking table called Site Excavation Date.

From figure 3.6 -7, the linking table is the table designated as “site Excavation Date” and it links the Archaeological Site table to the Excavation Date table. Again, the job of the “site Excavation Date” table is to store the relationship that exists between the two entities. Having gone through the challenges and resolved them, the conceptual map was transformed into what is known as “Entity Relations Diagram (ERD)”, which gives a detailed description of the tables and the nature of the relationships between them. This can be seen in the figure 3.6 -8.



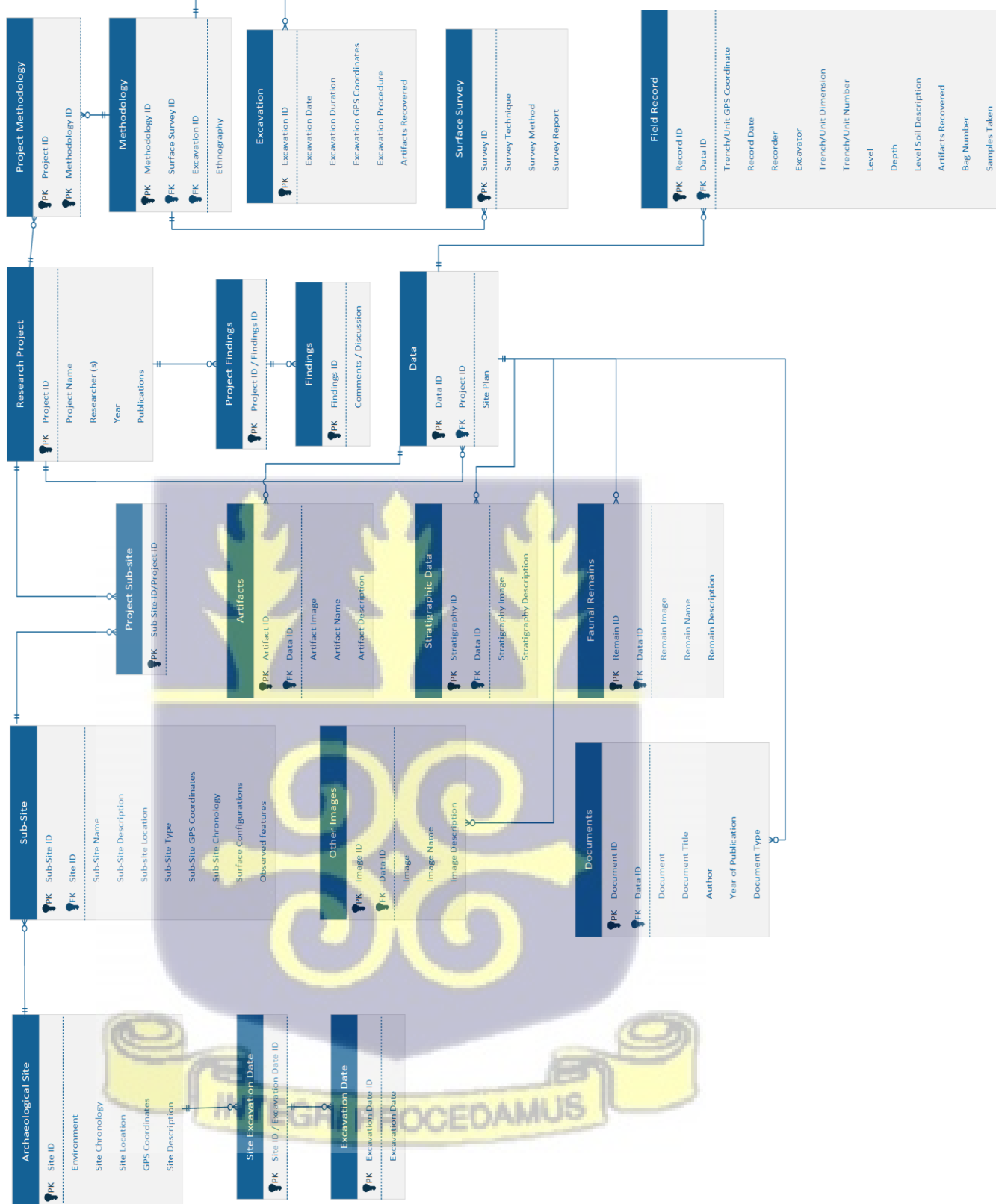


Figure 3.6- 8 The Entity Relations Diagram (ERD).

In all, the individual tables that make up the database are nineteen (19), out of which four (4) are linking tables. Four (4) are major or foundational tables and the other eleven (11) derived tables that were derived from the foundational tables and they can be seen below (figure 3.6-10 – figure 3.6-12).

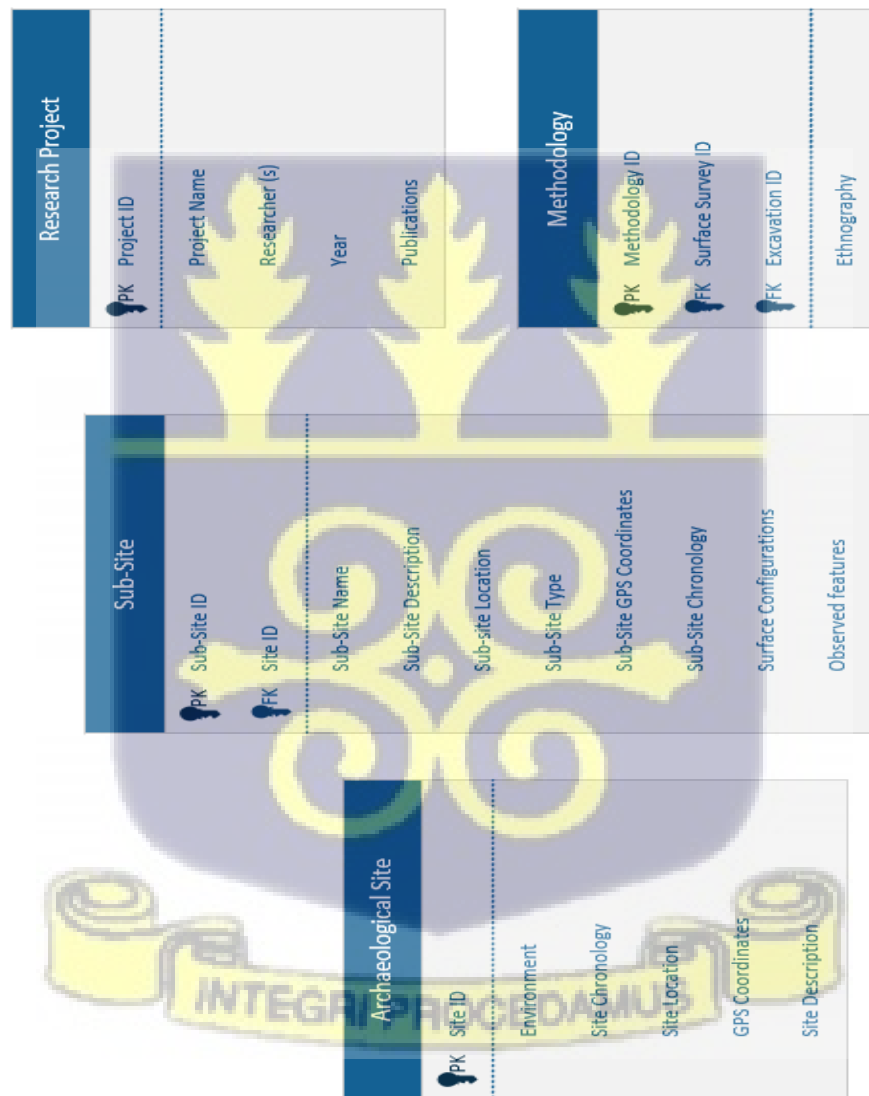


Figure 3.6- 9 Foundational Tables

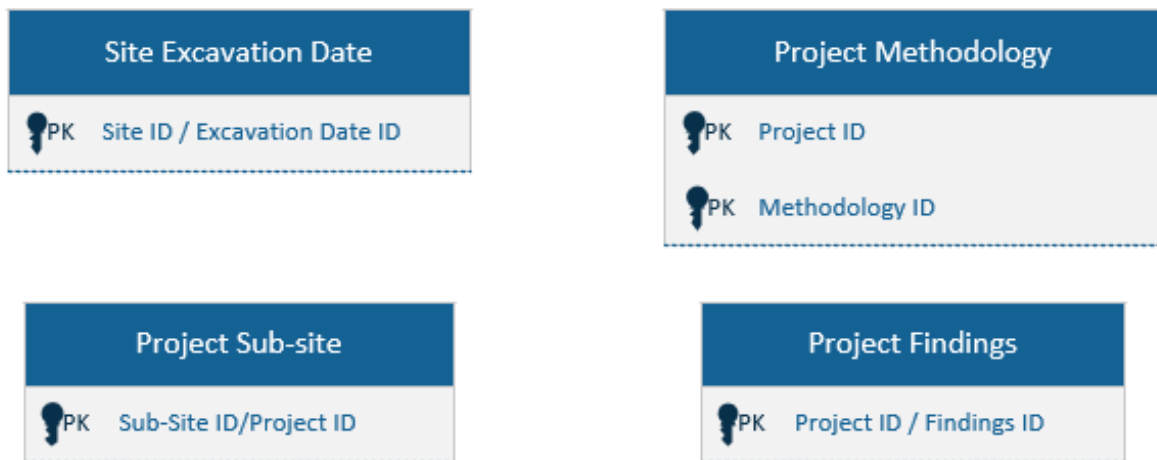


Figure 3.6- 10 Linking tables



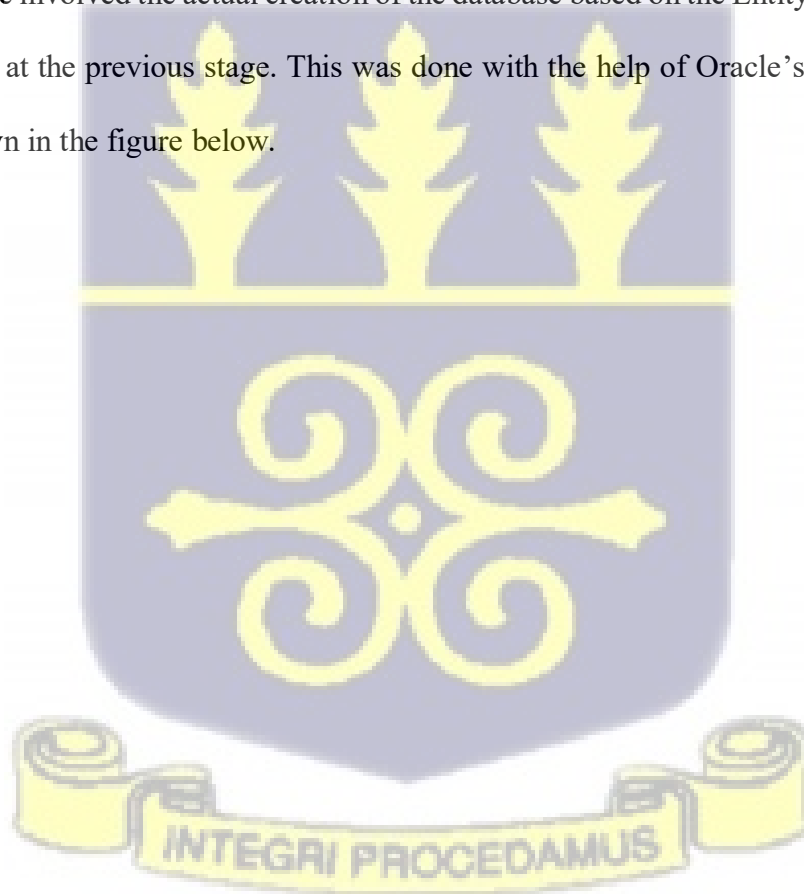


Figure 3.6- 11 Derived tables

The foundational tables are the start-up tables and they capture the three (3) broad sets of information revealed in the requirement gathering stage. The derived tables are the tables derived from the foundational tables due to the relationship constraints (many-to-many relationships) and the inability to store multiple values in the same data field, imposed on the project by database modeling rules. The linking tables are tables that link two separate tables and their job is to store the relationship between tables. The next stage, which is the actual creation of the database was done based on the Entity relations diagram above.

3.6.3. Stage three (3): Schema implementation and initial uploads

This stage involved the actual creation of the database based on the Entity relations diagram (ERD) designed at the previous stage. This was done with the help of Oracle's MySQL software package as shown in the figure below.



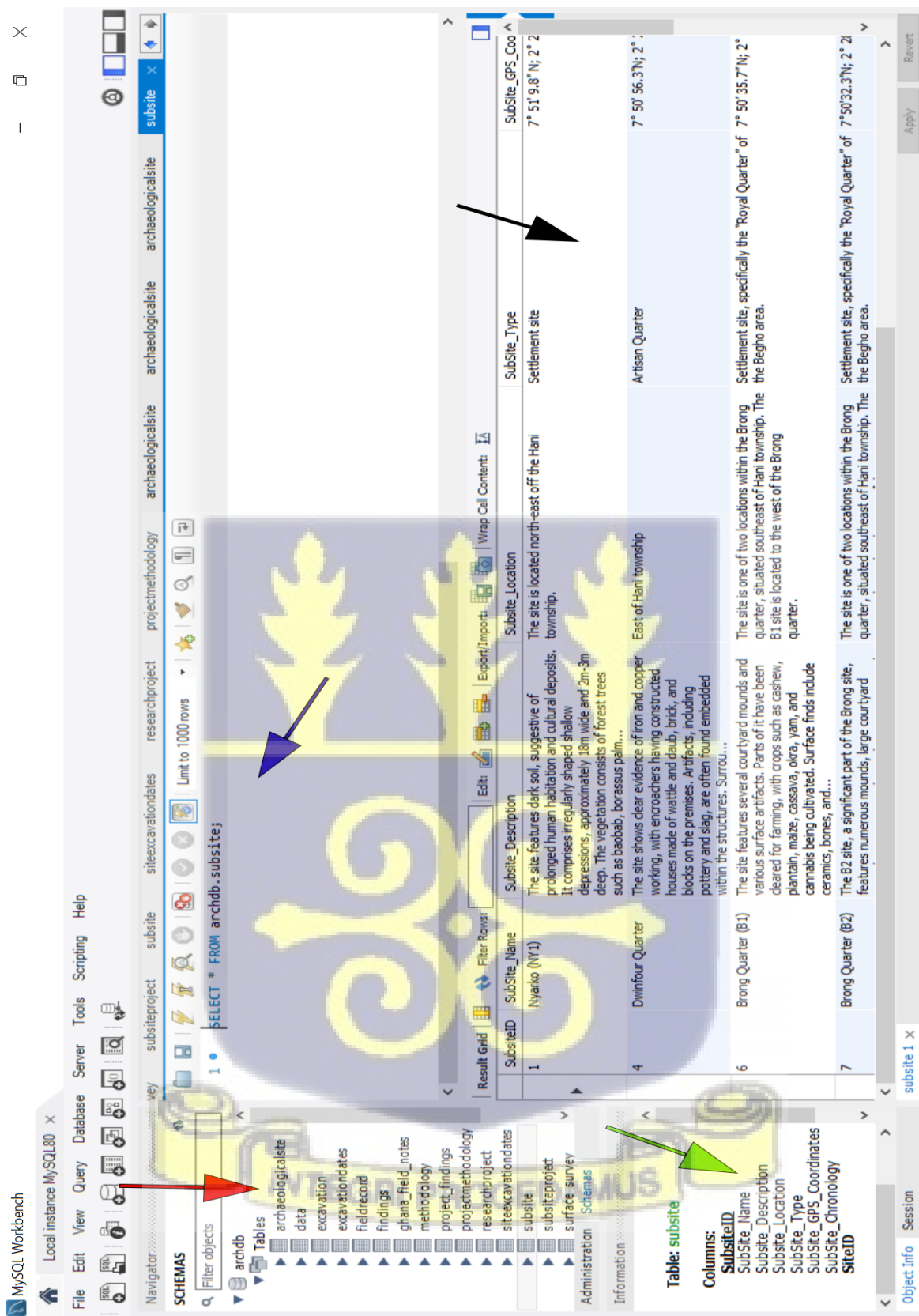


Figure 3.6- 12 Interface of MySQL software used for creating the database

The area with the red arrow is the schema compartment and it displays the tables that make up the database. The area with the blue arrow is the coding compartment where codes are writing to upload data and also query the database. The area with green arrow displays information about the tables. The area with the black arrow is the display compartment where results from codes are displayed.

After its creation, the first batch of information was then uploaded. These included information about the archaeological site, its sub-sites, research projects and so on, which were gathered earlier. The interface as seen in picture above relies solely on computer codes to upload and also query the data. This is not helpful for the end-user, hence the need to create a user interface



for querying the database. This led to the design of a user interface (UI) based on which an actual webpage will be developed as shown below (figure 3.6-14).

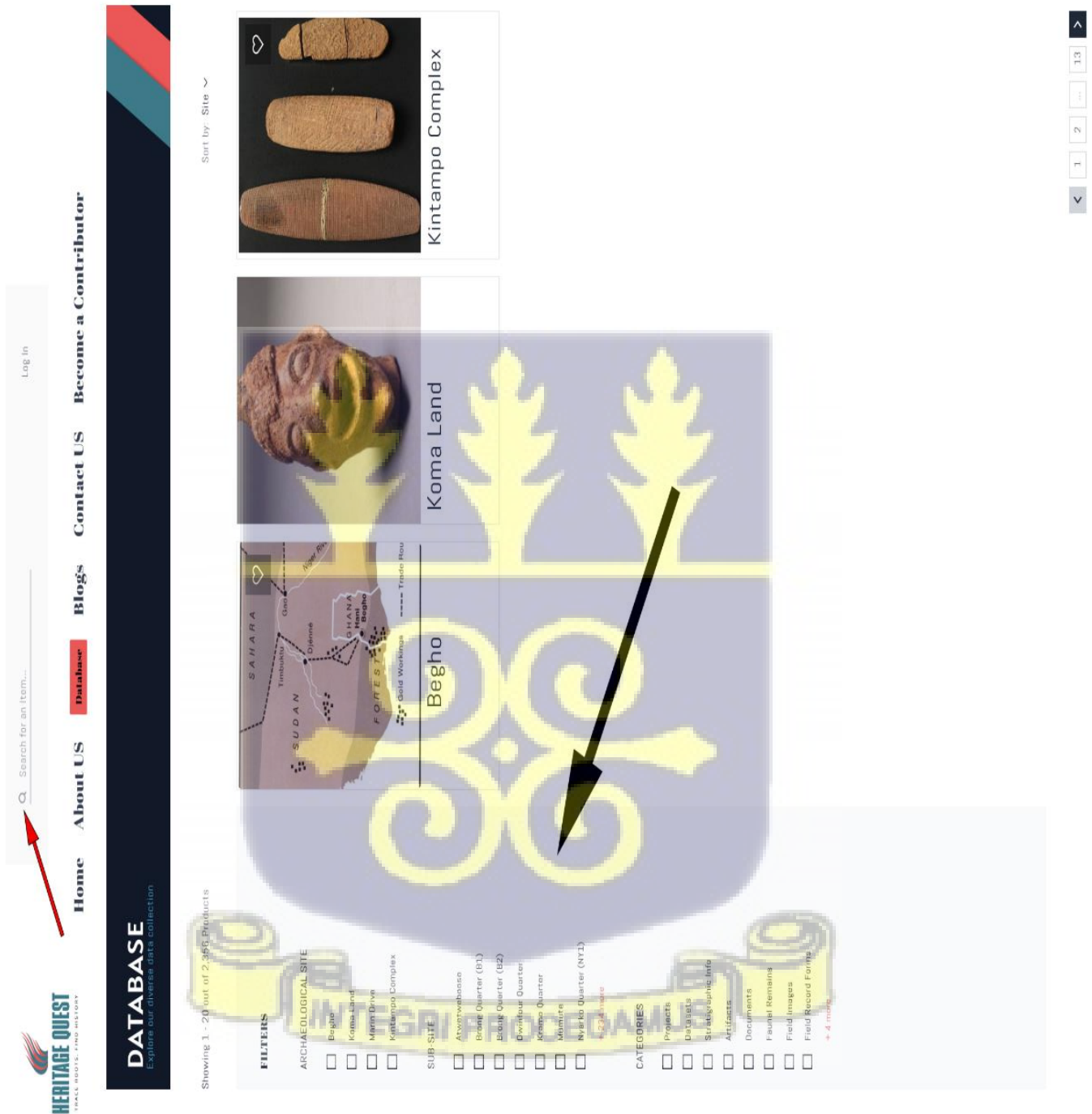


Figure 3.6- 13 User Interface for the database

The filter section (tip of black arrow) will allow end-users to query the database with simple checking of the boxes based on what they are looking for. Another query option is the search bar above (being pointed at by red arrow) which allows the end-user to search directly by keying in what they are looking for.

Having built the database and uploaded the underlying information, the next stage is to deal with the actual data.

3.6.4 Stage four (4): Data preparation and upload

This stage involved the preparation of the actual data from the Begho archives before uploading them into the database. The preparation process started with the sampling of data, from the archive. This was followed by cleaning, scanning and digitization with the help of computer software programs.

1. Sampling of data:

The Begho archives contains about four thousand three hundred (4300) individual files which have been organized into nineteen (19) different folders. The initial groupings were done by Daniel Kumah (2022) based on specific themes which included Correspondence and notes (n=1), Analysis sheets (n=14), Maps (n=1), Drawings (n=1) and Photographs (n=1). They numbered up to eighteen (18). I decided not to tamper with this initial grouping but rather improve upon it since I was introducing a new dataset from a different project. I therefore dedicated a separate folder to datasets from Kumah's work.

The individual files within this folder were then categorized based on the themes set out earlier and separated from one another with the help of paper clips. This brings the total number of folders

to nineteen (19) individual folders. Samples were drawn from each folder based on the themes established and these samples were then taken through the next phase of data preparation as seen below (figure 3.6-15).



Figure 3.6- 14 Researcher Sampling data from the Begho Archives.

The samples include, sixteen (16) maps and site plans, twenty-four (24) drawings and illustrations, twenty-one (21) letters of correspondence and one-hundred and forty-three (143) photographs.

2. Cleaning, Scanning and Digitization:

As mentioned earlier, time had taken its toll on the datasets, leaving some in various stages of deterioration. The datasets therefore, required some form of data cleaning, where dust was cleaned and crumpled surfaces were straightened to make them easier for scanning. Having cleaned the data, I proceeded to the AG Leventis Digital Resource Center, at the Department of Archaeology and Heritage Studies, where the scanning of the sampled files was done (figure 3.6 -16).



Figure 3.6- 15 The scanning process at Leventis Digital Resource Center with the help of Jonathan Addo (staff at the Center).

In instances where the scanned image is still not visible enough, I proceeded to digitize the scanned image with Adobe illustrator or QGIS software. For instance, from figure 3.6 -17 (a & b) below, is a scanned map of Mumute site (on the left) in Begho which was produced in 1973. This map after scanning was not clear enough for interpretation. So, I went on to Geo-reference and digitize the map with the help of the QGIS software program. This allowed me to produce a clearer image of the map as shown below (on the right-hand).

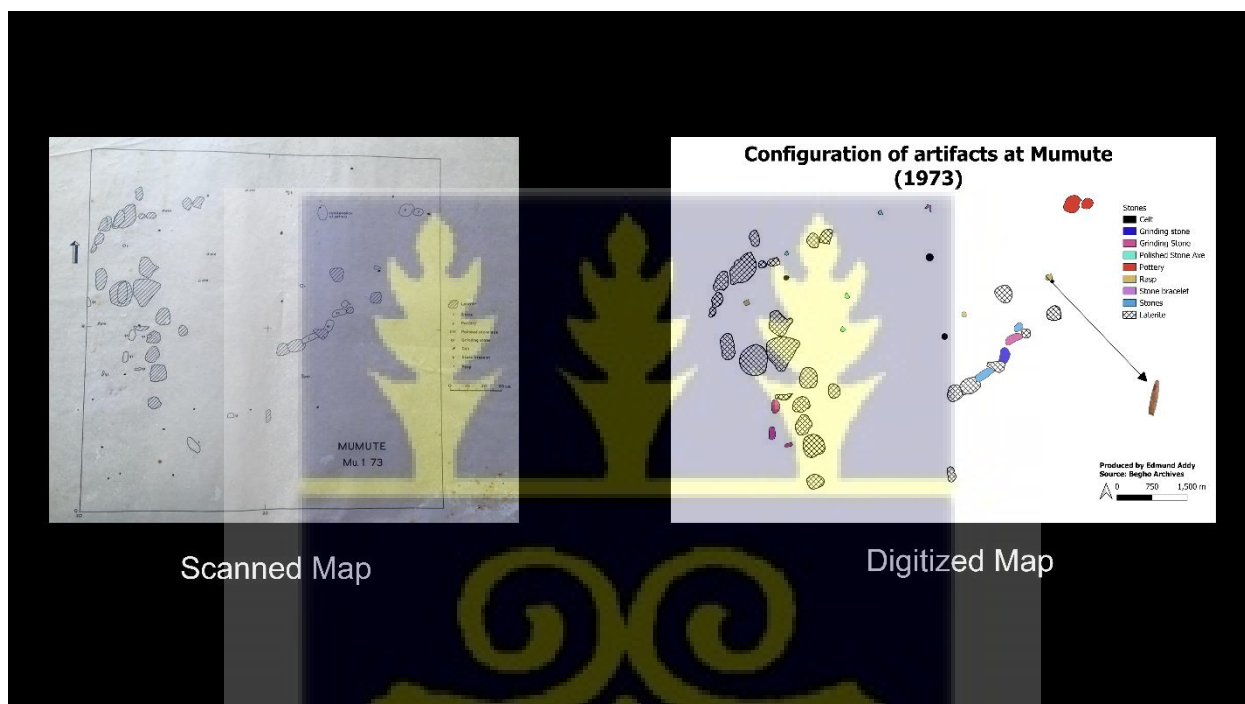


Figure 3.6- 16 a & b. A panel showing both scanned and digitized map of Mumute drawn in 1973

Having taken the data through these processes, they were now ready to be uploaded onto the database. The upload followed the same format as the contextual information as outlined earlier.

In the end, the database compartment of the website was fully developed and this concluded Phase one (1) of the project, giving way for phase two (2) to commence.

3.7 Phase Two (2): Re-Communication and Re-Presentation of published site information

This phase of the research involved the profiling of the selected archaeological sites. The rationale is to finetune existing literature on the Kintampo Complex, Daboya, and Dixcove sites, to make them reader friendly to non-academic audiences. To do this, two elements were considered; the techniques of re-communication and the format of presentation.

3.7.1 Techniques of Re-Communication

In academic publishing, archaeologists are expected to adhere to journals' editorial and author guidelines for their work to be published. Some of these guidelines include the use of appropriate terminologies and jargons, providing detailed methodology, in-depth discussions of findings and citing relevant authorities, among others. Although these guidelines are suitable for the academic community, they can make the work difficult for non-academic readers to understand due to information overload. An archaeological report for instance, provides detailed information about surveys or excavations ranging from research aims, methodology, processes and outcomes which are easier for experts to understand compared to non-academics.

The task therefore is for scholars to communicate clearly and concisely, while recognizing their audience's needs and trying to see things from their perspective (see Ryan, 2023). Most academics are trained to write in a specific style for scholarly publications, however, there are ways to make their writing more suited to none academic audiences.

According to Ryan (2023) some key strategies include writing informally, using simple and direct language. Jargons and complex words should be avoided or explained, with technical terms simplified where possible. Active voice and strong verbs enhance readability, and results

should be presented in a clear, logical sequence. Additionally, images and videos can make presentations more understandable.

To put things in perspective, I adopted the Executive Summary approach which involves reducing a report to its salient points, in a clear and concise manner. The main goal of an executive summary is to make an audience understand the main points of a report and the evidence for those points without them having to read the full report (Guidelines for Writing an Executive Summary, 2002). To do this I devised a strategy based on the Guidelines for Writing an Executive Summary (2002) and it involves the following steps;

- Identifying key points:

In this step, I went over the previously written works, paying close attention to the opening and closing sentences of each paragraph. Important details including the study's purpose, findings, and supporting data were prioritized.

- Summary outline:

This is where the summary's outline is drawn. This outline is based on the key points identified above. The key points are sequentially presented in the summary outline as they appear in the literature. This ensures that the author's logical flow of thought is maintained. This is essential to making the summary consistent with the literature.

- Executive Summary Draft:

This is where a concise version of the literature is produced based on the summary outline drawn from the previous step. Emphasis here is placed on communicating the points in simple and direct English with minimal disciplinary jargons and complex words. In places where they could not be

avoided, they were explained. Pictures were prioritized over text where they explain points better. My aim at this stage was to present the summary in one (1) page minimum and a page and a half maximum.

- Review Executive Summary:

I went through a series of reviews to make sure my aim of conciseness and clarity was achieved. Having drafted the summary, I went over it again while checking for errors in grammar, spelling and evaluating clarity. After my own review, I had colleagues unfamiliar with the literature, review and give comments or feedbacks. The feedbacks were implemented with the aim of arriving at an Executive Summary that is concise but provides readers with good understanding of the subject matter without reading the entire literature.

With these strategies, I was able to profile each of the three (3) sites sampled in this work to help communicate with a cross-section of audience. Links or references were provided to the actual literature at the end of each summary. This was for interested readers to explore further on the subject matter.

3.7.2 Presentation Format (Blog Posts)

Blogging involves the publishing of information (in textual, visual and audiovisual formats) on a website or webpage. An average blog combines text, images, videos and links to relevant pages and media on the Web. Blogging has had a great impact on communications throughout the world today in terms of speed and finding specific information (see Djuraskovic, Hines, & Team). Unlike the traditional communication channels (newspapers, books, magazines, Televisions etc.) blogs report news in real time. For example, a newspaper does not report news in

real time because of the lengthy production process involved in gathering, editing, printing, and delivering the news to the public. Since blogs do not require physical printing—all news is delivered online instantly, it is reported in real time. As a result, the production process is shortened, and the public receives the information as it happens in a matter of minutes.

Blogs also afford information seeking individuals the luxury of narrowing down their search for information to specific topics or niches. This is because a blog can be dedicated to providing information on specific interests such as health, lifestyle, sports or entertainment readers can find information with ease. These advantages of blogs over traditional means of communications made it the preferred choice when it came to deciding the appropriate means of presenting the re-communicated archaeological information. The blog posts are basically made up of images and texts, arranged aesthetically to make it eye-catching for readers to enjoy while learning about archaeological sites. In all three (3) blog posts were developed, with one dedicated to each site.

3.8 Phase three (3): Website Development

This phase involved the programming of the website and the programming languages used were Python¹², JavaScript¹³ and Hypertext Markup Language (HTML)¹⁴. To initiate the

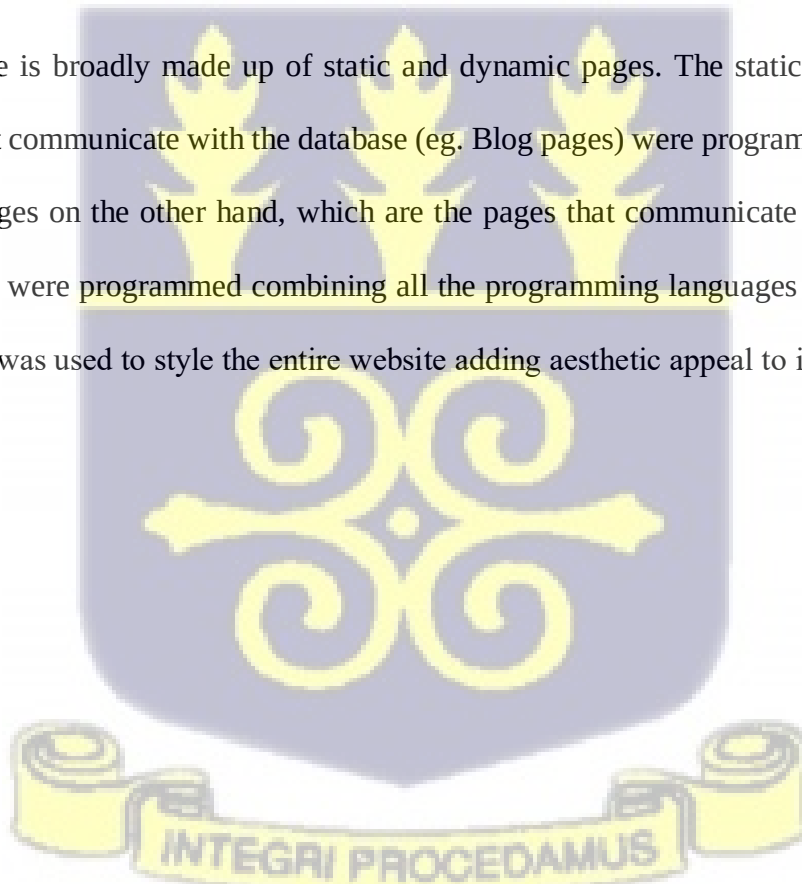
¹² Python is a high-level, interpreted programming language known for its simplicity and readability. It supports multiple programming paradigms making it suitable for web development, data science, artificial intelligence and software development (<https://www.python.org/doc/essays/blurb/>)

¹³ JavaScript is a programming language that allows for the implementation of complex features on a web page (https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Scripting/What_is_JavaScript)

¹⁴ It uses tags enclosed in angle brackets (< >) to define different types of content, such as headings, paragraphs, images, and links. HTML files are plain text files saved with the .html extension.

development process, the Django¹⁵ web framework was implemented as the core framework to integrate all aspects of the project, effectively consolidating the outcomes from various phases into a unified system. As part of the application setup, a Django project folder was created and configured to facilitate development. The initial step in the website development involved establishing a connection between the Django project and the MySQL database created during Phase 1. Given that Django supports direct database migrations from external database management systems, this functionality was leveraged to migrate the entire database—including its tables and associated data—into the project environment. This integration ensured seamless retrieval and display of database content on the website.

The website is broadly made up of static and dynamic pages. The static pages, which are pages that do not communicate with the database (eg. Blog pages) were programmed with HTML. The dynamic pages on the other hand, which are the pages that communicate with the database (eg. database UI) were programmed combining all the programming languages mentioned above. Tailwind CSS¹⁶ was used to style the entire website adding aesthetic appeal to it.



