Maritime Community Settlement History in Pangani Bay, Tanga Coastal Region, Tanzania

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To my wife (Mariam) and my daughters: Precious and Patricia.

For by the grace, I receive endless love and support from them.

ABSTRACT

Many Zanjian settlements (8th to 13th centuries AD) on Tanzania's coast are considered to have collapsed and not regarded as belonging to the formation of the Swahili culture (13th to 16th centuries AD). With this regard, Swahili traditions found on Tanzania's coast are seldom linked to local Zanjian precursors but to external influence especially from Lamu archipelago on the Kenya coast. Nevertheless, new archaeological evidences from Pangani Bay on the northern coast of Tanzania suggest that the external influences to cultural continuity and change from Zanjian to Swahili periods are overemphasized. This conclusion is grounded on archaeological field works conducted in the surrounding of Pangani Bay in 2010 and 2012, where major Swahili sites directly overlie Zanjian sites without recognizable changes of the cultural materials. The study compares and contrasts cultural materials (in particular pottery) and remains of economy and trade (fauna and glass beads) traditions from both Zanjian and Swahili phases. The aim of this comparative analysis is to trace change and continuity of archaeological traditions for better understanding the origin of Swahili culture in Pangani Bay.

In this endeavour, the analysis of ceramic, faunal remains and glass beads from Pangani Bay proposes negligible differences of materials and economical traditions from the late 1st to 2nd millennia AD. That is, local ceramic styles by Swahilis show only minor differences to those used by their ancestors, while fauna data suggest a similarity in subsistence economy between Zanjian and Swahili periods. Correspondingly, glass bead data indicate that although maritime trade became highly sophisticated during Swahili time, early involvement into oceanic far distance trade contact began in the Zanjian period. Thus, this thesis conveys all issues together. It presents research objectives, field work methods as well as analysis and interpretation of the results, with a main focus on ceramic, fauna and bead data. With the support of archaeological evidences, the current work concludes that there is more continuity than change in most of the Zanjian traditions that facilitated the origin of Swahili culture in Pangani Bay.

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LIST OF ABBREVIATIONS AND ACRONYMS

AD: Anno Domini

BC: Before Christ

c.: Aroundthis period

cm: centimeters

°C: Degree Celsius

C.E.: Common Era

DAAD: Deutscher Akademischer Austausch Dienst

EIW: Early Iron Working

km: Kilometers

LSA: Later Stone Age

MSA: Middle Stone Age

MOEVT: Ministry of Education and Vocational Training in Tanzania

NP: Neck Punctuated ware/ Swahili wares

m: Meter

m^2: Square meter

mm: Millimeters

PW: Plain Wares

TIW: Triangular Incised Wares/Zanjian wares

SRTM: Shuttle Radar Topography Mission

CHAPTER ONE
INTRODUCTION

1.1 The Study Context

This study investigates the origin of Swahili culture at Pangani Bay on the northern Tanzania coast. The investigation attempts to test the hypothesis that Swahili traditions from 13th to 15th centuries AD were rooted from Zanjian[1] settlements that existed on the bay in the periods between 8th and 13th centuries AD. The study examines the cultural developments which might have contributed to the formation of Swahili culture in the area. Interpretation of archaeological data for understanding developments that triggered the emergence of Swahili was not completely ignored in earlier studies. However, caused by the lack of studies that focused on the continuity and change of early traditions, the origin of Swahili culture in many sites of East African coast remains unknown. Alternatively, this work focuses on cultural transformation from Zanjian to Swahili periods by examining the changing characters of ceramics (material culture), glass beads (maritime trade economy) and faunal remains (food economy), from one occupational phase to the next. The study develops a number of archaeological tests to examine whether such continuing or changing traditional patterns existed between the phases under investigation. The presence of both change and continuity in the period between Zanjian and Swahili phases should provide avenue for the better understanding of the origin of Swahili culture in Pangani Bay.

1.2 Definition of Swahili and Zanjian Cultures

Swahili refers to culture and communities that inhabited the East African coast in the period between 13th to 16th centuries AD from southern Somalia to Mozambique coasts as well as the islands of Pemba, Unguja, and Comoro (Breen

[1] Zanjian is a term previously used by Chami (1994:11) and then by Kusimba (1999: 94) to denote "Zanjian" settlements and cultures that existed on the East African coast between 6th to 13th centuries AD. The term includes settlements that made pottery which are known as TIW (Chami 1994: 13) or Tana pottery tradition as defined by Horton (1996: 410). Therefore, in this study the use of "Zanjian" should be taken as synonymous term to Zanjian culture.

and Lane 2003: 470; Chami 1994: 13). Communities in Swahili period depended on mixed farming/fishing economy and played the role of middlemen in the ocean– hinterland trade (LaViolette 2008: 28). The term "Swahili" also designates society that succeeded Zanjian settlements and culture: the Zanjian culture existed from around 8th to 13th centuries AD (Pollard 2007: 53; Walz 2010: 90).

Signaling the emergence of Swahili culture is an architectural complex consisting of coral built houses, stone built Islamic mosques, tombs and urbanized plan of the towns (LaViollete 2008: 31; Middleton 1992: 36; Pollard 2007: 3; Spear 2000: 286). Architectural complex houses built with coral stones are considered to be special feature representing an early stage of Swahili culture (Horton 1996: 399).Archaeologically, Swahili culture is accompanied by a distinct ceramic tradition termed "Swahili wares" dated from 13thto 16th centuries AD (Chami 1999: 1; Pollard 2007: 112). Swahili period was characterised by ceramic decorated by a row of punctuations around the necks, known as "Neck Punctuated (NP) ware (Chami 1998: 203). Hematite–burnished, graphite designed and red slipped bowls were common during Swahili period (Walz 2010: 122).

While communities during the Swahili period lived in stone built houses, the people in the Zanjian phase resided in wattle and daub houses (LaViolette 2008: 30). They made pottery that included bowls and jars with incised triangular motifs, cross–hatching, and rows of punctuations (Chami 1998: 210–11). Potters crudely cut incised lines that appeared as triangle over the outer surface of the pot (Chami 1994: 62). The punctuation decoration (Chapter 5, Fig. 5.2) was also executed with greater skills by a stick, shells or fingernails on the pot's outer surface (Horton 1996: 253). Communities during Zanjian period smelted iron, constructed boats, fished and traded with foreign partners (Chami 1994: 43–47; Horton 1996: 394). Common imports included glazed ceramics, glassware containers, silver and copper (earrings, rings, beads and bangles) and glass beads (LaViolette 2008: 34). These items were imported from the Persian Gulf, the Indian subcontinent, and beyond (Horton 1996: 407).

1.3 Research History

The question concerning the origin of Swahili culture has created a strong tradition of archaeological research on the East African coast. Main themes that are investigated under the umbrella of Swahili origin include the origin of and causes of urbanism, trans-oceanic trade and the origin of Swahili stone-built architecture (Breen and Lane 2003: 472). Within these main themes, three topics that also relate to this study have also received attention by previous research. The following section will present these topics. Topic 1 covers about origin of Swahili material culture. Topic 2 is concerned with development of Zanjian trade traditions into Swahili trade economy and Topic 3 relates to development of Swahili subsistence economy.

Topic 1: Origin of Swahili Material Culture

Studies that deal with the origin of Swahili material culture, such as the origin of stone ruins and Swahili pottery traditions have attained special focus in the archaeology of the East African coast. On the Tanzania coast, the earliest archaeological investigations were conducted at Kizimkazi Dimbani on Zanzibar island and on the Kilwa archipelago (Chittick 1962, 1974). The earliest excavations on the Kenya coast took place at Gedi site (Kirkman 1963), followed by excavation of Manda on the Lamu archipelago (Chittick 1984). The assumptions generated from the previous investigations by Neville Chitick (1974, 1984) and James Kirkiman (1963) was that the sophisticated material cultures during Swahili period was introduced by Arabian and Persian immigrants. The conclusion was reached based on idea that is well summarized by Spear, who writes (1987: 18) that: "Archaeologists impressed with the impressive Muslim–influenced architecture of Swahili towns and the existence of imported pottery in Swahili ruins, easily interpreted the primary cultural influences as alien". Other evidence that supported the diffusionistic construal came from linguistic studies. Here, the existence of many Arabic loan words and Arabic scripts in Swahili language was noted. Also, ethnographers and Swahilis themselves claimed through oral traditions that the genealogies, monuments and Swahili names originated from Persia or Arabia (*ibid.*).

In order to test previous theories, when studying the origin of Swahili culture recent archaeological works (Chami 1994; Pollard 2007; Walz 2010) operate not only at sites with concentration of stone ruins, but also in coastal immediate hinterlands with no trace of stone-built structures. These studies have refined the interpretations that support what Chami (1994: 29) calls "Arabo–Persian theory". The chronology of local ceramics from 1st to 2nd millennia AD has begun to be established. Furthermore, a revised interpretation of the origin of the Swahili peoples on the East African coast has been generated. Scholars have considered immediate hinterlands beyond littoral sites and realized that ceramics and trade goods found there resemble those underneath Swahili ruins along the coast (Helm et al. 2012: 58; Soper 1967; Walz 2010: 26).

East African Archaeologists have concluded that Swahili culture is the product of Zanjian traditions and does not originate from Arabian or Persian culture as it was previously believed. However, no consensus on what part of East African coast Swahili culture evolved. The prevailing theory contends that Lamu archipelago may be the cradle of Swahili culture. It is here that Zanjian tradition evolved into Swahili culture and then spread southward along the East African coast (Allen 1981: 323; Nurse and Spear 1985: 97). The influence of the theory has led to consider that Zanjian settlements on the Tanzania coast collapsed with no contributions to the formation of the subsequent Swahili culture (Chami 1994: 90, 1998: 214). The idea that certain Swahili traditions spread from north is not denied when supported by archaeological evidences. However, the contributions of local people in the formation of such culture should also be investigated. Thus, this research hypothesized that Zanjian communities who inhabited Pangani Bay also played a role in the configuration of Swahili culture in the area.

Recent archaeological activities show a balanced view that the origin of Swahili material culture is a joint effort played by Zanjian settlements located in southern and northern parts of the East African coast and their hinterlands. These ideas are brought forth by several scholarly works, including that of Walz (2010: 348) which asserts for cultural continuity of maritime communities who inhabited Tanzania coast. The recovered evidence pointed out that Zanjian settlements transformed into Swahili settlements on the coast and in the

hinterlands of the Pangani Basin. Another work is that of Pollard (2007: 407) which argues for the continuities of using sheltered estuary and creek harbours for both fishing and entrepôt from 6th to 14th centuries AD by Zanjian and Swahili communities. Other studies including that of Fleisher and LaViolette (1999) on Pemba Island and Wynne-Jones (2005) on Kilwa island have suggested a provisional consent for the cultural continuity from Zanjian to Swahili periods. As a contribution to the debate, the current study centers on investigations whether Zanjian communities forwarded inputs that facilitated the development of Swahili culture on Tanzania's coast.

Topic 2: Origin of Swahili Maritime Trade Economy

Studies of the archaeological data for the understanding of the development of maritime trade economy and maritime trading links in the period between Zanjian and Swahili phases have taken an important position (Chaudhuri 1985; Ricks 1970; Rothman 2002; Sutton 1973). Of these studies, glass beads and foreign ceramics are used as material data for tracing the history of maritime trade economy. The general rarity of the foreign items and the abundance of locally manufactured goods on the East African coast is suggested only for the Zanjian period (Horton 1996: 323). However, during Swahili period, foreign items such as glass beads were available in abundance on the coast, sometime replacing local manufactured shell beads. The interpretations using the chronology of shell beads and glass beads present the gradual development of the coastal trade economy from local capacity into a wider international maritime sphere.

Unfortunately, efforts by archaeologists to establish the balanced view for the development of the coastal trade economy on the whole coast of East Africa face some challenges. One is maintained view that, the development of maritime trade started on the northern part of the East African coast before it spread south (Insoll 2003: 136). The supposed spread of Swahili pottery tradition all over the coast of Eastern Africa at the end of the 13th century AD is taken as a sign for the expansion of a larger cultural package known as the Swahili culture from Lamu archipelago (Chami 1998: 214). The conceived idea is that settlements located on the East African southern coast, including large parts of Tanzania coast, did not develop Swahili culture but received it as a full package from the northern coast.

However, recent excavations at Tumbe on Pemba Island (Fleisher 2003; LaViolette and Fleisher 1995) have indicated otherwise. The recovery of foreign pottery and a series of foreign glass beads stand as evidence that the southern part of the East Africa coast was also active in international trade at least by the 9th century AD. Similar evidences of foreign glass beads and pottery that back the notion of a continuity of the maritime trade economy on the southern coast has been recovered at Kilwa village site (Pollard 2007: 382) and Pangani Bay (Walz 2010: 317). The current evidences partly stand as a proof that the southern coast of East Africa was involved in Indian Ocean trade at least from the 8th to 16th centuries AD.

Maritime trade activities took place during Zanjian period and African products at a number of sites were exchanged with import from Middle East, China and India (Horton 1996: 416; Pollard 2007: 102). The commonest types of imported goods arriving in East African coast from 7th century AD onwards included glazed ceramics, glassware containers, silver and copper jewelry, and glass beads (LaViolette 2008: 31). The ability to manage this flow of exotic goods shows the emergence of entrepreneurs during Zanjian period who took a leading role in Swahili maritime trade society (Kusimba 1999: 100).

This thesis focuses on the study of imported goods that reached the East African coast from 8th to 16th centuries AD as recovered in archaeological localities of Pangani Bay. It integrates information from previous studies for investigating the part Zanjian settlements played in the evolution of the Swahili maritime trade economy on Tanzania's coast.

Topic 3: Development of Swahili Subsistence Economy

The proposition that Zanjian settlements of Pangani Bay partly contributed in the development of food economy seen during Swahili period is a subject of investigation in this research. The aim is to have unbiased perspective that support both internal as well as external views for the origin of Swahili food traditions in the area. Archaeological studies assert that early East African coastal settlements relied at least in part upon fishing and shellfish gathering. Previous research reports that fishing location and type of exploited fish indicate spatial difference along the coast. Modest effort was made at Shanga site on the Kenya's

coast to collect pelagic and offshore fish such as shark and barracuda until the 12th century AD, suggesting that the first inhabitants had limited technology to fish beyond the reef (Horton (1996: 411). However, Badenhorstet al's (2011: 11) study at Chibuene site on the Mozambique coast, and Juma's (2004: 130) research at Unguja Ukuu site on the Zanzibar Island indicate that fishing system that facilitated the catching of large fishes such as sharks and whales was well established from the end of the 1st millennium AD. To supplement fish and shellfish products, farming and a limited amount of local hunting and farming was practiced during Zanjian period (Horton 1996: 393; Pollard 2007: 376).

In the 2nd millennium AD community became culturally richer than the previous period. Domestic animals, such as cattle, camels and sheep/goat were heavily exploited (Horton 1996: 393). Fishing practise was advanced during Swahili period and shellfish products continued to be harvested but not as much as it was during Zanjian period. In alignment to previous studies, the current study analyzes fauna remains from Pangani Bay for testing if the food traditional continuity observed in other coastal areas may also be present in Pangani Bay.

1.4 Objectives of the Study

The broad objective of the study is to investigate the hypothesis that part of the history of the Swahili maritime economy and culture in Pangani Bay is traced back to Zanjian communities who lived on Pangani Bay before. The study attempts to trace the development of cultural traditions that led to the formation of Swahili culture, by testing archaeological elements that point to continuity or change.

More specifically, the main objectives are:

1. To recover samples of archaeological evidence from Zanjian and Swahili settlements, particularly from areas where Swahili settlements chronologically overlay Zanjian settlements.

2. To establish the changing and continuing trends of traditions in ceramic production, by comparing Zanjian and Swahili ceramics.

3. To identify the nature of the Zanjian traditions as regards to subsistence economy, and trace their development toward prevalent traditions in the Swahili food economy, through the study of fauna data.

4. To reconstruct the development of trade traditions in Zanjian economy and how Swahili maritime trade economy developed, based on the analysis of foreign glass beads and ceramics.

5. To establish the position of Zanjian and Swahili traditions in the Pangani Bay in a broader geographical and chronological context, by integrating results of the analysis with that of other information from East African coast archaeology.

1.5 Study Area

Primary survey and excavation work were carried out around the estuary environment of Pangani Bay within the territory that includes north and south of the Pangani River (Chapter 4, Fig. 4.2). Two main factors determined the selection of Pangani Bay as study area. First, Pangani Bay qualifies and is among the list of special estuarine bays suggested by Pollard (2007: 401) to have provided environment for the development of Swahili settlements and harbours. Pangani river mouth features deep sheltered harbour that offers landing space for boats engaged in fishing and maritime seafaring, and ultimately the establishment of ancient and modern settlements around the bay. The preliminary archaeological evidence provided by studies conducted by Gramly (1981) and Walz (2010) have confirmed the existence of such early maritime settlements in Pangani Bay. Walz's (2010) research, in particular, has identified stratified sequences of Zanjian deposit (ceramics, beads, fauna and other evidences) that chronologically underlying Swahili cultural strata. The latter provides room for testing the continuity or change between the Zanjian and Swahili phases. Also, it was important to conduct research in the area since it is famous for 19th century AD slave trade terminus (Biginagwa 2012: 66; Walz 2010: 32), but lacks a complete cultural history before that period.

1.6 Field Work Applied Methods

Archaeological research methods were used to acquire data at Pangani Bay in Tanga region in two major field works; that of August 2010 and October to December 2012.

Our archaeological survey depended on results from Walz's (2010) research. The approach helped us to briefly conduct pedestrian surface survey around the study area and select suitable loci for major excavation works. Areas where Zanjian sites coalesced with Swahili sites were reserved for further excavations. With this approach, Kimu and Muhembo sites qualified and were chosen for further archaeological examinations (Fig. 4.2).

Systematic excavation allowed the recovery of subsurface material cultures in particular pottery and beads as well as faunal remains. These data were important for the examination of the hypothesis that stands for continuity between Zanjian and Swahili cultures. To recover the data necessary for our study, excavation trenches named K1, K1A, K2, K3, and K4 were excavated at Kimu site (Chapter 3, Fig. 4.3). Furthermore, excavation trenches M1, M1A and M2, M2A were excavated at Muhembo site (Fig. 4.16). Excavation work began in the southern part of the Pangani River at Kimu site and ended at Muhembo site north of Pangani town. Information on excavations and results is presented in Chapter 4 and 5. The recovered pottery, glass beads and fauna remains were subjected into a comparative analysis. Analysis of pottery, glass beads and faunal remains is presented in chapter 6, 7 and 8 respectively. The aim of the analysis was to assess the origin of the Swahili culture in Pangani Bay by studying change or continuity of the excavated inventories.

1.7 Expected Outcome and Test Implication

Based on the analysis of ceramics, beads and fauna remains, the study hypothesizes that Swahili traditions in Pangani Bay were rooted from Zanjian settlements that existed on the bay from 8th century AD. To test the assumption of cultural continuity or change the study devised several hypotheses together with their implication tests are as follows:

General Hypothesis

- There is a continuous development from Zanjian to Swahili communities at Pangani Bay.

Hypothesis 1

- In Pangani Bay, the development of pottery tradition continues from Zanjian to Swahili periods.

Test Implications (1)

- Comparative analysis based on pottery forms, temper, decorations, neck height and vessel orifice sizes should test the existence of a continuity or discontinuity of pottery tradition in Pangani Bay from Zanjian to Swahili periods.

Hypothesis 2

- In Pangani Bay, subsistence economy develops from Zanjian to Swahili periods.

Test Implications (2)

- Analysis of excavated fauna remains from Zanjian and Swahili phases should indicate how far subsistence economy of the two phases differ or differ not.

Hypothesis 3

- In Pangani Bay, trade tradition develops from Zanjian to Swahili periods.

Test Implications (3)

- Analysis of glass beads from Zanjian and Swahili phases should indicate the continuity or discontinuity of trade practices of the two phases.

Hypothesis 4

- Pangani Bay is suitable for all these planned tests about Pre-Swahili and Swahili relation, because it was not hinterland but involved in the whole spectrum of the Indian Ocean trade on the East African coast from 8th to 16thcenturies AD.

Test Implications (4)

- Evidence of imported pottery and glass beads from stratified sequences should assesses regional connectivity beginning from Zanjian time to Swahili periods. Pottery forms and decorations at Pangani Bay should examine whether similar features exist or not in pottery from other sites of East African coast.

1.8 Significance of the Study

A survey of previous archaeological research reveals that either the origin of the Swahili urbanized culture or the demise of Zanjian communities at Pangani Bay and on the Tanzania coast is poorly investigated. It must be pointed out that it is a strong reason an investigation of the development of the said cultures at Pangani is necessary. Also, the study is timely and relevant because today, it is a knowledge that concerns the development of urbanized culture that is propelling research and conservation work to take place in many regions of the world. So, if the knowledge about the origin of Swahili urbanized culture is properly studied and taught it may also make the East African region highly knowledgeable and progressive in research and conservation of its heritage.

The limited information in regard to the origin of Swahili culture at Pangani Bay that is known for its Swahili civilization (13th to 16th centuries AD), and as a slave trade terminus (19th century AD) should be taken as problem and unsatisfactory condition for the area. Therefore, if the inquiry is made the possible roots of the Swahili culture can be discovered and the problem may be lessened. In the inquiry planned by the study about the development of Zanjian culture to Swahili culture, for instance, some trends of change or continuity could be discovered. The findings will benefit the archaeologists to formulate research design for new investigations in the region. In turn, the archaeological projects of the region may benefit for having new scientific information about the origin of the Swahili culture on the Tanzania coast. In the long run, the whole region shall enjoy the good results of the study.

Generally, information from the study contributes to the fund of knowledge. The study attempts to generate information and in particular to the development of Pangani Bay's settlements from 8th to 16th centuries AD, based on the study of ceramics, beads and fauna remains. It also offers way forward and guidelines for future research in the region.

1.9 Thesis Structure

Chapter 1 has set out the general themes of the study, its objectives, field setting on the Tanzanian coast, applied research methods, and significances of the

research. Chapter 2 provides detail on issues about location, physiography and climate of the study area. Other issues in the chapter constitute aspects of current demography, economic activities and resources utilization. Chapter 3 overviews previous research that investigated the origin of Swahili culture on the East African coast. Chapter 4 shows excavation results revealed by this research at Pangani Bay. It describes applied methods and archaeological contexts that resulted to the recovery of archaeological data – consisted mainly of pottery, beads, fauna and other artefactual evidences. Chapter 5 incorporates information from excavation results and reconstructs occupational phases uncovered among the strata. Emphasis is placed on establishing site´s chronology based on stratigraphic excavations, characteristics of local and imported pottery, beads and radiocarbon dating.

Chapter 6 presents the analysis of Zanjian pottery assemblage and the results are compared to pottery from Swahili period. The analysis focuses on tracing either change or continuity of pottery between these two phases. Chapter 7 brings forth the analysis and results of glass beads. Similar to pottery, the analysis of glass beads considers aspects of change or continuity of maritime trade traditions from Zanjian to Swahili periods. Chapter 8 puts forward results from the analysis of faunal remains. Using archaeozoological approaches, Zanjian faunal assemblage is compared to that from Swahili period. Then, the discerned pattern of change or continuity in subsistence economy from one phase to the next is presented. Chapter 9 integrates information from the fieldworks and analysis results and offer general discussion of the acquired research data under the reflection of the study's objectives. Finally, Chapter 10 sets forth general conclusion of the study and future research perspectives.

CHAPTER TWO
ENVIRONMENT AND POPULATION OF THE PANGANI BAY RESEARCH AREA TODAY

2.0 Introduction

This chapter describes the study area today. It addresses issues on location, climate, monsoon wind, topographic features, as well as human population and their activities on the Pangani Bay. Aspects concerning climate and human population are introduced first, followed by description of physical features. Within the chapter, a discussion is presented on the roles that natural and cultural environments play to the current developments on the bay. In the concluding section, the assumption is presented on how the reviewed natural setting at Pangani Bay might have supported the development of Swahili culture in the past.

2.1 Environmental and Cultural Setting

Pangani Bay (5° 25' 60" S, 39° 0' 0" E) is located at the end mouth of the Pangani River as it enters the Indian Ocean. It is found in the Pangani district in the Tanga region of northern Tanzania coast (Fig. 2.1). The current study was mainly concentrated on the southern bank of the river (Pangani) at Kimu site and 2 km away from the northern bank of the river, on top of the Muhembo ridge (Fig. 2.1). Pangani Bay is a funnel shaped estuary that has a unique inland extension of the Indian Ocean, into about 16km of Pangani River's lower course (Kamukala and Crafter 1993). The whole estuary section is dominated by meanders. The Bay is bounded by the alluvial plain that spread very slightly in the south bank of the river at Kimu site, but extends widely to about 2,500 meters north of Pangani River. The alluvial plain becomes narrower going further upstream and is bounded by a ridge on both sides. The climate of Pangani Bay is warm and moist with temperatures between 27 and 35°C. The annual rainfall varies around 1,250 mm (Walz 2010: 97). Seawater temperature on the Tanzania's coast varies between 20°C and 30°C (Pollard 2007: 51). The latter provides favourable conditions for the growth of maritime resources on the Tanzania's coast including Pangani Bay (Chami 1994: 36).

Fig. 2.1: Location of the Pangani Bay in broader geographical setting (map source: Natural Earth).

The monsoon wind (Fig. 2.2) blows southward toward Pangani Bay from January to March with the wind type called North–East monsoon (*Kaskazi*). The wind

then blows north between May and October. It is known as the South-East monsoon (*Kusi*) (Pollard2007: 51–52). These two winds create a bimodal distribution of rainfall in Pangani Bay and on the coast of East Africa. South-East monsoon brings long and the heaviest rains and storms from March to May. On the other hand shorter rainy season and fair weather conditions that occur between November and January are brought by the North-East *monsoon* (*ibid.*).

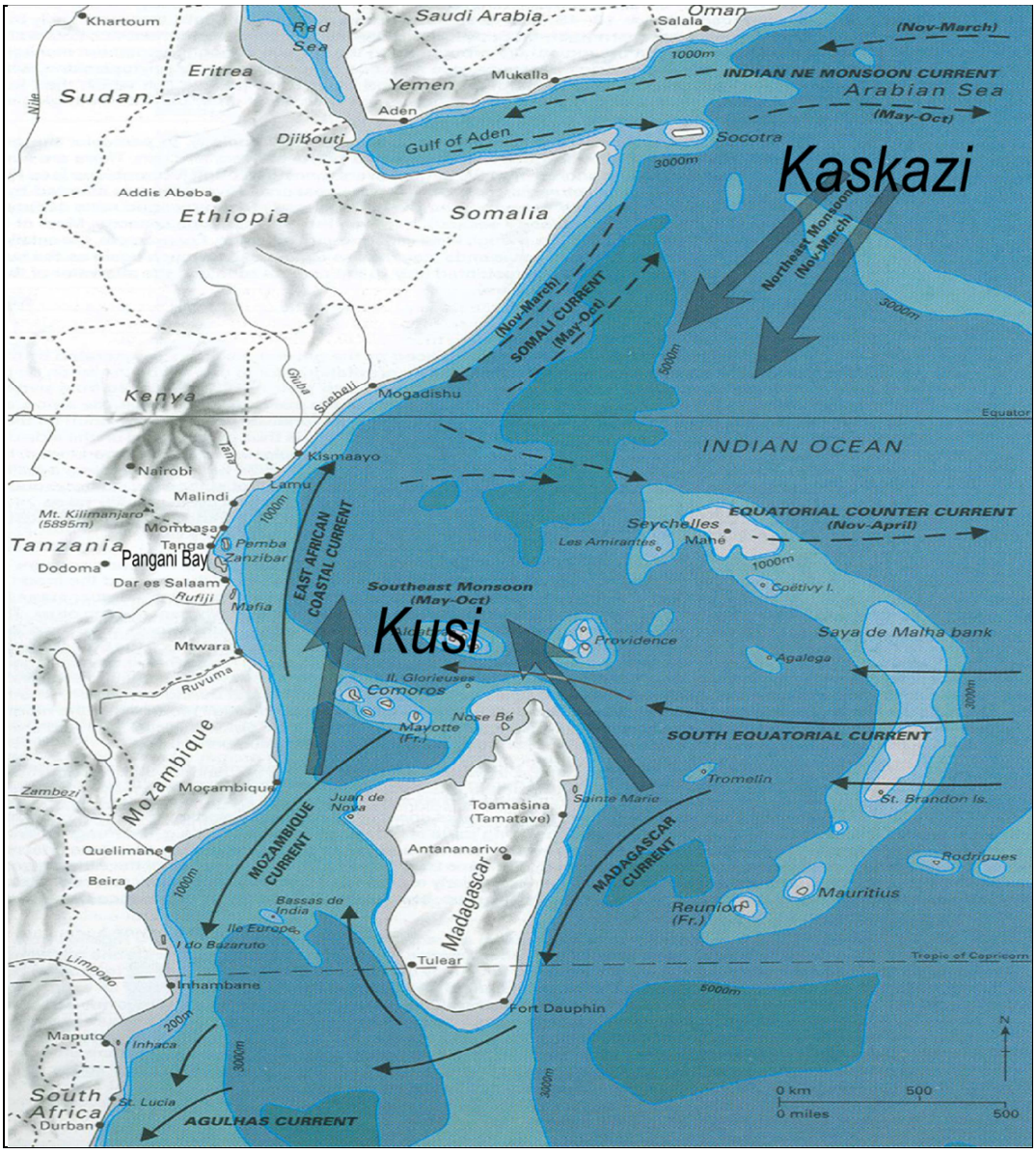

Fig. 2.2: The East African coast showing ocean currents and monsoon winds from the Western Indian Ocean (Pollard 2007: 50).

Due to sufficient precipitation as a pre-requisite for agricultural and trade with agricultural products, monsoon winds of the Indian Ocean triggered the development of early traditions and subsequent formation of Swahili culture on East African coast. Apart from climatic advantages, the monsoon winds drove the

growth of sea transport and maritime trade between the East African coast and southern Arabia as well as, the Persian Gulf and west coast of the Indian sub-continent. For at least 2000 years in the western Indian Ocean, knowledge of the seasonal reversal of monsoon winds allowed traders to travel the Indian ocean with their sailing ships (Pollard 2007: 52).

Knowledge of the dynamics of monsoon wind is said to have been kept secret by a few traders in order to monopolize trade (Chami 1994: 36). The monsoon regime has also influenced fishing activities on the East African coast. Unlike the onset of northeast monsoon from November to January which provides the best avenue for large catches of fishes, the poorest fishing season is from May to July, during which winds of the southwest monsoon are at their peak. During the poor fishing season fisherman are forced to engage in other economic activities such as farming, ship building and ship repairing (Sheriff 2010: 22).

According to the Population and Housing Census general report of 2012, the total population of Pangani District is estimated to be 54,025 inhabitants, giving a density of 53 people per square kilometer (United Republic of Tanzania 2013). The main inhabitants of Pangani Bay are the Zigua, Makonde, Pare and Yao. These tribes are mainly farmers (United Republic of Tanzania2013). Other inhabitants include Parakuyu, or Iloikop who are cattle herders (Walz 2010: 98).

Farming, potting, salting, fishing and basketry products produced by Pangani inhabitant find their way into Pangani modern-built central market. Other products such as fishes, cassava, maize and coconut are sold at markets further inland as well as into offshore Islands mainly Zanzibar and Pemba. Boat making and repairing, fishing and sailing persist as activities of men. On the other hand women and children occasionally collect mud whelks in the mangrove swamp (Walz 2010: 97).

2.2 Topographical Features and Vegetation

Pangani Bay and its immediate surroundings can be divided into two main topographic areas (Fig. 2.4): (i) coastal alluvial plain and, (ii) coastal upland (Hartemink 1995). Alluvial plain (Fig. 2.3) is characterized by a low-lying wetland

made up of estuarine deposits, mud, mangrove swamps, marshes and creeks (Hayes 1975). Parallel to the banks (north and south) of the Pangani River, the alluvial plain stretches to about 30 km long inland from Pangani river mouths. Creeks connected to the main channel of the river adds more significant features to the Pangani river. They provide natural branches of communication with low lying plains. The creeks are generally not wider than 10 meters, although some have a significant tidal prism, especially under spring tidal conditions when low lying plains are submerged (Sotthewes 2008).

Fig. 2.3: Alluvial plain of Pangani Bay.

The characteristic vegetation of the lowland alluvial plain is a mangrove forest. The mangrove forest in Pangani district occupies an area of 1,756 hectares (Semesi 1991). For a long time, Pangani communities have benefited from mangroves in many aspects, (1) many timbers were exported for house construction in the Arabian peninsula during the 10th centuries AD (Horton 1996: 415) (2) firewood for home consumption or for small scale marketing, (3) wood for charcoal making, and (4) fishing and gathering niches of prawns, fish and shellfish. Mangroves are also used for boat building, fishing gear and medicine (Semesi 1998).

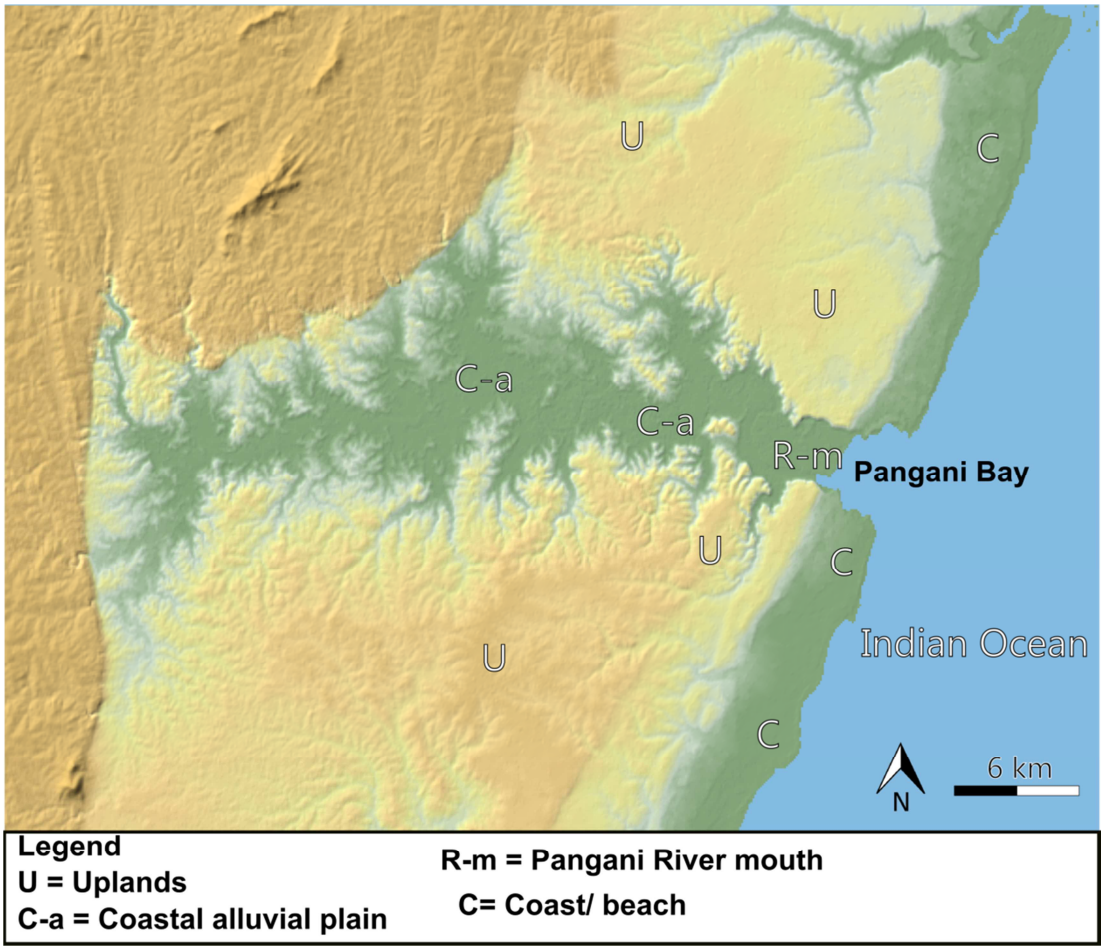

Fig. 2.4: Map of Pangani Bay showing its relief setting (based on SRTM elevation model).

The alluvial plain provides a suitable area for farming. Since Captain Burton (Burton and Speke 1858) arrived in Pangani in 1858 till present, Pangani garden-farms located in alluvial plain have continued with production of food crops such as banana, rice, coconut and sugar cane. Fishermen or boat makers could interchange their daily work by quickly reaching and working on these gardens, as they are in the town's immediate vicinity (Glassman 1995: 39).

