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ORIGINAL ARTICLE

Intersections, Networks and the Genesis of Social Complexity on the Nyali Coast of East Africa

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Abstract This paper examines intersections between different societies occupying the Nyali Coast region of southern Kenya from the late first millennium AD to the mid-second millennium AD. We explore interaction between societies at three scales: between hunter-gatherers and farmers in the coastal hinterland, between the hinterland and the coast and between the coast and the wider Indian Ocean. The patterns indicate that local intersections in the hinterland between hunter-gatherers and farmers went hand-in-hand with both the emergence of larger settlements in the hinterland and on the coast, and participation in a pan-Indian Ocean trade network.

Résumé Ce document examine des intersections entre différentes sociétés occupant la région de côte de Nyali du Kenya méridional, à partir vers la fin de le premier millénium ap. J.-C. et le milieu du deuxième millénium ap. J.-C. Nous explorons l'interaction entre ces sociétés à trois échelles: entre les chasseur-ramasseurs et les fermiers dans l'intérieur; entre l'intérieur et la côte; et entre la côte et l'Océan Indien plus large. Les modèles indiquent que les intersections locales dans l'intérieur entre les chasseur-ramasseurs et les fermiers sont allées de pair avec l'apparition de plus grands établissment dans la région, et la participation à un réseau du commerce de l'Océan Indien.

Keywords Iron Age · Swahili · Indian Ocean · Trade · Agriculture · Foragers

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Introduction

Interactions between different social, economic and cultural groups have been recognised as a major outcome and catalyst of social change as well as the rise of societal complexity. Here, we examine late Holocene interactions between populations inhabiting the Nyali Coast of Kenya. We explore three scales of interaction: those between hunter-gatherers and food producers in the coastal hinterland, interactions between the rural hinterland and the urban coast and engagement of the Nyali Coast in the wider Indian Ocean sphere.

Exploration of the relationship between forager, herder and farmer societies in East Africa reveals a complex process of interaction and piecemeal adoptions and reversals of traits, with significant regional and temporal variation (Lane *et al.* 2007; Prendergast 2010). Interactions between groups involved processes of exchange, cultural and linguistic borrowing, intermarriage and assimilation (Kusimba and Kusimba 2005; Stahl 2005). These elements require systematic investigation on the East African coast.

In understanding interactions across the Indian Ocean, scholars have shifted from an earlier emphasis on external catalysts for the development of urban societies along the Swahili coast (Allen 1981). The dichotomy between "sea-facing" stone towns and the rural hinterland (Horton and Middleton 2000) is now understood as an overlapping mosaic of different groups that connect the coast and the interior (Kusimba 1999; Kusimba and Kusimba 2005). Regional-scale studies have highlighted the diversity of lifeways on the East African coast (Abungu and Mutoro 1993; Chami 1994, 2004; Fleisher 2003, 2010a; Helm 2000; Kusimba and Kusimba 2000, 2005; Pawlowicz 2011; Walz 2011; Wright 2005; Wynne-Jones 2005).

The Oxford University-based Sealinks project seeks to enhance understanding of East Africa's Indian Ocean connections and the role of non-urbanised communities from both the coast and the hinterland in the emergence of the Swahili culture. This article presents a case study on the Nyali Coast of southern Kenya, where the project excavated three sites in 2010. Our dataset is drawn from the preliminary results of these excavations, coupled with an earlier program of intensive survey and small-scale excavation conducted by RH. The findings are situated in the broader context of East African–Indian Ocean connectivity through themes that have emerged during the course of regional (Boivin *et al.* 2013; Mitchell 2005) and wider Indian Ocean (Boivin and Fuller 2009; Fuller *et al.* 2011) syntheses.

The Nyali Coast

The Nyali Coast in southern Kenya runs from the Sabaki River (also known as the Athi and Galana) in the north to the River Umba in the south and encompasses the present counties of Kilifi, Mombasa and Kwale. The area is commonly differentiated into three main physiographic regions from east to west: a low coastal plain, the coastal uplands and the high coastal plain (Fig. 1).

The low coastal plain extends on average 8 km inland from the shoreline to the coastal uplands, widening along river flood plains and estuaries by up to 16 km, and also includes a number of offshore islands approaching the southern Kenya border, including from north to south: Mombasa, Chale, Funzi and Wasini (Fig. 1). The coastal uplands run parallel to the low coastal plain, extending up to 60 km inland