¹⁵ Django is a python-based, open-source web framework application used for designing complex websites easily and efficiently. It is purposefully built for the backend programming of websites.

¹⁶ Tailwind Cascading Style Sheets (CSS) are pre-designed utility classes that allow web developers to style HTML elements directly.

CHAPTER FOUR

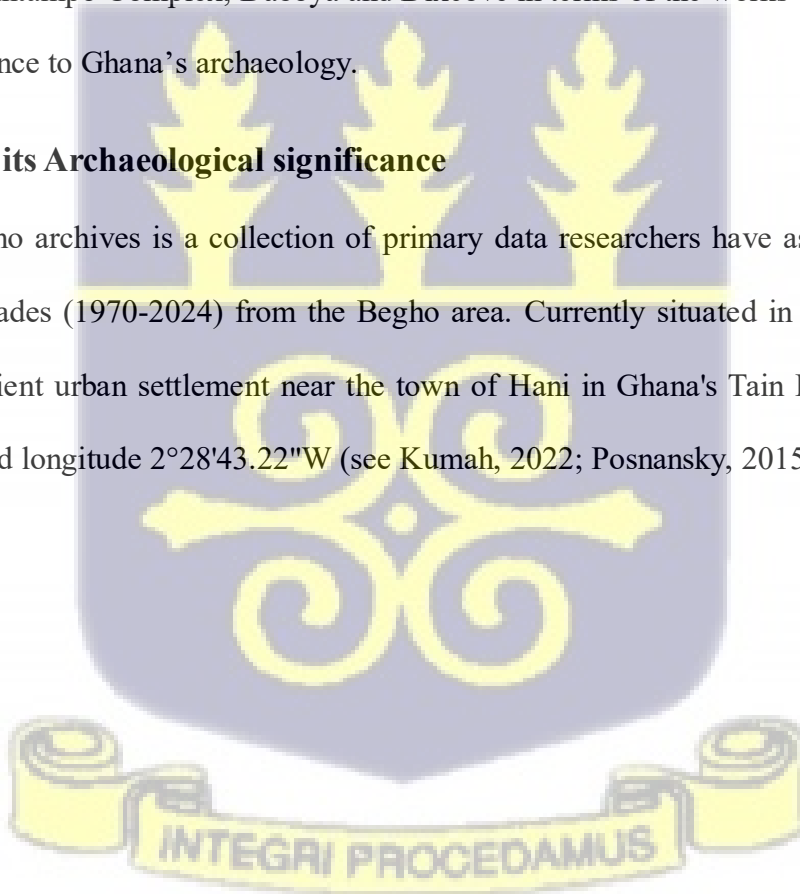
PRESENTATION OF DATA AND ARCHAEOLOGICAL SITE INFORMATION

4.1 Introduction

This chapter discusses the Begho Archives, Kintampo Complex and the two (2) selected sites profiled in this work. The selected sites are Daboya, and Dixcove. The chapter is in two parts. The first part deals with the Begho Archives and looks at the genesis of the archive and how it came to being. It also explores the Begho archaeological site and the main components of the archive as well as the factors that have contributed to the archive's current state. The second part deals with the Kintampo Complex, Daboya and Dixcove in terms of the works carried out as well as their significance to Ghana's archaeology.

4.2 Begho and its Archaeological significance

The Begho archives is a collection of primary data researchers have assembled over the span of five decades (1970-2024) from the Begho area. Currently situated in the Bono Region, Begho is an ancient urban settlement near the town of Hani in Ghana's Tain District at latitude 7°50'55.81"N and longitude 2°28'43.22"W (see Kumah, 2022; Posnansky, 2015; Asare, 2021).



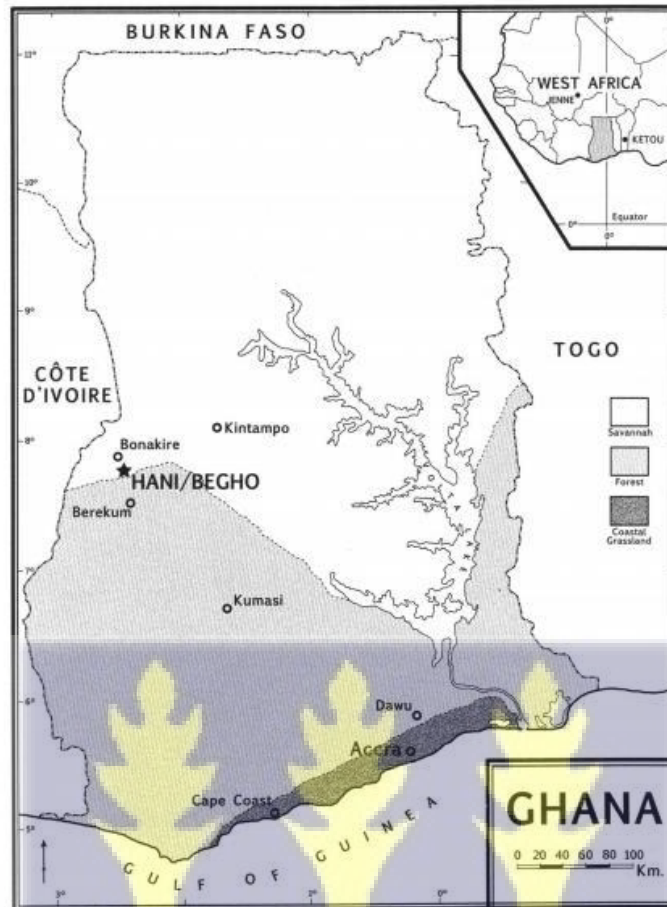


Figure 4.2- 1 Begho's location within Ghana. (Source: Posnansky 2015)

In terms of significance, Begho was a cosmopolitan trade town that played a major part in both regional and international trade within the West African Sub-region. It was a major player in the Trans-Saharan (Caravan) trade with its role as one of the leading suppliers of gold to Jenne (figure 4.2-2), the city-state that controlled the trade along the Niger basin, connecting West Africa to the Islamic world (see Wilks 1961; 1993; Massing 2012 as cited by Kumah 2022; Asare, 2021). The site also served the trade needs of societies from within the Akan forest, down to those on the Atlantic Coast (see Anquandah 1975 as cited by Kumah 2022).

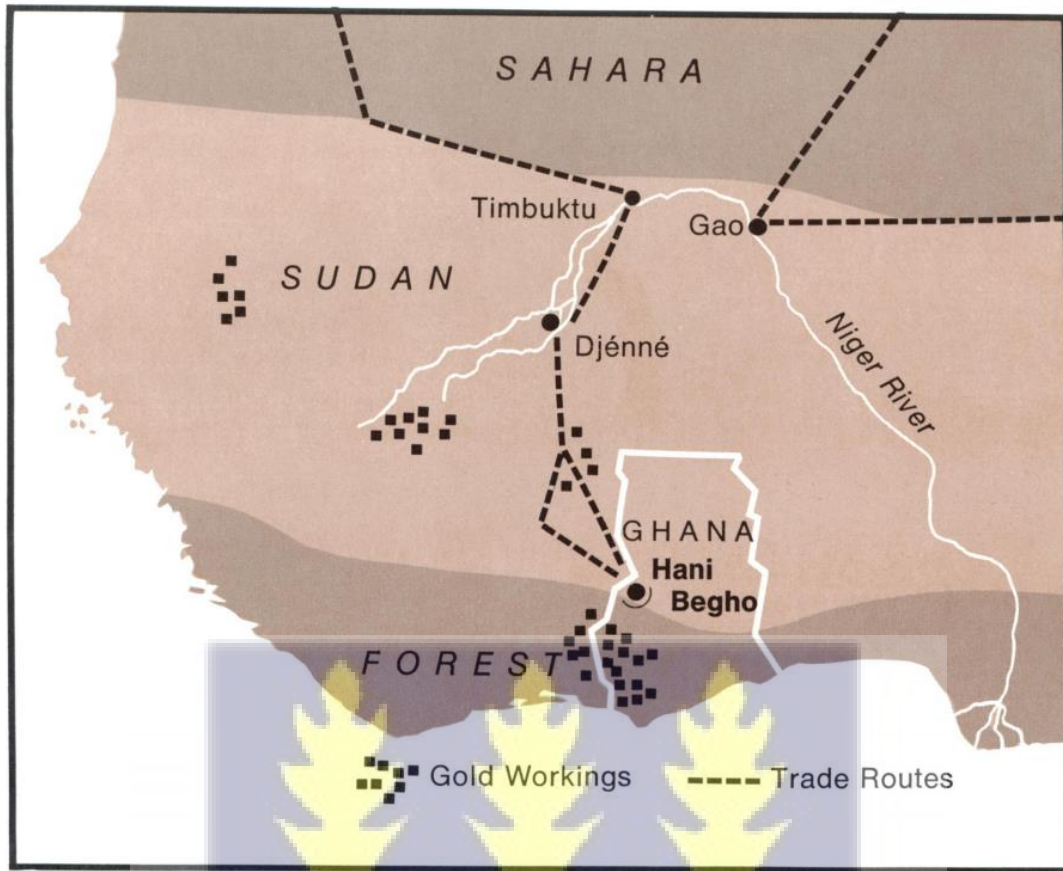


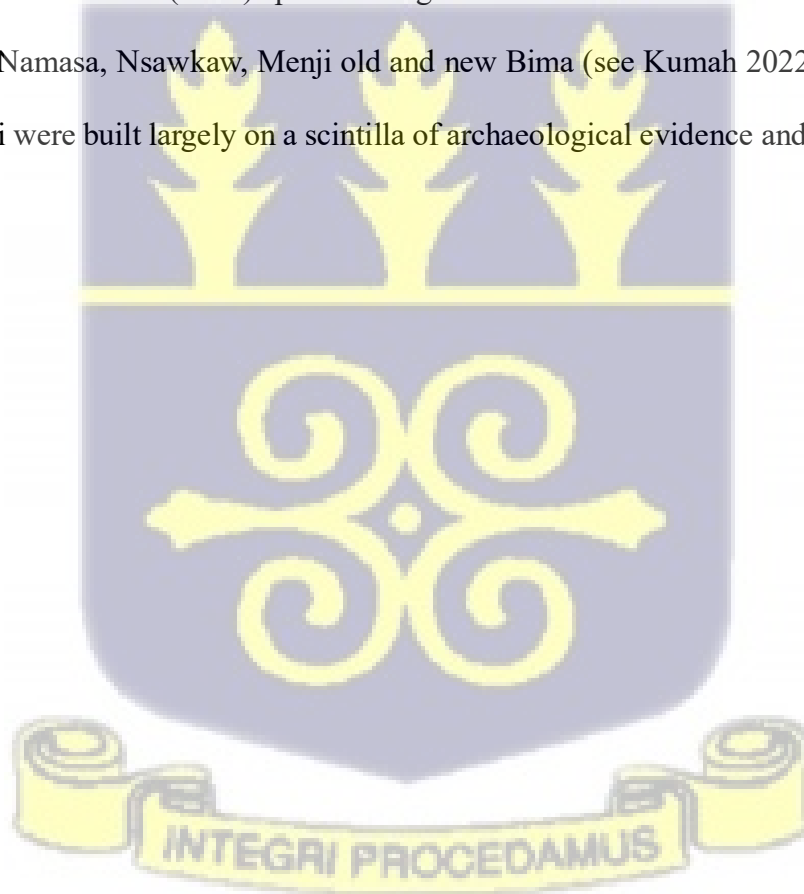
Figure 4.2- 2 Map connecting Begho to Jenne and the Trans-Sahara Trade. Sourced from McIntosh (1974)

Information on the site's importance derives from both oral history and written sources. According to Kumah (2022), Begho's reputation as a leading manufacturer of superior *Beo Ntoma* (Begho textile) was validated by oral history (Ameyaw 1965) and certain European maps (Daaku 1970; Kea 1982).

When the Portuguese landed on the coast of modern-day Ghana in 1471, Begho was the largest town in the interior, with a complicated linguistic makeup and a diversified population (see Posnansky 2015: 96; Kropp-Dakubu 1976 as cited in Kumah 2022). Begho's popularity made it a site of research and academic interest from the late 19th to the mid-20th Century (1890-1970), where

several attempts were made to locate this lost city by Archaeologists, Historians, Anthropologists and Explorers in general (see Kumah 2022).

These efforts that spanned almost a century resulted in several hypothesis being made about the precise location of Begho. Most of these hypotheses placed Begho within the then Brong Ahafo Region of Ghana. For instance, French ethnographers Delafosse (1925), Tauxier (1921; 1927) and Binger (1892) placed Begho's location at Bonduokuo (see Kumah 2022). Captain Benquey on the other hand placed the site's location at Banda (Wilks 1961: 36 as cited by Kumah 2022). Other scholars; Meyerowitz (1952), Wilks (1962), Anquandah (1965), Ozanne (1965), Goody (1964) and Bravmann & Matthewson (1970) placed Begho's location at Hani and its surrounding communities of Namasa, Nsawkaw, Menji old and new Bima (see Kumah 2022). The hypotheses in favour of Hani were built largely on a scintilla of archaeological evidence and an overwhelming



oral account from Hani and its surrounding towns (see Kumah 2022: 55). The map below shows the various suggested location of Begho based on scholars' hypothesis.

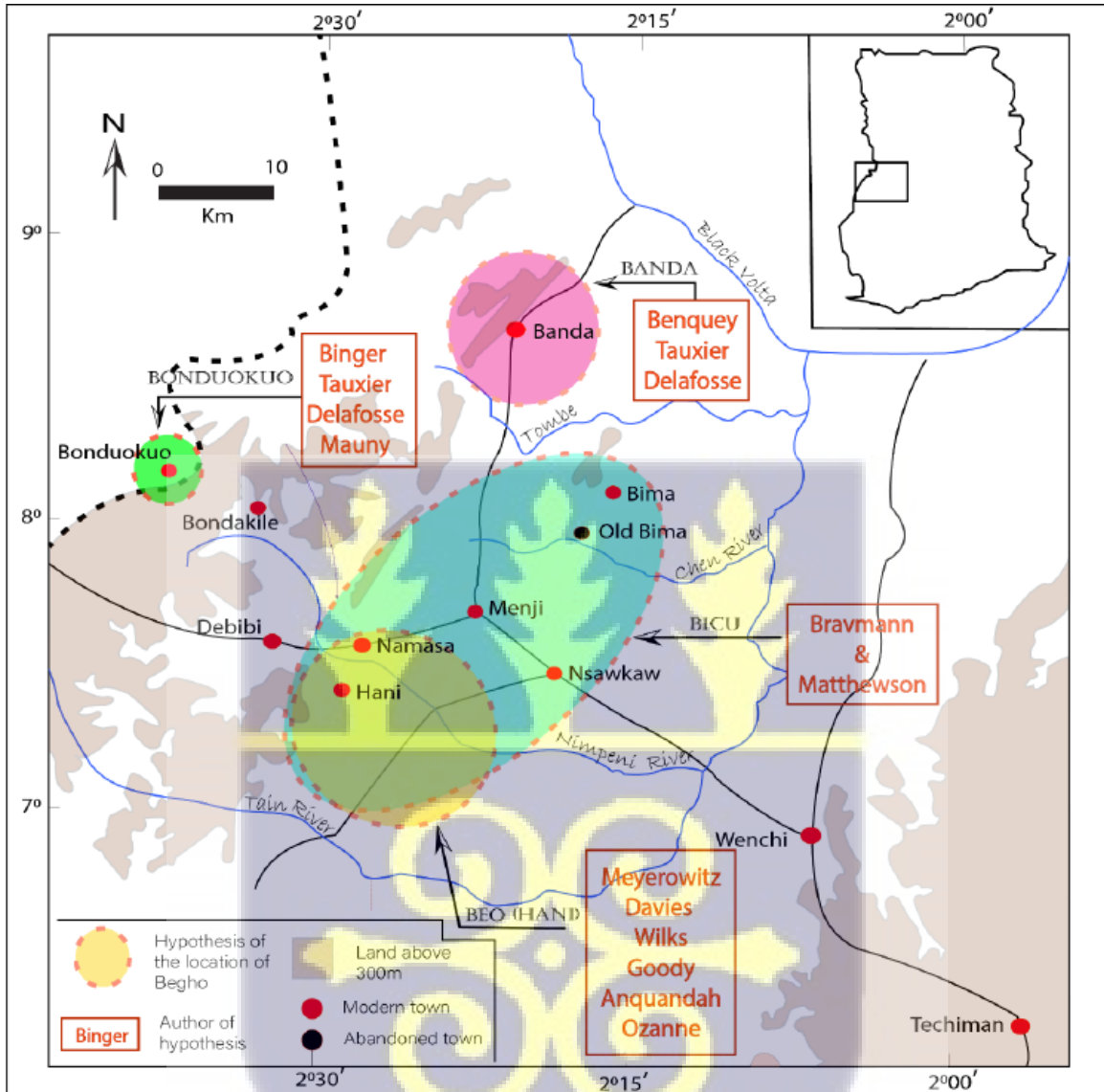


Figure 4.2- 3 Hypothesized location of Begho by scholars before 1970. (Source Kumah 2022).

With the majority of scholars placing Begho within Hani and its environs, coupled with overwhelming oral accounts collected from the area, Merrick Posnansky launched an archaeological research expedition in the area under the West Africa Trade Project (WATP) in 1970 (see Kumah 2022; Walz & Posnansky, 2010; Posnansky 2015).

4.2.1 The West Africa Trade Project (WATP)

The project was funded by the Leverhulme Trust, Wenner-Gren Foundation, the University of Ghana, the Scholarship Secretariat of Ghana and the Ghana Museums and Monument Board (GMMB) with a grant amount of 20,000 pounds from 1970 to 1979. The University of Ghana's role was to build a research center in Hani, which served as a base for the project during field work (see Quarcoopome, 1977; Walz & Posnansky, 2010). The project was scheduled to run for five (5) years but ended up running for nine (9) years (1970-1979). The aim of the project was to investigate and establish the origins and effect of long-distance trade between Ghana and other parts of West Africa, particularly the middle Niger area (see Posnansky 1971; Posnansky 1973).

Aside this, the project offered an opportunity to encourage and help finance student training in field archaeology in Ghana (see Quarcoopome 1977). This was very key because prior to this project, there had been no systematic field training for Ghanaian archaeology students (Posnansky, 1976, p.5a as cited by Quarcoopome, 1977). Posnansky, therefore used the project to train the first generation of Ghanaian archaeologists and other students who showed interest in participating in the Begho excavations. Some of these students included Leonard B. Crossland, Emmanuel Kofi Agorsah, Kweku Effah-Gyamfi and James Boachie-Ansah who ended up producing Thesis and dissertations based on the work done in Begho and its surrounding areas like Bono Manso and Wenchi (see Kumah, 2022 :136; Quarcoopome, 1977).

Begho was also used as site for training technical support staff for the department of archaeology. The likes of Bossman Murrey, the late Seth A. Darkwa, E. A. Adjedu, Ishmael O. Sowah, all had their training at Begho (Kumah, 2022: 137)

The excavation team also had foreign students volunteering to join the dig; they included, F. Musonda, Roderick McIntosh & Susan Keech, Marla Berns, Philip de Barros amongst others.

These students have gone on to become leading figures in African archaeology and have had successful careers in academia.

The general consensus among scholars is that Begho was composed of several distinct spatial units, often referred to as quarters or suburbs, with each potentially serving specific residential or functional purposes. Ethnohistorical sources suggest that Begho as a state was governed by an Akan chieftain (Anquandah 1995). In all, six (6) quarters were excavated under the West Africa Trade Project (WATP) though Posnansky admits there may have been more, since the WATP team did not conduct exhaustive and extensive surface survey of the site (Posnansky, 2015). The quarters include Brong (which was excavated in 1970, 1972 and 1975), Kramo (excavated in 1971 and 1979), Dwintfour (excavated in 1972 and 1975), Nyarko (excavated in 1975), and Dapaa (excavated in 1975). Other iron working sites such as Atwetwebooso and Srede were also excavated in 1975. In addition, prehistoric sites such as Mumute and Bonoase were also excavated in 1972, 1973 and 1974.

The Brong quarter is referred to as the royal quarter, residence for chiefs and royal Akans, who were the dominant ethnic group at Begho (Posnansky 1976). This is based on ivory trumpets and offering cups recovered from the site and consistent with chieftaincy among the Brongs in recent times (see Posnansky 2015). Excavations in 1970 at the B1 site revealed four (4) occupation layers with five (5) carbon 14 (C-14) dates that suggests an occupation between the mid- fourteenth and eighteenth centuries (mid-14th and 18th Centuries AD) (Posnansky 1972). The recovered artifacts include pottery, glass beads, chinese porcelain (17th -18th centuries), iron and corprous objects, spindle whorls, tobacco pipes, ceramic cups in ritual context and burials with no consistent orientation (see Posnansky 1972). The pottery recovered include distinctive red slipped carinated ware (found in the upper levels), stamped and impressed decorated wares with micaceous fabric

(found at lower levels) and three (3) pieces of design-painted pottery (see Posnansky 1972). Excavations in 1972 at the B2 site revealed materials almost similar to those recovered from the B1 site, except for the addition of eight (8) pieces of ivory objects recovered this time round. The ivory objects included the ends of two (2) side-blown trumpets (decorated with incised lines and circles), a complete bracelet (probably belonging to a child) and five (5) other fragments including a comb (see Posnansky 1972). The Pottery from B2 were carinated and featured red slipping and burnishing, with rouletting as the most common decoration. They included twenty seven thousand eight hundred (27800) sherds, eleven (11) whole pots, bowls and plates (Posnansky 1972). Additionally, one thousand one hundred and sixty (1,160) pieces of bones were recovered, most of which were small and featured knife cuts. They included remains of both large and small bovids such as cattle, antelopes, elephants, sheep and goats (see Posnansky 1972).

The Kramo quarter was home to Mande-Speaking Muslims who were traders originating from Mali. Excavations in 1971 revealed burials in a north-south orientation which may have indicated a muslim burial practice according to Posnansky (1972), although he admits that the people might have had the orientation wrong since Mecca is located on the north-east. In his publication in 2015, Posnansky admits further that the absence of a biological anthropologist onsite caused them to possibly overlook some information about the remains that may have enhanced our understanding of the entire context and by extension, the entire K1 site. This is very significant because in Islamic burial practices, the deceased must be oriented in a way that its face is turned towards Mecca (see Gorzalczy, 2007). In this context, Posnansky does not mention the positioning of the faces of the remains and it is highly unlikely that a clan of muslims will misinterpret the direction of Mecca since it plays a pivotal role in their prayer routines. Other discoveries include a bell-shaped cistern with small holes interpreted as dye pits, spindle whorls

and pottery similar to those found in other sites. Excavations at the K2 site in 1979 unearthed materials including over one hundred-thousand (100,000) Pot sherds, six-hundred (600) local tobacco pipe fragments (the largest assemblage from a single site in West Africa), imported ceramics (Rheinish blue stoneware), iron objects, Corprous fragments, terracotta and stone gold weights as well as carved ivory (see Posnansky 1979). The pottery recovered were similar to the begho ware pottery found at the brong and dwinfour quarters in previous excavations. The location of the tobacco pipes (beneath cultural materials to the surface) hinted at the site being occupied between the 17th and 18th century, the discovery of the imported early 18th century Rheinish blue stoneware on the son the surface confirmed confirmed this notion (Posnansky 1979). The faunal assemblage from this site were similar to those found from the other sites excavated earlier, with a notable difference occuring due to the relatively low number of cane-rat remains which was thought to have been forbidden to moslem (Posnansky 1979).

The Dwinfour quarter is known from oral tradition to have been the residence for various artisans who lived in Begho (see Posnansky 1975; Anquandah 1981; Agorsah 1973). Excavations in 1972 at T1 (D1) site revealed very few material remains including pottery (similar to begho ware pottery from the Brong and Kramo quarters), one drain pipe and beads. No burials were found. Additionally a single occupation was found with a cistern 3.60 meters deep, slightly belling out towards the bottom and with eleven well cut toe hold (Posnansky 1972). In 1975 two Dwinfour sites were excavated; D2 and D3. Excavations at D2 revealed materials suggestive of an industrial complex and they include nearly five hundred (500) fragments of clay crucibles, ten (10) complete crucibles and pits in association with charcoal, ash, furnace walling and pieces of slags (Posnansky 1975). Preliminary study of the crucibles showed the presence of what appeared to be copper or copper alloy deposits, this according to Posnansky (1975) strongly suggests that the D2 site was a

small-scale industrial where various smiths probably worked. Pottery recovered also included the Begho ware pottery (similar to those from the Brong and Kramo quarters) and a few slipped sherds with linear paintings, similar to those from the 12th century Nyarko quarter. This according to Posnansky (1975), makes the D2 site a bridge between the earlier Begho settlement (Nyarko phase) and the latter settlement (Brong and Kramo phase). Aside these, there was no trace of houses in the excavation and very few finished implements were recovered. Some of these included a large metal bracelet, one copper or brass ring and a number of iron objects (arrowheads, knife blades, rods, nails and fish hooks) (Posnansky 1975). Excavations at D3 site revealed three burials, all of which the remains were laying on their right shoulders and facing to the east. A possible explanation is found in brong burial customs in the area where men were buried facing east and women facing west (Posnansky 1975). The materials recovered include pottery (similar to those found at the Brong quarter), metallic objects, spindle whorls, smoking pipes, beads, animal remains (predominantly that of birds and small animals) and 3 ivory objects. The ivory object included a small carved comb with circular engravings similar to the decorative motifs on the side-blown trumpets recovered from the B2 site (Posnansky 1975).

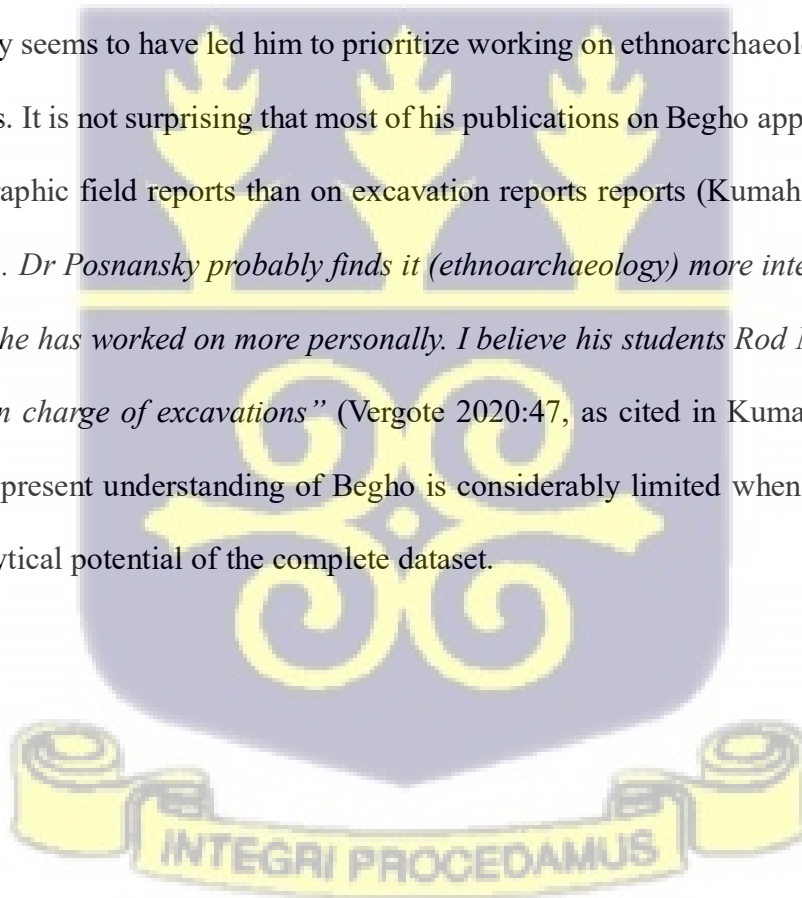
The Nyarko quarter is known to be the oldest and the first suburb to be settled on in Begho, this is evidenced by radiocarbon dates of A.D. 1045 $\pm$ 80 and A.D. 1120 $\pm$ 80 (see Posnansky 1975). Oral traditions claim that the settlement was founded by one Afua Nyarko and part of the Begho polity (Posnansky 1975). Excavations in 1975 revealed a very distinct pottery tradition, different from the 15th -18th Century red slipped Begho ware pottery tradition associated with the Brong, Kramo and Dwintfour (D1 and D3) sites. The Nyarko pottery is heavily weathered and has high incidence of notching on the rims and carved roulette motifs on the body sherds (Posnansky 1975). They also micaceous and design painted, similar to those recovered from the Dwintfour (D2)

site. This according to Posnansky (1975) means the two sites probably belonged to the same tradition.

Mumute and Bonoase sites are pre-historic sites with material culture consistent with those belonging to the Kintampo Complex (Late Stone Age). The materials recovered during excavations in 1972, 1973 and 1974 include pottery, polished stone axes, Terracotta Rasp (cigars), grooved stones, stone bracelets, bones and three pieces of iron from the upper levels (see Posnansky 1972).

As Posnansky (1975) remarked, information on technology at Begho (aside pottery) was inadequate at the time, so the 1975 excavation season was designed to give priority to technological information. Iron working sites like Dapaa, Srede and Atwetwebooso were thoroughly investigated. The site of Atwetwebooso is one of the earliest ironworking sites in Ghana and West Africa, evidenced by a date of AD 1820±80 (Posnansky 1975). The site consisted of a dense scatter of slag, tuyere and furnace fragments up to 10cm thick with the actual furnace focus clearly defined (Posnansky 1975). The Srede site (located 2.87 km west of Atwetwebooso) yielded slag, furnace and tuyere fragments in small quantities, without the focus of the furnace being located. None of the thirty-one (31) recognizable tuyere fragments were whole or more than 15cm. Also, none of the charcoal found were suitable for dating. This according to Posnansky (1975) proved “somewhat disappointing” considering the quantum of artifacts relative to square meters excavated (17.25 sqm). At Dapaa, only a test excavation was conducted due to the problem of clearing tick vegetation. The site was characterized by fourteen (14) slag mounds located in an open circle some fifty (50) meters across. The excavation revealed several iron slags, tuyere fragments, hammerstone and remains of a furnace (Posnansky 1975). Aside these, small quantities of pottery (similar to the Begho ware) were also recovered. Iron working on the site dates to between the 15th and 17th Century (see, Posnansky, 2015).

Despite the extensive data gathered through the project, it is noteworthy that the volume of publications remains limited in relation to the scale of work undertaken. A range of factors have been identified by researchers and project participants to account for this outcome. These include issues with funding, personal challenges faced by Posnansky and the broader political and economic context of Ghana during the 1970s and 1980s (see Kumah 2022). Among these, the most consequential appears to be Posnansky's methodological predisposition toward ethnoarchaeology. The West African Trade project (WATP) utilized a multi-disciplinary approach in its investigations. Aside archaeological data, Posnansky and his team also collected ethnographic data as well as oral narratives from the people of Hani and its surrounding communities. Posnansky's affinity for ethnoarchaeology seems to have led him to prioritize working on ethnoarchaeology data over data from excavations. It is not surprising that most of his publications on Begho appears to have relied more on ethnographic field reports than on excavation reports reports (Kumah 2022). As Rachel Roy¹⁷ puts it “.... *Dr Posnansky probably finds it (ethnoarchaeology) more interesting because it is a subject that he has worked on more personally. I believe his students Rod McIntosh and Phil de Baros were in charge of excavations*” (Vergote 2020:47, as cited in Kumah 2022:140). It is evident that our present understanding of Begho is considerably limited when measured against the broader analytical potential of the complete dataset.



¹⁷ Rachel Roy has been collaborating with Merrick Posnansky since 2013 on the release of two books based on excavations and ethnoarchaeological investigations at Hani (Vergote 2020:46, as cited in Kumah 2022:139).

4.2.2 The Begho Archives

The Begho Archives in its entirety is spread between Africa, Europe and America (Kumah, 2022: 135). This may be largely due to the dynamic nature of the project and its team members. The project drew volunteers and participants from around the world. This meant that whoever works on a particular aspect of the site will need access to the datasets for writing and publication. Posnansky himself had taken up appointment at the University of California, Los Angeles (UCLA) by the time the project came to an end in 1979. This meant parts of the datasets needed to be with him at UCLA for publications (see Kumah 2022). This decentralization of the datasets is a major reason why less is known of Begho (through publications) relative to the extensive excavations conducted, earning it the tag “Begho Mystery” (Vergote 2020: 4, as cited in Kumah, 2022).

The datasets from Begho between 1970 and 1975 under the WATP, constitute part of the archive located at the Department of Archaeology and Heritage Studies, University of Ghana, and is the dataset used in this work. The datasets had been in the custody of Leonard B. Crossland, a student of Merrick Posnansky who later became the director of the project after 1976 (Kumah 2022). He was meticulous in keeping together every single file, document and photograph connected to the project several decades after the project ended (see Kumah, 2022). He handed over the datasets to Daniel Kumah in 2018 when he began his doctoral research at Begho. His return to the site was the first of its kind in over four (4) decades after the end of the WATP and heralded a sign of hope for carrying on the work Posnansky and his team had started at Begho.

4.2.2.1 Datasets under the West African Trade Project (WATP) (1970-1975)

Upon receiving the datasets Daniel Kumah embarked on a data cleaning and digitization exercise aimed at systematically organizing, inventorizing and easing access to the dataset (see Kumah, 2022). At the end of the exercise he re-organized the datasets into eighteen (18) different

folders or dossiers based the following themes, Correspondence and notes (n=1), Analysis sheets (n=14), Maps (n=1), Drawings (n=1) and Photographs (n=1). In all, he had eighteen (18) different folders made up of three thousand five hundred and nineteen (3, 519) individual files that cut across the enumerated themes (Kumah, 2022: 143).