The coastal upland of the Pangani Bay made up of coral cliffs and terraces (Fig. 2.4), merge immediately north and south of the Pangani River, overlooking Pangani flood plain and ocean. The northern cliff is met after a distance of 2.5 km by passing through the alluvial plain. The cliff runs east-west almost completely cutting off the low lying flood plain upon which the Pangani town sits. The descent from the top-surroundings of the cliff to the floodplain is very abrupt. The slope descends at Muhembo site gradually making the seashore easily accessible (Gramly 1981: 19). To the south of the river, again, high cliffs (61m high) make access to the sea difficult. Easy access to the sea is only found in the

narrow coastal strip along the basement of Bweni cliff. Evidence shows that Muhembo and the basement of Bweni cliff were favoured for settlements in the past due to their provision of easy access to the sea or river. Hence, our investigations were concentrated in these two areas.

Immediate upland areas in Pangani Bay have better drained soil and are suitable for the growth of high-calorific value crops such as millet, sorghum, maize and cassava. Communities living in Pangani Bay depend on these upland–farms for the production of staple foods especially during low fishing seasons. The natural vegetation of coastal uplands of Pangani Bay is a mixture of physiognomic types, including patches of forest and savanna: the Zanzibar-Inhambane mosaic (Walz 2010: 97).

2.3 Summary

This chapter has presented the environmental and cultural setting of Pangani Bay today. The information from the chapter may help us to have a hypothetical reflection of the environmental setting of the period under study. The observed natural and cultural entities of Pangani Bay today may be used as inferential data to the past. For instance, the food traditions seen in Pangani Bay today such as fishing and shellfish gathering should test if similar activities existed in archaeological context. Main topographical features and vegetation covers in Pangani Bay help different economic activities to take place in the area today. Similar physical features might have supported chains of development in the past. Coastal alluvial plain which is covered by mangrove forests and coastal uplands of Pangani Bay provides many subsistence advantages to the inhabitants of area today. The information should assist the interpretation of archaeological records concerning the development of subsistence economy during the period under study.

CHAPTER THREE
PREVIOUS RESEARCH

3.0 Introduction

This chapter reviews previous researches from different localities of the East African coast that have attempted to investigate the origin of Swahili culture from Zanjian communities. The chapter begins by reviewing literature concerned with the evolution of ceramic traditions from Zanjian to Swahili periods. It proceeds by examining research that investigated the development of subsistence and trade traditions in relation to Swahili origin. In each sub-chapter, information concerning the general coast of East Africa is described first and then a section that specifically deals with history of research at Pangani Bay is presented below.

3.1 Pottery

Investigations conducted at Shanga sites in the Lamu archipelago (Horton 1996), Kilwa and Kaole in Tanzania coast (Pollard 2007) offer broader perspectives for the understanding of the development of ceramic traditions on the East African coast. Horton's (1996: 396) offer a schematic table that advocates that Zanjian ceramic traditions around the Lamu archipelago continuously evolved to become part of the Swahili culture. A similar account has been suggested from studies conducted in Kilwa and Kaole by Edward Pollard. He argues that Zanjian village transformed their ceramics into Swahili pottery traditions (Pollard 2007: 353, 370).

Archaeological analysis of pottery at Shanga site indicates that Tana (Zanjian) ceramic tradition Phase-A overlaps with Tana (Swahili) tradition Phase–B and C (Horton 1996: 255–266). The overlapping of traditions suggests a shared cultural tradition in ceramic making and use between Zanjian and Swahili periods. Punctuated mark is recorded to be common pottery motif in both Zanjian and Swahili periods (Horton (1996: 255, 260). It is postulated that coating ceramic surface with hematite, graphite or red slip (Chapter 5, Fig. 5.3), began in the Zanjian phase before they become popular in Swahili period (Pollard 2007: 99).

Other studies recommended that regional division for the development of ceramic traditions occurred in the period between c. 950–1250 AD (Chami 1998:

211). They hypothesize that the coastal area north of Tanga region had a ceramic tradition different to that common in the southern coast of East Africa. The northern coast transformed their ceramic traditions and made pottery with neck punctuation marks and many other motifs, while the southern coast made plain pottery. The latter is now termed as Plain Ware traditions (PW). The characteristic of this tradition is undecorated pottery with long, flared rims. Evidence of PW tradition has recently been excavated from Kaole, Kwale Island, and Kivinja, sites. All these areas are located between Bagamoyo and the Rufiji delta. Radiocarbon dates from these sites have put this tradition between 10th and 13th centuries AD (*ibid*.: 212).

The current argument regarding Plain Ware tradition is that the southern coast (and not northern coast) experienced a discontinuity of ceramic traditions. Therefore, the spread of ceramic traditions (and possibly Swahili culture) might have occurred from north to south. The latter reconstruction has also been used to support the idea that northern coast is the cradle of Swahili civilization (Chami 1998: 214). However, recent excavations at Kilwa and Kaole (Pollard 2007: 310) have indicated the presence of ceramic features in Zanjian pottery assemblage that looked similar to those found in Swahili periods. It is therefore impossible for the northern occupants to spread cultural elements or economic strategies to a place where those elements already existed.

Generally, the presented reviews point to the continuous development of ceramic traditions from Zanjian to Swahili in East African coast. However, more claims for the origin of Swahili culture still favour the north than the south coast. Researches and data from more sites along the coast are still needed in order to attain an understanding of the role played by both northern and southern coasts in the formation of Swahili culture.

Pangani Bay was first excavated in the 1980s by Gramly (1981). The second excavation was done 20 years later in 2007 by Jonathan Walz (2010). Gramly excavated a small test pit at Muhembo site and a collection of pottery, faunal remains and foreign objects were recorded. The pottery evidence suggested that people at Muhembo during Swahili period, made ceramics that resembled wares of the same period at Kilwa site (Gramly 1981: 20).The suggestion formed

the first attempt to connect Pangani Bay with other coastal sites. However, the recovery of little imports led Gramly to conclude that around 15th century AD poor residents existed at Muhembo site (Gramly 1981: 22). Aspects concerning the origin of Swahili settlement were not investigated by Gramly and this task remained undone until 2007 when Walz investigated the cultural history of the area. During the reconstruction of the cultural history of Pangani Bay, Walz's (2010) survey gives a glimpse of the possible origin of Swahili culture in the area. For example, low-lying area was identified with suggestive evidence for the antecedents of Swahili origin in the area. In the archaeological contexts dating from 600 to 1000AD, Zanjian ceramics were recovered (Walz 2010: 142). The analysis of these ceramic indicated that they mimicked pottery from the southern and central Swahili coast (e.g. Chami 2002; Pollard 2009). The latter gave further insight that Pangani Bay was not isolated from the general East Africa coast.

Despite all the cultural achievements that might have been attained from 750 to 1000 AD in the area, Walz (2010: 142) marks the period from 1000–1250 AD with cultural hiatus. The lack of Plain Ware pottery during the survey and excavation at Pangani Bay, a pottery supposed to be common in the south of Tanga's coast (Chami 1998: 211–212) led Walz to reach several interpretations. Firstly, he viewed the period from 1000 to 1250 AD as representative of diminishing population at Pangani Bay. Secondly, the missing of plain ware in the stratigraphy was taken as indication of abrupt change in ceramic tradition resulting from the spread of Swahili pottery from northern coast.

After the imaginary occupational gap, the subsequent period from13th to 16th centuries AD is documented as prosperous period. Swahili settlements with stone structure in form of houses, tombs, mosques and wells appeared in Pangani Bay. Potters decorated their ceramics with red hematite and made large bowls "for community feasts" (Fleisher 2010: 208). The characteristic Swahili ware with punctuate on the neck was now evident at Pangani Bay. Maritime trade contacts resumed and many of the traded goods were imported from India, Arabs and China (Walz 2010: 143).

Former studies at Pangani Bay have offered evidence that can be used to reconstruct the development of ceramic traditions from Zanjian to Swahili

periods in Pangani Bay. The chronological gap (1000–1250 AD) presented by Walz's excavation and a reconstructed scenario of poor settlement during 15th century AD at Muhembo by Gramly's research cannot underestimate the significance of these previous research in Pangani Bay. For instance, Gramly (1981: 20) was the first researcher at Pangani Bay who pointed the striking resemblance of Swahili pottery at the bay with those from other Swahili settlements along the coast. Similarly, Walz's (2010: 188) research has shown the evidence for the connectivity of ancient Pangani Bay (750–1500AD) with hinterlands sites.

3.2 Food Economy

Archaeological research in East Africa has investigated matters related to the development of food traditions of the East African coast from Zanjian to Swahili periods (Badenhorst et al 2011; Horton and Mudida 1993; Walshaw 2010). Food resources exploited during the early period of many coastal settlements were mainly shellfish, fish, dugong and sea turtles (Juma 2004: 152). Few fish and domesticated animals were consumed during the early period of occupation at Shanga site, but from post-1000 AD deposits, more fish were eaten, while domestic animals were bred and killed for their meat (Horton 1996: 393). The increased exploitation of fish and cattle during Swahili period is also documented at Pate on the Lamu archipelago (Wilson and Omar 1997), Kizimkazi, Dimbani on Zanzibar (Kleppe 1996; Van Neer 2001) and Dembeni on Maore, Comoro Islands (Wright 1984). Archaeological studies indicated that the increased consumption of domestic animals and fishing activities during Swahili period does not imply different groups of people on the coast. They were the same people rooted from Zanjian period whose social and religious attitudes towards meat and fish changed as a result of Islamic doctrine (Horton and Mudida 1993: Horton 1996: 393).

Archaeological works have documented the zonal areas that were used for fishing and shellfish gathering during Zanjian and Swahili periods. Fauna study at Shanga site insinuates that coral reefs and mangrove swamps were used as main fishing grounds by early coastal inhabitants (Horton 1996: 382). Offshore zones

were also exploited as fish species from such areas have been recorded in the fauna assemblage excavated by Juma (2004: 130) at Unguja Ukuu, Zanzibar. During Swahili period a lot of fishing activities occurred at nearby shores and offshore zones for the hunting large fishes such as shark (Horton and Mudida 1993).

In summary, several fishing traditions that link Zanjian and Swahili communities are recognized by previous research. One is maintenance of coral reefs and mangrove zones as important localities for local fishing (Horton and Mudida 1993) and the other is fishing systems that included catching large fishes such as sharks and whales. The fishing tradition that involved catching large fishes is traced back to an earlier period in Zanjian sequences of Chibuene and Unguja Ukuu, before they became popular in Swahili period. Thus, various insights have been offered by different archaeological research in East Africa on how Zanjian food traditions facilitated the development of Swahili food economy. However, more research that combine archaeological and ethnographic studies would offer further understanding about the development of Zanjian-Swahili food traditions. Such studies may help in guiding the current debate about the origin of Swahili communities.

Pangani's geographical position as a bay provides many benefits to its inhabitants with a wide ranging access of marine resources. Gramly (1981: 22) and Walz (2010: 144) noted that a largely maritime oriented society lived in Pangani Bay from 13th to 16th centuries AD; the inhabitants actively exploited the rich resources of the riverine and estuarine, and carried out daily subsistence activities on reef lying offshore. The available resources included kingfish, shellfish, marine gastropods, oysters, riverine fish, and mud whelk to mention a few. While wild terrestrial fauna played a minor role in the early Swahili diet, agricultural goods and domestic livestock played a supplementary role to the heavily exploited marine resources (*ibid*.: 144).

Unlike Swahili's food traditions which are now fairly documented, little is known about subsistence activities during the Zanjian period at Pangani Bay. Although, Walz's (2010) study at Pangani Bay is characterised by the use of a careful survey and excavation approaches, a lack of directness in the discussion of

fauna sequences is noted: we are told that at Mtakani and Mnyongeni sites located in Pangani Bay, the team collected a few examples of late TIW (Zanjian) and "faunal remains including shellfish, fish, crab, shark, and chicken" (*ibid*.: 139). The latter lack explicit statement and less is known on whether these fauna remains were from Zanjian or Swahili sequence. Consequently, using such evidence it is difficult to compare the food traditions of Zanjian and Swahili periods.

Nevertheless, any criticism may not surpass the important work done by Walz (2010). His research successfully synthesized the information from excavation and historical sources to describe the preliminary chronology and development of Pangani Bay. Aspects such as the location of settlements, trade systems, and the place of Pangani Bay in Swahili history has been also articulated. Generally, studies in Pangani Bay preliminary were able to reconstruct food traditions during Swahili period, but did not do the same for Zanjian period. Thus, this research proceeds from where previous research stopped and attempts to compare and investigate whether there is any link between the food traditions of Zanjian and Swahili periods.

3.3 Trade

Archaeologists and historians have documented the history of the early trans–oceanic trade that took place through a variety of Zanjian and then Swahili ports located along the West coast of the Indian Ocean from Somalia to Mozambique (Breen and Lane 2003; Casson 1989; Horton 1996; Juma 2004). Breen and Lane's (2003: 476) work, in particular, provides the chronological overviews of the maritime trade on the East African coast. The period between 4th and 8th centuries AD, saw moderate trading activities at most sites on the East African coast. However, at the beginning of the 9th century AD, intense commercial activities began on the East African coast. Based on ancient documents such as the *Periplus of the Erythrean Sea* (Casson 1989) and finds of Egypto-Roman imports on Mafia and the Rufiji delta by Chami (1991), Juma (2004: 13, 23) argues that early maritime trading partners of the East African coast from 2nd to 6th centuries AD were Greco-Roman. However from 8th onwards, East African coastal

communities traded with Persians, Chinese, Indian and Arabs (Horton 1996: 412; Pollard 2007: 3).

Spear (2000) asserts that trade exchange between the outside world and East Africa took place along the littorals. Therefore, many imported objects were only found on the littoral and island sites, while less imports were available as one moved to the hinterlands (Chami 1994: 46). Commodities going out of the East African coast have limited archaeological evidences and much knowledge about them originates from historical sources. In the *Periplus* (Casson 1989) and *Al–Masud's* archives (Freeman-Grenville 1962), ivory products are noted as important African products taken from the East African coast to Ancient Roman worlds, India and China. Archaeological evidence of ivory as export commodity are middens of waste ivory chipping at Shroda and K2 sites in the northern Transvaal, dated to 800–1100 AD (Hanisch 1981). On Shanga site, very little residue of ivory working is found, suggesting that ivory tusks were exported whole and trimming took place at the kill site inland (Horton 1996: 414). Other products taken from the coast, as stipulated by historical documents and partially confirmed by archaeological evidences include timbers, tortoise shells, ambergris, gold and slaves (Casson 1989; Freeman-Grenville 1962; Whitehouse 1968).

In contrary to exported items, evidences of imports on the East African coast are found in abundance. They are well stratified in coastal sites and archaeologists have inclined their efforts in the study of such trade imports. The most common imports that were probably required in quantity during Zanjian and Swahili periods are ceramic wares. For instance, *white glazed and colour splashed* ware (Chapter 5, Fig. 5.9), from probably Basra (Iraq) with oval patches of blue splashed colour on white glaze were common in the Zanjian settlements (Horton 1996: 277). Other imported ceramics from Zanjian to Swahili periods include Persian monochromes and polychromes, Chinese green wares, Chinese blue-on-white and porcelains (Horton 1996: 271–310). Other products were raw cotton from Egypt, and clothes and glass beads from India. Many imported goods also came from Arabia, Persia and India, which included lead, jewelry, silver, bronze, earrings, rings, and bangles (LaViolette 2008: 31).

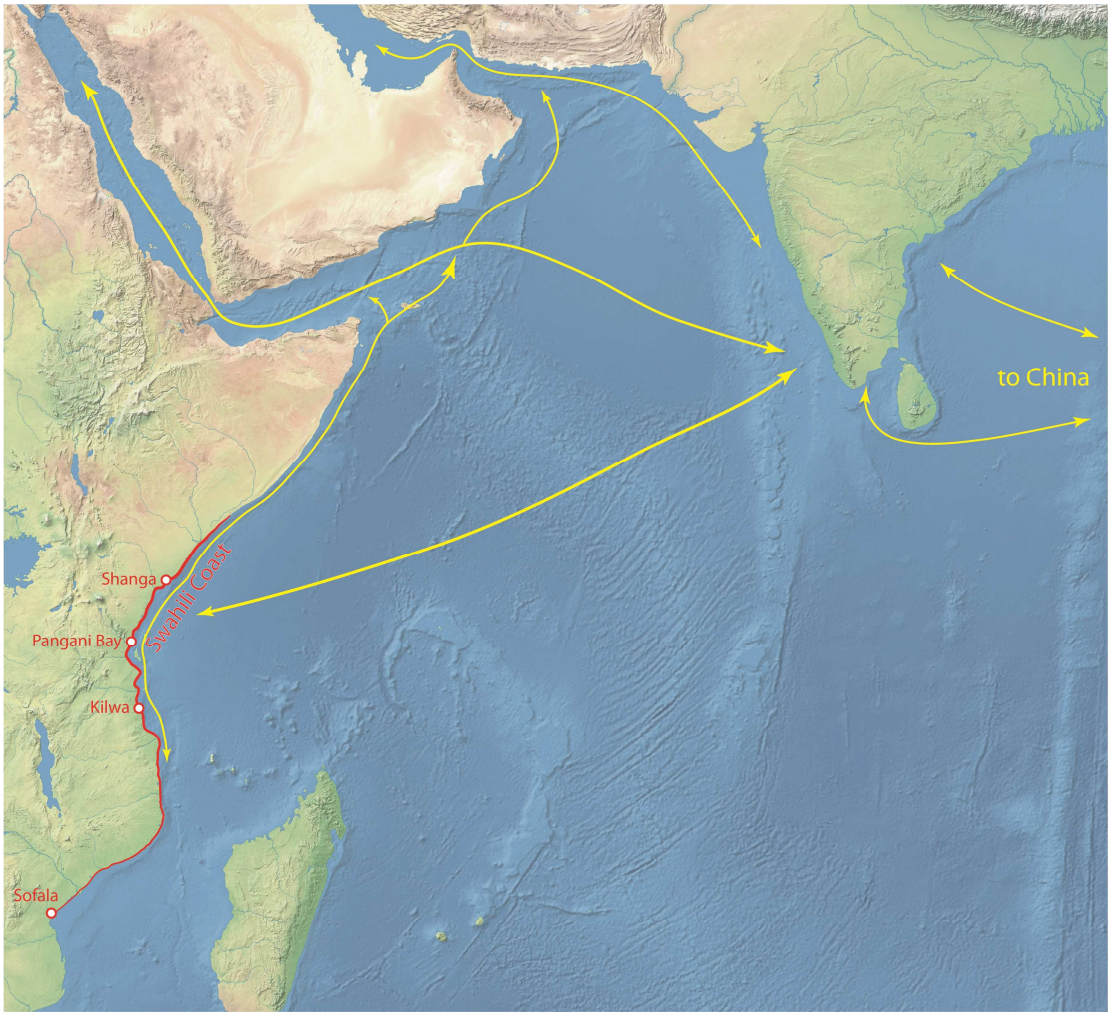

Fig. 3.1: East African maritime trade routes from 6th to 16th centuries AD (map source: Natural Earth).

Through the study of trade imports, four main regions that acted as early trade partners with East Africa have been documented (Fig. 3.1). Trade with the Mediterranean worlds was in operation at the beginning of the 1st millennium AD. This was followed by the Persian Gulf and Far East, the Arabian Peninsula and the Indian sub-continent (Horton 1996: 416–418).

Archaeological evidences which are interpreted as trade imports for the period between 6th to 16th centuries AD give insights on the development of maritime trade in East African coast. The blue glazed jars that are classified by Horton (1996: 274) as *Sassanian Islamic* are the earliest trade ceramic to reach East Africa coast. The term "SassanianIslamic" results from two combined aspects concerning origin and spread of the blue glazed ceramic (Horton 1996: 275). It originated in Mesopotamia in area around Basra in Sassanian period from 3rd to 7th centuries AD (Lane 1947). During Islamic period (7th to 10th centuries AD),

Sassanian ceramics spread from Mantai in northern Sri Lanka to the Persian Gulf and the Red Sea (Tampoe 1989: 105–16), reaching as far the East Africa coast (Horton 1996: 275). It has been found in the Zanjian sites of the East African coast including Manda (Chittick 1984), and Unguja Ukuu (Juma 2004). Radiocarbon dates (c. 600 AD) from Unguja Ukuu, indicate that Sassanian Islamic pottery was in circulation at the beginning of the early Zanjian period (Juma 2004: 109). It ceased to be imported to the East African coast, probably around 1000 AD (Horton 1996: 277).

Lead-glazed earthenwares are termed "sgraffiato" by Horton (1996: 281) and Juma (2004: 111) because of the decoration that consisted of *graffiti* in different styles. It is white-slipped on both surfaces and covered on top with a glaze containing lead-silicate. Sgraffiato ware from the Islamic world, replaced the circulation of Sassanian Islamic pottery in East African coast. At Unguja Ukuu, from the upper levels of the Islamic period, one base, a few rims and body sherds of sgraffiato ware from probably southern Iran have been recovered (Juma 2004: 112). Also, the pottery occurs widely on the other early East African sites such as Kilwa and Manda (Chittick 1974, 1984), and Pate (Wilson and Omar 1997). Stratigraphic analysis from Shanga shows that different varieties of Sgraffiato are more associated with early Swahili settlement than Zanjian culture (Horton 1996: 289).

Research has also documented trade imports from Indian sub-continent. Based on extensive excavation at Manda, and Shanga in Lamu archipelago, (Chittick 1984; Horton 1996) and at Unguja Ukuu (Juma 2004) in Zanzibar island, ceramics pointing to Indian sub-continent origin have been recovered. Much of the early Indian ceramics that arrived on the coast were made by wheel, but they were unglazed. Juma (2004: 115) identifies them as vessels with coarse, porous, red or reddish grey fabric and horizontal wheel marks and diagonal straw impressions from the inside. Many vessels gave a ringing sound when tapped, indicating that they were fired to a relatively high temperature (*ibid.*). Horton (2004) classifies four groups of Indian pottery on the East African coast. The first group is *a grass-tempered gray ware* that arrived in East Africa from western Indian probably as water jars. It is found in stratified sequences of Zanjian settlements,

but was common during Swahili times. The second is *grog-tempered marron wares* made as either large jars or carinated bowls. The third is *red-slipped orange wares* with a distinctive orange-red to buff pink fabric, with peeling fracture and striated air holes and thin vessel walls. The last category is *decorated red wares* (*ibid.*).

The strongest indication of Indian trade connection with East Africa comes from glass beads. Glass beads appear to have been one of the substantial trading articles from India to the East African coast and then into the African interior (Horton 2004). Swahili traders used the imported glass beads to tap the resources from the interior. Before glass bead became a common import on the East African coast, Zanjian settlements (before-1000AD) used to manufacture their own beads from sea shell, bones and semi-precious stones (Horton 1996: 323, 332). The local shell-bead industry used the marine gastropod named *Anadara,* and local bead grinders to manufacture beads (Pollard 2007: 61; Walz 2010: 329). The evidence shows that coastal traders used to trade shell beads in the interior until the glass beads became common on the coast (Walz 2010: 347). During early Swahili time, from around 1050 AD as dated by (Horton 1996: 323, 328), production of local beads declined probably due to excessive importation of glass beads.

Far-East and in particular China holds a privileged position in the ancient maritime exchange of East Africa coast. Ancient Chinese archives (see Inghams 1962: 1–3; Freeman-Grenville 1975) appear to support archaeological evidence. Chinese pottery is found consistently throughout the Zanjian Swahili deposits in a number of sites such as Kilwa and Manda (Chittick 1974, 1986), Unguja Ukuu (Juma 2004 and Pate (Wilson and Omar 1997: 56–7). The variety of early Chinese ceramics that reached the African coast includes stoneware*, green-wares, white-wares and porcelains* (Horton 1996: 303–310; Juma 2004: 107–108). The number of Chinese imports reflects that merchants from China had great influence in the East Africa trade. The earliest Chinese pottery that reached East Africa is *stoneware*. These are thick-walled, olive green glazed jars that were used in the maritime trade for transporting perishable goods such as oil and spices (Juma 2004: 107). At Shanga, coarse stoneware was in circulation from c. 760–900 AD (Horton 1996: 303). From the 11th to 13thcenturies AD as is evident at Shanga and

Unguja Ukuu, two Chinese vessel types were introduced. These vessels included *Green ware* with a shiny monochrome green glaze and *white ware bowls*. Chinese porcelains also reached East Africa. From 11th to 14th centuries AD, few specimens of porcelains with clear white glaze are found on the coast (Horton 1996: 310). However, from around 15th century AD onward porcelains that are named as "*blue-on-white"* by Juma (2004: 108) become more popular. They occurs in a form of smooth shiny blue-on-white porcelain bowls with a blue-tinted white glaze on the outside (*ibid*.: 108).

In summary, previous investigations has presented more knowledge concerning the development of early trans-oceanic trade from Zanjian to Swahili periods. Commodities going out and goods arriving to the East African coast have been documented with the help of historic sources and archaeologist researches. Four oversees regions were main partners in trade with East African coast. These included the Mediterranean worlds, Persian Gulf, Indian sub-continent and Far East. Sassanian Islamic wares from Persian Gulf indicate the involvement of the Zanjian communities in international trade. At the same time, Sgraffiato wares, also from the Persian Gulf, mark the beginning of Swahili elaborated trade activities in the Indian Ocean. Indian involvement in this trade is evidenced by the occurrence of glass beads in the Zanjian and Swahili period of East Africa coast. Far-East and in particular China was also involved in this trade. Chinese stonewares are found in many archaeological sites of East Africa dating from Zanjian period and by the 11th to 15th centuries AD, Chinese green wares, white wares, and blue and white porcelain were common in East Africa. Thus, from previous studies, it can be hypothesized that Swahili trade traditions were deeply rooted in the Zanjian period.

The inside of the Pangani River mouth acts as a natural harbour that provided shelter for incoming trading vessels in the past as it does today. Researches by Gramly (1981) and Walz (2010) demonstrate that Pangani Bay participated in maritime trade from Zanjian to Swahili periods. Exotic trade goods that have been reported on the site include glass beads and ceramics. Evidences show that Zanjian and Swahili traders inhabiting Pangani Bay, imported goods from the Persian Gulf, Arabian Peninsula, India and China. Foreign ceramics

found in Swahili sequence included thickly glazed Chinese celadon, hatched sgraffiato, and blue green Islamic monochrome wares (Walz 2010: 123).

From Swahili sequence a large amount of glass beads belonging to the widespread family of "Trade Winds Beads" have been recovered (Gramly 1981: 21). According to Davidson and Clarke (1974), glasshouses, probably located in India produced enormous quantities of beads from c. 1000–1700 AD, for sale everywhere along the Indian Ocean. The recovery of glass beads in Pangani Bay shows that Swahili traders played an important role in the acquisition and commercial supply of these beads to the neighbouring Swahili towns and immediate hinterlands.

Generally, exotic objects and other lines of evidences point out that Pangani Bay had a well found trade traditions from Zanjian to Swahili periods. Using new and previous data recovered from Pangani, this study attempts to establish trans-oceanic trade traditions first developed by Zanjian traders, but strengthened later by Swahili merchants.

3.4 Summary

A sense of success is realized from previous research's attempt to reconstruct the development of Zanjian-Swahili culture. However, information about the place of origin of Swahili culture remains unclear. For instance, a generalised view that the root of Swahili ceramic tradition is on the northern coast is still maintained. This observation seems prejudiced and more archaeological evidences are needed before it is accepted. While proponents of this hypothesis use pottery decoration motifs to trace the spread of ceramic traditions from north to south, it is noted from other studies that similar motifs existed throughout the East African coast prior to Swahili period.

The reviewed literature also indicates that Zanjian communities continuously developed into Swahili culture, with internal and external factors playing roles for that formation. However, more research that combine archaeological and ethnographic studies are required in the future for the holistic understanding of these said developments. At Pangani Bay, in particular, the Swahili phase is somewhat investigated and documented, but Zanjian phase

remains unstudied. Thus, the current study proceeds from where previous works stopped. It attempts to explore the archaeology of each occupational phase (Zanjian and Swahili) separately and then investigate on whether Zanjian traditions led to the origin of Swahili culture at Pangani Bay.

CHAPTER FOUR
RESEARCH METHODS AND FIELD WORK RESULTS

4.0 Introduction

Excavations were carried out at Pangani Bay in 2010 and 2012, as part of archaeological research that was designed to test the hypothesis for continuous development of culture from Zanjian to Swahili periods. The first section of the chapter describes previous survey conducted by Walz (2010) at Pangani Bay. It presents the usefulness of the information produced by Walz's survey at the bay to the current research. The second section begins with description of applied procedures that were employed during excavation and recording. The section proceeds with site by site description of the revealed stratigraphy and excavated deposits and structural remains encountered. It also includes the description of the radiocarbon dates from charcoal samples recovered from Kimu site. The brief overview of the finds recovered and the general conclusion about the field works is discussed in the last section of the chapter.

4.1 Previous Archaeological Survey

To avoid biased manner of selecting an area for excavation, and in an view of information to be extracted from the site, a review of previous archaeological survey in Pangani Bay was necessary. This task was possible given to the availability of Walz's (2010: 99–115) survey results. The review indicates that Walz's survey was conducted within approximately 64 km² of the Pangani Bay (Fig. 4.1). A sample of 8 km² (out of 64 km²) was chosen and divided into small units with a size of 1 km². Each unit was then intensively surveyed by pedestrian surface survey and sub-surface testing. 55 archaeological sites were identified that approximated to 6 sites/km² area (per survey unit). In additional to documented sites, 45 archaeological occurrences were recorded.

The meaning of archaeological site and archaeological occurrence was clearly defined (Walz 2010: 87). Archaeological site is defined as an area with concentration of archaeological materials (e.g., ≥15 pieces of ceramics per m²). On the other hand, archaeological occurrence referred to individual artifact or

concentration of archaeological material that did not meet archaeological site requirements, but was deemed significant (often diagnostic). Seven site-types (Fig. 4.1) were documented at Pangani Bay, that include the following list[2]:

Site-type 2: quartz lithics (presumably MSA–LSA transitional or LSA).

Site-type 3: quartz lithics and non-diagnostic ceramics (500 B.C–~500 AD).

Site-type 10: non-diagnostic ceramics (500 B.C–~500 AD).

Site-type 11: TIW (Zanjian ceramics) (~600–1000/1200 AD).

Site-type 13: Swahili ceramics (sometimes with foreign artifacts) (1200–1550 AD).

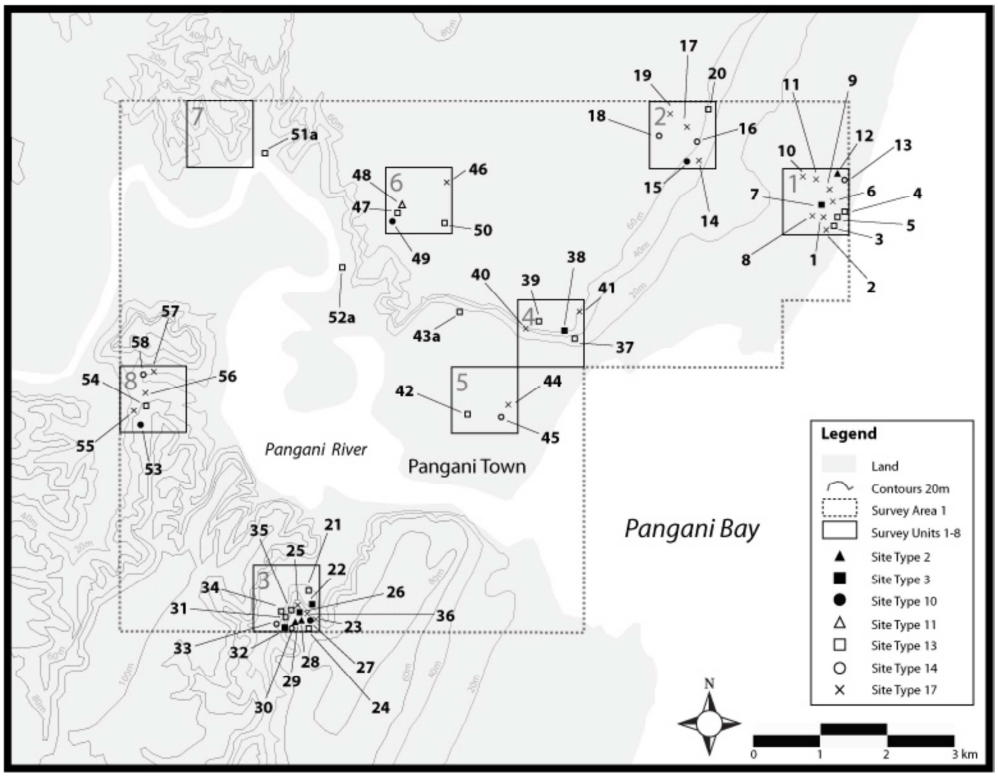

Fig. 4.1: Map of Pangani Bay showing Site-Types as documented by Walz (2010: 104).

Site-type 14: Post-Swahili ceramics (often with other local and/or foreign artifacts) (~1550–1750 AD).

Site-type 17: Post-Post-Swahili, ceramics (often with foreign artifacts) (post-1750 AD to early 20th century AD).

[2] The numbering of site-type is adopted from Walz's (2010: 102) list. Site-type 1 and other numbers missing in the list are not found in Pangani Bay, but found in other sites also researched by Walz (2010)'s project.

Locations of site-types 11 and 13, in expense of other site–types recorded by Walz (2010) are of concern to us here. This is because site-type 11 relates to Zanjian traditions and site-type 13 is attributed to Swahili culture. Walz asserts that surface survey confirmed the presence of site-type 11 (Zanjian 600–1000/1200 AD) at the top of escarpment near Mwembeni area. Moreover, survey along the river's edge at Kumbamtoni discovered more cultural remains associated to site-type 11. Walz's survey discovered that most of the Zanjian settlements were clustered in locations near the river or immediately overlooking the Pangani River.

Continuing with his documentation in Pangani Bay, Walz (2010) exposed a total of 15 Swahili sites in the area. These sites appeared in all survey units except in survey unit 7 located west of the Mtakani area (Fig. 4.1). Many sites of this type were found in Survey Unit 3 (Kimu site, n = 5) and Unit 1 (Choba site, n = 3) (Fig. 4.1). At Muhembo site, abundant remains of Swahili wares, tombs, fauna remains, and imported ceramics and glass beads were reported (Walz 2010: 109). Walz (2010) presents that Swahili-Type 13 sites range in size from 0.01 ha (e.g. Site 42 in Survey Unit 5) to >7 ha (e.g. Site 37 in Survey Unit 4 (Muhembo) (Fig. 4.1). He notes that Swahili sites are associated with large deposits of shellfish and estuarine molluscs, suggesting the existence of shellfish gathering behaviour during the Swahili period. Swahili sites were found to be located upriver or overlooking the Pangani river channel and occupied positions within 1 km of the oceanfront (Walz 2010).

Result from Walz's (2010) survey was adapted for choosing prospective areas for excavation. The potentiality of an area to be excavated was determined by its ability to test the hypothesis as regards to the continuing or changing chronology of Zanjian and Swahili settlements. By this approach, Survey unit 3 (Kimu site) and unit 4 (Muhembo site) qualified and were chosen for archaeological examinations.

4.2 Excavation

The major intention of the planned excavations was to recover sequences of archaeological artifacts, faunal remains and features in order to trace cultural

history of Zanjian-Swahili periods. The review of Walz's (2010) survey provided information about respective sites. One site is Kimu, which was investigated by five trenches (K1, K1A, K2, K3, and K4) (Fig. 4.3). The other site is Muhembo, where four trenches were excavated (M1, M1A, M2 and M2A) (Fig. 4.16). All excavation trenches were systematically excavated by 10 cm arbitrary levels because natural layers were not apparent. Excavation works began in the southern part of the Pangani River at Kimu site and ended at Muhembo site, north of Pangani town (Fig. 4.2). Excavations involved hand works assisted by trowels and hoes. A 3 mm wire mesh screen was used for screening the excavated deposits.