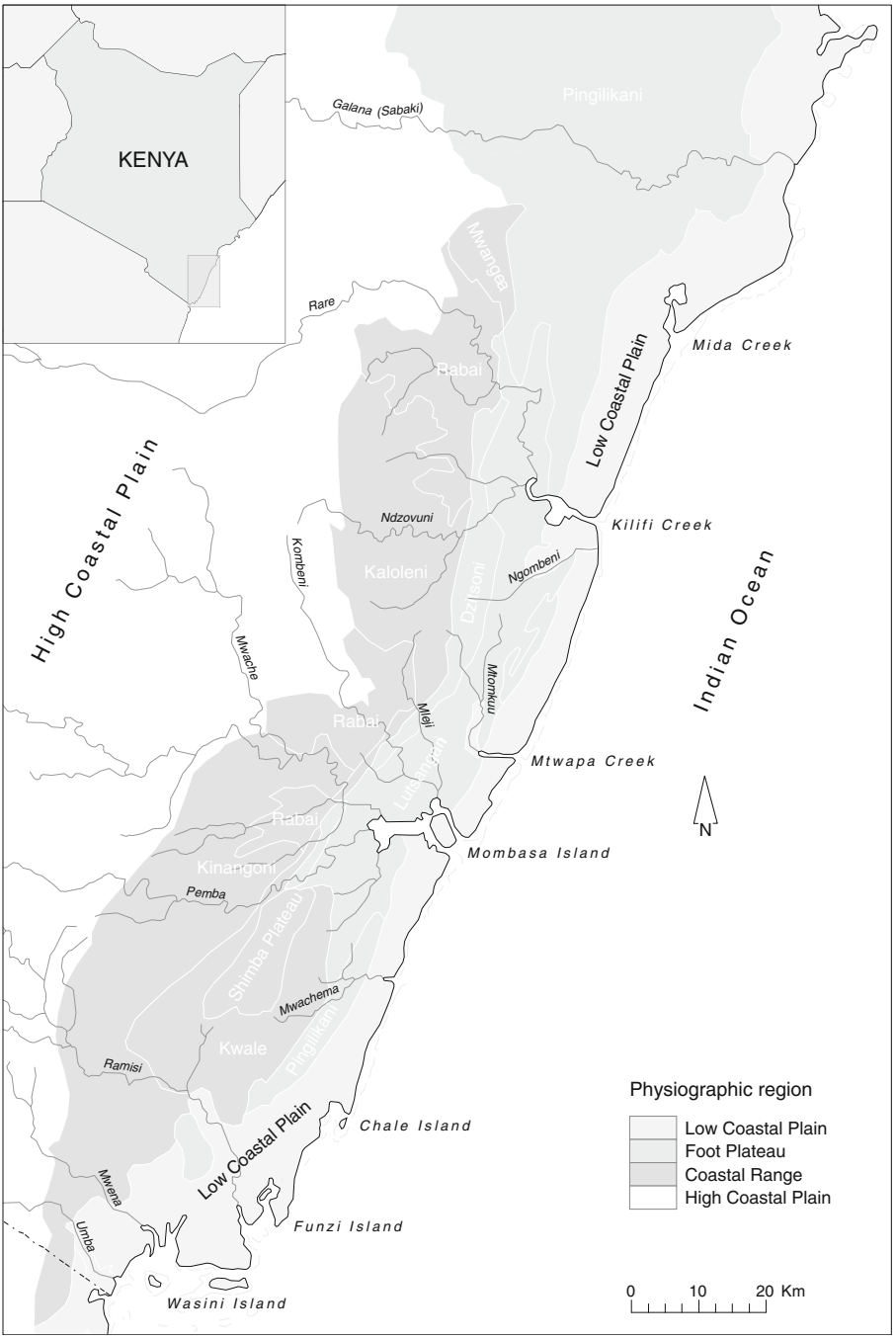

Fig. 1 Location of Nyali Coast showing main physiographic regions

from the shoreline. This area is broadly differentiated into the eastern-facing foot plateau (comprising the Pingilikani, Lutsangani and Dzitsoni uplands) and the western coastal range (comprising the Kaloleni, Kwale, Rabai and Kinango uplands, the

Shimba Plateau in the south and Mwangea Hill in the north) (Fig. 1). In the north, the foot plateau forms a transitional zone between the low and high coastal plains, while in the south, the latter are separated by the coastal range. Extending inland, the high coastal plain is an arid area, with poor soil quality and low agricultural potential. In general, altitude ranges from just above sea level along the low coastal plain to 350 m in the far west of the high coastal plain. However, the coastal range is also characterised by steep hills and erosion scarps immediately west of the foot plateau, which attain a maximum height of 520 m at Mwangea Hill.

Rainfall across the region is highly variable both spatially and temporally, being delivered in two distinct rainy seasons controlled by the monsoons and ranging from a high of 1,400 mm/year on the low coastal plain in the southeast to <700 mm/year on the high coastal plain in the northwest (Sombroek *et al.* 1982). The Nyali Coast is dissected, west to east, by 13 main rivers. These rivers enter the sea via coastal creek estuaries at Mida, Kilifi, Mtwapa and Mombasa, where they form alluvial valleys and floodplains. Of all the rivers, only the Sabaki, Rare and Umba have a catchment area, which extends far beyond the study region (to the Eastern Highlands, Taita Hills and Pare Hills, respectively). All other rivers in the area are intermittent and dry up almost completely in the long dry season (Boxem *et al.* 1987, 28; Michieka *et al.* 1978, 42–44).