Figure 4.2- 4 Folders holding datasets from the West Africa Trade Project (WATP)

- Correspondence and Notes folder:

This folder contains 359 documents categorized under letters and notes. I selected and scanned twenty-one (21) of them for this work. The letters category contains letters of correspondence between members of the WATP and in some instances, stakeholders. For instance, one of the letters was from Nana Kofi Ampofo (chief of Hani) to Dr Joane Dombrowski, one of the archaeologists of the WATP (see also Kumah 2022). In the letter (dated October 4, 1974), the Chief reported the

sudden death of the Hani Queen Mother on September 14, 1974, and her burial on September 17, 1974. Nana Ampofo included an invitation for Dombrowski, Posnansky, and other members of the Archaeology Department to attend a celebration in her honor on November 2, 1974. This letter highlights the close relationship between the archaeologists and the community of Hani. This kind of relationship is very essential to the practice of archaeology because it breeds trust between archaeologists and local communities whose past and heritage is the subject of archaeological enquiry.



Figure 4.2- 5 Letter from Nana Ampofo to Dr. Joane Dombrowski. Sourced from Kumah (2022)

Another Fascinating part of the letter's category is the correspondence between students (would be participants of the excavation) and Posnansky. At the very beginning Posnansky seems

to have advertised the project, calling for students to apply for participation. This led to an influx of numerous applications by prospective students from diverse backgrounds; from both local and international students from other fields or departments aside archaeology. Figure 4.2-5 below for instance, is an application letter from one Lawrence N. Ezeako, a science student from the University of Cape Coast (UCC) in 1972.

PA.118

Lawrence N. Ezeako
134 Cassely Hayford Hall
University of Cape Coast
Cape Coast
10th March 1972.

Professor Poznorsky,
Department of Archaeology,
University of Ghana,
Legon.

Sir,

Application for Vacation Employment
in the West African Archaeological
Research Project

I am a second-year Science student sponsored in the above university by the Association of African Universities Scholarship Program on behalf of the Nigerian Government. I have just been informed from my scholarship secretariate (A.A.U.) in Accra that you will be carrying out some archaeological survey of some places along this West African Coast. I understand you need some undergraduate students to help in this venture during the forthcoming long vacation.

I am very much interested in the project. I would be pleased to be enlisted as one of your assistants.

Yours faithfully,
(L. N. Ezeako)

Send him a Regio application form & say that if interested we can apply for it as soon as possible.

Figure 4.2- 6 Application letter from L. N Ezeako from UCC

Accepted students were sent an application forms to fill (as seen in figure 4.2-6 below). Upon receiving the filled-out application forms, the accepted students were sent acceptance letters

from the Department of Archaeology detailing the terms and conditions for participation, details on the trip to Hani, a well wish, introduction to the project team members and relevant information about the site in general (figure 4.2.7 below).

Application to participate in the Begho Field School
July 31 - September 9, 1972

Name (Mr./Miss) LAWRENCE N. EZEAKO Age 25 years
 Address 134 Casely Hayford Hall, U.C.C., Cape Coast.
 College education 2nd year Science Student
 (please mention if you have read any courses on Africa)
I passed "African Studies" in my 1st year.

Previous experience of archaeological work
 (a) course work None apart from reading about some archaeological findings, how these were obtained, and the inference drawn from them.
 (b) fieldwork None

Any special skills (viz photography, surveying, knowledge of vertebrate zoology, anatomy, art etc.)
Chemistry in particular.
But I can quickly learn to assist in surveying with my background in Physics & Mathematics.

Period of participation July to middle Sept. 1972

Source of financial provision (P.A.U.) Association of African Universities, Secretariat, State House, Accra.

Any other relevant information
I am being sponsored by the above Secretariat. Would you please ask them for enough funds to cater for me during the project period.
 I have read the conditions attaching to this application and wish to apply to participate in the Field School.

Signed: [Signature] Date: 14th March 1972

Figure 4.2- 7 Application forms filled out by Mr Ezeako in 1972

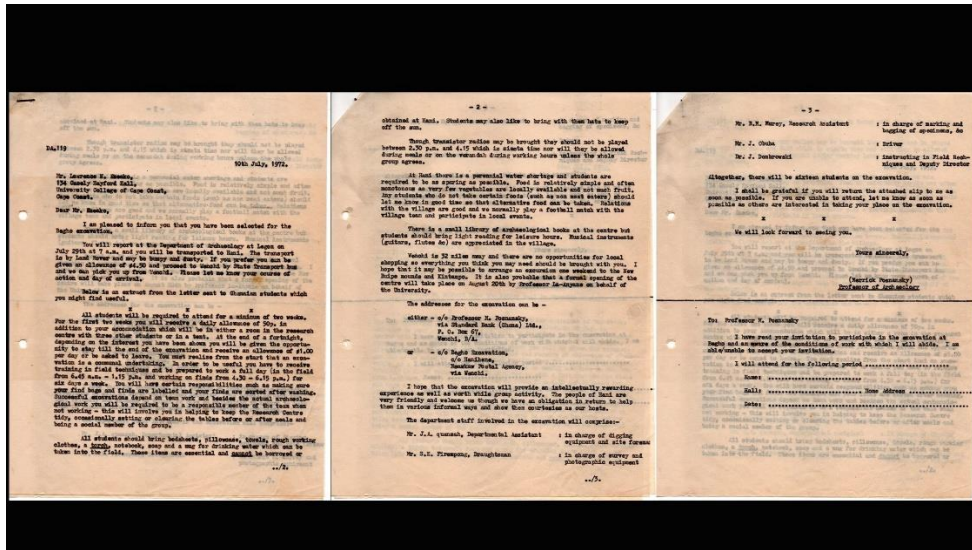


Figure 4.2- 8 Acceptance letter directed at Mr Ezeako

Students filled out a space provided as a way of signing up for the project and send the form back to the Department of Archaeology at University of Ghana as shown by figure 4.2.8 below.

Figure 4.2- 9 filled out Application form for participation in Begho excavations

This process of admitting students is significant because not only did it show the institutional dimension of the project (as a departmental project and not an individual's project)

but it is a model that can be emulated today in the Department of Archaeology and Heritage studies. This is where the department can open up its field school program to other departments both within and outside the University of Ghana to stimulate the interest of students as well as foster collaborations between Departments and Institutions at large. Archaeology as a discipline in itself is multi-dimensional, archaeologists do not solely rely on archaeological theories and methods for knowledge production but a mix of other theories and methods from other fields especially the sciences. This model can benefit the department in this regard.

The other letters are correspondence between Leonard Crossland and Merrick Posnansky, and they cover topics ranging from Crossland's invitation to join the Begho excavations, grants, and reports. Notable letters include Posnansky's first invitation in 1970, a 1972 letter discussing hospital delays in Accra that probably hindered his ability to participate in the excavations that year, and a 1980 letter revealing Posnansky's busy schedule at UCLA hindering his ability to concentrate on working on the Begho materials and the steps taken to ensure work continues (Kumah 2022: 147). These letters of correspondence give us insight into how the WATP team dealt with challenges they encountered over the course of the project.

The twenty-one (21) samples were uploaded into the documents table on the database dedicated to storing documents. This table has Document ID, Data ID, Document, Document title, Author, Year of publication and document type as its columns. This is seen in the figure (4.2-9) below.



Server: 127.0.0.1:3306 » Database: archdb » Table: documents

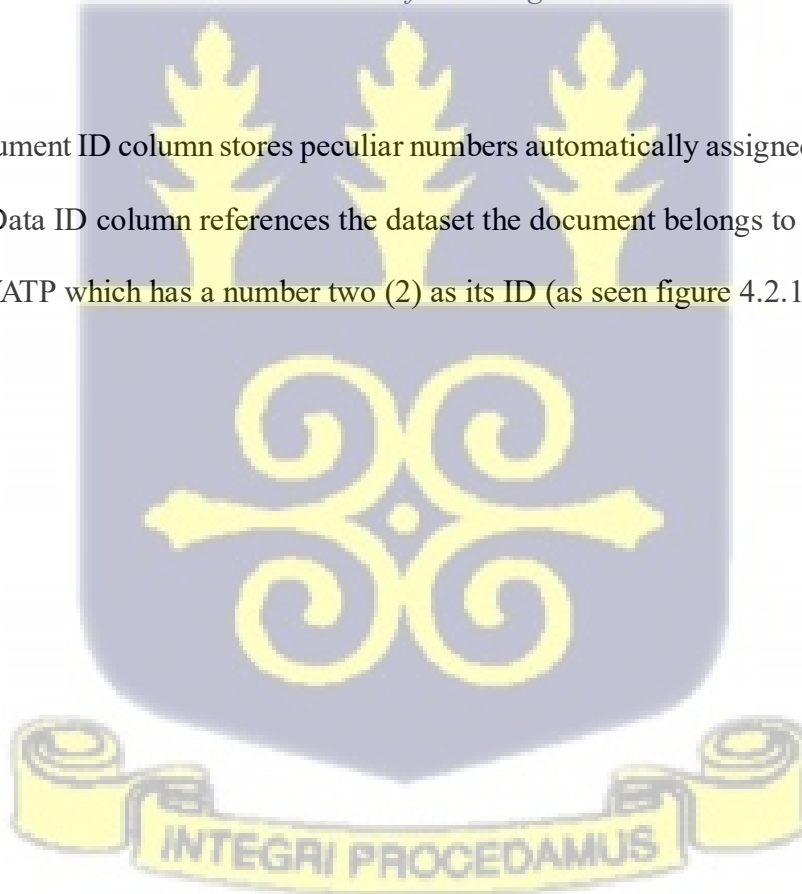
Browse Structure SQL Search Insert Export Import Privileges Operations Triggers

	DocumentID	DataID	Document	DocumentTitle	Author	YearOfPublication	DocumentType
☐ Edit Copy Delete	1	2	[BLOB - 887.9 KIB]	Admission Letter to all participants of Begho Exca...	Merrick Posnansky	1972	Scanned document. Letter of Correspondence
☐ Edit Copy Delete	2	2	[BLOB - 937.3 KIB]	Letter of Admission into Begho field school	Merrick Posnansky	1972	Scanned letter of correspondence
☐ Edit Copy Delete	3	2	[BLOB - 868.8 KIB]	Letter for Assistance to University of Ghana Vice ...	Merrick Posnansky	1972	Scanned letter of correspondence
☐ Edit Copy Delete	4	2	[BLOB - 700.3 KIB]	Rod McIntosh's Application letter for Begho excava...	Roderick McIntosh	1971	Scanned Letter of correspondence
☐ Edit Copy Delete	5	2	[BLOB - 657.7 KIB]	Follow-up letter from Rod McIntosh	Rod McIntosh	1972	Scanned letter of correspondence
☐ Edit Copy Delete	6	2	[BLOB - 660.4 KIB]	Anders Lindahl's request to join Begho Dig	Anders Lindahl	NULL	Scanned letter of correspondence
☐ Edit Copy Delete	7	2	[BLOB - 1.1 MIB]	Application form for Begho field school participat...	NULL	1972	Scanned letter of correspondence
☐ Edit Copy Delete	8	2	[BLOB - 1.2 MIB]	De-Souza's request to join Begho dig	Hector De-Souza	1972	Scanned letter of correspondence
☐ Edit Copy Delete	9	2	[BLOB - 917.0 KIB]	E.D Owusu's request to join Begho dig	Ebenezer Darko Owusu	1972	Scanned Letter of correspondence
☐ Edit Copy Delete	10	2	[BLOB - 816.9 KIB]	James Boachie-Ansah's request to join Begho dig	James Boachie-Ansah	1972	Scanned letter of correspondence

Check all With selected: Edit Copy Delete Export

Figure 4.2- 10 Documents Table used for storing documents on the database

The Document ID column stores peculiar numbers automatically assigned to each uploaded document. The Data ID column references the dataset the document belongs to and in this case, it belongs to the WATP which has a number two (2) as its ID (as seen figure 4.2.10 below).



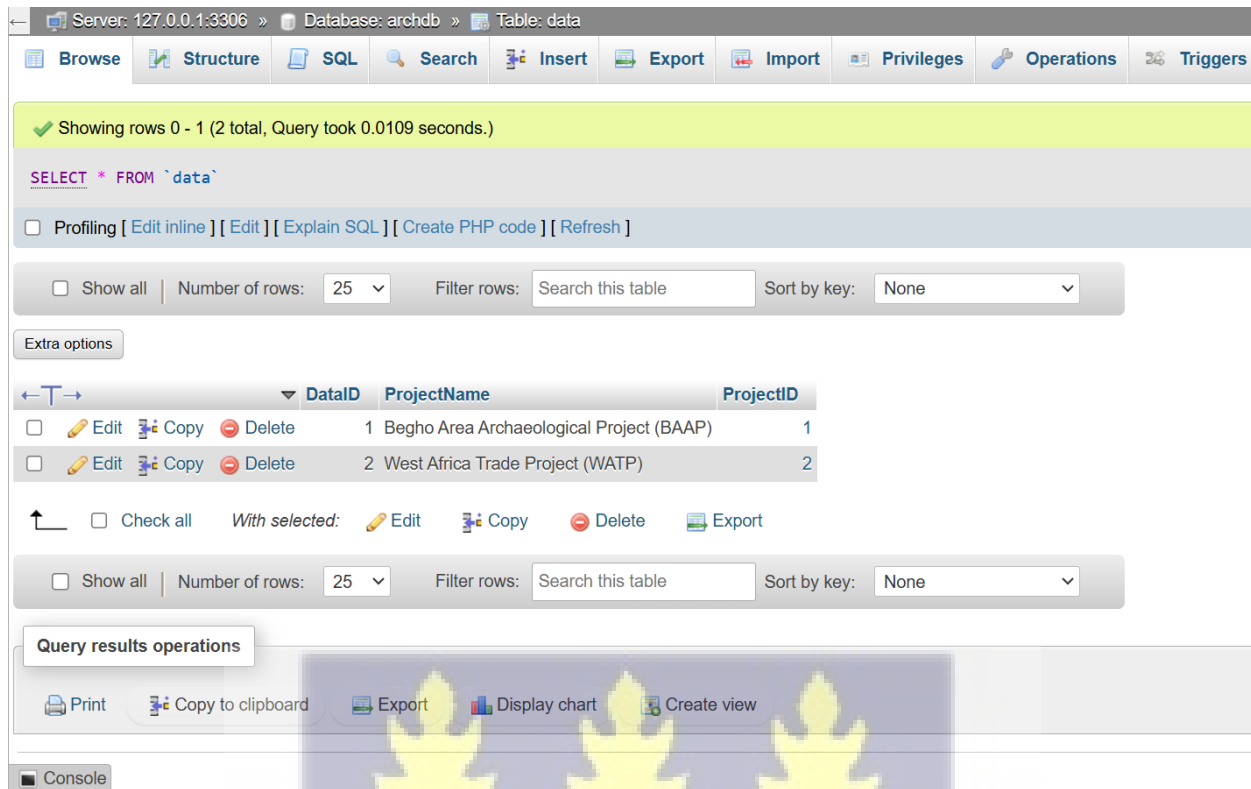


Figure 4.2- 11 Data table

The Document column stores the actual image. Information pertaining to document title, author and the year it was written is captured by the Document Title, Author and Year of Publication columns respectively. The last column which is the document type, stores information pertaining to the type of document being stored, thus scanned letters of correspondence in this case. This column is there because it is the only table dedicated to documents within the database, hence the need to specify the type of document.

The other documents in the folder aside the letters of correspondence are notes on special finds, pottery industry research, and papers on Brong Ahafo pottery. These notes also include a set titled "Notes for Anquandah" and a paper extract by Boateng presented at University of Science and Technology (UST) (See Kumah 2022).

- Maps folder

The Maps folder contains all hand-drawn maps produced on Begho during WATP. They are sub-grouped into two namely, Regional maps (n=10) and Site Plans (n=77), putting the total number to eighty-seven (87). It is important to note that Kumah (2022) has already worked on nine (9) in his thesis, scanning and digitizing them with the help of Adobe Illustrator.

For the purpose of this work, I sampled sixteen (16) of the maps, scanned and digitized them where necessary. Figure 4.2-11 below shows a digitized map of Hani, based on the original produced under the WATP. The map shows the various quarters surveyed and excavated. This map was scanned and digitized using QGIS software. Unlike Kumah (2022) who used Adobe Illustrator to digitize his maps, I used QGIS to geo-reference the old map. A Geo-referenced map is a digitized



map with its internal coordinate system consistent with the ground system of geographic coordinates.

ARCHAEOLOGICAL SITES AT BEGHO

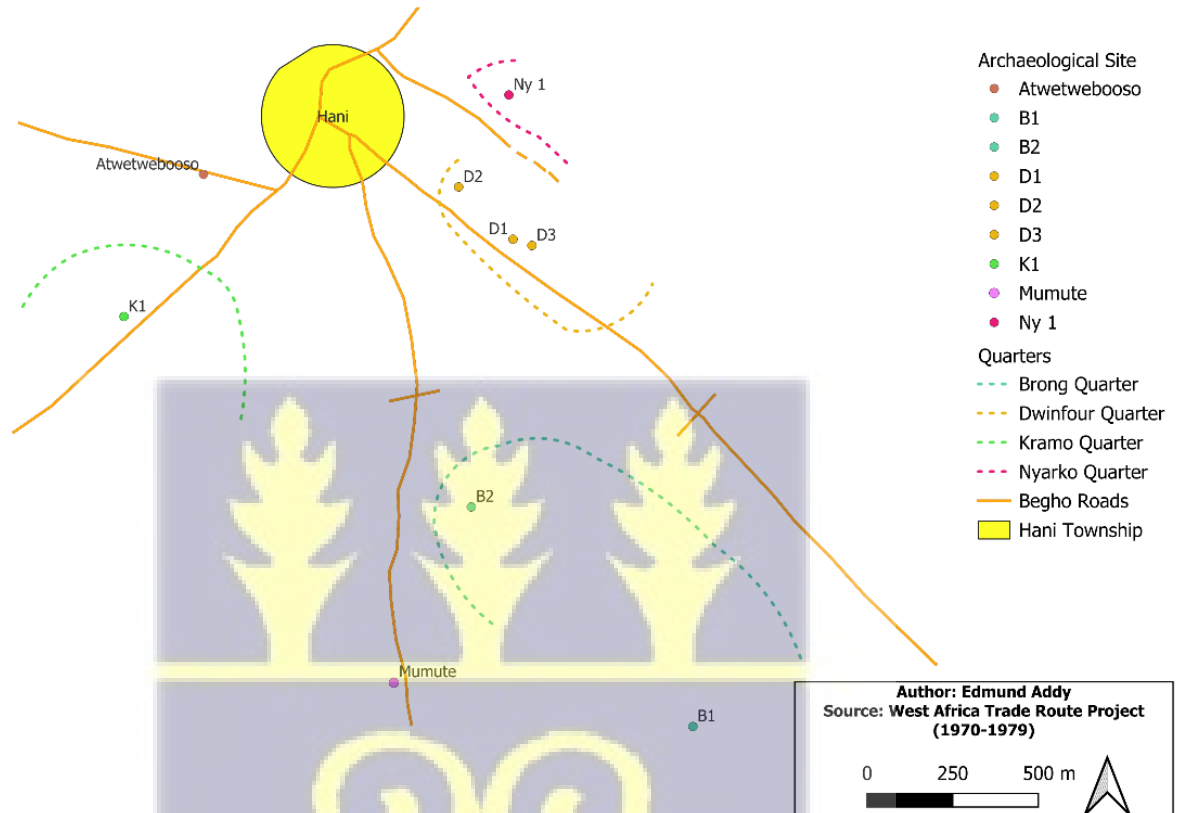


Figure 4.2- 12 Digitized Map of Archaeological sites in Begho-Hani

The sixteen (16) samples were uploaded into the Site plans table on the database dedicated to storing site plans. This table has SitePlan identity (ID), Data identity (ID), SitePlan image, Image name and Image description as its columns (as seen in the figure 4.2-13). The columns work according to their designated names, storing relevant information accordingly.

Server: 127.0.0.1:3306 » Database: archdb » Table: siteplan

[Browse](#)
[Structure](#)
[SQL](#)
[Search](#)
[Insert](#)
[Export](#)
[Import](#)
[Privileges](#)
[Operations](#)
[Triggers](#)

SELECT * FROM `siteplan`

☐ Profiling
 [\[Edit inline \]](#)
[\[Edit \]](#)
[\[Explain SQL \]](#)
[\[Create PHP code \]](#)
[\[Refresh \]](#)

☐ Show all
 Number of rows: 25
 Filter rows:
 Sort by key: None

Extra options

		SitePlanID	DataID	SitePlanImage	ImageName	ImageDescription
☐	Edit	Copy	Delete	1	2 [BLOB - 9.5 MiB]	Bonoase Site Plan
☐	Edit	Copy	Delete	2	2 [BLOB - 7.8 MiB]	Mumute Site plan
☐	Edit	Copy	Delete	3	2 [BLOB - 11.0 MiB]	Mumute level 3
☐	Edit	Copy	Delete	4	2 [BLOB - 9.8 MiB]	Kramo Quarter (K1)
☐	Edit	Copy	Delete	5	2 [BLOB - 10.0 MiB]	Hani-Rubbish Dump No. 1
☐	Edit	Copy	Delete	6	2 [BLOB - 9.9 MiB]	Hani-Rubbish Dump No. 2
☐	Edit	Copy	Delete	7	2 [BLOB - 8.5 MiB]	Brong Quarter (B2, 1972)
☐	Edit	Copy	Delete	8	2 [BLOB - 10.8 MiB]	Kramo quarter (K2)
☐	Edit	Copy	Delete	9	2 [BLOB - 10.1 MiB]	Atwetwebooso (Nami)
☐	Edit	Copy	Delete	10	2 [BLOB - 10.1 MiB]	Hani Area

Figure 4.2- 13 Site plan table used to store siteplans inside the database

- Drawings and illustrations

This folder contains drawings ranging from artifacts, features, trench depictions, stratigraphy and remains excavated under the WATP. In all there were thirty-six (36) drawings and illustrations, out of which twenty-four (24) were sampled, scanned and used in this work. Figure 4.2-14 shows drawings of human remains found at layer 5 of a trench at the Brong quarter in 1970. This was drawn by Gudula Strohmann as shown at the bottom of the drawing, next to the scale (figure 4.2-14).

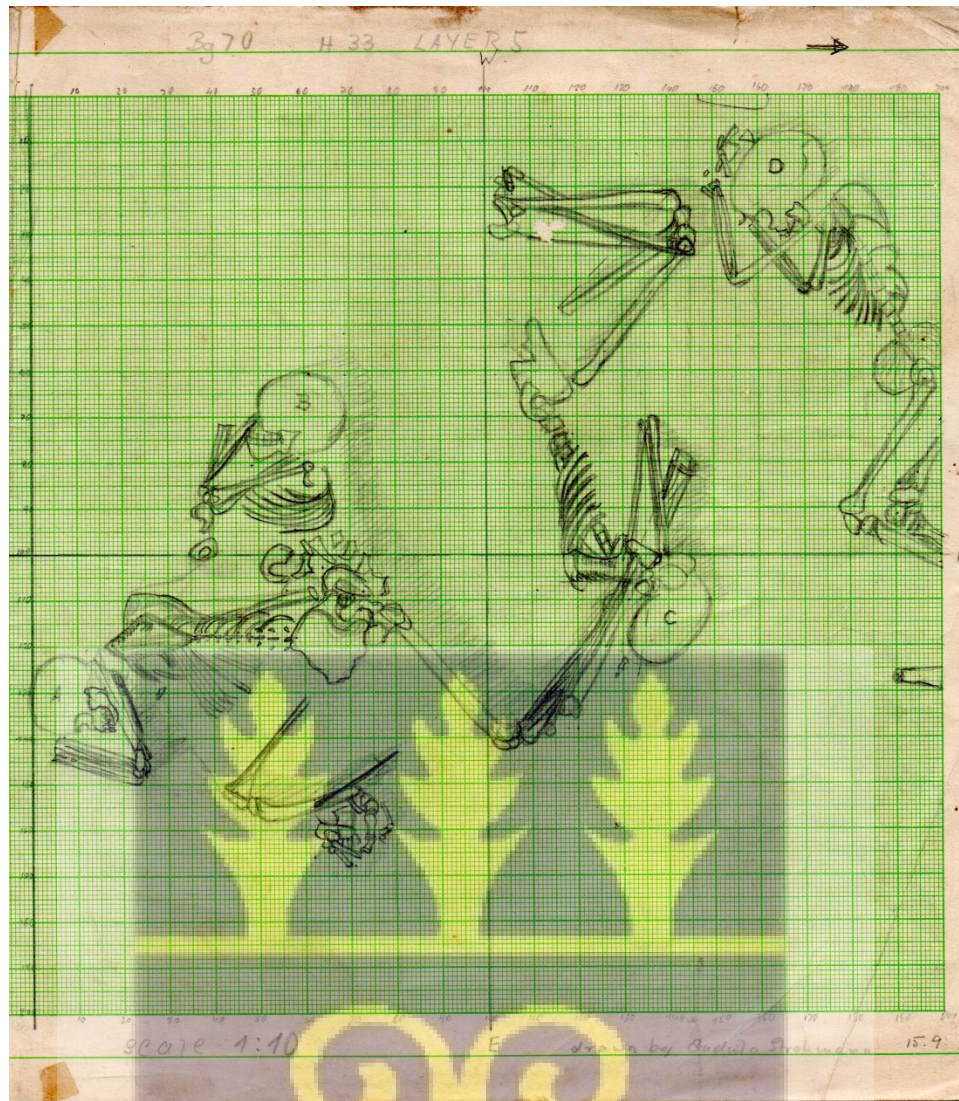


Figure 4.2- 14 Human remains found in situ at B1 in 1970. (Source: Begho archives).

Some of the illustrations seems to be from ethnographic research like the figure 4.2-15, showing various pottery decorations from Bondakile.

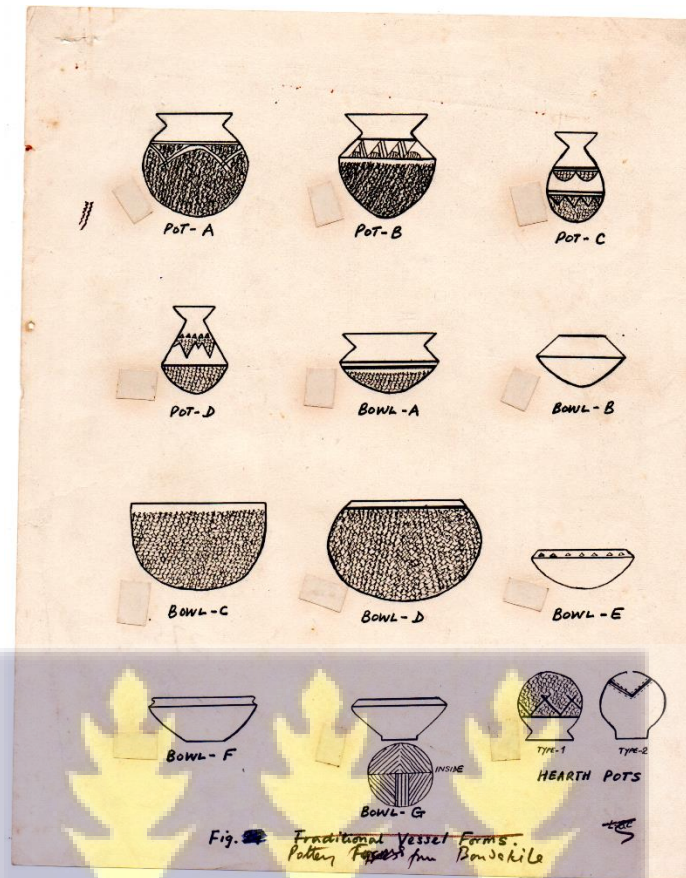


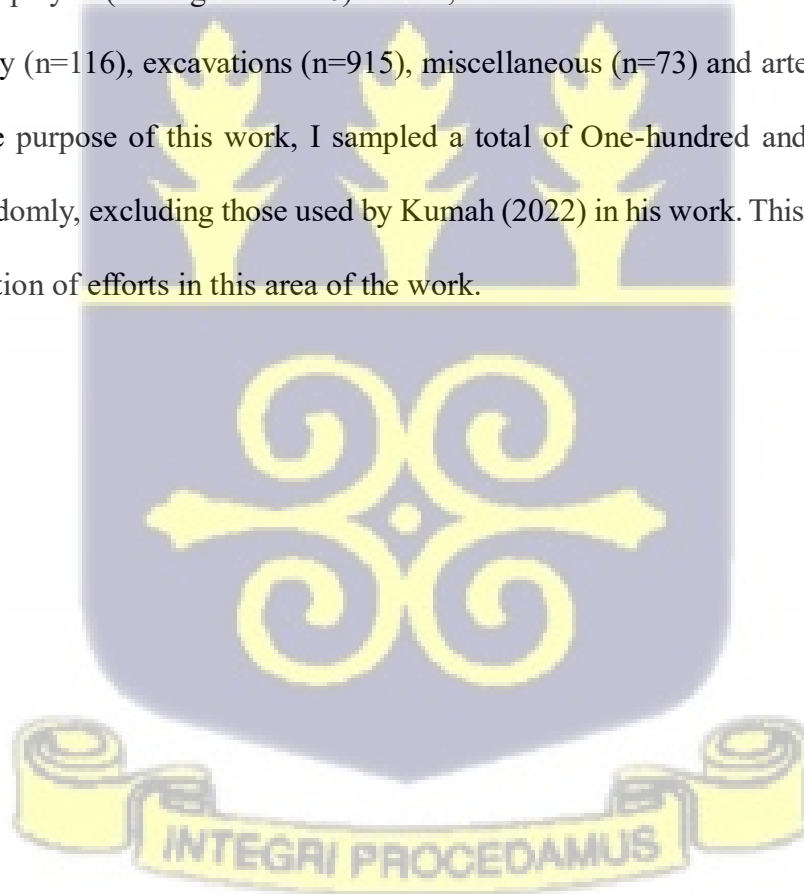
Figure 4.2- 15 Illustrations of forms and designs on pottery from Bondakile (Source: The Begho Archives)

- Analysis Sheets

The Analysis sheets folders form the largest proportion of all the datasets from the WATP. The files in these folders number up to one thousand five hundred and eighteen (1,518) and are spread across fourteen (14) different folders (see Kumah, 2022). The analysis sheets play a vital role in the archaeological knowledge production process, as they are used to record data during cultural material analysis. In spite of its enormity, I did not sample files from this folder. The reason is that the analysis sheets lack summary reports that provide meaning to the dataset. Figure 4.2-16 shows an example of the analysis form for the Nyarko quarter (Ny1) in 1975. The form is designated

- Photographs

This folder shows almost all aspects of the project in pictorial view that deepens my appreciation for the work done under the WATP. This folder has a total of 1,408 images and is the second largest of all the folders. The files in this folder were categorized under three (3) themes; ethnoarchaeology, excavation, and artefacts photographs (Kumah, 2022: 158). When I re-assessed the photographs, I made some adjustments to this categorization by introducing one more category called Miscellaneous which captures other activities that do not fall within the initial groupings. One of such activities is a football game between the community and the project team with Merrick Posnansky as a player (see figure 4.2.16). In all, the files in the folder are subdivided into ethnoarchaeology (n=116), excavations (n=915), miscellaneous (n=73) and artefacts photographs (n=304). For the purpose of this work, I sampled a total of One-hundred and forty-three (143) photographs randomly, excluding those used by Kumah (2022) in his work. This was done in order to avoid duplication of efforts in this area of the work.





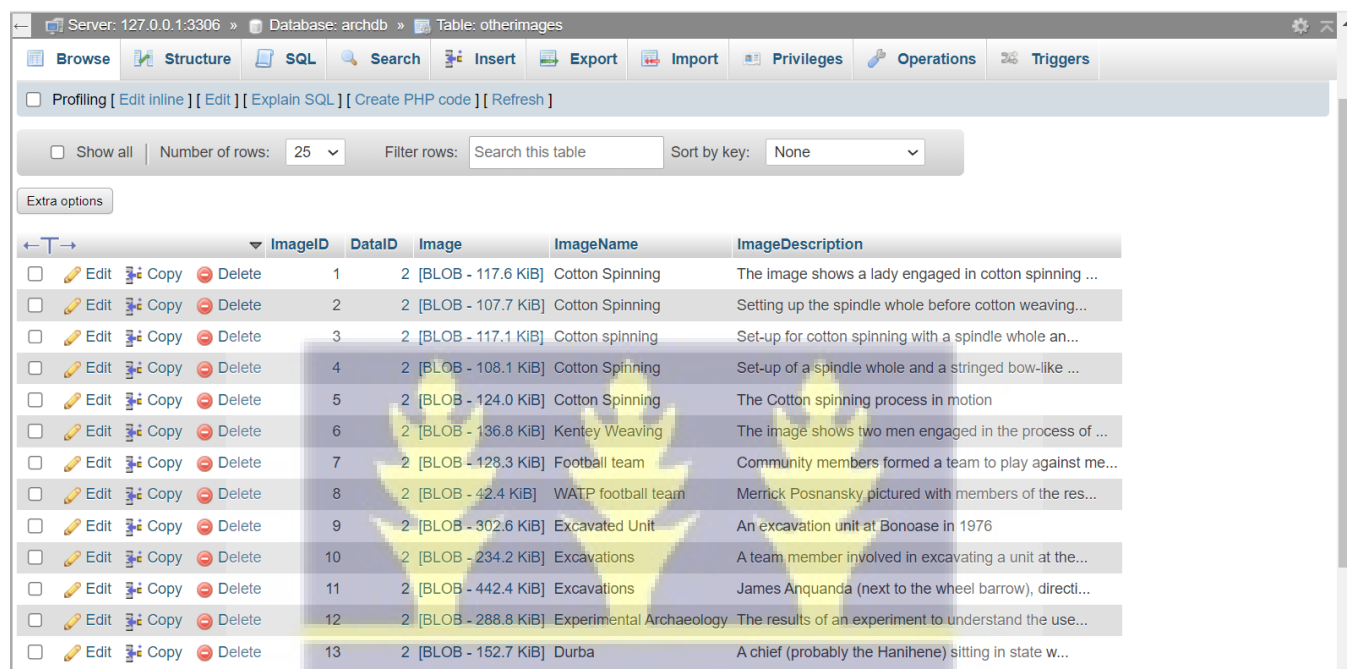
*Figure 4.2- 17 Merrick Posnansky in a team photo during a football match at Hani in 1970
(Source: Begho Archives)*

The figure below shows a picture of excavation work ongoing at one of the quarters.



