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Exploring the Social Context of Maritime Exploitation in Tanzania between the 14th-18th c. AD: Recent Research from the Mafia Archipelago

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Introduction

This paper presents some of the results of recent research in the Mafia Archipelago, Tanzania. The archipelago is situated approximately 21 kilometres off the coast of mainland Tanzania, opposite the Rufiji Delta. It comprises four main islands – Mafia, Chole, Juani and Jibondo – as well as several smaller islands and uninhabited coral atolls formed by the emergences of the fringing reef, which extends along the East African coast (Baumann 1895:5) (Figure 1).

Part of the archipelago was designated as a marine park in 1995 (Walley 2004:3). This has resulted in a number of studies that have examined the nature of the coastal ecology within the park as well as the biodiversity of the surrounding reefs (Dulvy et al. 1995; Garpe and Ohman 2003; Gaudian and Richmond 1990; Horrill 1991; Jidawii and Ohman 2002; Kamukuru et al. 2005).

This paper focuses on the preliminary analysis of the faunal assemblages collected during excavations at the site of Kua Ruins on Juani Island (Figure 1(a)). These excavations aimed to elucidate the socio-cultural context of maritime exploitation (specifically fishing and shellfish collections), looking in particular as to whether, in line with data from other anthropological studies (Conte 2006; D'Arcy 2006; Hviding 1996), there was any evidence to suggest that higher status individuals controlled access to marine resources.

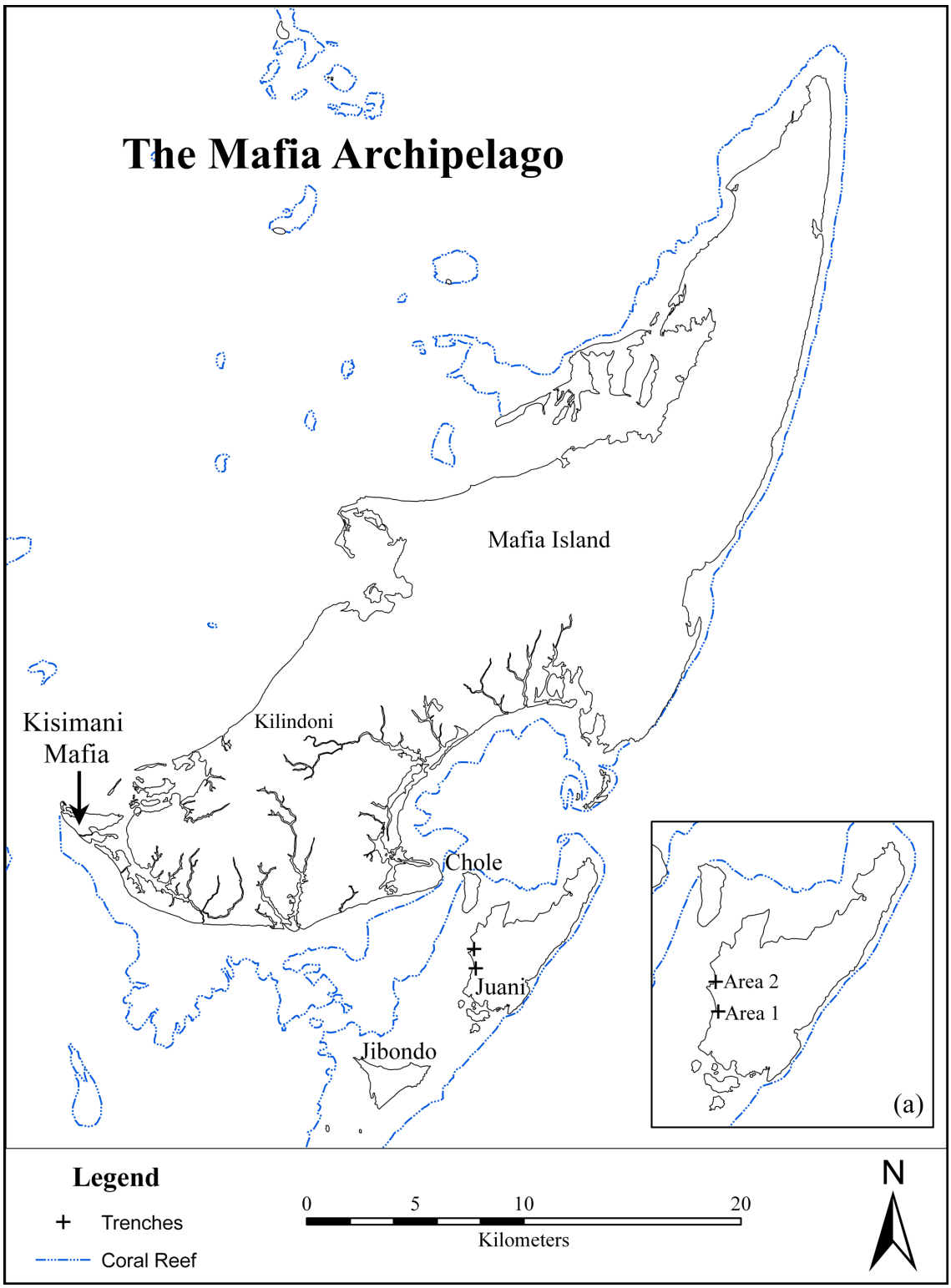

Figure 1. Map of the Mafia Archipelago. Inset (a) Showing the location of the excavation areas at Kua.

Source: Map by author.

In recent years, research into the nature of the subsistence economy of the Swahili communities living along the East African coast between the 8th – 15th centuries AD has become more prominent. Studies such as Horton and Mudida's analysis of some of the faunal assemblages

from the site of Shanga in the Lamu Archipelago, Kenya (Horton 1996; Horton and Mudida 1993), van Neer's examination of the assemblages from Kizimkazi Dimbani on Zanzibar (van Neer 2001), and Fleisher's analysis of remains recovered from several sites around Pemba Island (Fleisher 2003), have highlighted the importance of marine resources within Swahili subsistence strategies. While these are useful developments, much of this recent work has aimed to elucidate the nature of Swahili diet, or changing patterns of resource exploitation, rather than on the socio-cultural context of maritime interactions. The work at Kua was part of a larger research project, one aim of which was to develop a theoretical and methodological framework within which to explore the diverse meanings and manifestations of 'maritime-ness' and 'maritime identities'.

Research Context

Maritime archaeology has developed considerably over the last fifty years, incorporating a wide range of remains both on land and underwater, and tackling a variety of socio-cultural questions. However, with the greater integration of terrestrial remains into the remit of maritime archaeology over the last twenty years, more emphasis has been placed on understanding the nature of the societies responsible for the creation, manipulation and destruction of the submerged heritage that had once been the focus of maritime archaeological studies. Consequently, archaeologists have started to question 'what makes a society maritime?' or 'what is a maritime culture?'. In answer to this, Westerdahl (1992:5) proposed that we situate these societies within the context of their surrounding landscape and research a set of five components (shipwrecks, land-based remains, tradition of usage, natural topography and place names), which collectively comprised what might be termed a 'maritime cultural landscape'. Defined as the archaeological examination of "the human utilisation (economy) of maritime space by boat: settlement, fishing, hunting, shipping and its attendant sub-cultures" (Westerdahl 1992:5), the concept has since been expanded to address some of the socio-cultural aspects of these communities through the examination of 'ritual landscapes' (Westerdahl 2005, 2007). Despite this, most maritime cultural landscape studies have continued to focus on examining the technology and economy of coastal communities – and this has led to the underlying implication that a maritime society is one that lives by the sea and exploits marine resources.

The lack of an explicit statement outlining what maritime societies are is problematic, if maritime archaeology is to be considered a worthwhile area of study. After all, the archaeologies of 'coastal' communities have been comparatively well-examined by archaeologists more generally—what, if anything, differentiates these communities from specifically maritime communities? Until these differences are clarified and any unique features indicative of maritime communities identified, calls for archaeologists to engage more fully with maritime archaeological approaches and provide a "more holistic understanding of the development of maritime traditions" (Breen and Lane 2003:470) can never be fully realised.

In postulating some of these questions, it became apparent during this research that perhaps it was the presence of the sea itself (as opposed to the resources it provides and the communication and trade networks it facilitates), that shapes explicitly 'maritime' identities —creating a maritime-ethos—and which has the potential to influence the broader socio-cultural and ideological organisation of such societies. Similar perspectives, that 'maritime-ness' is as much a social construct as it is a technological or environmental one, are often presented by literature pertaining to anthropological studies within maritime societies (Chapman 1987; Conte, 2006; Cooney 2003; D'Arcy 2006; Hau'ofa 1994; Hviding 1996). Although the social context of the maritime interactions observed and recorded in these ethnographies were both culturally specific and representative of living traditions, it should be noted that in some cases, these social complexities can be manifested in the archaeological record. When examined within an

anthropologically informed framework and in conjunction with locally derived ethnographic and ethnoarchaeological datasets, archaeological data could therefore be used to examine this maritime ethos using a multi-faceted research strategy.