The primary vegetation is broadly categorised within the Zanzibar-Inhambane Regional Mosaic, represented by lowland moist forest and lowland dry forest remnants (Moomaw 1960; Robertson 1987; Robertson and Luke 1993). Along the low coastal plain, coral rag (*Combretum schumannii–Cassipourea*) and mangrove thicket (*Ipomoea pes-capre–Rhizophora mucronata*) predominate. In the coastal uplands, plant communities include the lowland dry forest (*Manilkara-Diospyros*), Sokoke Forest (*Cynometra–Manilkara*); shale savanna (*Manilkara–Dalbergia*), lowland "Miombo" woodland (*Brachystegia–Afzelia*), lowland rain forest (*Sterculia–Chlorophora/Memecylon*) and lowland moist savanna (*Albizia–Anona*/*Panicum*). In the high coastal plain, this diversity is replaced by dry acacia thorn bushland (*Acacia–Euphorbia*). Human influence on this vegetation has been significant, particularly in the more heavily populated areas of the low coastal plain and coastal uplands. As a consequence, the present vegetation ranges from natural to completely artificially induced formations (notably coconut plantations or large-scale sisal estates), with a variety of semi-natural or semi-degenerated stages in between (Boxem *et al.* 1987, 29).

This juxtaposition of a diverse range of habitats has encouraged the coexistence of multiple subsistence strategies. With their higher moisture availability, soil fertility and varied physiography, the low coastal plain and the coastal uplands are both suitable for agriculture, while in the more arid high coastal plain livestock herding predominates today. Hunter-gatherer groups in the past would likely have utilised resources from all regions. The small sizes of the physiographic regions means resident groups would have been aware of the resources in neighbouring regions, and the short distances would have encouraged interactions between adjacent communities.

Ethno-Linguistic Groups and Their Documented Interactions

East Africa is one of the most genetically diverse regions in the world (Gonder *et al.* 2007; Tishkoff *et al.* 2009) and is home to all four major African language families,

including the click languages. Genetic links exist between click-speaking hunter-gatherers (Hadza and Sandawe) in East Africa, click-speaking hunter-gatherers (Khoisan) in southern Africa and hunter-gatherers (pygmies) in central Africa going back at least 40,000 years (Tishkoff *et al.* 2007a). Ancestral clusters of genetic variation associated with the Sandawe hunter-gatherers form a cline from central Tanzania to southern Ethiopia (Tishkoff *et al.* 2009). In conjunction with linguistic observations (Greenberg 1963; Blench 1993a, b), this suggests click-speaking hunter-gatherers may have originally occupied this entire region. Lactase persistence alleles associated with pastoralism are proposed to have spread into Kenya and Tanzania between 6,800 and 2,700 years ago, and may be associated with Southern Cushitic-speaking pastoralists (Tishkoff *et al*. 2007a, 2007b). Linguistic phylogenetics suggests that pastoralism was a feature of the Cushitic way of life since the proto-Cushitic period (Ehret 1979). An eastern Bantu migration through East Africa appears to have occurred around 2,000 years ago as evidenced by both Y-chromosome and mitochondrial DNA variation (Pereira *et al.* 2001; Salas *et al.* 2002; Scheinfeldt *et al.* 2010; Tishkoff *et al.* 2009; Wood *et al.* 2005). The expansions of pastoral and farming groups across East Africa likely resulted in the large-scale demise or incorporation of the incumbent click-speaking populations (Diamond and Bellwood 2003), though the exact nature of their disappearance remains to be ascertained. The Sandawe have experienced gene flow with neighbouring Cushitic Burunge and Bantu Turu people, indicating intermarriage between these groups (Tishkoff *et al.* 2009).

Six main ethnolinguistic groups occupy the Nyali Coast today, three of which are Bantu speakers and three of which speak Oromo, a form of Eastern Cushitic. The latter are known as the Waata, Degere and Vuna and, until recently, were hunter-gatherers living in scattered small groups among the Bantu. The Waata occupy parts of the lowland dry Sokoke Forest in the hinterland of Malindi, as well as regions further inland along the Galana and Tsavo rivers. The Degere and Vuna peoples are located in the hinterland south of Mombasa. Further north along the Tana River are the Boni and Dahalo hunter-gatherers who speak Eastern and Southern Cushitic languages, respectively. Dahalo has a click substrate hinting at a pre-pastoral hunter-gatherer language (Tosco 1991). Evidence shows that the Waata and Boni are genetically indistinguishable from their pastoral Cushitic neighbours, so they may have originally been pastoralists who adopted hunting and gathering (Tishkoff *et al.* 2009).

Two of the Bantu languages, Swahili and Mijikenda, are part of the Northeast Coast Bantu group spoken in eastern Kenya and northeastern Tanzania. The third, Segeju, belongs to the Thagicu group spoken in central Kenya, but with considerable influence from Northeast Coast Bantu (Nurse and Hinnebusch 1993). Mijikenda and Swahili both belong to the Sabaki branch of Northeastern Bantu, which is estimated to have split from its sister group Seuta around AD 500 (Nurse and Hinnebusch 1993). The Swahili-speaking peoples traditionally occupied the coast, while the related Mijikenda languages were found in the hinterland. The Sabaki group also includes Pokomo, the sister language of Mijikenda, which is spoken further north on the Kenyan coast along the lower Tana River. The Pokomo today practice floodplain and flood recession agriculture, including cultivation of the African crops sorghum and pearl millet, and also non-African species such as maize and Asian rice, and tree crops like mango and banana (Hamerlynck *et al.* 2010; Terer *et al.* 2004). Another noteworthy member of the Sabaki group is the language of the Comoros Islands,

which is more closely related to Mijikenda and Pokomo than it is to Swahili (Nurse and Hinnebusch 1993).