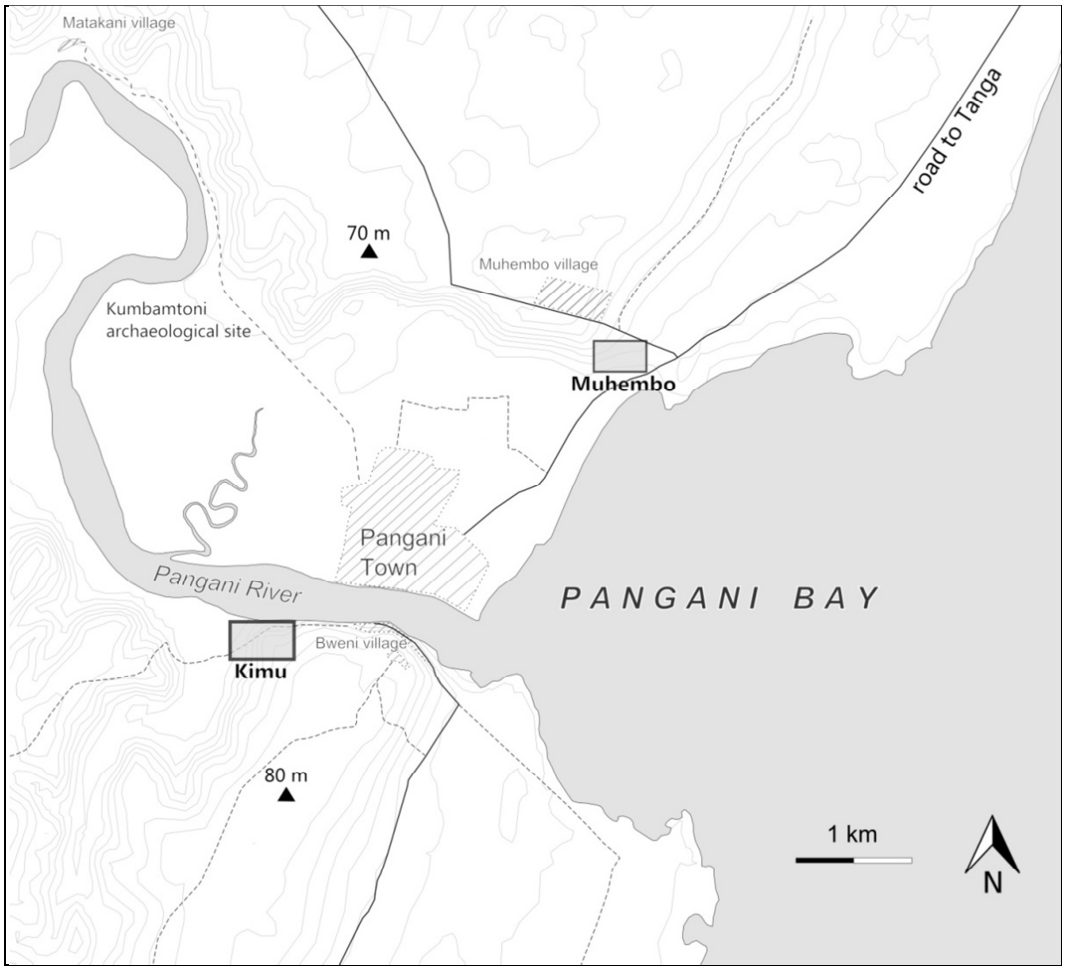

Fig. 4.2: Locations of major excavated sites from Pangani Bay fieldworks.

Archaeological artifacts were picked out from sieved deposits, sorted, washed and stored for transport to the University of Dar es Salaam for analysis. Particular attention was paid to charcoal samples which were collected whenever encountered for radiocarbon dating. Physical features and structures such as post holes, furnaces, and pits, were documented as structural data to understand the

nature of the excavated site. Floor profiles of excavated units were drawn and photographed at level as the excavation proceeded. The Munsell (1976) system was used to describe the soil colour from these units.

4.3 Excavation at Kimu site

Kimu site is situated at approximately 05° 25' 58"S, 038° 57'45"E in the southern bank of Pangani River (Fig. 4.2). About 300 metres from the river bank in an area for local boat landing, the site is bounded by the road that runs from Bweni village to Kilimangwido secondary school (Fig.4.3). The site is flat to gently sloping lowland that ascends in elevation to its south and west area.

Trench K1 (2x2 m)

Trench K1 was located on the northern side of the road leading to Kilimangwido secondary school, approximately 5 meters away (Fig. 4.3). Seven natural strata made from 12 arbitrary levels (10 cm each) were uncovered from trench K1 (Fig. 4.4). All finds from this trench are displayed in Table 4.1. From stratum 1 up to stratum 8 (surface up to 120 cm below surface) the deposits have similar composition of sandy loam soil and a variation of colour from black and dark gray on top and dark yellowish brown at the base.

Pottery was recovered throughout the strata. However, stratum 3 contained higher number of ceramics when compared to other strata. Beads were recovered from strata 1 up to 6 missing in stratum 7. Stratum 3 has a larger number of glass beads, when compared to other strata. Higher quantity of daubs was found in stratum 7, than from other strata of the trench. Coral stones were recovered from all strata of the trench, but the large number was found to be concentrated in stratum 3. Shells fragments, and fish and animal bones were recovered in all strata, but high concentration was found from strata 2 up to 4.

Fig.4.3: Excavated trenches (K1, K2, K1A, K3, and K4) at Kimu Site (source: here.com).

Natural feature K1/F1 was found in Stratum 5 (67–72 cm). It was a greyish soil layer with compacted deposit of estuarine shells. The feature seems to have been formed by natural deposition as a result of flooding probably in the period between 10th and 11th centuries AD. This period might have been so much "wetter" and probably accompanied by heavy rainfall (Pollard 2007: 53).

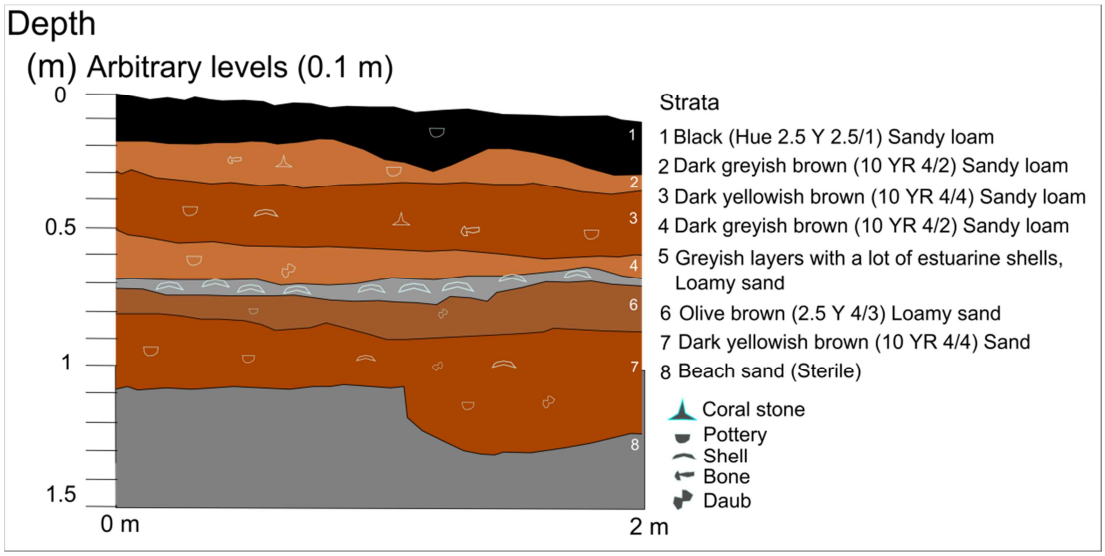

Fig. 4.4: The stratigraphy at Kimu site by the western wall profile of trench K1.

Fig. 4.5: Feature K1/F1/a (a = Stratum of shells) at Kimu site from trench K1. Below is the floor with pottery from level 10 (at 100 cm below surface).

	K12x 2 M	Material culture							Fauna		
Strata	Arbitrary Level (10cm)	LCM	FCM	GV	GB	NGB	D (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	1(0–10)	12	0	0	15	1	0	171	12	0	0
	2(10–20)	64	2	0	145	2	0	624	50	2	4
2	3(20–30)	107	3	0	228	6	38	600	127	2	117
3	4(30–40)	576	12	0	300	4	166	1,237	491	10	121
	5(40–50)	240	2	0	247	4	134	558	261	6	28
4,	6(50–60)	176	5	1	96	4	0	547	962	7	76
5 (67 cm–)	7(60–70)	117	2	0	5	1	43	93	34	1	5
5 (72 cm) 6	8(70–80)	126	0	0	8	2	299	751	460	11	37
7	9(80–90)	67	3	0	0	0	0	255	543	1	6
	10(90–100)	47	0	0	0	0	613	144	151	1	8
	11(100–110)	156	2	0	0	0	1,317	711	627	9	25
	12(110–120)	161	4	0	0	0	1,835	463	128	13	62
	Total	**1,849**	**35**	**1**	**1,044**	**24**	**4,445**	**6,154**	**3,846**	**63**	**489**

Table 4.1: Materials from trench K1: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, CS = Coral stones, S= Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

Trench K1A (2x1 m)

This trench was sunk 5 metres to the north of trench K1. It was opened near trench K1 because the area had a good concentration of archaeological materials and an adequate data were needed for the research. Cultural deposits in K1A as displayed in Table 4.2 extended to a depth of 1.3 metres, within which twelve arbitrary levels forming eight strata were recognized (Fig. 4.6). From stratum 1 up to stratum 8 (surface up to 120 cm below surface) the deposits have similar composition of sandy loam soil and a variation of colour from black and dark gray on top and dark yellowish brown at the base. Potsherds constitute the most frequent finds. While fewer locally made ceramics were found in stratum 1, larger quantities were recovered in stratum 3. They began to deposit in the basal stratum 8, increasing in quantity in the upper strata.

Potsherds which are identified as foreign (see Chapter 5) were encountered from strata 2 to 6 lacking in stratum 7 and then collected from stratum 8. Glass beads were recovered from strata 1 up to 4 and stratum 8, missing in strata 5 and 7. Stratum 3 has a larger number of glass beads, when compared to other strata. Non–glass beads were found only in strata 1 and 2. Daubs were recovered from strata 2 up to 8. Higher quantities of daubs were found in stratum 8, than from other strata of the trench. Coral stones were recovered from all strata of the trench, but the large number was found to be concentrated in stratum 3. Shell fragments, and fish and animal bones were recovered in all strata, but high concentration was found from strata 2 up to 4.

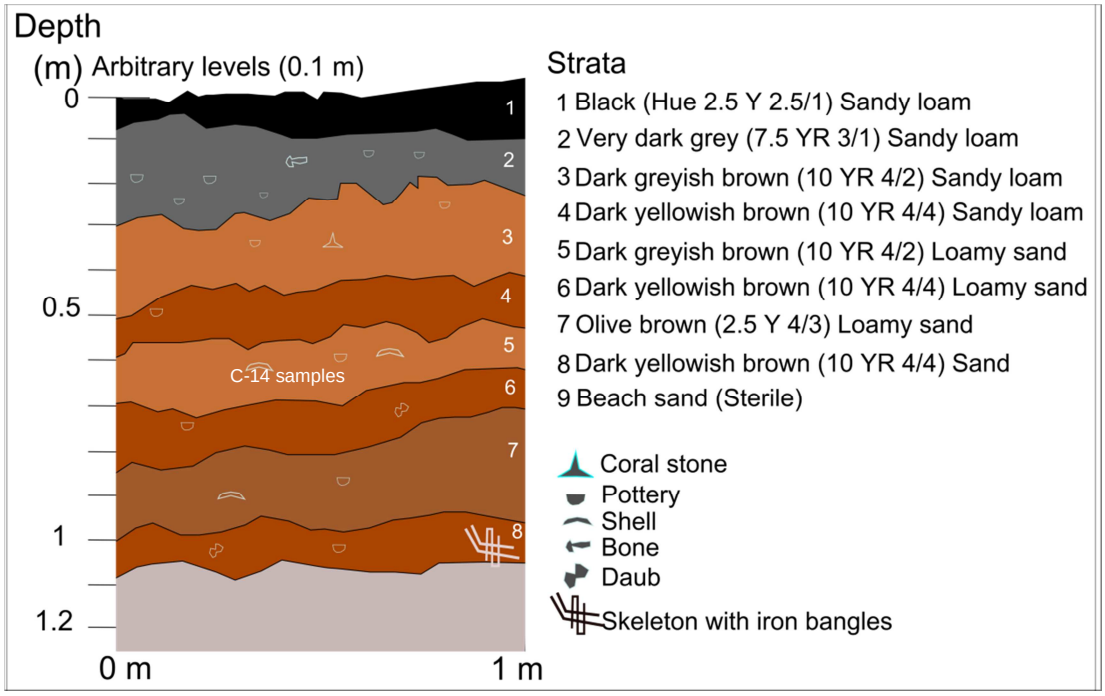

Fig. 4.6: The stratigraphy at Kimu site by eastern wall profile of trench K1A.

	K1A (2x1 M)	Material culture							Fauna		
Strata	Arbitrary levels (10cm)	LCM	FCM	GV	GB	NGB	D (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	1(0–10)	15	0	0	0	2	0	271	18	0	0
	2(10–20)	100	0	0	12	3	0	1,624	79	0	2
2	3(20–30)	470	1	0	107	7	48	609	120	1	195
3	4(30–40)	631	1	0	242	0	155	1,333	392	9	117
	5(40–50)	321	0	0	187	0	140	777	461	3	48
4	6(50–60)	225	2	1	13	0	0	531	972	6	86
5	7(60–70)	31	0	0	0	0	23	84	24	0	5
	8(70–80)	332	1	0	0	0	299	851	360	12	30
6	9(80–90)	214	1	0	2	0	0	356	440	2	3
7	10(90–100)	207	0	0	0	0	922	132	136	0	7
8	11(100–110)	310	1	0	0	0	1,517	612	547	8	35
	12(110–120)	178	0	0	3	0	1,795	362	168	14	63
	Total	**3,034**	**7**	**1**	**566**	**12**	**4,899**	**7,542**	**3,717**	**55**	**591**

Table 4.2: Materials from trench K1A: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, CS = Coral stones, S= Shells, FB = Fish Bones, NFB= Non-fish bones, g = grams.

Feature K1A/F1 is recovered in stratum 5 (Fig. 4.7). This feature comprised of five short walled structures made up of hard-packed soil. Broken potsherds were found around the feature. The base of the feature begins in stratum 6, at depth 80cm below surface. It rises 0.2 m high and ends up at depth 60 cm below

surface. The use of the feature remains unknown. Another feature named K1A/F2 appeared as excavation proceeded through levels 11 and 12 to a depth of 120 mm at stratum 8 (Fig. 4.8). The feature comprised skeletons of two human individuals that emerged at the south east corner of the trench K1A. One skeleton was found with iron bangles in its hind limbs. The orientation of the skeleton with iron bangles is the head to the south and the feet to the north. The other skeleton is oriented east-west with its head in the east. The discovery of human skeletons in trench K1A, await further osteoarchaeological research for its interpretation. However, it can be hypothesized that the skeletons offer evidence related to special burial traditions during Zanjian period.

Fig. 4.7: Short walled structures made up of hard-packed soil from trench K1A, looking east (scale 1 m).

Fig. 4.8: Feature K1A/F2: Skeleton with iron bangles, looking south, (scale 1 m).

Two charcoal samples were recovered in trench K1A, from stratum 5. One from level 7 at the depth of 70 cm below surface and the other from level 8 at the depth of 80 cm below surface. The samples were submitted for radiocarbon dating at the Institute of Prehistory and Early History and Archaeology of the Middle Ages of the University of Tübingen. The sample from level 7 (K1A L7

S102) yielded a date of 942 ± 28 BP and sample from level 8 dated to 963± 28 BP (Table 4.3, Fig. 4.9).

Lab No MAMS	**Sample ID**	**Material**	**Date BP**	**±**	**Cal. Age (2 sigma)**
17415	K1A L7 S102	Charcoal	942	28	cal AD 1026–1157
17416	K1A L7 S103	Charcoal	963	28	cal AD 1020–1154

Table 4.3: Radiocarbon dates from trench K1A at Kimu site.

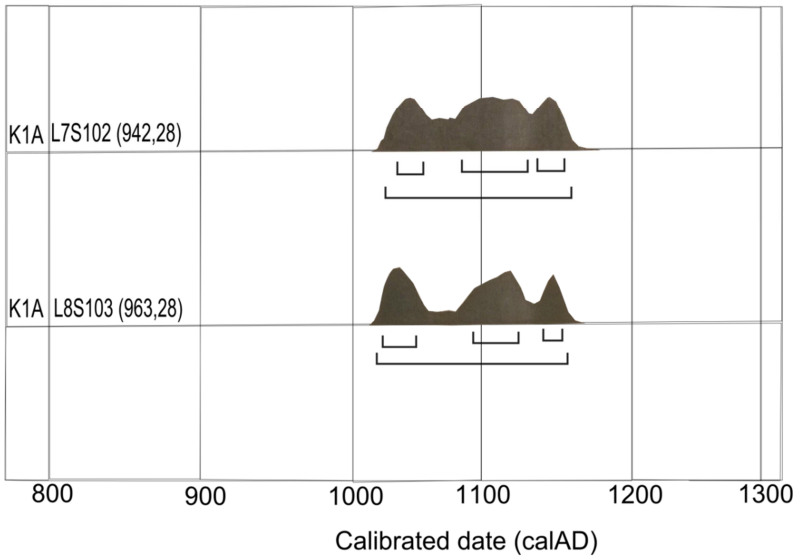

Fig. 4.9: Cumulative distribution from C14 tests of sample from trench K1A (Calibration according to OxCal v4.1.7 Bronk Ramsey (2010).

Trench K2 (2x1 m)

Trench K2, lying approximately 50 metres away on the northwest of trenches K1 and K1A was excavated into a depth of 1.2 metres. Quantities of excavated materials are compiled in Table 4.4. Six natural strata constructed from 12 arbitrary levels (10 cm each) have been uncovered (Fig. 4.10).

From stratum 1 up to stratum 5 (surface up to 100 cm below surface) the deposits have similar composition of sandy loam soil and variation of colours from yellowish brown on top, grayish below and brown at the base. Only stratum 6 (100–125 cm below surface differ. The deposit consists of dark yellowish brown.

	K2 (2x1M)	Material culture							Fauna		
Strata	Arbitrary levels (10cm)	LCM	FCM	GV	GB	NGB	D (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	1(0–10)	5	0	0	0	0	0	260	10	0	0
	2(10–20)	46	0	0	8	0	0	867	89	0	0
	3(20–30)	63	0	0	116	0	28	607	110	0	197
2	4(30–40)	110	2	0	186	0	35	1,344	402	0	115
3	5(40–50)	111	3	2	176	0	40	779	451	5	199
	6(50–60)	135	0	1	13	0	10	521	982	3	83
	7(60–70)	19	0	1	0	0	23	94	34	4	8
4	8(70–80)	124	1	0	0	0	49	841	370	12	25
	9(80–90)	78	1	0	2	0	10	366	533	2	8
5	10(90–100)	97	1	0	0	3	82	122	1,146	2	7
6	11(100–110)	98	0	0	0	0	96	869	1,537	3	30
	12(110–120)	87	0	0	0	0	110	352	975	0	68
	Total	**973**	**8**	**4**	**501**	**3**	**483**	**7,022**	**6,639**	**31**	**740**

Table 4.4: Materials from trench K2: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, SG Slags, CS = Coral stones, S= Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

Local pottery was found in all strata, but concentration was in stratum 3. Foreign ceramics were recovered from strata 2 up to 5. Glass beads were collected from strata 1 up to 4 and larger quantity was found in strata 2 and 3 than in any other strata of the trench. Non-glass beads were available only in stratum 5. Other materials that included daub and coral stones appeared throughout the strata. However, a great number of coral stones were found in stratum 2 than in any other strata of the trench. Shells fragments were found concentrated at the base of trench in strata 6 and 5. Two post holes identified as feature K2/F1 were discovered in stratum 6 (Fig. 4.11). Both postholes proceeded in depth from 100 cm to 120 cm below surface. The postholes imply to be the negative feature of wattle and daub house. The remains of daubs with wood impression recovered in association with the postholes support that proposition.

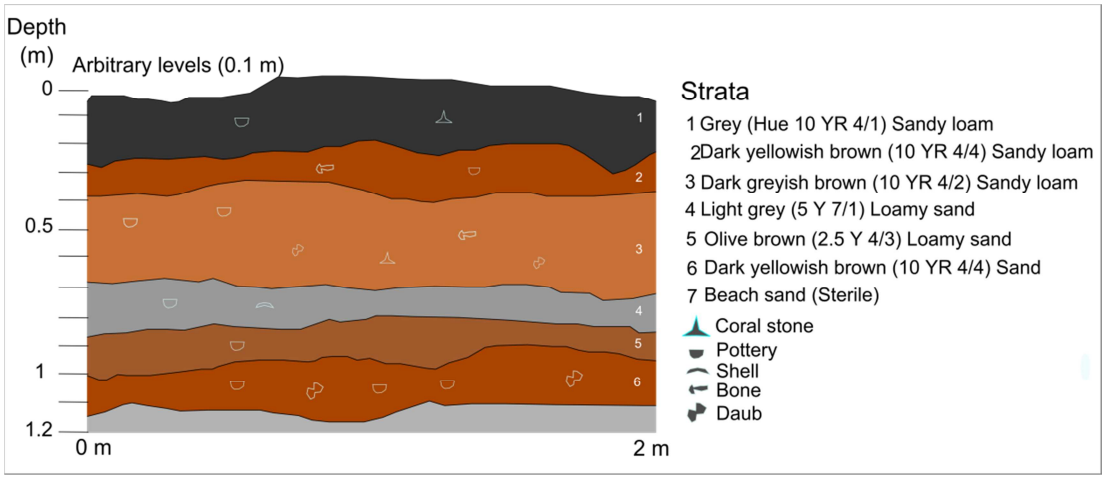

Fig. 4.10: The stratigraphy at Kimu site, by the southern wall profile of trench K2.

Fig. 4.11: Feature K2/ F1: Postholes (a and b) from trench K2, stratum 6.

Trench K3 (2x2 m)

Trench K3 was excavated in the north east corner of Kimu site, where ancient stone ruined structures consisting of tombs, wells and houses occur (Fig. 4.3). The uncovered profile is displayed in Fig. 4.12 and the find's inventory is given in Table 4.5. Eight natural strata formed by 13 arbitrary levels (10 cm each) were revealed from K3. Loamy sand soil with colours that range from black to dark grayish brown on top, yellowish brown in the middle, to brown at the base

characterizes the stratigraphy of trench K3. Pottery, beads, shells and bone were found in all the strata, but larger concentration of artifacts occurred in stratum 5 than in any other strata. The basal stratum 8 was the layer with high concentration of shellfish and daubs. Glass beads began to deposit in stratum 6 upwards. In stratum 5, the number of glass beads is higher than any other strata in the stratigraphy. Also, the stratum contained large quantities of ceramics and non-fish bones. Coral stone accumulates in high density from stratum 3 to 1.

Two pit fills were recovered in trench K3. One is stratum 4 – a pit-fill of stratum 3 from which a total 107 glass beads and one metal object (nail) were found. The other is stratum 7 – a pit fill of stratum 6, containing six pieces of ivory fragments. Feature K3/F1 is found in this stratum. It includes the recovery of complete *in-situ* open bowls whose in filled soil deposit was mixed with 234 glass beads (Fig. 4.13).

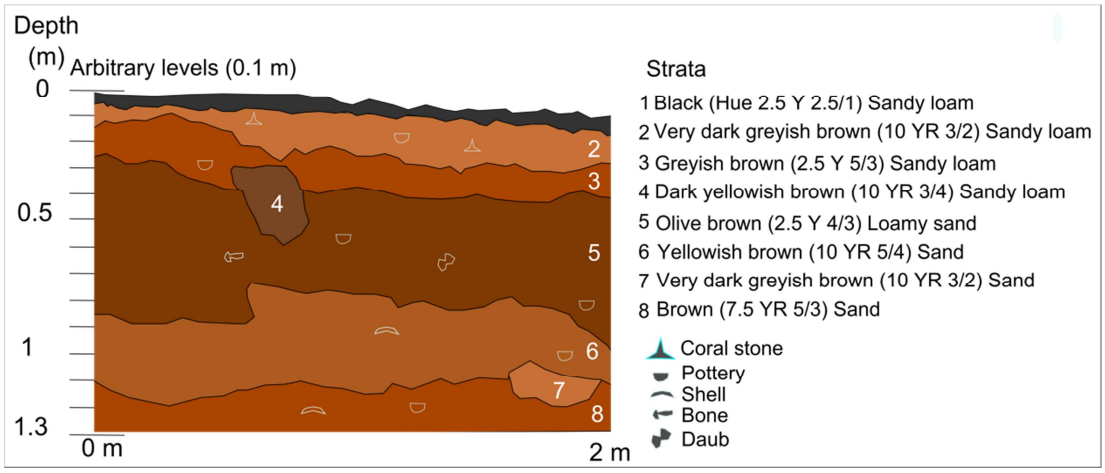

Fig. 4.12: The stratigraphy at Kimu site as presented by the western wall profile of trench K3.

Fig. 4.13: Feature K3/ F1. In situ pot whose soil deposits contained 234 glass beads from trench K3, looking east (scale 1 m).

	K3 (2x 2M)	Material culture								Fauna		
Strata	Arbitrary levels (10 cm)	LCM	FCM	GV	GB	NGB	D (g)	SG (g)	CS (g)	S (g)	FB (g)	NFB (g)
1,2	(0–10)	21	0	0	1	4	310	0	206	13	0	0
	1(10–20)	186	0	0	62	2	0	0	4,120	671	6	72
3 (4=fill of 3)	2(20–30)	185	0	0	109	0	263	0	1,200	258	0	43
5	3(30–40)	276	0	0	46	0	28	0	44	538	5	58
	4(40–50)	160	2	0	44	0	184	0	1,481	477	2	76
	5(50–60)	350	1	2	460	0	82	0	728	624	3	146
	6(60–70)	200	1	0	302	0	34	0	717	556	0	48
	7(70–80)	115	1	0	37	0	5	0	275	327	0	33
6 (7=fill of 6)	8(80–90)	332	0	1	20	0	24	46	637	1,087	1	26
	9(90–100)	240	0	0	3	1	0	0	43	994	0	248
	10(100–110)	142	0	0	1	0	257	0	0	336	0	69
8	11(110–120)	196	0	1	0	0	150	0	31	1,456	0	0
	12(120–130)	121	0	0	0	0	540	0	19	2,099	0	0
	Total	**2,524**	**5**	**4**	**1,085**	**7**	**1,877**	**46**	**9,501**	**9,436**	**17**	**819**

Table 4.5: Materials from trench K3: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, SG Slags, CS = Coral stones, S = Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

Trench K4 (2x1 m)

At approximately 70 metres south of local harbour's entrance, a trench labelled K4 was excavated (Fig. 4.3). Finds from the trench are shown in Table 4.6. The stratigraphy of the trench consisted of five natural strata made of 15 arbitrary levels (10 cm each) (Fig. 4.14). Loam sandy soil and variation of colours from black on top, olive brown at the middle and dark grayish brown at the base characterizes strata 1 up to 4. Only stratum 5 (130–145 cm below surface) differed by its yellowish brown, beach sand soil.

Local pottery were found in all strata, but concentrated in stratum 3. Glass beads occurred only in stratum 1 and 2. Daubs and coral stones were found repeatedly throughout the strata and both have high presence in stratum 3. Slags were found in larger quantity in stratum 1 than in any other strata. A concentration of shells was recovered from stratum 2 to stratum 3. Feature termed K4/F1 – *in-situ* open bowl – was revealed within stratum 2 (Fig. 4.15).

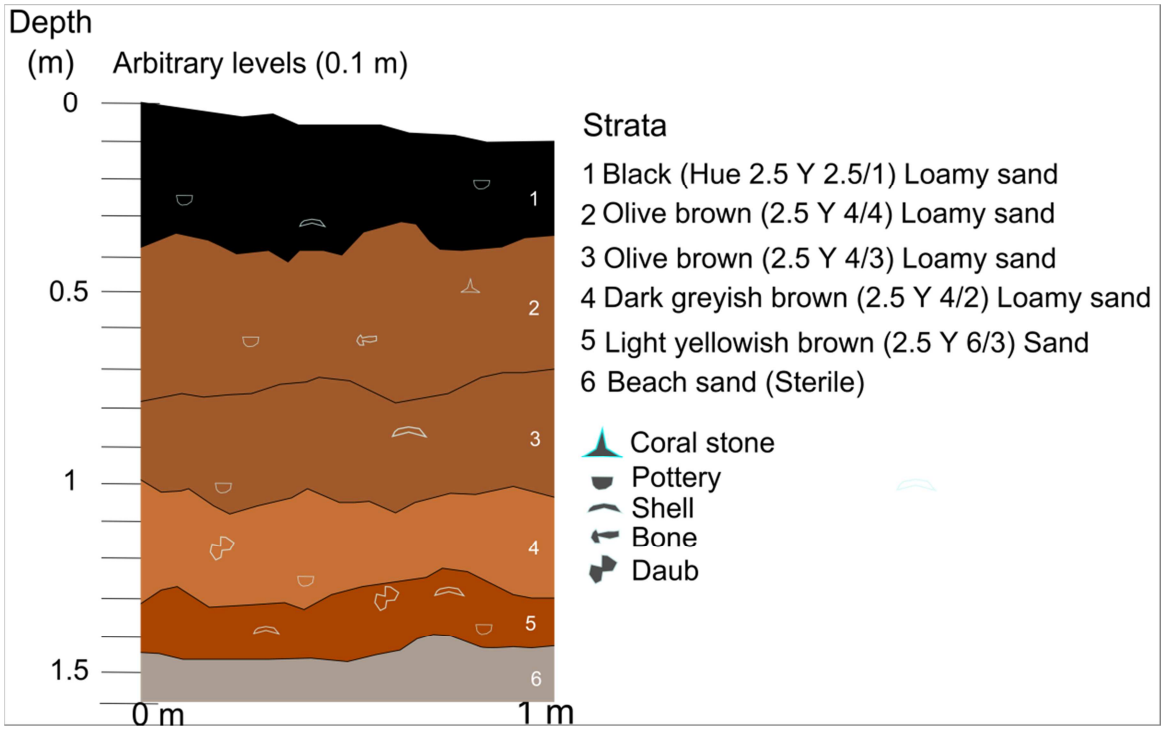

Fig. 4.14: The stratigraphy at Kimu site as presented by the northern wall profile of trench K4.

Fig. 4.15: Feature K4/ F1/ a (a = in-situ pot) at Kimu site as found in trench K4 (scale 1 m).

	K4 (2x 1 M)	Material culture							Fauna		
Strata	Arbitrary levels (10 cm)	LCM	FCM	GV	GB	D (g)	SG (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	2(20–30)	34	2	0	16	104	602	0	3	0	11
	3(30–40)	248	0	0	28	0	1,395	617	50	0	55
2	4(40–50)	135	0	0	49	0	45	61	12	0	45
	5and6(60–80)	380	2	1	24	341	4	381	2401	0	83
3	7and 8(80–90)	252	0	0	0	962	0	274	735	2	25
	9(90–100)	280	0	0	0	1,787	0	1,084	421	0	79
	10(100–110)	250	0	0	0	1,904	0	732	577	0	64
4	11(110–120)	124	0	0	0	707	0	142	210	0	0
	12 (120–130)	67	0	0	0	268	552	619	162	0	0
5	13(130–140)	15	0	0	0	0	0	35	63	0	0
	Total	**1,785**	**4**	**1**	**117**	**6,073**	**2,598**	**3,945**	**4,634**	**2**	**362**

Table 4.6: Materials from trench K4: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, SG Slags, CS = Coral stones, S= Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

4.4. Excavation at Muhembo site

Muhembo site (5°24'30.87"S, 38°59'27.23"E) is an upland that rises on the north of Pangani town (Fig. 4.2). The site is divided into two terraces (Fig. 4.16). Terrace 1 descends eastward toward the sea, with an average elevation of approximately 30 meters above the sea level. Terrace 2 is a plateau that ascends approximately 20 metres high from terrace 1. Stone ruins consisting of mosques, houses, and tombs were found on this terrace, bounded by baobab trees that grow along the terrace's edge.

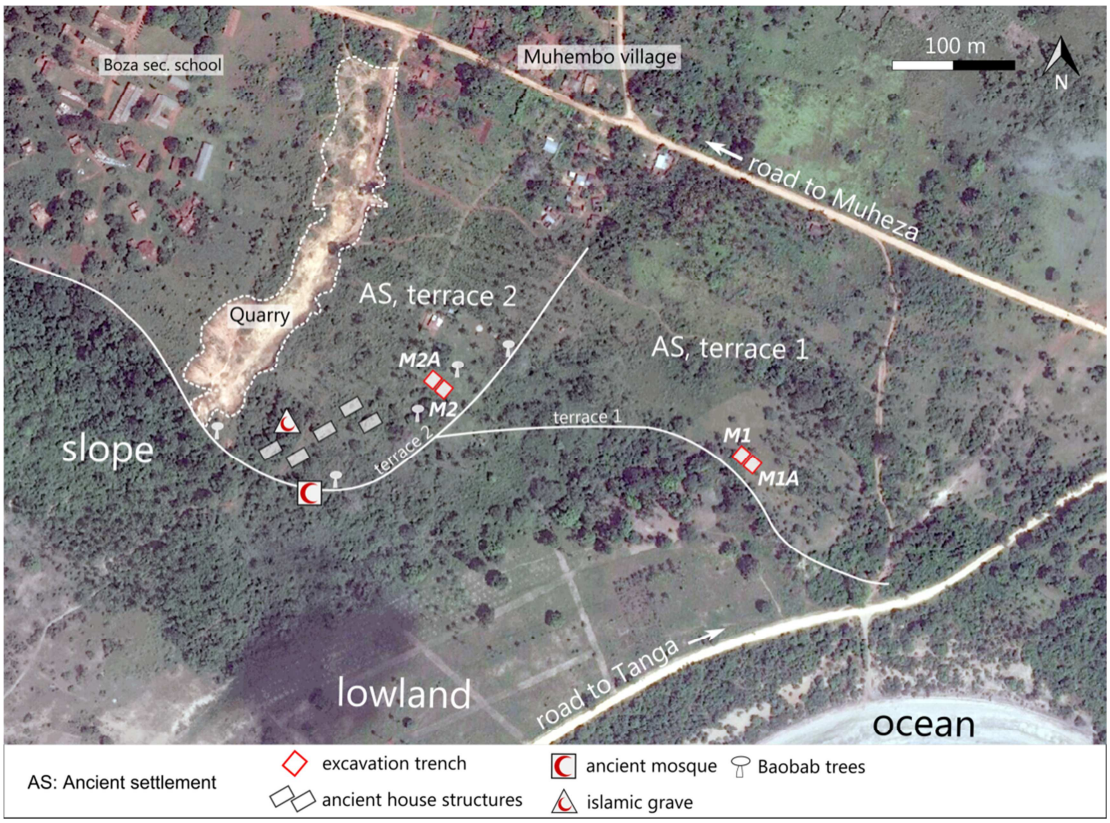

Fig. 4.16: Excavated trenches (M1, M1A, M2 and M2A) at Muhembo Site (source: here.com).

Trench M1 (3x1 m)

On terrace 1 of Muhembo site, trench M1 was opened (Fig. 4.17), cutting through five strata made of 13 arbitrary levels (10 cm each) (Fig. 4.18). The soil profile of all strata was made of clay soil. However, the colour of soil varied from gray to grayish brown in strata 1 and 2, dark to yellowish brown in stratum 4 and gray in stratum 5.

Fig. 4.17: Setting and excavation of trench M1A. The excavated area belongs to trench M1, looking east.

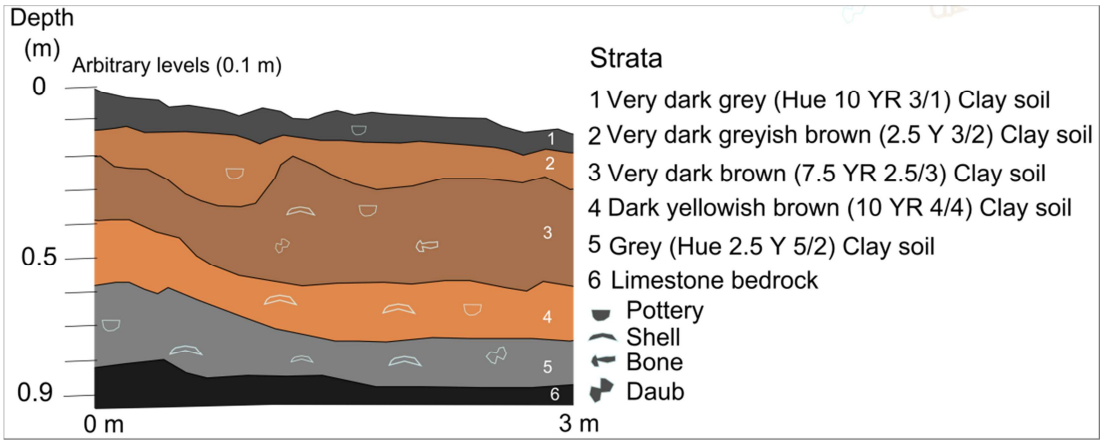

Fig. 4.18: The stratigraphy at Muhembo terrace 1 as presented by the eastern wall profile of trench M1.