Existing archaeological and historical evidence suggest that the Swahili communities living on the East African coast were clearly maritime societies (Middleton 1992; Nurse and Spear 1985; Prins 1965, 1971). Much of the archaeological work in the region has focused on the role of the Swahili as cultural brokers between the African interior and the broader Indian Ocean trading networks (Horton and Middleton 2000:89), examining, in particular, the role of this trade on architectural styles, religion, linguistics, social and settlement organisation (Abungu 1998; Kusimba 1999). However, more recently, projects such as Breen and Lane's research around Mombasa Harbour (Breen and Lane 2003) or Pollard's (2007, 2008a, 2008b, 2008c) work around Kilwa have started to examine these coastal communities within the context of their broader maritime cultural landscapes. While this recent work has broadly followed the implicit archaeological perspectives of the features that make a society maritime, these studies and the extensive body of previous research conducted along the coast provide a strong foundation from which to develop anthropologically informed frameworks and explore the socio-cultural context of maritime interactions. To this end, I decided to focus my research in the heretofore comparatively under-investigated Mafia Archipelago.

Kua - Historical and Archaeological Context

Described as the "Pompeii of East Africa" (Wheeler 1955:46), Kua is an extensive complex of coral-stone architecture that may have been surrounded by a network of smaller villages similar to other stone town sites along the Swahili coast (Wynne-Jones 2006:7). Extending over 30-40 acres, recent surveys of the site indicate that the settlement once comprised seven mosques, four cemetery areas, a large double-storied 'palace', at least 10 'complex structures' (likely houses, containing several distinct spaces/rooms), approximately 30 "walled courts" (Garlake 1966:109), which may have been associated with houses constructed from non-stone materials (Freeman-Grenville 1962:193), and numerous internal and external latrines. The site is extensively overgrown, a problem documented in several of the historical sources (e.g., Chittick 1957:3; Kirkman 1964:191; Piggott 1941a:5; Wheeler 1955:46) and this seems to have influenced how much of the site has been observed and recorded in the past. The history of Kua recorded by Freeman-Grenville in 1955 (Freeman-Grenville 1962:211-215; referred to as the 'Kua Chronicle') states that the site was initially founded by Shirazi settlers "who had come long ago from Persia" (Freeman-Grenville 1962:211). The original settlement was concentrated in an area south of the main ruin complex, known as *Mkokotoni* (Freeman-Grenville 1962:211) and although the precise date for the foundation of Kua is unknown, it is shown on the maps of Arab geographer Al-Idrisi in 1154 as Kahua (Chittick and Rotberg 1975:141). Numismatic evidence from the site suggests that it was occupied by at least the 13th century AD, and Freeman-Grenville (1962) notes the presence of possible 14th century AD celadon ware. Piggott (1941a) and Chittick (1957) were both less convinced of the antiquity and elegance of the settlement. Chittick (1957) argues that "most of the buildings at Kua are uninspiring and... of no great antiquity" (Chittick 1957:3). The Kua Chronicle (Freeman-Grenville 1962) indicates that the main settlement area was founded at a later date by Arabs who approached the Shirazi settlers asking for a place to build. "The Arabs were given the north part of... [*Mkoktoni*]... After they had finished building their town, they called their hosts, that is, the Shirazi and said to them: The name of our town will now be called Kua" (Freeman-Grenville 1962:211). On this basis, discrepancies between Chittick's (1957) and Freeman-Grenville's (1962) dating of the site could be explained by the fact that Chittick only visited the later phase of settlement. The fact that Freeman-Grenville (1962:172) records the

presence of seven mosques whereas Chittick (1957:3) only records five suggests that Freeman-Grenville had also visited the mosque in the *Mkokotoni* Area to the south of the site. While he does not note the large burial ground surrounding this mosque, as shown by his observation that there were only two cemeteries at Kua and his suggestion that "earlier burials ... [may have taken place]... elsewhere in cemetery not yet found" (Freeman-Grenville 1962:172), it is possible that the graves were obscured by the dense vegetation. Many of the burials in this area are marked by stones at the head and foot of the grave and even today, they are not easily visible.

Although dates for the foundation of Kua still need to be firmly established though further archaeological reconnaissance, an account of the collapse and subsequent abandonment of the site derived from local traditions is referred to by many historians (Freeman-Grenville 1962; Kirkman 1964; Piggott 1941a, 1941b; Revington 1936). A popular narrative suggests that Kua was raided in the early 19th century AD by the Sakalava from Madagascar who "arrived in their small canoes call '*laka*' and captured many people" (Piggott 1941b:25). It is possible that this attack was orchestrated by an artisan from Kua, who was upset with the poor way slaves and others were treated by their rulers, escaped and returned with reinforcements (Freeman-Grenville 1962:213). The dates of the attack can be further refined to sometime between "1810 and 1835" (Piggott 1941b:7) as news of the attack was sent to the Sultan of Zanzibar, whose control of Mafia was well-established by 1812. As a result of this, "an expedition was made up and sent to chase the invaders ...[who] ... were found on a small island and defeated, the prisoners brought triumphantly back to Mafia" (Piggott 1941a:7). In light of the reported response to the raid, it is also probable that it occurred prior to 1838, when the Sultan is said to have "made a treaty with Queen Seneekoo of the Sakalava" (Piggott 1941b:7). Despite this victory, the tradition holds that Kua never recovered from the attack and the site was subsequently abandoned when the Sultan's seat of power was moved to nearby Chole Island. During this subsequent period, Chole had considerable involvement in long-distance trading networks, playing an important role in the supply of cowrie shells to other parts of Africa (Hongerdon and Johnson 1986; Piggott 1941a:7). Although Kua was involved in long-distance trading networks—as evidenced by the presence of considerable quantities of imported material including pottery and beads, the nature of the harbour led Piggott to suggest that the "population [could not] have depended on sea trade" (Piggott 1941a:5). Whether this comment refers exclusively to long-distance trade, or whether it includes their involvement in local networks and maritime exploitation is unclear; however, it is likely that fishing was an important part of the subsistence economy of the site's inhabitants.

Excavation Context

While a similar study could have been conducted at the other stone town settlement site in the archipelago—Kisimani Mafia (Figure 1), Kua was selected for excavation as the standing ruins and their associated archaeology were more extensive. This was beneficial from two perspectives: first, the surviving standing remains lent themselves to mapping using a handheld Global Positioning System (GPS), which could then be used to evaluate the influence of the sea on settlement organisation. Second, and more relevant from the perspective of this paper, local ethnographies collected during the course of the broader project had suggested that rubbish was disposed of on a house-by-house basis. It was therefore hypothesised that the examination of the midden deposits associated with two households of different social status (determined based on the ethnographic and architectural data and the associated cultural material within the midden deposits that could be used as social markers), could be used to evaluate whether access to marine resources was influence by social or economic status in the past.

Site selection

Two 2 x 3 m trenches (Trenches 1 and 2) and one additional 1 x 1 m trench extension (Trench 1A) were excavated during the field season (Figure 1(a)), selected based on local knowledge of the site, ethnographic data, surveys and small-scale Shovel Test Pit (STP) excavations. The assemblages recovered from Trenches 1 and 1A were combined during the spatial analysis and these Trenches are referred to collectively as 'Area 1', as their deposits are thought to have been associated with the same household. To maintain consistency, Trench 2 is therefore referred to as 'Area 2'. All deposits were dry-screened using a 3mm mesh, with a 0.5mm mesh used in a secondary screen for the initial deposits of Trench 1. This smaller mesh size was subsequently abandoned after heavy rains left the deposits waterlogged. Although wet screening would have been preferable, maximising the recovery of smaller bones, this was not logistically feasible as the water supplies on the island were limited.

Area 1

Situated approximately 1 km south of the main ruins complex, Area 1 is probably situated within the area of the original settlement of *Mkokotoni*, mentioned by Freeman-Grenville (1962:211). Located over 80 m from the shore, Trenches 1 and 1A were associated with a low circular mound of large coral rocks (Figure 2), which ethnographic surveys had suggested were the remains of a collapsed house.

Figure 2. Low circular stone mound in Area 1.

Source: Photo copyright author.

Trench 1 was opened in this area as a sizeable scatter of marine shells, land-snail shells, local and imported pottery, and bone had been identified. It was believed to be the remains of part of a rubbish dump deposit created by the occupants of the associated house. A number of similar mounds were identified during a small-scale survey of the surrounding area and marked with GPS coordinates using the Garmin eTrex Vista. One of these 'house' mounds was considered to have the potential for further excavation, however, despite the excavation of four 0.5 m x 0.5 m test pits, the location of its associated rubbish dump remained uncertain. To identify a second area for excavation, additional surveys were conducted within the main ruins complex.

The coastline west of Area 1 is covered with a thin humic layer and considerable leaf litter. As the name of the area ('*Mkokotoni*' literally 'at the mangroves') suggests, direct access to the sea is limited by a dense band of mangrove at least 150 m thick, and unlike Area 2 (discussed below), there are no distinct breaks in the mangroves along the immediate coastline. The nearest coastal

access point is approximately half a kilometre north of the area, towards the main ruin complex. The dense mangrove forest in this area is an ideal environment for mangrove mollusc species, such as *Terebralia palustris* and surface scatters of the shells from these molluscs around the excavation area suggest they have been quite extensively exploited, at least in recent years. Trench 1A was opened towards the end of the field season as an extension to the southeast corner of Trench 1. A large proportion of the faunal remains recovered from Trench 1 had been concentrated in this area and there was a lot of material still in the section. The excavation of Trench 1A had two aims: first, it aimed to determine the maximum extent of the deposits identified in Trench 1. Second, as a wall feature running along the west of Trench 1 had been uncovered, I hoped the excavation of Trench 1A would help clarify whether the deposits excavated were internal or external.

Area 2

To identify the second excavation area, archaeological scatters – particularly those associated with shell and bone debris – were identified during the surveys of the ruins. Test pits were excavated at four of these scatters to gauge the extent of the subsurface remains. These test pits were productive and Trench 2 was opened next to Test Pit 5 (TP5), which had the richest deposits (Figure 3).