Historic and modern ethnographic sources have provided some useful insights into interactions between different linguistic groups. The justification for using ethnographic data in archaeological interpretations is banal: All archaeologists recognise that societies change over time, and therefore, ethnographies are never exact replicas of prehistory. However, archaeologists should also acknowledge the richness of data obtained from observing behaviour first-hand, in comparison to inference from partially preserved material remains.

Interactions between Waata, Dahalo and Boni hunter-gatherers, Oromo pastoralists and settled agricultural Pokomo along the lower Tana River have been well documented in the nineteenth and twentieth centuries (Abungu 1989, 162–169; Stiles 1981). Boni hunter-gatherers inhabited the tsetse-infested regions of the coastal hinterland, unsuitable for occupation by pastoralists. The Boni and Dahalo lived in parallel with their pastoral and agriculturalist neighbours, providing them with forest products including wild gum and rubber, honey, palm wine, carved wooden objects, rope, water lily bulbs and gourd containers (Stiles 1981). In addition, the hunter-gatherers would sometimes provide field labour for the Pokomo and guard their gardens (Bollig 1987, 207). Loan words in the Southern Cushitic Dahalo language from Eastern Cushitic and Bantu (Fedders and Salvadori 1988) reflect long-standing interaction between these groups. Likewise, there are borrowings in Pokomo from Dahalo, including words for body parts, which are normally resistant to borrowing and suggest intimate intermarriage relationships (Abungu 1989, 165; Nurse 1986, 283). The Oromo pastoralists provided domestic livestock products in return for agricultural produce and access to the river from the Pokomo. The Pokomo language has many loan words deriving from Oromo, especially terminology for cattle and also terms relating to societal institutions, ceremonies and ironworking (Abungu 1989, 164; Nurse 1986, 209).

Interactions between different groups were not always harmonious, with conflict over resources also documented (Kusimba and Kusimba 2000; Merritt 1975). The violence between Pokomo and Oromo groups that erupted in 2012 is a sharp reminder of the aggression that can occur between different groups existing in close proximity.

Hunter-gatherer communities often hold a low social position in the eyes of their pastoral and agricultural neighbours (Stiles 1982, 169; Walsh 1992/1993, 141–144). The Waata were referred to pejoratively as pig-eaters (pig being a low status food) by pastoralist Oromo, and intermarriage between them was forbidden (Kassam and Bashuna 2004). However, the value of hunter-gatherers within the economic network ensured that close interactions with agricultural and pastoral groups were maintained. In the early twentieth century, Waata exchanged forest products for domestic crops and goods with the Oromo (Kassam and Bashuna 2004). The Waata were expected to give one tusk from every elephant killed to the Oromo or Somali, and in return, they received a degree of political security (Hobley 1895; Stiles 1982, 169). Waata were even an integral part of certain lifestyle transition ceremonies in some pastoralist Oromo communities (Kassam and Bashuna 2004). Linguistic data suggest the Waata may originally have spoken a Southern Cushitic language (Stiles 1982; Walsh 1992/1993), adopting the Eastern Cushitic Oromo language following the expansion of Oromo pastoralists and the construction of a patron–client relationship.

Inland among the Taita hills, the Waata specialised in elephant hunting as the demand for ivory grew in the latter half of the second millennium AD (Thorbahn 1979). They used their specialist technique of poison-dart hunting to acquire elephants and then traded the ivory with caravans heading for the coast (Hobley 1895). Neighbouring Waataita agriculturalists formed blood brotherhoods with Waata for access to the poison-dart knowledge because the trade was so lucrative (Merritt 1975).

Reciprocal relations are often referred to in Mijikenda agriculturalist and Waata hunter-gatherer oral traditions. In the oral tradition of the Giriama (one of the nine Mijikenda groups), who live on the lower Tana River, it was the Waata who first showed them where to establish their Kaya settlement and how to make poison (Spear 1978, 30). Spear (1978, 68) shows how the Waata obtained sheep, goats, grain and iron for arrowheads from the Giriama, in exchange for ivory and rhino horn, which would then be exchanged on the coast for cloth and glass beads. The Waata formed blood-brother relationships with the Giriama and intermarriage took place between the two, eventually resulting in the Tana River Waata adopting the Giriama language (Fedders and Salvadori 1988; Stiles 1981).