Local pottery was recovered from all strata and a significant increase was noted in the lower strata (Strata 4 and 5) (Table 4.7). From strata 2 down to 5, foreign ceramics appeared, with large quantity being deposited in stratum 3. Glass vessels were collected only in stratum 5. Glass beads were recovered from strata 1 up to 5. Shells were found in a large concentration within the lower strata of trench M1. A small quantity of fish and non-fish bones was collected in each stratum.

	TrenchM1(3x 1 M)	Material culture							Fauna		
Strata	Arbitrary levels (10 cm)	LCM	FCM	GV	GB	NGB	D (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	1(0–10)	5	0	0	1	0	0	0	0	0	0
2	2(10–20)	9	7	0	2	0	0	36	383	1	5
	3(20–30)	100	12	0	3	0	60	124	53	2	12
3	4(30–40)	132	16	0	3	0	0	129	615	1	10
	5(40–50)	234	51	0	8	1	36	507	535	1	9
4	6(50–60)	181	1	0	6	1	0	541	365	1	2
	7(60–70)	284	0	0	0	0	138	4	1,462	1	5
5	8(70–80)	1158	2	4	0	0	147	0	3,261	0	2
	Total	**2,103**	**89**	**4**	**23**	**2**	**381**	**1,341**	**6,674**	**7**	**45**

Table 4.7: Materials from trench M1: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, SG Slags, CS = Coral stones, S= Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

Trench M1A (3x1 m)

Trench M1 was extended to a length of 3 metres and a width of 1 meter in the eastern side. The aim was to excavate the lower strata and recover more samples belonging to Zanjian settlement. This extension was labelled trench M1A. The soil profile is similar to that of trench M1 and the recovered materials are shown in Table 4.8.

	M1A (3x1 M)		Material culture							Fauna		
Strata	Arbitrary levels (10 cm)	LCM	FCM	GV	GB	NGB	D (g)	SG (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	1(0–10)	0	0	0	0	0	0	0	0	0	0	0
2	2(10–20)	25	1	0	0	0	0	0	45	284	0	4
	3(20–30)	22	2	0	0	0	60	0	136	79	19	19
3	4(30–40)	206	2	0	0	0	46	1	376	1,086	0	23
	5(40–50)	301	0	0	2	1	0	15	1,029	630	0	2
4	6(50–60)	422	3	0	0	2	5	5	4	1,242	0	1
	7(60–70)	591	1	4	0	1	230	1	0	1,551	0	3
5	8(70–80)	273	4	0	0	16	246	0	0	2,468	0	1
	Total	**1,840**	**13**	**4**	**2**	**20**	**587**	**22**	**1,590**	**7,340**	**19**	**53**

Table 4.8: Materials from trench M1A: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, SG Slags, CS = Coral stones, S= Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

While the upper level from 0 cm to 10 cm below surface lacked cultural materials, stratum 2 yielded pottery, coral stones, daubs, shells, fish bones and non-fish bones. A larger number of artifacts were recovered in stratum 3 than in stratum 2. Local and foreign ceramics were collected throughout the strata between 10 cm to

80 cm below the surface. Shell deposit is found in high concentration beginning from stratum 3 down to basal stratum of the trench. The basal stratum (stratum 5) contained a larger number of glass beads in comparison to other strata.

Trench M2 (2x1 m)

Trench M2 was located at Muhembo terrace 2 on the eastern corner of the area that contained stone ruins consisting of mosque, houses and graves (Fig. 4.16). The excavation profile and material recovered is shown in Fig. 4.19 and Table 4.9, respectively. Fourteen arbitrary levels made up of five strata were revealed from trench M2. The soil from strata 1 up to 2 is loam consisting of very dark to dark brown colour. The soil changes to clay loam with reddish to grayish brown colour from strata 3 till 4. Silt loam with light gray soil differentiates stratum 5 from the rest of the strata.

The main categories of archaeological finds are pottery, beads, daubs, shells, fish and non-fish bones. Local pottery was recovered from all strata, with high concentration in stratum 3. Foreign ceramics and glass beads occurred only in stratum 3. Shells were collected from the surface down to the stratum 4, but none was found below the depth of 110 cm below surface. Non-fish bones were recovered in a significant quantity only in stratum 3.

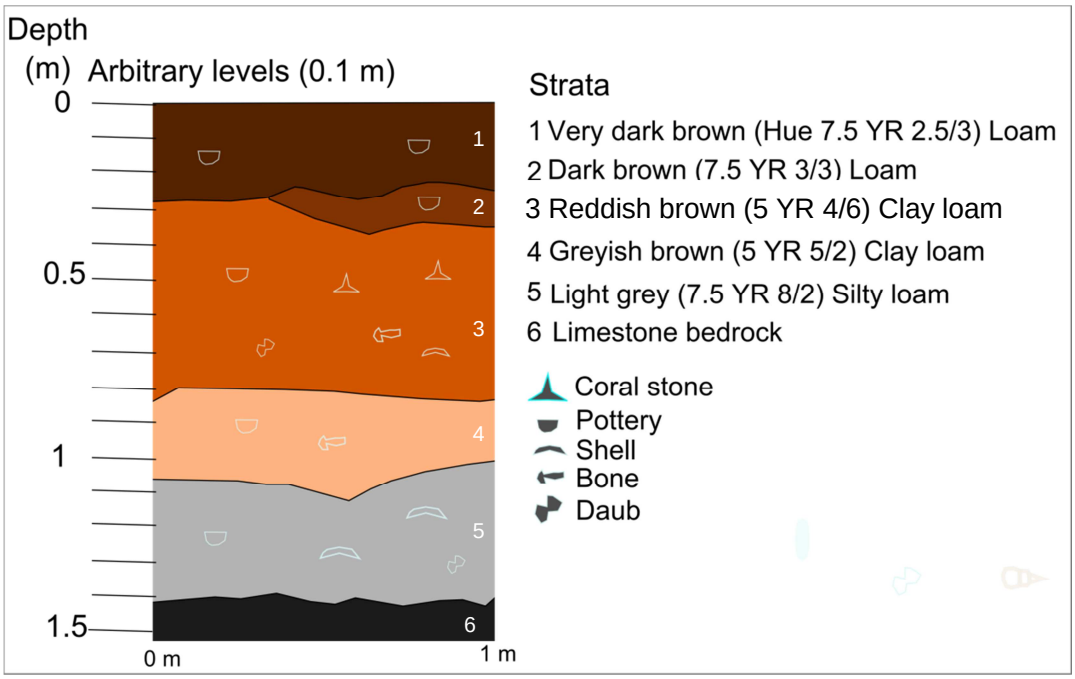

Fig. 4.19: The stratigraphy at Muhembo terrace 2 as presented by the western wall profile of trench M2.

Strata	M2 (2x1 M)	Material culture							Fauna		
	Arbr-lvs(10 cm)	LCM	FCM	GV	GB	NGB	D (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	1(0–10)	12	0	0	0	0	0	3,136	67	0	0
	2(10–20)	63	0	0	0	0	0	5,788	121	0	7
	3 (20–30)	51	0	0	0	0	0	1,400	74	0	0
2	4(30–40)	93	0	0	0	0	0	1,344	45	0	4
3	5(40–50)	122	6	0	4	0	0	1,900	476	2	0
	6(50–60)	74	0	1	1	0	0	1,786	108	0	29
	7(60–70)	93	6	1	0	0	117	4,138	367	1	94
	8(70–80)	110	0	0	0	0	0	2,995	454	2	37
4	9(80–90)	51	0	0	0	0	0	383	0	0	0
	10(90–100)	52	0	0	0	0	0	675	26	0	0
	11(100–110)	32	0	0	0	0	0	256	0	0	0
5	12 (110–120)	20	0	0	0	0	0	210	0	0	0
	13 (120–130)	20	0	0	0	0	0	145	0	0	0
	Total	**793**	**12**	**2**	**5**	**0**	**117**	**24,156**	**1,738**	**5**	**171**

Table 4.9: Materials from trench M2: LCM = Local ceramics, FCM = Foreign ceramics, GV = Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, CS = Coral stones, S= Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

Trench M2A (2x1 m)

Trench M2A was excavated five metres away from M2 in order to recover more samples for the study. The soil profile of M2A is shown in Fig. 4.20 and it looks more or less similar to that of trench M1. Materials recovered from M2A are shown in Table 4.10.

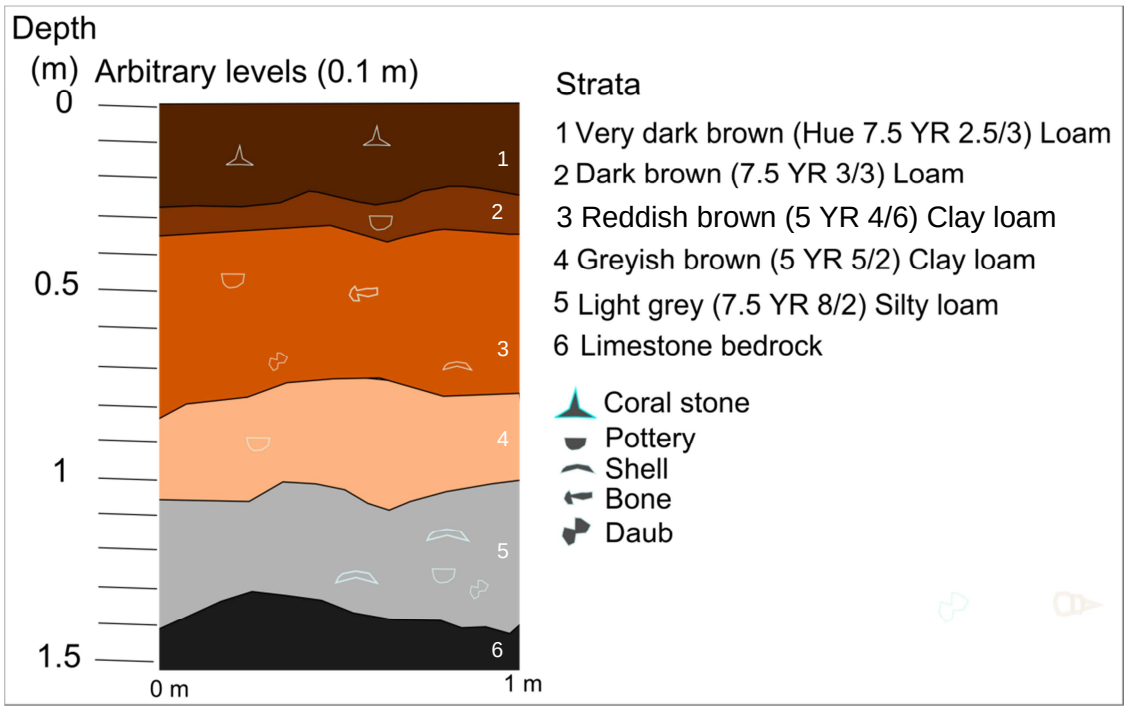

Fig. 4.20: The stratigraphy at Muhembo terrace 2 as presented by the western wall profile of trench M2A.

	M2A (2x1 M)	Material culture							Fauna		
Strata	Arbitrary lvs (10 cm)	LCM	FCM	GV	GB	NGB	D (g)	CS (g)	S (g)	FB (g)	NFB (g)
1	1(0–10)	25	0	0	0	0	0	1,006	46	0	0
	2(10–20)	122	0	0	1	0	0	4,733	97	1	6
	3 (20–30)	125	0	0	0	0	0	1,300	81	0	0
2	4(30–40)	75	0	0	1	0	0	1,400	62	1	3
3	5(40–50)	76	2	0	1	0	7	1,700	338	1	2
	6(50–60)	44	4	1	2	0	0	1,896	99	2	17
	7(60–70)	42	6	1	2	0	0	4,122	254	2	71
	8(70–80)	40	0	0	3	0	20	1,997	317	3	46
4	9(80–90)	38	5	0	2	0	18	484	23	1	12
	10(90–100)	54	2	0	3	0	0	631	33	1	43
	11(100–110)	56	0	0	3	0	0	111	42	1	61
5	12(110–120)	122	0	0	1	1	0	90	22	0	12
	13 (120–130)	120	4	0	1	0	0	57	11	0	27
	Total	**939**	**23**	**2**	**20**	**1**	**45**	**19,527**	**1,425**	**13**	**300**

Table 4.10: Materials from trench M2A: LCM = Local ceramics, FCM = Foreign ceramics, GV= Glass vessels, GB = Glass beads, NGB = Non Glass beads D = Daubs, CS = Coral stones, S= Shells, FB = Fish Bones, NFB = Non-fish bones, g = grams.

Local pottery was recovered throughout the strata. The high concentration was found at stratum 5. From stratum 4 to 3 the ceramics were evenly distributed across arbitrary levels. The upper stratum 1 was found with higher number of potsherds when compared to stratum 2. Foreign ceramics were recovered only from strata 3 down to 5. The concentration of foreign ceramics was in stratum 3. Glass beads were found in all strata but glass vessels were recovered only in stratum 3. Daubs were very rare in trench M2A and few samples were recovered in strata 4 and 3. Coral stones were found deposited in large amount from strata 1 to 3, decreasing in quantity in the lower strata of the trench. Shells, fish bones and non-fish bones were recovered in each stratum. However a considerable accumulation was found in stratum 3 for shells and stratum 4 for non-fish bones.

4.5 Summary

Excavation of Pangani Bay resulted in a series of discoveries that matched with the objective of the study. A deep stratigraphic sequence (Chapter 5, Fig. 5.1) consisting of cultural materials (Tables 4.1–4.10), features (Figs. 4.7–4.8) and

charcoal samples resulting into radiocarbon dating (Fig. 4.9) was uncovered. In term of vertical artifact distribution, the stratigraphy succession from all the excavated trenches supports a dichotomy that separates most of the lower strata (8–4 (K1 to K4), 5–4 (M1), 5–4 (M2) from most of the upper strata (3–2 (K1–K4), 3 (M2)[3]. The difference between these sets of sequences is the higher frequency of shellfish, daubs, bead grinders (Fig. 5.13), and shell beads in the lower strata. A sudden increase of cultural remains from strata 4 through 2 (upper strata) forms a considerable difference of artefact density between the lower and upper strata. Glass beads, pottery, coral stone and bones from domestic animals increase in the upper strata. The absence of bead grinders in the upper strata probably indicates that the local making of beads was replaced by importation of ready-made glass beads. A concentration of coral stones in the upper strata replacing daub materials seen in the lower layers indicates the use of new building materials for house construction.

The radiocarbon dating from K1A, and examined pottery type give us glimpse for dating the upper and lower strata. Stratum 5 from K1A dated to 942 ± 28 BP relatively place the lower strata and upper strata into the period before and after 1000 AD. Pottery with triangular incisions (Fig. 5.2) mainly found in lower strata dates the lower sequence into the period from 8th to 13th centuries AD. Pottery with triangular incised motifs has been used to define Zanjian period in the chronology of East African coast (Chami 1994: 1; Pollard 2007: 112). Pottery with punctuation mark (Fig. 5.22) was recovered in the upper strata and relatively dates from 13th to 16th centuries AD. Similar pottery is attributed to Swahili period in Kilwa and Bagamoyo site (Chami 1998: 203).

Generally, the excavation revealed a form of village–occupation that was distributed both at Kimu and Muhembo sites in Pangani Bay from 8th to 13th centuries AD. The postholes (Fig. 4.11) and amount of daubs indicate that the inhabitants lived in wattle and daub houses. The occupants heavily depended on shellfish and they made shell-beads using bead grinders. The foreign items such as glass beads and foreign ceramics were not common during Zanjian period. However, fishing, craftworks and trade activities increased and the settlement

[3] The examination of materials and stratigraphy as shown in Chapter 5 reveals that the lower strata were formed during Zanjian phase and the upper strata in the Swahili period.

gradually grew in size from 13th to 16th centuries AD. The latter is confirmed by an increase of material culture and fauna as noted in the upper archaeological sequences of Pangani Bay. During Swahili period, stone houses, were introduced adding new features to villages formerly characterised by wattle and daub houses. Trade that insured the acquisition of foreign items such as glass beads and foreign ceramics was heightened and fishing and livestock keeping activities was improved.

CHAPTER FIVE
OCCUPATIONAL PHASES AND FINDINGS

5.0 Introduction

Having presented the soil profile and cultural deposit in each of excavated trenches, a turn is made to the question of occupational phases revealed among the strata. This chapter integrates excavation results from chapter 4, and presents the descriptive information of the findings in their respective phases.

5.1 Occupational Phases

The earliest occupation in Pangani Bay is defined as Zanjian phase based on the characteristics of local pottery (Figs. 5.2–5.8), imported pottery (Figs. 5.9–5.11), beads (Fig. 5.12) and radiocarbon dating (Fig. 4.10). The cultural materials of Zanjian phase began to deposit on top of beach sand at Kimu site and on limestone bedrock at Muhembo site (Fig. 5.1).

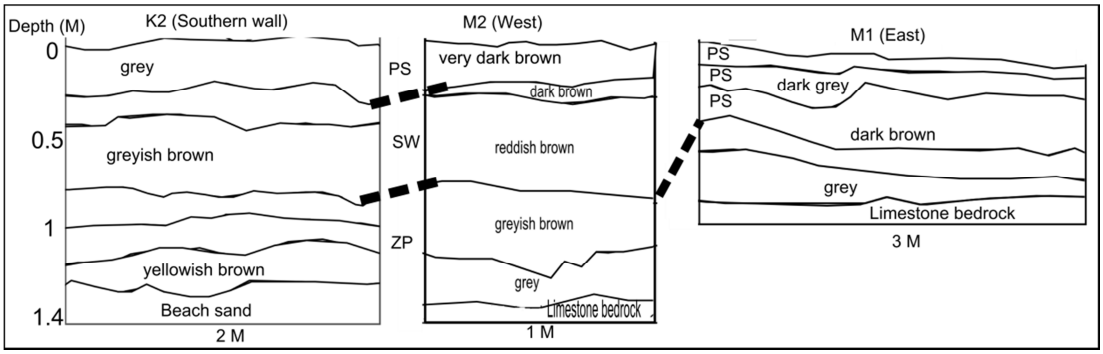

Fig. 5.1: The distribution of occupational phases in Pangani Bay as revealed by excavation trenches from Kimu and Muhembo sites. ZP = Zanjian phase, SW = Swahili and PS = Post–Swahili.

At Kimu site, the deposit from Zanjian phase accumulates from 1.2 m up to 0.8 m below surface, forming strata 8–4 recovered from trenchesK1 to K4 (Figs. 4.6, 4.10). At Muhembo, the Zanjian phase is formed by strata 5 and 4 of trenches M1, M1A, M2 (Figs. 4.18, 4.20).

The examination of stratigraphy and archaeological data reveal that the formation of Zanjian cultural deposits was the result of daily activities of people in village sized settlements that were located at Kimu and Muhembo sites (Walz 2010: 142). Cultural materials were probably discarded by the users less than 20

meters away from the house parameters. The latter is confirmed by the recovery of large quantity of daub with wood impressions (indicative of wattle and daub houses) admixturing with other archaeological materials in the same place. Similar archaeological pattern of recovering significant quantity of daub with wood impressions occurred in all excavated trenches (Table 4.1, 4.7). Furthermore, the recovery of postholes from trench K2 partially suggests the type of the houses constructed during Zanjian period (Fig. 4.11). It seems that the earliest occupants lived in the circular wattle and daub houses, undertook their daily domestic activities and discarded their waste at easy just outside, near their houses.

Worth to note, the area around trench K3 (Fig. 4.3) consists of tombs related to Swahili period and graves inscribed with modern dates. Thus, the recovered deposits of Swahili and Zanjian phases from trench K3 might have been disturbed by human burial activities as evidenced by pit-fills, strata 4 and 7 (Fig. 4.3). Nevertheless, the area around trench K3 provides significant information in the spatial use of the Kimu site. While the area around trenches K1, K2 and K4 was used for housing, the area with trench K3 was used as graveyard, probably from Swahili period onward. The data indicate that the discard-behaviour of people was not structured and domestic materials like pottery and beads ended up deposited in the graveyard. The latter is evidenced by the numbers of artifacts recovered from trench K3 (Table 4.13). Trenches M1 and M2 at Muhembo were located away from the grave parameters that are visible in the western part of the site (Fig. 4.16). Therefore, the recovered inventory from trenches M1 and M2 seems to originate from the housing context away from burial grounds.

As time went on, the Zanjian "wattle and daub" small villages developed into "coral stone houses" large villages in the same areas, at Kimu and Muhembo sites (Walz 2010: 143). These new Swahili villages were wealthier in materials compared to their predecessors. They were characterised by the mixture of wattle and daub and coral stone houses as evidenced by the increase of coral stones in the upper layers of the excavations (Table 4.9). The discard-behaviour of people during Swahili period continued to reflect previous practices as materials were discarded within the settlements probably at the back or front spaces of the

houses. Characteristic artifacts during Swahili period are local pottery (Figs. 5.17–5.22), imported pottery (Fig. 5.23), and beads (Fig. 5.24). The Swahili phase is comprised of strata 3–2 of trenches K1 to K4 and stratum 3 of trenches M2 and M2A. Post-Swahili phase is the topmost deposit in the general stratigraphy of Pangani Bay. The cultural materials of Post-Swahili phase consist of local and imported pottery (Fig. 5.26)[4].

5.2 Cultural Materials from Zanjian Phase

5.2.1 Local Pottery

Local ceramics made by hand, without the aid of a wheel were found in archaeological strata defining Zanjian phase. They were unglazed but smoothed both on the outer and interior surfaces. Distinguished chiefly on the basis of shape and rim morphology as well as decorative motifs the whole material has been grouped into seven principal types as follows:

Type 1: Necked jars with inward turning rim (Fig. 5.2).

Type 2: Necked jars with step-profile at their shoulders (Fig. 5.3).

Type 3: Necked jars with outward turning rim (Fig. 5.4).

Type 4: Globular jars (Fig. 5.5).

Type 5: Open bowls (Fig. 5.6).

Type 6: Carinated bowls (Fig. 5.7).

Type 7: Bowls with breaded rims (Fig. 5.8).

Pottery type-1 is tempered by large sand (3–4 mm) and medium–sized, angular quartz (5–7mm). The exterior surface of this pottery type is smoothed and sometime burnished with gray slip. The vessel wall is fairly thick up to 12 mm. The rims are usually inverted and tapered. The rim and neck are used as locations for incised and punctuated decorations.

[4] Throughout the thesis Post-Swahili phase receive brief discussion when compared to Swahili and Zanjian phases because the period Post-1500 AD is beyond the study's objective.

Fig. 5.2: Pottery Type 1
Sherds 1, 3, 5 = Scale 1:2, sherds 2 and 4 = Scale 1:3
1: Phase: Zanjian (K1A/Level 11). Orifice diameter: 140 mm. Rim thickness: 8 mm. Surface colour: Grayish yellowish brown (Hue 10 YR 4/2)/Core colour: Similar to surface.

2: Phase: Zanjian (K1A/Level 8). Orifice diameter: 200 mm. Rim thickness: 11 mm. Surface colour: Bright red (Hue 5 YR 5/6)/gray slip/Core colour: Yellow orange (Hue 7.5 YR 7/8).
3: Phase: Zanjian (K1A/Level 7). Orifice diameter: 200 mm. Rim thickness: 8–10 mm. Surface colour: Reddish brown (Hue 2.5 YR 4/8)/gray slip/Core colour: Similar to surface.
4: Phase: Zanjian (K3/Level 11). Orifice diameter: 200 mm. Rim thickness: 9–11 mm. Surface colour: Yellow, orange (Hue 10 YR 8/8) Core colour: Similar to surface.
5: Phase: Zanjian (M1A/Level 7). Orifice diameter: 200 mm. Rim thickness: 7–12 mm. Surface colour: Light yellowish red (Hue 10 YR 8/3)/Core colour: Dull reddish brown (Hue 10 YR 5/3).

Common decorations are single or double zigzag lined triangles (Fig. 5.2, 1), punctuates (Fig. 5.2, 3), triangle filled in with parallel oblique lines (Fig. 5.2, 5), and burnishing that involved the adding of gray-slip on the surface (Fig. 5.2, 3–4).

Pottery type-2 is characterized by moderately wide-mouthed necked jars (Fig. 5.3, 3). A slight angular profile made up of a step that separate neck and body is a common feature. The vessel`s temper is less coarse than that of type-1 pottery.

Fig. 5.3: Pottery Type 2
Sherds 1 and 2 = Scale 1:2, sherd 3 = Scale 1:4
1: Phase: Zanjian (K1A/Level 11). Orifice diameter: 180 mm. Rim thickness: 9 mm. Surface colour: Bright reddish brown (Hue 5 YR5/8)/Core colour: Reddish gray (Hue 2.5 YR 6/1).
2: Phase: Zanjian (K1A/Level 9). Orifice diameter: 180 mm. Rim thickness: 5–8 mm. Surface colour: Dark reddish brown (Hue 10 YR 3/3) Core colour: Similar to surface.

3: Phase: Zanjian (M1A/Level 6). Orifice diameter360 mm. Rim thickness: 8–10 mm. Surface colour: Bright reddish brown (Hue 2.5 YR 4/8)/gray slip/Core colour: Similar to surface.

Pottery type-3 (Fig. 5.4) has a temper type characterised by large sand (3–4 mm) and medium-sized, angular quartz (5–7 mm). It is featured by everted rims which are rounded, thickened or tapered. Common decorations are incised triangles and burnishing that involved adding of gray slip on the surface.

1

2

Fig. 5.4: Pottery Type 3, Scale 1:2
1: Phase: Zanjian (K1A/Level 10). Orifice diameter: 200 mm. Rim thickness: 8–11 mm. Surface colour: Dull reddish brown (Hue 5YR 5/4)/Core colour: Similar to surface.
2: Phase: Zanjian (M1A/Level 8). Orifice diameter: 200 mm. Rim thickness 8–9 mm. Surface colour: Bright reddish brown (Hue 2.5 YR 5/6)/Core colour: Similar to surface.

Pottery-type 4 is globular jars made up of coarse temper materials (Fig. 5.5). The exterior surface is burnished with gray slip. The vessel wall is fairly thick (8–9 mm). Common decoration includes punctuates or zigzag lined triangle motif, which is sometime bounded by a line of punctuates at its base.

Fig. 5.5: Pottery Type 4, Scale 1:2
Phase: Zanjian (K3/Level 9). Orifice diameter: 220 mm. Rim thickness: 8–9 mm. Surface colour: Orange (Hue 7.5 YR 6/6)/Core colour: Bright brown (10 YR 6/6).

Pottery type-5 is characterised by inverted and vertical rims (Fig. 5.6). Its orifice is wide up to 180 mm and it has coarse temper and compact texture.

1

2

Fig. 5.6: Pottery Type 5, Scale 1:2
1: Phase: Zanjian (K1A/Level 10). Orifice diameter: 180 mm. Rim thickness: 10 mm. Surface colour: Light gray (Hue 10 YR 8/2)/red slip/Core colour: Similar to surface.
2: Phase: Zanjian (M1A/Level 6). Orifice diameter: 280 mm. Rim thickness 6 mm. Surface colour: Light reddish gray (Hue 10 R 7/1)/Core colour: Similar to surface

Pottery type-6 is carinated bowl (Fig. 5.7). Decorations consist of punctuates, red slip, and graphite.

1

2

Fig. 5.7: Pottery Type 6, Scale 1:2
1: Phase: Zanjian (K1A/Level 7). Orifice diameter: 200 mm. Rim thickness: 8 mm. Surface colour: Light reddish gray (Hue 10 YR 8/2)/Core colour: Similar to surface.
2: Phase: Zanjian (K4/Level 10). Orifice diameter: 200 mm. Rim thickness 8 mm. Surface colour: Dark reddish brown (Hue 10 R 8/2)/Black burnish/Core colour: Similar to surface.

Pottery-type 7 is defined by vessels with beaded rims (Fig. 5.8). The common decoration is a row of punctuated marks along the neck.

Fig. 5.8: Pottery Type 7, Scale 1:2
1: Phase: Zanjian (K3/Level 11). Orifice diameter: 200 mm. Rim thickness: 8mm. Surface colour: Bright brown (Hue 2.5 YR 5/8)/Core colour: Similar to surface.
2: Phase: Zanjian (K3/Level 9). Orifice diameter: 200 mm. Rimthickness9 mm. Surface colour: Light gray (Hue 10 R 8/2)/Core colour : Similar to surface.
3: Phase: Zanjian (K3/Level 8). Orifice diameter: 150 mm. Rim thickness 9–10 mm. Surface colour: Dull reddish brown (Hue 5 YR 3/6)/Core colour : Dark reddish brown (Hue 5 YR 3/6).

5.2.2 Imported Pottery

Imported pottery (Figs. 5.9–5.11) was recovered from the stratigraphic layers belonging to Zanjian phase. They were wheel turned and glazed unlike local pottery. Fabric, glaze and decoration were used as variable to classify the type and determine the origin of the vessels, as rim or base sherds were scarce and complete vessel even rarer. The classification of the type, age and the origin of the sherd depended on cross-checking with Horton's (1996) data on the imported pottery from Shanga on the Kenya coast.

Pottery from probably Near East recovered from Zanjian strata included four sherds which are defined as *lustre ware* (Fig. 5.9, 1). This ware has soft to buff paste, with a fine temper and fairly smooth fracture. The external surface is glazed with silvery-brown lustre. At Shanga, identical lusterware appeared in the early of 9th century AD phase and their forms corresponded with small bowls. They are

categorized as import from the head of the Persian Gulf, Basra in particular (Horton 1996: 279).

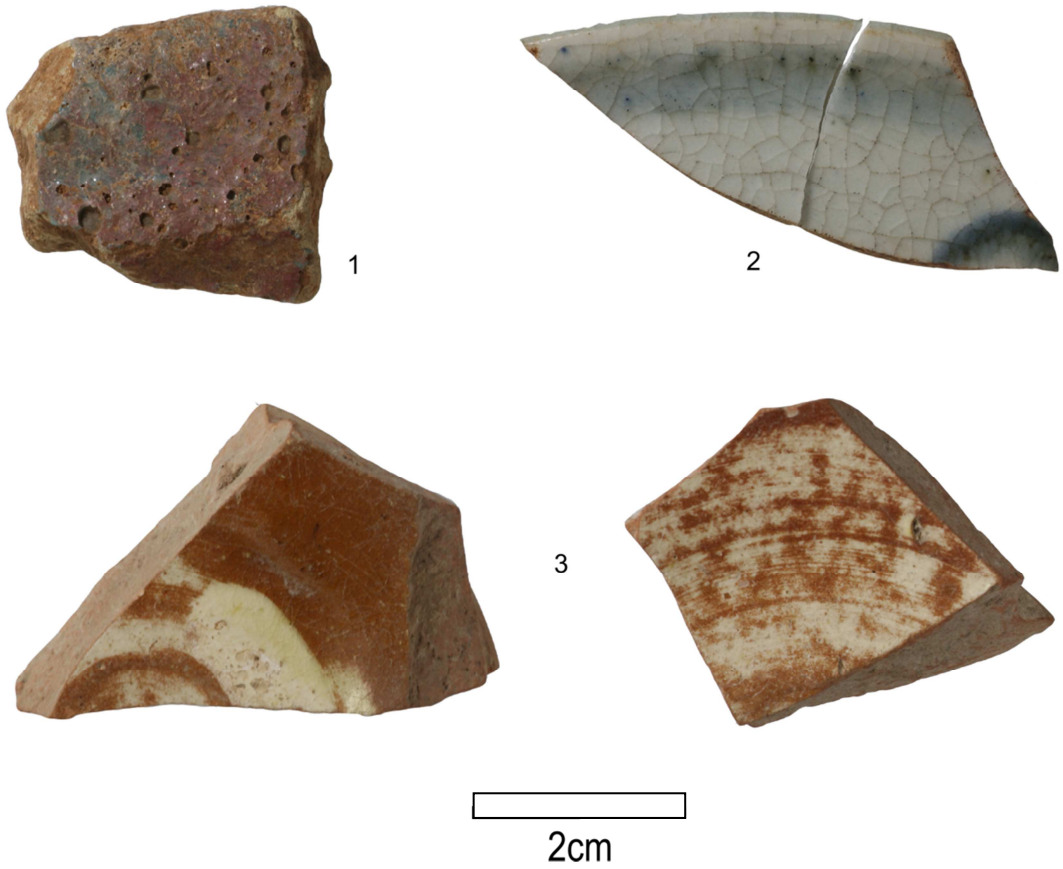

Fig. 5.9: Imported ceramics from early period of Zanjian phase (750–1050 AD).
1: Phase: Zanjian (M1A/Level 8)/Lustre ware
2: Phase: Zanjian (M1/Level 7)/White glaze and colour splashed ware
3: Phase: Zanjian (K1/Level 6)/Lead glazed polychrome

Apart from *lustre ware*, three sherds classified as *white glaze and colour splashed ware* (Fig. 5.9, 2) were found within early period of Zanjian phase (c. 800–1000 AD). These sherds have soft white to buff paste, with a fine temper and fairly smooth fracture. The forms seem to be small sized bowls. The white glaze with oval patches of blue splashed colour extends throughout the whole vessel. Identical sherds of blue splashed ware appeared in the phase dating from 800 to 1000 AD at Shanga site and are considered to be an import from Siraf or Susa sites (Iran). The main forms of these wares as identified at Shanga site were bowls and cups (Horton 1996: 277).

Also, four sherds identified as *lead glazed polychrome* ware (Fig. 5.9, 3) appeared from strata that are relatively dated from 900 to 1050 AD. These ceramics have soft pink to pink-buff paste, very fine, with little temper and

smooth fracture. The forms seem to be small sized bowls. The internal surface is decorated with white glaze and brown colour iridescence. At Shanga, various types of this ware appeared in the phase dating from 9th to 10th centuries AD and are noted to be from Siraf and Susa sites (Iran). The identifiable form corresponds to bowl (Horton 1996: 279).

Fig. 5.10: Imported ceramics from later period of Zanjian phase (1050–1250 AD).
1: Phase: Zanjian (M1A/Level 6)/Late sgraffiato/Plain glaze
2: Phase: Zanjian (M1/Level 6)/Late sgraffiato/glaze with floral motif
3: Phase: Zanjian (K1/Level 11)/Late sgraffiato/hatched motif

Pottery defined as *late sgraffiato* (6 sherds) was recovered (Fig. 5.10). A lead glaze was applied on white slip and a glaze effect cut away with a thin stylus to create a hatched sgraffiato motif (Fig. 5.10, 3). Some sherds have plain slip and glaze with no sgraffiato decoration (Fig. 5.10, 1). Late sgraffiato wares appeared in the period dating from 1000 to 1300 AD at Shanga site and are defined to be of Southern Iran by origin (Horton 1996: 281).

Pottery from probably Far East included five sherds classified as *Ru–ware* (Fig. 5.11). The fabric of this ware shows colour closer to ochre or whitish gray. The internal and external surfaces are decorated with sky-blue glossy glaze. At Unguja Ukuu, Zanzibar identical ware was identified with lighter green crackled

glaze and dated to the period before 700 AD. The form of this vessel was identified to be tableware (Juma 2004: 108). In the sequence of Pangani, this ware appears during early period of Zanjian phase (750–1050 AD).

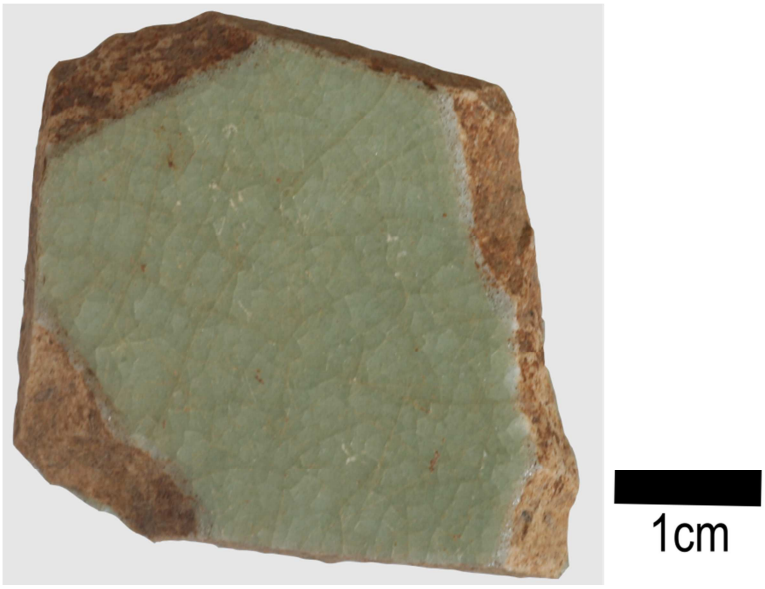

Fig. 5.11: Ru-ware from later period of Zanjian phase (1050–1250 AD).