Figure 4.2- 18 Excavations at one of the Quarters at Begho. (Source: Begho Archives).

The one-hundred and forty-three (143) samples were uploaded into the table called other images on the database dedicated to storing any other image aside images of artifacts. Just like the other tables, this table has Image ID, Data ID, Image, Image name and Image Description as its column and they work according to their designated names (see the figure 4.2-19).



	ImageID	DataID	Image	ImageName	ImageDescription
☐ Edit Copy Delete	1	2	[BLOB - 117.6 KiB]	Cotton Spinning	The image shows a lady engaged in cotton spinning ...
☐ Edit Copy Delete	2	2	[BLOB - 107.7 KiB]	Cotton Spinning	Setting up the spindle whole before cotton weaving...
☐ Edit Copy Delete	3	2	[BLOB - 117.1 KiB]	Cotton spinning	Set-up for cotton spinning with a spindle whole an...
☐ Edit Copy Delete	4	2	[BLOB - 108.1 KiB]	Cotton Spinning	Set-up of a spindle whole and a stringed bow-like ...
☐ Edit Copy Delete	5	2	[BLOB - 124.0 KiB]	Cotton Spinning	The Cotton spinning process in motion
☐ Edit Copy Delete	6	2	[BLOB - 136.8 KiB]	Kentey Weaving	The image shows two men engaged in the process of ...
☐ Edit Copy Delete	7	2	[BLOB - 128.3 KiB]	Football team	Community members formed a team to play against me...
☐ Edit Copy Delete	8	2	[BLOB - 42.4 KiB]	WATP football team	Merrick Posnansky pictured with members of the res...
☐ Edit Copy Delete	9	2	[BLOB - 302.6 KiB]	Excavated Unit	An excavation unit at Bonoase in 1976
☐ Edit Copy Delete	10	2	[BLOB - 234.2 KiB]	Excavations	A team member involved in excavating a unit at the...
☐ Edit Copy Delete	11	2	[BLOB - 442.4 KiB]	Excavations	James Anquanda (next to the wheel barrow), directl...
☐ Edit Copy Delete	12	2	[BLOB - 288.8 KiB]	Experimental Archaeology	The results of an experiment to understand the use...
☐ Edit Copy Delete	13	2	[BLOB - 152.7 KiB]	Durba	A chief (probably the Hanihene) sitting in state w...

Figure 4.2- 19 Other Images table used for storing any image aside artifact images

4.4.2.2 Datasets from 2020 Excavations

The Begho archives were expanded to include recent research projects in this work. The primary reason for this action was that the site is subject to continuous research. As part of the academic requirements for students majoring in Archaeology, field schools are organized for them by the Department of Archaeology and Heritage Studies to give students a practical learning experience. Begho is one of the sites used for the field school.

This results in a continuous flow of data from Begho. With this in mind, it is only prudent we do not treat the Begho archive as static but rather a dynamic one that has the potential to outgrow its current scale. In relation to this work, the above action was taken as a measure against time induced loss of artifacts' contextual information. In archaeology, artifacts' contextual information is as key as the artifact itself because the artifact alone without context does not reveal much. It is only by combining it with its contextual information that meaningful conclusions can be drawn.

Most of the artifacts collected under the WATP are currently in the Museum storage of the Department of Archaeology and Heritage Studies. The issue is that many of the artifacts do not have contextual information. This makes it difficult to work with them today. Hence the artifact component of this work was solely taken from the 2020 excavations conducted by Daniel Kumah. A separate folder was dedicated to the datasets from his project. This puts the total number of folders in the Begho archives to nineteen (19).

Within this folder are two-hundred and eighty (280) files, excluding photographs and GPS coordinates. Within this are field record forms (n=51), photo copied articles (n=13), notes (n=77), analysis sheets (n=59), drawings and illustrations (n=79), and a graph book (n=1) within which all stratigraphic drawings were. Photographs and GPS coordinates are excluded from the folder because they are in digital formats which exist on the researcher's External Hard drive whiles the artifacts are in the museum storage.

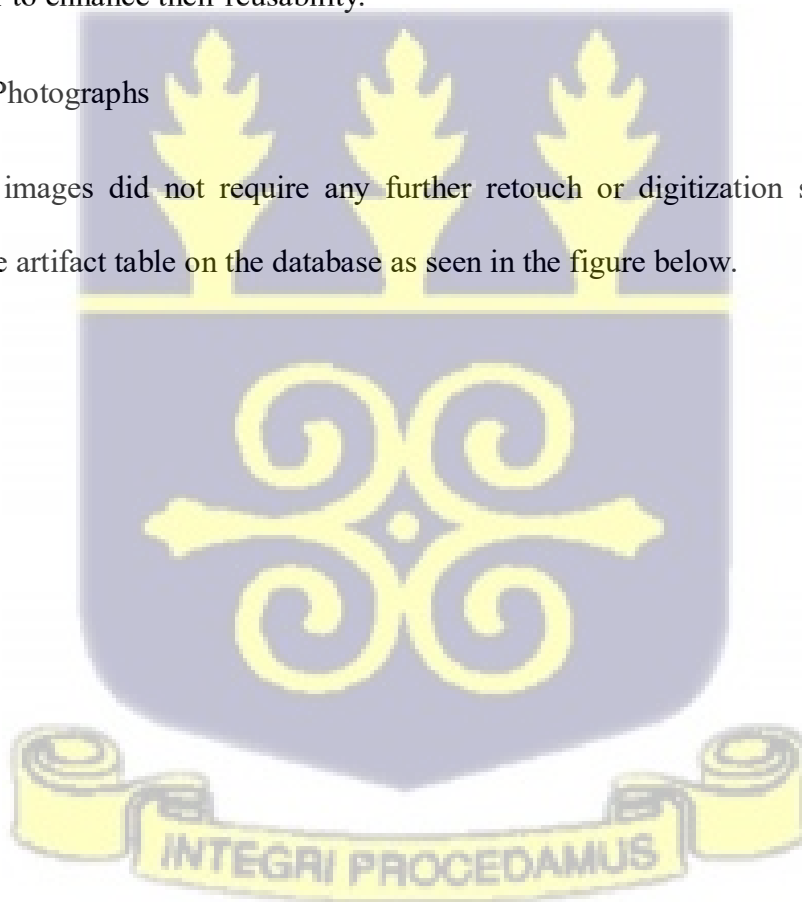
A total of 27,451 artifacts were recovered from the 2020 excavations of which 4,533 were faunal remains, 22,489 were potsherds, 51 stone tools, 68 metal artifacts, 1 plant remain, 19 beads, 197 pieces of daub, 18 charcoal samples, 49 smoking pipes, 1 ceramic disc, 3 spindle whorls, and 3 drainpipes (Kumah, 2022: 321). The entire assemblage is from a Trench (2m x 10m) excavated

at the Brong quarter (B3). In the production of his dissertation, the researcher analyzed pottery, faunal remains, smoking pipes, crucibles, metal objects and beads. With the exception of pottery (which was sourced solely from Unit 1), the other artifacts analyzed by the researcher cut across the entire trench. The researcher made available to me some of the artifact images he photographed for his work and this was where my samples were taken.

In all, one-hundred and twenty-three (123) samples were taken from this dataset and they include artifact photographs (n=72) and Field record forms (51). The idea is to match the selected artifacts to their corresponding field record forms as well as other relevant metadata within the database in order to enhance their reusability.

- Artifact Photographs

The artifact images did not require any further retouch or digitization so it was directly uploaded into the artifact table on the database as seen in the figure below.



Server: 127.0.0.1:3306 » Database: archdb » Table: artifacts

		ArtifactID	DataID	ArtifactImage	ArtifactName	ArtifactDescription	Typology	Chronology/Date	Comments
☐	Edit Copy Delete	1	1	[BLOB - 862.0 KiB]	Fragmented Smoking Pipes	Surface finds. Local tobacco smoking pipes.	Type 3b is the one on top-left, type 4b (1) is the...	Top-Left (1630-1670), Top-right (1670-1700)	Typology is based on Ozanne (1963), Boachie-Ansah ...
☐	Edit Copy Delete	2	1	[BLOB - 1.0 MiB]	Local Smoking Pipe	Surface Find, It has a flat base and stems that ar...	Type 3a	1630-1670	Typology is based on Ozanne (1963), Boachie-Ansah ...
☐	Edit Copy Delete	3	1	[BLOB - 875.2 KiB]	Flat-based smoking pipe.	flat-based, with incisions as their decoration.	Type 3b	1630-1670	Typology is based on Ozanne (1963), Boachie-Ansah ...
☐	Edit Copy Delete	4	1	[BLOB - 5.1 MiB]	Smoking Pipe	They are flat-based, multi-decorated, with triangu...	Type 3b	1630-1670	Sourced from Excavations at the B3 site. Typology ...
☐	Edit Copy Delete	5	1	[BLOB - 5.3 MiB]	Smoking pipes	Flat and double angled base. Large bowl with groov...	NULL	NULL	NULL
☐	Edit Copy Delete	6	1	[BLOB - 382.3 KiB]	Design painted pottery	Potsherds with designed paintings, usually geometr...	NULL	1000 AD to mid-1600s	The designed painted pottery have been found in Bu...
☐	Edit Copy Delete	7	1	[BLOB - 301.9 KiB]	Begho ware pottery	The fabric is well fired and texture varies from m...	For jar forms, they range from form A-I and a misc...	AD 1250-1650 AD	Begho ware pottery was named by Crossland who work...
☐	Edit Copy Delete	8	1	[BLOB - 857.1 KiB]	Micaceous ware Pottery	It has shiny reflections as a result of mica. They...	BF11	AD 1250-1650 AD	They are mostly moderate brown or brownish grey po...

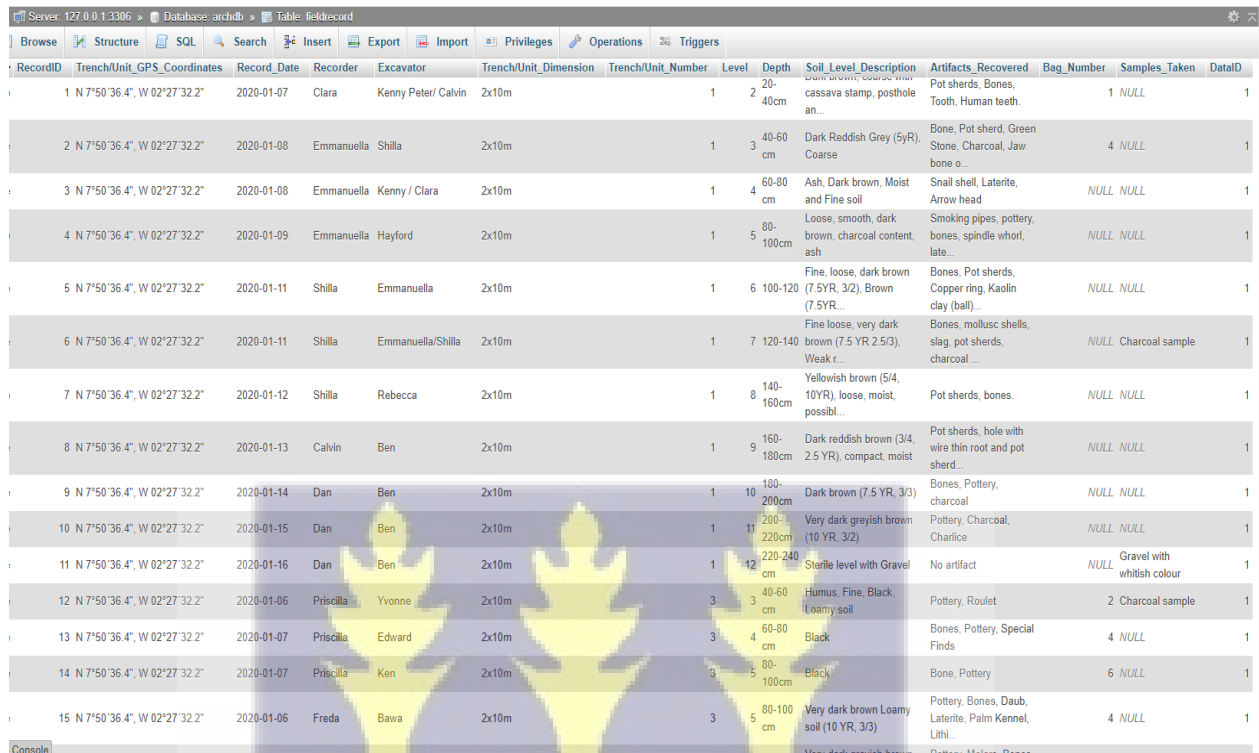
Figure 4.2- 20 Artifacts table dedicated to storing artifacts and their relevant information on the database.

The Artifact table has Artifact identity (ID), Data identity (ID), Artifact Image, Artifact Name, Artifact Description, Typology, Chronology/Date and Comments as its columns. The comments column was introduced as a way of capturing other artifact information that do not fall under the already established columns. The columns work as their names suggests and they store information in that regard.

- Field Record Forms

115

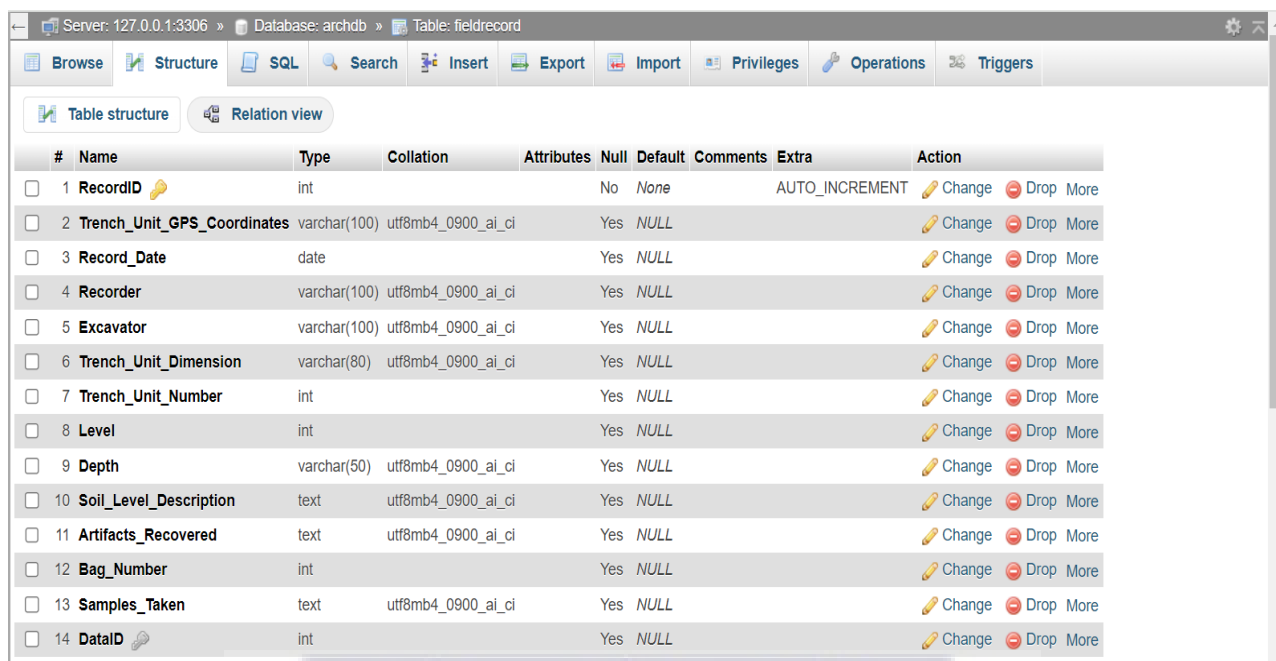
The information on all the field record forms were entered into a table named Field record dedicated to storing field record information as shown in figure 4.2-21.



RecordID	Trench/Unit_GPS_Coordinates	Record_Date	Recorder	Excavator	Trench/Unit_Dimension	Trench/Unit_Number	Level	Depth	Soil_Level_Description	Artifacts_Recovered	Bag_Number	Samples_Taken	DataID
1	N 7°50'36.4", W 02°27'32.2"	2020-01-07	Clara	Kenny Peter/ Calvin	2x10m	1	2	20-40cm	Dark brown, coarse with cassava stamp, posthole an...	Pot sherds, Bones, Tooth, Human teeth.	1	NULL	1
2	N 7°50'36.4", W 02°27'32.2"	2020-01-08	Emmanuella	Shilla	2x10m	1	3	40-60 cm	Dark Reddish Grey (5yR), Coarse	Bone, Pot sherd, Green Stone, Charcoal, Jaw bone o...	4	NULL	1
3	N 7°50'36.4", W 02°27'32.2"	2020-01-08	Emmanuella	Kenny / Clara	2x10m	1	4	60-80 cm	Ash, Dark brown, Moist and Fine soil	Snail shell, Laterite, Arrow head	NULL	NULL	1
4	N 7°50'36.4", W 02°27'32.2"	2020-01-09	Emmanuella	Hayford	2x10m	1	5	80-100cm	Loose, smooth, dark brown, charcoal content, ash	Smoking pipes, pottery, bones, spindle whorl, late.	NULL	NULL	1
5	N 7°50'36.4", W 02°27'32.2"	2020-01-11	Shilla	Emmanuella	2x10m	1	6	100-120	Fine, loose, dark brown (7.5YR, 3/2), Brown (7.5YR...	Bones, Pot sherds, Copper ring, Kaolin clay (ball)...	NULL	NULL	1
6	N 7°50'36.4", W 02°27'32.2"	2020-01-11	Shilla	Emmanuella/Shilla	2x10m	1	7	120-140	Fine loose, very dark brown (7.5 YR 2.5/3), Weak r...	Bones, mollusc shells, slag, pot sherds, charcoal ...	NULL	Charcoal sample	1
7	N 7°50'36.4", W 02°27'32.2"	2020-01-12	Shilla	Rebecca	2x10m	1	8	140-160cm	Yellowish brown (5/4, 10YR), loose, moist, possibl...	Pot sherds, bones.	NULL	NULL	1
8	N 7°50'36.4", W 02°27'32.2"	2020-01-13	Calvin	Ben	2x10m	1	9	160-180cm	Dark reddish brown (3/4, 2.5 YR), compact, moist	Pot sherds, hole with wire thin root and pot sherd...	NULL	NULL	1
9	N 7°50'36.4", W 02°27'32.2"	2020-01-14	Dan	Ben	2x10m	1	10	180-200cm	Dark brown (7.5 YR, 3/3)	Bones, Pottery, charcoal	NULL	NULL	1
10	N 7°50'36.4", W 02°27'32.2"	2020-01-15	Dan	Ben	2x10m	1	11	200-220cm	Very dark greyish brown (10 YR, 3/2)	Pottery, Charcoal, Charlice	NULL	NULL	1
11	N 7°50'36.4", W 02°27'32.2"	2020-01-16	Dan	Ben	2x10m	1	12	220-240 cm	Sterile level with Gravel	No artifact	NULL	Gravel with whitish colour	1
12	N 7°50'36.4", W 02°27'32.2"	2020-01-06	Priscilla	Yvonne	2x10m	3	3	40-60 cm	Humus, Fine, Black, Loamy soil	Pottery, Roulet	2	Charcoal sample	1
13	N 7°50'36.4", W 02°27'32.2"	2020-01-07	Priscilla	Edward	2x10m	3	4	60-80 cm	Black	Bones, Pottery, Special Finds	4	NULL	1
14	N 7°50'36.4", W 02°27'32.2"	2020-01-07	Priscilla	Ken	2x10m	3	5	80-100cm	Black	Bone, Pottery	6	NULL	1
15	N 7°50'36.4", W 02°27'32.2"	2020-01-06	Freda	Bawa	2x10m	3	5	80-100 cm	Very dark brown Loamy soil (10 YR, 3/3)	Pottery, Bones, Daub, Laterite, Palm Kennel, Lithi...	4	NULL	1

Figure 4.2- 22 Field Records table dedicated to storing field record data in the database.

The field record table has fourteen (14) columns under which data is stored as seen in the figure 4.2-23. The columns function as their name suggest and they store information in that regard. The Data ID column as usual, references the table to the dataset the field record belongs to within the Data table (see figure 4.2-11).



Server: 127.0.0.1:3306 » Database: archdb » Table: fieldrecord

Table structure | Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	RecordID	int			No	None		AUTO_INCREMENT	Change Drop More
2	Trench_Unit_GPS_Coordinates	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
3	Record_Date	date			Yes	NULL			Change Drop More
4	Recorder	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
5	Excavator	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
6	Trench_Unit_Dimension	varchar(80)	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
7	Trench_Unit_Number	int			Yes	NULL			Change Drop More
8	Level	int			Yes	NULL			Change Drop More
9	Depth	varchar(50)	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
10	Soil_Level_Description	text	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
11	Artifacts_Recovered	text	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
12	Bag_Number	int			Yes	NULL			Change Drop More
13	Samples_Taken	text	utf8mb4_0900_ai_ci		Yes	NULL			Change Drop More
14	DataID	int			Yes	NULL			Change Drop More

Figure 4.2- 23 Information on the various columns within the field record table

In summary, a total of three-hundred and twenty-seven (327) data samples were taken from the entire Begho archives. These are Letters of correspondence (n=21), Maps (n=16), Illustrations (n=24), WATP Photographs (n=143), Record forms (n=51) and Artifact photographs from 2020 excavations (72). The database compartment of the website was developed using these sampled data from the Begho Archives.

4.3 Kintampo Complex

Found across all major ecological zones in Ghana and parts of Ivory Coast and Togo, the Kintampo Complex or “Kintampo Neolithic” marks a pivotal phase of transition in West Africa from mobile hunter-gatherer lifestyle to settled lifestyle and complex society. A total of twenty-seven (27) sites have been found within Ghana, out of which seven are excavated sites namely

Kintampo (K1, K6 and K8 rock shelters), Ntereso, Mumute, Bonoase, Boyasi, Daboya and Christian Village (figure 4.3-1) (Anquandah, 1995a). The remaining are known from surface finds.

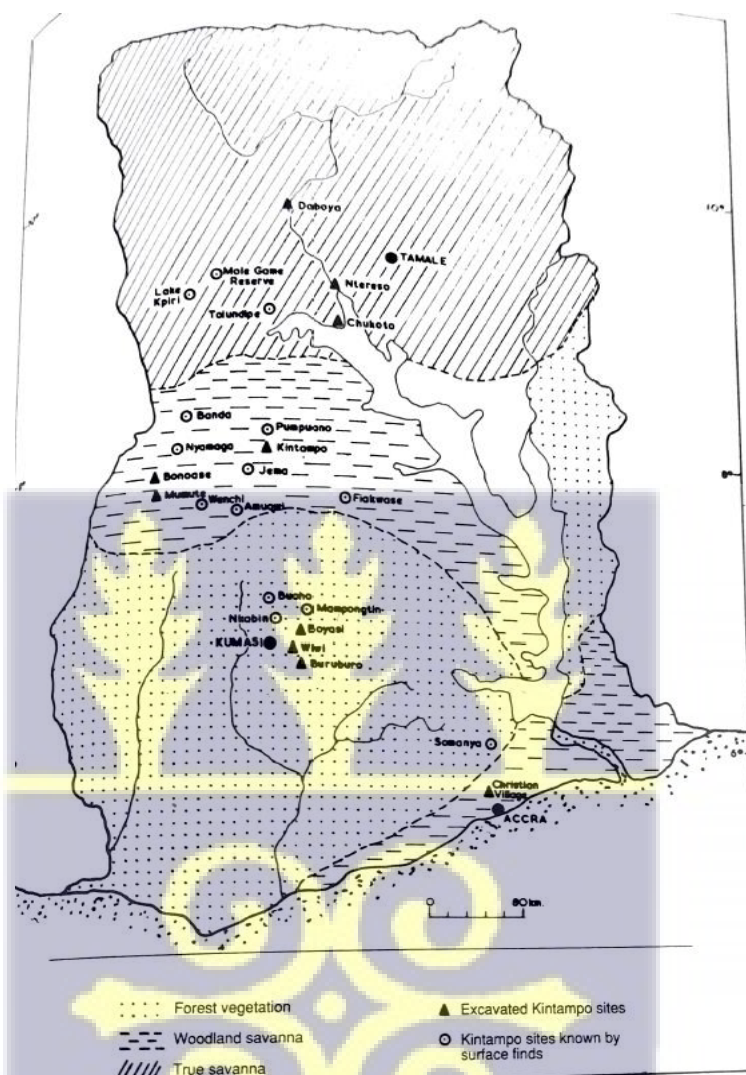


Figure 4.3- 1 Kintampo Complex sites in Ghana (Source: Anquandah 1995a)

The Kintampo complex has been one of the most intriguing topics in Ghanaian archaeology. It provides evidence that support the genesis of Neolithic lifestyle in West Africa on one hand but raises interesting questions about the conventional argument of Sedentism walking hand-in-hand with food production. Repeated patterns in evidence from both surface collection

and excavations, both from Ghana and the Ivory Coast point to the hypothesis that Late Stone Age people led a sedentary life and produced their own food shortly after 2000 BC (Anquandah, 1995a).

The evidence supporting sedentism include daub, pottery, body adornments, polished stone axes for farming and ceramic sculptures. However, scholars are unsure whether faunal and floral remains from Kintampo complex sites are wild or domesticated. Also, doubts have been raised about grain impressions (cob of Pennisetum) on pottery found at Ntereso (Gavua, 1985). These doubts raise questions about food production at Kintampo complex sites. By way of timelines, seventeen (17) out of the twenty-two (22) radiocarbon dates from excavated Kintampo complex sites (except Boyasi and Christian Village) range between 19th -12th Century BC (Anquandah 1995a).

4.3.1 Material Assemblage

- “Terracotta Cigars”

One of the most puzzling pieces of artifacts belonging to the Kintampo Complex is what was referred to as “cigars” by Oliver Davies (1962). Terracotta cigars are slabs of flat-oval sections, scored horizontally and vertically on both faces but usually not to the ends, though some taper slightly to both ends (Davies, 1980). Some of the scoring crisscross one another creating small grids while others run in one direction as seen in the figure 4.3-2. They come both in rocks and clay and are usually broken, exhibiting heavy wear in the form of abrasion possibly due to excessive use (see Stahl 1994; Davies 1980). Those discovered at Ntereso are perforated with a measurement of 27mm across. Davies (1980) argues that “the perforations must have served as

handles, either set at right angles or formed by a prolonged stick on the same axis as the cigar with a peg to hold it in place”.

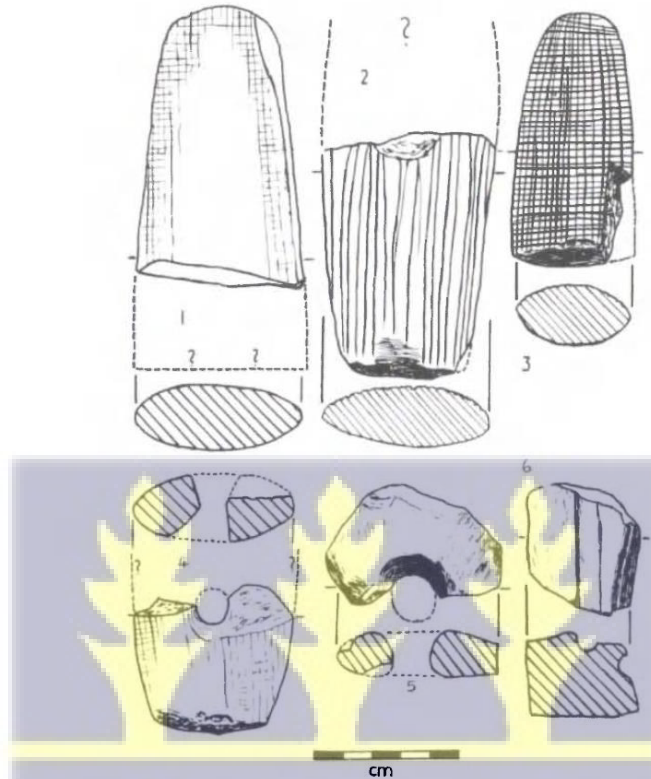


Figure 4.3- 2 Various Terracotta "cigars". (Source: Davies 1980)

Researchers over the years have theorized about their possible usage. Davies (1980) suggests that they were used as beaters in bark cloth production. He likens it to stone pestles scored at the ends found in Eastern Guinea, used for the same purpose. Anquandah (1965), Dombrowski and Priddy (1978) have argued that they were used in pottery production as tools for decorations (see Stahl 1994). Other scholars have raised questions about this argument citing the wearing of the ends and breakage as not being the result of pottery design process. Davies (1980) remarks that the stamp impression process is unlikely to cause the braking of the “cigar”.

The mismatch between the ornamentation on Kintampo Complex pottery and the impressions the "cigar" is likely to create on a pot's surface when employed as a decorative tool, is another reason Stahl (1994) questions the usage of the "cigar" in pottery design. Others have also argued for their use as rasping tools for nuts and other foods. In spite of the attempts to explain what they were actually used for, we are nowhere close to knowing their exact purposes and uses.

- Lithics industry

Most tools belonging to the Kintampo complex are made from locally available materials like quartz, mudstone and shale (Stahl 1994). Toolmaking techniques include bipolar and core reduction, with undefined "cores" observed at sites like K1, Mumute, and Ntereso (Watson 2010). Chipped quartz stone assemblages have been recovered from many sites but remain poorly described (Stahl 1994; Watson 2010).

Geometric microliths are noted at sites like Gambaga, Boase, and Ntereso, suggesting widespread use of these tools, along with non-geometric microliths. Bifacial projectile points, which are mostly composed of mudstone, quartz, and rarely greenstone, are distinctive features of this industry. Their morphology resembles tools from the Saharan and Sahelian regions but lacks parallels in Sub-Saharan West Africa (Watson 2010). Davies (1980) recovered 95 projectile fragments, some of which had hollow bases and attributed them to Sahelian influence (Stahl 1994). This implies a certain level of local adaptation and regional spread.

- Ground Stone Tools

Another significant material in the Kintampo assemblage is the ground stone tools which are tools made of rocks with coarse structure that makes them ideal for tool making. The most prominent of the ground stone tools are Celts, also known as *Nyame Akuma* which appears at

various Late Stone Age (LSA) sites across Ghana. Other ground stone tools include polished stone rings, grooved stones, perforated stones and polished projectile points.

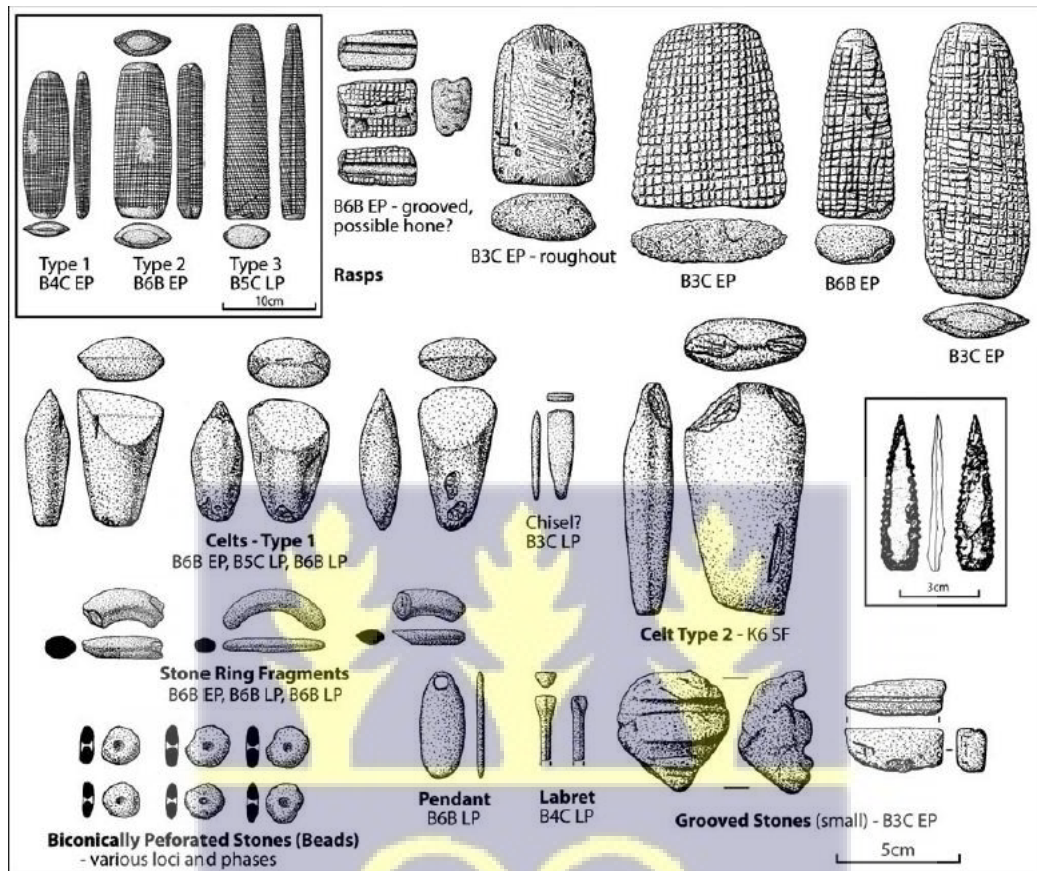


Figure 4.3- 3 Artifact Assemblage of Kintampo Complex. (Source: Watson 2010)

Most of the celts found in sites within Ghana are Type 1 in nature as seen in figure 4.3-3, though other types have been discovered elsewhere (see Watson, 2010). These celts are small in size with sharpened edges that make them ideal for use as axe heads, hoe blades or adzes. Casey (1993, as cited in Stahl 1994) argues that they may have been used intensively as wood-working wedges relative to the increased demand for wood for fuel and construction. This is due to wear

patterns found on them. Stahl (1994) argues that the celts are evidence of exchange, this is due to the non-local nature of the raw material used for their manufacture.

The celts are typically made of “greenstone” found in metamorphosed rock formations found in the west central, northern and southwestern Ghana (see Stahl 1994). It has also been reported that these celts have been subjected to secondary usage. R.P. Wild is quoted to have suggested that the smaller types were used as toys, burial inclusions or practice pieces (Watson 2010). Apoh and Gavua (2010) shed light on their secondary usage with their discovery within shrine context at Katamansu, which includes medicinal and magical potencies.