Pastoralist taboos against intermarriage and communal residence generally prevented full assimilation of hunter-gatherer communities into pastoral groups, but no such constraint seems to have existed with the Mijikenda. Hunter-gatherer communities sold wild animal products to the Mijikenda in exchange for food, cloth, iron and other products and looked after the crops of landowners in exchange for food and land on which to cultivate their own crops (Stiles 1982, 169). As such, there was greater assimilation between hunter-gatherers and agricultural populations than with pastoral ones, a process that continues today (Walsh 1992, 144). Giriama oral tradition recalls an aboriginal population of hunters, the Laa, who were later absorbed by the northern Mijikenda (Walsh 1992). Linguistic evidence suggests there was a hunter-gatherer group living around Mombasa, called the Maumba, who also were assimilated by the Mijikenda (Walsh 2003). The Degere and Vuna were related to the Waata formerly, but are now assimilated with the Digo and Duruma Mijikenda in the region south of Mombasa (Walsh 1990). The Digo group of southern Mijikenda have a matrilineal kinship system, unlike the northern Mijikenda, and they do not have a primary Kaya (Spear 1978), both of which may reflect a substrate hunter-gatherer culture that was absorbed by the Mijikenda.

Reciprocal relationships are known to have existed between interior communities and the Swahili coastal towns. The Portuguese record that Oromo pastoralists were allied to the coastal town of Pate in 1637, whilst the Somali (Marakatos) were linked with the towns of Siyu, Faza, Manda and Lamu (Abungu 1989, 167; Strandes 1961). Traditions collected from the Mijikenda who occupy the mainland overlooking Mombasa, suggest that the town-dwellers and farmers were closely related through intermarriage (Pouwels 1987, 14). In 1505, the Sheikh of Oja used friendly "Kafirs" from the interior to help defend against the Portuguese (Kirkman 1966, 11), whilst the Mossegejos (commonly identified as Segeju) and the Mossegulos (believed to be the antecedent Mijikenda) helped defend the coastal towns of Malindi and Mombasa in return for tribute (Freeman-Grenville 1962; Strandes 1961). Such alliances, embedded through patron–client networks, have continued into the present (Parkin 1991; Willis 1993; Willis and Miers 1997).

The interior communities of East Africa, with their various subsistence economies, have formed a network of intersections with each other and the commercial towns of

the coast in the recent past. In documentary sources, the nature of such interactions varies widely depending on when they were recorded and the groups involved. This evidence thus provides a range of models to aid the interpretation of prehistoric evidence for interaction.

Prehistoric Interactions between Hunter-Gatherers and Farmers in the Coastal Hinterland

The present known distribution of prehistoric hunter-gatherer sites utilising Late Stone Age (LSA) lithic technology on the southern Kenya coast is limited, with only two sites recorded on the low coastal plain (Mtongwe and Kinuni Cave), and nine situated within the coastal uplands (Helm 2000; Helm *et al.* 2012; Omi 1991; Soper, unpublished papers; Soper 1975) (Fig. 2). More detailed survey undertaken in the Tsavo region of the high coastal plain (Kusimba and Kusimba 2005; Wright 2005, 2007) indicates that the number of occurrences currently known nearer the coast probably underrepresents the true density.

In the coastal uplands, LSA hunter-gatherer groups particularly favoured the Dzitsoni region, which is characterised by a limestone escarpment along its eastern edge, with outcropping rock shelters and caves. Prior to agricultural clearance, the area would have been covered in lowland rain forest directly overlooking a lowland shale savannah landscape on the Lutsangani Upland to the east. Perennial freshwater is available from springs emerging from the limestone escarpment as well as from seasonal streams. From the Dzitsoni region, access to marine resources is no more than 15 km distant, either from inland creeks such as at Mtwapa and Kilifi, or from the coast. It has been suggested that these communities purposefully occupied this interface between different physiographic regions to maximise resource availability (Helm 2000). Ethnographic parallels with modern hunter-gatherer groups suggest that land-use strategies were determined primarily by access to a variety of resources, including water, lithic raw materials, plants and animals (Kusimba 1999, 174).

During the late 1960s, Robert Soper investigated several rockshelter and cave localities in the Dzitsoni region, including Mlungu Maewe, Cha Simba and Panga ya Mwandzumari (Sinseme Cave) (Soper, unpublished papers; Soper 1975). More recently, excavation has resumed at Panga ya Mwandzumari and initiated at Panga ya Saidi, the relevant preliminary findings of which we present here (see also Helm *et al.* 2012). At present, we do not have any radiometric dates for the two Panga sites, but the sequences are long and continuous with dense concentrations of lithics (11,246 flaked stone artefacts from 6,350 litres of sediment at Panga ya Saidi, while over 28 kg of lithics were recovered from *ca.* 2 tonnes of sediment at Panga ya Mwandzumari), continuing well below the upper ceramic-bearing layers (Figs. 3 and 4). The lithics were exclusively manufactured on locally available quartz, chert and limestone and <1 % of the Panga ya Saidi assemblage was retouched, indicating an expedient approach to raw material use and relatively low mobility. The location of the sites in fertile areas where resources would have been diverse and abundant across the seasons likely reduced the need for mobility. The presence of coral and marine shells, including cowrie shell beads, in the preceramic levels at Panga ya Mwandzumari and Panga ya Saidi indicates exploitation of the coast (Helm *et al.* 2012).