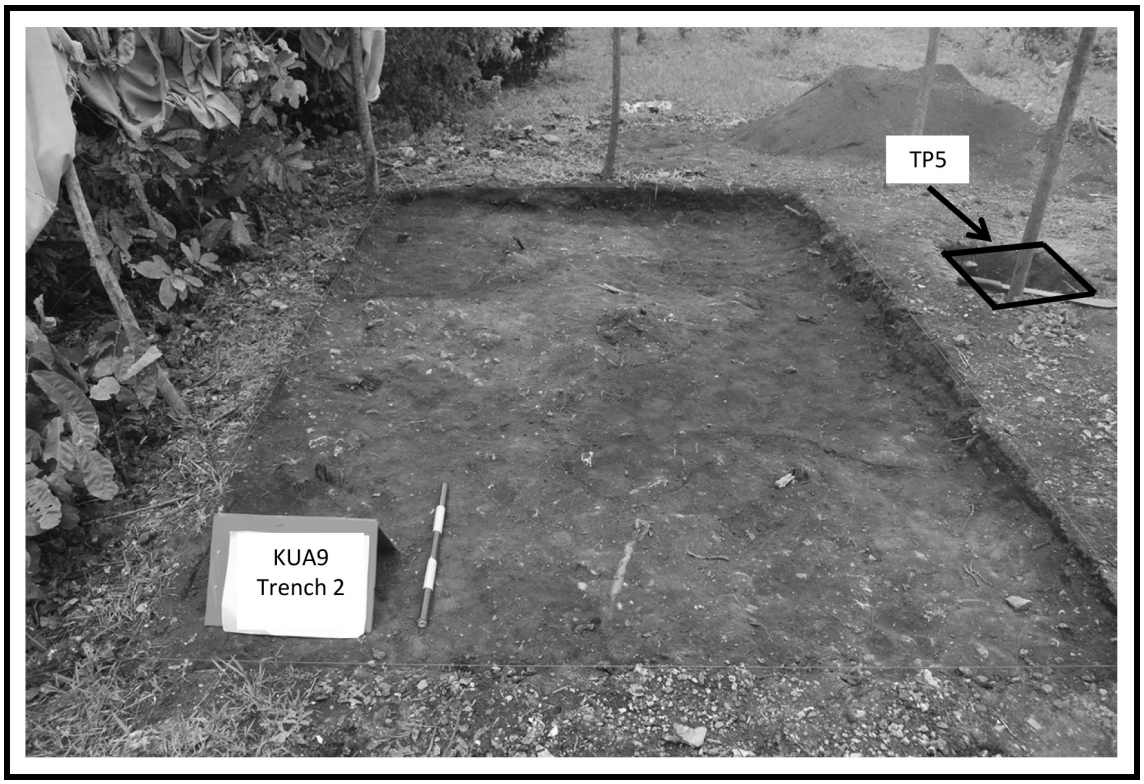

Figure 3. View of Excavation Area 2 looking North (Scale with 10cm divisions).

Source: Photo copyright author.

Bisecting a low mound close to the coastal edge on the top of a small but steep cliff which is exposed to water during the high tides of the *Ba Mvua* (times of the month when there is a high tidal range), Trench 2 is located slightly to the north of the main ruins complex. The beach immediately below the trench is quite rocky and the mangroves open out slightly to provide access to the bay. The beach in this area is strewn with a comparatively dense concentration of local and imported pottery, bone, beads, shell and iron slag; all of which extend seawards approximately 10-15 m.

Beyond the mangroves, the inter-tidal zone becomes increasingly silted with occasional concentrations of seagrass, and though difficult, it is possible to walk between Juani and Jibondo on foot during the *Ba Mvua* at which times shellfish and seagrass are intensively exploited. The seagrass species frequently used as bait in the *Madema* fish traps is also collected in this area.

The terrestrial environment around Trench 2 was relatively open compared to other parts of the site, and while the trench was not directly associated with visible standing remains, there are a number of plastered remains and toilets in the immediate vicinity. The coastal edge to the west of the trench (extending north and south of the unit) was lined with trees and shrubs including a large baobab tree—which is often considered indicative of past human settlement (Wynne-Jones 2006:10) was growing approximately 10 m to the south. Human skeletal remains were observed eroding out of a path providing access to the beach; however, these were not examined out of respect for local customs and because of the issues associated with obtaining permission to excavated human remains in Tanzania. The presence of a grave this close to the high water mark (HWM), and the dense concentration of slag and other cultural deposits on the immediate inter-tidal zone, does suggest that this area of coast may have been exposed to a certain degree of coastal erosion in the past in which cultural material may have been washed out of the cliff section.

Site chronology

To evaluate the influence of social or economic status on patterns of resource exploitation, it is important to consider each of the excavation areas within their chronological context. To this end, twelve charcoal samples were collected at various stages of the excavation from sealed layers or undisturbed contexts; three of which were sent to Rafter GNS science labs in New Zealand for dating.

While radiocarbon dating tends to provide more refined chronological data than other indicators such as pottery sequences, it can produce quite a wide date range as the calibration curve can oscillate. Thus, the peak of the radiocarbon age signal can bisect the calibration curve at several date ranges.

KU1 (NZA33897)

Taken from a layer near the bottom to Trench 1A in Area 1, this sample yielded a date of 531 ± 25 years BP. Calibrated, this gave two possible date ranges at a 95% confidence interval of either AD 1325 to 1346 or AD 1393 to 1437 (Figure 4).

The calibrated date range suggested above is difficult to refine further. Other chronological indicators recovered from this area were limited to one piece of Chinese celadon ware, which could be associated with either of the dates suggested (14th-15th century AD).

KU2 (NZA 33898)

The second sample, taken from an undisturbed context near the top of the midden deposition in Trench 1A in Area 1, yielded a date of 470 ± 25 BP, which gave a calibrated date range of AD 1415 to 1451 at a 95% confidence interval (Figure 5).

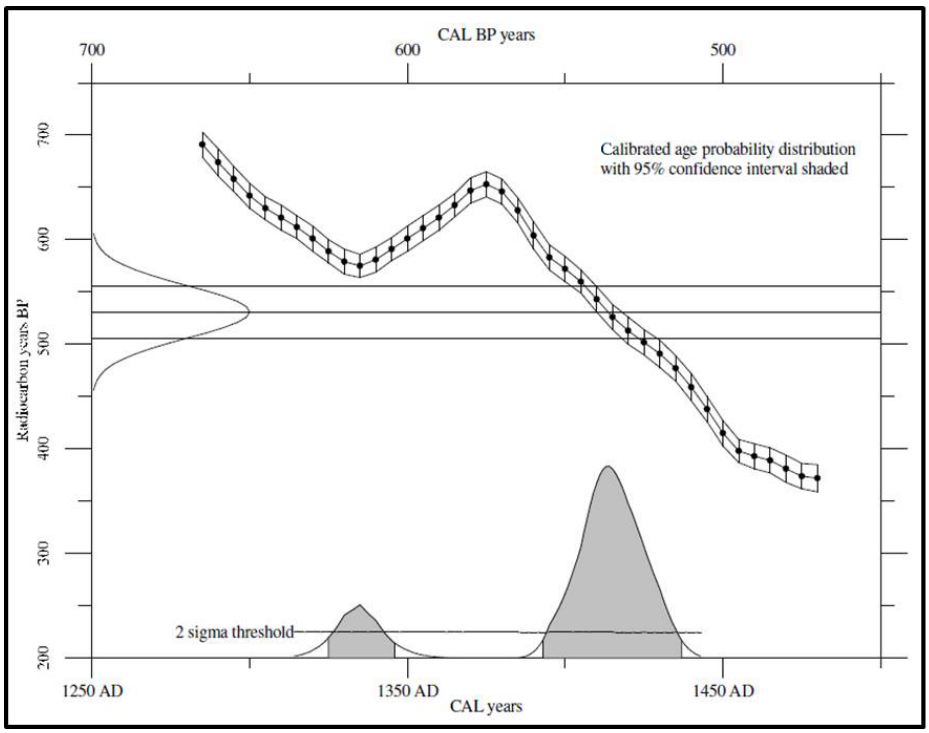

Figure 4. GNS radiocarbon calibration curve for sample KU1 (NZA33897).

Source: Rafter Radiocarbon Laboratory report for KU1 (NZA338978).

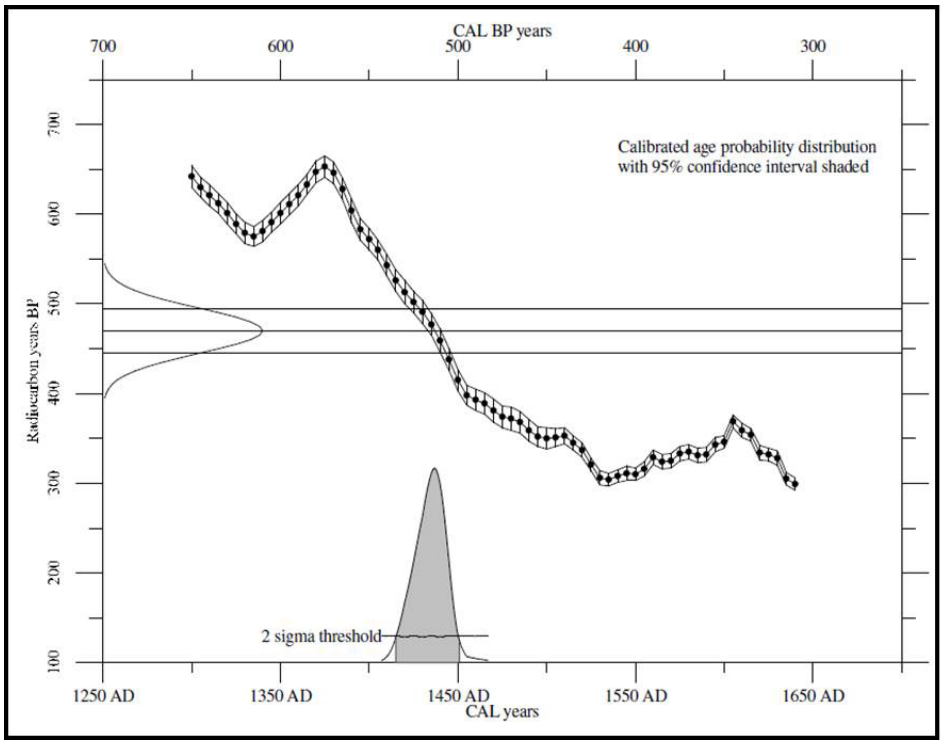

Figure 5. GNS radiocarbon calibration curve for sample KU2 (NZA33898).