- Ceramics

Kintampo complex pottery include bowls and jars. The bowls are usually shallow and vary in diameter, sometimes with red slipping. The jar forms vary in size, form and decorative treatment but have “rolled rims” which are highly diagnostic but not dominant. Decorations are usually zoned and combines comb-stamping, grooving and spatulate impressions (Stahl 1994). Some of the pottery have attachment of modelled zoomorphic and anthropomorphic figurines (Anquandah 1995a). Stahl (1994) argues that Kintampo Complex ceramics are homogeneous in terms of decorative treatment but quite heterogeneous by way of paste or fabric. She attributes this homogeneity in decorations as being inspired by a common style rather than being the consequence trade. This was re-echoed by Watson (2010) who attributed the heterogeneity in fabric as being the result of localized production rather than resulting from trade.

- House remains

Several evidence that points to sedentism have been reported at several Kintampo Complex sites including Ntereso (Davies 1980), Boyasi Hill (Anquandah, 1976, 1982b), Mumute and

Bonoase (Dombrowski, 1976) and Gambaga (Casey 1993) (see Stahl 1994). The evidence is in the form of daub, sometimes with wooden post impressions and stones foundations. At Ntereso for instance, Davies (1980) located the remnants of rectangular dwellings, each measuring approximately 4 m², and most likely constructed of wooden poles, mud, and grass. Davies argues that these dwellings might have been damaged through conflagration caused probably by bushfire, fanned by strong winds (referred to by Davies as tornado) and followed by downpour. This explains the presence of burnt daub in the various stratigraphic level.

At Bonoase, stone settings depicting house foundations coupled with distribution of Kintampo materials found in hut squares measuring 4 or 4.5 m² were mapped (Dombrowski 1976, as cited by Anquandah 1995a). The K6 rockshelter's middens produced a lot of daub with sticks and thatch impressions, which could indicate nearby dwellings within the vicinity (Flight 1976, p.217, as cited by Stahl 1994). In spite of the enormous evidence above, scholars stress that this does not herald the advent of sedentism. Anquandah (1995a: 258) remarks “The Kintampo complex does not represent a sudden break with the past as far as residence or mobility is concerned”, citing secondary usage of some rockshelter sites (*Nkukua Buoho* to be precise) as evidence of re-occupation. Stahl (1994) posits that areas with seasonal variations of dry and wet seasons may have facilitated the reduction of mobility amongst Kintampo People and not an abrupt end to mobility.

- Art pieces

Kintampo archaeological sites provide the earliest evidence of decorative art and personal adornment objects (such as beads, pendants, and rings) in Sub-Saharan West Africa (Watson 2010). Beads, primarily made from shell and quartz, are common across various sites. Small shell

beads, some made from marine shells, were found at Ntereso and K6, suggesting trade with coastal areas (Stahl, 1994; Watson 2010; Davies 1980).

Quartz beads appear in smaller quantities, while pendants, bracelets, and labrets are infrequently but widely distributed. These items, often crafted with grooved stones, were likely valued possessions, explaining their scarcity in the archaeological record (Watson 2010). Pottery with anthropomorphic and zoomorphic attachments have been found mostly at open-air sites, including two figurines found at the K6 site. Other broken figurines were uncovered at Ntereso, Mumute, Bonoase, and Boyasi Hill (Stahl 1994). At Daboya one terracotta figurine that looks like a tortoise, decorated by stamping on its decorated upper surface and a flat undecorated under surface which could have been attached to a pot as handle was also found (Gavua 1985). These materials may also have served symbolic purposes or functioned solely as art pieces that expressed aesthetic value. Nevertheless, their actual interpretation remains speculative.

- Faunal and Floral Remains

Both faunal and floral remains from some Kintampo Complex sites point to a subsistence strategy that utilized both domesticated and wild resources. Most of the evidence come from rockshelter sites like K6, near Kintampo, where Flight's excavation uncovered carbonized plants and faunal remains showing a transition from earlier Late Stone Age (LSA) traditions to the Kintampo complex (see Carter and Flight, 1972; Flight, 1976 as cited in Stahl, 1994). Though the evidence is limited, K6 and other sites (Ntereso, Mumute) provide the earliest clear proof of domesticated species in sub-Saharan West Africa, including sheep/goat (*ovicaprids*) at K6 and Ntereso (Stahl 1994).

Stahl (1994) is however skeptical of the evidence for cattle domestication due to challenges of distinguishing domestic *Bos* from wild African buffalo species. Additionally, two guinea fowl bones found at K6 may indicate domestication, though this remains uncertain.

Compared to domesticates, there is stronger evidence of a wild component in the Kintampo diet. Numerous wild species such as duiker, royal antelope, monkeys, rodents (including the gigantic rat and grasscutter), small reptiles, freshwater turtles, snakes, birds, and rare fish are among the faunal remains found at the K6 rockshelter (Stahl 1994). Giant snail shells are also less common in the Kintampo strata at K6, than in previous layers, although some still seem processed. Stahl (1985b, as cited in Stahl 1994) argues that this could have been a shift in predation toward "garden hunting" as some of these animals were attracted to places that had been cleared by humans.

Plant remains include local species like incense tree, hackberry, legumes, and oil palm, along with domesticated crops like cowpea and pearl millet, the latter likely imported from the Sahara/Sahel (Watson 2010). The cowpea, *Vigna unguiculata*, which was abundant in Kintampo strata, is the sole plant that could be domesticated at the K6 site though these specimens appear very small in size compared to modern cowpea. Flight attributed the size disparity to shrinkage during carbonization, however, carbonization tests with contemporary cowpeas revealed little shrinking during carbonization (Stahl 1994). This discovery according to Stahl, raises the possibility that the K6 seeds are not a completely domesticated crop but rather a primitive and potentially undomesticated type of *Vigna*. Significant plant processing is indicated by numerous grindstones found at Kintampo sites (see Stahl 1994; Watson 2010).

In conclusion, the Kintampo Complex reflects an evolving lifestyle in West Africa, marked by early signs of settled life and food production. However, the evidence does not point to an

abrupt transition to sedentism or full reliance on domesticated crops, revealing a complex interplay of local adaptations, subsistence strategies, and evolving cultural practices.

4.3.2 Executive Summary for Kintampo Complex (Transformed Version)

The Kintampo Complex marks a pivotal shift in West African prehistory, illustrating the transition from a mobile hunter-gatherer lifestyle to more settled communities and complex societies around 2000 BC. Spread across Ghana and parts of Ivory Coast and Togo, the Kintampo Complex is represented by 27 known archaeological sites, seven of which have been excavated, including Kintampo, Ntereso, Mumute, and Bonoase.

The Kintampo Complex provides critical insight into the early stages of sedentism and food production in West Africa. While the evidence supports the presence of settled life, it raises questions about the extent of domestication in the region at this time. Artifacts such as daub, pottery, polished stone tools, and figurative ceramics suggest evolving societal and agricultural practices, yet uncertainties remain regarding whether the plant and animal remains at these sites were from domesticated or wild species.

One of the most intriguing artifacts from the Kintampo Complex is the "terracotta cigars," whose exact function remains debated. Scholars suggest they could have served various roles, from bark cloth beaters to pottery design tools, though their wear patterns suggest heavy use beyond decorative purposes. In addition, the lithic industry of the Kintampo Complex reveals a robust stone tool technology, with geometric microliths, bifacial points, and ground stone tools pointing to a versatile toolkit for subsistence activities.

The ground stone tools, especially polished stone axe heads otherwise known as celts or "*Nyame Akuma*," were vital for wood-working, indicating increased resource management, while

the ceramics showcase diverse forms and decorations suggestive of a unique cultural style rather than trade-based production. Evidence of daub and post-impression foundations hints at semi-permanent dwellings, though scholars caution against viewing this as a clear-cut shift to fully sedentary life.

Furthermore, decorative art and personal adornments from the Kintampo Complex sites, such as beads, pendants, and bracelets, represent the earliest forms of such artifacts in sub-Saharan West Africa, indicating a budding sense of identity and craftsmanship.

The Kintampo Complex reflects an adaptive and evolving lifestyle, marked by experimentation with domestication, environmental management, and artistic expression. However, the transition to sedentism was gradual, with evidence pointing to continued reliance on both wild and possibly domesticated resources, underscoring the complexity of this pivotal phase in West African history.

4.4 Daboya

In the middle of the 16th century, the Gonja state arose in the savannah area of present-day northern Ghana, just outside the tropical forest zone and intrigued archaeologists, leading to the quest to understand the beginnings and growth of Gonja (Kumah 2022). In 1977, Peter Shinnie and Francois Kense started conducting a comprehensive archaeological study at Daboya to explore the early history of the Gonja state, focusing on the impact of the Gonja people who settled in the region (Shinnie and Kense, 1989; Gavua, 1985).

Daboya is situated on the west bank of the White Volta River, where the river flows southeast, within the expansive Volta Basin. Covering an area of about 0.75 square kilometers, parts of Daboya remain uninhabited. The site is bordered to the north by the White Volta River and

to the northwest by an exposed bedrock formation (Shinnie and Kense, 1989). The site was selected for its significant surface distribution of cultural materials, elevated terrain, exposed riverbank, and rich historical background (Shinnie and Kense, 1989: 3-4).

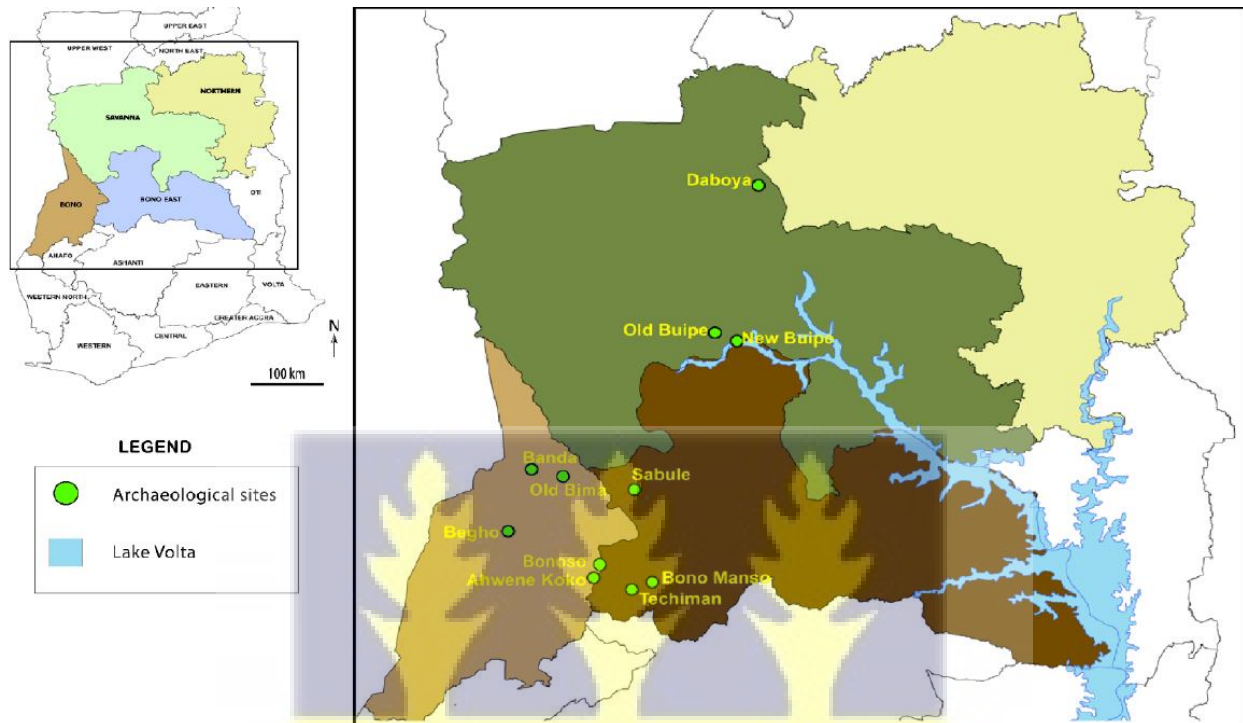


Figure 4.4- 1 Map of Daboya. (Source: Kumah 2022).

The project spanned four excavation seasons (1978, 1979, 1982, and 1983), each with specific objectives. The 1978 and 1979 seasons aimed to understand the extent of settlement at Daboya, while the 1982 and 1983 seasons focused on locating areas with stratified Kintampo Neolithic materials and sites near the town center (Shinnie and Kense, 1989: 17-19). Shinnie and Kense excavated fifteen distinct areas, their work uncovered five main stratigraphic layers comprising various soils, including humid, sandy loam, sandy clay, and clayey soils with inclusions. The insight from Daboya paints a picture of a site with about four thousand (4000) year history of occupation, making it one of the oldest settlements in the West African sub-region. This is evidenced by insights from analysis carried out on artifacts recovered from the site.

4.4.1 Material Assemblage

Artifacts found included, pottery, smoking pipes, terracotta figurines, bones, beads, bracelets, spindle whorls, cowry shells, stone artifacts, and metal objects. Some of these are discussed below.

- Pottery

The excavations produced over 330,000 potsherds over the four seasons. From their analysis of the pottery, Shinnie and Kense identified seven distinct pottery characteristics, such as plain, red-slipped, comb-stamped, and roulette-decorated pieces, leading them to define seven pottery traditions, including the Kintampo, Daboya, and Silima traditions (figure 4.4-2) (Shinnie and Kense, 1989: 60-143).

Tradition I (2000 – 1000 BC) reflects the Kintampo Complex era, featuring comb-stamped and walking comb impressions and simple rim forms, with red slip being rare (see Shinnie and Kense, 1989: 74).

Tradition II (800 BC – 600 AD) evolved beyond Kintampo's techniques, introducing two families: Family A with gritty, coarse paste and simple rouletting, and Family B with larger inclusions, twisted cord decoration, and occasional red slip application (see Shinnie and Kense, 1989: 77).

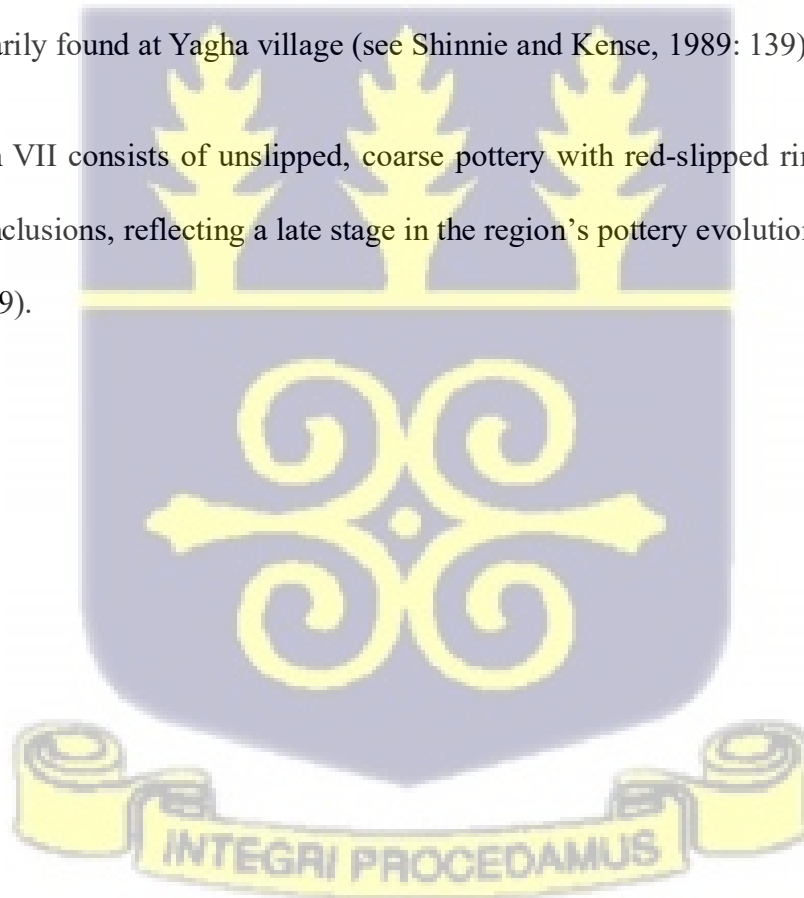
Tradition III (200 BC – 200 AD) pottery utilized chalky or micaceous paste, decorated with carved roulette designs and complex motifs, paralleling patterns found across West Africa (see Shinnie and Kense, 1989: 84).

Tradition IV (7th – 19th century AD) introduced red slip over entire vessels and pedestal bases, with diverse decorative techniques such as grooving, channeling, and incisions (see Shinnie and Kense, 1989: 89).

Tradition V (Silima) featured painted designs in red or black and red, linked to Mande and Sudanic influences. Found across Ghana, this tradition consists of Family A (well-fired with geometric patterns) and Family B (less refined and varied firing tones), dating from 1300 to 1850 AD (see Shinnie and Kense, 1989: 130).

Tradition VI (Yagha) (1600 – 1800 AD) is distinguished by lugs with twisted cord rouletting, primarily found at Yagha village (see Shinnie and Kense, 1989: 139).

Tradition VII consists of unslipped, coarse pottery with red-slipped rims and crumbling due to chunky inclusions, reflecting a late stage in the region's pottery evolution (see Shinnie and Kense, 1989: 139).



S/N	Tradition	Family	Ware	Calibrated C-14 dates
1	I (Kintampo)	Family A Family B Family C	-	2000 – 1000 B.C.
2	II (Daboya)	Family A	Ware 1	800 B.C. – A.D. 200
			Ware 2	800 B.C. – A.D. 200
		Family B	Ware 1	A.D. 200 – 600
			Ware 2	A.D. 600
			Ware 3 – Ware 4	A.D. 600 – 1000
3	III	-	-	B.C. 200 – A.D. 200
4	IV	Family A	Ware 1	A.D. 700 – 1200
			Ware 2	A.D. 600 – 1000
			Ware 3	A.D. 600 – 1000
		Family B	Ware 1 – Ware 10	A.D. 1000 – 1800
5	V (Silima)	Family A	-	A.D. 1300 – 1800
		Family B	-	A.D. 1400 – 1850
6	VI (Yagha)	-	-	A.D. 1600 – 1800
7	VII (Yagaba)	-	-	A.D. 1850 – 1925

Figure 4.4- 2 Summary of Pottery traditions at Daboya. Source Kumah 2022

- Tobacco Pipes

A total of 216 clay smoking pipes fragments are known from Daboya, only Seventeen (17) out of the total are without archaeological context, making the assemblage significant in comparison to others from the entire northern region of Ghana (see Shinnie and Kense 1989). The Daboya pipe typology reflects a chronological sequence of types (A, B, C, D, and E) that align with prior research by Ozanne (1962) and Bellis (1972) (see Shinnie and Kense 1989). Carbon dating, where available, suggests that most Daboya pipes post-date the 16th century, indicating an association with tobacco smoking, which likely started in the early 17th century (Shinnie and Kense 1989). The sequence shows that new pipe types were adopted alongside older ones, resulting in overlapping usage periods.

Type A pipes, particularly A1 (Figure 4.4-3), appear distinct in form and finish, with red slip and unique decorations that hint at specialized production, possibly imported.

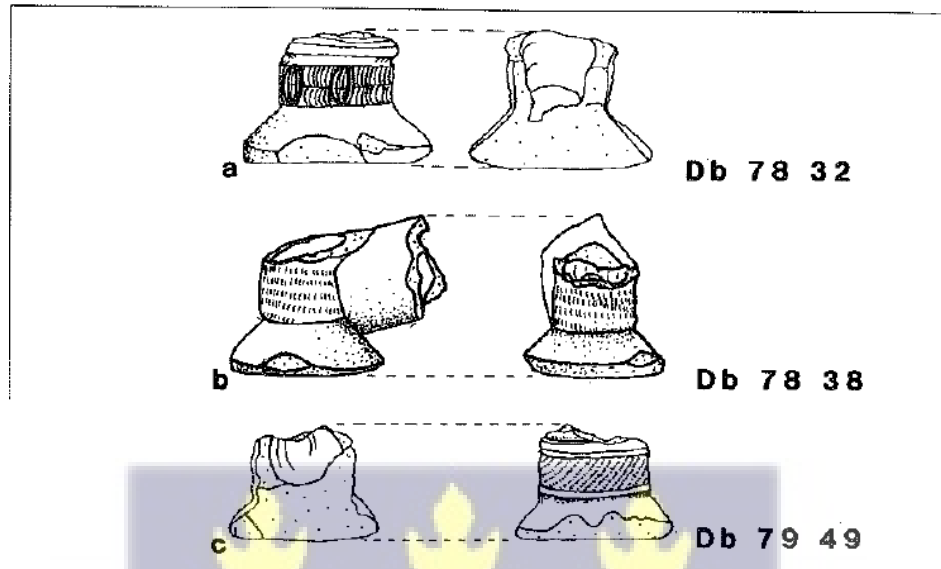


Figure 4.4- 3 Type A1 pipe typology. Source: Shinnie and Kense (1989)

Type B and later types reflect a variety of styles, and Type E (figure 4.4-4), a round-based, non-pedestalled pipe, resembles European pipes, suggesting imitation of European briar pipes by local artisans.



Figure 4.4- 4 Type E pipe from Daboya. Source: Shinnie and Kense (1989)

Insight from Daboya smoking pipes raise questions as to whether tobacco smoking in West Africa was an indigenous tradition or it came about due to European contact. Considering that local clay pipes seem to have been adopted alongside or after the introduction of tobacco. Shinnie and Kense (1989) suggest that no indigenous smoking tradition with clay pipes was identified, implying tobacco-smoking practices were likely to have been influenced by European contact.

- Terracotta Figurines

The terracotta figurines, found across six Daboya excavation sites, remain enigmatic due to the lack of ethnographic context. They are thought to have been made between AD 770 and AD 1420 and precede tobacco use, according to stratigraphy and radiocarbon dating (Shinnie and Kense, 1989). The figurines vary in shape, ornamentation, and implied purpose. Although none of the figurines were found complete, two primary figurine types were identified: standing and seated figures, each with distinct attributes. Seated figurines commonly feature rounded heads, lack red paint or slip, and display comb-stamped designs on the torso (see Shinnie and Kense, 1989). Standing figures, in contrast, often have tapered heads, are red-painted, and lack comb-stamping. Notably, extended navels (likely representing hernias) appear in both types, suggesting shared symbolic or cultural significance (Shinnie and Kense, 1989).

The figurines also vary in size, with standing figurines generally larger. While some stylistic changes may hint at possible chronological differences, evidence suggests the two types (standing and seated figurines) were contemporaneous. Researchers hypothesize the figurines might have held spiritual roles, possibly linked to ancestor veneration or twin births (see Shinnie and Kense, 1989). The standing figurine was reconstructed as seen in the figure below.

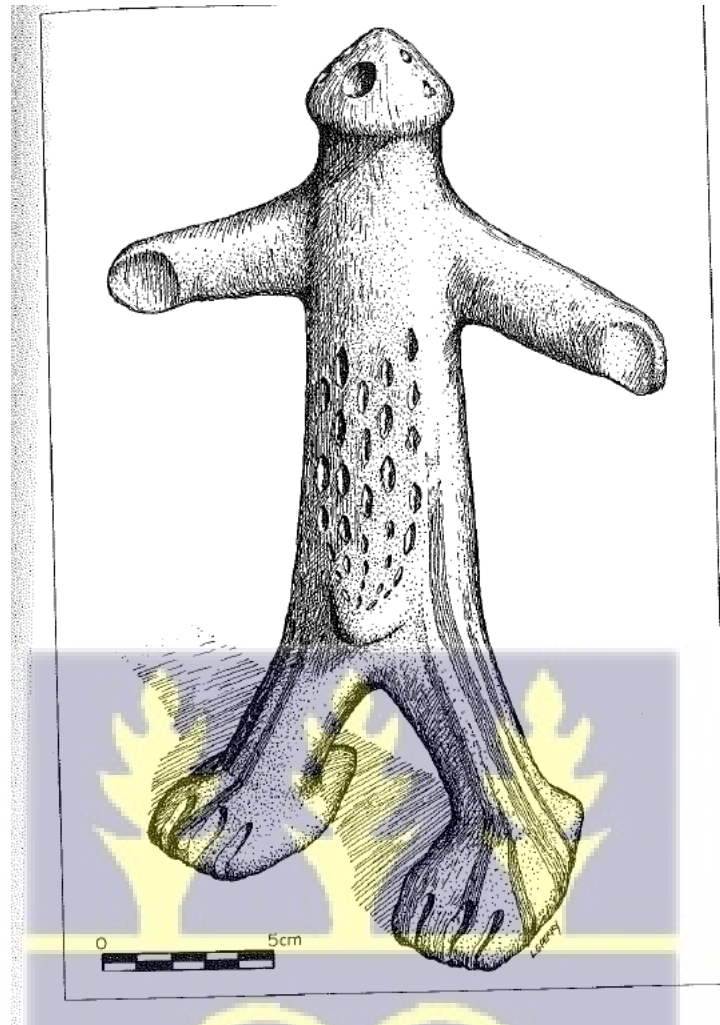


Figure 4.4- 5 Reconstructed figurine (Standing). Source: Shinnie & Kense (1989)

Shinnie and Kense (1989) argue that production of figurines stopped at least during the 20th century. They speculate this to be due to the present inhabitants not knowing anything about the figurines.

All in all, Shinnie and Kense (1989) established four occupational phases at Daboya as follows:

Phase A: Represents the Kintampo occupation, dated to the last half of the second millennium B.C., based on two radiocarbon dates (3405 ± 150 B.P. and 3185 ± 325 B.P.)

Phase B: Characterized by two pottery traditions (II and III), with Tradition II being more prevalent. This phase aligns with the Early Iron Age, supported by ten radiocarbon dates spanning roughly 1000 years from the middle of the first millennium B.C. to the middle of the first millennium A.D. Additional dates suggest an even earlier timeline extending into the early first millennium B.C.

Phase C: Associated with Tradition IV (1180 ± 165 B.P.), showing diverse ceramics that suggest multiple cultural influences, possibly from different ethnic groups or artisans in Daboya or nearby communities involved in trade.

Phase D: Linked with Silima pottery (Tradition V) and dates to sometime after the 12th century A.D. This phase indicates a wide distribution of Silima pottery in northwestern Ghana, with New Buipe possibly serving as a production center due to the significant quantities of pottery found there.

With approximately four thousand (4000) years of occupation history, Daboya is one of the oldest inhabited settlements in West Africa (see Shinnie and Kense, 1989). Having been occupied from the late stone age, through the iron age and to contemporary times.

4.4.2 Executive Summary for Daboya (Transformed Version)

The archaeological site at Daboya, located on the west bank of the White Volta River in northern Ghana, offers valuable insights into the origins and growth of the Gonja state, a prominent 16th-century polity. In 1977, archaeologists Peter Shinnie and Francois Kense conducted extensive

excavations across four seasons (1978, 1979, 1982, and 1983) to uncover the settlement's early history and cultural significance. Covering approximately 0.75 square kilometers, the Daboya site features a wealth of cultural materials, unique pottery traditions, and other artifacts, reflecting a rich occupational history spanning around 4000 years, making it one of West Africa's oldest inhabited areas.

The material assemblage at Daboya includes over 330,000 potsherds, which were categorized into seven distinct pottery traditions, representing different time periods and cultural influences. These traditions highlight the evolution of ceramic techniques and decorative styles, ranging from the early Kintampo complex (2000-1000 BC) to the Silima and Yagha traditions linked to the 13th-19th centuries. The pottery styles, along with other artifacts like smoking pipes, terracotta figurines, stone tools, and metal objects, suggest that Daboya was a dynamic cultural hub, potentially influenced by both local and broader West African interactions.

The Daboya site has four occupational phases:

Phase A represents the Kintampo occupation during the second millennium B.C., indicated by radiocarbon dates.

Phase B marks the Early Iron Age, featuring two pottery traditions and spanning approximately 1000 years from the first millennium B.C. to the first millennium A.D.

Phase C, dated to 1180 ± 165 B.P. (605–935 AD.), shows a variety of ceramics possibly produced by different ethnic groups engaged in trade or exchange.

Phase D, associated with Silima pottery, dates post-12th century A.D. and reflects a broad distribution in northwestern Ghana, hinting at specialized production centers like New Buipe.

Artifacts such as terracotta figurines and smoking pipes reveal aspects of the social life of Daboya's past inhabitants. The figurines, which may have held spiritual significance, and the smoking pipes, likely introduced as a result of European contact, add depth to the understanding of Daboya's cultural practices. Through its archaeological record, Daboya serves as a vital link to West Africa's historical trajectory, highlighting its significance as a longstanding settlement shaped by multiple cultural and trade influences.

4.5 Dixcove

The site of Dixcove is significant due to its links to the Trans-Atlantic trade. Dixcove is located in Ghana's Ahanta West District, about 24km west of Takoradi and is split into Upper Dixcove (Ntuakro) and Lower Dixcove (Dadzi-kese) due to historical chieftaincy disputes over land ownership (Biveridge 2014). Originally called Efiema, Dixcove's name evolved during the colonial era, with two main theories explaining its origin: one attributes it to "Dekyi's Cove," named after a local chief, while the other suggests it came from "Dick's Cove," referring to a British trader (Biveridge, 2014).

Prior to European contact, Dixcove thrived on fishing, gold mining, and production of palm oil and salt. The presence of a cove on the landscape which acted as a natural harbour for ships, made Dixcove an ideal place for trade and attracted European merchants. Trade with Europeans,

especially the British, intensified due to the town's rich resources, including gold, timber, and granite, essential for European ships and trade operations (Biveridge 2014).

English interest in trade began in 1551 when Thomas Windham, the first Englishman to visit the Guinea Coast, returned with ivory and gold. As a result, the Royal Africa Company was founded, and in 1692 it started constructing Fort Metal Cross at Dixcove in order to protect their interest and fend off competition from the Dutch and Brandenburg (Biveridge, 2014). Built on high ground, the fort was once characterized as being weak, with early European traders using makeshift buildings. Due to ongoing commercial disputes, including Dutch bombardments, the fort became highly reinforced (Biveridge, 2014).

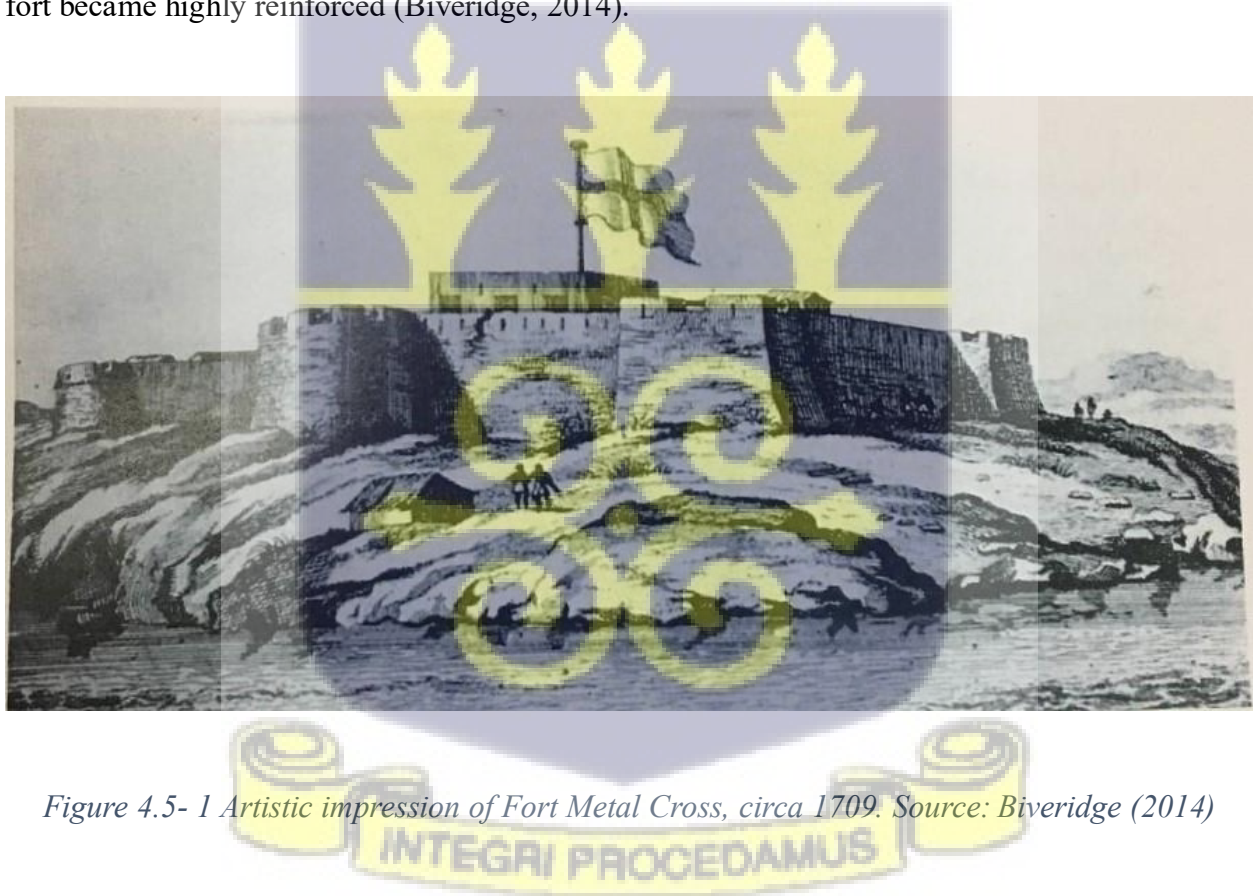


Figure 4.5- 1 Artistic impression of Fort Metal Cross, circa 1709. Source: Biveridge (2014)



Figure 4.5- 2 Central Courtyard of Fort Metal Cross. Source: Biveridge (2014)

Despite its location, Fort Metal Cross struggled commercially, especially after the abolition of the slave trade in 1807. However, it remained important for its supply of palm oil, shellfish (for lime), timber, and fresh water, as well as its calm cove for safe docking (Biveridge, 2014). The fort briefly passed to the Dutch in 1867 but reverted to the British in 1872 after local resistance. It became an administrative center, later restored by Ghana's Museums and Monuments Board in 1958 (Biveridge, 2014). Currently, the fort is leased to a businessman for conversion into a hotel, though some of its archaeological heritage has since been lost to development.