5.2.3 Beads

Glass and non–glass beads were recovered in stratigraphic layers belonging to Zanjian period. A diverse range of materials were used to make them including rock crystal (Fig. 5.12, 1), shell (Fig. 5.12, 2) and glass (Fig. 5.12, 3–4). Four roughout rock crystal beads were found in trench M1A, while seven of them were recovered in trench K3 at Kimu site. They are found within a context that is relatively dated to later period of Zanjian phase (1050–1250 AD).

Fig. 5.12: Beads from Zanjian phase
Column 1, top: rock crystal bead, roughout, polished and faceted, no bore (M1A/Level10).

Column 1, down: rock crystal bead, polished and faceted, polyhedron, single bore (K3/Level 8).
Column 2, shell beads (M1A/Level 6).
Column 3, top: glass beads, wound, decorated, yellow colour (M1A/Level 8).
Column 3, down: glass beads, wound, yellow colour (K3/Level 9).
Column 4, glass beads, drawn, spheroid and tubular, blue colour (K3/Level 9).

At Shanga, rock crystal beads were recovered from the context dating from 960 to 1250 AD (Horton 1996: 332). Rock crystal beads were probably locally made at Shanga due to compelling evidences presented by Horton's (1996: 332) work; the same is probably true for Pangani Bay. The crystal beads recovered from Pangani Bay–often clearly unfinished roughout or beads with misdrilled holes (Fig. 5.12, 1) could have been made locally. However, the latter does not preclude the possibility for external origin of rock crystal beads, such as India that is often cited as source of rock crystal beads (Horton 1996: 332).

Shell beads mainly in disc form (Fig. 5.12, 3–4) which was associated with bead grinders (Fig. 5.13) that might have been used for their production (Flexner, Fleisher, and LaViolette 2008: 162) were found in Zanjian strata. Shell of *Anadara,* a marine gastropod might have been used as raw material for shell beads. This has also been suggested by Walz's (2010: 329) study of shell beads from Pangani Bay.

Fig. 5.13: Bead grinder that was probably used to make shell beads, from M1A, Level 6.

At Shanga, the substantial distribution of shell beads occurs in the periods between 750 to 1100 AD (Horton 1996: 323), while at Pangani Bay shell beads and bead grinders appear within early period of Zanjian phase from 750 to 1050 AD.

Glass beads begin to appear in archaeological context from the early period of Zanjian phase. However, they are more common in Swahili phase. Drawn beads dominate Zanjian phase. The predominant colour for Zanjian glass bead is brownish red. Other colour groups were recorded and included green, blue, white, yellow, black and turquoise. Patchy evidences exist for the importation of glass beads on the East African coast during Zanjian phase. Very few beads are reported in Manda. Only 79 were retrieved and dated from around 800 to 900 AD. At Shanga only 33 glass beads were recovered from trench 6–10, below phase 11(Horton 1996: 329). In the sequence of Pangani, 171 glass beads were recovered from Zanjian phase.

5.2.4 Fauna

Faunal remains were recovered from layers representing Zanjian occupational phase (Figs. 5.14–5.16). The fauna consisted of fish (Fig. 5.14), domestic and wild animals (Fig. 5.15) and shellfish (Fig. 5.16). Of the domestic fauna caprine (sheep and goat) are the largest group. This is followed by chicken and then cattle *(Bos taurus)*.

Fig. 5.14: Fish bones from Zanjian phase (M1/Level 10)

Fig. 5.15: Bones from domestic (first row, K1/Level 8) and wild animals (second row, K1A/Level 7) from Zanjian phase. The last piece in the row is ivory bone.

Wild animals such as warthog, zebra and elephant were identified in the fauna assemblage. The heavily collected shellfish during Zanjian phase were *Saccostrea cucullata, Anadara spp., Haliotidae spp., Achatina spp., and Oliva spp.* Also, *Terebralia polustris, Cerithidea decollata* and *Chicoreus ramusus*, *Cyprae annulus/moneta* and *Polinices mammilla* were fairly accumulated during this period.

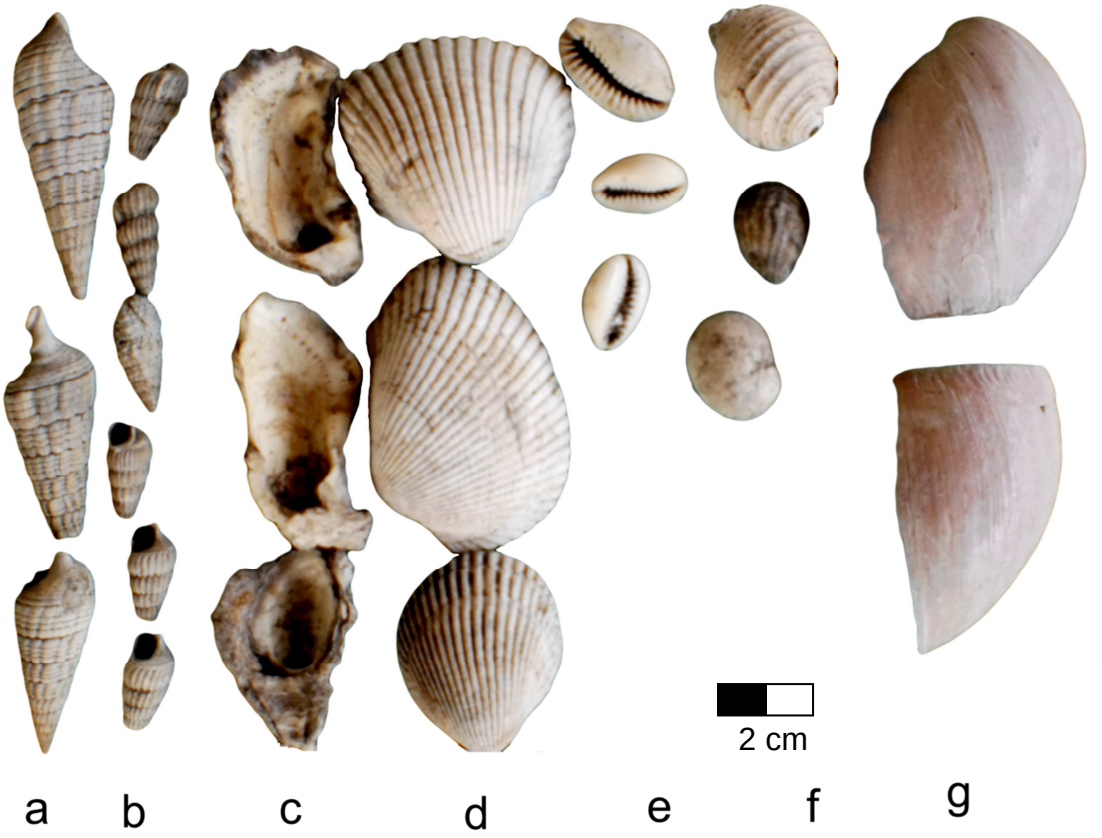

Fig. 5.16: shellfish common in Zanjian and Swahili phases. a = Terebralia palustris (mud whelk) b = Cerithidea decollata c = Saccostrea cucullata, d = Anadara spp., e = Cyprae annulus/moneta, f = Polinices mammilla, g = Achatina sp. [landsnail].

5.3 Cultural Materials from Swahili Phase

5.3.1 Local Pottery

Pottery type-1 (Fig. 5.17) from Swahili phase is defined with the vessels with lips which are more straight and pointing upward than those from Zanjian phase, which usually point inward. The temper of Swahili vessels is less coarse than that of Zanjian vessels. Thick and sometimes crude incised marks seen in pottery-type 1 of Zanjian phase is replaced by thinner and fine-tuned criss-cross incised marks. Pottery type-2 (Fig. 5.18) has an angular profile that separates the body and rim, but is not so much prominent as in pottery type-2 of Zanjian phase. The vessel`s tempering materials of Swahili type-2 pottery is less coarse than those from Zanjian phase.

Fig. 5.17: Pottery Type 1
Sherd1 = Scale 1:2, Sherd 2 = Scale 1:4
1: Phase: Swahili (K1A/Level 3). Orifice diameter: 200 mm. Rim thickness: 8–9 mm. Surface colour: Red (Hue 7.5 R 4/8)/Core colour: Similar to surface.
2: Phase: Swahili (K3/Level 6). Orifice diameter: 320 mm. Rim thickness 8 mm. Surface colour: Orange (Hue 7.5 YR 6/6)/Core colour: Similar to surface.

Fig. 5.18: Pottery Type2, Scale 1:2
1: Phase: Swahili (K1A/Level 4). Orifice diameter: 230 mm. Rim thickness: 8–9 mm. Surface colour: Bright brown (Hue 2.5 YR 5/6)/Core colour: Dark brown (Hue 2.5 YR 3/6).
2: Phase: Swahili (K3/Level 4). Orifice diameter: 220 mm. Rim thickness 8 mm. Surface colour: Bright brown (Hue 2.5 YR 5/8)/Core colour: Similar to surface.
3: Phase: Swahili (K4/Level 9). Orifice diameter: 180 mm. Rim thickness 11 mm. Surface colour: Reddish brown (Hue 5 YR 3/4)/Core colour: Similar to surface.

Fig. 5.19: Pottery Type 4, Scale 1:4
Phase: Swahili (M2A/Level 10). Orifice diameter: 300 mm. Rim thickness: 11 mm. Surface colour: Dark red (Hue 10 R 3/4)/Core colour: Similar to surface.

Type-4 pottery (Fig. 5.19) includes globular jars made up of texture which is less coarse in comparison to those in Zanjian phase. Exterior surface's colour varies from black to red. The vessel wall is moderately thick. Triangular motifs seen in Zanjian vessels are less employed in Swahili type-4 pottery. The texture of pottery type-5 (Fig. 5.20) is less coarse, but compact than that of Zanjian vessels. Type-5 pottery is in a form of bowls and is characterized by graphite burnished surface with a row of punctuation below the lip. The latter was not common during Zanjian period.

Fig. 5.20: Pottery Type 5, Scale 1:2
1: Phase: Swahili (K4/Level 6). Orifice diameter: 200 mm. Rim thickness: 7 mm. Surface colour: Dull orange (Hue 5 YR 7/4)/Black burnish/Core colour: Similar to surface.

Pottery type-6 (Fig. 5.21) is carinated bowls with punctuates, red slip and graphite decorations.

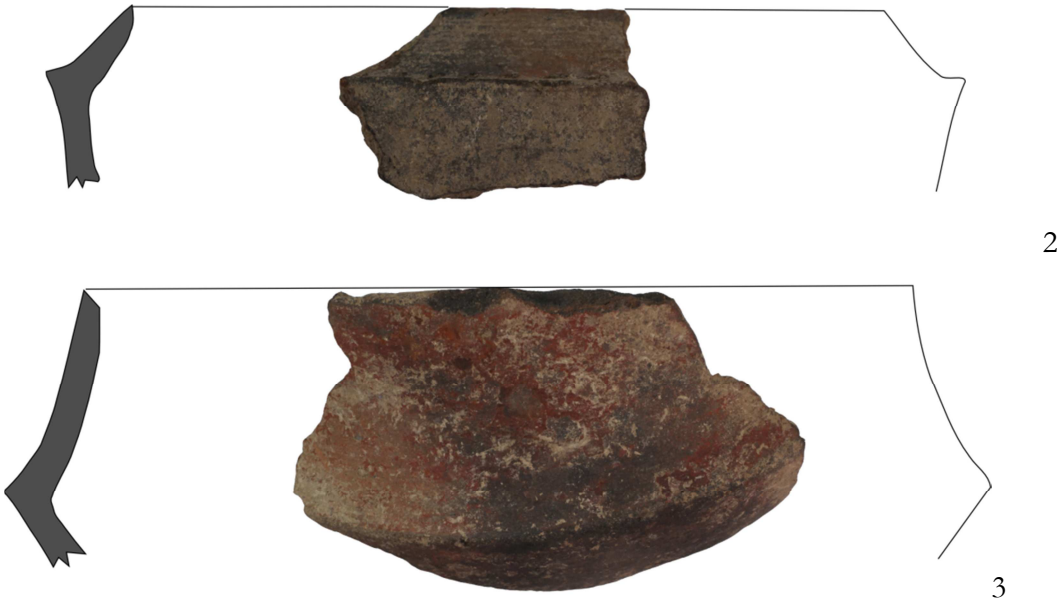

Fig. 5.21: Pottery Type 6, Scale 1:2
1: Phase: Swahili (K1A/Level 5). Orifice diameter: 200 mm. Rim thickness: 9–10 mm. Surface colour: Dark reddish gray (Hue 10 R 3/1)/Core colour: Similar to surface.
2: Phase: Swahili (K1A/Level 2). Orifice diameter: 200 mm. Rim thickness 7–9 mm. Surface colour: Reddish black (Hue 7.5 Y R 2/1)/Core colour : Pale reddish (Hue 2.5 YR 7/3).
3: Phase: Swahili (K3/Level 6). Orifice diameter: 220 mm. Rim thickness 9 mm. Surface colour: Dull orange (Hue 2.5 YR 6/3)/Core colour: Reddish black (Hue 7.5 R 2/1).

Pottery type-7 (Fig. 5.22) consists of vessels with beaded rims. The common decoration is a row of punctuated marks along the neck. These vessels are more common in Swahili phase than in Zanjian period.

4

Fig. 5.22: Pottery Type 7, Scale 1:2
1: Phase: Swahili (K1A/Level 5). Orifice diameter: 200 mm. Rim thickness: 9 mm. Surface colour: Bright brown (Hue 2.5 YR 5/8)/Core colour: Similar to surface.
2: Phase: Swahili (K1A/Level 5). Orifice diameter: 170 mm. Rim thickness8 mm. Surface colour: Bright brown (Hue 2.5 YR 5/6)/Core colour: Similar to surface.
3: Phase: Swahili (K3/Level 4). Orifice diameter: 200 mm. Rim thickness 8 mm. Surface colour: Dark reddish brown (Hue 10 R 3/3)/Core colour: Similar to surface
4: Phase: Swahili (M2A/Level 9). Orifice diameter: 150 mm. Rim thickness 9 mm. Surface colour: Dark reddish gray (Hue 10 R 3/1)/Core colour: Light reddish gray (Hue 10 R 7/1).

5.3.2 Imported Pottery

Imported pottery (3 sherds) defined as *black on yellow ware* (Fig. 5.23, 1) was recovered from the archaeological strata that define Swahili phase. It is characterised by hard red-orange paste, with a fine temper and smooth fracture. The inside is slipped and glazed with whitish–green glaze on which the design is painted. The painted design includes a set of oblique lines bounded around the vessel by double straight lines. At Shanga, similar wares, identified as bowls, appeared in the early 14th century AD phase and is thought to have originated from southern Arabia (Horton 1996: 291).

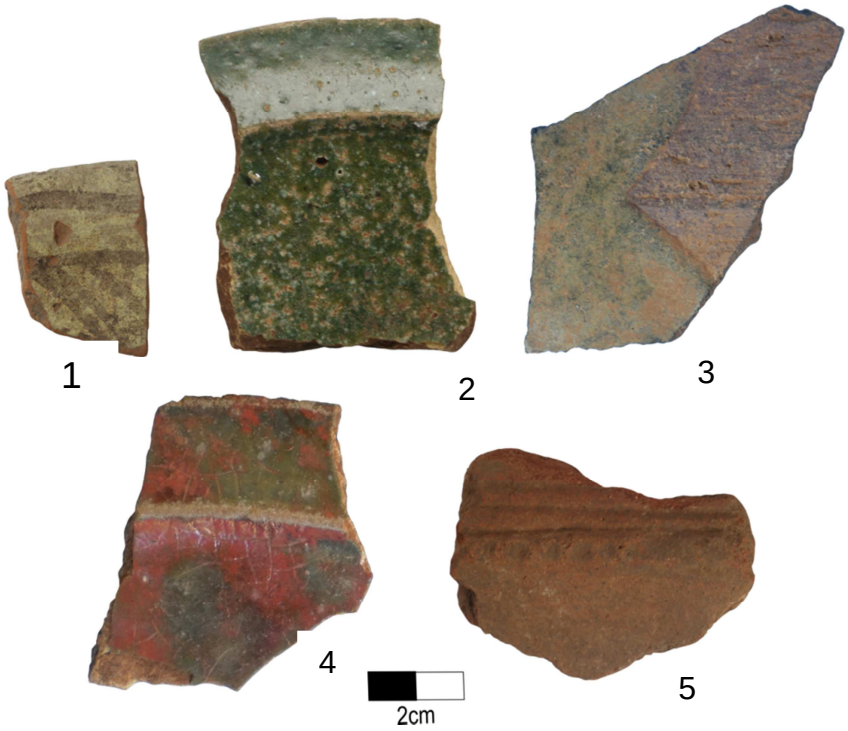

Fig. 5.23: Imported Pottery in Swahili phase.

1: Black on yellow ware (K1A/Level 6)
2: Monochrome ware (M2A/Level 6).
3: Jian-ware (M2A/Level 8).
4: Copper red-green ware (M2A/Level 7).
5: Decorated red ware (M2A/Level 6).

Seven sherds classified as *monochrome ware* (Fig. 5. 23, 2) were found. This ware has soft pinkish-gray, buff paste, with smooth fracture and fine temper. The glaze is a uniform dark gray-green, with lighter gray on ledged rim and green colour on the body. The glaze runs internally, just over the rim. The sand inclusions are very fine. Monochrome ware classified as bowls appeared in the early of 16th century AD phase at Shanga and is interpreted as an import from Red sea or southern Arabia (Horton 1996: 293).

Four sherds identified as *Jian–ware* (Fig. 5.23, 3) also termed as *Hare's Fur* by (Wong 2006) were found. This ware has dark, coarse-grained stoneware body. It consists of lustrous bluish black or brownish black glazes that are generally shot through with brownish streaks which look like hare`s fur. Jian-ware mainly comprising tea bowls, were made at kilns located in Jianyang of Fujian province (Wong 2006). In the sequence of Pangani Bay, this ware appears at the beginning of Swahili period probably from around 1250s AD. Imported pottery categorized as *copper red-green ware* (7 sherds), probably from the Ming dynasty (1368–1644 AD) was recovered (Fig. 5.23, 4). It has gray to pale cream-gray paste with a green to red crazed glaze. The identifiable form at Shanga is bowl with ledge rim with light-brown-glaze and dated to 14th century AD (Horton 1996: 309).

Five sherds classified as *decorated red ware* (Fig. 5.23, 5) were recovered. They had red to orange-red paste with dark gray core and fine sand temper. The fabric has a smooth fracture. The surface is burnished to smooth red finish. The decoration consists of horizontal sets of incised lines bounded by simple punctuates on top. At Shanga this ware in form of bowls and jars was at peak consumption around 1300 AD and it is considered to have been imported from Indian or made by Indian settlers in East Africa (Horton 1996: 303).

5.3.3 Beads

From 13th century AD onwards the majority of beads are glass (Fig. 5.24) with few others made of copper, ivory or bones (Fig. 5.25). Brownish red drawn beads

dominate other type of beads in Swahili phase. In the sequence of Pangani, the importation of glass beads was at a peak from around 13th century AD, and declining steadily thereafter in 16th century AD. At Shanga, glass beads were highly available around 13th century AD with a sharp decline at around 15th century AD (Horton 1996: 329). Furthermore, non-glass beads (Fig. 5.25), that consisted of nine copper, five ivory and four bone beads were recovered from Swahili phase.

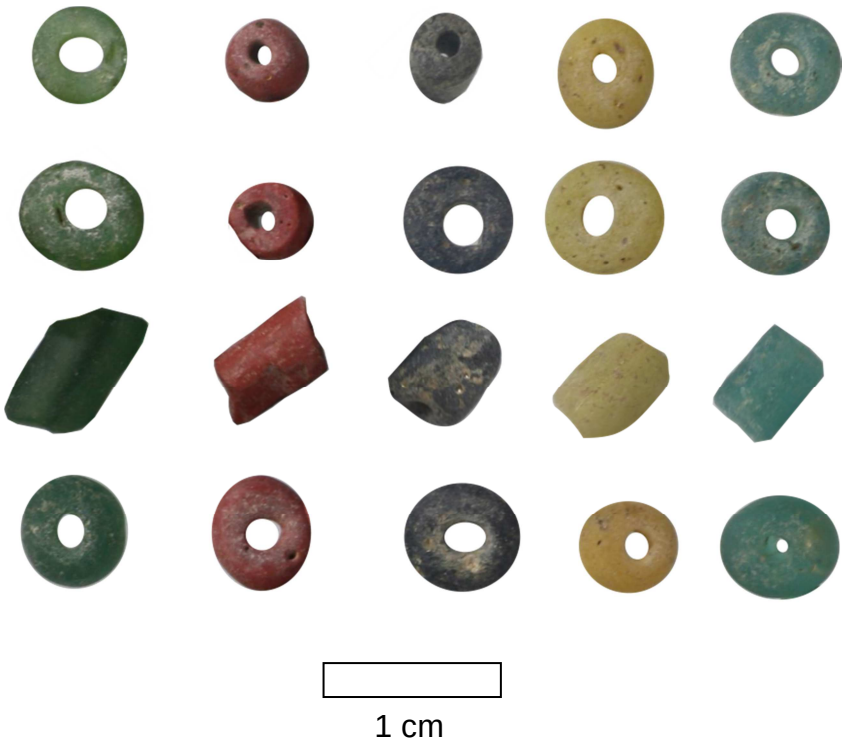

Fig. 5.24: Beads from Swahili phase (1250–1500 AD). Drawn = 1st to 4 throws, Wound = 5th row
Column 1: glass, drawn, green colour (K3/Level 5).
2: glass, drawn, brownish red colour (K1A/Level 4).
3: glass, drawn, black colour (K3/Level 5).
4: glass, drawn, yellow colour (K4/Level 4).
5: glass, drawn, blue colour (K1A/Level 4).

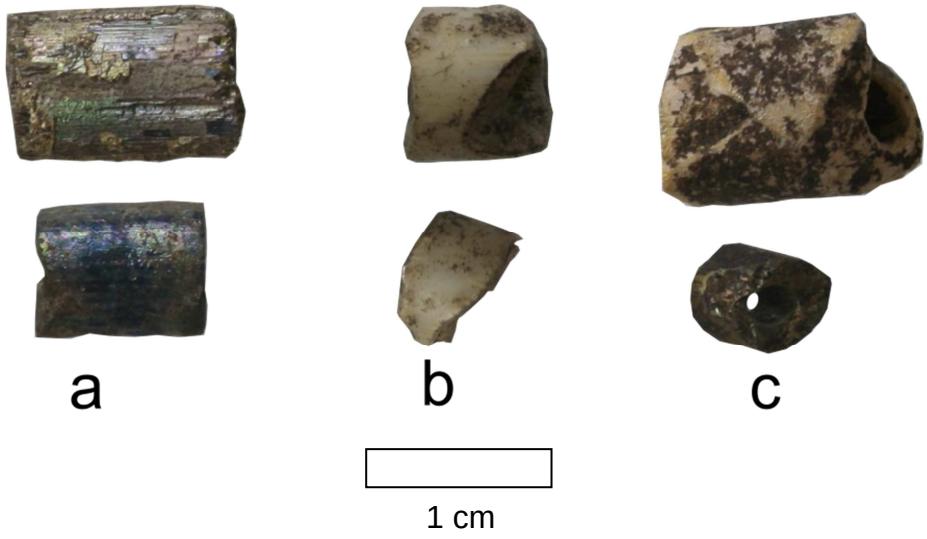

Fig. 5.25: Non-glass beads
a: Wood coated with brass (K1A/Level 3)
b: Ivory beads (K1A/Level4)
c: Bone beads (K1A /Level 3)

5.3.4 Fauna

Domestic stock dominates the Swahili fauna assemblage followed by wild animal and fish. Of the domestic fauna, cattle *(Bos taurus)* are the largest group, followed by chicken and then sheep and goat *(Ovis/Capra)*. Seven pieces of ivory bones recovered from the Swahili strata (Trench K1A, stratum 3) probably hint to the existence of elephant hunting and ivory trade during this period.

Shellfish species, *Terebralia polustris*, *Cerithidea decollata* and *Chicoreus ramusus* were heavily accumulated. On the other hand, shellfish species including *Saccostrea cucullata, Anadara spp., Haliotidae spp., Achatina spp., and Oliva spp.,* experienced a sharp decrease of accumulation in Swahili phase when compared with Zanjian phase. Conversely, shellfish species types such as *Cyprae annulus/moneta and Polinices mammilla* continued to be common in Swahili phase as it was in Zanjian phase.

5.4 Post-Swahili Phase

Local pottery from Post-Swahili phase is characterized by brown or dark reddish gray surface colour with a light grayish core (Fig. 5.26). Common motif in pottery is impressions that seem to have been executed by fingernails. Post-Swahili ceramics have been previously retrieved in the surroundings of Pangani Bay by Walz's (2010: 112) work and dated to post-1750 AD.

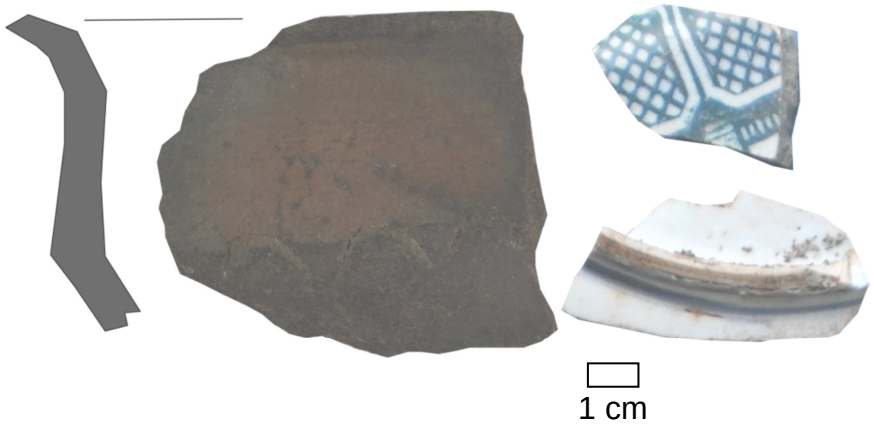

Fig. 5.26: Local and imported pottery in Post-Swahili phase
Left: Post-Swahili pottery with fingernail impression (K1/Level 2). Orifice diameter: 250 mm. Rim thickness: 10 mm. Surface colour: Dark reddish gray (Hue 10R 3/1)/Core colour: Light reddish gray (Hue 10 R 7/1).
Right: Imported blue and white porcelain (K1A level 2).

Imported pottery during this period is dominated by *blue and white Porcelain* (Fig. 5.26). It is made in a form of bowl and characterised by hard white fabric and a smooth fracture. The pale creamy glaze has a bluish-gray tint. Decoration includes blue, red or black painted lines together with simple floral and abstract design. At Shanga (Horton 1996: 310), identical ware was identified as a bowl, but in a non-stratified phase, and dated to 14th century AD. In the sequence of Pangani, this ware appears within the Post-Swahili phase (1500–1750 AD).

5.5 Summary

The results from examined stratigraphy and cultural materials demonstrate a sequence of cultural history at Pangani Bay that can be divided into the following three phases: Zanjian, Swahili and Post-Swahili. Zanjian occupational layers underlie Swahili cultural deposits both at Kimu and Muhembo sites on the Pangani Bay. Using C14 dates (Fig. 4.9) as well as the typological study of local (Fig. 5.2), and imported (Fig. 5.9) pottery, the Zanjian phase is dated from 8th to 13th centuries AD. The second, Swahili phase is dated to between the 13th and 16th centuries AD, and the Post-Swahili phase from 16th to 18th centuries AD. The study of pottery typology helps to classify the basic differences and similarities between Zanjian and Swahili phases. Zanjian assemblage has jars with course sand temper, and profile of pottery type-2 is characterised by sharp angular profile between the neck and the body (Fig. 5.3). Swahili jars is tempered with fine sand,

and angular profile that separate the neck and the body in pottery-type 2 (Fig. 5.18), is less prominent as in Zanjian vessels.

A continuing and changing tendency is documented in the decoration style of the Zanjian and Swahili traditions. A key factor separating the two traditions is the emphasis of triangular incisions (Fig. 5.2), in Zanjian phase and a row of punctuates in Swahili period. The Zanjian tradition has high record of incised pottery, but the incisions were bold and crudely cut (Fig. 5.2). In contrary, Swahili assemblage contained very few incised pottery, but the incisions were precisely executed and neat (Fig. 5.17).

The study of imported materials from the archaeological stratigraphy of Pangani Bay suggests that maritime trade tradition firmly established during Swahili phase was rooted in Zanjian period. Trade activities that resulted to the availability of foreign ceramics and glass beads in Zanjian and Swahili settlements seem to have continuously evolved from 8th to 16th centuries AD. Foreign ceramics from China, Indian sub-continent, and Middle East were recovered from archaeological contexts associated with both Zanjian and Swahili settlements. With time, the imported pottery of Swahili period had become quite different from those popular during Zanjian period. However, the similarity in term of the quest for foreign items and trade relation with regions where imports originated were maintained and improved.

In conclusion, the excavated cultural materials reveal a general pattern of continuing and changing patterns of trade traditions and material culture between the Zanjian and Swahili phases. The latter suggests that the chronology of Pangani Bay between 8th and 16th centuries AD represents a homogenous population undergoing cultural evolutionary trend toward urbanism associated with increased trading, fishing and craftworking activities.

CHAPTER SIX
POTTERY ANALYSIS AND RESULTS

6.0 Introduction

This chapter provides a comparative analysis of Zanjian and Swahili pottery from the excavations at Pangani Bay. Study materials comprised of 4,641 diagnostic sherds from Zanjian phase which are compared with 4,520 diagnostic potsherds from Swahili assemblage. The studied inventories from both phases were recovered from within housing context of ancient villages located at Kimu and Muhembo sites (Chapter 5). The frequency variability of pottery shapes, size, temper and decoration attributes was examined between the two phases in order to record change and continuity of pottery making traditions over time. The aim of the analysis was to investigate the hypothesis that Swahili pottery making traditions might had been rooted from those of Zanjian period. The chapter begins with the analysis and results of pottery shapes, followed by size, temper and decoration. The last section provides the summary and conclusion of the chapter.

6.1 Pottery Shape

The study recognized six distinct vessel shapes from Zanjian and Swahili pottery assemblages. These included necked jars, globular jars, open bowls, closed bowls, carinated bowls and bowls with beaded rims (Fig. 6.1).

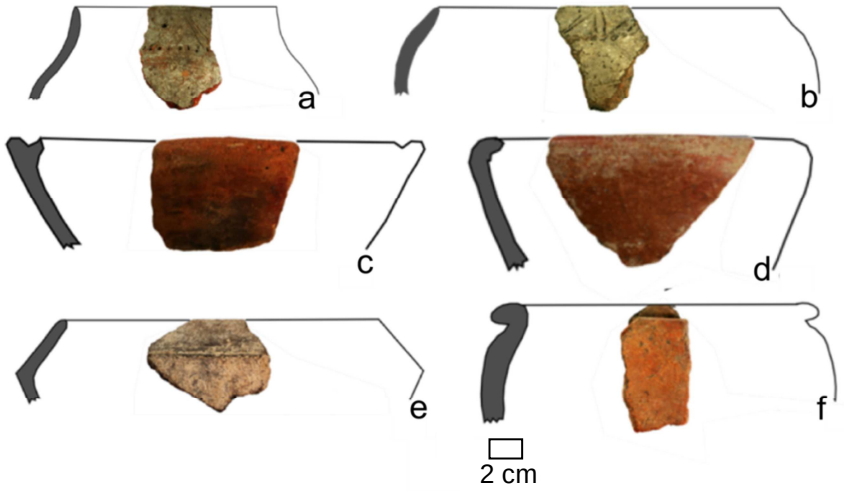

Fig. 6.1: Different pottery shapes identifiable from Zanjian and Swahili phases at Pangani Bay sites. A = necked jars, b = globular jars, c = open bowls, d = closed bowls, e = carinated bowls, f = bowl with beaded rim.

This classification differs slightly to that of Juma`s (2004: 88–106) study that groups ceramics into two categories: restricted and unrestricted jars. The former contained mostly necked jars, while the latter included bowls. Fleisher and Wynne-Jones's (2011: 265) classification (Fig. 6.2) broadly matches shape categorization approach used in this analysis. However, this study includes one new category, the bowl with beaded rim (Fig. 6.1, f).

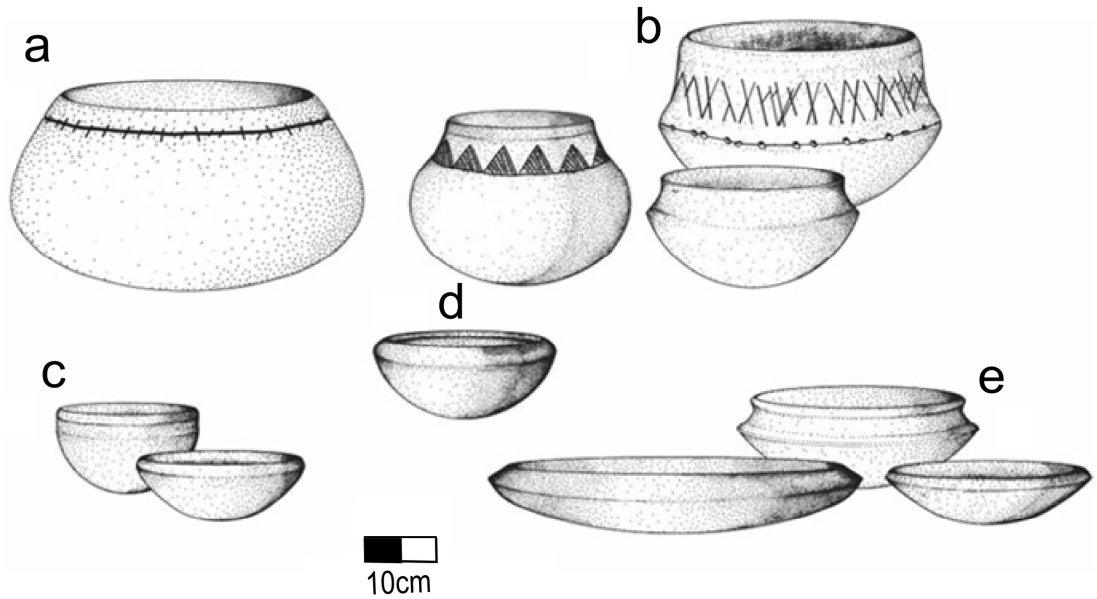

Fig. 6.2: Different pottery shapes as identified by Fleisher and Wynne-Jones (2011: 265) from Zanjian phases of the East African Coast. A = globular jars, b = necked jars, c = open bowls, d = closed bowls, and e = carinated bowls.

Only sherd that had combination of rim, neck and body sections, all at once, was considered suitable for identification of vessel shapes. Therefore, a total of 1,290

of such potsherds qualified as study sample from Zanjian assemblage and 1,204 potsherds came from Swahili assemblage. The criteria for identification of a potsherd into its specific shape category resembles to that used by Chami (1994: 78–79). In this analysis, the classification of a sherd into its specific vessel shapes as illustrated in Fig. 6.1 considered the following factors:

1. Necked jar: inflected contour is found between neck and shoulder in the general curvature of the sherd profile. In other words, a sherd is considered necked jar when its maximum diameter occurs in the body and exceeded the orifice diameter.
2. Globular jar: maximum diameter occurs between shoulder and base, but it lacks inflection curve between neck and shoulder as it happens in necked jars.
3. Open bowl: no part of the vessel body is wider than the orifice. Given to the fact that bowls were found to have several sub–classes, it was exclusively categorized as open bowl only when a sherd was found to have out–turned rim.
4. Closed bowl:rim is inverted.
5. Carinated bowl: composite contours in the general profile and its maximum diameter is not found in the orifice but in the body section.
6. Bowl with beaded rim: upper rim section is in the form of a small rounded molding.

