THE ARCHAEOLOGY OF NUNGE SITE: AN ANCIENT SALT MAKING SETTLEMENT AND TRADING CENTRE IN BAGAMOYO, TANZANIA

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Abstract

The Bagamoyo area is among the Tanzanian coastal locations where evidence of intercontinental trade dates back to the last few centuries of the first millennium AD. Previous investigations have indicated that the region's earliest settlement is represented by Early Triangular Incised Ware [TIW] around 600 to 700 AD, at Bwembweni site located two kilometres south of Kaole. During the Later TIW, the population shifted to Kaole Hill during the period noted by the use of Plain Ware, and later moved to the adjacent Kaole Ruins by the thirteenth century.

Traditionally, the majority of earlier investigations for such conclusions have been restricted to Bwembweni and Kaole sites, and to a limited extent to Bagamoyo Town itself and its vicinity. However, recent reconnaissance and excavation of Nunge, a single type pottery tradition site located to the north, suggests that although Bagamoyo's involvement in intercontinental exchange dates back to the seventh century AD, the narrative is more complicated than previously assumed. It appears that between the subsequent ninth to eleventh centuries, the area lost such links, before resurfacing again in the twelfth to thirteenth centuries. Within that time frame, Nunge developed into an extensive urban centre whose prosperity was based on salt production for exchange.

This discovery suggests that the development to urbanism at Bagamoyo predates that of the Kaole town, when the area is known to have had a few links with the outside world. These findings contribute crucially to the debate regarding early urbanisation along the Swahili coast, by challenging the conventional view that Arab or Asian settlements were the earliest urban centres along the coast of East Africa.

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Key words: *Nunge site, Pre-Kaole urbanism, Plain Ware (PW), Salt making for exchange*

Introduction

Plain Ware pottery represents one of the major phases of pottery evolutionary sequences along the Tanzanian coast. Plain Ware is distinguished from other types of pottery because it is mostly undecorated and rarely associated with imported artefacts. This paper reports on Plain Ware excavated from Nunge settlement located one kilometre northeast of Bagamoyo Town. At Nunge, Plain Ware [hereafter PW] appears as a single pottery tradition, hence eliminating the possibilities of stratigraphic mixture with materials from other cultural phases. Since PW is the immediate predecessor of the Swahili Ware [SW] (Chami 2009), the Nunge site provides an opportunity for deciphering what happened during the transition from PW to Swahili civilisation.

Based on the nature of the Nunge findings, it is worthwhile reviewing the history of Tanzanian coastal pottery in order to present more thoroughly the arguments leading to the conclusions drawn in this paper.

Tanzania's Indian Ocean coast local pottery sequence

Advancing from Chittick's (1974) work, Chami (1994, 1998, 2009) developed a complementary sequence of local pottery and associated materials for the Swahili coast. The earliest pottery along the eastern African coast is of Neolithic type and similar to Nderit, Narosura and Ileret ware types which are found along the central eastern African Rift Valley, where they date from 5000 to 3000 BP (Barthelme 1985, Chami 2001, 2002d; Chami and Kwekason 2003, Bower et al. 1977, Robertshaw 1990). Along this coast, the pottery dates to the last three millennia BC.

The next in sequence is composed of Iron Age assemblages, with several type forms, the earliest being Limbo type ware that dates from the last millennium BC to the third century AD (Chami 1992a, 1998). Apart from the common characteristics shared by most Early Iron Age pottery such as thickened rims, bevels and flutes, this group is characterised by necked pots; whereas associated bowls have upturned rims with the inside of the lip curving gradually. A number of imported trade goods have been found in the archaeological record verifying information from the *Periplus of the Erythrean Sea*, to the effect that the East African coast was already in contact with the outside world (see Chami 1999, 2001, 2002a).

Kwale ware dates later, after Limbo. As first reported by Soper (1967) from the Kwale site in Mombasa Kenya, the pottery dates from the

third to the fifth centuries AD at most excavated sites (Chami 1994, 1998). As differentiated from the Limbo pottery, Kwale pottery is characterised by the introduction of false relief chevrons, zigzag incised lines, triangles, comb stamping, punctuations, longer neck and flared rims. Also, Kwale bowls have an obtuse angle that separates the upturned rim from the body. It has been noted that post Kwale pottery types have bold decorations with a tendency to lose neatness in that aspect. Some of the triangular incisions from Kwale continue up to the Triangular Incised Ware [TIW] phase (Chami 1998). Mwangia pottery, which follows after Kwale, dates between 500 and 600 AD. It is differentiated from the latter by bold zigzag incised lines, a decrease in beveling, and a lack of false relief chevrons.

The TIW that follows chronologically dates from 600 to 1000 AD and is characterised by necked open vessels with a body diameter slightly larger than the neck diameter. As the name implies, incised triangles are the most prevailing feature. This tradition has been divided into two phases, namely pre-Islamic [Early TIW] and Islamic [Later TIW], whereby the former and the latter date to pre- and post-eighth century AD, respectively (Chami 1998, Fleisher and Wynne-Jones 2011). The terms pre-Islamic and Islamic were coined on the basis of associated materials. Whereas the former is not associated with imported Islamic materials, the latter is associated with such imports. While the early phase retained some features that were inherently common in the previous Iron Age pottery, including bevels and thickened rims, the 'later' phase completely dropped those elements as well as declining in the number of motifs and frequency of decoration. The tradition of making open bowls with upturned rims continued in all phases.

The TIW pottery is said to have been replaced by Plain Ware [PW]. The name connotes pottery without decoration. This excludes isolated cases where decorations appear on the rim in the form of nicks or incised lines or punctuations at the junction of the neck or shoulder (Chami 1998, Chittick 1974). This pottery type has been traditionally reported from sites on the southern Tanzanian coast (Chami 1994, 1996, 1999; Chami and Kessy 1995, Chami and Mapunda 1998, Chittick 1974, Ichumbaki 2015, Kwekason 2007, 2011; Pawlowicz 2013, Ombori and Mabulla 2013); but more recently it has been reported at Pangani and Maramba (Mjema 2018, Ntandu 2018).

With respect to the pottery types just mentioned, the PW period represents unique features in the history of pottery making, and certainly the nature of community interactions along the eastern African coast (Chami 1998, Pawlowicz 2013). The discovery of PW as a single pottery type site at Nunge provides an opportunity to further discuss these implications.

Previous research in the area of the excavation

The Nunge archaeological site is located one kilometre northeast of Bagamoyo Town centre and about seventy kilometres north of Dar es Salaam, at latitude 6˚43′ and longitude 38°89′ (figure 1). To the north of the town passes River Ruvu that flows eastwards before it discharges its waters into the Indian Ocean. South of the town is an elevated marine terrace known as Mtoni Terrace (Temple 1970, 1971) which extends to Kaole ruins (Chami 1994, 2002b; Chittick 1962, Mturi 1974). Archaeological reports about Bagamoyo area date back to the 1950s (Chittick (1958-1962, 1970; Mturi 1974). Other explorations in the area include the work done by the Archaeology Unit of the University of Dar es Salaam 1988 Field School and the Department of Antiquities' field expeditions.

The first significant work done at Kaole were excavations by Chami (1992b, 1994, 2002b) that resulted in the recovery of various local pottery traditions, including both Early and Later TIW, PW and SW, suggesting that the site was continuously occupied from 600 AD to modern times. Three sites occupied at different chronological time frames were recovered. These sites include the 600 to 700 year old early TIW site (Bwembweni) located about two kilometres south of the Kaole ruins, Kaole Hill with Later TIW, and PW dating 800 to 1200 AD, as well as Kaole ruins that date from 1400 to 1800 AD, mostly with SW pottery (Chami 2002b, Ntandu 2007). Early TIW pottery was associated with Sasanian Islamic pottery, early Islamic and white-glazed ware, while the Later TIW and SW levels with white glazed wares, glass lustre and sgraffiato (Chami 1994).

Beyond Kaole and Maganbani (Pollard and Kinyera 2017), archaeological investigations focused on the center of Bagamoyo town. These included surveys of the town and excavation of Caravanserai by Chami et al. (2004). Later works included excavation of the Fort and the area near the Catholic Primary School by Musa Said in 2011, and by Elgidius Ichumbaki in 2012. The work by Chami et al. (2004) covered the town towards the College of Arts, the Roman Catholic Church, and the road to Kiwangwa to the west. Survey results recovered early TIW pottery sites between the Market and Bus Stand, while SW pottery was recovered near Mwanamakuka grave yard and the Boma area towards the northern slopes of Mtoni Terrace.