The site was archaeologically investigated for the first time by Biveridge (2014) for his doctoral dissertation. Since then the site has been a place for training final year archaeology students of the University of Ghana under the directorship of Fritz Biveridge. I served as a field assistant during the 2024 field school season. Majority of what is known about Dixcove today stems from European sources, oral narratives, ethnography and archaeological sources.

4.5.1. Ethnicity, settlement, and migration histories of the people of Dixcove.

The people of Upper and Lower Dixcove, now identifying as Ahanta, claim to have migrated from Eguafu and Takyiman, relocating due to security concerns. Oral histories and research by scholars like Lawrence (1963) and Owusu-Ansah (1995) reveal that Dixcove initially consisted of two independent states, each with distinct origins and not affiliated with the Ahanta people (Biveridge 2014). Early European documents, including those by Jean Barbot (1732), omit Dixcove from Ahanta villages, implying ethnic assimilation into Ahanta culture likely occurred in the early seventeenth century. This shift may have been influenced by the proximity of Ahanta settlements and economic opportunities after the construction of Fort Metal Cross, which attracted Ahanta and Nzema populations, encouraging intermarriages and cultural integration (Biveridge 2014).

Colonial authorities later introduced the terms "Upper" and "Lower" Dixcove for administrative purposes. Both groups maintain independent political identities and claim original settlement rights, though Lower Dixcove asserts dominance through control over nearby villages (Biveridge 2014). The Archaeology reveals two cultural levels, with the earlier "Cultural Level 1" containing only local materials, predating European contact. "Cultural Level 2" shows European imports, reflecting a later period of interaction (Biveridge, 2014). Biveridge (2014) asserts that these findings confirm the settlements' pre-European origins, though additional research is needed for a comprehensive understanding of Dixcove's early history.

4.5.2. Early vocations, subsistence and adaptive strategies.

- Pottery Production

Evidence of a wide variety of ceramic types and decorative styles, suggest that pottery was a prominent craft in Dixcove. Production techniques involved both coil and slab construction methods, while firing was done in open pits. The pottery types include jars, bowls, and pots, many of which featured intricate incisions and motifs (see Biveridge, 2014). Pottery production remained a consistent activity across both pre-Atlantic and Atlantic contact periods, reflecting cultural continuity (Biveridge, 2014).

- Textile Production

The recovery of spindle whorls provides proof of textile production, which includes spinning, dying, and weaving. Biveridge (2014) argues that herbs and minerals were used to dye the textiles, which were probably fashioned from plant fibers that were acquired locally. The vivid hues and elaborate designs are emphasized by early European observations. The importation of European textiles may have led to a decrease in textile output (Biveridge 2014).

- Iron smelting

Evidence of furnace fragments, tuyeres, and excavated slag points to ironworking at Dixcove (Biveridge, 2014). The industry existed before European contact and flourished until the 17th Century, due to the importation of affordable iron and metal implements from Europe. This led to low patronage and eventual decline of iron production (Biveridge, 2014).

- Horticulture

Numerous horticultural activities, such as the production of oil palm and other staple crops like rice, sorghum, millet, and yams, are documented in archaeological and historical sources. According to Biveridge (2014), labor-intensive techniques such as slash-and-burn as well as basic

farm implements were employed. Local agriculture and cuisine were changed throughout the Atlantic contact period by the introduction of new crops from Europe and the Americas (maize, tomatoes, etc.) (Biveridge, 2014).

- Animal Husbandry, Hunting, and Trapping

Faunal remains from excavations suggest that Dixcove's inhabitants raised goats, sheep, chickens, and guinea fowls (Biveridge, 2014). They also hunted wildlife (e.g., giant rats, baboons, grasscutters). Roasting might have been the primary method used for processing meat, as evidenced by the presence of charred bones (see Biveridge, 2014).

- Salt Production

Historical sources attest to salt production at Dixcove, despite the lack of direct archeological evidence (See Biveridge, 2014). Nevertheless, salt, which is essential for cooking, preservation, and trading, was created by boiling saltwater and evaporating it in the sun. Cheaper imported salt from Europe probably caused the industry to fail in the 19th century by undercutting domestic prices (Biveridge, 2014: 271).

- Gold Mining

Oral narratives and historical records suggest a seasonal, small-scale gold mining close to Dixcove and its environs, despite the lack of direct archeological evidence, nonetheless deep shaft mining, shallow pit mining, and alluvial panning were among the techniques used. The trade in gold probably started in the first millennium and grew by the eighth century (See Biveridge, 2014).

4.5.3. The nexus between Trade, exchange and Fort Metal Cross

With the construction of Fort Metal Cross by the British in 1692, Dixcove became a trade hub due to its unique location that gave it access to gold, timber, and calm waters. Early European involvement focused on trade in commodities such as gold, ivory, and palm oil while supplying European goods and consumables. Historical records suggest that about 70% of European imports to the Dixcove area comprised textiles, firearms, and metal goods, while consumables and ornaments like glass beads and coral accounted for the remaining 30% (See Biveridge, 2014).

The fort, initially without dungeons (as seen in figure 4.5-3), reflects that early European interest was resource-driven, with the trade in enslaved people intensifying only later.

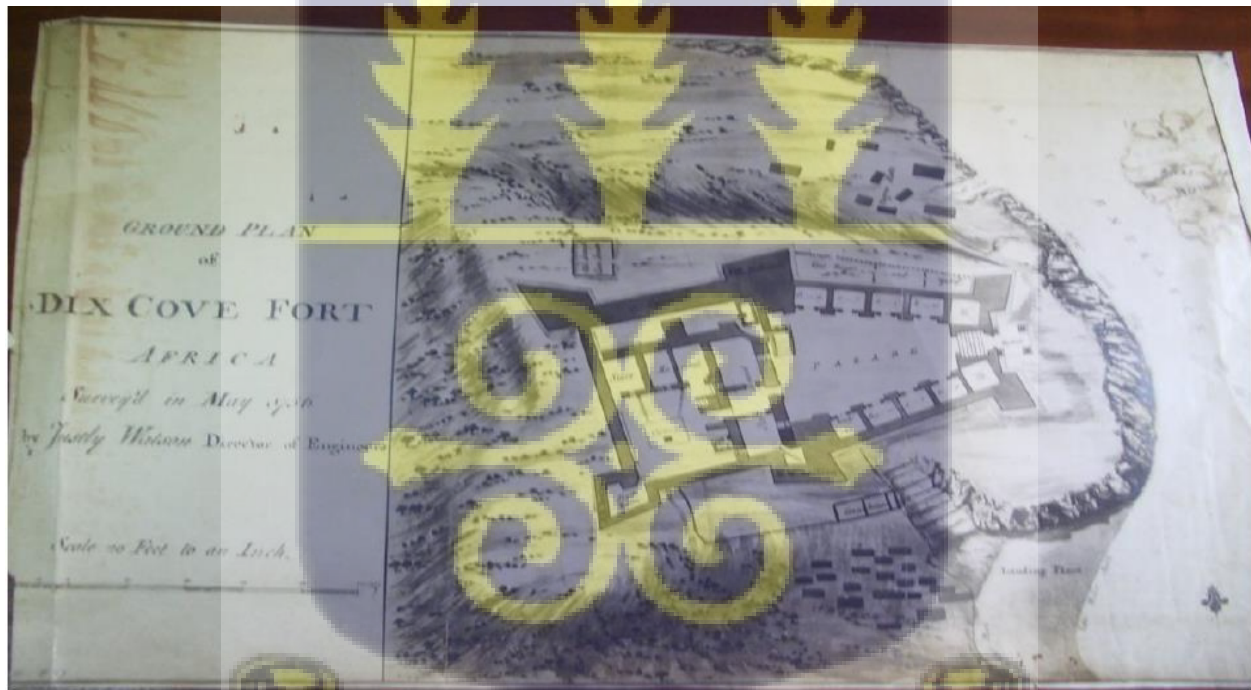


Figure 4.5- 3 Plan for Fort Metal Cross circa 1727 by William Smith (Note the absence of dungeons). Source: Biveridge (2014)

Though historical sources emphasize the profitable nature of the trade in enslaved people, evidence from Dixcove suggests trade in enslaved people were minimal. This according to Biveridge (2014) is down to two reasons; one being that earlier drawings show that Fort Metal Cross was without dungeons. Dungeons were not added until the mid-18th century (Lawrence 1963 as cited in Biveridge, 2014). Secondly, the size of the two Dungeons was too small to hold enough slaves compared to the other forts like Elmina or Cape Coast castle (See Biveridge 2014). Also, the enslaved might have been sent to Elmina, the main hub for trading in enslaved people.

To add to this, Fort Metal Cross was dedicated to trading in mineral resources rather than enslaved people because, its location in the mineral rich Western Region made it well placed for mineral exploitation. The Western Region of Ghana is a region rich in mineral resources ranging from gold, timber, bauxite, rubber and so on. This made it prudent for the British to dedicate the fort to trade in minerals resources while the others in the Central region were used for commercial trading in enslaved people.

In a nutshell, Dixcove's significance lies in its role as a key trade hub during the Trans-Atlantic era, centered around Fort Metal Cross, which allowed British traders access to rich resources like gold and timber. Archaeological findings reveal a thriving pre-European economy based on fishing, salt production, gold mining, and craft industries, with some local practices declining as European imports increased. Fort Metal Cross remains a historical symbol of economic and cultural exchange, although modernization poses risks to its heritage.

4.5.4 Executive Summary for Dixcove (Transformed Version)

Dixcove, located in Ghana's Ahanta West District, has significant historical and archaeological value due to its connection to the Trans-Atlantic trade. The town, historically known as Efiema, is divided into Upper Dixcove (Ntuakro) and Lower Dixcove (Dadzi-kese), a division rooted in historical chieftaincy disputes over land ownership. The name Dixcove probably evolved during the colonial era, with two primary theories attributing it to either a local chief, Dekyi, or a British trader, Dick. Before European arrival, Dixcove prospered through fishing, gold mining, and the production of palm oil and salt. Its natural harbor made it an ideal trading post, attracting European merchants, particularly the British, due to its rich resources, including gold, timber, and granite.

European interest in Dixcove began as early as 1551 when the first English trader, Thomas Windham, visited and returned with ivory and gold, prompting the foundation of the Royal Africa Company. In 1692 the company built Fort Metal Cross in Dixcove to protect its trading interests from Dutch and Brandenburg competitors. Although initially weak, the fort was later reinforced due to commercial disputes and Dutch bombardments. Despite struggles after the abolition of the slave trade in 1807, the fort remained vital for its supply of palm oil, timber, shellfish (for lime), and fresh water.

The fort briefly passed to Dutch control in 1867 before returning to the British in 1872, where it became an administrative center. In 1958, it was restored by Ghana Museums and Monuments Board. However, modernization efforts, including plans to convert the fort into a hotel, have threatened its archaeological heritage.

Dixcove's early economy was diverse, with pottery production, textile weaving, iron smelting, and horticulture playing key roles. Pottery and textiles, produced using local techniques and materials, continued through the Atlantic contact period, although European imports led to a decline in these crafts. Iron smelting, which flourished before European contact, also declined as cheaper European metal goods became available. Horticulture included the cultivation of oil palm and staple crops, while the introduction of new crops from Europe and the Americas transformed local agriculture.

The fort played a central role in the trade of minerals such as gold, timber, and palm oil. Although early European interests were resource-driven, the fort's involvement in the slave trade was minimal due to the lack of slave dungeons and its focus on mineral exploitation. Dixcove's strategic location in Ghana's mineral-rich Western Region made it ideal for the trade in gold and other valuable resources, in contrast to forts in other regions dedicated to the slave trade.

Dixcove's significance as a key trade hub during the Trans-Atlantic era is evident through its archaeological record and its association with Fort Metal Cross. The town's early economy, based on fishing, agriculture, and crafts, transformed with the introduction of European trade goods, leaving a lasting impact on local practices. Despite threats from modern development, Dixcove remains a symbol of historical and cultural exchange.

All three (3) executive summaries on Kintampo Complex, Daboya and Dixcove were used to create three (3) blog posts which were then published on the website.

CHAPTER FIVE

THE WEBSITE (HERITAGE QUEST)

5.1 Introduction

This chapter is in two parts; the first explores the developed website called Heritage Quest by delving into the various pages that make up the website and how they work. The second part discusses how the platform can improve the practice of archaeology in Ghana.

5.2 Heritage Quest

The Heritage Quest website is available online at www.heritagequest24.com. A simple google search of the address above, with the help of the internet, will take anyone to the website. The website is organized into three primary components, each corresponding to distinct tiers of access privileges: the administrative dashboard (reserved for users with administrative rights), the main website interface (designed for general users), and the contributors' dashboard (intended for registered contributors). These access levels are hierarchically structured. At the base level, general users are limited to accessing the main website, where they may only view and download publicly available information. Contributors possess elevated privileges, enabling them not only to access content but also to upload and disseminate data and scholarly materials on the platform. Administrators occupy the highest tier of access. In addition to enjoying the full range of user and contributor capabilities, the admins are entrusted with key regulatory responsibilities. These include the authority to review and approve applications from prospective contributors, remove content that contravenes the platform's terms of use, and revoke contributor privileges in instances of policy violations.

5.2.1 Main website compartment

The website compartment is composed of a header, footer, six (6) main pages and a log-in section. The pages include a “Home” page, “About Us” page, “Database” page, “Blog” page, “Contact Us” page and “Become a Contributor” page. There are also sub-pages which are extensions of the main pages that allow for the display of detailed information. They include three (3) blog posts (belonging to the blogs page) and three (3) detail pages (belonging to the database page).

5.2.1.1 Site Header

The header section features the website’s logo, a list of available pages, a “log in” link and a banner that indicates the page opened (figure 5.1-1). The purpose of the header is to aid navigation, show site identity and facilitate log ins. The header cuts across the entire site with every single page showing the header.

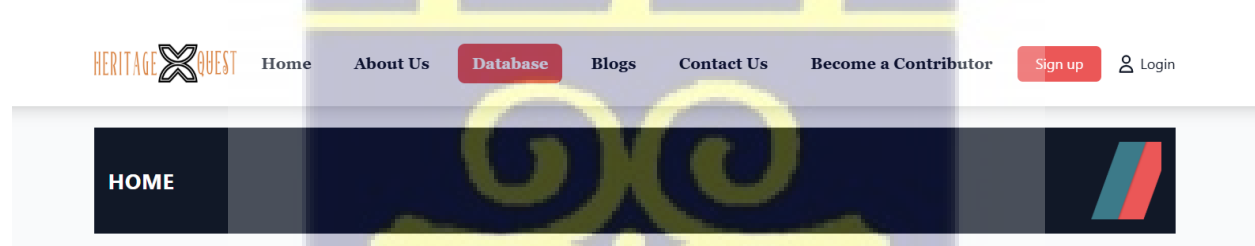


Figure 5.1- 1 Header Section

5.2.1.2 Site Footer

The footer is located at the bottom of pages on the site. It also cuts across the entire site and feature’s a logo (with the site’s name and tag line), links to pages and social media icons (figure 5.1-2).

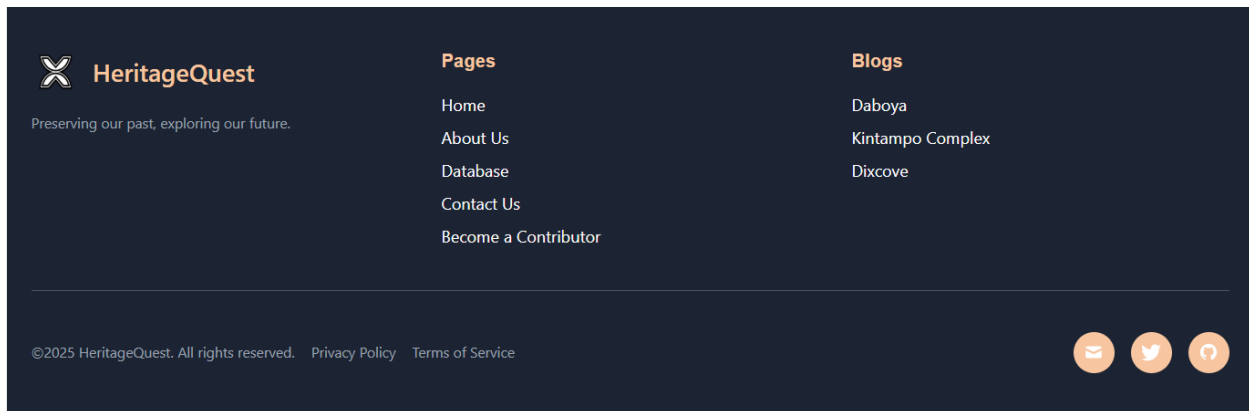


Figure 5.1- 2 Website’s Footer

The footer serves as look-up section that aids navigation on the website. The links it features, point to vantage pages (such as the homepage) of the site. This allows users to seamlessly move from one page to the other.

5.2.1.3 Homepage

The Homepage is the first page visitors see when they access the site via the web address. The page is made up of five (5) main building blocks; the header section, the welcome address section, a vision section, a database section and a blog highlight section (See full page on the website). The rationale behind the homepage is to offer visitors highlights of the website’s content. They show snippets of sampled pages on the website. A clickable button often designated “read more”, links the snippets to the actual page with detailed information (figure 5.1-3 below). This highlight is connected to the “about us” page which provides detailed information about the platform.

Our Vision



We envision a world where archaeological knowledge transcends borders and can be shared freely. Our platform addresses the needs of different audiences by offering content that is both academically thorough and publicly accessible. With decades of archaeological practice behind us, we aim to curate and archive archaeological data in a way that promotes easy access, management, and efficient retrieval.

[Learn More →](#)

Figure 5.1- 3 Vision section of the Homepage

5.2.1.4 “About Us” page

The “about us” page is the page dedicated to information about the website. It informs visitors about what the website is about, the vision behind its creation, how it works and the website’s features as seen in figure 5.1-4 (see complete page on the website). It ends with a call to action that invites visitors to join the website’s endeavour.



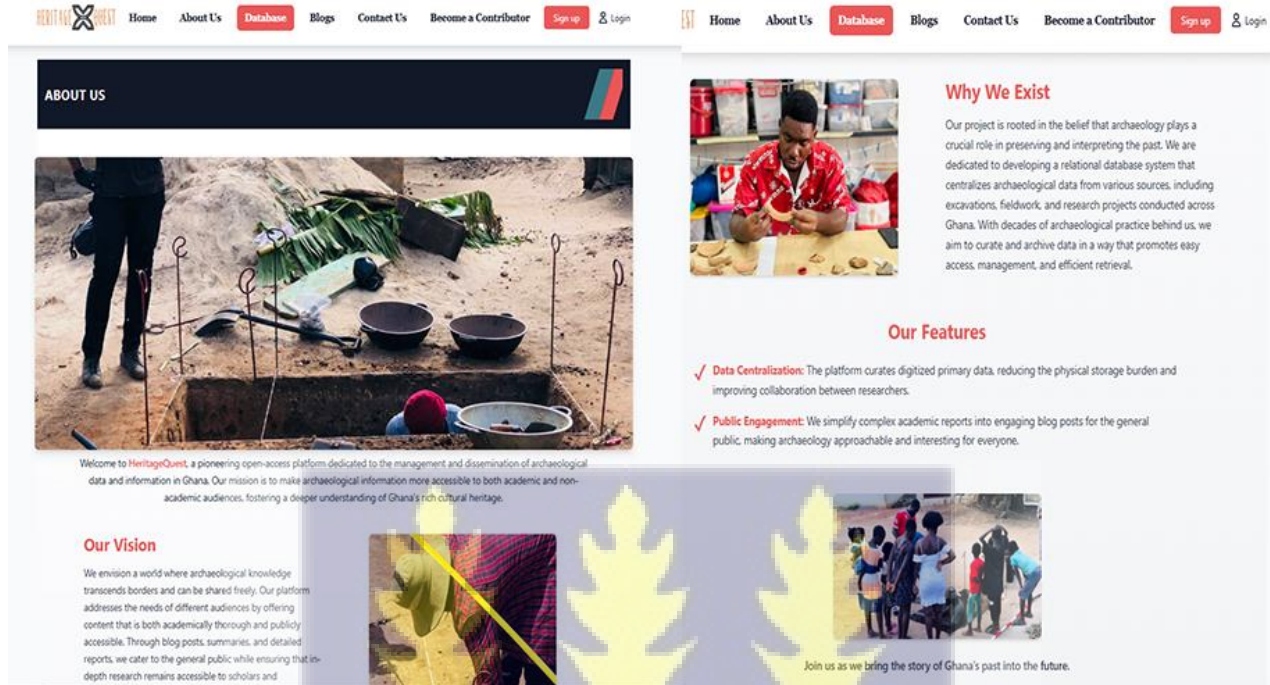


Figure 5.1- 4 The About us page

5.2.1.5 Database page

The database page is the user interface (UI) that fronts the designed database. This is the only page within the entire website that communicates directly with the database, it handles and executes queries. The queries are sectioned into three (3) namely Data queries, Archaeological site queries and Research projects queries as seen in figure 5.1-5 (see complete page on the website). This is the first appearance visitors see when they open the database page. This design allows users to query the database based on the data itself or its contextual information which includes the archaeological site information and the project level information.

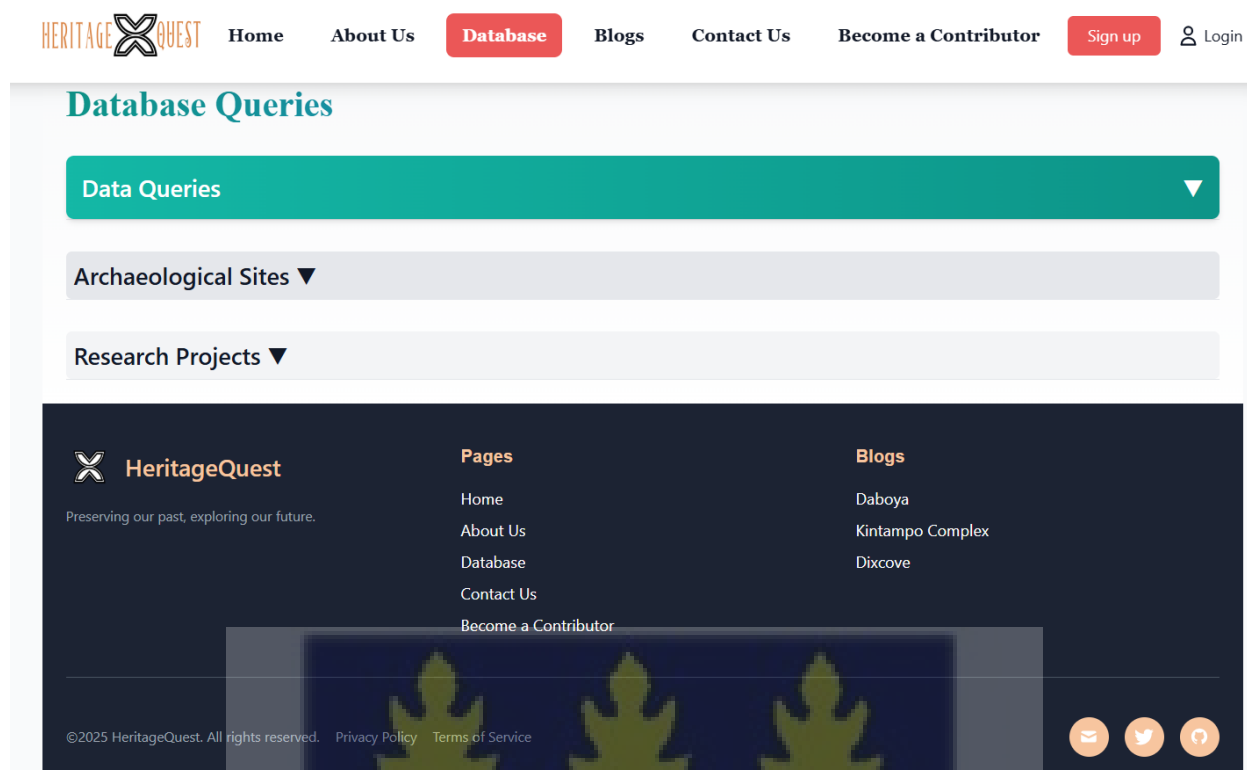


Figure 5.1- 5 Database Queries

5.2.1.5.1 Data Queries section

The Data queries section allows users to query the database to retrieve data from it with just a click. In terms of appearance it has a main section that features data from the database in the form of images as seen in figure 5.1-6. It also has a filter section on the left-hand side of the page that helps narrow down searches for visitors (figure 5.1-7). The filter section is divided into three sections; the archaeological site, research project and data category. The archaeological site section allows visitors to show results for data emanating from specific sites, in this case only two sites were enlisted namely marine drive and Begho. The research project section allows the visitor to display only data belonging to particular research projects captured in the database, in this case West Africa Trade Project (WATP) and Begho Area Archaeological Project (BAAP). The data

category section on the other hand allows visitors to display only specific data such as artifacts, stratigraphy, faunal remains, documents, field records and other data types within the database. Once the various options are checked, the visitor is required to click the filter button beneath the filter section to execute the command to filter. The page also has a search bar that allows visitors to directly search for an artifact (highlighted in black).

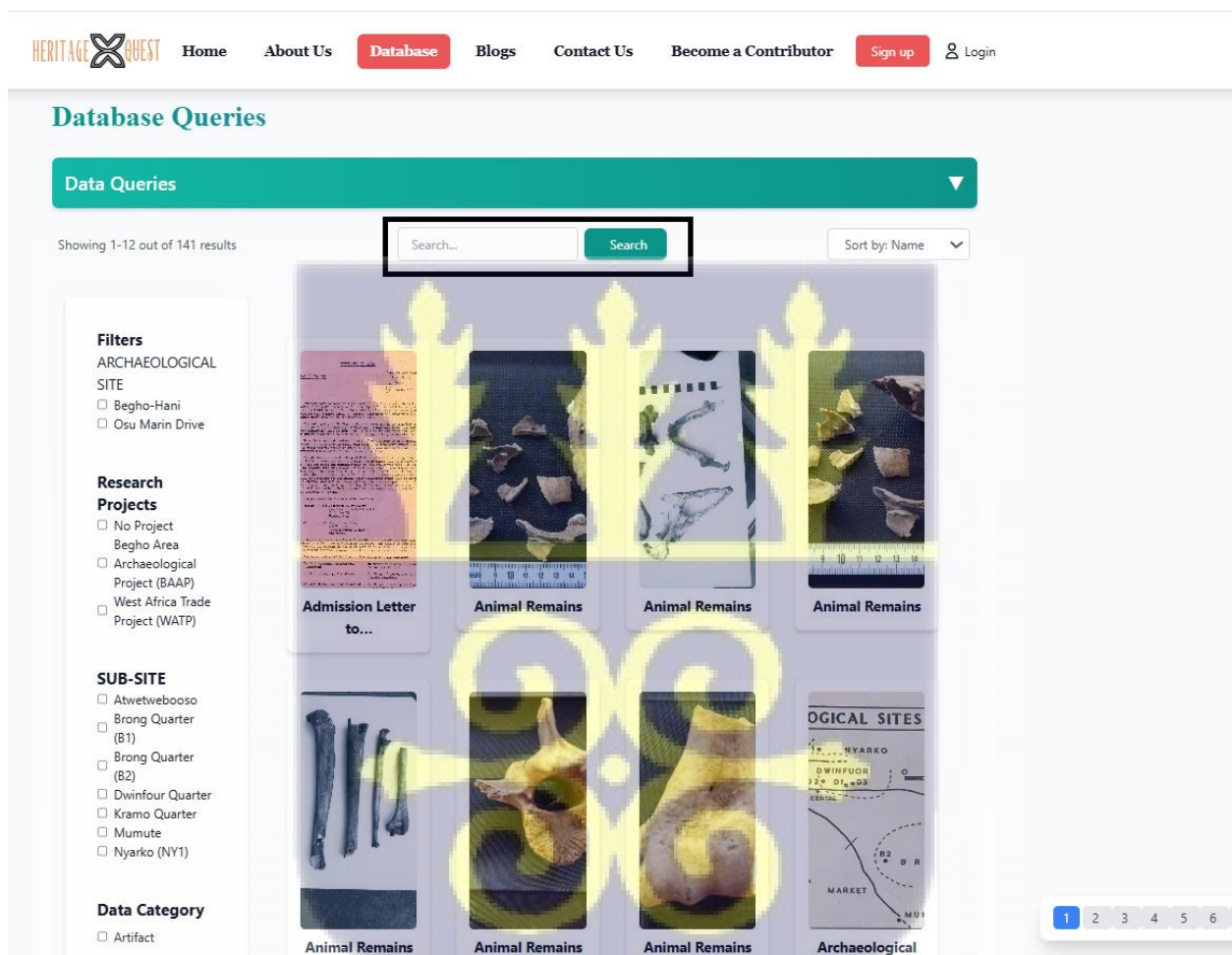
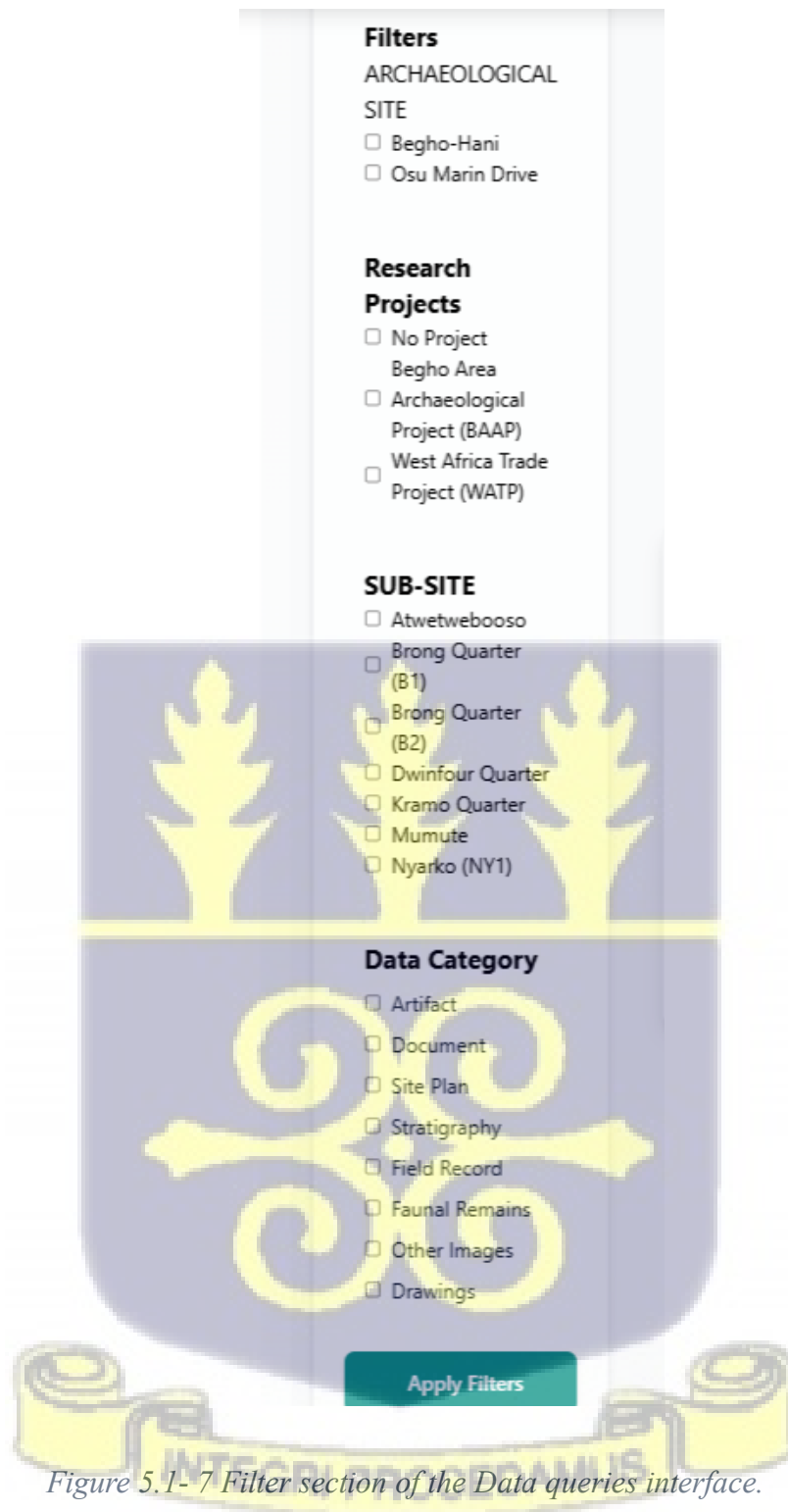


Figure 5.1- 6 The Database page



The image shows a web interface for filtering data. It features a light blue sidebar on the left with a yellow crest and a banner at the bottom that reads 'INTEGRITY OF DATA'. The main content area is white and contains several filter sections, each with a title and a list of checkboxes. The sections are: 'Filters' (ARCHAEOLOGICAL SITE), 'Research Projects', 'SUB-SITE', and 'Data Category'. Each section has a title in bold. The 'Filters' section has two options: 'Begho-Hani' and 'Osu Marin Drive'. The 'Research Projects' section has three options: 'No Project', 'Archaeological Project (BAAP)', and 'West Africa Trade Project (WATP)'. The 'SUB-SITE' section has six options: 'Atwetwebooso', 'Brong Quarter (B1)', 'Brong Quarter (B2)', 'Dwinfour Quarter', 'Kramo Quarter', and 'Mumute'. The 'Data Category' section has seven options: 'Artifact', 'Document', 'Site Plan', 'Stratigraphy', 'Field Record', 'Faunal Remains', and 'Other Images'. A green 'Apply Filters' button is located at the bottom right of the filter sections.

Filters

ARCHAEOLOGICAL SITE

☐ Begho-Hani

☐ Osu Marin Drive

Research Projects

☐ No Project

☐ Archaeological Project (BAAP)

☐ West Africa Trade Project (WATP)

SUB-SITE

☐ Atwetwebooso

☐ Brong Quarter (B1)

☐ Brong Quarter (B2)

☐ Dwinfour Quarter

☐ Kramo Quarter

☐ Mumute

☐ Nyarko (NY1)

Data Category

☐ Artifact

☐ Document

☐ Site Plan

☐ Stratigraphy

☐ Field Record

☐ Faunal Remains

☐ Other Images

☐ Drawings

Apply Filters

INTEGRITY OF DATA

Figure 5.1- 7 Filter section of the Data queries interface.