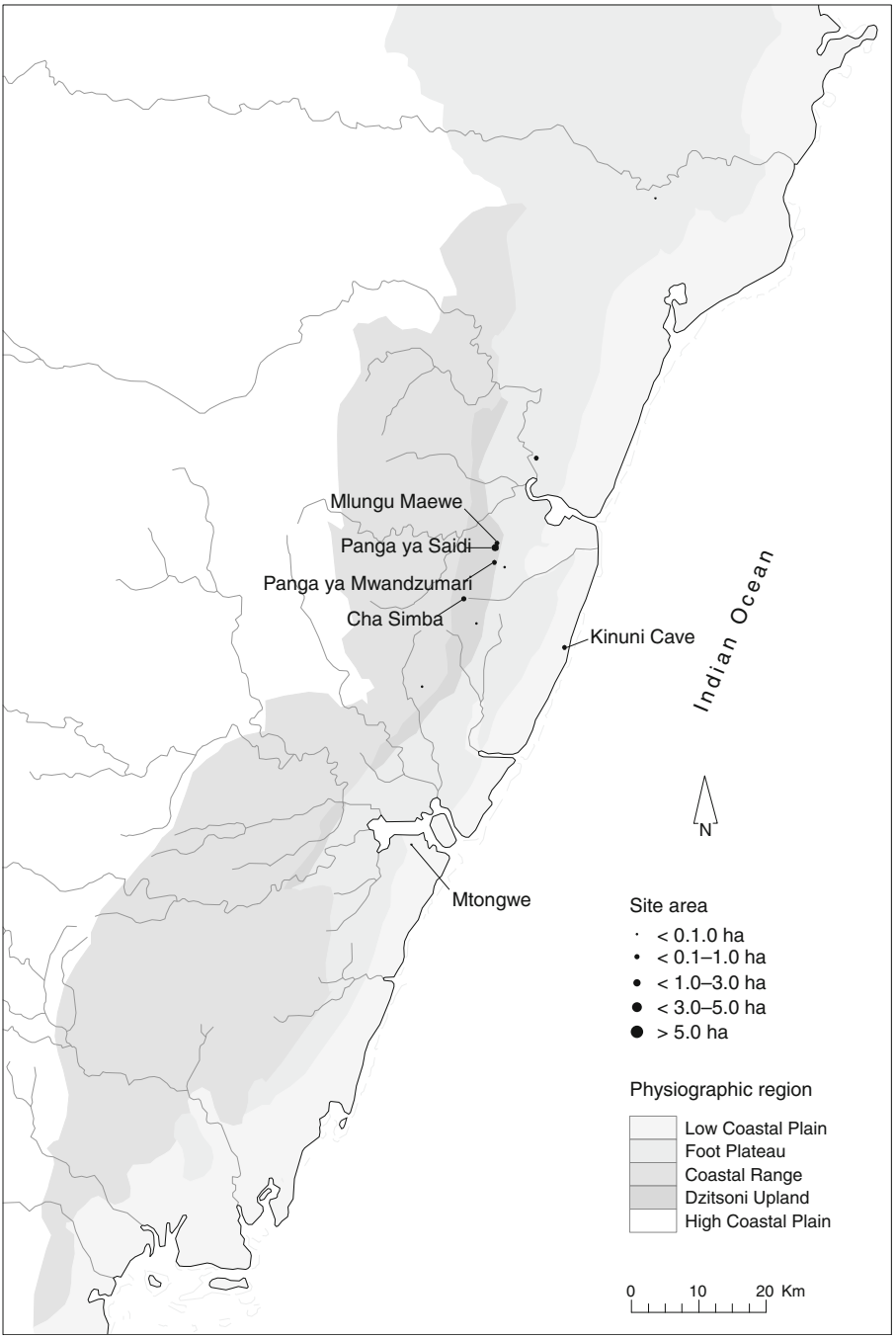

Fig. 2 Distribution of LSA hunter-gatherer sites

There is ambiguous evidence for introduced domesticated plant species in the preceramic levels at both sites, including baobab (*Adansonia digitata*) and finger millet (*Eleusine coracana*), but further sampling and direct dating are required to