The rest of the survey area produced only post-eighteenth century materials. Excavation of the Caravanserai yielded material dating from the seventeenth to the nineteenth centuries, including Chinese and European porcelain, beads, as well as western Tanzanian pottery, suggestive of by-products of transport by caravan routes through that area. Alternatively, the

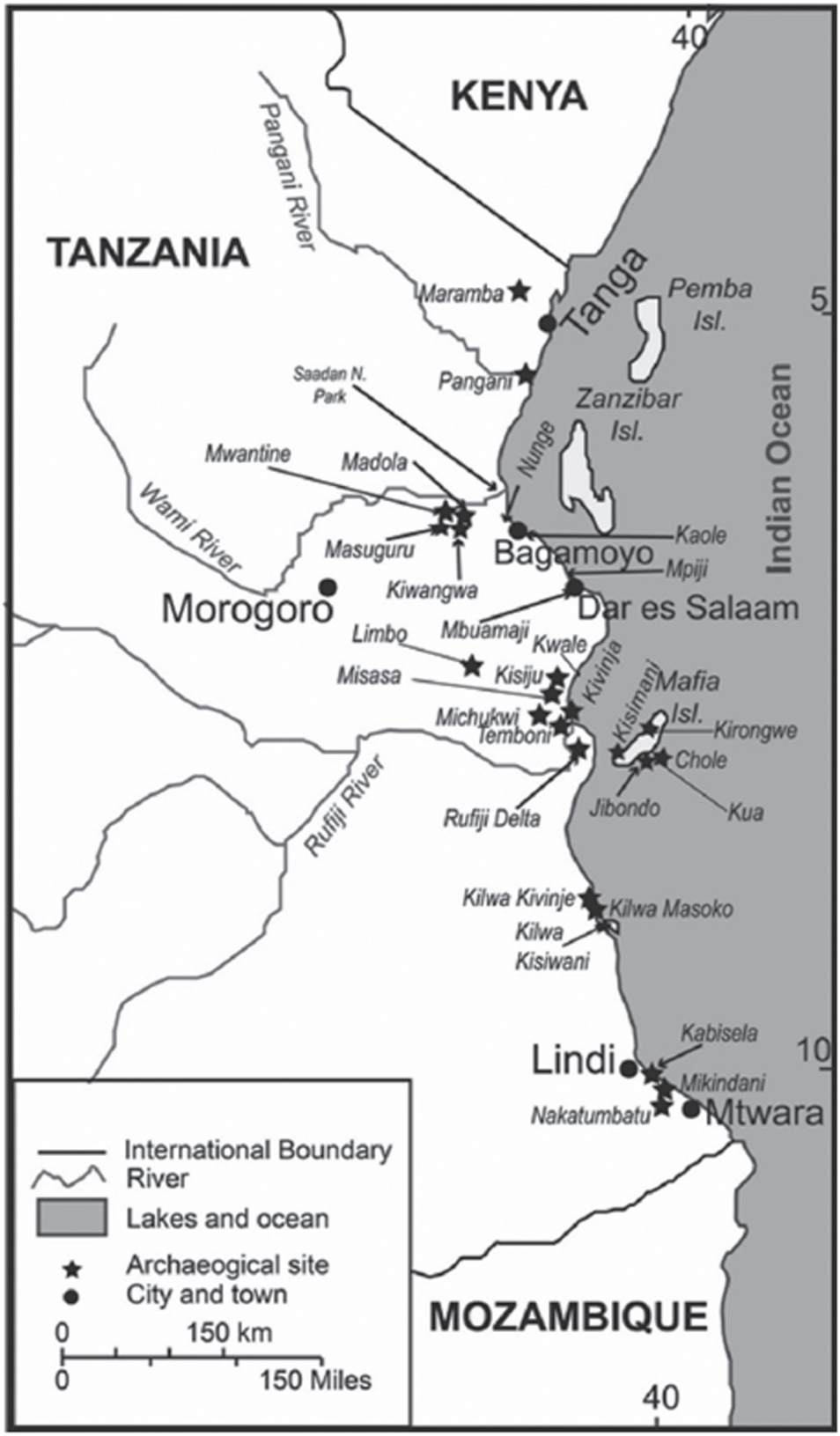

Figure 1: *Location of Bagamoyo and Plain Ware pottery sites along Tanzanian coast*

artefacts might have been made by Tanzanian migrants in their own styles once they settled along the coast.

Later, in 2004 to2005, investigation of the area between Bagamoyo Town towards Kaole (Maganbani site and another one located 1.5 kilometres to the south) undergone by Pollard and Kinyera (2017), recovered local and imported artefacts dating from the seventh to tenth centuries AD, including grinding and rubbing stones, bead grinders, iron nail, slag, Sasanian-Islamic ware, and pieces of unglazed Siraf storage jars and glass beads.

These previous archaeological investigations of the Bagamoyo area covered the modern Bagamoyo Town and Kaole in the south. Very little was known about the northern part of the town at the time of the excavation work reported here, which explored the northern part of the town in order to trace its cultural connections to the development of rest of Bagamoyo region.

The methods used

Three types of approach were involved in this excavation: systematic and random land walkovers as well as systematic shovel test pits.

Systematic land-walkovers were conducted to start off the survey, with a crew of forty people spaced at two metre intervals covering an area of 3.36 km^2, which included the Catholic Mission area past the Marian Secondary School as well as the western resident compounds. The team then proceeded northwards to the Bagamoyo Research and Training Centre (figure2).

Systematic shovel test pits were established next, testing an area of 1600 m^2 within the systematic land walkover area along the northern side of the Catholic main entrance road. This involved using nine systematic shovel test pits [STPs] at intervals of 200 metres (figure 2). These STPs were 50 x 50 centimetres, dug using arbitrary levels at twenty centimetre intervals to the maximum of sixty centimetres below the surface. Only sea shells and seventeenth to twentieth century local pottery were recovered (table 1).

Random walk survey was the third approach, employed on the eastern side of the road that runs from the Bagamoyo town centre to Nunge Salt Works Industry, passing between the mangroves and land terrace towards the southern part of the Ruvu River's delta. In total, the area under this type of survey covered approximately1.76 km^2 (table 1). The entire area recovered only PW pottery and Later Stone Age [LSA] quartz artefact scatters in various parts of the site. Subsequent surveys further north of Nunge established that the PW sites and LSA artefacts extended to the southern part of the Ruvu River's delta (figure 1). In summary, the whole survey exercise covered a total of 5.12km^2 (table 1).

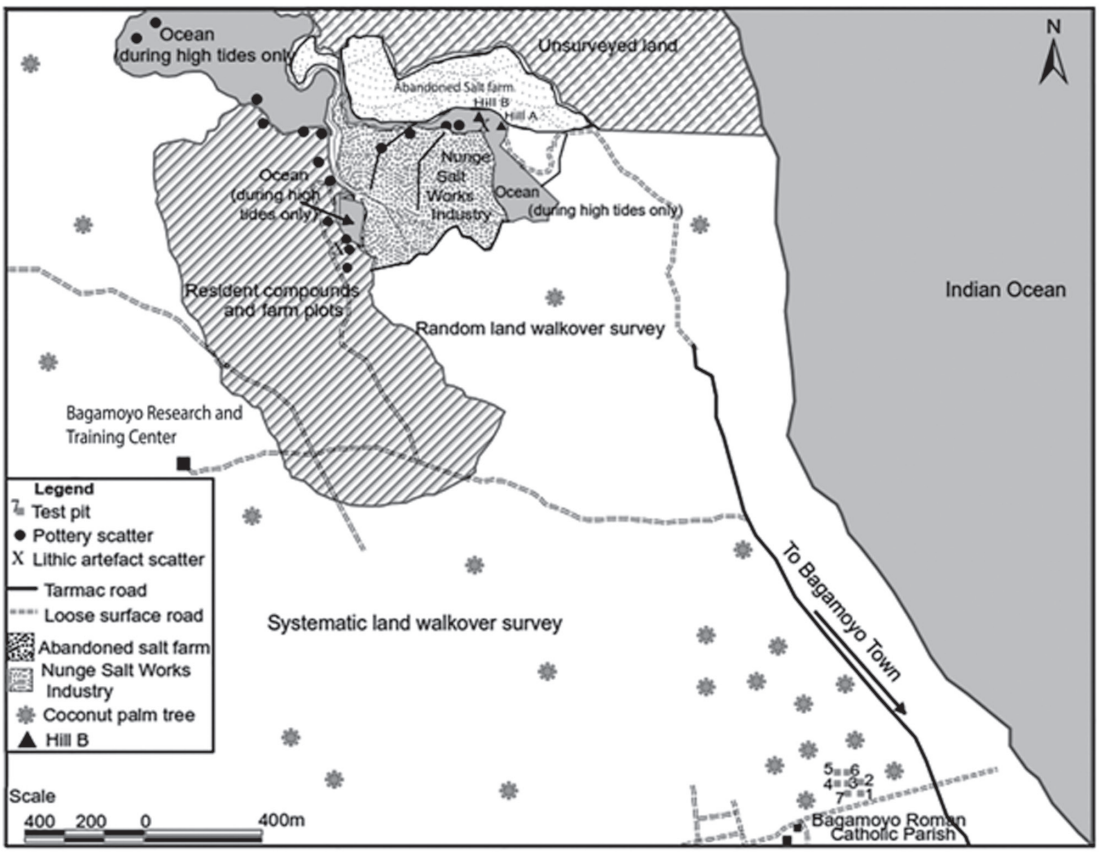

Figure 2: *field survey plan*

Table 1: survey sampling strategies

Type of survey	Area covered (in km^2)
Systematic land walk over and Systematic Shovel Test Pits	3.36
Random land walkover	1.76
Grand total	5.12

Survey and excavation results

Procedures in selecting the area for excavation were judgmental, based on the site's potential for yielding archaeological materials. Excavation was done using arbitrary levels dug at an interval of 20 centimetres. Excavated soils were screened using five millimetre wire mesh. Materials collected from the systematic walk survey from the Catholic Mission area northwards to the Bagamoyo Research and Training Centre included: post Swahili local ware, a variety of coins (Dutch 1906, Arabic 1891, and British 1922), eighteenth to nineteenth century glazed European ware, and modern beads. In general,

the area had very little surface archaeological materials, a situation which was verified by subsurface testing of seven STPs that yielded insignificant amounts of cultural materials (table 2).