Source: Rafter Radiocarbon Laboratory report for KU2 (NZA33898).

As the date ranges from KU1 could not be refined further, it is difficult to assess the period of deposition. The midden could have accumulated over a period of approximately 100 years, although it is also possible that this period could have been rather shorter, around 10-20 years. Whether this period reflects the entire occupation of the associated household or whether an as yet unidentified site was selected for additional deposition at the end of this sequence remains unclear, and remains to be determined through further excavation.

KU3 (NZA 33899)

Taken from a deposit considered to represent an initial phase of midden deposition in Trench 2 (Area 2), this sample yielded a date of 263 ± 30 BP. Unlike the previous two samples, there were more oscillations on the calibration curve resulting in four possible ranges suggested at a 95% confidence interval. The ranges were as follows: AD 1520 to 1593, AD 1619 to 1669, AD 1781 to 1798, and AD 1945 to 1950 (Figure 6).

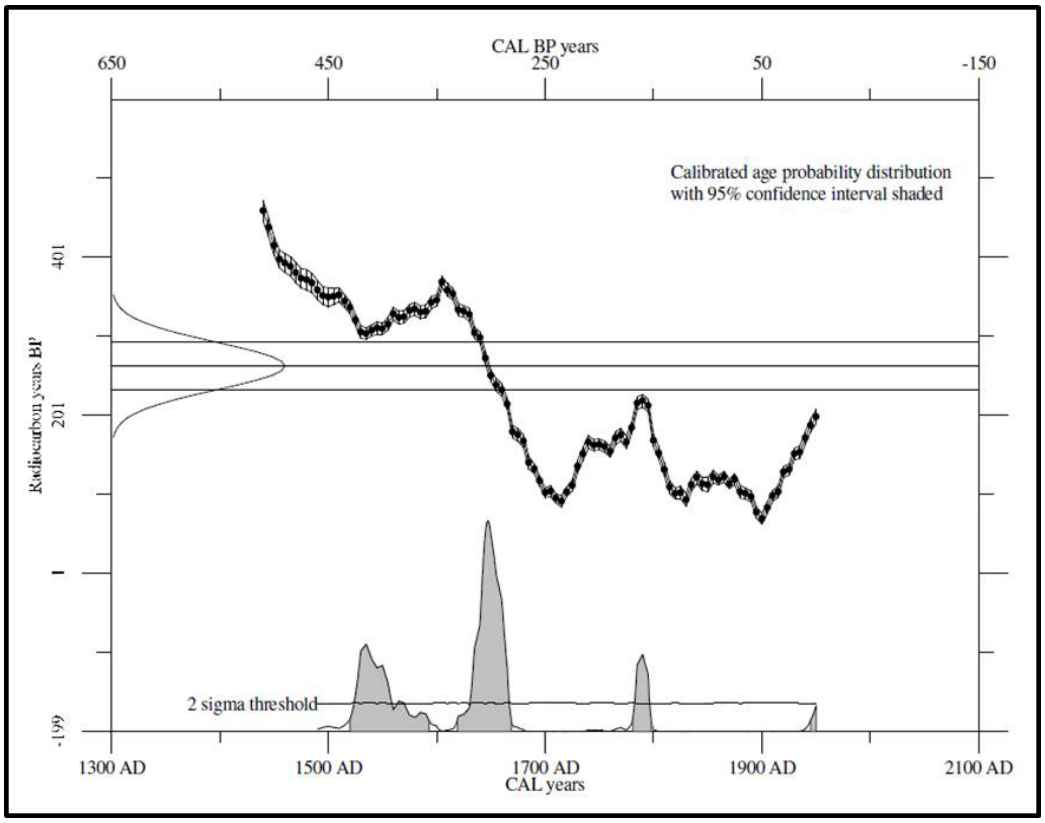

Figure 6. GNS radiocarbon calibration curve for sample KU3 (NZA33899).

Source: Rafter Radiocarbon Laboratory report for KU3 (NZA33899).

These dates can be refined when examined in conjunction with other chronological indicators including historical sources, architectural features, pottery sequences and beads, (see Christie 2011 Vol. 1:262-264 for more details). Based on the historical data, it is possible to eliminate the date range of AD 1945 to 1950, while the architectural, inscriptional and historical sources would all seem to suggest that the date ranges AD 1619 to 1669 and AD 1781 to 1798 could both be applicable. Based on these ranges, there seems to have been a gap of at least two centuries between the final deposits in Area 1 and the founding deposits in Area 2. Although the historical sources point to a possible status differentiation between the two areas, arguing that the Arabs who built Kua, "resolved after they had settled down to make themselves the rulers and subdue

the inhabitants" (Freeman-Grenville 1962:212), in light of the radiocarbon dates, it is possible that any differences in the patterns of consumption observed between the two excavation areas could also have resulted from chronological changes.

Status differentiation: Archaeological and historical indicators

One factor considered in the selection of the excavation areas was the likely status of the associated households. While this was initially determined based on ethno-historical data and small-scale surveys, analysis of the associated cultural materials within the midden deposits has been used to test whether the preliminary status differences noted were justifiable archaeologically. The primary indicators for status differentiation were the imported pottery assemblages and the beads, amongst others, as these items are often associated with prestige and higher status (c.f Donley-Reid 1990).

The assemblages from Area 2 have a much higher proportion of each of these materials, with the recovery of beads limited to the deposits from this area. From the perspective of the imported pottery and the beads, the difference in the quantities between the two excavation areas could support the interpretation that they represent households of differing social status, with the household in Area 2 having increased access to commodities available through long-distance trade and exchange. Additionally, Donley-Reid (1990:122) proposes that imported pottery, particularly Chinese porcelain (particularly Chinese blue-on-white), is frequently considered to be a marker of social status. It should be noted that the lack of beads recovered from the lower status household is not likely to have resulted from differential recovery procedures, as the deposits from Area 1 were screened through a finer sieve.

In addition to the archaeological assemblages, the architectural and historical data also suggest that, at least to some extent, there was some status differentiation between the two areas. From the perspective of architectural data, a buildings survey was conducted as part of the broader project, during which status markers within the standing remains were identified and recorded. Given the likely importance of Islam within the community, the mosques were considered to have been representative of higher status buildings. Pollard (2007:110) suggests that "the position of stone mosques probably indicates wealthier areas; status symbols showing the piety of the inhabitants, as well as places for Muslim sailors to head towards for navigation and worship." On this basis, several of the features observed within the mosques were used as status indicators at other buildings around the site. Status markers included evidence of plastering, particularly red plastering, the number of rooms, the number and the degree of elaboration of niches within the structure, the presence of other decorative features including "plaster decorations on the walls, with beautiful geometrical designs around doors and entrances" (Sheriff 2001:66), the use of marine coral or non-coral building materials, and evidence for a second floor.

During the surveys, it was noted that the majority of the houses recorded within the main ruins complex can be interpreted as being of high social status based on the criteria discussed above. While there are some slight variations within this, in terms of the fact that some of the buildings have more status indicators than others, this interpretation seems to fit with the traditional history of the site. Specifically, the history of Kua suggests that the "Arabs [who built Kua] gain a considerable footing and strength and became rulers of both parts of the town" (Freeman-Grenville 1962:212). The poor survival of the mounds interpreted as structures in the Mkokotoni area of the site when compared to the levels of preservation of the higher status buildings like K012 or K037, when examined in conjunction with the predominance of 'lower status' burials recorded in that area could suggest that individuals living in Mkokotoni had a different status to those living in Kua.

Results

Description of the assemblage

Over 3000 bones were recovered from the two excavation areas, of which 2700 specimens were identifiable to element, taxa, or both. Once the assemblages had been sorted by element, and the remains from 'marine' and 'terrestrial' taxa separated, the terrestrial remains were further sub-divided into the following categories (Table 1).

Table 1. Size classes for terrestrial taxa.

CATEGORY	CLASSIFICATION METHOD	LIKELY TAXA	LATIN NAME
Large Ungulate	Bones from taxa weighing 76-500 kg	Cow	*Bos spp.*
Medium Ungulate	Bones from taxa weighing 26-75kg	Goat, Sheep	*Capra spp.; Ovis spp.*
Small Ungulate	Bones from taxa weighing 0-25kg	Blue Duiker	*Philantomba monticola*
Bird		Chicken	*Gallus gallus*
Other		Rat, Dog	*Rattus spp.; Canis familiaris*

Source: Primary data from author's analysis of the excavated materials.