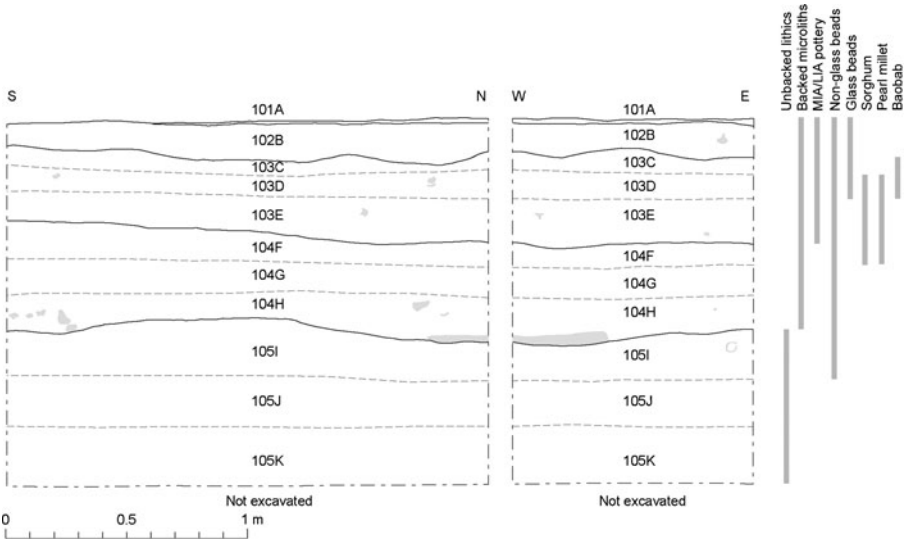

Fig. 3 Stratigraphic sequence at Panga ya Saidi trench 1

confirm these finds, which could be intrusive from overlying ceramic levels that have larger crop seed assemblages. The appearance of finger millet could indicate early interaction with agro-pastoral groups, perhaps Southern Cushitic speakers, prior to contact with Bantu speakers (*cf.* Ehret 1998). Baobab, on the other hand, is now established as wild in West Africa and regarded as anthropogenically introduced to East Africa (Pock Tsy *et al.* 2009). It is tempting to link this to the spread of the West African cereal crop, pearl millet (*Pennisetum glaucum*), which is more generally regarded as part of Bantu agriculture alongside sorghum (*Sorghum bicolor*) from Sudanic Africa (Ehret 1998). Elsewhere in interior East Africa, such as in Rwanda, Early Iron Age agriculture includes evidence for both sorghum and pearl millet but not finger millet (Giblin and Fuller 2011).

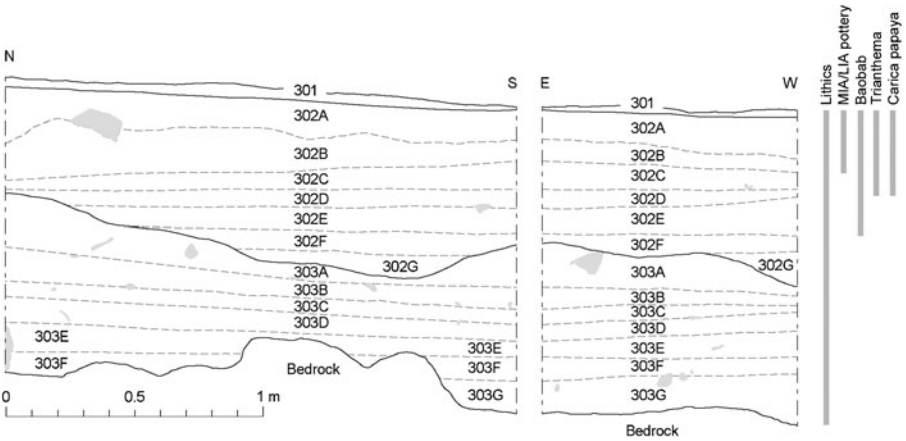

Fig. 4 Stratigraphic sequence at Panga ya Mwandzumari trench 3

Middle Iron Age (MIA) to Late Iron Age (LIA) pottery, reflecting both regional and chronological variants of the early to late Tana Tradition/Triangular Incised Ware (TT/TIW) (Fleisher and Wynne-Jones 2011; Helm 2000), were recovered in the upper levels at Panga ya Mwandzumari and Panga ya Saidi, along with three imported glass beads at the latter site. Of 638 sherds (8.6 kg) from Panga ya Saidi, 75.3 % diagnostic pieces by weight were MIA (*ca.* AD 600–1000) TT/TIW, characterised by having more complex incised decoration patterns, and the remainder were LIA (*ca.* AD 1000–1650) TT/TIW, with more simple punctate decorations (Helm *et al.* 2012). Archaeobotanical sampling at Panga ya Saidi provided definitive evidence for baobab and cereal crops including sorghum, pearl millet and finger millet in the ceramic-bearing layers (Fig. 3, Fig. 5). The lithics indicate continuity with the preceramic levels, as the same raw materials were exploited (quartz and chert), using the same techniques (bipolar and discoidal reduction), to produce the same tool types (crescent and trapezoidal backed