However, the random walk survey was very productive following the discovery of an area of approximately 0.84 km^2 with a heavy concentration of PW pottery, sea shells accumulations, and scatters of LSA lithic artefacts. The area extends from the Nunge Salt Works Industry towards the west, and immediately north along the base and walls of the terrace that separates land from mangrove swamps (figure 2). The northeastern and far northern side (mostly covered by mangroves swamps) as well as the southern side of Nunge Salt Works Industry produced very few scatters of PW pottery. Following the discovery of concentrations of PW deposits on the northwestern and immediately northern part of Nunge Salt Works Industry, two trenches of 1x2 metres were set at Hill B. Trench 1 was set to the southeastern side of Hill B, while the other was established eleven metres to the east.

At the time of occupation, the site seems to have been a harbour; and certainly its growth and functions were related to this location. Occasionally, water covers the lower levels of Hill B during high tides (figures 2 and 3). Both trenches were excavated to sterile levels. Trench 1 had fourteen arbitrary levels of cultural materials, while trench 2 had only five (figures 4 and 5, table 3). The area is composed of medium compact to medium loose sandy clay soil that can be easily worked using a trowel although a few contexts required the use of a hoe (figures 4 and 5).

The profiles had clearly defined stratigraphic units with a few complex poaches (figures 4 and 5). On the northwestern side of trench 1, a 'jar'-like shaped pit (feature 1) with similar outline to PW pottery was located at 217 centimetres below the surface (figure 4). Trench 1 cut through feature 1 with one half located inside the trench, while the rest remained outside. It was 61 centimetres deep (running from 217 to 278 centimetres below datum point); while the widest point was 86 centimetres at the rim. At the time of construction, the wall of feature 1 seems to have cut through strata 8, 10 and 11, during which stratum 8 was the ground surface and was certainly abandoned before the development of layer 7 (figure 4). Also, one of its sides (the right side) was slightly higher than the other, and the walls were built with dark brown compacted clayey sandy soil, suggesting that is was a storage facility (to be discussed momentarily) or 'tanks' for evaporation of brine solution for salt making (see Chittick 1975, Sutton and Roberts 1968). Level 1 of trench 1, and levels 1-5 of trench 2 were sterile (table 3).

The rest of the levels, including feature 1, produced substantial quantities of PW pottery and sea shells. The exception to this was levels 8, 9 and 11of trench 1 which, in addition to the aforementioned materials, also produced turtle shell, a fish bone, and a piece of very fragile purplish brown glass, respectively. The glass was manufactured by the blowing technique. Apart from yielding PW throughout, trench 2 also recovered red brown glass beads from level 8, while levels 9-10 produced mammal bones and LSA quartz artefacts. As a matter of principle, feature 1 was excavated separately with soil contents subjected to flotation, but no floral remains were recovered.

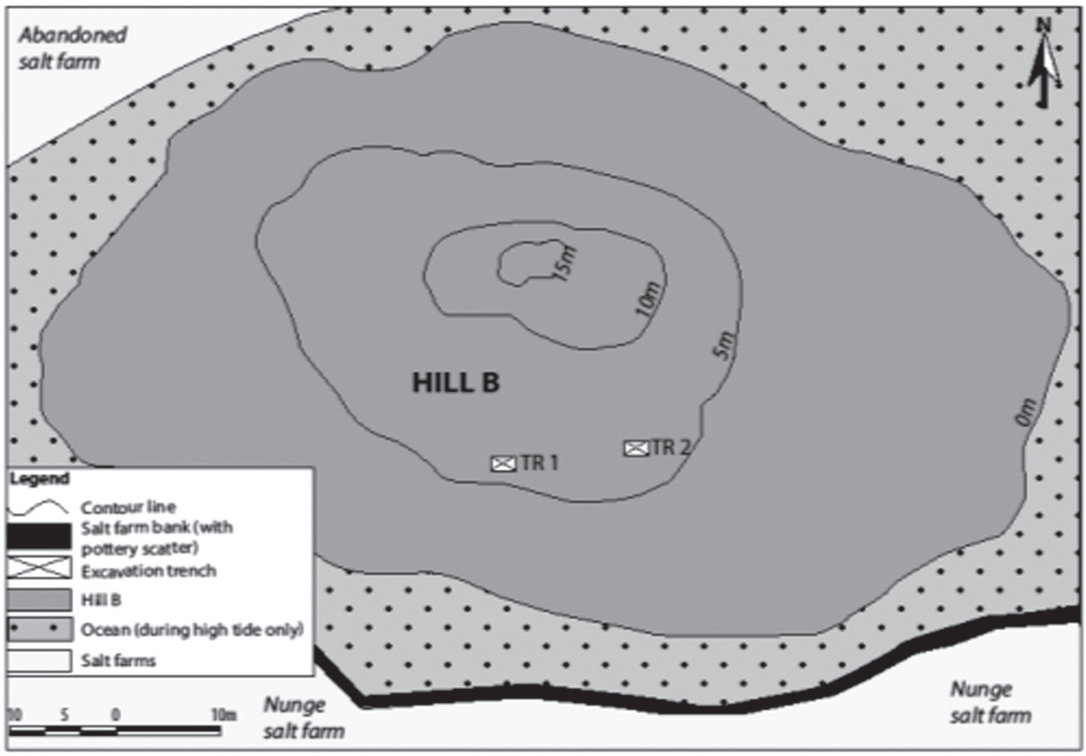

Figure 3: *Location of Excavated Trenches at Nunge Hill B*

Table 2: Shovel Test Pits Results

Level in cm	STP					
	1	2	3	4	5	6
0-20	3p, 6s	2s	1p	0	0	0
20 -40	0	0	0	0	0	0
40-60	0	0	0	0	0	0

Key: 3p = 3 pottery; 6s = 6 sea shells

Analysis

With the exception of sea shells, all collected materials including pottery, lithics, bones and a bead were subjected to different detailed analyses depending on the type of material. Pottery analysis included determination of body part, method of manufacture, temper, type of rim profile and diameter, vessel form, surface finish, decoration, cross section and pottery surface color

Table 3: Summary of excavated artefacts from Nunge trenches 1 and 2

Trench	Level	Pottery								Lithic	Glass	Bead	Animal remain			
		Rim			Neck	Shoulder	Base	Body sherd	Total (only pottery)				Shell		Fish bone	Mammal Bone
		Jar	Bowl	Plate									Sea shell	Turtle		
1	1															
	2							32	32							
	3							66	66				1			
	4	1	4		1			93	99							
	5	1	1					31	33				15			
	6	2	1			1		103	107				14			
	7							23	23				45			
	Ft. 1							11	11							
	8	8			3	4		65	80				38	1		
	9	2			1			22	25						1	
	10	1				1		29	31							
	11	1		1				14	16		1		1			
	12	3			1			126	130				21			
	13	1				1		87	89				51			
	14	5	1			1		23	30				1			
	15	7	2		8	6		46	69							
	Sub-total	32	9	1	14	14	0	771	841	0	1	0	31	1	1	0
2	**1-5**															
	6	16	11		2	5		219	253				3			
	7	15	3		7			138	163				4			
	8	15	5		11	3		179	213			**1**	46			
	9	10	30		7	6	2	190	245	3						2
	10	3	9					39	51							1
	Sub-total	59	58	0	27	14	2	765	925	3	0	1	53	0	0	3
	Grand-total	**91**	**67**	**1**	**41**	**28**	**2**	**1536**	**1766**	**3**	**1**	**1**	**37**	**1**	**1**	**3**
	% pottery	5.	3.	0.1	2.3	1.6	0.1	86.9	100							