The ungulate size divisions were arbitrarily created to reduce potential errors arising from the mis-identification of remains to species level. For example, although most 'large ungulate' remains are likely to have been representative of cattle bones, there are a number of other cattle-sized antelope which could have been exploited. The NISP for each of the taxa recorded is shown in Table 2.

Table 2. Representation (NISP) of taxa from each excavation area.

TAXA	AREA 1	AREA 2
Fish	1391	455
Large Ungulate	144	331
Medium Ungulate	59	158
Small Ungulate	3	2
Bird	43	93
Marine Mammals	4	4
Other	10	1
TOTAL	1654	1044

Source: Primary data from author's analysis of the excavated materials.

Over fifteen mollusc species were also recorded. Of these, the food species *Volema pyrum (Nalwale)* and *Terebralia palustris (Tondo)* were most frequently recovered, with non-subsistence molluscs such as cowrie shells *(Cypraea tigris)* and *Cypraea annulus (Kikete)* also well-represented, particularly in Area 2. Molluscs were recorded in the field using their local names and, where possible, these have been identified to species level following further examination. The MNI for the most frequently represented species within the assemblages is shown in Table 3. For gastropod species, MNI was calculated based on the counts of the numbers of complete specimens. For bivalve species, these counts are based on the number of intact right side valves to avoid the same animal being counted twice.

Table 3. MNI mollusc species identified in the excavated material (identified after Richmond 1997).

LOCAL NAME	LATIN NAME	AREA 1	AREA 2
Nalwale	*Volema pyrum*	833	272
Tondo	*Terebralia palustris*	604	19
Kiboko	*Nerita textilus*	109	51
Makome	*Chicoreus ramosus/ Pleuroploca trapezium*	36	20
Cowrie	*Cypraea tigris*	30	24
Combe	*Anadara antiquata*	23	42
Kikete	*Cypraea annulus*	8	156
Other		9	8
TOTAL		1900	647

Source: Primary data from author's analysis of the excavated materials.

Spatial analysis

Several levels of spatial analysis were conducted, three of which are presented below.

1. the proportions of marine and terrestrial fauna recovered from each excavation area were examined to evaluate patterns of resource use on an intra-settlement scale.

2. the proportions of the different ungulate size classes were evaluated, particularly from the perspective of element representation in each of the excavation areas to determine whether the different households had access to different parts of the carcass.

3. the molluscs assemblages from each of the excavation areas were studies from the perspective of the spatial distributions of subsistence and non-subsistence molluscs and the proportions of shell exploited.

1. Proportions of marine and terrestrial resources

Analysis of the Kua assemblages has indicated that there were differences in patterns of resource use between the two excavation areas. Material from Area 1 was comprised primarily of fish bones from much larger fish. In contrast, the assemblage from Area 2 comprised a more diverse assemblage with only a few smaller fish bones (Figure 7).

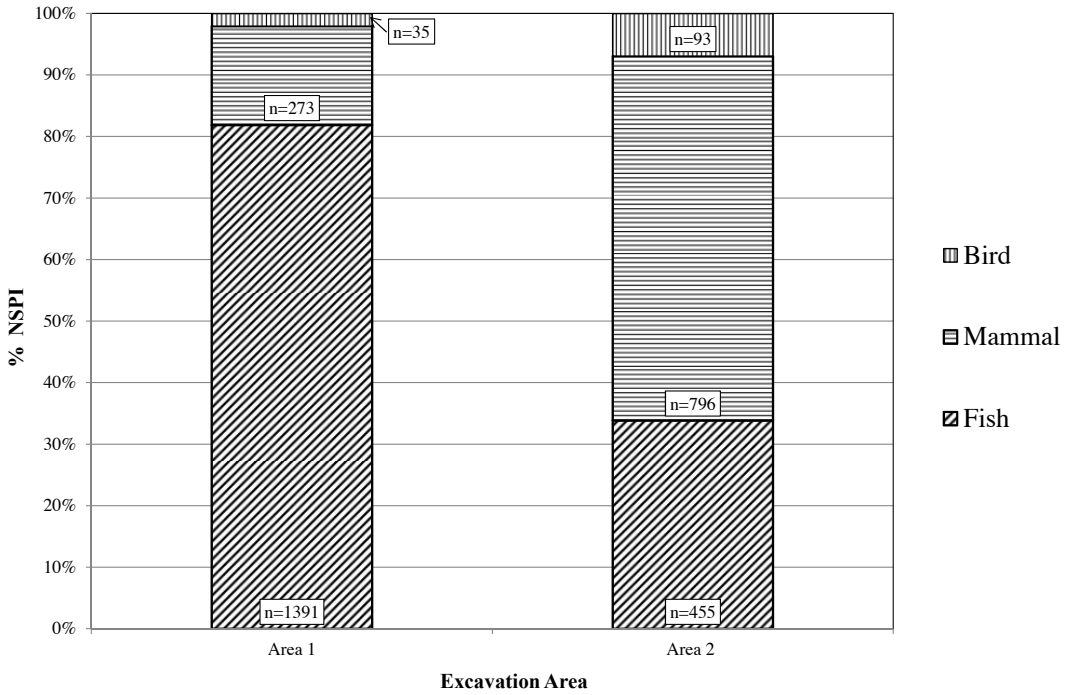

Figure 7. % NISP of different taxa recovered from each of the excavation areas.

Source: Created by author from primary data.

I had expected that the assemblages of both households would comprise equal proportions of marine resources, but also that the assemblages from Area 2 would have been made up of a higher proportion of larger marine taxa. This was based on the observation that higher status individuals would have had access to improved fishing technologies, or could afford bigger boats that would have given them access to fishing grounds further offshore (or more simply, as wealthier households, they could afford to purchase better quality/more expensive fish). Instead, in this deposit, most of terrestrial taxa and many of the fish remains were representative of smaller specimens. The higher

proportion of terrestrial remains in Area 2 suggests that status was actually manifested through the control of access to terrestrial taxa, rather than through the direct control of marine resources. The higher proportion of marine remains (in terms of fish and edible shellfish) in Area 1 could then be seen to have been a means by which this household was able to make up the shortfall in their subsistence requirements.

2. Ungulate remains

Although a higher number of terrestrial resource were consumed at Area 2 (Table 2), when examined in terms of specific ungulate size classes, the contributions of each taxa within the total assemblage was fairly consistent. It should be noted that these figures are based on identifiable elements. Bone chips and unidentifiable fragments have been excluded.

While there are not any considerable differences in the proportions of large or medium sized ungulates being considered by each household, there is a difference in the elements represented at each area, particularly in the large ungulate category. Specifically, at Area 1, the identifiable large ungulate elements recovered are either from the cranium (zygomaticus/mandible), or from the forelimbs (humerus, radius, ulna and metacarpals). In contrast, the large ungulate elements recovered from Area 2 are more varied, with the majority coming from the skull, or the hind limbs (femur, tibia) and pelvis (Figure 8).

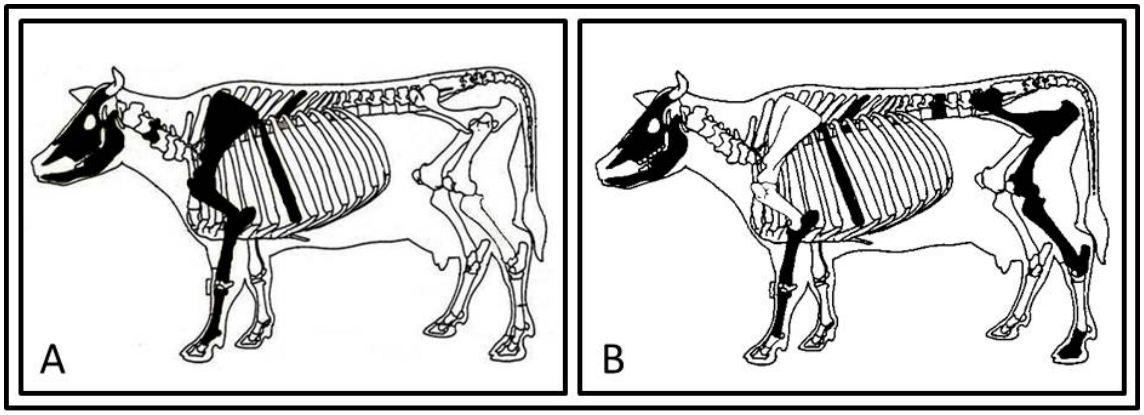

Figure 8. Large ungulate element representation in A) Area 1 and B) Area 2.

Source: Adapted from http://www.tumblr.com/tagged/animal%20science

This is interesting from the perspective of butchery practices as the leanest steaks such as the fillet, the rump or the sirloin are normally removed from the rear of the cow, whereas cuts from the front of the animal tend to be tougher, more suitable for stewing or for use as mince meat (c.f. Shultz and Gust 1983:48). The distribution of different meat cuts has implications for understanding socio-economic status. As Crabtree (1990:171) notes, "the most commonly examined indicator of status [when assessing faunal remains] include: differences in the quality of the meat cuts consumed… generally measured by examining differences in body part frequencies." While element distribution has in this case been used as a marker of socio-economic status, as Enloe (2003:4) highlights, "the ethnographic literature makes it clear that food sharing is neither universal nor uniform." The ways in which animal carcasses are divided is likely to depend on the size of the animal, its value within society and, most importantly, the cultural context of food sharing. This is particularly well-demonstrated by Mooketsi's (1991) examination of the distribution of meat cuts within different Tswana clans. Although part of the same cultural unit, different parts of the carcass are assigned a different value depending on relationships within specific clans (Mooketsi 1991:119-120). Further work would need to be conducted to assess the cultural value of specific meat cuts amongst the Swahili, however, ethnoarchaeological observation of the butchery of a

goat carcass during the field season suggests a preference for cuts from the haunches of the animal over the lower limbs (e.g., metacarpals, metatarsals, phalanges) and cranium, which were quickly discarded. When queried as to why these elements were not retained, my informants suggested that they were not considered a worthwhile source of meat. Archaeologically, lower limb elements accounted for only 5% of the total ungulate assemblage, and over half of these were recovered from Area 2. Lower limb/feet bones were also the third most common elements showing evidence of butchery.