Once a picture is selected (for example Islamic eye beads), the website takes the visitor to a details page where details of the selected artifact is displayed. The details page shows an image of the artifact (figure 5.1-8) and its associated contextual information. The contextual information displayed include artifact description, typology, chronology and comments by researcher (figure 5.1-9), artifact provenience information (figure 5.1-10), project information (figure 5.1-11) and excavation information (figure 5.1-12). Every piece of information shown on this page is retrieved directly from the database including the image.

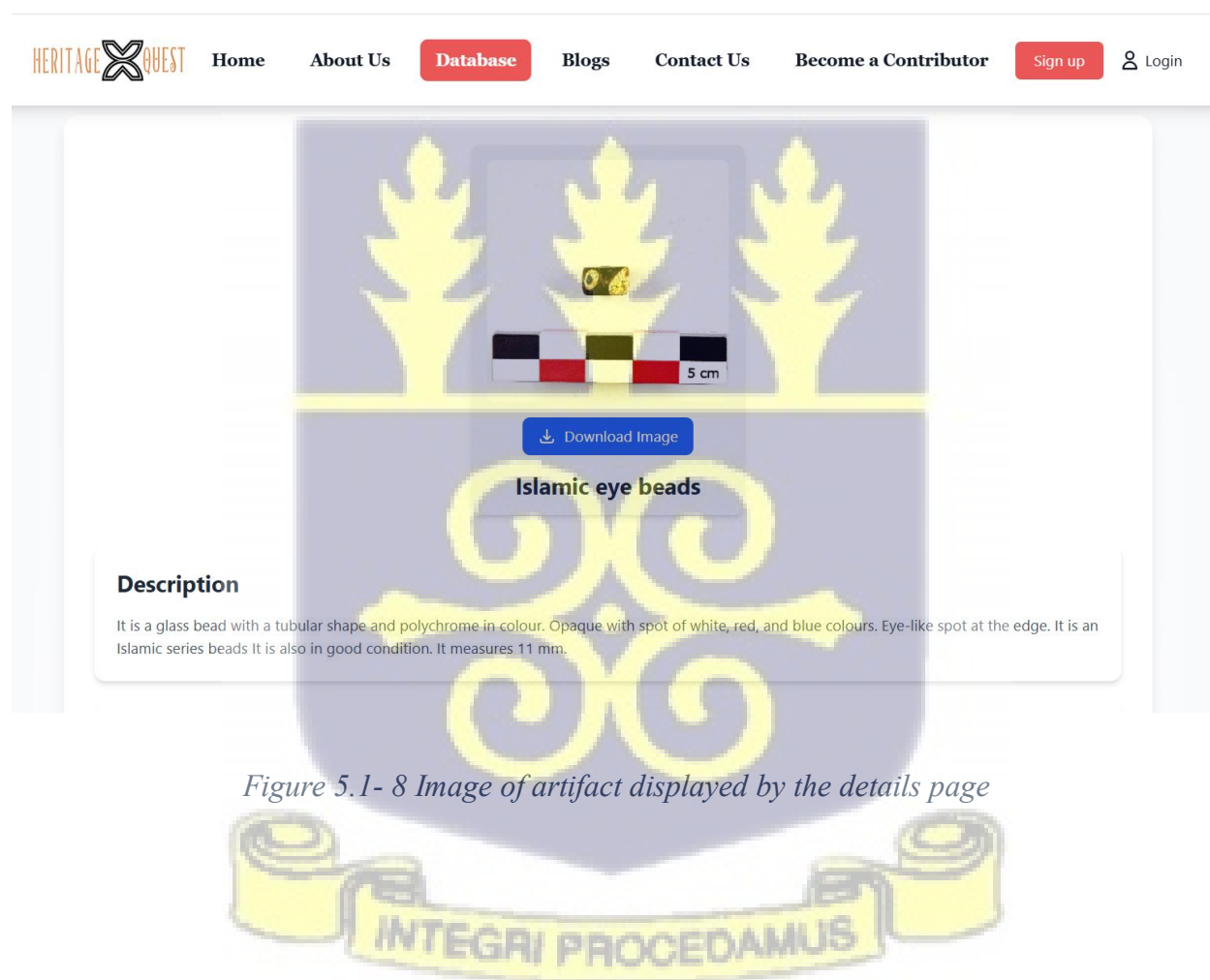


Figure 5.1- 8 Image of artifact displayed by the details page

Description It is a glass bead with a tubular shape and polychrome in colour. Opaque with spot of white, red, and blue colours. Eye-like spot at the edge. It is an Islamic series beads It is also in good condition. It measures 11 mm.
Typology N/A
Chronology Dates to 13th century (see Robertshaw et al. 2010) / Antiquity to middle ages
Comments Likely from the eastern Mediterranean area. Analysis was done by Prof. Kalis Karklins and Bertrand Poissonnier.

Figure 5.1- 9 Artifact context including description, typology, chronology and comments

Provenience (context) Project Label: BAAP'2020 Excavation Type: Trench Trench GPS: N 7°50'36.4", W 02°27'32.2" Trench Dimension: 2x10m Record Date: Jan. 12, 2020 Recorded By: Shilla Excavated By: Rebecca Level: 8 Depth Range: 140-160cm Soil Description: Yellowish brown (5/4, 10YR), loose, moist, possible posthole found at the south eastern corner. Artifacts Recovered: Pot sherds, bones. Bag Number: N/A Samples Taken: None Field Notes: No field notes available.
--

Figure 5.1- 10 Artifact provenience information derived from field record forms



Project Context

Project Name: Begho Area Archaeological Project (BAAP)

Project Description: None

Research Year: 2018

Researcher(s): Daniel Kumah

Publications: No publications available

Figure 5.1- 11 Project context showing the project from which the artifact emanated from.

Excavations

Site: Begho-Hani

Subsite: Brong Quarter (B2)

Excavation Date: Jan. 6, 2020

Excavation Duration: 20

GPS Coordinates: N 7°50'36.4", W 02°27'32.2"

Excavation Procedure: A courtyard mound measuring 21m by 26m with a height of approximately 2.72m was selected for excavation. A trench measuring 2m by 10m, oriented in the south-north direction, was dug across the mound, extending from its crest to its depression. Excavation began at arbitrary levels of 20cm. All deposits were excavated by hand using trowels or small handpicks for compact materials. A 20mm mesh sieve was used to ensure optimal recovery of artifacts and fragmentary materials. Special and fragile finds were bagged in clear zip-lock bags, while ceramics, which comprised the majority, were bagged in black polythene bags. The excavation revealed four main cultural layers and a fifth layer that did not contain any cultural material. There were clear traces of collapsed wall material and a wall stump (W 01) constructed into the natural laterite platform, extending 0.90m deep and stretching from the north-western to the north-eastern part of the trench. To verify if the trench had reached sterile soil, a 1m x 1m unit was excavated in the middle part of the trench. This test-pit, excavated to a depth of 18cm (from 260cm to 278cm), revealed no cultural materials, only a reddish laterite natural layer.

Artifacts Recovered: Ceramics, smoking pipes, faunal remains, metal objects (iron and copper), beads, crucibles, and flakes.

Figure 5.1- 12 Contextual information of the excavation from which the artifacts emanated.

The main idea behind the detail page's design is to allow reusability of the data by providing the contextual information that gives meaning to the data. This ensures that contextual information about datasets are preserved for use by future researchers.

5.2.1.5.2 Archaeological Site Queries section

The Archaeological site query allows visitors to query the database for information pertaining to specific archaeological sites enlisted on the website. By clicking on the tab designated "Archaeological sites", a drop-down interface containing a search field, search button and a result

field opens up to the user. The search field allows viewers to key in the name of the site of interest. The search button executes the search command when clicked and sends the request to the database. The database processes the request and displays the result in the result field as seen in figure 5.1-13. The displayed results include the name of the site and a brief description of it.

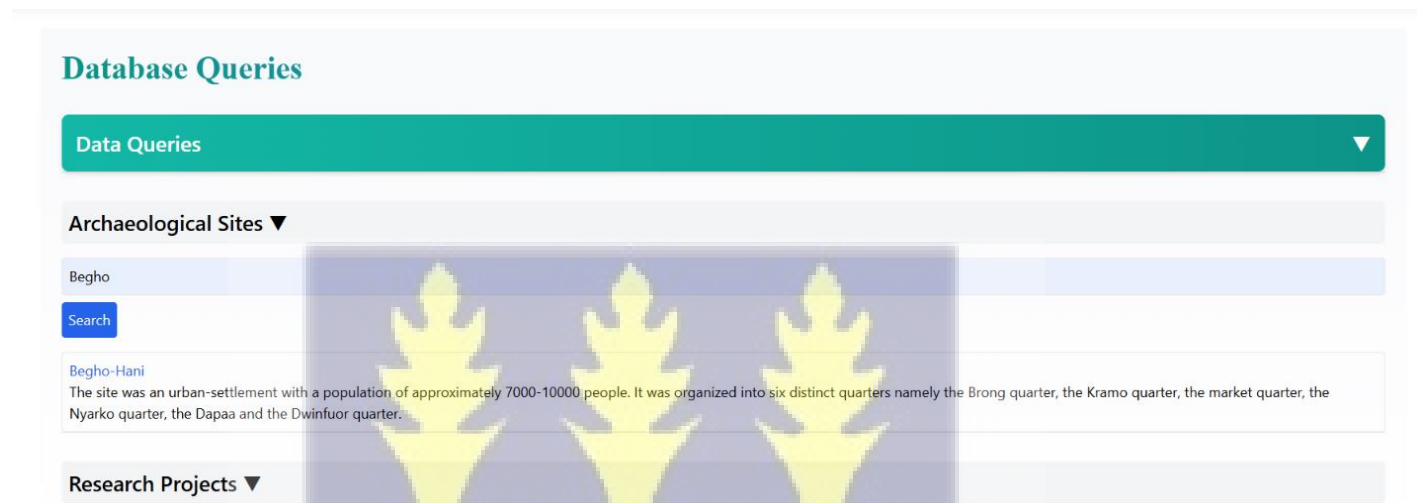


Figure 5.1- 13 Interface showing the results of a query from the archaeological site query section.

For a detailed information, the visitor would have to click on the name of the site displayed in the results field. This action takes the visitor to the archaeological site details page.

The archaeological site details page shows all site information captured within the database. It includes the site's name and location (top panel), site description, environment chronology and coordinates (site details panel), subsites (subsite panel), excavations undertaken at the site (excavations panel) and research projects carried out on the site (projects' panel) as seen in figure 5.1-14.

HERITAGEQUEST
Home
About Us
Database
Blogs
Contact Us
Become a Contributor
Sign up
Login

Begho-Hani

Begho, Tain district, Bono Region, Ghana. Near Hani. Flanked to the east by the Wenchi Municipal, west by Jaman North and South, north by Banda and south by Sunyani west.

Site Details

Description: The site was an urban-settlement with a population of approximately 7000-10000 people. It was organized into six distinct quarters namely the Brong quarter, the Kramo quarter, the market quarter, the Nyarko quarter, the Dapaa and the Dwinfuor quarter.

Environment: The site is situated at the boundary between two ecological zones, marking the transition from forest to savanna woodland. The vegetation zones are home to significant wood species such as odum, sapele, wawa and mahogany. The site experiences two clearly defined seasons: rainy and dry. With an annual rainfall averaging between 1140 and 1270 millimeters, and an average temperature of 24.5°C. In terms of drainage, the Nimpene river and its tributaries are the main.

Chronology: 11th century - 18th century

Coordinates: 7°50'55.81"N, 2°28'43.22"W

Subsites

- Brong Quarter (B2)
- Nyarko (NY1)
- Dwinfour Quarter
- Brong Quarter (B1)
- Kramo Quarter
- Mumute
- Atwetwebooso

Excavations

- Brong Quarter (B2) - Jan. 6, 2020
- Mumute - July 23, 1972
- Brong Quarter (B2) - July 23, 1972
- Dwinfour Quarter - March 19, 1972

Projects

- Begho Area Archaeological Project (BAAP) (2018)
- West Africa Trade Project (WATP) (1970)

Figure 5.1- 14 Archaeological site details page

5.2.1.5.3 Research Project Queries section

The research project query section allows visitors to query the database for information pertaining to specific research projects captured in the database. Clicking the research project tab opens up an interface with a search field, search button and a result field. The search field allows visitors to key in the name of the research project of their choice. The search button executes the

search command when clicked and sends the request to the database. The database processes the request and displays the result in the result field as seen in figure 5.1-15. The displayed results include the name of the project and the name of the project's principal investigator/researcher.

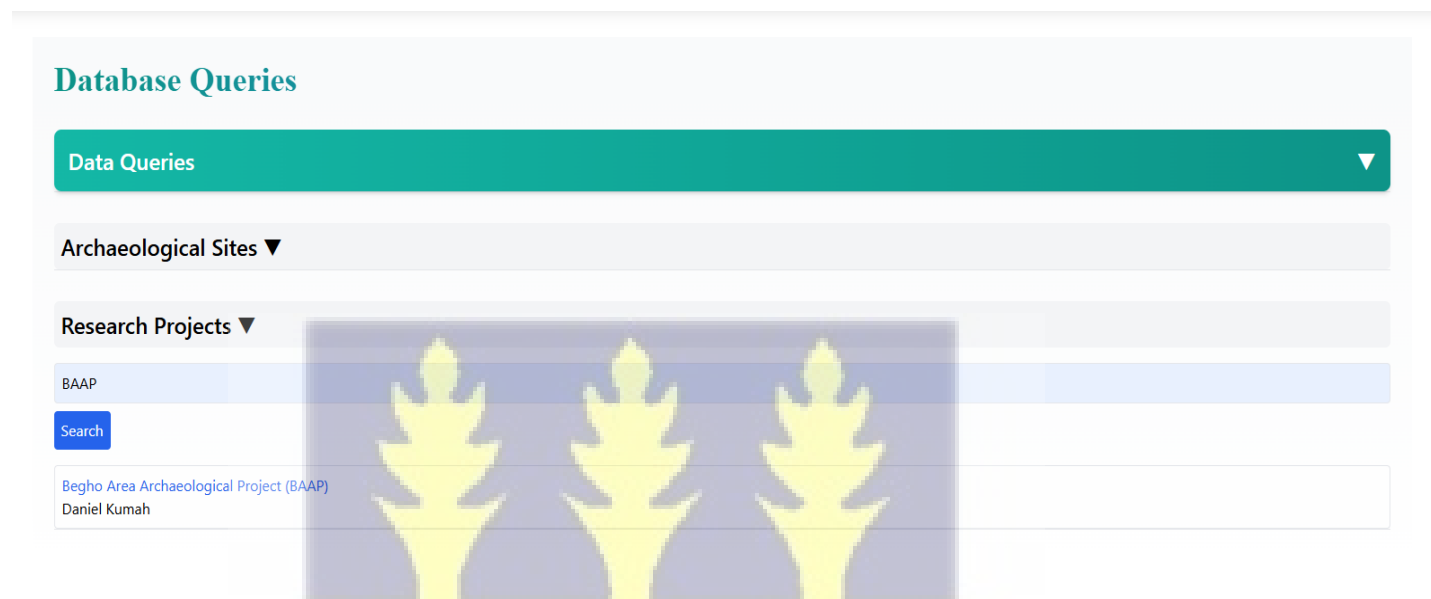


Figure 5.1- 15 Interface showing the results of a query from the research project query section
Clicking project's name in the results field takes the visitor to the project details page where detailed information about the project can be accessed.

The project details page displays all the project information captured within the database pertaining to a particular research project. The displayed information includes the project name, the year the project took place, the site on which it took place and the various loci or subsites it covered (see figure 5.1-16). It also includes the excavation procedure, and surveys carried out under the project. It again includes information such as project methodologies as well as the data collected under the project (see complete page on the website).

Begho Area Archaeological Project (BAAP)

Year: 2018

Archaeological Sites

Begho-Hani

The site was an urban-settlement with a population of approximately 7000-10000 people. It was organized into six distinct quarters namely the Brong quarter, the Kramo quarter, the market quarter, the Nyarko quarter, the Dapaa and the Dwinfuor quarter.

Subsites (Locus) covered

Brong Quarter (B2)

Nyarko (NY1)

Dwinfour Quarter

Brong Quarter (B1)

Kramo Quarter

Mumute

Atwetwebooso

Figure 5.1- 16 Research project details page

5.2.1.6 Blogs page

This page is dedicated to showing the various blog posts published on the website. So far only three (3) posts on Daboya, Dixcove and Kintampo Complex have been made. The page shows the individual blogs in a preview format with featured images, a brief write-up and a “read more” button linking the preview to the actual blog (figure 5.1-17 below). Clicking the “read more” button takes the visitor to the blog details page (in this instance the blog detail for Daboya in figure 5.1-18). The blog detail page displays the featured image, main text, additional images (if any) and a reference section for further reading (Figure 5.1-19). All blog details appear in this format to ensure uniformity (see all blog posts on the website).

BLOGS



August 15, 2024

Daboya

One of West Africa's Oldest settlement with 4000 years of settlement history

[Read More →](#)



August 10, 2024

Dixcove

A vibrant trade hub during the Atlantic Trade era with an intriguing Anglo-Ahantan interactions

[Read More →](#)



August 5, 2024

Kintampo Complex

The Kintampo Complex marks a pivotal shift in West African prehistory, illustrating the transition from a mobile hunter-gatherer lifestyle to more settled communities and complex societies around 2000 BC

[Read More →](#)

Figure 5.1- 17 The Blogs page



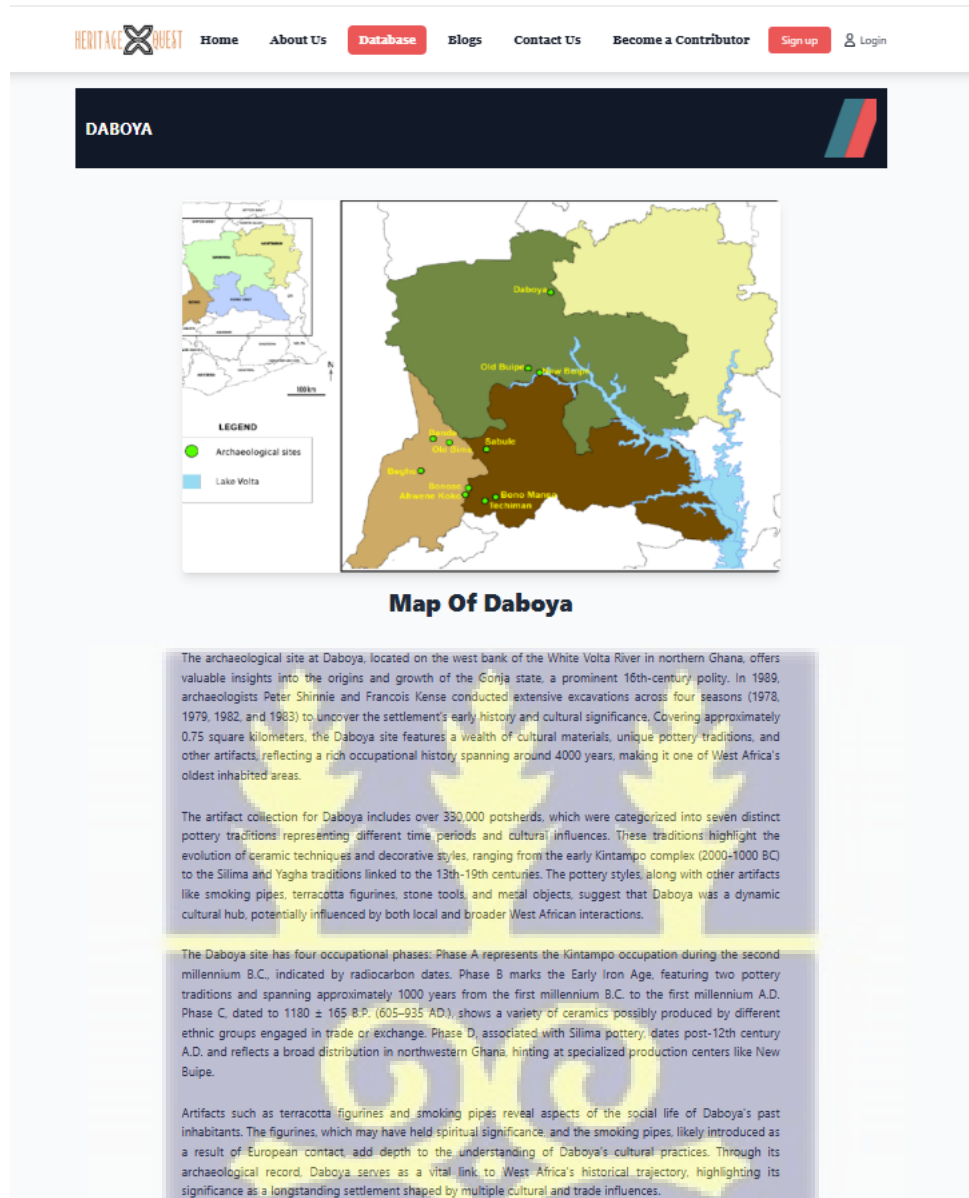


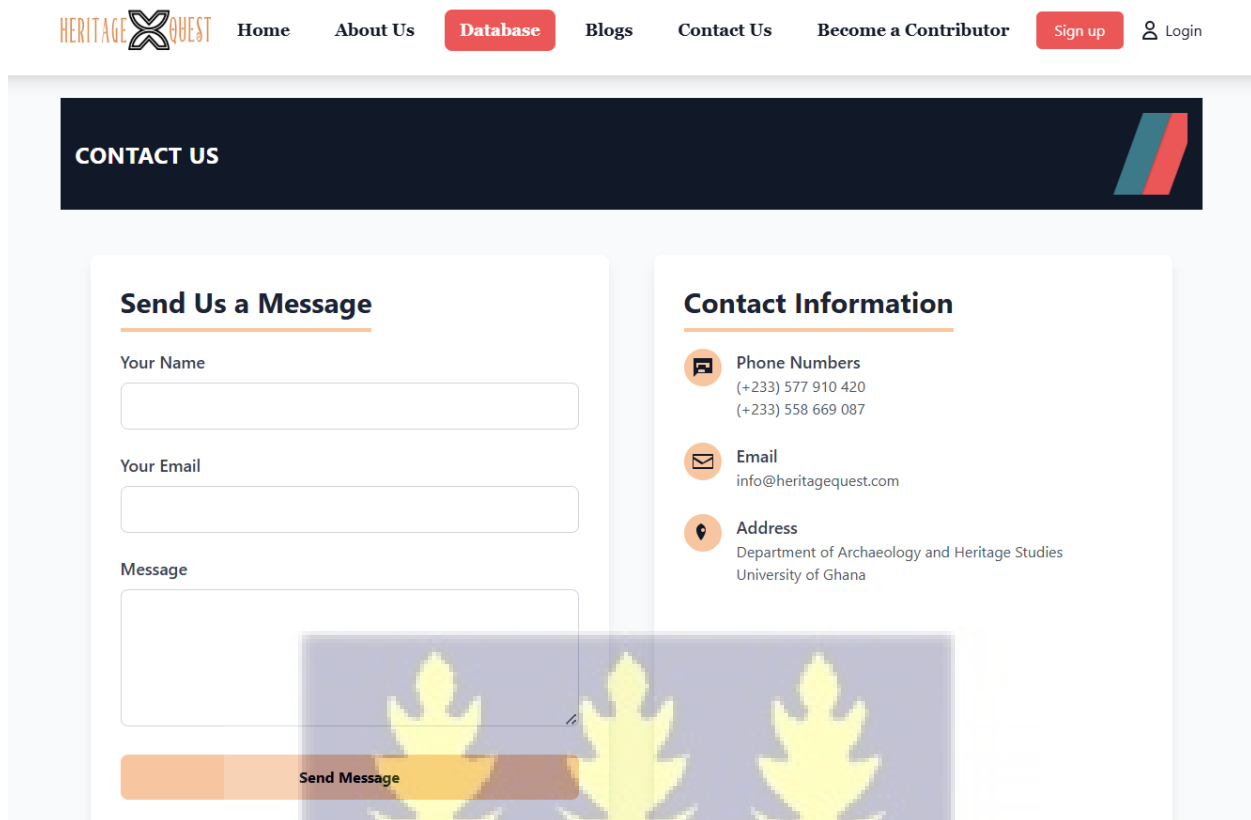
Figure 5.1- 18 The Blog detail for Daboya



Figure 5.1- 19 The Blog detail for Daboya showing the featured image and a reference for further reading

5.2.1.7 “Contact Us” Page

The contact page is dedicated to revealing contact information of the managers of the site. In the context of this work, my details are what is displayed on the contact page (figure 5.1-20). The page displays three (3) icons; a cell phone, email and location icons with relevant information (all of which are on the right-hand panel). This panel allows visitors to reach out to the site’s administrators either via phone, email or come to the Department of Archaeology and Heritage Studies, University of Ghana. The left-hand panel displays a form that allows visitor to send a direct message to the site’s administrators. It requires the name of the sender, his/her email address and the message he/she wishes to send.



HERITAGEQUEST Home About Us Database Blogs Contact Us Become a Contributor Sign up Login

CONTACT US

Send Us a Message

Your Name

Your Email

Message

Send Message

Contact Information

Phone Numbers
 (+233) 577 910 420
 (+233) 558 669 087

Email
 info@heritagequest.com

Address
 Department of Archaeology and Heritage Studies
 University of Ghana

Figure 5.1- 20 The Contact Us page

The purpose of this page is to help visitors reach management of the site with regards to questions and concerns encountered during their visit to the site. This ensures that the needs and concerns of visitors are addressed to foster trust between handlers of the site and visitors.

5.2.1.8 “Become a Contributor” page

The “Become a contributor” page allows prospective contributors to sign-up and submit their details to enable them attain the status of a contributor. The contributor status gives contributors the privilege of publishing their work on the website. They have the option of either submitting their data or writing blogs about the sites on which they work. This avenue would allow them to make their work visible not only to other researchers but also the broader public. For a

user to enlist as a contributor, there are a number of steps to follow. First of all, the user must read, understand and agree to the platform's terms and conditions presented on the page. The user must then click the checkbox below the terms and conditions before access to the application forms will be allowed (as seen in figure 5.1-21).

Figure 5.1- 21 Terms and conditions section of the contributor page

The application form requires two broad categories of information, namely, account and personal information. The account information sought includes a username, email address and a password that the user intends to use when his/her application is approved (figure 5.1-22). The personal information required include, the user's full name, his/her institution, academic qualifications, research interests and a Curriculum Vitae (CV). The CV is to be sent as an attachment to the form (as seen in figure 5.1-23). The user is required to click the button designated "Register as Contributor" to submit the application.

Account Information

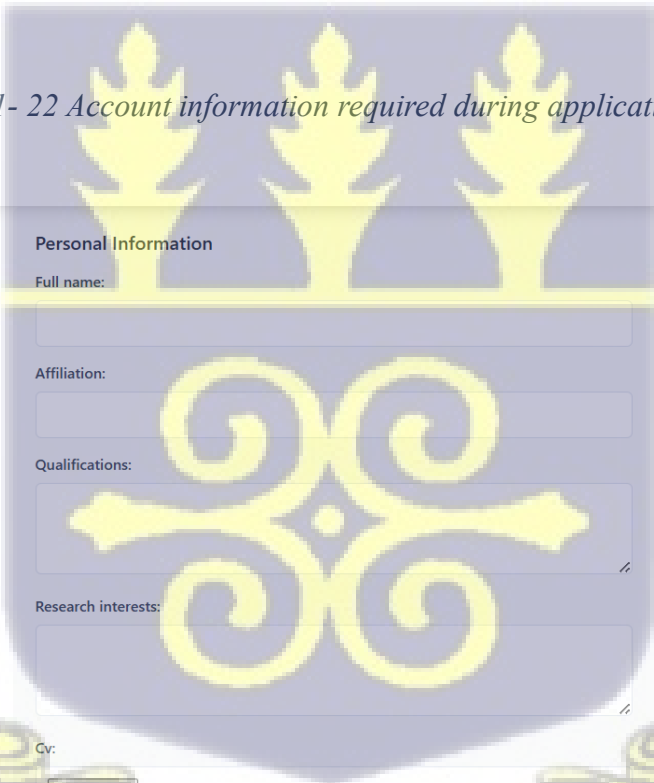
Username:

Email address:

Password:

Password confirmation:

Figure 5.1- 22 Account information required during application process



Personal Information

Full name:

Affiliation:

Qualifications:

Research interests:

Cv:

No file chosen

Please upload your CV (PDF or Word document)

INTEGRI PROCEDAMUS

Figure 5.1- 23 Terms and conditions section of the contributor page

Once the application process is submitted, the prospective applicant receives a success message in their email (submitted during the application process) confirming the successful completion of the process. The site's administrators are notified accordingly and they review the request to approve or reject the application. Once the application is approved, the prospective contributor is sent a congratulatory email confirming the approval of their application. The email comes with a link to a log-in page connected to a contributors' dashboard. By keying in the account information provided during the application process, the user is redirected to the dashboard where all the publishing tools are available to allow them publish on the site.

5.2.1.9 Log-in

The log-in section allows contributors to gain access to the contributors' dashboard. It features text fields for username and password, a sign-in button, and a link designated for resetting one's password in case it is forgotten (figure 5.1-24).

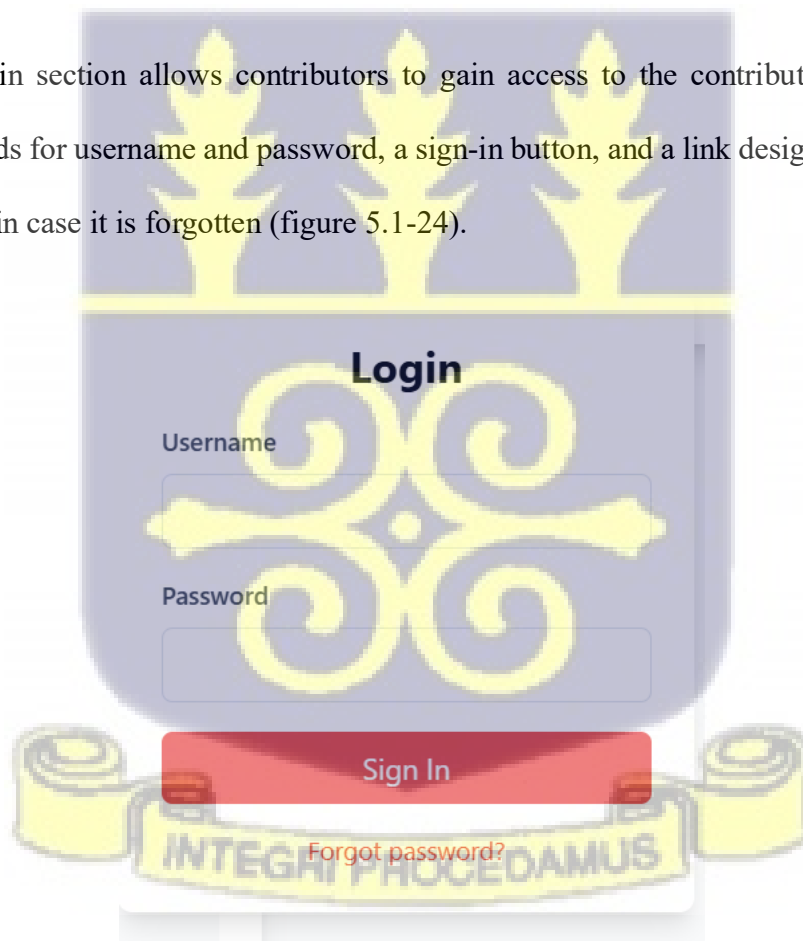


Figure 5.1- 24 Website's Log-in section

5.2.2 Contributors' Dashboard

The contributors' dashboard is solely reserved for users with contributor status. The dashboard contains tools and functionalities that enable contributors to publish resources on the site. The dashboard has three main building blocks (figure 5.1-25). It includes the header (highlighted in black, same as one described earlier), the sidebar (highlighted in red) and the display section (highlighted in blue).

Figure 5.1- 25 Dashboard interface

5.2.2.1 Sidebar

The sidebar is located on the left-hand side of the interface. It features tabs connected to tables in the database used for storing data. The tabs include dashboard overview, edit profile, add blog post, submit data, add archaeological site, add project, add project finding, add project methodology, add surface survey, add field record and add excavation (figure 5.1-26). Once a tab is clicked in the sidebar, it opens up in the display section. The overview section gives highlights of the user's profile details, and submissions made (see figure 5.1-27). The edit profile tab allows users to edit their profile, while the remaining tabs allow users to upload various categories of data as suggested by their names. All the tabs are connected to the database and they communicate with it to fetch data.



Figure 5.1- 26 Dashboard sidebar

5.2.2.2 Display Section

The display section displays the content of tabs in the sidebar to allow users input data into the database and website. Assuming a user wants to add an archaeological site to the database, he/she must click the “Add ArchSite” tab. This opens up its content on the display section and shows all the text fields that enable the capture of archaeological site information within the database (see figure 5.1-27).

The screenshot shows a web application interface for adding archaeological site information. On the left is a sidebar with a 'Dashboard' header and a list of menu items: 'Dashboard Overview', 'Edit Profile', 'Submit Data', 'Add ArchSite' (highlighted in blue), 'Add Project', 'Add Project Finding', 'Add Project Methodology', 'Add Surface Survey', 'Add Excavation', and 'Add Field Record'. The main content area is titled 'Add Archaeological Site' and contains a form with the following fields: 'Name', 'Environment', 'Chronology', 'Location', 'Coordinates', and 'Description'. Each field has a corresponding input box. At the bottom of the form is a blue 'Submit' button. The background of the form area features a large, semi-transparent watermark of the University of Ghana crest and a banner that reads 'UNIVERSITY OF GHANA'.

Figure 5.1- 27 Interface for adding archaeological site information to the database.