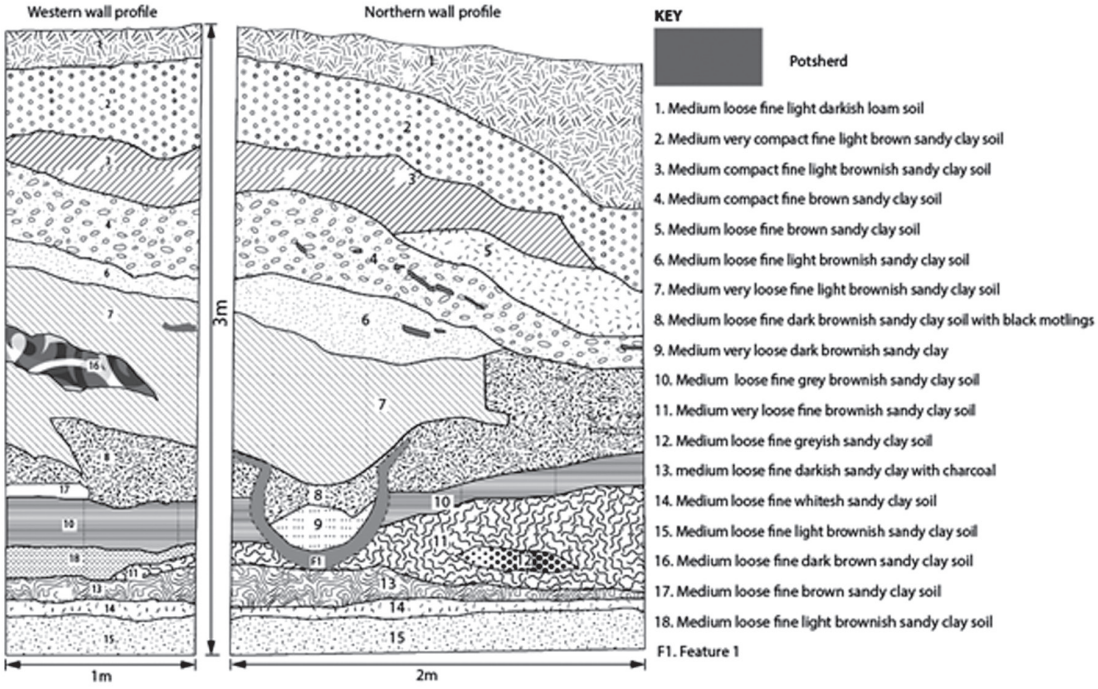

Figure 4: *Trench 1 wall profiles*

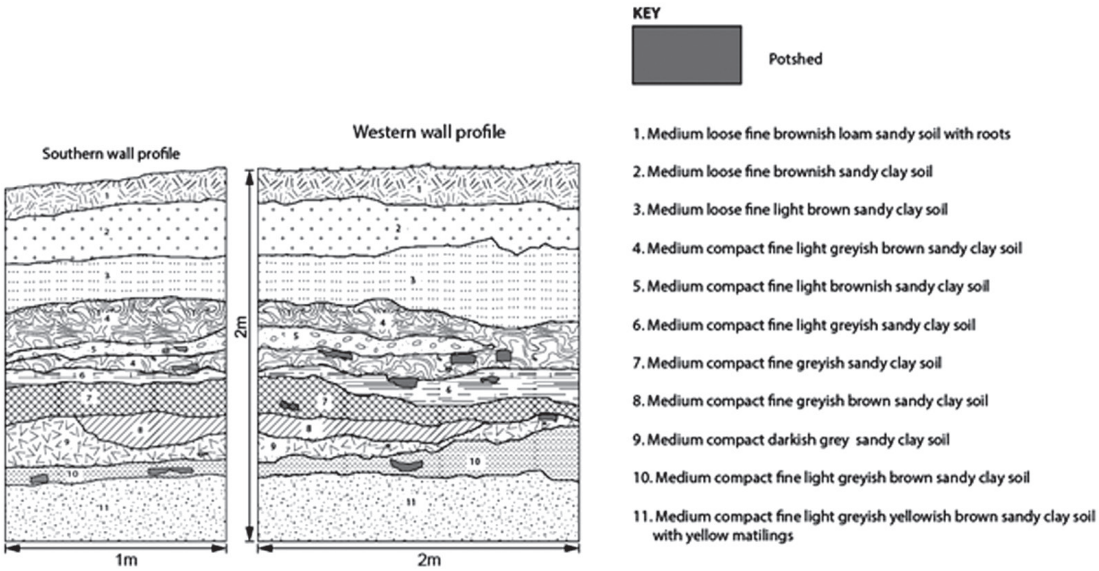

Figure 5: *Trench 2 wall profiles*

after firing. Trenches 1 and 2 yielded 841 and 925 potsherds, respectively, making a total of 1,766 potsherds (table 3). All rims, and wherever possible a number of shoulders, were used to reconstruct vessel shape. Represented pottery forms include unrestricted jar (66.5%, number = 167), unrestricted bowl (33%, number = 68) and plate (0.5%, number = 1) (see table 4). With

jars, the rim diameters varied, measuring between 12 and 34 centimetres (average 23.9 centimetres), while the bowls ranged from 12 to 34 centimetres (average 24.9 centimetres). The only recovered plate had a rim diameter of 32 centimetres.

Since the majority of pottery were PW jars with more or less gently plain rounded bases; and since most of the sherds were small pieces, identifying bases from such pieces with certainty proves impossible. The difficulty comes from the fact that the curvature of the base and that of the body immediately after the base are indistinguishable. On that ground, consideration was only given to bases of pottery with projecting support. From this juncture, body sherds formed 86.9% (n = 1536) of the recovered pottery, followed by rims constituting 9.1% (n = 159), neck 2.3% (n = 41), shoulder 1.6% (n = 28) and base 0.1% (n = 2) (see table 3). The two recovered bases were flat and round. All the pottery was thin walled with rough finishing, without application of burnishing, paint or slip, with the exception of three sherds (from level 7, trench 2), another (from level 9, trench 1) and yet another (from level 11, trench 1) which were clay slipped, burnished, and red-painted, respectively. The slipped pottery was from jars, while the burnished sherd came from a bowl, and the red painted potsherd from the only recovered plate (table 3). Coincidentally, the plate and the sole recovered piece of glass came from level 9, trench 1 – signifying that these were imports. The rim profiles appear in eleven distinct forms (table 5, figures 6 and 7). As the name of the pottery connotes (Plain Ware), most were undecorated; only seven had incisions on the rim tip; two had punctates on the neck and one was punctated on the shoulder (figure 7).

The cross-section analysis indicates that most of the pottery was made out of clay composed of moderately fine to coarse sand, with the outside and inside surfaces roughly smoothed. Six pieces from trench 1 had evidence of the use of grog as temper, while two pieces in level 3 of trench 1 indicated shell. Infrequent use of grog and shell implies that the raw clay material was well balanced and did not need addition of temper or sand.

Pottery wall cross-section colour is exhibited in tables 6 and 7 as well as figures 8 and 9. For purposes of clarity, this work only discusses a few examples characteristic of major patterns. The cross-section colour of pottery from trench1 indicates that a total of 133 pottery had clear red cross-section, 83 brown, while 128 were buff. In trench 2, 118 potsherds had clear red cross-sections, while 424 were brown and 42 were buff (tables 6 and 7). According to Bunning (2000) and Shepard (1985), pottery that has been subjected to an adequate length of firing, temperature, and oxidation (in the case of non-

carbonaceous clay) will have cross-sections that are uniformly white, red, buff, or orange. This would mean that a total of 344 (40.9%) sherds from trench 1, and 584 (63.1%) from trench 2 were well fired and fully oxidised. This makes an average of 52.5% (n = 928) fired to full oxidation across the site against the total number of potsherds from the site (1,766), as presented in tables 6 and 7. Although the latter is an indication of quality firing treatment, the majority of potsherds from the site were very fragile and corroded.

Further comparative analysis of the distribution of color patterns between sherd surfaces, i.e. inside and outside surface colours and core, indicate significant contrasts (figures 8 and 9). The color contrasts of pottery surfaces (inside and outside) were minimal within trench and between trenches (figure 8); but these diversify in pottery cores (figure 9). This situation explains variation in oxidation processes between the core and surfaces, hence verifying the contrasting status of oxidation access between pottery cores and surfaces.

The lithic artefacts were made up of moderately high quality cloudy quartz. The assemblage produced an insignificant amount of angular fragments; and none of the collected pieces had a cortex. Rarity of angular fragments and absence of cortex among the pieces suggests that the primary reduction process took place away from the site's vicinity. Identified artefacts include point, bipolar core, bec, burin and flake (figure 10). These pieces measured between 19 and 35 millimetres with an average length 28.1 millimetres.

Although no substantial amounts of fish remains were recovered, evidence of burnt sea shells indicates that the inhabitants depended upon exploitation of marine resources and possibly cultivation, as did their Iron Age predecessors. The majority of the shells represented *Terebralia palustris, Pleuproka trapezium* and *Anadara antiquata* species, commonly used as food among the present Bagamoyo communities (Msemwa 1994).