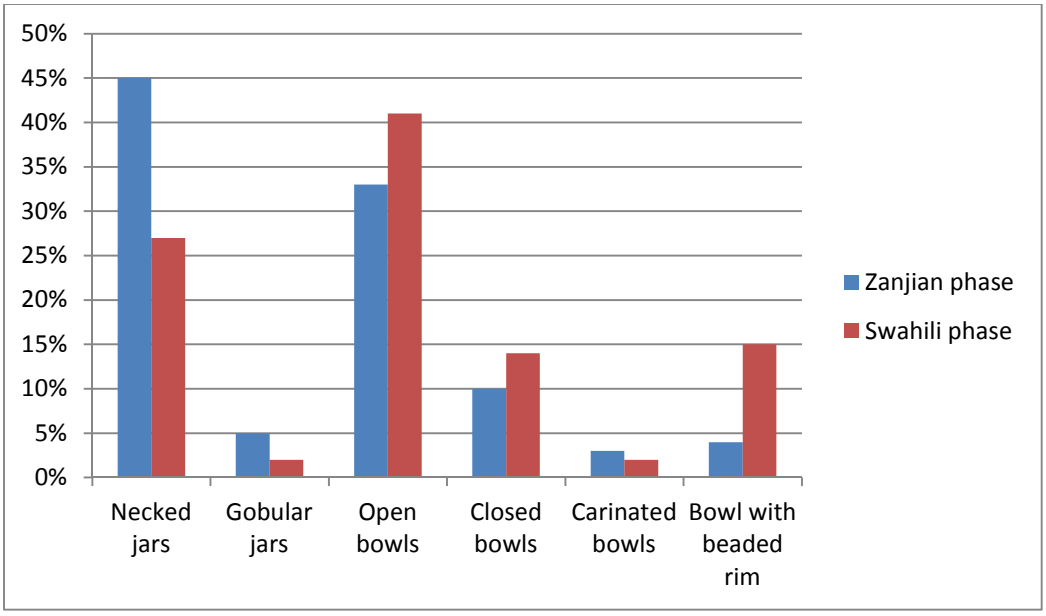

Fig. 6.3: Frequency of major vessel shapes in Zanjian and Swahili phases.

Using the above described identification criteria, a total of 576 necked jars (45%), 66 globular jars (5%), 422 open bowls (33%), 134 closed bowls (10%), 42 carinated bowls (3%), 50 bowls with beaded rim (4%) was identified from Zanjian pottery. On the other hand, a sample from Swahili phase was found with 324 necked jars (27%), 20 globular jars (2%), 492 open bowls (41%), 172 closed bowls (14%), 20 carinated bowls (2%), 176 bowls with beaded rim (15) (Fig. 6.3).

The shape analysis of ceramics from Zanjian and Swahili periods provides a significant contribution to our understanding of the development of pottery tradition at Pangani Bay. Swahili potters integrated similar shape types descending from Zanjian period. Two most common vessel shape, open bowls and necked jars were produced during the Zanjian period and continued to be made in the Swahili period. The frequency of vessel shape varies from phase to phase (Fig. 6.3), but the difference is not remarkable to overshadow the degree of continuity. The increase of frequency is noted in the open bowls and bowls with beaded rim during Swahili period, coinciding with the declining frequency of necked jars. Nevertheless, other vessel shapes such as globular jars, closed bowls and carinated bowls maintained relatively similar frequency from one phase to the next, suggesting a stable pottery tradition. Diachronic pattern of vessel shapes supports the hypothesis that pottery tradition associated with Swahili culture is rooted from ceramic traditions found in Pangani Bay from the beginning of the 8th century AD.

6.2 Orifice Diameter

The pottery sample for the analysis of vessel orifice sizes consisted of 1,290 sherds from Zanjian assemblage and 1,204 sherds from Swahili phase. The same pottery material was used to determine the vessel shapes per phase and produced the significant results (Fig. 6.3). To determine the orifice diameter, the lip surface of the sherd was placed in contact with standard rim diameter chart. Then the sherd was moved onto various arcs to determine which provided the closest fit to the curvature of the lip. The diameter of the circle described by that arc was then recorded as the diameter of the pot at the orifice.

Pottery materials from both phases were initially classified into two major categories. They consisted of jars and bowls. The analysed jars from Zanjian and Swahili phases were composed of four different classes of orifice diameters. They were composed of small (140–180 mm), medium (200–230 mm), large (280–320 mm) and very large (360–400 mm) orifice diameters. The frequency of jar and bowl's orifice diameters presented for Zanjan and Swahili phases is given in Figs. 6.4 and 6.5, respectively.

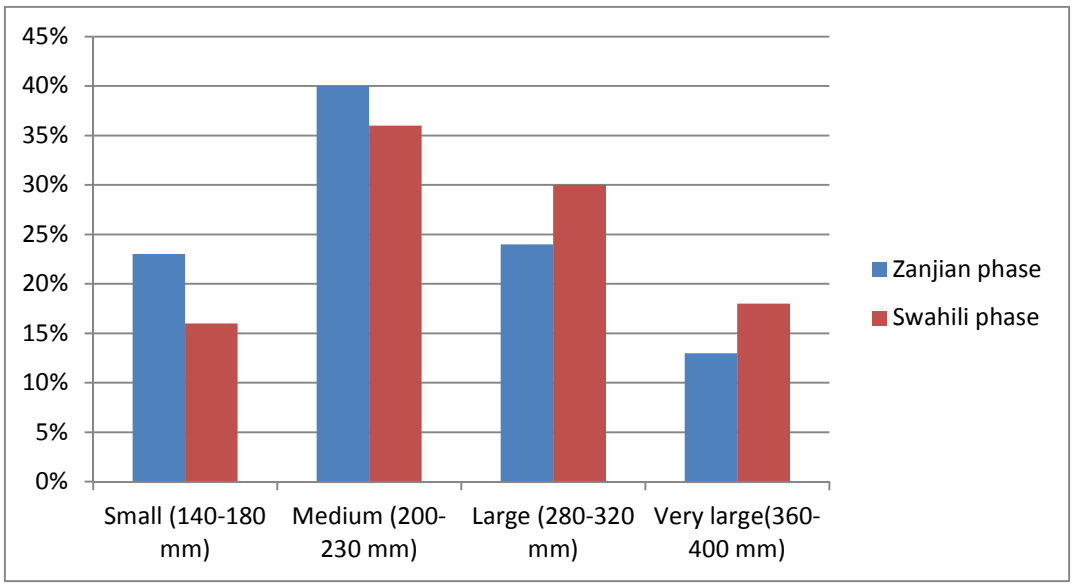

Fig. 6.4: Frequency variability of jar orifice sizes from Zanjian to Swahili phases.

A total of 257 (40%) sherds of the analysed jars from Zanjian phase had medium orifice diameter, 154 (24%) large, 148 (23%) small, and 83 (13%) had very large orifice. From Swahili assemblage, 124 (36%) jar sherds were medium, 103 (30%) large, 62 (18%) very large and 55 (16%) had small orifice diameter. On the other hand, the identified frequency of the Zanjian phase's bowls consisted of 201 (31%) sherds with large orifice diameter, 156 (24%) very large, 149 (23%) small and 143 (22%) medium. In the analysed bowls from Swahili assemblage, 387 (45%) sherds were large, 258 (30%) very large, 146 (17%) medium and 69 (8%) had small orifice diameter (Fig. 6.5).

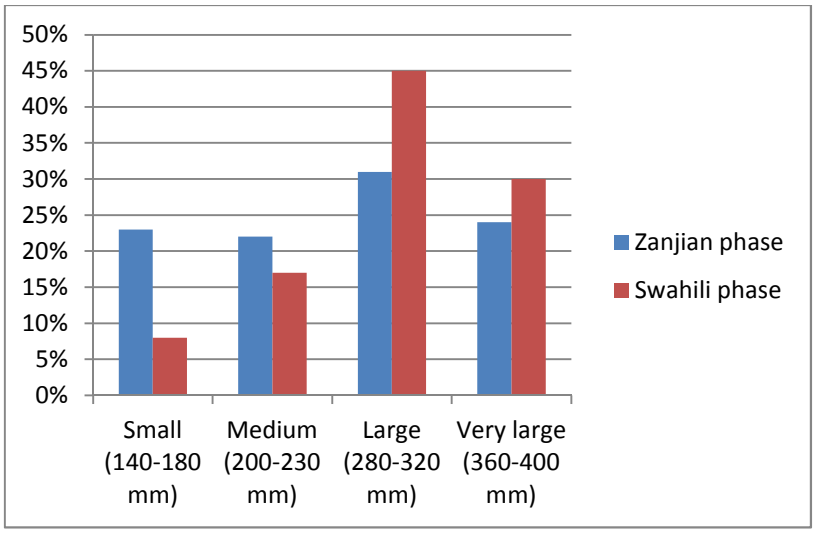

Fig. 6.5: Frequency variability of bowl orifice sizes from Zanjian to Swahili phases.

The analysis results show that the orifice diameters of jars from Zanjian phase have related sizes to Swahili pottery tradition. Zanjian assemblage is dominated by jars with medium orifice, a feature which also appears in Swahili tradition. Large orifice sized jars occupy the second position after medium jars in Zanjian phase, a trend which also occurs in Swahili tradition. Jars with small orifice size continue from phase to phase, but their frequency decline during Swahili period. In the analysed jars of Zanjian phase the lowest amount is jars with large sized orifice, but their frequency increase during Swahili period.

The analysed bowls from both phases were dominated by large and very large orifice sizes. Unlike earlier phase, Swahili phase contained fewer small sized orifice bowls. The increase of the percentages in the large and very large orifice bowls during Swahili period, together with the decrease of those with small sized orifice, probably reflect the higher preference of large vessels during this time than the period before. Other than the reduction of medium and small orifice bowls in the Swahili phase, the results emphasize the frequency continuity of bowl's orifice sizes from phase to phase.

Generally, diachronic pattern indicates that the same, probably acceptable variation of the vessel orifice sizes during Zanjian phase persisted to the Swahili period. This upholds the hypothesis that much of the Swahili pottery tradition internally originated from within Pangani Bay.

6.3 Temper

Zanjian ceramics from different sites on the East African coast have been repeatedly identified to be composed of either, shell, fine sand or sandy grit temper (Lindahl 1994: 85–88; Juma 2004: 88–103; Walz 2010: 138). While, the spatial patterning of temper of Zanjian pottery is considered to be more uniform across sites (Fleisher and Wynne-Jones 2011: 267), little is known for the variation of temper type from Zanjian to Swahili periods.

This analysis investigates the continuity and change of traditions in the addition of temper materials by potters from Zanjian to Swahili periods. The analysed material comprises 4,641 and 4,520 sherds from Zanjian and Swahili phases, respectively. Magnifying glass was used for temper identification. Three categories of temper materials were identified from both phases:

1. Coarse: sherds with inorganic materials such as angular quartz and corals with size larger than beach sand.
2. Fine: consisted sherds with beach sand-sized temper.
3. Organic: comprised sherds with shell and bone material as temper.

More than 50% consisting of 2,460 vessels of the analysed pottery from Zanjian phase had coarse temper, 1,717 (37%) had fine temper and 464 (10%) were tempered with organic materials. In Swahili phase, 2,215 (49%) sherds were tempered with fine sand, 1,311 (29%) by coarse temper and 994 (22%) were tempered with organic materials (Fig. 6.6).

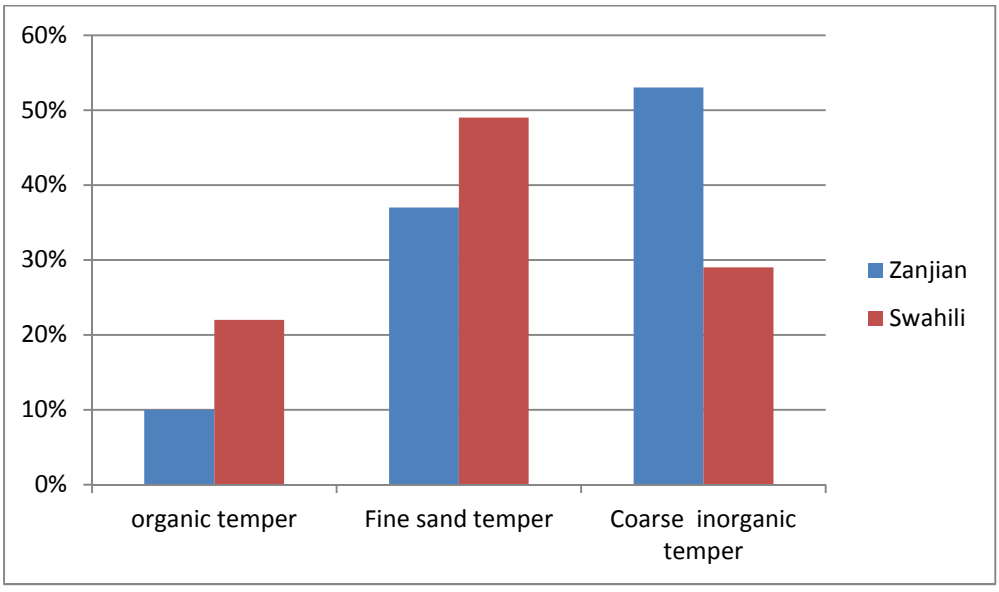

Fig. 6.6: Frequency variability of vesseltemper from Zanjian to Swahili phases.

Diachronic patterns in the Zanjian-Swahili temper types may be summarized in terms of two general trends: (1) the increase of the vessels with fine sand temper (2) a concomitant decrease of the vessels with coarse inorganic temper during Swahili period. However, the general data put forward that all temper materials continued to be used from phase to phase. Hence, Swahili potters integrated all temper materials descending from Zanjian period, but over time, they reduced the amount of vessels with coarse temper by the increase of those with fine sand temper.

6.4 Decoration

The analysis of pottery motifs aimed at investigating the continuity and change of traditions concerned with vessel decoration between Zanjian and Swahili phases. The study material consisted of 724 and 640 decorated sherds from Zanjian and Swahili phases, respectively. In the analysis, a motif was identified from a single sherd after the recognition of its design element[5]. Once a motif was identified it was given a specific label differentiating it from other motifs. Then, all potsherds bearing this particular motif were clustered in one group. A total of 24 pottery motifs that are alphabetically labelled from A to X were identified across Zanjian and Swahili phases. The illustrations and descriptions of these motifs are presented in Fig. 6.7. The number of vessels identified with a particular motif from both Zanjian and Swahili phase is presented in Table 6.1. The graphic representation of frequency variability of motif per phase is presented in Fig. 6.8.

[5]A design element has been defined as independent pattern which in multiple combination form motif (Chami 1994: 74; Chiu and Sand 2005).

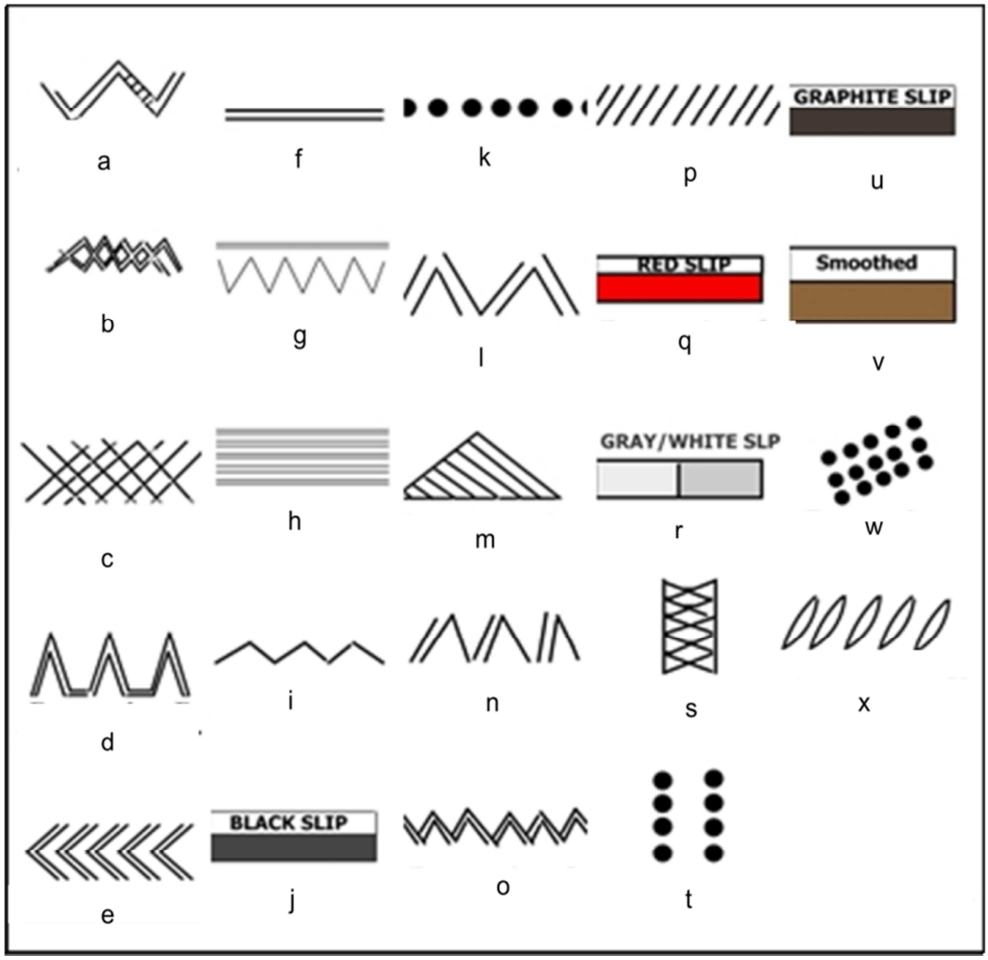

Fig. 6.7: Ceramic motifs across Zanjian and Swahili phases.

a. horizontal double-lined zigzag-shaped triangles placed one inside the other. In the central space of these triangles, a series of lines has been added to the main pattern, uniting the two triangles.
b. a horizontal succession of incised double lined interlocking triangles that are placed one opposite the other.
c. cross hatching design whereby a double set of parallel lines is incised perpendicular to each other.
d. a horizontal succession of sets of incised double-lined, non-inverted shaped triangles placed one inside the other. A horizontal lines act as a bridge to unit one set of triangles to another.
e. a horizontal succession of incised double-lined << (a left quote mark) shaped triangles placed one inside the other.
f. a horizontal double line (with = mark-shape) that run across the neck of the pot.
g. a horizontal succession of incised single-lined zigzag-shaped triangles. The upper parts of the triangles are bound, by double lines that run parallel to the set of the continuing triangle.
h. a horizontal succession of a band of horizontal lines that run around the neck of the pot.
i. a horizontal succession of incised single-lined design that forms zigzag-shaped triangles.
j. black slip that is applied on exterior or interior or both surfaces of the vessels.
k. a horizontal succession of punctuates that form a single line motif.
l. a horizontal succession of incised double-lined zigzag-shaped triangles placed one inside the other. The two lines that are supposed to meet at the upper and lower angles of these triangles are left unattached to each other.
m. a horizontal succession of a set of joining triangles filled in with lines. The infill of each triangle is made by a band of parallel oblique incised lines.

n. a horizontal succession of mirrored triangles. Each triangle is preceded by an oblique line that parallel one side of the triangle.
o. a horizontal succession of narrow incised double-lined zigzag-shaped triangles placed one inside the other.
p. a horizontal succession of a band of parallel oblique lines that run around the neck of the pot.
q. red slip that is applied on exterior or interior or both surfaces of the vessels.
r. white or gray slip that is applied on exterior or interior or both surfaces of the vessels.
s. a set of vertical rectangles filled in with the cross hatching motif.The infill of each rectangle is made with a set of parallel lines that are incised perpendicular to each other.
t. a vertical double line of punctuates that form a rectangular motif if united.
u. vessels with graphite pattern that covers the outer, inner or both surfaces of the vessels.
v. vessels that appear with a smooth surface texture probably as a result of rubbing a leather hard surface with a hard but smooth tool.
w. a band of oblique lines of punctuates that form an oblique rectangle motif if united.
x. a line motif formed by successive thumb impressions.

As indicated in Table 6.1, four major groups of decoration motifs were discovered across the Zanjian and Swahili phases. These include motifs:

A) recorded in both phases, but increase in Swahili phase: a row of punctuations (motif = k) and gray/white slip (motif = r).
B) identified in both phases but decrease in Swahili phase: graphite or red/black slip (motifs=j, q, u, v).
C) appeared in both phase with equal frequency: incised lines around the neck (motifs=f, h).
D) occurred only in Zanjian phase: triangular incisions (motifs a–e, g, i, l–o, s).

The Zanjian ceramics contained a diverse range of motifs types including: triangular incisions, punctuations, gray as well as black and red slips. Triangualar incised motif has been classified as distinct style forthe definition of Zanjian period (Chami 1994: 72). In this analysis, it was found to be largely varied in term of styles, but maintained very low frequency (<2%) among the decorated vessels of the Zanjian phase (Fig. 6.8). As time went on, triangular incisions became very rare. They significantly drop to almost nil during Swahili period. However, other predominant motifs such as punctuates and surface slips continued from phase to phase with increased frequency.

	Zanjian phase		Swahili phase		Percentage variation of motif per phase			
Motif	Number of vessels	%	Number of vessels	%	% only seen in Zanjian phase	% equal in both phases	% reduced in Swahili phase	% increased in Swahili phase
a	4	1	0	0	a			
b	3	0	0	0	b			
c	13	2	2	0	c			
d	4	1	0	0	d			
e	3	0	0	0	e			
f	10	1	5	1		f		
g	5	1	0	0	g			
h	55	8	50	8		h		
i	6	1	0	0	i			
j	134	19	74	12			j	
k	38	5	89	14				k
l	3	0	0	0	l			
m	10	1	0	0	m			
n	11	2	3	0	n			
o	10	1	0	0	o			
p	14	2	0	0	p			
q	156	22	132	21			q	
r	79	11	218	34				r
s	7	1	3	0	s			
t	6	1	4	1		t		
u	47	6	12	2			u	
v	93	13	43	7			v	
w	10	1	3	0	w			
x	3	0	2	0	x			
Total	724	100	640	100				

Table 6.1: The number of vessels and their respective motifs in Zanjian and Swahili phases.

The analysis indicates that other decoration types prevent the declining trend in the use of triangular motif to form discontinuity between Zanjian and Swahili phases. For example, a band of horizontal lines that run around the neck of the pot is the common motif at both phases. This indicates considerable continuity in the decoration of vessels between the Zanjian and the Swahili pottery. Also, a row of punctuated line and gray/white slip are fairly frequent decoration types in the Zanjian phase and they are present at an even higher frequency in Swahili phase.

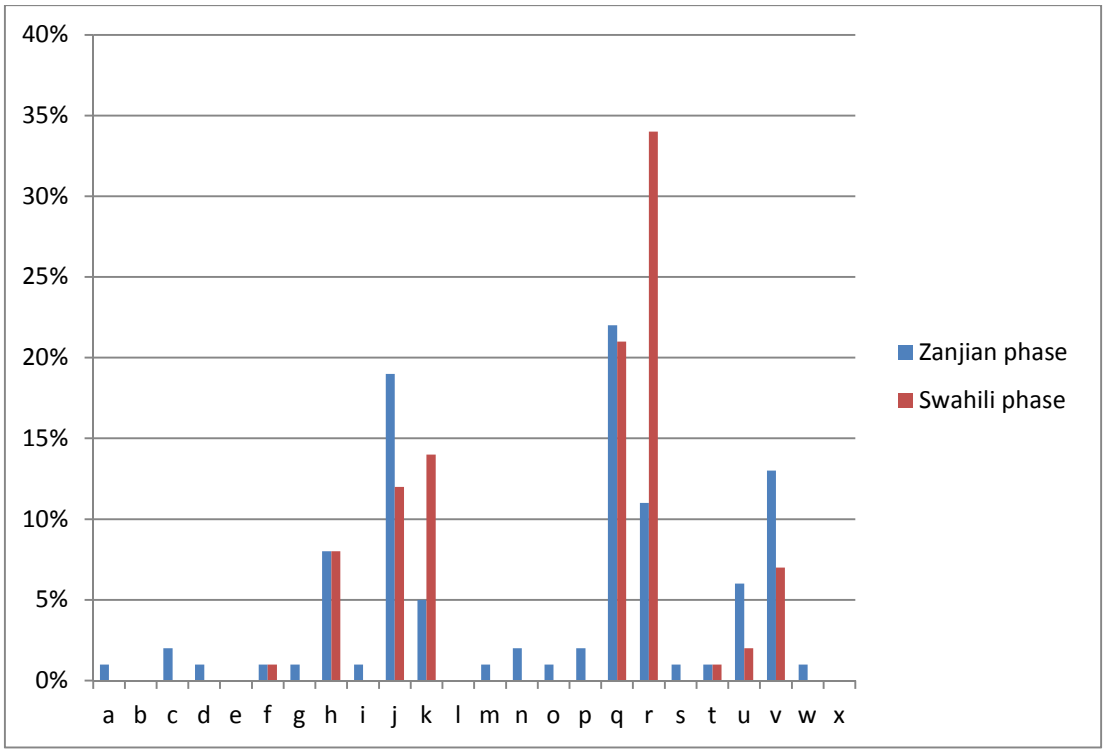

Fig. 6.8: Frequeny variability of vessel motifs in Zanjian and Swahili phases

Generally, despite temporal variability of the motifs from phase to phase, the analysis supports the conclusion that Swahili pottery traditions integrated almost all decoration motifs practised during Zanjian period.

6.5 Summary

This chapter has presented some interesting insights on the continuity and change in the ceramic traditions of Zanjian and Swahili communities in Pangani Bay between 8th and 16th centuries AD. The ceramic sequence presents a great deal of stylistic continuity from Zanjian period onwards, indicating an uninterrupted local development. This continuity can be traced in the persistence, across phases, of vessel shapes, sizes, temper materials and decoration motifs. For example, open bowls with large orifice diameter are produced in Zanjian phase and the frequency of production increase in Swahili period.

The only transition in the ceramic sequence that appears to be abrupt between the two phases is vessels decorated with triangular motifs. They occur in various styles during Zanjian period, but are very few in the Swahili phase at the expense of punctuated wares. However striking this change might have been, it is important to emphasize that the Zanjian-Swahili sequence does not represent a

total break in the ceramic tradition, whether stylistic or technological. For example, vessels decorated with a band of horizontal lines were made during Zanjian period and persist unchanged into the Swahili phase.

The variability of pottery attributes between Zanjian and Swahili phase such as increased punctuated motifs during Swahili period has prompted some scholars to express the view that the transition was brought by the immigrating people bearing foreign traditions (Chami 1998: 213). Given the continuities just discussed, however, the view that this transformation was an indigenous process becomes more preferable and conceivable by this study. Undoubtedly, interaction with other regions and ceramics traditions conditioned the content and perhaps some ceramic changes, but I see no compelling evidence to believe that "neck punctuated" ceramics necessarily had to be brought in by an outside group.

Summing up the evidence just presented, it appears that Zanjian pottery traditions underwent a gradual development through time. The ceramic chronology is marked by continuities of traits from one phase to the next. These continuities support the notion that the Zanjian and Swahili phases represent local evolved culture – slightly affected by other groups from outside.

CHAPTER SEVEN
GLASS BEAD ANALYSIS AND RESULTS

7.0 Introduction

In 2010 and 2012 excavations at Pangani Bay, a significant number of glass beads were retrieved from Zanjian and Swahili phases. The glass beads associated with many other artifacts were found from settlement context of ancient villages that flourished at Muhembo and Kimu sites (Table 7.1). The context in which these beads were found suggested that they were imported, and that they were items for trade given that the existence of a local manufacturing site had yet to be confirmed. The recovery of glass beads in smaller number (n = 171) in Zanjian than in Swahili phase (n = 2,930), readily suggest that a change occurred between these two phases. The communities during Swahili phase imported more glass beads than those during phase.

Despite this change of glass bead quantity from phase to phase, the data still allow to test the continuity or change of the specific type of beads imported over time. Do the people in Swahili phase imported specific type of beads similar or different to those imported during Zanjian period? If the type of beads imported in both phases were similar in the method of manufacture, form, and colour, it might indicate that similar preferences of aesthetic value and import type of people in the Swahili phase originated from Zanjian period. The dissimilarities should propose other possible explanation that these two phases were occupied by two groups with different trade tradition backgrounds.

Trenches		K1	K1A	K2	K3	K4	M1	M1A	M2	M2A	Total
Phases	Zanjian	109	18	2	24	0	6	2	0	10	171
	Swahili	935	536	375	998	73	0	0	5	8	2,930

Table 7.1: Glass beads from Zanjian and Swahili phases.

This analysis therefore tests the hypothesis that the people in Swahili phase imported similar type of beads as those seen in Zanjian period. A comparative analysis, quantitative, of the technological attribute (method of manufacture) form attributes (shape and size) and stylistic attributes (colour) of the glass beads from

both sites is used to test this hypothesis. It is imperative to compare the glass beads from two phases, in order to investigate the origin of advanced trade tradition of glass bead during Swahili period.

7.1 Method of Manufacture

All glass beads from Zanjian and Swahili phases were analyzed to determine if they were formed by either drawing or wounding methods. A bead was classified as drawn when it had either tubular or cylindrical shapes. Also, this bead has to be confirmed that it was made by the processes that involved the drawing out of hot glass matrix by a metal rod to form long tube, which, when cooled is broken off into cylindrical segments forming tubular beads (Horton 1996: 328). On the other hand, beads were considered wound when they had ellipsoid, barrel, bicones or spherical shapes and showed to have been made by a furnace winding process. This happens when a thread of glass is drawn out from a molten matrix and wound around a thin rod until the desired bead size is reached (Wood 2011: 30).

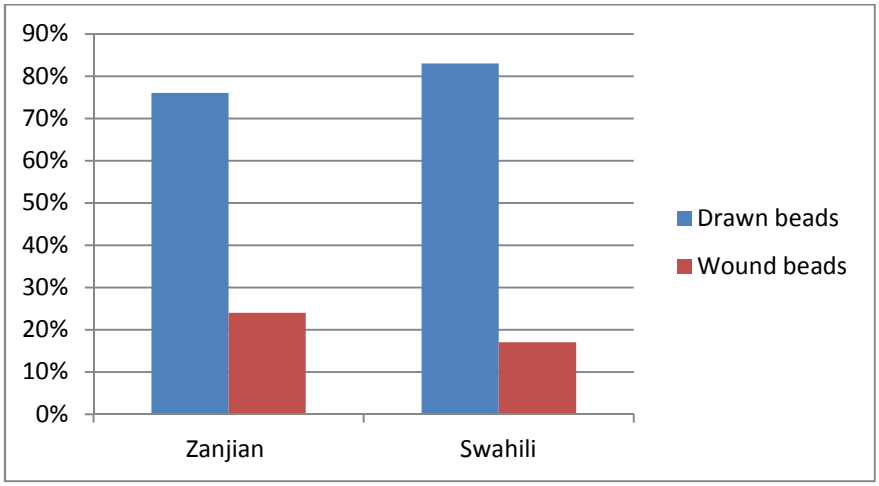

Fig. 7.1: Frequency of bead manufacture- type in Zanjian and Swahili phases.

The analyzed glass beads from Zanjian phase were composed of 130 drawn (76%), and 41 wound beads (24%). Swahili assemblage was comprised of 2,426 drawn (83%) and 504 (17%) wound beads (Fig. 7.1). The comparison between Zanjian and Swahili phase shows that drawn beads dominate both phases. While the frequency of drawn beads keeps growing from Zanjian to Swahili phase, frequency of wound bead drops. The analysis indicates that the technological

attributes and specifically the methods of manufacture of glass beads imported during Zanjian and Swahili periods were similar. The drawn beads which are considered to have been produced in large quantity and cheap sale (Horton 1996: 328) continued to be the most preferable import from Zanjian to Swahili periods.

7.2 Shape

Glass beads from Zanjian and Swahili phase can be separated into five basic shapes: cylindrical tubular, oblate, spherical, and barrel (Fig. 7.2). To classify each bead into its respective shapes the guidelines developed by (Wood 2011: 31) were followed. A bead was considered in a particular shape by observation of the following factors:

1. Tubular: they have parallel straight sides and its ends may be left untreated or slightly rounded by reheating.
2. Cylindrical: are similar to tubular, but their ends have been heat treated to the point that the bead has a rounded profile.
3. Oblate: have been heat treated to the point that the entire length of the bead has a smoothly rounded profile. Their lengths are always less than their diameters.
4. Spherical: are round with lengths that are roughly equal to diameters.
5. Ellipsoid: are elongated sphere with lengths that are greater than diameters.
6. Barrel: have rounded sides and flat ends.
7. Bicone: have two symmetrical cones with a common base.

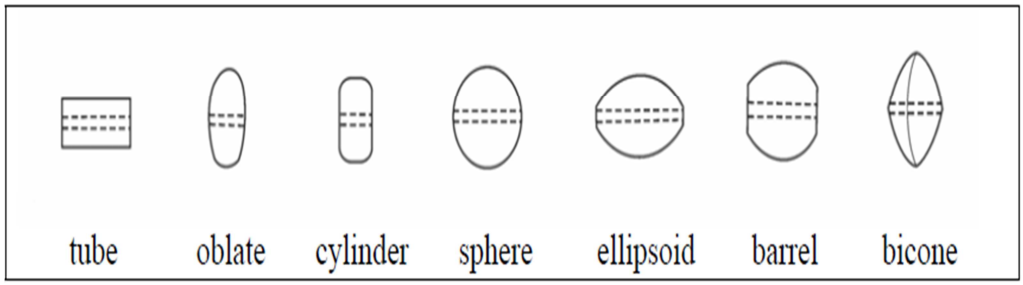

Fig. 7.2: Bead shapes (Adopted from Wood 2011: 31).

The identified bead shapes in Zanjian phase comprise 84 cylinders (49%), 31 tubular (18%), 31 oblates (18%), 18 barrel (10%) and 8 sphere (5%). In Swahili

phase, 1,802 beads (62%) were cylindrical in shape, 483 spherical (175), 337 oblate (12%), 284 tubular (284%) and 23 barrel (1%).

The analysis indicates that the predominant bead shape in Zanjian phase is drawn cylinder (Fig. 7.3). Its frequency kept growing and ultimately became the prevalent bead shape in Swahili phase. Other bead shape type that its frequency increased is spherical bead. High frequencies exist for tubular, oblate and barrel shaped beads during Zanjian phase. However, their frequencies kept declining toward Swahili phase.

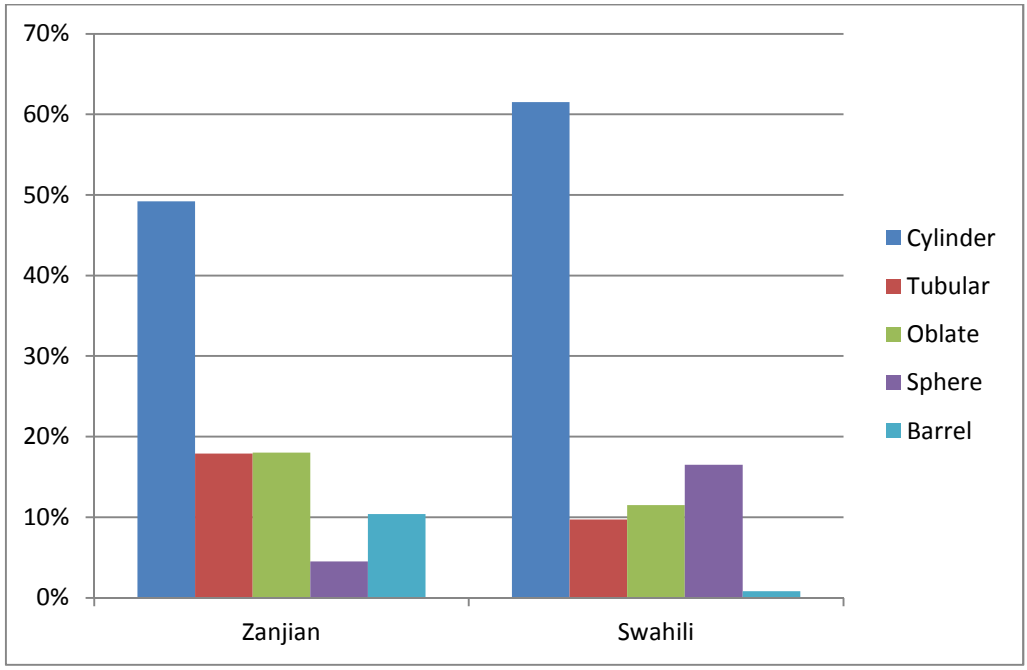

Fig. 7.3: Frequency of bead shape in Zanjian and Swahili phases.

About 50% of the glass beads that circulated between the 8th to 13th centuries AD in Pangani Bay were cylindrical in shape. The preference of cylinder shaped beads is associated with the high importation of drawn beads (Fig. 7.1) which were made in that shape. The high import of cylinder shaped drawn beads in expense of other type of beads continued from 8th to 16th centuries AD onwards, suggesting the continuity of trade traditions between people in Zanjian and Swahili periods.

7.3 Size Range

By employing Wood (2011: 34) criterion, the entire glass bead assemblage in this study was classified with the following basic sizes: minute, small, medium, large or very large (Table 7.2).