5.2.3 Administration (Admin) Dashboard

The administrative dashboard is exclusively accessible to the website’s administrators and is equipped with functionalities that facilitate the execution of core administrative tasks. These include reviewing and approving applications from prospective contributors and overseeing contributor activity to ensure compliance with the platform’s terms and conditions. Structurally, the admin dashboard comprises a header and a main content area (see Figure 5.1-28). The header features navigational links—highlighted red in figure 5.1-28—that enable administrators to switch between the admin dashboard and the main site, update their password, or log out of the system. The main content area is organized into several functional tabs—also highlighted black on figure 5.1-28—designed to support the publication process and the oversight of contributor submissions. These tabs are grouped into three principal categories: Authentication and Authorization, Core, and Dashboard. The Authentication and Authorization section enables administrators to assign contributor privileges and view a comprehensive list of users with contributor status. The Core section allows for direct data entry into the platform’s underlying database tables and includes a tab titled “Contributor Enlistment,” which provides tools for evaluating and either approving or rejecting contributor applications. The Dashboard category comprises tabs linked to the contributor dashboard, enabling administrators to monitor and regulate content published by contributors.



WELCOME, ADDY

VIEW SITE / CHANGE PASSWORD / LOG OUT

Django administration

Site administration

AUTHENTICATION AND AUTHORIZATION

Groups

Users

CONTENT

Arch sites

Contributor enitments

Datas

Excavations

Field records

Project findings

Project methodologies

Projects

Subsites

Surveys

DASHBOARD

Blog posts

Data submissions

Notifications

User profiles

Recent actions

My actions

Edmund Akye Addy

Contributor enitment

Excavation for West Africa Trade Project (WATP) on 1972-03-19

Excavation

Excavation for West Africa Trade Project (WATP) on 1972-03-19

Excavation

Excavation for West Africa Trade Project (WATP) on 1972-07-23

Excavation

Excavation for West Africa Trade Project (WATP) on 1972-07-23

Excavation

Excavation for West Africa Trade Project (WATP) on 1972-07-23

Excavation

Brong Quarter (B2)

Subsite

Brong Quarter (B3)

Subsite

Methodology for West Africa Trade Project (WATP)

Project methodology

Bad Polisher - Artifact

Data

Field Record - BAAP 2020 (BAAP 2020 (U1, L4))

Field record

Figure 5.1- 28 Administrative (Admin) interface

5.3 Discussions

The Heritage Quest platform offers several advantages that collectively aim to improve the practice of archaeology in Ghana. These include; bridging the gap between academics and non-academics, minimizing data death through secondary usage, facilitating project tracking and optimizing storage management.

5.3.1 Bridging the gap between academics and non-academics

Archaeologists, like scientists, have a responsibility to engage the non-academic public by communicating in plain and simple language that resonates with them (see Ryan, 2023; Orritt & Powell, 2020). It has long been the case in Ghanaian archaeology that a wedge exists between those in academia and the broader public. Archaeological resources seem to be of relevance to those within academia alone, leaving out the broader public whose past is the subject of archaeological enquiry (see Gavua, 2006). Even within the University of Ghana community, members outside the discipline of archaeology hardly have knowledge of what the discipline is about and what the Department of Archaeology and Heritage Studies (DAHS) does.

Ironically there is an aura of fascination that grips members of the broader public when they are exposed to archaeology whether in the field or at the University of Ghana's Museum of Archaeology. I have witnessed this first hand with my three years association with the department in various capacities notably as museum and field assistant.

This wedge is therefore, the result of many factors, notably, the mode and medium through which archaeological insights are communicated and the target audience. Archaeological insights are mostly communicated academically, through publications (books and journal articles). The only issue with this arrangement is that it serves the needs of the academic community, leaving out

the needs of the broader public. The voluminous nature, and the use of technical language in academic publications, make reading and comprehension difficult for non-academic members of the public.

This is exacerbated by today's digital age, where a wide array of content (blogs, podcasts, videos and multimedia) compete with archaeology for the public's attention online, often overshadowing archaeological discourse. It has therefore become imperative for archaeologists in Ghana to find innovative ways of communicating their work to serve the needs and interest of a cross-section of the public.

The Blog compartment of the website empowers Ghanaian archaeologists to adopt innovative ways of communicating their work. Through techniques such as storytelling, relatable analogies and multimedia contents, archaeologists are able to evade the technicalities involved in academic publications, thereby fostering curiosity and appreciation for the past among a cross-section of the public. The blog post can be likened to summaries of academic works, making it useful to both academic and non-academic audiences. With the help of the information at the tail end of each post, designated "For more information", interested readers are directed to a more detailed information about the subject addressed in the blog. This synergizes both pieces of information and ensures the gap between academia and the broader public is minimized or blurred.

5.3.2 Minimizing data death through secondary usage

One key challenge in Ghanaian archaeology is the unusability of archaeological data over a long period of time. Archaeological data just like data from other disciplines, possess qualities useful beyond the primary goals for which they were collected. The usefulness of archaeological data over a long period of time hinges on good preservation and archiving practices that preserve the raw data along with its associated metadata. However, factors such as poor preservation

practices and the lack of structured archiving systems or mechanisms have limited the usefulness of archaeological data to the primary purpose for which they were collected.

By providing a secured and systematically organized space for storing both raw data and their associated metadata, the database compartment of the website ensures that archaeological data is not only preserved but also remains accessible for future use. Metadata, which includes details such as the context of discoveries and methodologies employed, add layers of meaning to the raw data, making them comprehensible and reusable by other researchers, students, or institutions, thereby facilitating secondary usage. This implies that the stored data can support new research, comparative studies, and reinterpretations without the need to repeat fieldwork or excavation. This is essential to Ghanaian archaeology since it may minimize the fragmentation of Ghana's archaeological narrative, promote continuity in research and enable scholars to build upon the work of their predecessors. This will enhance the global visibility of Ghana's archaeological heritage and ensure the nation's archaeological legacy endures for future generations.

5.3.3 Facilitating Project Tracking

Another key challenge in Ghanaian archaeology has to do with the absence of a searchable national database to effectively track projects. The Ghana Museums and Monuments Board (GMMB) is the state institution mandated by law to keep inventory of materials, oversee and monitor the execution of archaeological projects in Ghana. They do this by issuing permits and deploying staff as part of any research expedition. GMMB does not have a database system for comprehensively tracking projects. They usually rely on reports from their representatives attached to projects as means of tracking projects for which permits are issued.

I surmise a file system made up of permits issued within a period, as a mechanism for keeping track of research projects undertaken within the country at a particular time. This

arrangement appears to be unsustainable based on issues related to project directors' failure to accommodate GMMB representatives during projects. By law, all archaeological research projects must have a representative from GMMB with the cost borne by the project. However, challenges with project funding, especially for small-scale initiatives like student projects, often make it difficult for directors to include GMMB representatives. This is primarily because these projects are typically self-funded with little room to accommodate staff from GMMB. This is usually the case for small-scale projects, though compliance levels for large-scale projects are high due to sufficient funding. The net effect of this problem is the inability of GMMB to comprehensively track projects nationwide regardless of project scale.

Tracking archaeological projects offers numerous advantages for researchers, policymakers, and the broader cultural heritage sector. Tracking promotes accountability and transparency by ensuring that archaeological projects stay on schedule, comply with ethical standards, and meet reporting obligations. This is likely to build public trust and foster responsible management of cultural heritage. Tracking enhances global visibility. A national archaeology database for tracking projects highlights a country's commitment to safeguarding heritage. This can attract collaborations, funding, and recognition worldwide and set the country out as a key stakeholder in global conversations on heritage. It may also enhance policy and promote good heritage management. Tracking aids strategic decision-making through the identification of sites at risk, enhancing conservation efforts, and influencing policies to protect cultural heritage. This will ensure responsible management of heritage amidst pressure from development.

Tracking can also help in consolidating data across projects which enables a broader historical analysis, interdisciplinary research, and the study of long-term cultural trends. This may create a holistic understanding of Ghana's past and promote efficient resource allocation;

optimizing the use of funds, personnel, and specialized equipment by prioritizing impactful projects to ensure efficient resource deployment across several projects.

Establishing a national database will greatly help in comprehensively tracking archaeological projects nationwide. By introducing a policy requiring project directors to submit progress reports certified by the GMMB to the national database after each expedition, all projects—regardless of scale—can be effectively accounted for and tracked throughout their various stages of completion. The Heritage Quest platform can be a catalyst for the establishment of a national archaeology database. With improvements and iterations, the platform can be upgraded from its current pilot status to a fully-fledged repository capable of serving the entire country.

5.3.4 Optimizing storage management

Storage facilities are an integral part of archaeological institutions. With regard to the Department of Archaeology and Heritage Studies at University of Ghana, the Museum of Archaeology takes care of the storage needs of the Department. However, the museum currently struggles with storage space due to the constant inflow of artifacts mainly from the Department's annual field school and student research projects.

The Heritage Quest platform promises to provide a digital storage facility capable of complementing the physical storage space at the Department. Through the digitization processes adopted in this work, some of the materials (specifically the undiagnostic ones) can be digitized, uploaded online and then reburied or discarded to make room for new ones. This process will ensure that vital information is not lost in the process of making space for new data.

CHAPTER SIX

SUMMARY AND CONCLUSIONS

6.1 Introduction

This chapter provides a summary of the entire work, with special attention to how the methods employed in the work helped in achieving its objectives and ultimately its aim. It also looks at how the work's aim addresses the research problem for which this endeavour was embarked upon and the significance of the work to Ghana's heritage and archaeology.

6.2 Summary

This work was spurred on by the need to address the issue of information accessibility in Ghanaian archaeology. Several decades of archaeological practice in Ghana (dating back to the 1940s) has yielded a lot of archaeological resources (data and information) that reveal the country's past. In spite of this, the resources seem to be of relevance only to academia, leaving out the broader public whose past is often the subject of archaeological enquiry. As a way of addressing this issue, the project set out to research and develop an open-access archaeological website useful for archaeological data management and information dissemination.

As a pilot project, the study relied on sampled data and information from Begho, Daboya, Dixcove and the Kintampo complex. A total of three-hundred and twenty-seven (327) data samples were drawn and compiled, from the Begho archives; which is a collection of primary data from the Begho site. The samples were used to establish a digital database and included; Letters of correspondence (n=21), Maps (n=16), Illustrations (n=24), WATP Photographs (n=143), Record forms (n=51) and Artifact photographs from 2020 excavations (n=72). The development of the database started with the gathering of the data's contextual information through desk-based

research. Through consultations, the relational database model was adopted for storing and organizing the compiled data. A schema was designed to accommodate all the data types as well as contextual information, and was implemented with the help of Oracle's MySQL database software. The sampled data was taken through cleaning, scanning and digitization (where necessary) before they were uploaded onto the database system. A user interface (UI) was then designed and programmed to aid access to the database. The UI comes with a search button and a filtering section to aid easy access to the database.

Developing the database and the UI has addressed the project's first three objectives; Compiling archaeological information and data from the Begho archive, Developing and implementing a flexible database model to accommodate various data types, and creating a user-friendly UI to ease access to the database.

The project's final objective was to explore ways in which archaeological research results could be communicated to a cross-section of the public. The executive summary approach (which reduces reports to their salient points) was adopted as the means through which research results were to be communicated. Publications were reviewed from Daboya, Dixcove and Kintampo complex to gather information for site profiling. The gathered information was then processed to take out jargons and technicalities that make them difficult for non-academic audiences to understand. The language was also reduced to simple everyday English for easy understanding. In the end, three (3) executive summaries were produced, with each bothering on Daboya, Dixcove and the Kintampo Complex. The executive summaries were used to create blog posts which were later published on the website.

The website was programmed with Python, JavaScript and Hypertext Markup Language (HTML) with Django as its main framework. The site was given the name Heritage Quest as its

identity. The website is made up of three (3) main compartments; the main website, contributors' dashboard and the administrative dashboard. The website also has three access levels: user, contributor, and administrator levels. Users are restricted to the main page and can only view and download public content. Contributors have access to the main website added to their access to the contributors' dashboard that enables them to publish on the main website. Administrators have the highest access, with all user and contributor capabilities, plus the authority to approve contributor applications, manage content, and enforce platform policies. Administrators have access to the main website as well as an exclusive access to the admin dashboard. The main website is made up of a header, footer, login section, six main pages—Home, About Us, Database, Blog, Contact Us, and Become a Contributor—and several sub-pages. The sub-pages consist of three blog posts linked to the Blog page and three detail pages linked to the Database page. The Database page is the only page across the entire site that communicates with the database developed earlier. The blog posts developed earlier are published under the blogs page. The contributor dashboard is also made up of a header, a sidebar and a display section. The sidebar features the various core tables for storing data in the database. The Admin dashboard is also made up of all tables within the database including tables for storing account information of all contributors of the platform. This allows admins to perform their regulatory functions.

The domain name www.heritagequest24.com was procured for the website, enabling it to go live on the internet. This means typing the above domain name in google or any search engine will automatically take visitors to the site, making access to all the information on the site easy. This marks the achievement of the project's aim of developing an open-access archaeological website for data management and information dissemination.

The Heritage Quest platform is an approach to enhancing the practice of archaeology in Ghana by addressing the issue of information access and the management of heritage resources. It is expected to bridge the gap between academia and the broader public through accessible blogs that simplify research results, fostering a broader interest and appreciation from the general public. The platform should also mitigate data loss by providing an avenue for preserving and reusing archaeological data. This will ensure long-term accessibility and continuity in research. By facilitating project tracking, the platform improves accountability, policy-making and global visibility, while also optimizing resource allocation. Furthermore, the platform addresses storage constraints in archaeology institutions by offering digital storage solutions to complement physical ones. This enables the digitization and online archiving of artifacts.

6.3 Recommendations

The Heritage Quest platform is currently a prototype, featuring a limited selection of archaeological resources. However, it is designed with the capacity to accommodate a significantly larger collection in the future when extended. The following are some limitations with recommendations that when followed, can lead to the realization of its full potential.

- User Experience

Priority was given to the development of the database and blogs compartments of the website since they are foundational to the entire endeavour. Other areas such as user experience which is another critical component in ensuring that the platform fulfills its intended purpose was given little attention. Areas like easy navigation, accessibility across devices, interactive features, performance and aesthetic design play crucial role in drawing and maintaining visitors on the

website. Thorough research in this area is, therefore, recommended in order to improve the Heritage Quest platform. This will guarantee that the platform's promise is fully fulfilled.

- Institutionalization of the Platform

To ensure the platform's long-term sustainability and maximize its impact on archaeology in Ghana, the University of Ghana's Department of Archaeology and Heritage Studies must take a leading role in institutionalizing it. The platform must be integrated into the department's core activities, policies and academic framework.

To do this, the department's Leventis Digital Resource Centre should be in charge of the platform's management. Funding must then be secured to expand, maintain and support the growth of the platform. The department must then champion public awareness campaigns to promote the platform. This will enhance public awareness and also strengthen the department's role as a key stakeholder in heritage management in Ghana.

With the above recommendations, the Heritage Quest Platform can set the stage for the development of a national digital archive for archaeology, similar to prominent ones like Archaeology Data Service (ADS in the United Kingdom) and the Digital Archaeological Record (tDAR in the United States).

6.4 Conclusion

Transparency through easy access to archaeological resources, is critical to inspiring deep appreciation for Ghana's cultural heritage. Making archaeological resources easily accessible removes barriers that often limit public engagement with the past and allows the public to explore and connect with Ghana's heritage. This research has successfully demonstrated the feasibility and

potential benefits of an open-access archaeological website in managing archaeological data and disseminating archaeological information in Ghana.



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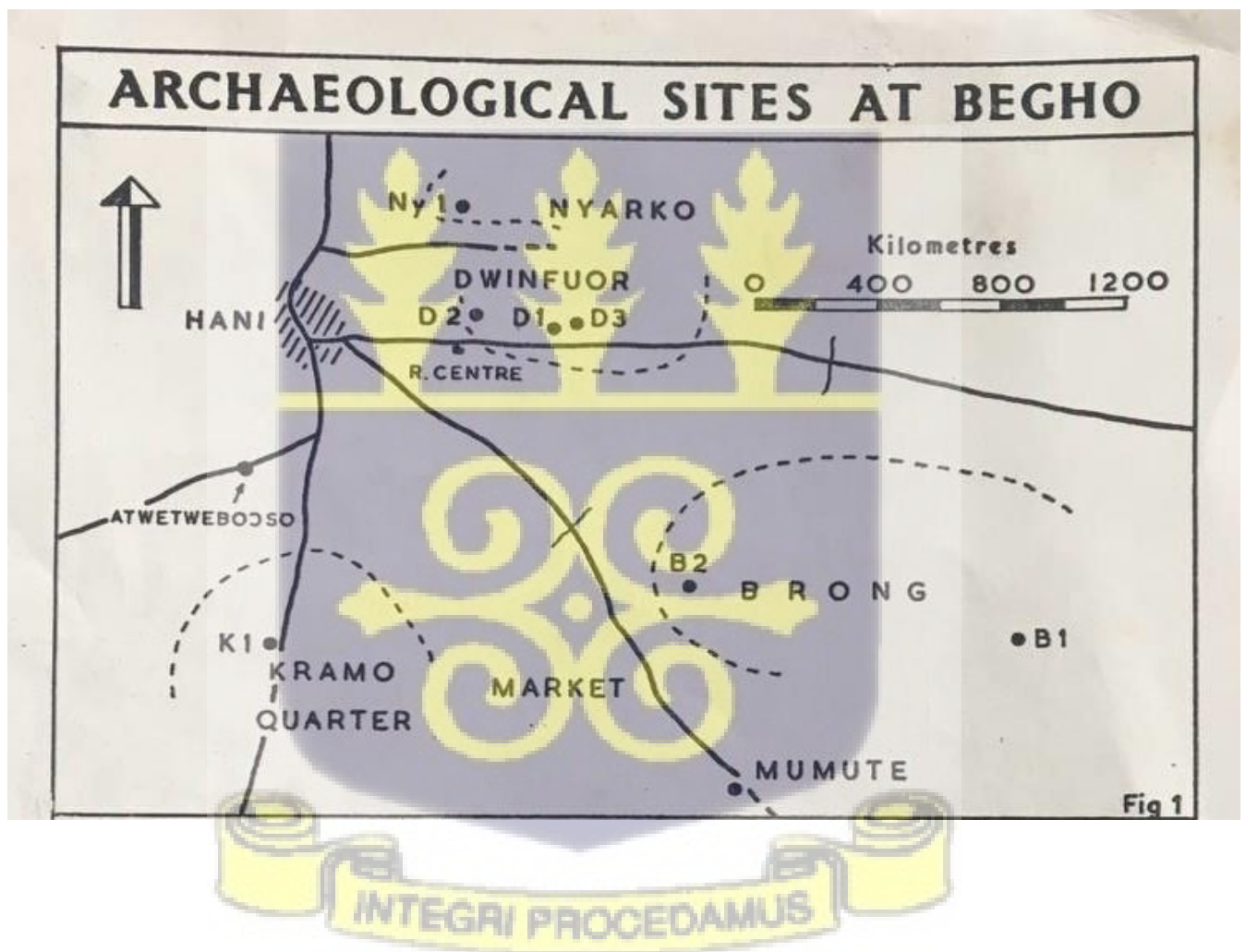
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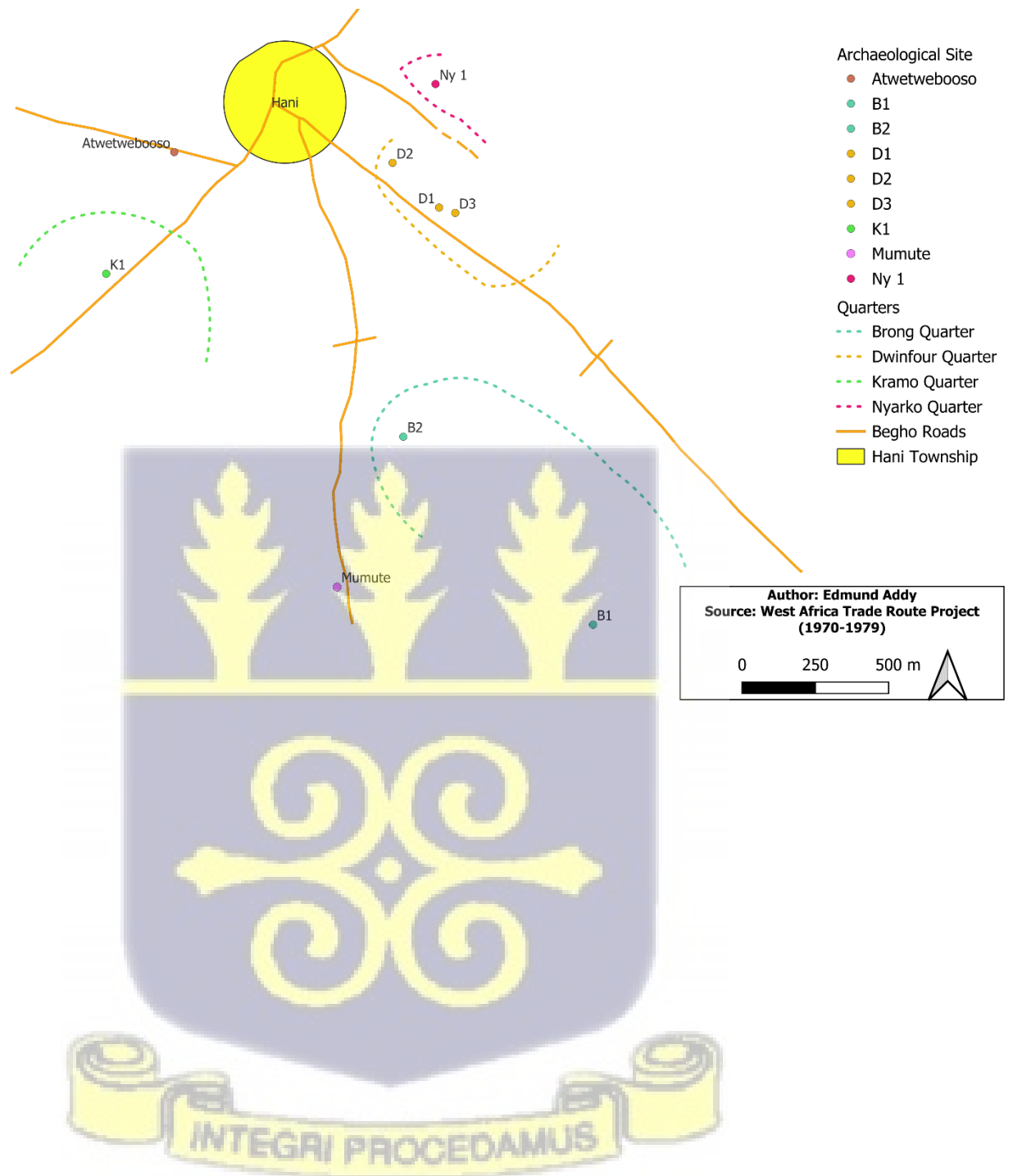


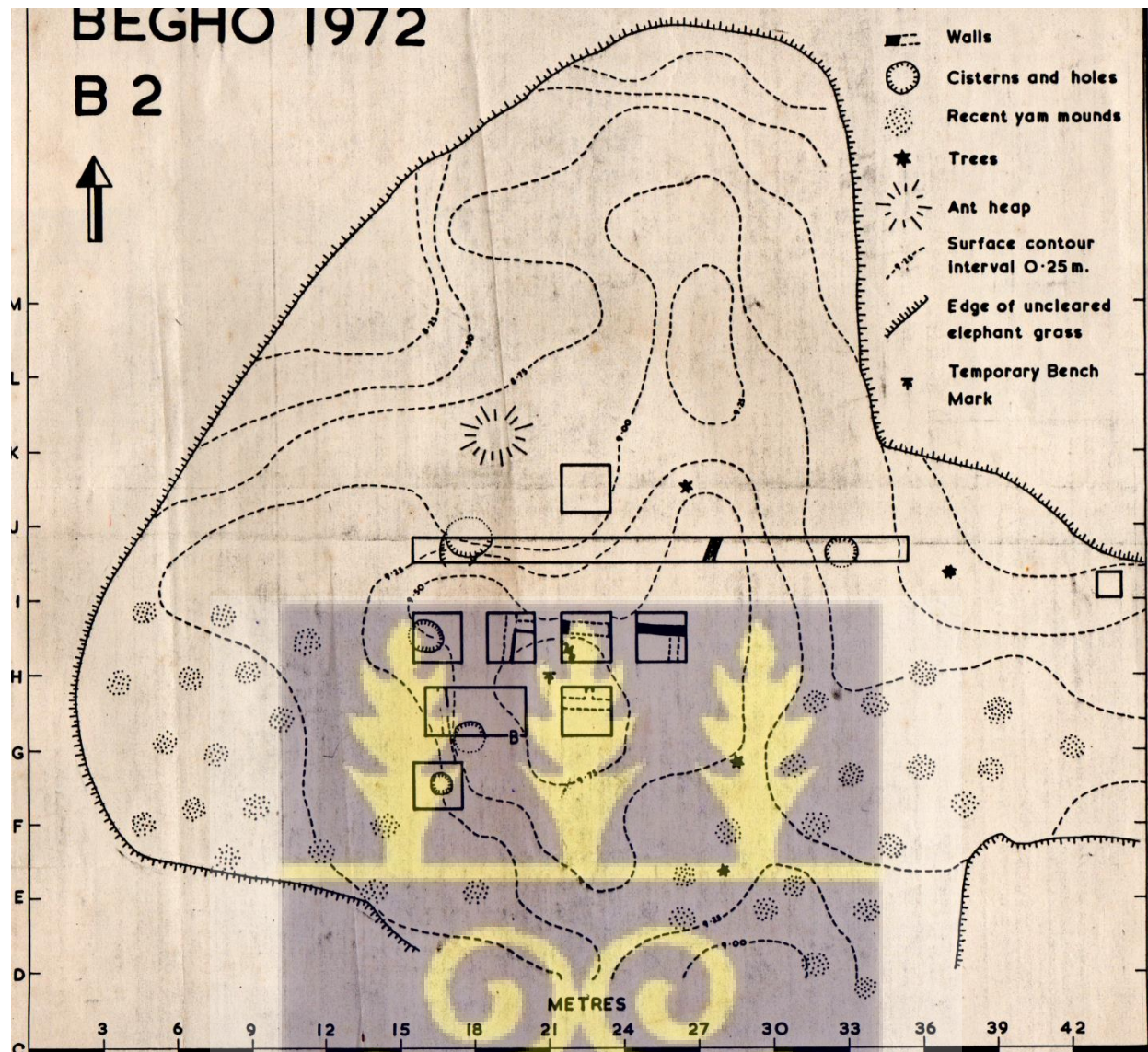
APPENDIX

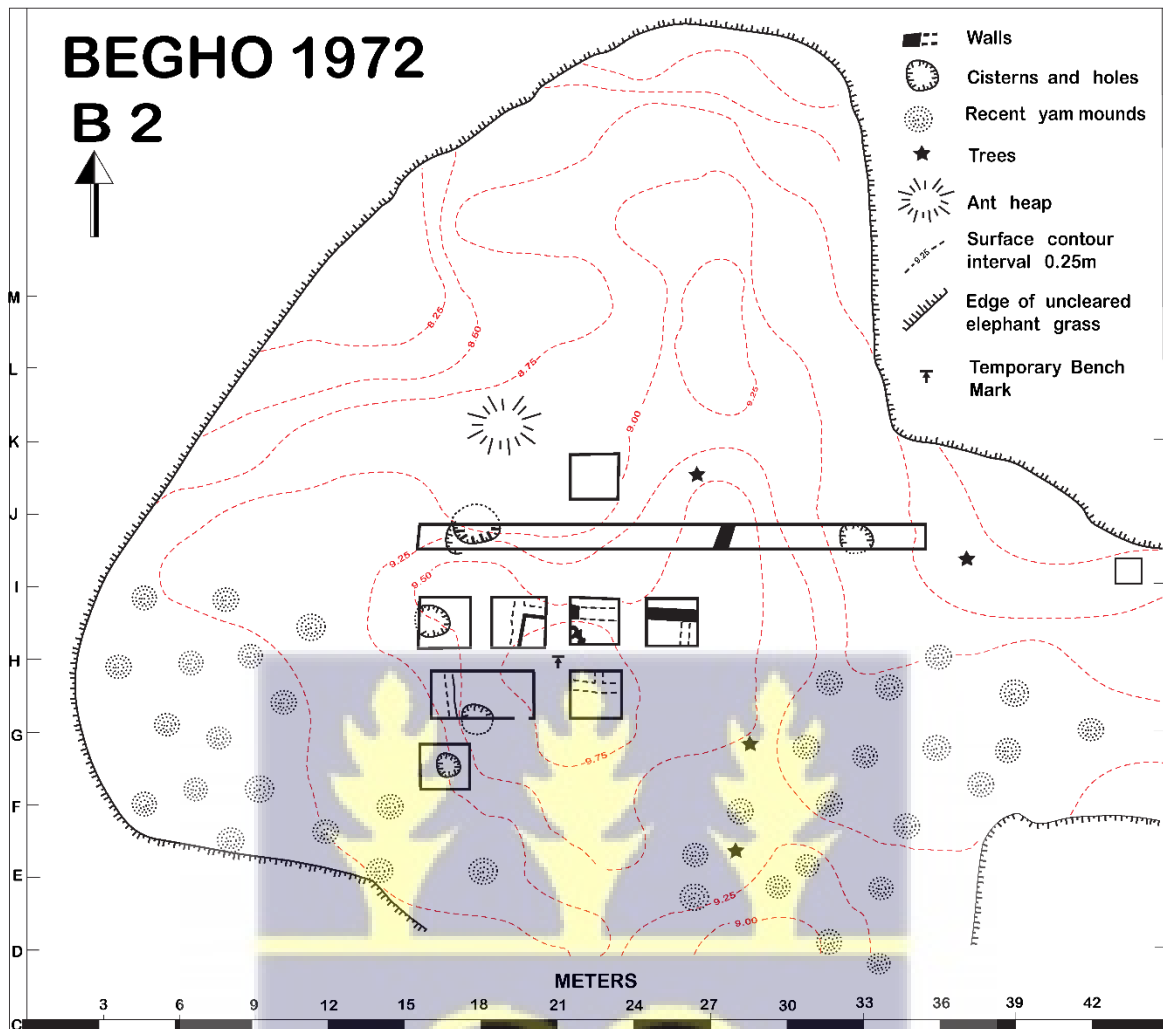
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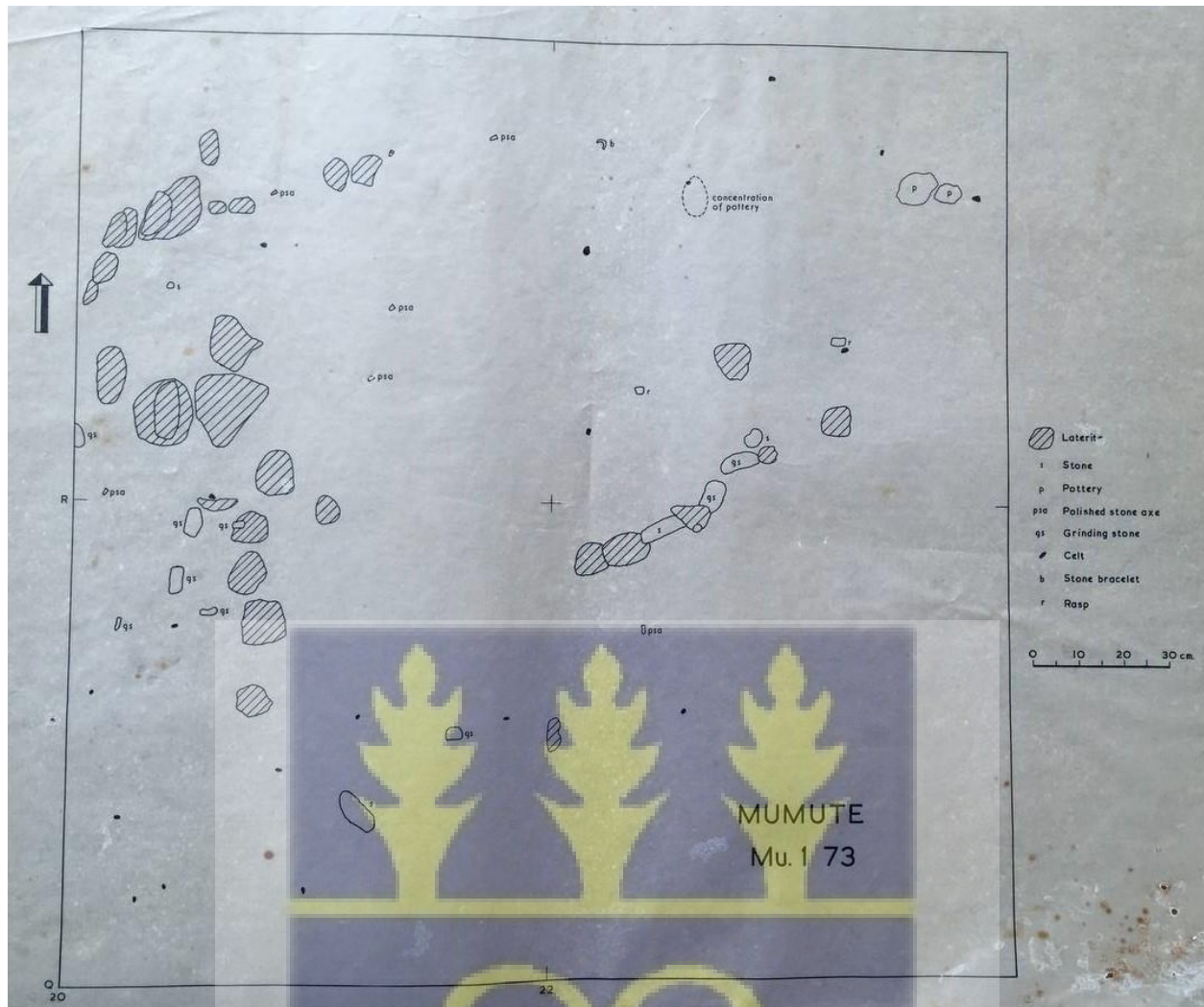


ARCHAEOLOGICAL SITES AT BEGHO









Configuration of artifacts at Mumute (1973)