Table 4: Vessel form

Trench	Level	Vessel form		
		Unrestricted jar	Unrestricted bowl	Plate
1	1-3			
	4	2	4	
	5	1	1	
	6	2	1	
	7			
	8	13		

Table 4: Vessel form *(Continued)*

Trench	Level	Vessel form		
		Unrestricted jar	Unrestricted bowl	Plate
	9	2		
	10	1		
	11	1		1
	12	2		
	13	1		
	14	5		
	15	21	2	
	Ft. 1			
2	6	18	11	
	7	22	3	
	8	26	5	
	9	17	32	
	10	3	9	
Total		137	68	1
%		66.5	33.0	0.5

Ft. 1 = Feature 1

Chronology

Absolute dates of the PW have yet to be established; and the dating for the site depends upon previous research reports. At Kilwa, Chittick (1966) dated PW levels to AD 930 ± 100. Later Chittick (1974) classifies the pottery to Period II which falls in the twelfth to thirteenth centuries. At Kilwa, this pottery was associated with a few imports including sgraffiato ware in the tenth to eleventh century. Elsewhere, at sites such as Changwehela, Kaole, Kiwangwa, Masuguru, and Mpiji, the pottery dates to 1000-1400 AD (Chami 1994), in the Rufiji Region to 1000-1300 AD (Chami 2001), in Kwale to 1200AD (Chami and Msemwa 1997) while at Mkindani and Nakatumbatu, Plain Ware pottery presence dates to 880 AD ± 35 (Kwekason 2007); and PW found at Maramba dates to 1204 AD ± 34 (Ntandu 2018). Chittick (1975) noted similar type of pottery (PW) in Mkadini area located on the northern side of the Ruvu River's Delta. Few Sasanian Islamic wares and another unglazed ware led Chittick to date the site between the twelfth and thirteenth centuries AD. Based on the chronological summary of various PW sites, it is presumed here that the Nunge PW must date back to the tenth and twelfth centuries at least. It is worth noting that prior to Plain Ware occupation, this site was occupied by LSA people whose chronology remains undetermined.

Table 5: Type of rim profile

Trench	Level	Straight and rounded		Straight and pointed		Straight and flattened			Straight and angled		Out-turned and pointed		Out-turned and rounded		Out-turned and flattened		In-turned and flattened		In-turned and and angled		In-turned and rounded		In-turned and pointed	
		Jar	Bowl	Jar	Bowl	Jar	Bowl	Plate	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl
1	1																							
	2																							
	3																							
	4				4						1													
	5			1	1																			
	6		1								1		1											
	7																							
	8										6				2									
	9			2																				
	10										1													
	11							1			1													
	12	1											2											
	13										1													
	14														5			1						
	15						2						6		1									
2	6	2		4	11						10													
	7		1						4		4		3	1	3			1		1				
	8		4		1						4		10		1									
	9		14										9					8				5		4
	10		2								2		1					5				1		1
Total		**3**	**22**	**7**	**17**		**2**	**1**	**4**		**31**		**32**	**1**	**12**			**15**		**1**		**6**		**5**

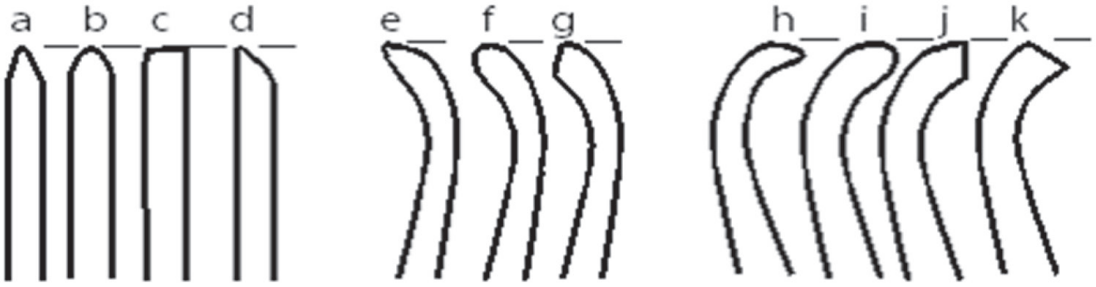

Figure 6: *Nunge PW pottery rim profile types*

a, Straight and pointed; b, Straight and rounded; c, Straight and flattened; d, Straight and angled; e, Out-turned and pointed; f, Out-turned and rounded; g, Out-turned and flattened; h, In-turned and pointed; i, In-turned and rounded; j, In-turned and flattened; k, In-turned and angled.

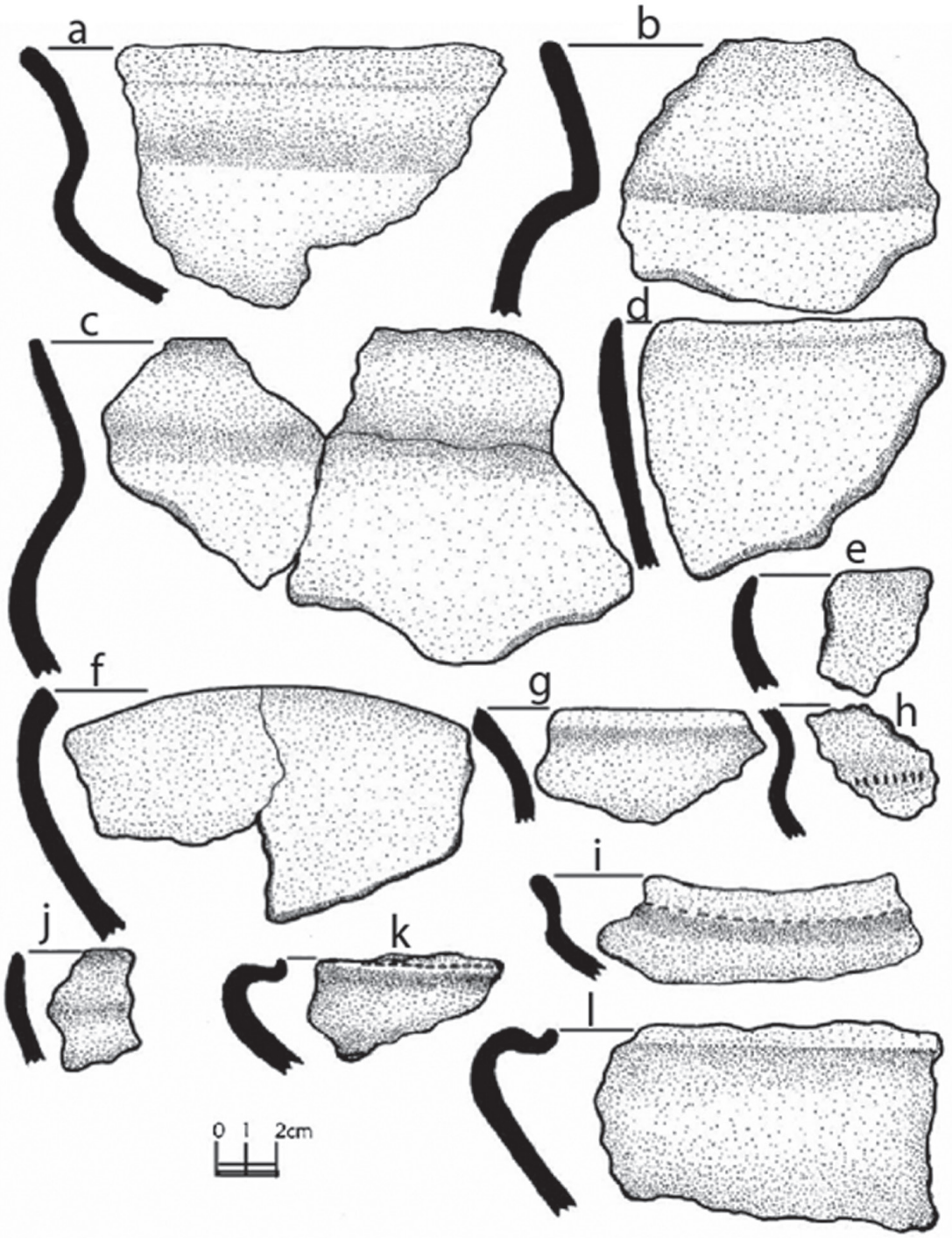

Figure 7: *Nunge pottery*

a - c, g - h, PW jars; d - f, j, PW bowls; i, k - l, restricted bowls (certainly produced at the end of PW during the transition to Swahili period)