When considered in the context of the ethnographic data, it is possible that the low representation of lower limb bones within the total assemblage is the result of differential discard practices. In the case of the goat butchery, the carcass was butchered on the shore, and the lower limbs were thrown into the mangroves. Of the lower limb bones recovered from the archaeological deposits, over half of them would have been removed from a large ungulate (likely cow). In her report on *Food and food security on Mafia,* Caplan (2002) stipulates that cattle tend to be utilised in rituals and ceremonies rather than as a general food source (Caplan 2002:25). Given this association, it is possible that cows were butchered in a different way to goats. The lower limbs of a cow are also meatier, so may have been considered a more valuable food source. This does seems to be supported archaeologically as the observed patterns of medium ungulate element distribution are different to that noted for large ungulates. Specifically, there is a larger variation in the elements represented in Area 1. Medium ungulate elements recovered from Area 2 tend to come from the skull and upper forelimbs (scapula, radii and ulna) (Figure 9).

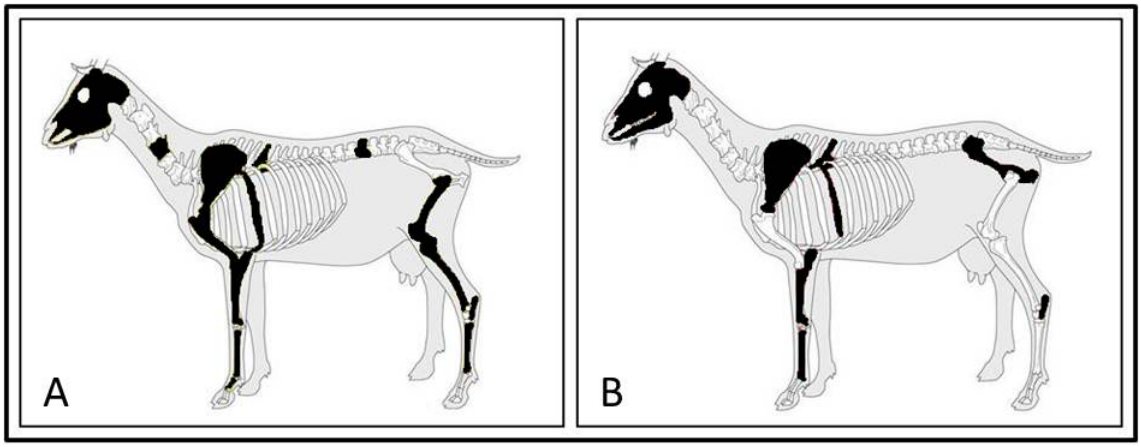

Figure 9. Medium ungulate element representation in A) Area 1 and B) Area 2.

Source: Adapted from http://thekebun.wordpress.com/2008/10/02/goat-skeleton/

Given that the representation of large ungulate elements in Area 2 is quite varied, the reduced variety of medium ungulate remains could suggest that medium sized taxa were less favoured by this household, possibly because they had access to a wider variety of large ungulate meat cuts.

Birds

Comparative analysis in conjunction with a modern reference collection would seem to indicate that most of the archaeological bird remains are chicken (*Gallus gallus*). There is a slight difference in terms of the proportions of bird remains recovered from each of the excavation areas, with a higher proportion of the bird assemblage recovered from Area 2; however, unlike the ungulates, there is very little difference in the elements represented at the two areas. The only difference between the two areas was the presence of two additional wing bones (the humerus and carpometacarpus), and a chicken cranium recovered from the deposits in Area 1. The similarity

between the two units in terms of the spatial distribution of elements is not unexpected given the average size of the chicken, as the entire carcass can be eaten by one family. As Wilson (1996:67) states, "large carcasses are extensively butchered, small ones scarcely."

Although there is little difference in the spatial distribution of elements, the higher proportion of chicken remains in Area 2 could suggest that access to chickens may have been restricted.

Marine Resources

To assess the fish remains within the assemblages, a small reference collection of Indian Ocean reef fish (now stored at the University of York) was made. Fish were purchased from local fishermen and the fishing technique used was recorded. The catch was measured and identified, then subsequently cooked to remove the majority of the meat and skin. The bones were collected and allowed to soak overnight in a separate bowl of warm water to soften any excess flesh. These were then sorted and the cleaned bones were submerged and left in a second bowl of warm water, this time mixed with biological washing powder, for up to two days to break down any fatty residues. The bones were subsequently removed and allowed to dry before being soaked in white spirits to preserve them and mitigate against mould and rot. The dried bones were bagged and labelled with the following information: Common Name, Latin Name, Swahili Name, Size of Fish, Date of Collection and Fishing Method.

The collection comprised 57 specimens from over 22 different families and was used to identify the archaeological fish bone assemblages. As my expertise in fish identification was limited, ten cranial elements with clear differences were selected as the basis for the analysis to reduce any errors. Any uncertainties in identification were marked as such. The cranial elements selected included: the upper and lower jaw bones (dentary, articular, maxilla, premaxilla), the pharyngeal bone, the vomer, the palatine, the hyomandibular, the cleithrum, the quadrate and the post temporal.

Given the small selection of elements from which to identify the specimens, the sample size of elements identified to family level is necessarily small, representing just over 14% (n=271) of the entire fish bone assemblage from all three trenches. Of this, 32% (n=87) of the cranial elements available remained unidentified. The proportion of identifiable elements in each of the excavation areas generally reflects the contribution of the fish bones in the assemblages from each of the excavation areas (Figure 10).

The analysis of the identifiable elements suggests that at least nine families are represented in the archaeological assemblages, with emperors (*Lethrinidae*) and groupers (*Serranidae*) being the most abundant (Table 4).

Table 4. Frequency of elements from specific families.

COMMON NAME	LATIN NAME	FREQUENCY	
		AREA 1	AREA 2
Emperor	*Lethrinidae spp.*	58	6
Grouper	*Serranidae spp.*	55	5
Snapper	*Lutjanidae spp.*	29	4
Parrotfish	*Scaridae spp.*	17	3
Sweetlips	*Haemulidae spp.*	3	0
Rabbitfish	*Siganidae spp.*	1	0
Triggerfish	*Balistidae spp.*	0	2
Goatfish	*Mullidae spp.*	0	1

Source: Primary data from author's analysis of the excavated materials.

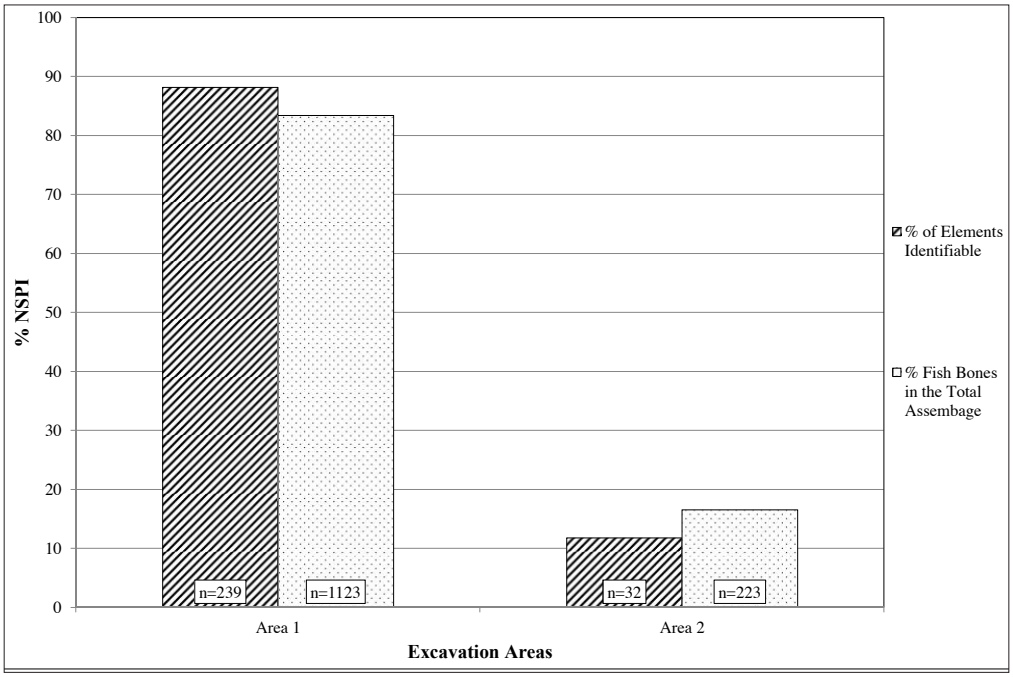

Figure 10. % Fish bones in the total assemblage compared to the % of the assemblage representing identifiable elements.

Source: Created by author from primary data.