Size designation	Diameter
minute	≤2.5 mm
small	>2.5 – 3.5 mm
medium	>3.5 – 4.5 mm
large	>4.5 – 5.5 mm
very large	>5.5 mm

Table 7.2: Bead size classes

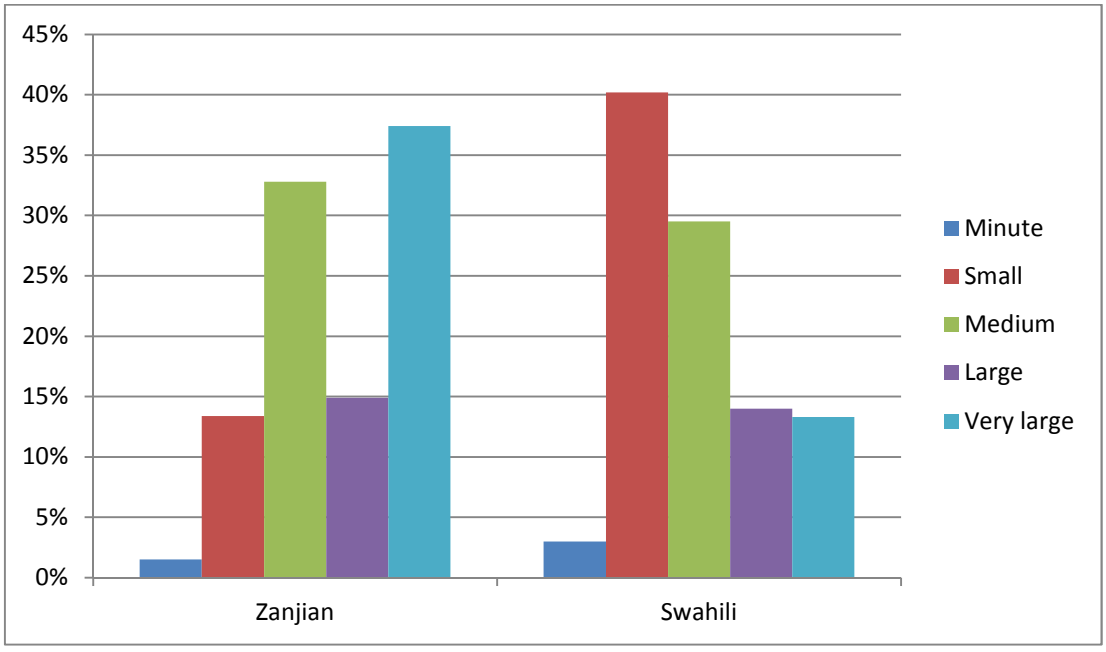

Fig. 7.4: Frequency of bead size range in Zanjian and Swahili phases.

Of the analyzed glass beads in Zanjian assemblage, 64 had very large size (37%). Another 56 beads were in medium (33%), 25 large (15%) and 23 (13%) were in small size range. Only 3 beads (2%) were in minute size. On the other hand, small sized beads (n = 1,178) dominate Swahili assemblage. They form 40% of the analysed beads. The second predominant bead size range is medium with a total number of 864 beads, making 30% of the assemblage. The remaining beads were 410 large (14%), 390 very large (13%) and 88 beads (3%) were in minute size range.

The analysis reveals that a varied size ranges of glass beads that were favored during Zanjian phase continued to imported and used during Swahili period. For example medium sized bead is the second predominant group in both Zanjian and Swahili phases, suggesting the continuities of size-preference between the two phases. However, a change is noted in the preference of very large versus small sized beads. Very large beads were mostly privileged during Zanjian phase, but they were less predominant during Swahili period. Instead, small sized glass beads were the dominant group during Swahili period (Fig. 7.3). The appearance of all glass bead sizes ranges in both phases despite frequency change support the hypothesis that the import-use tradition of people in Swahili phase was rooted in Zanjian period.

7.4 Colour

Glass beads in Pangani Bay were not colour-standardized and it had huge hue variations as affected by size and shape. Even a colour classification using the Munsell Book of colours (Munsell 1976) for the sake of standardization proved to be inadequate for colour description. Describing individual colour for each bead using the Munsell Book of colours, from thousands of such beads would be needlessly time consuming and with less outcome. Munsell numbers have other limitations such as their lack of suitability for databases and as a result they cannot easily be sorted by colour group (Wood 2011: 36).

To accomplish the task of comparing colours between Zanjian and Swahili bead assemblages, this study follows the guidelines for identification of standard bead colours proposed by Horton (1996: 328). I used generic names (e.g. yellow, green or red) for classifying each bead into its respective colour group. Then, I looked for further confirmation using the relevant Munsell chip of the Munsell Book of colour. Therefore Munsell Book of colour was used just for reconfirmation and assurance that each bead is assigned in its proper colour group. Using this classification approach, seven colour groups were identified from both Zanjian and Swahili phases. Each glass bead colour from the seven identified main groups had its subsequent colour-range as follows:

1. Yellow: ranges from pale yellow, yellowish brown to orange.

2. Green: pale green, mid blue to dark blue
3. Blue: pale blue to blue-green.
4. Turquoise: sky-blue to greenish-blue
5. Red: mid red, opaque, dark red to brownish red.
6. Black: black to very dark blue black
7. White: white to creamy white.

The analysis of glass beads from Zanjian phase shows that the most popular colours were formed by 56 red beads (33%), 32 green (19%) and 27 black (16%). The remaining beads had the following colours: 26 were yellow (15%), 15 blue (9%), 9 turquoise (5%), and 5 beads were white (3%). In the Swahili assemblage predominant bead colours were identified in 908 red beads (31%), 703 blue (24%), and 586 green (20%). Other beads from the assemblage had the following colours: 352 black (12%), 264 yellow (9%), 88 white (3%) and 29 torquoise (1%).

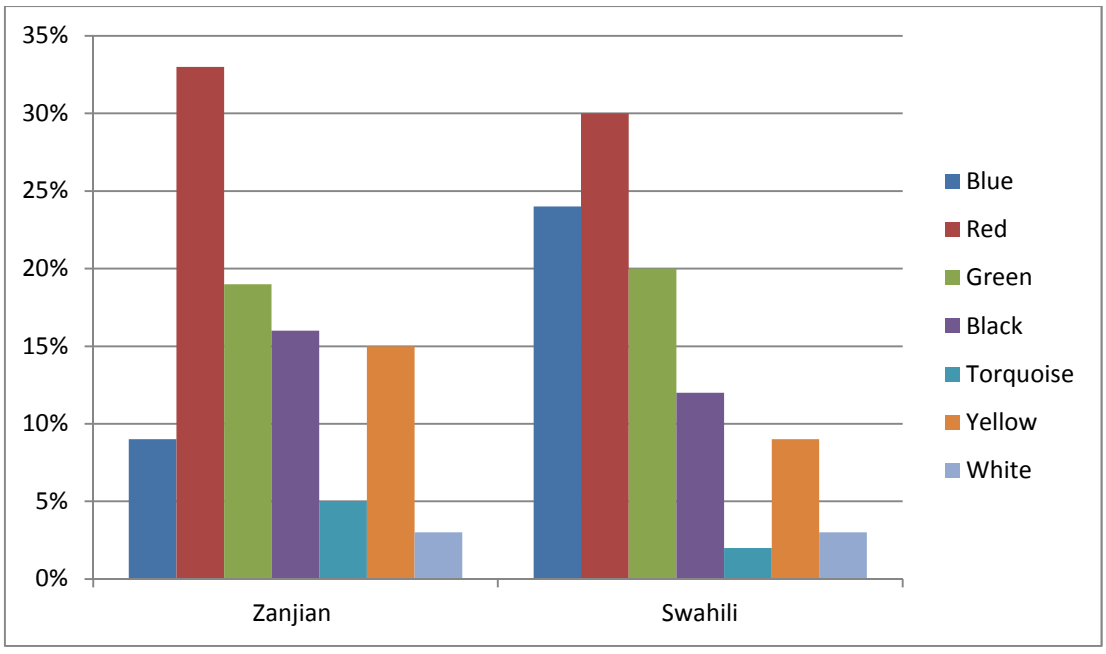

Fig. 7.5: Frequency of bead colour in Zanjian and Swahili phases.

As shown in Fig. 7.4, the predominant glass bead colour for both Zanjian and Swahili phases is red. The latter reflects the continuity of colour-preference from one phase to the next. Blue and green beads were common in Zanjian phase and continued to be highly favoured during Swahili period. However, the colour such as yellow, black and turquoise made good popularity only in Zanjian phase and become less popular in Swahili phase, suggesting preference of one colour over

another during Swahili period. The general data imply that all bead colours continued to be preferred from phase to phase. Over time, the people living in Zanjian and Swahili periods maintained similar frequency of the red coloured beads, and reduced the amount of yellow and black beads at the expense of blue and green beads.

7.5 Summary

New perspectives regarding the continuity and change in the importation and use of glass beads between 8th and 16th centuries AD in Pangani Bay has been presented in this chapter. The glass bead assemblages from both phases show a great deal of technological and stylistic continuities. The technological continuity can be argued from the persistence of cylindrical drawn beads from phase to phase. The perseverance of stylistic attributes is evidenced by the maintained preference of red coloured beads from Zanjian to Swahili periods.

The only change in the importation and use of glass beads that appears to be clear between the two phases is the predominance of large sized beads in Zanjian phase versus small sized ones in Swahili period. This change can be explained by the reduced frequency of wound beads during Swahili period in comparison to that seen during Zanjian period. The reason for that change is probably related to development of pricing and bead manufacturing strategies. The small sized beads which in most cases were drawn type were easy to produce *en masse* and were cheaper in the market than wound large sized beads (Horton 1996: 328). Therefore, it reasonable to contend that over time people preferred cheaper beads than expensive ones. Despite the observed change in bead sizes, the results from the analysis emphasize the continuity of other bead attributes from Zanjian to Swahili periods.

The abrupt increase of glass beads and other foreign objects during Swahili phase in comparison to previous periods on the Tanzania coast has prompted some scholars to express the view that the transition had no local roots. For them this transition might have come as the result of the spread of advanced trade traditions from Lamu archipelago in 13th century AD (Chami 1998: 214). Given the continuities just discussed, however, the view that this transformation was an

indigenous process becomes more plausible. Unquestionably, trade relations of Pangani Bay with other regions existed and this might have contributed perhaps to some changes noted above. Nevertheless, the synthesis of evidence suggests that traditions related to the importation and use of glass beads emphasize continuity than change. These continuities reinforce the notion that Swahili cultural traditions in Pangani Bay might have evolved locally.

CHAPTER EIGHT
FAUNAL ANALYSIS AND RESULTS

8.0 Introduction

This chapter provides an analysis of archaeofauna recovered from field excavation at Pangani Bay. The studied faunal remains from both Zanjian and Swahili phases were recovered from settlement context of ancient villages that existed at Kimu and Muhembo sites between 8th and 16th centuries AD (Chapter 5). Using zooarchaeological procedure, methods and techniques, a descriptive result of faunal analysis is presented. While the shellfish account for a substantial proportion of the recovered faunal deposit (22 kg and 374 g) terrestrial fauna is relatively rare. It is important to note that the whole excavation yielded only 314 bone elements of terrestrial-marine faunal remains other than shellfish.

Nevertheless, this small but significant terrestrial-marine faunal data were submitted to zooarchaeologist specialist, Dr. Thomas Biginagwa of University at Dar es Salaam for a detailed analysis. Using the number of Identifiable Specimens (NISP) technique, the general composition of the assemblage, taxonomic characters and species types over time have been reconstructed. This section presents this faunal analysis result in relation to one of the thesis's objectives; to discover change or continuity of dietary behaviors of Pangani's occupants before and after the emergence of Swahili culture.

8.1 Composition and Taxonomic Abundance

Zooarchaeologists use the Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI) for identifying faunal taxonomic abundance (Biginagwa 2012: 219–21). Both methods measure the approximate number of a certain taxonomic group recovered from a particular site, strata, or excavation unit (Grayson 1973: 432–434; Reitz and Wing 2001: 191). The Number of Identified Specimens (NISP) is a simple tally of the number of specimens retrieved from various taxonomic classes. NISP had often been the lone quantification technique used in faunal analysis until the adoption of the use of Minimum Number of Individuals (MNI) in the early 1950s (Holm 1994: 88).

The use of Number of Identified Specimens (NISP) has many advantages and – like all quantification techniques – great disadvantages (Holm 1994: 87–90; Grayson 1973: 432).

One of the advantages of using NISP is the ease with which can calculate the measurement itself as a simple tally of recovered specimens. In addition, numbers of individual excavation units are easily added to one another, leading to a total quantitative number of identified specimens (Holm 1994: 88). The disadvantage of the NSIP-method is that a researcher does not know whether individual specimens are related to one another. Different bones could be part of the same animal, for example, but the researcher would never know that (Grayson 1973: 432; Holm 1994: 90). Despite these and other relevant downsides of using NISP, the measure can still be useful, especially for understanding broad concepts related to subsistence.

On the other hand the Minimum Number of individuals (MNI) method is defined by Grayson (1973: 433) as "that number of individuals which are necessary to account for all of the skeletal elements (specimens) of a particular species found in the site". There are several advantages of using Minimum Number of Individuals (MNI) as a quantification method. For one, MNI allows more inferences from the data to be made. In addition, the measure gives room the development of further quantification techniques specific to individual circumstances (Grayson 1973: 433). The disadvantage of using MNI is that there is a tendency for the quantification to overestimate the degree to which a site's inhabitants depend on less common species. This error becomes especially pronounced if the faunal sample is small (Holm 1994: 91–92).

Given the fact that the analyzed fauna sample was small in the current study, the analyst chose NISP method to estimate taxonomic abundance in the studied assemblages. NISP values were obtained by counting all the identifiable cranial and postcranial materials that could be securely assigned to a particular taxonomic category (Biginagwa 2012). Each bone was allocated to one of three ccategories. The first category termed *Maximally identifiable* included material identical to body parts and that could be assigned to a specific taxonomic group such as family, genus or species, whenever possible (Biginagwa 2012: 221).

SIZE CLASSES	BODY WEIGHT	EXAMPLE
Artiodactyls 1/Mammal 1	< 10 kg	Rodent, Suni/Dikdik
Artiodactyls 2/Mammal 2	10 – 20 kg	Duikers
Artiodactyls 3/Mammal 3	20 – 80 kg	Ovicaprine, warthog
Artiodactyls 4/Mammal 4	=/> 100 kg	Cattle, buffalo, zebra

Table 8.1: Animal size classes for recording minimally identified fauna (Source: Biginagwa 2012: 223).

A bone element that does not fall into the first category belongs to the second category termed as *Minimally identifiable*: This included material that was identical to a skeletal element and to a particular mammal sizes (Table 8.1), but could not be assigned to exact taxonomic units such as family, genus or species.

The last category is *Non-identifiable:* It includes bone fragments which are often less than 2cm and neither identifiable to body part nor taxonomic unit. The unidentified bone parts were only counted and bagged with important labels of their recovery context.

Results

Table 8.2 presents the general composition of faunal assemblage recovered from the Zanjian phase. About 35.1 percent (n = 40) of the materials were maximally identified. Of this portion, 95 percent (n = 38) were terrestrial fauna and the remaining 5 percent (n = 2) were fish.

Category	**Sub–category**	**Group**	**Sub–Total**	**Total**	**%**
Maximally identifiable	Terrestrial		38	40	35.1
	Fish fauna		2		
Minimally identifiable	Mammal sizes	Size 1	0	47	41.2
		Size 2	0		
		Size 3	14		
		Size 4	33		
Non-identifiable			27	27	23.7
Total				**114**	**100**

Table 8.2: Composition of the assemblage from the Zanjian phase.

On the other hand, minimally identifiable materials constituted 41.2 percent (n = 47) of the whole Zanjian assemblage. Of this portion, 70.2 percent (n = 33) were

mammal size 4 and the remaining 29.8 percent (n = 14) were mammal size 3. The remaining 23.7 percent (n = 27) of the materials were unidentifiable.

The general composition of the faunal assemblage recovered from the general Swahili phase is shown in Table 8.3. About 36.1 percent (n = 57) of the materials were maximally identified. Of this portion, 72 percent (n = 41) were terrestrial fauna and the remaining 28 percent (n = 16) were fish. On the other hand, minimally identifiable materials constituted 63.9 percent (n = 47) of the whole Swahili assemblage. From this portion, 82 percent (n = 83) were mammal size 4 and the remaining 18 percent (n = 18) were mammal size 3.

Category	**Sub–category**	**Group**	**Sub–Total**	**Total**	**%**
Maximally identifiable	Terrestrial		41	57	36.1
	Fish fauna		16		
Minimally identifiable	Mammal sizes	Size 1	0	101	63.9
		Size 2	0		
		Size 3	18		
		Size 4	83		
Total				**158**	**100**

Table 8.3: Composition of the assemblage from the Swahili phase.

Information on the taxonomic representation of the maximally identified faunal specimens in Zanjian phase is presented in Table 8.4. The result shows that domestic stock dominates the Zanjian faunal assemblage forming 95 percent, while the remaining 5 percent is made up of fish.

	Zanjian phase							
Trench	K1A		K2	M1	M1A		Total	%
Stratum	*7*	*5*	*5*	*5*	*4*			
Identification								
Sheep/goat	2			13		4	**19**	**48**
Cattle			2	4		1	**7**	**18**
Chicken		5	2	4		1	**12**	**30**
Fish			1		1		**2**	**5**
							40	**100**

Table 8.4: Taxonomic representation/NISP for Zanjian phase.

No wild animals were found from the maximally identified elements in the Zanjian phase. However, their presence cannot be denied given to the fact that animal size 4 and 3 were identified during the analysis of minimally identifiable elements (Table 8.2). Of domestic fauna, caprine (sheep and goat *(Ovis/Capra)* is

the largest group (48%), followed by chicken (30%), and then cattle *(Bos taurus)* (18%).

Taxonomic representation of the maximally identified faunal specimens in Swahili phase is described in Table 8.5. The result shows that domestic stock dominates the Swahili fauna assemblage forming 63 percent, while the remaining 37 percent belong to wild animals and fish. Of the domestic fauna, cattle *(Bos taurus)* (26%) are the largest group, followed by chicken (21%) and then sheep and goat *(Ovis/Capra)* (16%). For the non-domestic animal fauna, one bone from elephant and 4 bone elements from Bovid size 3 were identified. Bone elements from Bovid size 3 seem to belong to gazelle class.

	Swahili phase							
Trench	K1A			K2		M2	Total	%
Stratum	*3*		*2*	*3*	*2*	*3*		
Identification								
Sheep/goat			2		5	2	**9**	**16**
Cattle			7	4	2	2	**15**	**26**
Chicken	4		2	3	1	2	**12**	**21**
Elephant					1		**1**	**2**
Bovid size 3						4	**4**	**7**
Fish				3	8	5	**16**	**28**
							57	**100**

Table 8.5: Taxonomic representation/NISP for general Swahili phase.

8.2 Taphonomic Aspects

As has long been acknowledged and thoroughly discussed by zooarchaeologists (e.g. Grayson 1984; Lyman 1994), archaeofauna is subject to a wide variety of environmental factors that impact the degree to which these remains do or do not survive in the archaeological record. Many processes – such as scavenging, trampling, wind or water erosion, soil acidity, and site disturbance – can affect the number of animal species that will remain in the archaeological record after they die.

During faunal analysis taphonomic aspects were observed. Six sub–aerial bone weathering stages as proposed by Behrensmeyer (1978) and well applied by Biginagwa (2012: 224) provided the weathering classificatory scheme for the assemblage under analysis. According to Biginagwa (2012), bone weathers from stage one to six. From stage one through four the bone weathers with progressive damage and during its last stages (Stage 5 and 6), it may not survive in the

archaeological record. Fortunately, a large proportion of the faunal elements from the sample were in a good state of preservation. Using a hand lens, it was also possible to examine other human-induced bone surface modifications such as cut, tooth and burning marks (e.g., Biginagwa 2012: 224).

Results

While no bone in the recovered fauna from Zanjian phase was identified in weathering stage 0 (as for not showing any cracking or flaking), few (4%, n = 4) were categorized into stage 1, because they manifested cracking in a mosaic pattern (Biginagwa 2012). About 43 percent of the faunal material was clustered under weathering stage 2 (n = 50) by showing flaking along the edges. The majority of analyzed faunal material fall under weathering stage 3 (52%, n = 60) because they had roughened patches (Biginagwa 2012). The absence of weathering stages 4 and 5 (stages of heavily weathered fauna) suggests that a large proportion of the fauna studied from Zanjian phase was in a good state of preservation. A cut mark was the only bone modification aspect recorded in faunal material from Zanjian phase. In this case, metacarpal bone of a caprine (from trench M1A, stratum 4) and scapula bones of a caprine (from trench M1, stratum 5) were found with cut marks.

No bone of the recovered fauna from Swahili phase was identified in weathering stage 0 (as for not showing any cracking or flaking), or in stage 1 – with cracks in a mosaic pattern (Biginagwa 2012). However, about 27.8 percent of the faunal materials were clustered under weathering stage 2 (n = 44) by showing flaking along the edges. The majority of analyzed faunal materials fall under weathering stage 3 (72.2%, n = 114) because they had roughened patches (Biginagwa 2012). The absence of weathering stages 4 and 5 (stages of heavily weathered fauna) indicates that a large proportion of the fauna studied from Swahili phase was in a good state of preservation. Bone elements with chop, cut and other with evidence of being burnt were identified in Swahili assemblage. In this case, metacarpal bone of cattle was found from trench M2A, stratum 3. Long bone (Trench K2, stratum 3) and vertebrate bone (K2, stratum 2) of animal size 3 were found with chopped marks. A burnt rib bone from animal size 4 was found

from trench K2, stratum 3. Humerus bone of cattle with cut mark was found from trench K2, stratum3. Two phalange bones from caprines, one from trench K2, stratum 3 and the other from trench M2, stratum 3 were found with cut marks.

Continuous trend in the exploitation of domestic animals from Zanjian to Swahili phases is implied by the analysis. Chicken had the second higher number in both phases out of alternating first class of caprine and cattle. Indication of change is found in caprine class that dominates the assemblage in Zanjian phase, but is the last group of livestock during Swahili period. Increased utilization of fishes in Swahili phase is noted when compared to the Zanjian period. Animal size 4 dominates both phases. While the percentage of utilization of animal size 4 (cattle, Table 8.1) rises from 70% (Zanjian) to 82% during Swahili period, the percentage of animal size 3 (caprines) drops, from 29% (Zanjian) to 18% during Swahili period. With exception of gradual intensification of cattle keeping and fishing, the period between Zanjian and Swahili phases in Pangani Bay is a stable with a lot of continuities in domestic animal economy.

8.3 Shellfish Fauna

Shell assemblage was identified using reference materials (Richmond 1997: 256; Pollard 2007: 62). Each piece of shell was identified down to the most specific taxa level possible (whether family, genus or species). One mode out of the three used for quantification was applied during the analysis of the shellfish assemblage. Shell Weight Measure (SWM) (in g) mode was used instead of Minimum Number of Individuals (MNI) or Number of Identified Specimens presents (NISP). With this method, when an individual species was identified (e.g., *Anadara* spp.) using reference materials, the whole aggregate of that species was quantified by its weight (in g). This study is aware that robustness does not always reflect the size of a shell or the amount of edible meat it contains (Szabó 2009: 187). It is also clear that taphonomic and cultural processes such as leaching and burning can significantly reduce the weight of the shell. However, few pitfalls of weight (g) method did not disqualify it from being a positive means of avoiding serious problems posed by the other two modes of quantification.

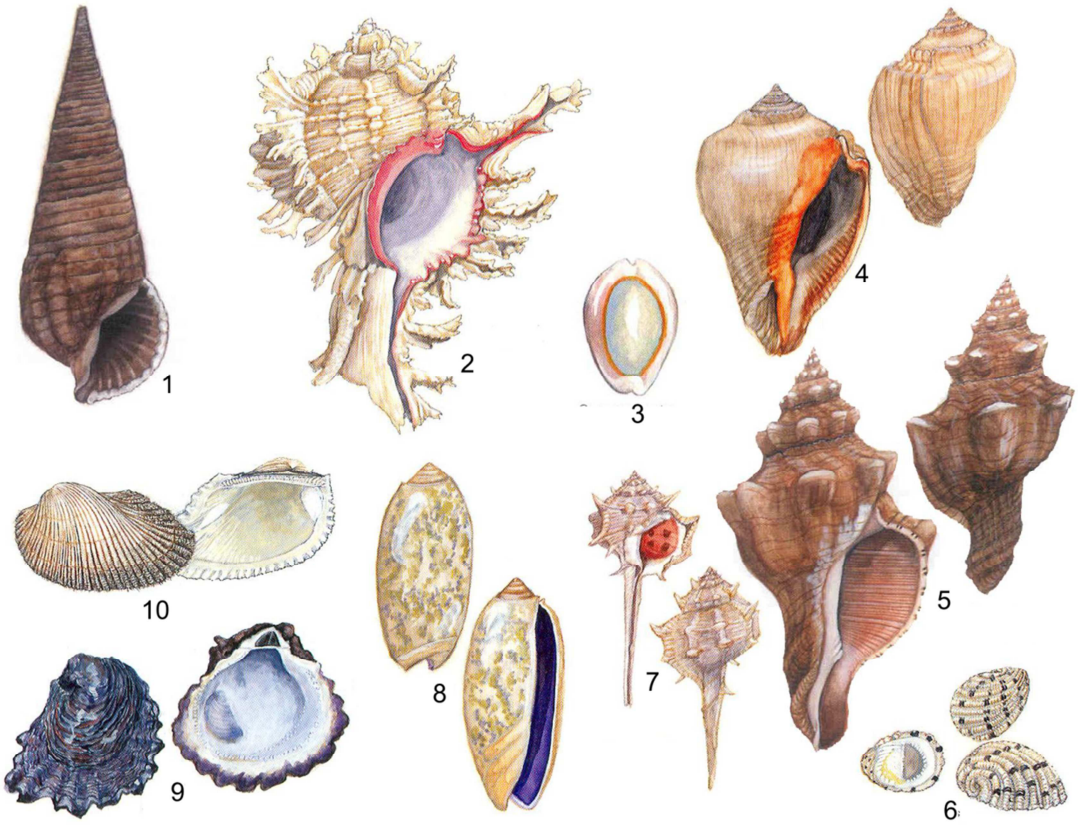

Fig. 8.1: Shellfish frequently encountered at archaeological sites of Tanzanian coast. From top left by reading clockwise: 1 = mangrove whelk, 2 = rock shell Chicoreus, 3 = cowrie, 4 = crown conch, 5 = tulip shell, 6 = Nerites, 7 = rock shell Murex, 8 = olive shell, 9 = hooded oyster and 10 = bivalve Anadara (Pollard 2007: 62).

For example, NISP approach was not used because taphonomic aspects upon shellfish fauna and diversified sizes of shellfish assemblage in the study could cause the method to overestimate the number of a certain taxa in the assemblage. On the other hand MNI approach was not used because it did not reflect the collection methods used by past occupants in the area. Shellfish like mangrove whelk was collected *en masse*. However, counting the number of identified species one by one could only reflect scientific quantification than reality. The weight measure approach seems to reflect a true measure of shellfish collections by occupants over time. In this approach less weight per provenance indicates a minimal collection of shellfish in comparison to phase of shellfish with heavier weight.

Results

From all archaeological phases, ten species of shellfish were identified (Table 8.6).

Local name	Scientific name	Use	Habitat and season
A) Tondo	*Terebralia palustris(mud whelk)*	Meat and fish bait	Found throughout the year in mangrove areas
B) Nyambua	*Cerithidea decollata*	Meat and bait	Found throughout the year in mangrove areas
C) Gandiana	*Saccostreacucullata*	Meat	Found throughout the year on trunks and roots of mangroves
D) Kombe	*Anadaraspp. (Anadara natalensis/ Anadara antiquata)*	Meat and shell–beads making	Found in mud flats Associated with seagrass throughout the year
E) Simbi	*Cyprae annulus/ moneta*	Decorations, ritual and as money	In shallow water, tide pools, under stones or amongst seagrass
F) Abalonia	*Haliotidae spp.*	Meat and jewelry	Attach themselves to rocks in the ocean around the coastline.
G) Konokono	*Achatina sp. [landsnail]*	Meat	Land
H) Mbalamwezi	*Polinices mammilla*	Meat	Found in sandy habitats
I) Sheila	*Oliva spp.*	Inlay ornament	Shallow and deep sand
J) Kome bunda	*Chicoreus ramusus*	Meat and as side –blown horn	Sandy and rubble bottoms near coral reef to depths of around 10 m

Table 8.6: Ten species of shellfish collected for food, bait, shell making and decorations as found in Zanjian-Swahili phases.

Diachronic patterns in the Zanjian-Swahili shellfish exploitation may be summarized in terms of three general trends (Table 8.7):

1. Shellfish species, *Terebralia polustris* (by letter A or *tondo*), *Cerithidea decollata* (by letter B or *nyambua)* and *Chicoreus ramusus* (by letter J, *kome bunda)* were fairly accumulated in the Zanjian phase but there is increased consumption during Swahili period.
2. Shellfish species (by letters C, D, F, G, and I, respectively) including *Saccostrea cucullata (Gandiana), Anadara spp (kombe), Haliotidae spp,Achatina spp., and Oliva spp.* were heavily accumulated in Zanjian phase, but experienced a sharp decrease of accumulation in Swahili phase.
3. However, shellfish species types such as *Cyprae annulus/moneta and Polinices mammilla* (By letter E and H) showed similar percentages of accumulation in both phases.

Shellfish Species by letter	A	B	C	D	E	F	G	H	I	J
Zanjian phase										
Total weight (13,975 g)	2,652	676	2,854	1,038	121	2,32	2,887	282	792	323
100%	**19**	**5**	**20**	**7**	**1**	**17**	**21**	**2**	**6**	**2**
Swahili phase										
Total weight (6,163 g)	1,578	2,156	325	300	52	680	427	76	188	381
100%	**26**	**35**	**5**	**5**	**1**	**11**	**7**	**1**	**3**	**6**

Table 8.7: Variability by weight of shellfish exploitation from Zanjian to Swahili phases.

Generally, the increase of *Cerithidea decollata* and *Chicoreus ramusus* (used as baits than for their meat by fishermen) shellfish species in Swahili phase probably indicates the stabilization of fishing tradition that was established during Zanjian period. The decrease of shellfish species in Swahili phase, such as those from *Anadara ssp.* is related to a notable decline of shell bead making after the increased importation of glass beads. Shellfish species such as *Saccostrea cucullata* (collected for their meat) had lower frequency during Swahili period than in Zanjian phase. Some changes in dietary behaviors from Zanjian to Swahili periods, suggested by the analysis results, occurred probably as result of introduction of the Islam religion which discouraged the eating of shellfish.

8.4 Summary

This chapter provides valuable insights in the continuity and change of traditions related to animal husbandry and shellfish gathering between 8th and 16th centuries AD in Pangani Bay. The analysed faunal assemblages from both Zanjian and Swahili phases show a great deal of continuity both in animal husbandry and shellfish gathering. The continuity of similar practices in animal economy can be claimed from the presence of cattle, caprine and chickens in both periods. Also, shellfish gathering behavioural patterns seem to develop a continuing trajectory from Zanjian to Swahili phases. The latter is evidenced by the increased consumption of mudwhelks (tondo) through time. The presence of increased number of domesticated animals during Swahili period does not support the hypothesis posed by Walz (2010: 148) that the increased use of mud whelks during this period was associated with the dwindling of food resources.

A change is noted in the consumption of caprine versus cattle from Zanjian to Swahili periods – caprine decline somewhat in importance and cattles increase in importance. The decline of caprine in the expense of cattle probably suggests that caprine products (meat and milk) was sufficient for Zanjian population but failed to keep pace with demand of the growing population during Swahili period. Pangani Bay experienced population growth during Swahili period (Walz 2010: 319), therefore cattle would have been the solution for a great demand of meat and milk as result of this growing population. Another change occurred in the consumption of shellfish from Zanjian to Swahili phases. While shellfish were heavily collected for meat during Zanjian period, they were mainly gathered as fishing baits during Swahili phase. In other words, shellfish meat was less consumed by people during Swahili period than in the previous phase. This shift can be explained by anthropogenic than environmental factors. The climate of both Zanjian and Swahili phases was dry (Chami 2003: 13). Therefore, the dry climates in both phases provided conductive environment for shellfish growth because river outlets and mangrove forests were more saline (Pollard 2007: 52): hence opportunities were available for people in both phases to exploit equal proportions of shellfish resources. Therefore, the noted change in shellfish consumption is not climatic but result from human behaviours such as the prohibition of eating shellfish by Islamic religion and the increased fishing activities during Swahili period.

By concluding, the analysis of faunal remains reflects continuity in so far as caprines, cattle and chicken were kept and consumed in both Zanjian and Swahili phases. At the same time, shellfish gathering and fishing were also significant activities from phase to phase. An important development was the increased consumption of cattle and fishing activities over time. The increased population during Swahili period explain the dominance of cattle than caprines during this period. The methodology for the recovery and small sample size of the studied faunal remains probably affect the pattern produced by the analysis. For example, it is clear that the study samples were recovered from within residential areas (away from burial grounds), but it was not possible to ascertain which part of the settlement (house, trash pit, kitchen) these data originated due to the uniformity

of the assemblage across the stratigraphy. No structured depositional features such as trash pits or abnormal concentrations of bones were recovered during the excavation (Chapter 5). Therefore, despite a great deal of information provided by this zooarcheological study, the result is considered preliminary due to the challenges explained above.

CHAPTER NINE
DISCUSSION

9.0 Introduction

This study was designed to give understanding of the origin of Swahili culture and the development of Zanjian tradition on Pangani Bay from between 8th and 16th centuries AD. The investigation was fulfilled through archaeological excavation and analysis of pottery, fauna and beads from the surroundings of Pangani Bay. The chapter integrates information from the previous researches, fieldworks and analysis results as presented in previous chapters to form a discussion concerning the development of Swahili culture in Pangani Bay. It offers main conclusions with respect to data results and main objectives of the research. The chapter begins by discussing data related to traditions in ceramic production followed by those related to food and trade economies from Zanjian to Swahili periods.

9.1 Ceramic

During the excavation at Pangani Bay, the Zanjian and Swahili archaeological sequences were recovered. One of the indicators for the Zanjian phase was the recovery of many sherds in a form of necked jars with triangular incisions. In further details, these ceramics are made of coarse fabric with large sand/quartz temper. Their exterior surface is smoothed and sometime burnished with gray slip and their vessel walls are fairly thick. Between the rims and necks of Zanjian pottery is a location for incision and punctuation decoration (Chapter 5, Fig. 5.2). Walz (2010: 107) reports a collection of such pottery at the top of the northern escarpment near the Mwembeni area in Pangani Bay. The latter adds more locations of archaeological encounter of Zanjian pottery in Pangani Bay, from Mwembeni, Muhembo, Kumbamtoni and Kimu sites.

Zanjian pottery from Pangani Bay resembles ceramics of the same period from different sites of the littorals and hinterlands of the East African coast. The littoral settlements include Shanga (Horton 1996: 243), Kilwa and Kaole (Pollard 2007: 172, 289). Hinterland sites consisted of Mombo (Walz 2010: 188), and Limbo (Chami 1998: 202). The affinity of Zanjian pottery were not limited to the

mainland but also to sites located on the islands of the Indian ocean such as Tumbe on Pemba (Fleisher and La Violette 1999: 68), and Unguja Ukuu on Zanzibar (Juma 2004: 87). The similarity of Zanjian pottery from Pangani Bay with other in the region suggests a socioeconomic connection of Zanjian people on the bay with littoral, hinterland and island partners. At Pangani Bay, the Zanjian pottery can be associated, as Chami (1994: 92) proposed, with later TIW settlements that flourished on the East African coast after 8th century AD. The later TIW pottery which I and Chami (1994: 11) call Zanjian characterises the lower layers of Pangani Bay, implying that the maritime and iron using communities began to inhabit the bay from around 8th century AD.

Kimu and Muhembo sites at Pangani Bay offer good superimposed archaeological stratification that indicates the continuity of archaeological traditions from Zanjian into Swahili phases. The fieldwork work results presented in Chapter 4 and 5 show that during 8th to 13th centuries AD, fishing and trading villages characterized by wattle and daub houses existed on Pangani Bay. From around 13th to 16th centuries AD, fishing, craftworks and trade activities continued as previous period, but with an increased pace and stone built structures were introduced and supplemented wattle and daub houses.

The evidence indicative of continuity of pottery tradition is presented in Chapter 6. Pottery forms and decorations persist from Zanjian to Swahili periods. Similarly, Pollard's (2007: 89) research at Kaole site located approximately 120 km south of Pangani Bay, documents continuity of pottery traditions from 7th to 16th centuries AD. Thus, it can be argued that Pangani Bay might have shared analogous trend of ceramic tradition continuity with its close neighboring settlements.