Table 6: Trench 1 PW pottery cross-section colour

Level	r/r/r	r/r/br	r/r/bl	r/br/br	r/br/bf	r/br/bl	r/bl/r	r/bl/br	r/bl/bf	r/bl/bl	r/gr/r	r/gr/br	br/r/br	br/br/r	br/br/br	br/br/bf	br/br/bl	br/bf/br	br/bf/f/bf/	br/bl/r	br/bl/br	br/bl/bl	br/gr/br	bf/r/br	bf/br/bf	bf/br/r	bf/br/bf	bf/br/bl	bf/bf/bf	bf/bl/br	bf/bl/r	bf/bl/bf	bf/bl/bl	bf/gr/bf	bl/br/br	bl/br/bf	bl/br/bl	bl/bf/br	bl/bl/r	bl/bl/br	bl/bl/bl	gr/br/r	gr/gr/gr	Total
2	5				2		1	2	1						1	1			1								1				1	16												**32**
3	12														4						5											45												**66**
4	10			2		1							2		2						43	2							26						11								**99**
5	1												10		11						1								9			1											**33**
6	21												17		1		8				28			2					17				6								7			**107**
7	1		1						1													8				11			1													**23**
8	6	1													15		3		6					1			4		12			1	15		16								**80**
9	8														3						1						1								12									**25**
10														10	1						4						2	4	9							1								**31**
11	1														4						1	2					1		6								1							**16**
12	27														14						64	14										2								9			**130**
13	17														7								7			4			38					1						14	1		**89**
14	4									5															4				11				4					2					**30**
15	16										1	1			14			6		1	5		5										4							7	6		3	**69**
Ft. 1	4														6																										1			**11**
Total	**133**	**1**	**1**	**2**	**2**	**1**	**1**	**2**	**2**	**5**	**1**	**1**	**29**	**10**	**83**	**1**	**11**	**6**	**7**	**1**	**152**	**26**	**12**	**3**	**4**	**4**	**20**	**4**	**128**	**1**	**1**	**65**	**29**	**1**	**28**	**11**	**1**	**1**	**2**	**7**	**37**	**1**	**3**	**841**

Key: Pottery wall cross section color: br/bl/r = brown outside/black core/red inside

Table 7: Trench 2 PW pottery wall cross-section colour

Level	r/r/r	r/r/br	br/br/br	br/br/bf	br/br/bl	br/bf/br	br/bf/bf	br/bl/br	br/bl/bl	br/gr/br	br/gr/bf	bf/br/br	bf/br/bf	bf/br/bl	bf/bf/bf	bf/bf/bl	bf/bl/bf	bf/gr/br	bf/gr/bf	bl/br/br	bl/br/bf	bl/br/bl	bl/bl/r	bl/bl/br	bl/bl/bl	bl/gr/gr	gr/bl/gr	gr/gr/gr	Total
6	23		79				1	65	40	1			3		4		2	12	14					1	7	1			253
7	46		49					1			10		2	21	25	1					1				6			1	163
8		1	161			3		5	15	2		1			6									2	14			3	213
9	41		115	1	33			3							7		2			7		1	1		26		1	7	245
10	8		20						7			2													7			7	51
Total	118	1	424	1	33	3	1	74	62	3	10	3	5	21	42	1	4	12	14	7	1	1	1	3	60	1	1	18	925

Key: Pottery wall cross section color: bf/gr/br = buff outside/gray core/ brown outside

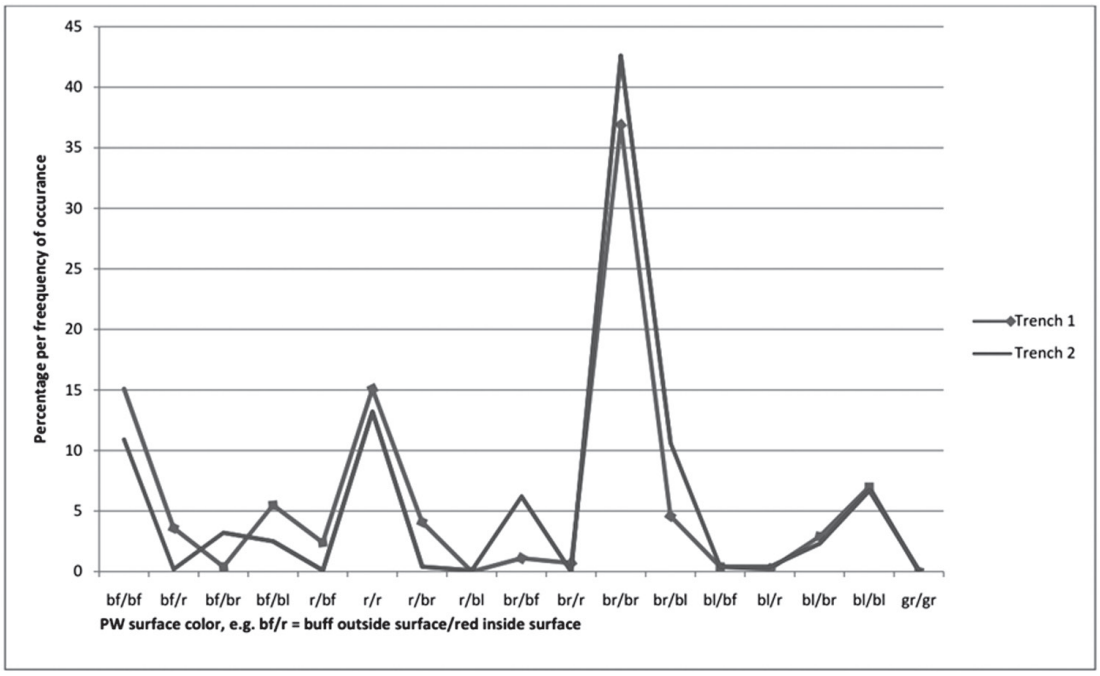

Figure 8: *PW frequency of exterior surface and interior surface colour in trenches 1 and 2 compared*

The Nunge site in the context of the Bagamoyo vicinity

As noted above, prior to the excavation work reported here, major archaeological investigations in Bagamoyo focused on the southern area of town, particularly the Kaole ruins, Bagamoyo Town and its vicinity. The Kaole ruins received the first attention because of its impressive stone buildings and its evidence of foreign contacts with distant points of the Indian Ocean world. Early occupation of the region seems to have begun in the sixth century AD, the Early TIW population two kilometres to the south at Bwembweni, with the possibility of a settlement shift by the Later TIW population to Kaole Hill around 800 AD. From there, settlements developed to PW before settling at Kaole ruins in the thirteenth century, where part of the discovered assemblage

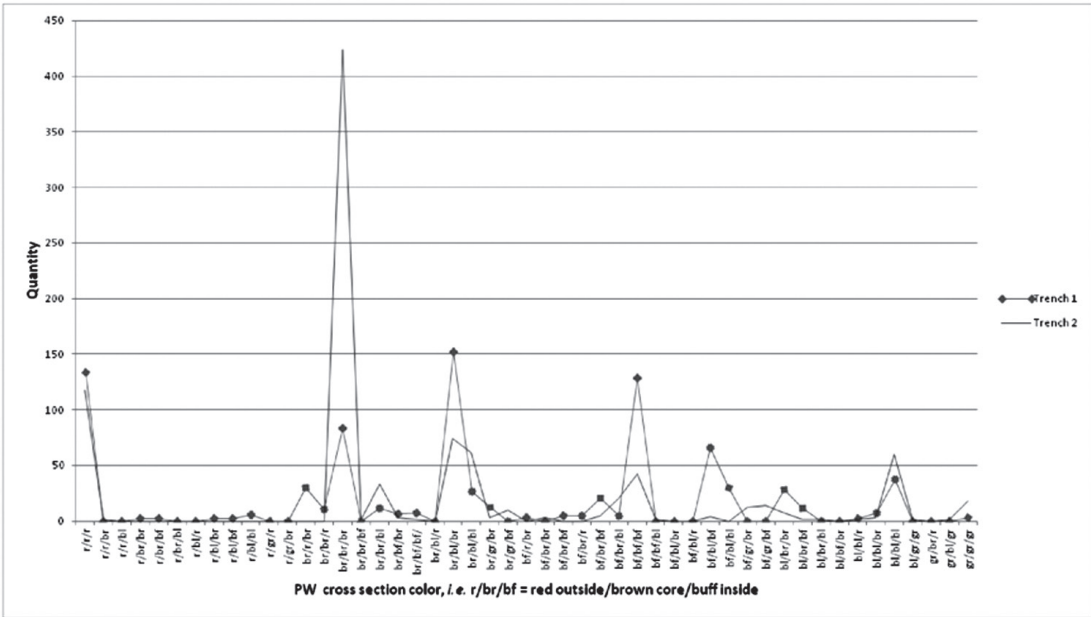

Figure 9: *Cross-section colour patterns in trenches 1 and 2 compared*

remains is SW (Chittick 1958-1962, 1970; Mturi 1974; Chami 1994, 2002b, 2002c; Ntandu 2007). The TIW levels at Kaole Hill are associated with early Islamic and white-glazed wares, an indication of contacts with the outside world. Given that background, it is more likely that the Nunge people branched off from the PW people, presumably from Kaole or Mkadini around the Ruvu Delta where Chittick (1975) located both TW and PW.