As shown in Figure 11, the proportion of the families represented in each of the excavation areas is similar. While Area 1 has a slightly higher proportion of elements identified as groupers (*Serranidae*) and emperors (*Lethrinidae*), it is possible that this is the result of the differential sample size from each of the excavation areas. The higher proportion of goatfish (*Mullidae*), triggerfish (*Balistidae*) and parrotfish (*Scaridae*) in Area 2 is interesting, as data collected during the fish catch surveys suggested that these families are caught more frequently in the *Madema* fish traps. That said, there is still considerable overlap in the composition of fish catch between *Madema* and *Mshipi* techniques. McClanaghan and Mangi (2004) conducted a detailed examination of fish catch off the Kenyan coast near Mombasa, correlating fish catch composition with fishing technologies. Their observations indicated that catch from hand lines *(Mshipi)* had a high dominance of emperor (*Lethrinus*) families, while big traps (*Madema*) had a high dominance of parrotfish (*Scaridae*) (McClanghan and Mangi 2004:57).

Examination of the families identified, in the context of marine zones/habitats, suggests a likely explanation for this overlap, as the habitat preferred by each of these families is quite similar (Table 5). These types of habitat are common around Kua and Juani in general.

Table 5. Habitats of the represented families (after Richmond 1997: 338-364).

COMMON NAME	LATIN NAME	ECOLOGY/HABITAT
Emperor	*Lethrinidae spp.*	Coral and sea grass beds
Grouper	*Serranidae spp.*	Shallow coral reefs and lagoons
Snapper	*Lutjanidae spp.*	Coral and rocky reefs, mangrove forests
Parrotfish	*Scaridae spp.*	Reefs, lagoons and sea grass beds
Sweetlips	*Haemulidae spp.*	Coral reefs
Rabbitfish	*Siganidae spp.*	Inshore areas, especially sea grass beds
Triggerfish	*Balistidae spp.*	Reefs, lagoons and sea grass beds
Goatfish	*Mullidae spp.*	Sandy Bottoms especially around reefs

Source: After Richmond (1997: 338-364).

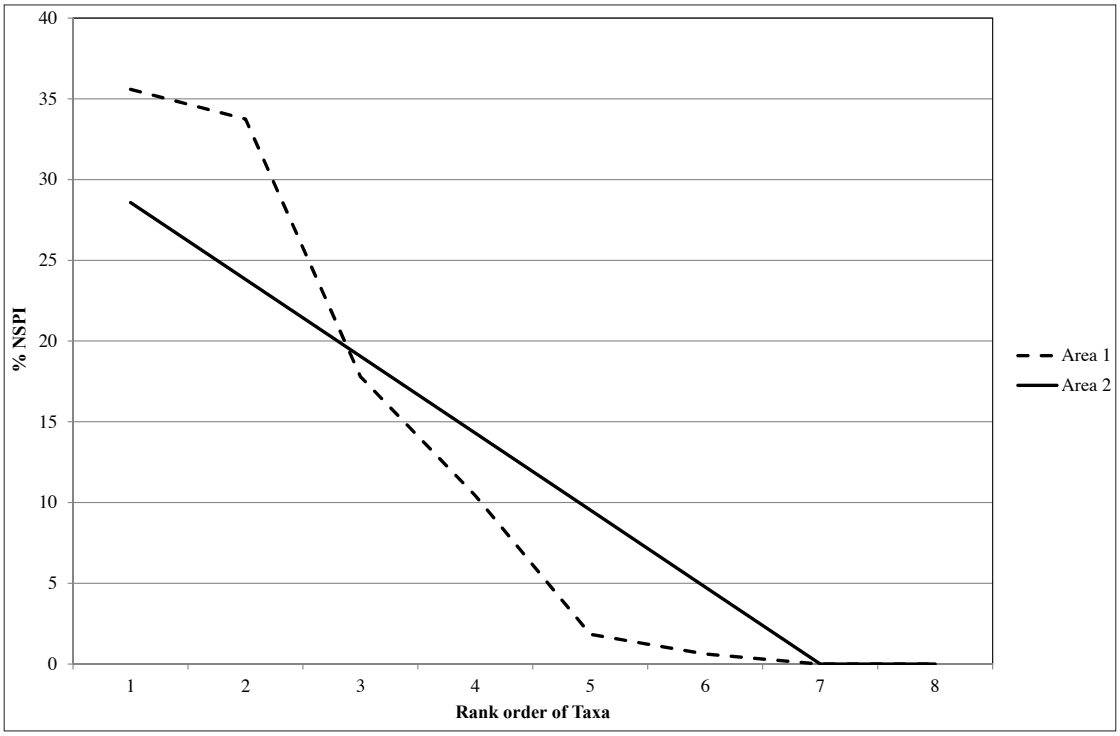

Figure 11. Rank order of taxa between the two excavation areas.

Source: Created by author from primary data.

Interestingly, several of the families that were proportionately more abundant in the assemblage from Area 2 tend to prefer nearshore lagoon and sea grass areas, whereas the families that were proportionately more abundant in Area 1 tend to prefer coral and rocky reefs, which are often slightly further offshore, and while additional data would be needed to make a more conclusive interpretation, it could be indicative of some differences in fishing practices between the two areas either in terms of selection of fishing technique or in terms of access to different vessel types.

Bones from larger pelagic species, often caught outside the reef by large gill nets, are notably absent from the assemblages of both excavation areas. This could suggest that these communities were not exploiting marine zones farther offshore, or did not have access to net technologies. Walley (2004) suggests that net fishing was only introduced as a viable fishing practice after the independence of Tanzania, proposing that nylon seine nets and shark nets were considered as "modern... fishing gear" (Walley 2004:149). It is also possible, however, that their absence is either the result of sampling biases and taphonomy. While preparing the reference collection, it was noted that the remains of both sharks and rays had very poor survival rates, and that the cranial elements in particular were very soft and friable. It is possible, therefore, that the cranial elements of these taxa have since been lost through poor preservation, and thus have not been identified. The slightly more robust vertebral elements were not included in the range of elements selected for analysis.

It is also possible that the remains of many of the more robust pelagic families such as trevally (*Carangidae*), barracuda (*Sphyraenidae*) and tuna (*Scombridae*) were not identified archaeologically, as these families were not included in the reference collection. These families were not collected as their size and weight made them expensive and too large to be shared amongst only three people. Additionally, fish from these larger pelagic families tend to be sold directly to local fishmongers where it is butchered and sold by the kilogram.

3. Mollusc Assemblages

Several of the patterns observed in the analysis of the osteological remains were also noted in the mollusc assemblages. Specifically, it was noted that a higher proportion of mollusc remains were recovered from the lower status units in Area 1 (c.f. Table 3). Within this, a much higher proportion of these remains were from species likely to have been exploited for consumption (such as *Tondo* and *Nalwale*) (c.f. Horton 1996:389-390) (Figure 12):

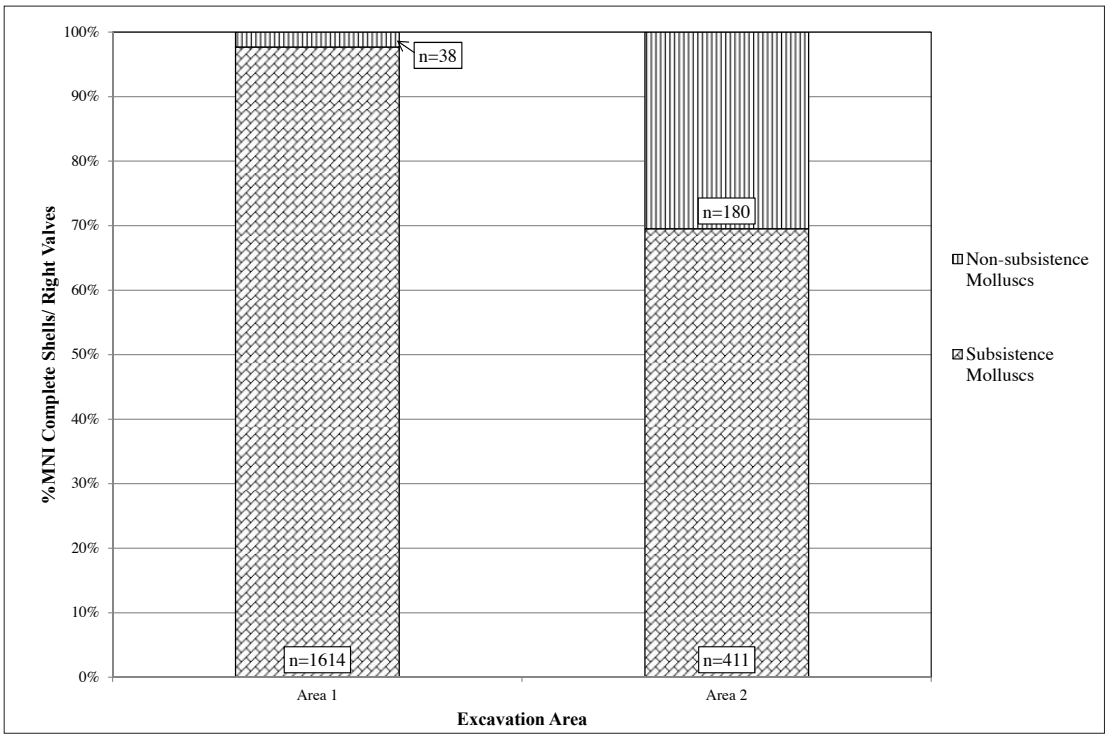

Figure 12 % MNI of molluscs used for subsistence and non-subsistence practices between the two excavation areas. This is based on complete specimens or the right valve of bivalve species.

Source: Created by author from primary data.