Swahili pottery assemblage has been distinguished with previous pottery traditions with emphasis that it contained ceramics decorated with "Neck Punctuated" motif (Chami 1998: 203; Pollard 2007: 112). The motif occurred as a horizontal succession of punctuates that form a single line motif (Chapter 5, Fig. 5.8). The evidence indicative of continuity of the punctuate-motif, and the implication that it was not restrictive to Swahili period is presented in Chapter 6. Of the analysed pottery from Zanjian phase 5% were found with punctuated

motifs. Over time, the punctuation design continued to be used and about 14% of the analysed pottery in Swahili phase had punctuated motif (Table 6.1). Also, chapter 6 shows that all the vessel shapes in Swahili period seem to display forming traditions that originated from Zanjian period. Two most common vessel shapes, open bowls and necked jars were produced during the Zanjian period and continued to be made in the Swahili period (Fig. 6.3). Apart from shape and decoration, the evidence for continuity of pottery tradition is also recorded by the analysis of vessel size between Zanjian and Swahili periods. The results show that Zanjian and Swahili pottery assemblages are dominated by jars with medium orifice (Fig. 6.4). The relatedness of vessel size from one phase to the next proposes that acceptable variation of the vessel orifice sizes might have evolved from Zanjian to Swahili periods. Similarly, Swahili potters integrated all temper materials – organic temper, fine and coarse sand descending from Zanjian period (Fig. 6.6).

Despite, the apparent continuity of pottery features from one phase to another, Chapter 6 presents data that imply that numerous changes occurred from Zanjian to Swahili phases. For example, vessels decorated with triangular motifs were common during Zanjian period, but were very few in the Swahili phase (Table 6.1). Necked jars highly favoured during Zanjian period was less common from 13th to 16th centuries AD. Instead, there is a substantial increase in the use of large open bowls during Swahili period (Fig. 6.3).

Bowls that displayed large orifice sizes (280–320 mm) were mostly used in Swahili period than it was during the Zanjian times (Fig. 6.5). Most of the bowls found in Swahili phase on Pemba Island were both larger than those in previous centuries and fancier in decoration (Fleisher 2010: 208). Domestic vessels were purposely made large during Swahili period in order to accommodate ceremonies that intended to empower the socioeconomic position of the host. The assumption is that "large vessels indicate the communal act of consumption, as one bowl would contain food for a number of individuals who would sit in a circle around it" (Fleisher 2010: 208). Thus, by having large sized open bowls within their settlements, Swahili communities in Pangani Bay seem to have also participated in such consumption ceremonies. Furthermore, the presence of large

sized bowls in Zanjian phase to about 30% of all analysed pottery (Fig. 6.5), signifies that consumption-ceremonies of Swahili phase trace their origin in Zanjian period.

By conclusion, the cooking and storage jars used by Zanjian-Swahili inhabitants in the Pangani Bay looked similar to vessels found in various East African coastal settlements of the same period. Pangani Bay was one of the significant coastal sites that formed the Swahili culture of the East Africa coast. Earliest commnunities in the bay made pottery known as TIW/Tana/Zanjian tradition. The latter was the same with communities residing from Tana River in Kenya, Shanga, Manda, Kilwa, and Zanzibar to Chibuene in Mozambique Coast. All coastal settlements continued decorating their pottery with triangular incision, punctuation, graphite and hematite burnishing until Swahili culture was conceived. Around 13th century AD, all coastal sites including Pangani Bay switched their emphasis into pottery tradition known as Swahili or Neck Punctuated (NP) pottery. Generally, Zanjian traditions were practiced on the whole coast. It matured and became a Swahili culture that also affected the whole coast of East Africa.

9.2 Trade

Traditions governing trade activities in Pangani Bay seem to continually develop from 8th to 16th centuries AD. The small but significant amount of glass beads found in Zanjian phase (Chapter 7, Table 7.1) suggests that from the 8th century AD, coastal communities developed a demand of glass beads. Kimu site is observed to be the site with high amount of glass beads from 8th to 16th centuries AD. Having a good landing place, ships carrying different goods including glass beads would have landed on Kimu harbor. From here, goods were circulated in many areas of Pangani Bay such as the Muhembo site in the north. It is also possible that many glass beads were traded inland by coastal merchants as their demand increased. Hinterland communities such as those of the Mkiu site (9th century AD), located, 20km inland developed a large demand of foreign items and formed a tradition of trading gum copal and iron for obtaining glass beads (Fawcette and LaViolette 1990: 21, 245).

However, the trade in glass beads during Zanjian period should not be over-emphasized because shell beads continued to be made, traded and used by local inhabitants. Juma (2004: 128) presents that at Unguja Ukuu, shell beads were most abundant during Zanjian period; three times more than glass beads. In addition, glass beads were rare before the 11th century AD at Shanga and Kilwa (Horton 1996: 323; Chittick 1974: 473). Walz's (2010) findings from Pangani Bay point out that from (750–900 AD) glass beads were rare and accompanied a small number of shell beads. However, increased frequency of glass beads is recorded from 900 to 1000 AD at the bay. By the 12th and 13th centuries AD glass beads greatly outnumber shell beads in many coastal sites (Pollard 2007: 114). However, the use of shell beads was not completely abandoned, but persisted on the coast till 16th century AD (*ibid.*: 114).

At Pangani Bay, it was the tradition of Zanjian and Swahili settlements to import and/or use drawn than wound glass beads (Chapter 7, Fig. 7.1). Also, cylindrical beads (Fig. 7.3) were mostly favored by both communities before and after 13th century AD. Red was the most favoured glass bead colour during Zanjian phase (Fig. 7.4). Around 8th century AD, Unguja Ukuu settlements on Zanzibar Island, used many bluish green glass beads than red coloured beads (Juma 2004: 128). Bead colour differences between contemporaneous Zanjian villages of Unguja Ukuu and Pangani Bay insinuate efforts made by each settlement to develop its own trade autonomy. On the other hand, Horton (1996: 329) informs a view that is highly contrary to what is observed in Unguja Ukuu or Pangani Bay. He presents that glass beads on Shanga site during Zanjian period were mostly yellow in colour. The variation of bead colour across sites imply that Pangani, Shanga and Unguja Ukuu settlements were engaged in similar glass bead trade, but with different preferences of the item involved in the trade.

Pangani Bay settlements obtained glass beads and foreign ceramics by exchanging their trade items that were mainly ivory, mangrove timber, amber, tortoise shells and crystals. Other trade items would have been slaves and gold as obtained from the hinterland and further south. All the assumptions concerning exported trade items are formed by historical sources (Freeman-Grenville 1962; Rick 1970) due to the absence or scarce archaeological evidence to confirm them.

Also, Horton (1996: 414) notes the difficulties of reconstructing export than import commodities on the East Africa. Evidence for ivory trade is found in Zanjian phase of Pangani Bay. Residues of ivory piece (Fig. 5.15) probably a result of an ivory trimming process was found at Kimu site. At Pangani Bay ivory hunters probably trimmed their tusk at kill sites inland. Then the whole tusks were brought to the coast and exported overseas, leaving little or no trace for archaeological records (Horton 1996: 414). Contrary to little evidence for export items, a significant number of imported artifacts, such as pottery and glass beads have been recovered in Zanjian phase of Pangani Bay. Glass beads might have originated from the Indian sub-continent (LaViolette 2008), suggesting a trade connection between Pangani Bay and the Indian sub-continent from 9th century AD or even earlier.

Local traders of Pangani Bay might have established a good relation with merchants from Persian Gulf from the beginning of 8th century AD. Many other coastal sites such as those located in the Lamu archipelago down to Sofala in Mozambique formed a more similar experience of dealing with merchants from the Gulf (Horton 1996: 416). A historian named al-Mas'sud sailed with merchant ship from the port of Sohar in 916 AD to the East Africa coast. He then compiled the detailed description of the East Africa coast, especially the life ways of Zanjians in the "Land of Zanj" (Freeman-Grenville 1962). One of the recorded traditions was the use of local boats for seizing big fish with a harpoon for taking amber out for trade. Mas'ud explains that the Zanjians were also engaged in elephant hunting for ivory. He added that their ivory was so valuable in China, a region which he also visited (Freeman-Grenville 1962). The monsoon winds helped merchant ships travel the Indian Ocean, facilitating the exchange of bulky items between East Africa and Persian Gulf (Horton 1996: 417).

Manufactured goods from the Persian Gulf are found in the Zanjian phase of Pangani Bay (Chapter 5, Figs. 5.9, 5.10). These include lustrewares, white glaze and colour splashed ware. Others include lead glazed polychrome and late sgraffiato. A similar pattern is observed at Shanga site. However, the amount of trade imports from Shanga is much higher when compared to that at Pangani Bay. The variation of trade import from site to site reflects that each locality on the

Swahili coast was engaged in maritime trade with oversees in different magnitude. Goods from China are also present in the Zanjian sequences of Pangani Bay, suggesting a connection of Zanjian merchants with Chinese partners. Trade items included tableware such as Ru-ware (Fig. 5.11) and Chinese stoneware (Juma 2004: 29).

Chinese historians and merchants knew about the East African coast. In a 9th century AD-Chinese text, the East African coast was described as place where Persian merchants bartered products for clothing (Freeman-Grenville 1962; Juma 2004: 25). In the basal occupational period of Unguja Ukuuon Zanzibar Island (7th to 9th centuries AD), when houses were entirely built with thatched mud–filled timbers, Chinese stoneware was the most common foreign item (Juma 2004: 29). Chinese stoneware arrived on the East African coast as containers for more valuable product such as dates and oils (Horton 1996: 417). The later suggests that communities on the East African coast traded not only glass beads, but also a variety of other products such as oil, dates, and clothes which hardly survive in archaeological records.

A tradition of importing glass beads rose up during Swahili period. Glass beads occur in higher density in Swahili phase than in Zanjian period (Chapter 7, Table 7.1). From 13th century AD onwards, glass beads were readily available item to each member within coastal settlements, while few of them were traded inland. Walz's (2010: 326) research synthesizes that a small number of glass beads were traded to the hinterlands, while the majority were preserved at coastal sites. A suggestion for distribution inequality of foreign items is supported by the evidence that coastal sites experienced the increase of glass beads and the decrease of shell beads while the hinterlands sites such as Mombo in Nkomazi corridor, marine shells and land snail shells outnumbered glass beads (*ibid.*: 326). In this case, it is plausible to say that until the 13th century AD, the coastal Swahili merchants kept trading shell beads to the hinterland communities while preserving glass beads and other foreign items for their status quo.

As it was during Zanjian period, the Kimu site continued to be the site with the highest amount of glass beads throughout Swahili period (Table 7.1). Given to the quantity of glass beads recovered at Kimu site, one could argue that

the site acted as glass bead market for the whole Pangani Basin region (Coastal and hinterlands). Probably, the confirmative evidence that Pangani was ancient bead market comes from trench K3 at Kimu site where *in–situ* pot with glass beads (n = 234) was discovered (Fig. 4.13). Its advantageous location as an area with a good harbor probably made people from other areas such as Muhembo, Kumbamtoni and Mtakani sites to congregate at Kimu siteto get foreign items.

As shown in Table 7.1, small quantity of glass beads were found at Muhembo site when compared to those recovered from Kimu site. One hypothesis for intrasite variation could be that Muhembo merchants might have traded most of their foreign items for profit, preserving few in their settlement. The latter might explain why communities at Muhembo site built a rich 13th to 16th centuries AD Swahili settlements with coral architecture (Fig. 4.16), that surpassed other contemporaneous sites in their surroundings.

Glass beads and other foreign items originating from coastal settlements were traded in many areas of the deep hinterlands. Walz's (2010: 215) investigation shows that many surveyed localities of Mombo area (50 km from Pangani Bay) produced glass beads that were traded from the coast. These localities included Kwa Mgogo, Kobe, Mbugani, Ulimboni and Kwa Mkomwa. At all those localities, the Kwa Mgogo site had a large amount of glass beads. At Kwa Mgogo site alone, 34 glass beads were recovered. They belonged to the Indo-Pacific (Trade Wind) and dating from the late 1st millennium AD to 1700 AD (Walz 2010: 212).

Swahili merchants continued with a tradition of importing more drawn glass beads than wound glass beads throughout the 13th to 16th centuries AD (Chapter 7, Fig. 7.1). Brownish red is the predominant bead colour in Swahili phase (Fig. 7.4), perpetuating the tradition rooted in Zanjian period. Disparity observed during the Zanjian period in regard to bead colour between Pangani Bay and Shanga site continues throughout the 13th to 16th centuries AD. While, yellow was the most preferred bead colour at Shanga site (Horton 1996: 330), red beads were predominant at Pangani Bay. Spatial variability in the choice of trade items indicates the existence of autonomous preference of certain goods over the others

by different settlements along the coast by which the trade exchange was reinforced.

From the 13th century AD onwards, maritime trade increased across East Africa and glass beads arrived in substantial numbers from India (Wood 2011; Chittick 1974; Horton 1996: 72). At Pangani Bay, only finished made glass beads are found in Swahili phase. No evidence of glass working debris was found in the site, suggesting that Pangani residents relied more on importation than manufacturing glass beads. However, from the mid to late 13thcentury AD, a possibility that glass beads were manufactured in other coastal areas of East Africa is presented by Horton (2004). A recovery of glass working debris and significant deposit of unfinished beads associated with Indian pottery dated to 14th century AD is made at Mkokotoni and Tumbatu sites in Zanzibar Island. The latter is claimed by Horton (2004) to indicate the immigration of glass bead makers from south Asia who settled on the East African Islands and begun to manufacture glass beads locally. In all cases, whether glass beads came directly from India or were manufactured from the East African Islands, they remained a trade itemin Pangani Bay. They were imported to Pangani Bay either from Zanzibar or India.

Throughout the 14th and 15th centuries AD, merchants from India and especially from Cambay and Pires made large profits by trading in East African coast. A witness of such trade is a Portuguese historian named Barbosa, who complained that Malindi, Mombasa and Kilwa towns were full of Indian traders gaining profit by trading glass beads, rice, wheat, soap, indigo, butter, oil and cloth (Horton 1996: 418; Freeman-Grenville 1962: 126). East Africa served as a good market for Indian products in such a way that Early Portuguese traders found difficult to sell their glass beads from Europe. People on the East African coast preferred Indian made glass beads and would not accept European beads. The latter forced Portuguese traders to purchase beads from Cambay and Negapatam in India for trading with East Africa (Wood 2011).

East African merchants experienced a change of trade partners during 13th to 15th centuries AD (Horton 1996: 417–418). Persian merchants who dominated from the 8th to early 13th centuries AD were now replaced by South Arabian

traders and probably a few Red Sea merchants. In Pangani Bay, a clear evidence of such change exists. Black on Yellow and monochrome-wares (Fig. 5.23) replace late sgraffiato-wares (Fig. 5.10). Such evidence points to the existence of trade connection between the South Arabian or Red Sea ports and Pangani Bay and the diminishing trade connection with the Gulf. The shift of East African connection from Gulf to South Arabian ports is explained by Horton (1996: 417–418). He argues that from the 11th century AD, after the Siraf earthquake of 977 AD, much of the trading activities (to East Africa) moved to the mouth of the Persian Gulf. The move was fueled by boom in trade between the Red Sea and India. Thus, locating trading port in the Persian Gulf would have profitless during this time. As time went on, even the Gulf mouth was no longer an important partner in East Africa, but Yemen and especially the port of Aden took over. Ibn al-Mujawir recorded trade between the Yemen and East Africa in 1240 AD (Trimingham 1975: 118, 125). The Port of Aden became rich quickly because ships arriving from Red Sea to India or vice versa, hardly escaped this strategically located port, and Aden charged tariff or tax on all industrial items such as iron and wood that passed through it (Margariti 2007: 134–135).

Many merchant ships that voyaged along the Indian Ocean from Aden to East Africa coast arrived safely. The seafaring culture was successfully due to great mastery of monsoon wind and avoidance of open sea using many port stops located on the western coast of the Indian Ocean (Ricks 1970: 349). Ibn Battuta – Islamic historian of that time – records a smooth journey of boarding in and out of ships going to East Africa from Aden to Somalia to Mombasa and finally to Kilwa Island in 1330 AD (Freeman-Grenville 1962).

Chinese products became more common in the Pangani Bay from 13th century AD than during Zanjian period. Archaeological evidences for Chinese products during Swahili period include tea cups known as Jian-ware (Hare's Fur) (Fig.5.23). Wong (2006) argues that Jian teacups common during Song Dynasty might have been produced only for clan heirlooms or may have been circulated in Chinese markets in very limited quantity. Therefore, its presence in Pangani Bay indicates that the bay was important port of trade by Chinese during Swahili

period. Another Chinese product that is archaeologically evidenced in Pangani Bay is copper red-green ware (Fig. 5.23).

During the Ming dynasty two Chinese fleets were reported to have visited Mogadishu in Somalia, Barawa and Malindi in 1417 and 1422 AD (Inghams 1962: 5; Kirkman 1964: 86–89; Freeman–Grenville 1975: 7). Also, Chinese chronicles note that in 1415 AD a Malindi embassy gifted the Chinese emperor with a giraffe (Beaujard 2007: 25). Fair trade relations between China and East Africa with gift exchange at political level had a great economic impact in East Africa. A famous Chinese trader named *Zheng He* made several expeditions to the East Africa coast. This kindled a fire of trade between East Africa and China (Inghams 1962:1–5; Kirkman 1964: 88–89). Chinese products were traded on the Swahili Coast in exchange for mangrove poles, ambergris, leopard skins, slaves, ivory, gums, rhinoceros horns, and tortoise shells (Chittick 1979: 273–277; Whitehouse 2001: 411–424; Forsythe, et al. 2003: 133–138). Chinese pottery is found in many coastal towns in significant amounts, as well as in the Pangani Bay, Kilwa, Comoros and Madagascar, suggesting an ancient integration of East Africa with China in trade system (Beaujard 2007).

Generally, when significant coastal sites in East Africa exhibit their exotic glass beads, those from Pangani appear most often. For example, the amount of glass beads from Kimu site at Pangani Bay is remarkably higher when compared to other coastal sites. While Horton (1996: 328) reports only 576 glass beads from all phases of trench 6–10 on Shanga site, in Pangani Bay a total of 2,917 glass beads was recovered at Kimu site only from Swahili phase (Table 7.1). At Kaole site, only 47 glass beads were recovered by Pollard (2007: 325, 327) at strata 5 and 4 of Kaole PT1 dated to 13th and 14th centuries AD. Foreign ceramics from the Persian Gulf, China, India and south Arabian areas were common in coastal sites including Pangani Bay. However, the Shanga site on Kenyan coast stands as the topmost for foreign ceramics when compared to other sites on the coast. Pangani Bay's ceramic imports increased in frequency, but remained less common than at other larger Swahili sites located elsewhere on the East African coast, such as Mombasa and Kilwa (Walz 2010). The higher demand of glass beads than of

foreign ceramics during trade exchange probably explains why Pangani Bay has higher number of glass beads when compared to other larger Swahili sites.

Pollard (2007: 399) presents a model on how Zanjian village transformed into Swahili town. It is postulated that each settlement along the coast prospered as long as it acted as trade market for the agricultural and marine produce of surrounding villages and possessed the main links with oceanic trade. Using accumulated wealth from trade, many settlements transformed from village to urban communities in the center while preserving village in the surroundings (*ibid.*). Given to the current evidence from Pangani Bay it seems that many settlements on the coast, including Pangani Bay grew in that model. Basing on Horton and Middleton's (2000: 123) criteria for patrician and the commoner towns Pangani Bay also qualifies to enter into the category of patrician towns, similar to Kilwa and Kaole. The sites classified as patrician towns were those characterized by stone architecture and sophisticated traditions in the 2nd millennium AD. Evidence of the stone town at Pangani Bay encroaching upon the estuaric river bank is seen at Kimu site, with signs of merchant houses, wells and tombs. The building of the stone town overlooking waterfront can also be traced at Muhembo site where a 13th century AD mosque, tombs and traces of stone houses are found.

9.3 Food

Faunal data–animal, fish and shellfish–provide an assessment of the overall continuity and change in diet from the 8th to 16th centuries AD. During the Zanjian period, it was tradition to collect shellfish for consumption, bead making and as bait for fish traps (Pollard 2007: 375). Shellfish such as *Saccostrea cucullata* were collected for their meat, *Anadara* for bead making and *Cerithidea decollata* and *Chicoreus ramusus* for making fishing baits and for their meat (Chapter 8, Tables 8.6 and 8.7).

The high sea fishing activities during Zanjian period is proposed by the results from this study. Juma's (2004: 134) research at Unguja Ukuu site recovered bones of pygmy whales (*Kogia breviceps*) that were dated to the period between 750 and 900 AD. According to Juma, the finding of the remains of whale – a deep-

water pelagic species – at the site indicates that they might have been caught offshore by boat during Zanjian period. Other evidence for advanced fishing during Zanjian period is presented from Kaole village. Although, Pollard's (2007: 376) fauna analysis did not classify species from the investigated fish bones from Kaole village, it is postulated that the recovered fish vertebrae with 28 mm size could indicate some high sea fishing during Zanjian period. Evidence that Zanjian communities in Pangani Bay had good fishing traditions are the remains of fish bones recovered during the excavation (Chapter 5, Fig. 5.15). The collection included vertebral bones of fish identifiable to be shark. The latter is indicative of high sea fishing practices by Zanjian communities. Today, the cliff top of Muhembo site overlooks a modern fishing ground, which is likely to have been similarly exploited in the past.

Furthermore, Zanjian communities in Pangani Bay were engaged in tradition of collecting shellfish *(Anadara)* for making shell beads. Example of shell beads (Chapter 5, Fig. 5.12) and bead grinders (Fig. 5.13) were found in Zanjian phase on the Pangani Bay site, with particularly high concentrations in early levels. It seems that shell bead making tradition at Pangani Bay began in 750 AD and ceased around 1050 AD. The excavation inventories indicate that Muhembo site had more shell beads and bead grinders than Kimu site. The intra-site variation of shell bead making reveals the development of area-specialization in local craft working at Pangani Bay. Other coastal settlements of the same period were also involved in making shell beads. These included inhabitants of Shanga (Horton 1996: 390), Unguja Ukuu (Juma 2004: 144) and Kaole (Pollard 2007: 348). The whole processes that were involved during the shell bead production have been explained by Horton's (1996: 323) work. The manufacture begins by cutting a thick lamented shell – *Anadara* – into pieces. Then the irregular pieces of shell are drilled then strung together and rubbed down into cylinder shapes using hard surface pottery which is named as "bead grinder" (*ibid*.:323).

Fauna analysis presents that shellfish were gathered as meat on a daily basis and the practice was more active in the1st millennium AD, than during Swahili period (Chapter 8, Table 8.7). A considerable shellfish midden is reported within the basal layers of the Shanga site (Horton 1996: 389). The high quantity of

the recovered shellfish in those layers was considered enough to supplement the overall protein diet of the first inhabitants at Shanga (*ibid.*). As time went on, in Pangani Bay, the tradition of shell gathering for meat or shell bead making were minimized and the gathering behavior was concentrated on shellfish that could be used as baits for fishing. Correspondingly, research at Shanga (Horton1996: 393) shows that, over time, fish bones kept rising in numbers, suggesting that more fish were caught and eaten. However, Horton maintains that the change in dietary behaviour should not be associated with greater prosperity, but instead with new social and Islamic religious attitude that encouraged fish than shellfish. Extending that point of view, one could argue that Swahilis embraced many similar traditions from Zanjian communities, but had a religious attitude change in their minds regarding fish and meat.

Evidence for hunting and animal husbandry is also present at Pangani Bay, during Zanjian period. Fauna data show that warthog, buffalo and zebra were hunted by Zanjian communities. The suggestion for the type of animal hunted results from the consideration of Minimally Identifiable Number (MNI) of mammal sizes 3 and 4 as indicated in Chapter 8, Tables 8.1 and8.2. At Shanga, small quantities of marine and terrestrial animals were hunted by Zanjian inhabitants (Horton 1996: 393). The terrestrial animals included suni, bushbuck and dikdik while dugong and sea turtle represented the marine hunted animals (*ibid.*). Animal husbandry was practiced by Zanjian inhabitants and sheep and goat *(Ovis/Capra)* as the largest group (47.5%), followed by chicken (30%), and cattle *(Bos taurus)* (17.5%) were kept (Table 8.4). At Shanga site, the inhabitants started to keep sheep, goat and chicken and cattle from 840 AD and in significant quantities from 980 AD onwards (Horton 1996: 391). The synthesis of fauna remain signifies that communities at Pangani Bay during Zanjian period were multifunctional societies whose food economy incorporated hunting/gathering, fishing, shellfish collection, and sedentary crop and animal production.

During the 13th to 16th centuries AD, communities inhabiting Pangani Bay continued with the tradition of collecting shellfish for food and as bait for fish traps (Tables 8.6 and 8.7). The continuity of similar subsistence strategies over time suggests that Swahili people imitated traditions descending from Zanjian

period. Shellfish species such as *Saccostrea cucullata* were collected for their meat and *Cerithidea decollata* and *Chicoreus ramusus* were gathered as baits by fishermen. Despite the occurrence of *Anadara* shellfish which is associated with shell bead making within Swahili deposits (Table 8.7), little evidence is found of bead grinders and shell beads to support the existence of shell bead making tradition during Swahili period. Glass beads were abundant and easily available from 13th to 16th centuries AD and local craft working in the shell bead making was probably out dated during this period. Thus the *Anadara* shellfish that occurs in Swahili sequences was probably collected not for shell bead making, but for bait by fisherman, suggesting an increased activity of fishing during Swahili period. Pollard's (2007: 254) excavation recovered a midden of *Anadara* shells at Ras Ruvura in Kilwa Kisiwani. He also dates the midden into the period between the 14th and 15th centuries AD using pottery and mentions that they may have been used as bait in a nearby fish trap.

A peak is noted in fish consumption from 13th century AD onwards at Shanga site (Horton 1996: 391). The quantity of fish bone found in early level is low, in comparison to Post-1000 AD. Horton links the change of increased fish consumption with increased wealthy and introduction of Islamic social and religious mind-set that encouraged fish than shellfish eating. The discoveries of abundant fish bones from 11th to 16th centuries AD can be associated with the period when many settlements along the coast were transforming from subsistence villages into autonomous towns and city–states (Pollard 2007: 106–107). These include, as Pollard mentions, Maore in the Comoro Islands, Chwaka, Kwale Island, Pangani Bay and Shanga (2007: 107). At Pangani Bay, the evidence for the increased consumption of fish is presented in chapter 8. Fish bones form only 5% of the analysed faunal remains in Zanjian period but increase to 28% in Swahili phase (Table 8.4, 8.5). In addition to that, shellfish species such as *Cerithidea decollata* and *Chicoreus ramusus* (collected for fishing bait) were fairly accumulated in the Zanjian phase, but were heavily accumulated in Swahili phase (Table 8.7), suggesting an increased need of baits for fishing during Swahili period.

Similar to Zanjian period, evidence of hunting and animal husbandry is also present during Swahili period at Pangani Bay. Warthog, buffalo and zebra continued to be hunted in Swahili phase as in the previous period. The recovery of pieces of ivory bones from trench K1A, stratum 3 suggests that elephants were being hunted by Swahili communities residing on the bay. Elephant hunting at the bay might have been influenced by the intensification of ivory trade on the East African coast that began from 1200 AD onwards (Horton 1996: 414; Walz 2010: 274).

Swahili inhabitants continued with their tradition of animal husbandry as it was in Zanjian period. However, during Swahili period (instead of sheep and goat to be the dominant group as it was during Zanjian period), the cattle *(Bos taurus)* was the largest group, followed by chicken and then sheep and goat *(Ovis/Capra)* (Table 8.5). At Shanga especially from the 13th century AD onwards, cattle bones were common (Horton 1996: 384). A full range of body parts, including cranial elements was found, indicating that butchery took place within the settlement. Horton adds that camels were also kept and their meat consumed during Swahili period. Also, the inhabitants at Shanga made a big success in livestock keeping as cattle enclosures were found within their settlement from the beginning of the 14th century AD (*ibid.*: 411).

The abundant evidence for animal husbandry, hunting and fishing activities from 13th to 16th centuries AD sites, probably indicates the presence of a rich urban community in Pangani Bay. At Muhembo and Kimu ancient Swahili villages, the recovery of large quantity of animal and fish bones denotes wealthy communities who had access to meat and fish on a daily basis. The latter challenges the previous view presented by Gramly (1981) that Muhembo was inhabitated by poor people during Swahili period. The hunting of elephants during Swahili period was preserved for ivory trade as animal and fish were enough for their daily meals. The increased amount of animal and fish bones at Pangani Bay probably indicates wider resource exploitation activities for economic gains. The latter was aimed at meeting the food demand in exchange for profit from guests arriving in the Pangani Bay for trade. Pollard (2007: 352) hypothesizes that during Swahili period different local traders arrived in the Kaole

village from the surrounding rural areas when vessels from the Persian Gulf arrived in coastal harbors for trade.

Travelling along the coast of Shanga (Horton 1996), Chibuene (Badenhorst et al. 2011) and Pangani Bay (Chapter 8) during Zanjian period, one would have encountered a group of fishermen catching large fishes such as sharks. To show their capacity as fishing communities, the Zanjian inhabitants in Pangani Bay built their houses at Muhembo site overlooking a rich fishing ground of the Indian Ocean. Pangani Bay was not alone in locating settlement near fishing grounds. All over the East African coast, settlements e.g. Shanga, Manda, Kaole, Kilwa, Unguja Ukuu, and Chibuene were oriented near the fishing grounds. In most of the East African coastal sites including Pangani Bay, communities were busy collecting shellfish for food, lime making and for bead making (Pollard 2007: 375). The Zanjian communites had a tradition of gathering shellfish for meat on daily basis. This tradition went on till it lost its popularity in the 2nd millennium AD.

The decline of shellfish-meat consumption from 13th century AD onwards was probably a result of Orthodox Islam that discouraged shellfish eating behaviors (Walz 2010: 342). The archaeological evidence from different sites of the East African coast shows an increase in the consumption of fishes and livestock-meat that replace shellfish-meat during Swahili period. However, in Pangani Bay and many other coastal sites shellfish kept being gathered. The great quantity of shellfish was collected as fishing baits and a limited quantity as food, probably for poor or non-Muslim individuals within the community. Also, sheep, goat, chicken and cattle were kept, slaughtered, and eaten. Livestock were in minimal numbers within the households of Zanjian settlements, but in more quantity in Swahili settlements from the 11th century AD onwards. The discoveries of abundant chicken, cattle and fish bones in all coastal sites from the 11th century AD onwards, indicate a transformation of Zanjian coastal villages to Swahili coastal towns, all at once (Pollard 2007: 106–107). Many settlements along the coast from Pangani Bay, Comoro Islands, Chwaka, Kwale Island, Kaole, Kilwa and Shanga transformed themselves from Zanjian subsistence villages into autonomous Swahili mercantile towns.

CHAPTER TEN
CONCLUSION

10.1 Conclusion

Pangani Bay and many Tanzania coastal sites were always kept on the periphery during the discussion of Swahili origin. The justification for this was that they did not form Swahili culture but received it in its full package from Lamu archipelago. This study calls for reconsiderations and inclusion of not only Pangani Bay, but all coastal sites stretching from Lamu archipelago to the Mozambique coast as potential in the discussion of Swahili origin. This is because current evidence shows that Pangani Bay and many other coastal sites participated in the creation of the Swahili coast from its root as Zanjian tradition. In many coastal sites, Swahili traditions in the sphere of material culture, maritime trade and food economies, were rooted from Zanjian settlements and were firmly established in Pangani Bay, from the 8th century AD onwards.

A hypothesis upon which the whole study was based was that Pangani Bay represents Swahili culture that was rooted from ceramic, food, and trade traditions available in the bay in the period between 8th to 13th centuries AD. The outcome of the excavation and analysis support this hypothesis. Evidence advocates that maritime communities with continuing patterns in food and trade economy existed in the Pangani Bay from 1st to 2nd millennia AD. The latter is confirmed by the recovery of archaeological data – ceramic, fauna and foreign imports – that showed similar traditional features in both Swahili and Zanjian phases.

Furthermore, this study concludes that Pangani Bay was unlikely at the marginal zone in the whole spectrum of the development of Indian Ocean trade during the period of Zanjian to Swahili changeover. Evidence of imported pottery and glass beads from stratified sequences imply international connectivity beginning from Zanjian time to Swahili periods. The increased consumption of non–local items such as glass beads and ceramics from Eurasia and simultaneous changes in production of local shell beads suggests a development of maritime trade economy in Pangani Bay. Zanjian communities in Pangani Bay developed

fully fledged Swahili socio-economic life by themselves while tightening social and trade contacts with neighboring groups along the East African coast. During all periods, ceramic traditions at Pangani Bay indicate that Zanjian and Swahili people shared similar features to pottery found in other sites in East African coast (Shanga, Kilwa and Kaole) and its hinterland (Mombo). Such evidence insinuates a continuing regional connectivity of the inhabitants of Pangani Bay with other communities in East Africa.

10.2 Future Research Perspectives

Despite new perspectives brought by this study in regard to Zanjian-Swahili archaeology of Pangani Bay, it cannot be claimed that all issues have been exhaustively studied. Thus, recommendations for future research are hereby presented. This study was restricted not only along the Zanjian-Swahili sequences (8th to 16th centuries AD), but also within the scope of comparative analysis of pottery, beads and fauna from these two sequences which ideally would have restricted the inclusion of post-Swahili's (after 1500 AD) artifacts in the analysis. Evidence of Post-Swahili settlements is potentially located in the surroundings of Pangani Bay. When one studies Post-Swahili sites new insights regarding neglected Post-Swahili period in East Africa archaeology could also be revealed. The period from 1500 AD onwards is considered a time of confusion and the demise of Swahili culture due to the intrusion of Portuguese in the 15th century AD. Historians (e.g. Beachey 1967; Sheriff 1987) regard the Portuguese period (1498–1750 AD) in East Africa as the most chaotic era as far as Swahili maritime culture is concerned. No archaeological work has been done so far to confirm this historical hypothesis. Thus, archaeological survey and excavation work is needed in Pangani Bay that will focus on comparisons between Post-Swahili and Swahili sequences. This will help to unravel the socioeconomic life of Pangani inhabitants before and after the arrival of Portuguese colonization on the East African coast. The knowledge gained can be extended to get understanding of the nature of Swahili culture and its origin.

Information concerning the type of food consumed, and thus agricultural areas exploited, would be obtainable if archaeobotanical studies were to be

conducted within the deposits from Swahili and Zanjian sequences. Lacking the necessary expertise, little attempt was made to float sediments for archaeobotanical analysis. Knowledge of the domesticated plants in Zanjian and Swahili periods is necessary for tracing changes and continuity of staple food (rice, sorghum, millet) production in Pangani Bay. For instance, evidence of rice cultivation during the early Swahili period has been confirmed by archaeobotanical evidence from Pemba and Zanzibar suggesting that rice is present from early in the Swahili period (Walshaw 2010). The evidence shows that rice was a rare find at the earlier Swahili sites of Tumbe and Unguja Ukuu (both dating between the 7th and 10th centuries AD), and only becomes a staple after 1000 AD, as demonstrated at the later site of Chwaka on Pemba (Walshaw 2010). Thus, expert analysis of archaeobotanical remains offers considerable potential for further understanding of subsistence activities and diet before and after Swahili period in Pangani Bay.

Supplementary work is needed for a comprehensive investigation of the unusual skeleton with iron bracelets on its legs as found in trench K1A at Kimu site. Future work regarding this skeleton is intended to extend trench K1A into 10 by 10 meters, so as to capture the wider archaeological and cultural contexts from which this skeleton emerge. It is still unknown if this skeleton represents a form of elite burials and hence the evidence of the origin of pillar tombs during Swahili period or was just a slave buried with a chain. Detailed research with diverse archaeological expertise is inevitable for the unraveling the unknown aspects of this archaeological discovery.

Exigency is needed to conduct a detailed inventory of all Swahili and Post–Swahili stone ruins covering Kimu and Muhembo sites as they are currently endangered by Pangani district developmental plan (personal observation, 2013). The piece of land carrying stone ruins at Muhembo site is now divided into plots for house construction. Moreover, the rampant activities of quarrying mines for road construction materials reported by Gramly (1981) still continue at Muhembo site. Thus, a detailed research is needed to record the morphology, spatial organization and relationship of all stone ruins and traces of ruins at Muhembo and Kimu sites before they vanish.

This research has provided various insights into the change and continuity of material, food and trade traditions from Zanjian to Swahili periods and hence serves as basis for the reconstruction of the origin of Swahili culture in Pangani Bay. However, the results help to prompt additional inquiries and encourage further research on the origin of Swahili culture in Pangani Bay and the Tanzania coast.

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