Despite being situated just six kilometres apart, the Kaole and Nunge sites exhibit remarkable contrasts in their occupation history. While Kaole and its vicinity demonstrate continuous occupation from 600 AD to the present, Nunge is a single pottery tradition site representing only the PW tradition (albeit with some scatters of LSA artefacts at lower levels). A comparable site is Nakatumbatu (approximately one km^2) in the Mikindani area further south in Tanzania, where the stratigraphic cultural sequence is wholly PW (Kwekason 2011).

The heavy extent of potsherd concentration along the Nunge surveyed area, as well as from the excavated levels in trenches 1 and 2, and from site coverage (approximately 0.84 km^2), suggest that the site supported a dense population. Taking this into account together with the comparative distribution of PW across the Bagamoyo vicinity, it is reasonable to suppose that the Plain Ware pottery makers must have occupied an extensive area of Bagamoyo, running all the way from Kaole and its vicinity to the Ruvu River's delta, with the Nunge area as their urban centre. This account would imply that Nunge developed into an urban center before Kaole.

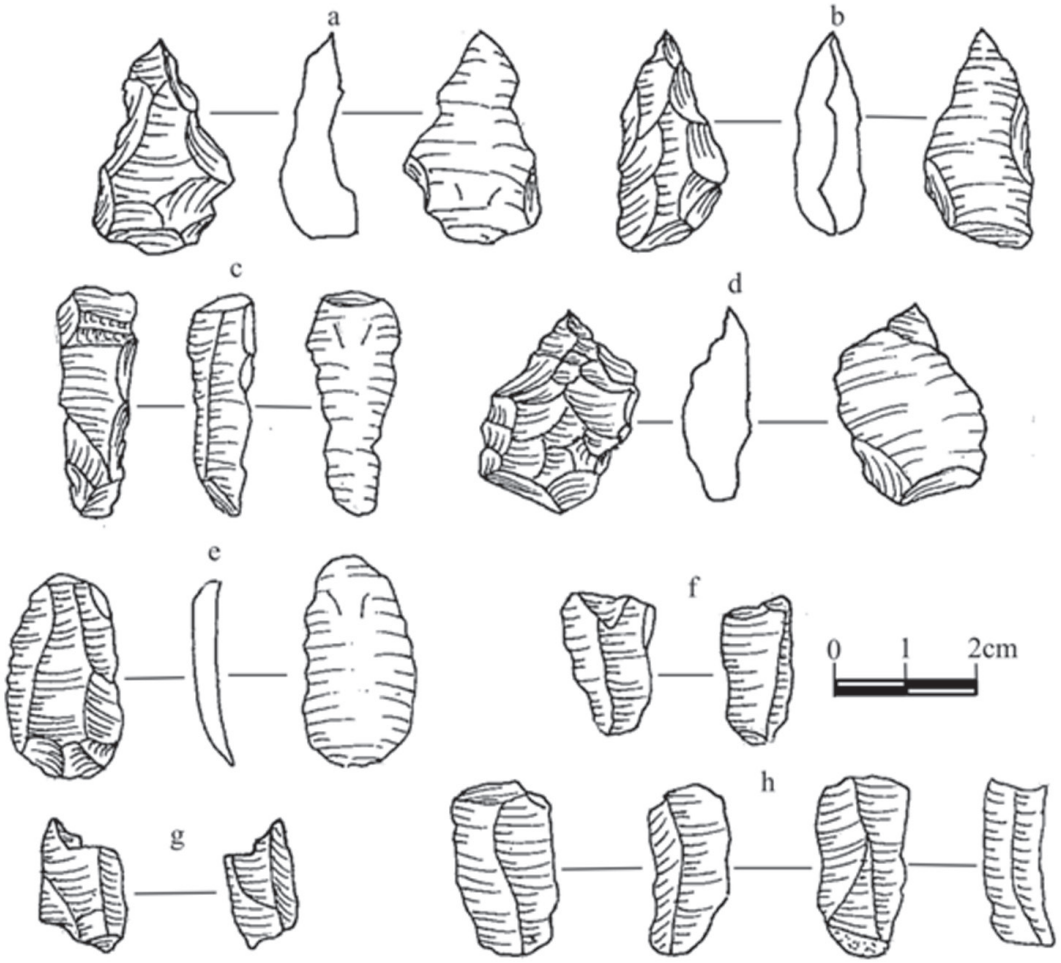

Figure 10: *Lithic Artefacts. a - b, point; c, core flake; d, bec; e, flake; g, burin; f&h, bipolar core*

The difference between the Kaole and the Nunge site during the PW period is obvious. For example, although the Kaole Hill site produced some PW pottery according to Chami's (1994) report, an extensive excavation (ten trenches) that was carried out in 2002 down the Hill at Kaole for just a few hundred metres did not recover PW pottery (Chami 2002b). The dense concentration of PW at Nunge not only suggests that the site was densely populated, but further, that the majority of the population at Bagamoyo probably resided at Nunge during the PW period. The population definitely extended to the PW Mkadini site, reported by Chittick (1975).

The three centuries 900-1200 AD is said to have marked a remarkably formative period in the East African coastal area, with several social, political and economic changes manifesting as major shifts of settlement and population. For example, at the end of the first millennium AD, the sites of Unguja Ukuu,

Chibuene and Tumbe seem to have been abandoned or reduced in size, while new settlements were established (Fitton and Wynne-Jones 2017; Fleisher 2010). At that same juncture, during the PW period, Kaole seems to have lost its hegemony to Nunge/Mkadini sites. The occupation of Nunge appears to have taken place when the East African environment is considered to have been wet and warm, around 900 to 1250 AD (Chami 2003). As has been suggested by Chami (2003), at that time the majority of coastal populations avoided wet lowlands and moved to hills where arable land was available. Nonetheless, the Bagamoyo area reveals that PW sites were located at various elevations from Kaole hills to Nunge/Mkadini lowlands, the latter sites being the most populated.

Nunge's salt making industry

As noted earlier, the Mkadini site located immediately to the north bears similar attributes to Nunge, in this respect: apart from heavy concentrations of PW pottery, the former site covers an extensive area and is located close to the modern Mkadini salt making industry (Chittick 1975). The Nunge site's location is likewise proximate to Nunge Salt Works Industry which is operative today, indicating the suitability and continuity of these areas for salt production from the distant past to modern times. The observed PW concentration at Mkadini led Chittick (1975) to suggest that the PW pottery was used for brine making (first through sun evaporation, followed by the boiling processes). Chittick (1975) had earlier observed similar patterns of pottery concentration in several other archaeological sites along the including Kilwa in Tanzania, and Bui near the southern corner of Kenya at Pate.

This speculation of brine making activities in ancient Mkadini, Kilwa and Bui follows Chittick's 1968 observation of salt making in the Winde area north of Mkadini, though on a smaller scale (Chittick 1975). According to Chittick, salt making "involves the digging out of a circular depression in the mud-and-sand floor of the creek . . . The brine seeps [in] . . . where the sun evaporates it to a concentrated solution" (Chittick 1975: 151). The concentrated solution was then boiled in pots to produce salt crystals.

In the Nyamsunga and Pwaga salt industries at Uvinza, in western Tanzania, Sutton and Roberts (1968) located clay pits that are comparable to those at Nunge (see feature 1 in figure 1). Like the Nunge case, the walls of the Nyamsunga and Pwaga salt pits were sealed with clay, to retain the salt during the evaporation process. In addition, attributes of the pottery from Nyamsunga and Pwaga are similar to those of PW at Nunge. With reference to the Pwaga site in Uvinza, Sutton and Roberts (1968: 47) noted the following:

> . . . scatters of potsherds were noted in the vicinity of all three springs, being especially numerous at Pwaga, where they litter many acres of land. Most of these sherds belong to large coarse, blackish pots with wide mouths and peculiarly moulded rims, below which bands of crude decoration had been executed with a roulette of knotted grass or string.

Apart from the crude nature of decorations, Sutton and Roberts (1968) also noted that most Uvinza pottery was not very regularly made; the rims, for example, contained kinks and sags. Like the Nunge case, the majority of Uvinza pottery was thin walled with wide mouths and very fragile; while the surfaces were badly flaked. Sutton and Roberts (1968) suggest that the pottery was thinly built to assist rapid boiling of the brine; while its fragility was related to salt actions and probably due to exposure to excessive heat during brine boiling.

The association of the pottery with fragility at Uvinza and at Nunge accounts for why such salt making centres consist of dense deposits of potsherds. Interviews at Uvinza indicated that pottery could be used to boil brine twenty times before being discarded. In contrast, at the Ivuna site in southern Tanzania, the pottery for brine boiling seems to have been of a superior make compared with those of Nunge, Mkadini and Uvinza; but it was probably used only once. According to oral traditions, concentration of pottery scatters at Ivuna may have resulted from the fact that pots were immediately smashed into pieces to release the remaining block of salt from pots after the brine boiling process (Fagan and Yellen 1968).