The higher proportion of molluscs (and indeed subsistence molluscs) in the assemblages from Area 1 is particularly interesting in light of several ethnoarchaeological studies that have proposed that shellfish consumption is generally associated with lower social status (Chittick 1974; Fleisher 2003; Lyall 2007; Moss 1993; Szasbo 2002; amongst others). These assertions have equally been referred to in a local context, as several informants interviewed as part of the project suggested that the consumption of shellfish was only preferable when access to other marine or terrestrial resources is restricted. Although these restrictions could have been imposed as a result of status differentiation, it is also possible that restrictions to other fish and terrestrial resources could have been the result of environmental stresses. While examination of longer-term environmental or climatic conditions was not possible in the scope of the project, it would be an interesting avenue for further research.

More generally, comparative examination of the species represented in each of the assemblages also has the potential to inform our understanding of the marine environment, and zones of resource exploitation, as different mollusc species are exploited from different parts of the intertidal zone (Table 6). Similar to the interpretations made about the shovel-test-pit assemblages, the high

proportion of the mud whelk *Tondo* in the assemblage from Area 1 could suggest that individuals from this household were more actively exploiting mangrove resources. This seems likely given the coastal environment around the *Mkokotoni* area.

Table 6. Habitats of the mollusc species identified (after Richmond 1997:247-261, 274-277).

SWAHILI NAME	LATIN NAME	HABITAT	USE
Nalwale	*Volema pyrum*	Eulittoral sand and sea grass flats	Food
Tondo	*Terebralia palustris*	Upper eulittoral mud or in mangrove swamps	Food, bait
Kiboko	*Nerita textilis*	On rocks in the littoral fringes	Food
	Chicoreus ramosus	Around shallow, sheltered reefs	Food
Makome			
	Pleuroploca trapezium	Sea grass Beds	Food
Kikete	*Cypraea annulus*	In shallow water, tide pools under stones or amongst sea grasses	Decoration
Cowrie	*Cypraea tigris*	Under coral and boulders in shallow or deep water	Decoration
Combe	*Anadara antiquata*	Eulittoral buried in muddy sand	Food
Panga	*Pinna muricata*	Semi buried in eulittoral and shallow sea grass beds	Food

Source: After Richmond (1997:247-261, 274-277).

Discussion

Status differentiation

One of the main aims of the excavation was to evaluate whether there was any evidence to suggest that resource exploitation was influenced by social or economic status, and from this perspective, the results of the spatial analysis are of most interest.

Analysis of the architectural data, and the ceramic and bead assemblages would seem on one hand to support the hypothesis that the two excavation areas represent the midden deposits associated with two households of different social or economic status. The higher proportion of imported pottery – particularly Chinese blue-on-white porcelain associated with the display of social status (Donley-Reid 1990:122) – and the presence of both imported and likely locally manufactured beads both suggest that the midden deposits excavated from Area 2 would seem to be associated with individuals of higher social status.

If we accept that the two areas are representative of households of different social status, the faunal analysis suggests that marine exploitation (most evident in Area 1) was conducted primarily by individuals of lower social status. Furthermore, while these individuals also had access to some livestock, the presence of hind-limb bones in the assemblage from Area 2, and the lack of the same in the assemblages from Area 1 implies that the higher status household would have had access to leaner cuts of meat. While this could be interpreted as suggesting that the lower status household had preferential access to marine resources, this is very unlikely. What seems more reasonable is that the lower status individuals, unable to access the more expensive subsistence base provided by the exploitation of terrestrial remains, demonstrated an increased dependence on marine resources to supplement their diet.

The high proportion of terrestrial exploitation in the higher status household (Area 2) could be interpreted as a way of signifying their status. If the sea was commonplace within society – as one would expect in a maritime society that derives its livelihood from the sea in terms of its role in the subsistence economy and as a facilitator of local and international exchange networks and involvement in local and international exchange networks – then consumption of terrestrial

resources may have been a form of distanciation (Garnham and Williams 1996:57-58), by which the 'elite' differentiated themselves from the ordinary. The association between high status and the exploitation of terrestrial remains is also interesting when considered in light of anthropological observations concerning the role of cows as status symbols, used more in ritual activities and feasting than for everyday consumption (Caplan 2002:25).

Parallels could be drawn with Moss's (1993) ethnographic study of shellfish consumption among the Tlingit society on the northwest coast of the United States of America. Her research suggested that although shellfish were likely to have been a primary protein source amongst the community, the consumption of shellfish was considered to be associated with poverty and low social status. Consequently, members of the elite were "encouraged to avoid eating shellfish as part of a larger strategy to achieve wealth and status" (Moss 1993:646).

So where does this leave us in terms of exploring differential access to marine resources? When evaluated wholly from the perspective of the faunal assemblages, it could be argued that access to marine resources is not restricted by status. However, this is not the full story. Although details of the buildings' surveys conducted at the settlement have not been discussed in detail in this paper, the differential patterns of consumption observed could be evaluated differently when examined in light of the buildings' survey data (see Christie 2011 for more details). These data suggest that higher status individuals lived closer to the sea than those of lower social status. If we accept the interpretation that the two areas represent households of different social status, the proximity of the higher status houses to the sea could be regarded as a further iteration of this status as, although they are not actively exploiting marine resources (as evidenced by the higher proportion of terrestrial remains in the associated midden deposits), they are still controlling access to the sea. To a certain extent, this is supported by the ethnographic data on Juani. During one interview, the informant suggested that access to the landing site closest to the 'palace' was restricted, as the people of Kua were not allowed to walk past the palace to gain access to the shore. He also suggested that access to the fishing grounds immediately adjacent to Kua was also limited, as only the king or people carrying out his requests could fish there.

Alternative interpretations

While status differentiation between the two units is a reasonable argument for the interpretation of differences in the patterns of resource exploitation discussed above, in light of the historical data that suggests that the main complex of ruins at Kua (surrounding Area 2) were built sometime after the settlement in *Mkokotoni* (near Area 1) was founded, it is possible that the two units are not directly contemporary. This is further complicated by the fact that these historical sources also suggest that the majority of the ruins around Area 2 were built by a group of foreign Arabs who approached the existing community in *Mkokotoni* and asked for land on which to build.

On this basis, three alternative interpretations to explain the different patterns of resource exploitation between the two excavation areas could be proposed. First, it could be argued that the differences between the two areas were the result of a changing preference from marine resources to terrestrial resources over time. One possible explanation for this change could be that the marine resources were overexploited to the point that they were no longer viable. This seems unlikely, however, as modern observations of marine consumption suggest that communities are currently exploiting a similar range of marine resources to those identified in the archaeological assemblages. This could be tested through further research through the collection and analysis of larger faunal assemblages in a secure chronological sequence – specifically, fish bones identified to family level could be measured to determine whether there is any evidence to suggest over-fishing (possibly indicated by a decline in the average size of the catch, or the elimination of specific families from the sequence). Such levels of over-fishing are possible – for example, analysis of the

faunal remains from Shanga suggested that one family (*Siganidae*) that was exploited in the past is now "hardly ever caught…[hypothesising]… perhaps it was over-exploited in the thirteenth century and populations have never recovered" (Horton 1996:384).

A second explanation for the differential patterns of resource exploitation observed during the faunal analysis is that the incoming Arab population that was said to have built Kua (Freeman-Grenville 1962:211) had a preference for terrestrial resources such as cows or goats. This would also need to be evaluated through further research to determine whether similar patterns of resource use are present in other midden deposits within the main ruins complex. This could possibly be examined by comparing the midden deposits associated with houses close to the shore with a midden associated with houses slightly inland. Interestingly, Caplan (2002:25) suggests that there may be a division between individuals involved in animal husbandry and those involved in fishing, which is attributed to the preferences of different population groups (the Arabs and Shirazi compared to the *Wambwera*). One reason suggested for the abandonment of Shanga in the 14th century AD is that it might have run out of water (Horton 1996:427). Reduction in the water supply – a resource that is comparatively scarce on Juani today - might have encouraged a decline in the exploitation of domestic terrestrial taxa, with less livestock kept at the site in order to preserve the water available, thus resulting in a higher dependency on the exploitation of marine resources.

Finally, given Caplan's (2002:25) assertion that "cattle are sold to be slaughtered at big rituals such as funerals and weddings, and also at spirit healing rituals," one final interpretation for the high proportion of terrestrial remains in the assemblage from Area 2 is that the deposits from this midden were primarily associated with 'ritual' activities. This could explain the higher quality of locally produced ceramics and the higher quantity of imported remains – also often associated with protection and ritual, however, it seems unlikely given the high proportion of other terrestrial and marine remains (that are likely to have been less ritually important) within the same contexts. This would need to be examined through further research – possibly through a close study of the butchery and discard practices involved in these ritual activities. Do they result in different butchery marks? Is the entire carcass utilised in these activities, or are only select elements likely to be deposited?

Conclusion

The data from Kua have highlighted the multi-faceted nature of archaeological interpretation. While these alternative interpretations need to be examined in more detail, I would argue that status differentiation between the two excavated areas is likely to have at least *contributed* to the observed differential patterns of resource exploitation. On this basis, the Kua excavations have highlighted that, to some extent, maritime interactions including exploitation were socially complex. From the perspective of developing anthropologically-informed maritime frameworks to elucidate the maritime nature of the communities living along the East African coast, these excavations have highlighted the importance of examining the social context of maritime exploitation, rather than just the technological and economic aspects of the Swahili subsistence economy. The targeted analysis of faunal remains within a spatial framework has the potential to develop our understanding of the maritime nature of the Swahili, and the influence of the sea in the construction of the Swahili maritime identity.

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