Despite some common features observed in the three salt-making sites (Uvinza, Ivuna and Nunge), the pottery samples from these different sources show some disparities with respect to surface treatment: from those which are finishes (Sutton and Roberts 1968), decorated, carefully smoothed and burnished (Fagan and Yellen 1968); while others are undecorated with rough un-slipped surfaces (such as the Plain Ware in this work).

While such observations provide useful insights for interpreting the functions of the PW pottery at Nunge, the extent to which Plain Ware pottery was used in brine boiling remains uncertain. For example, only 87 and 74 sherds, from trenches 1and 2 respectively, had a blackened coating of soot on their outside surface, suggesting that only 9.11% (n = 161) out of the total recovered sherds were subjected to activities related to cooking with fire. In advance, the proportion of jars observed at Nunge (66.5%, being 137 in number), bowls (33%, or 33 in number) and plates (0.5%, only 1 in number), would mean that a substantial amount of pottery was produced

to be used as food serving vessels for a considerable population (see table 4). In contrast, at the Uvinza find, the majority of pottery is blackish in color, presumably suggesting carbonic blackening acquired as a byproduct of combustion from the firewood burned during the brine boiling process (Sutton and Roberts 1968).

At this juncture, it is reasonable to conclude that if PW pottery from Nunge was involved in brine production, then the majority served as salt storage vessels, while only a small proportion might have been used for brine boiling. Alternatively, salt making at Nunge might have involved solar evaporation, using artificially dug ground pans as is done in modern times. The brine from the pans might have been placed in the pottery whereby solar evaporation completed the process.

Information from the chronicles of nineteenth century explorers, missionaries and German Colonial offices at Uvinza, indicate that the salt making centres harbored about fifty to two hundred huts, while the number of people involved could have reached 3,000 to 20,000 per centre (Sutton and Roberts 1968). It is also pointed out that Uvinza salt was traded in a wide region including Manyema, south of the Ruaha, Victorian Nyanza and south of Lake Tanganyika. That being the case, if the salt making hypothesis for Nunge is correct, the magnitude of pottery concentration and site coverage suggest the site served as both an industrial area and as a town centre and market place for salt, particularly serving people from the countryside where salt was not available (Kusimba 2018, Walz 2010).

The wider context of Plain Ware along the Tanzanian coast

As has been noted previously (Chami 1998, Chittick 1974, Kwekason 2011, and Pawlowicz 2013), Plain Ware is distinguishable from other pottery found along the East African coast by its lack of decoration, rough and course surface, extreme widened rim orifice relative to body diameter, and its thinness and fragility. Specifically, the austere absence of decoration and generally poor surface treatment of the pottery are the main characteristics that serve as a point of departure for this particular analysis. For example, of all recovered pottery at Nunge, only three, one, and one sherds from level 7 (in trench 2), nine (in trench 1) and eleven (in trench 1) were clay slipped, burnished and red painted, respectively, suggesting that these items were brought to the site from somewhere else.

While the lack of decoration marked a major departure of the Plain Ware from other pottery used over the ages in this region, research indicates that the diminishing interest to decorate or the decrease in availability of

decorative elements did not occur as abruptly as one might expect. Instead, findings indicate that this trend began much earlier, during the transition from Early to Later TIW, so that by the PW period, most pottery had no decorative or finishing elements at all (Chami 1994, 1998; Pawlowicz 2013). This break with established production styles is said to have ended the inherent Early Iron Age decoration styles and types.

However, at the end of Plain Ware period, in the twelfth and thirteenth centuries, such a break came to an end. There followed a distinct revival of interest to invest in pottery decoration, as well as improved surface treatments such as smoothing, burnishing and painting (see Chittick 1974: figures 100-103, types 3-5). Although previous research suggested the development of PW to have marked departure of pottery making styles between the north and south Indian Ocean coast of Tanzania (Chami 1998, 2009; Pawlowicz 2013, 2018), more recent research indicates that the distribution of PW pottery is much wider than previously thought. Research in Tanga, by Mjema (2015) on the Pangani coast, and by Ntandu (2018) at Maramba, indicates that the PW covers the whole Tanzanian coast from Nakatumbatu - Mtwara in the far south (Kwekason 2011) all the way to the north as far as Tanga region.

Lack of imports in the PW assemblage is another feature that has attracted the attention of scholars (Chittick 1974, 1975; Chami 1998, Kwekason 2011). While some scholars (Oka and Kusimba 2008, Oka 2018) associate this with the development of political stability, growth of Islam, and commercial activity along the coast, others suggest the paucity of imports represents a period of cultural, political, and social crisis along this East African border of the Indian Ocean (Chami 1998, Fitton 2018, Fleisher et al. 2015). For example, along the Mozambican coast, the Chibuene site lost its position as a trade center, a devolution of the region's economic welfare indicated by a drop of imports in glass and beads. That event is suggested to have been caused by Waqwaq pillaging and conquering of villages at Sofala (Chantal 2018; Ekblom and Sinclair 2018). Chami (1998, 2009) and Horton and Chami (2018) link such assumptions to the coming of Islam or the Zanj revolt in Mesopotamia from 869 to 883 AD. Accordingly, the arrival of Islam might have been received initially with suspicion and resistance at the end of the first millennium AD, but became accepted later, during and after the thirteenth century AD. Perhaps the earlier resistance brought an end to economic and social interaction with the outside world for a time, accounting for the lack of foreign goods found in most PW sites reflecting activities of that period.

On the other hand, this situation appears to have affected sites located at the littoral and immediate mainland coast, while those communities on the

islands of Mafia, Zanzibar and Comoros seem to have continued with trading connections with the outside world throughout (Chami 1998, 2000, 2009).

Conclusions about the abandonment of Nunge

It is quite probable that the ancient route from Bagamoyo to central Tanzania dates back several centuries ago, where items such as salt were purchased for use by hinterland people.

The analysis of the primary data from this recent excavation of Plain Ware pottery in Nunge contributes new knowledge to our understanding of economic and political transformations of the East African Indian Ocean coastal communities. As noted, with the exception of the Later Stone Age artefacts that are found in the basal levels of the site, Nunge was occupied only by Plain Ware pottery users from its beginning to its end. The Nakatumbatu site at Mkindani-Mtwara region shows a similar pattern, whereby after the abandonment by PW people, the site was never settled again until recently (Kwekason 2011).

It is difficult to determine the causes for the abandonment of Nunge site using data from the current excavation. At the moment, two hypotheses may be considered to account for the causes of such abandonment. The most probable cause is thought to be a catastrophic event in the form of a tsunami from the Indian Ocean which swept the site, forcing people to leave. This assumption follows observation from exhumation of human skeletons from the PW context at Pangani, whose circumstances of death are suggested to have been abrupt, most likely from a natural flood disaster (Mjema 2018).

However, while natural floods could explain why Nunge site was abandoned, the topographical location of Nakatumbatu rules out such a possibility because it is located on higher ground.[2] Another hypothesis suggests that siltation and growth of mangroves at the site may have been the main factor for abandonment. The siltation process from the sea and alluvial deposits from the nearby Ruvu River have been suggested as one of the possible reasons for abandonment of ancient sites in the Bagamoyo vicinity including the Kaole ruins (Kwekason 2002). The growth of mangroves as observed today, together with siltation would have affected the site's access to the ocean for fishing and for harbour-related activities. Hills A and B (figures 2 and 3) stand out as remnants of previous ocean-water eroded landscapes. However, whether such weathering was related to the Nunge abandonment remains unestablished.

[2] A. Kwekason, personal communication.

Whatever the causes that led to the abandonment of Nunge, it is certain that soon after (somewhere in the twelfth to thirteenth centuries AD), Kaole subsequently prospered. This development is evident in the construction of stone architecture and the prevalence of imports such as Chinese and Persian ceramics (Chami 1994, 2002b, 2002c). This period is also associated with the rapid growth of urban centres and city states all along the East African coast, such as at Kilwa, Mtwapa, and Manda (Chittick 1974, 1984; Fleisher 2010, Kusimba and Kusimba 2013, Fleisher et al. 2015). In Pemba, for example, after 1050 AD the littoral settlements underwent transformations leading to the formation of towns such as Chwaka, Mkia wa Ngombe, and Mduuni. This was followed by a decrease in the hinterland settlements (Fleisher 2010, Fleisher et al. 2015).

In any case, these discoveries suggest that the development to urbanism at Bagamoyo predates that of the Kaole town, when the area had a few links with the outside world. The considerations assembled here, inspired by this excavation of Plain Ware pottery at Nunge, contribute crucially to the debate regarding early urbanisation along the Swahili coast. These findings challenge conventional thought that Arab or Asian settlements were the earliest urban centres along the coast of East Africa.

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