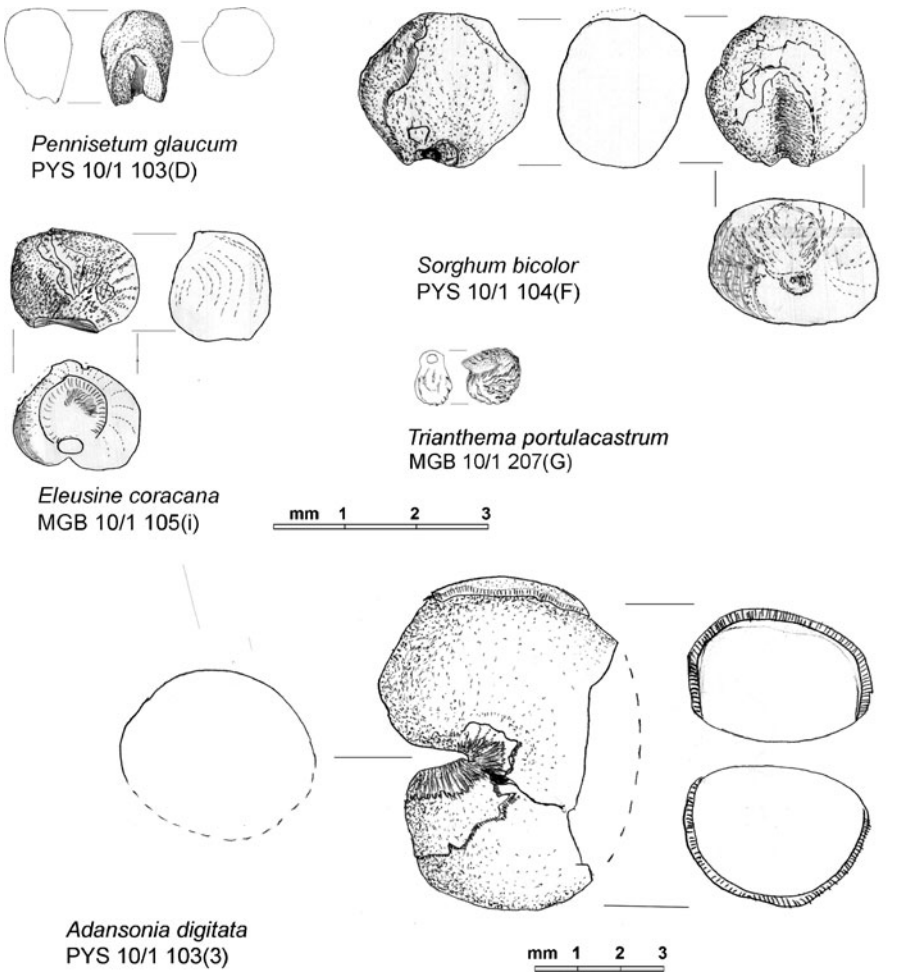

Fig. 5 Examples of identified taxa in the archaeobotanical evidence from Panga ya Saidi and Mgombani. Note: baobab at a different scale than the others. (Drawings by D.Q. Fuller)

artefacts). By contrast, there were no antecedent ceramics at the site and the MIA ceramics are comparable to those at neighbouring Iron Age sites lacking in lithics such as Mgombani (Helm *et al.* 2012). At Panga ya Saidi and Panga ya Mwandzumari then, we likely have material evidence of hunter-gatherers utilising ceramic vessels, domestic crops and imported glass beads from the late first or early second millennium AD through interaction with agricultural groups. There is no evidence for permanent occupation of these sites post-Iron Age, but they are both used today as sacred spaces where prayers and offerings are made to ancestor spirits for healing and good harvests.

Coast and Hinterland Interactions: The Emergence of Settlement Hierarchy

Current evidence for early ironworking, farming settlement in the coastal region of Kenya from the early first millennium AD is limited to 13 sites. These comprise a small cluster of Early Iron Age (EIA) (*ca.* AD 200–600) sites on the Shimba Plateau southwest of Mombasa (Soper 1967), including the type site for the regional EIA ceramic variant Kwale Ware, and extending as far north as Mwangea Hill (Helm 2000) (Fig. 6). The provisional distribution of these settlements as defined by the distribution of Kwale Ware would suggest that they favoured the same locational parameters as the LSA hunter-gatherer communities, with a distinct concentration evident along the escarpment of forested hills in the Dzitsoni Uplands (Fig. 6). Given this distribution, it is surprising to note that interactions between neighbouring LSA and EIA communities appear to have been minimal during this "pioneer phase" of Bantu colonisation (Lane 2004). No EIA pottery was recovered from Panga ya Mwandzumari and Panga ya Saidi, despite the deep continuous sequence, the proximity of neighbouring EIA sites and the later occurrence of MIA-LIA pottery (Helm *et al.* 2012). At the excavated EIA-MIA site of Mgombani, only a handful of lithics were recovered from preceramic levels (n=22), and these included artefacts of non-local stone, perhaps indicative of visits by transient forager groups.

In contrast to the quantity of excavated data on EIA communities from the coastal mainland and offshore islands of Tanzania (*e.g.*, Chami 1992, 1999, 2003, 2009; Chami and Msemwa 1997a,b), only two EIA sites, the type site of Kwale (Haro 2008; Soper 1967) and the transitional EIA-MIA site of Mgombani (Helm 2000; Helm *et al.* 2012), have so far been excavated on the Nyali Coast. Occupation appears to date from the third century AD at Kwale, perhaps indicating an original northward movement of EIA communities from the central Tanzanian coast where the earliest dates indicate occupation by *ca.* 200 BC. At Mgombani, occupation appears to be even later, with the ceramics potentially reflecting a transition between the EIA Kwale Ware and MIA early TT/TIW pottery (Helm 2000; Helm *et al.* 2012). A single radiocarbon date on charcoal (Pta-7957) from a deposit containing both EIA and MIA pottery gave a calibrated date range of the late seventh to eighth century AD (Table 1). Ironworking was evidenced by the recovery of iron slag, furnace fragments and a tuyere.

Archaeobotanical evidence is plentiful at Mgombani, indicating that sorghum, pearl millet, finger millet and baobab were all cultivated (Fig. 5). Quantitative evidence suggests not only a dominance of pearl millet throughout the sequence but also significant levels of sorghum, including evidence for sorghum dehusking onsite (*i.e.*, charred husks). Of note is the presence of quantities of the horse purslane (*Trianthema*

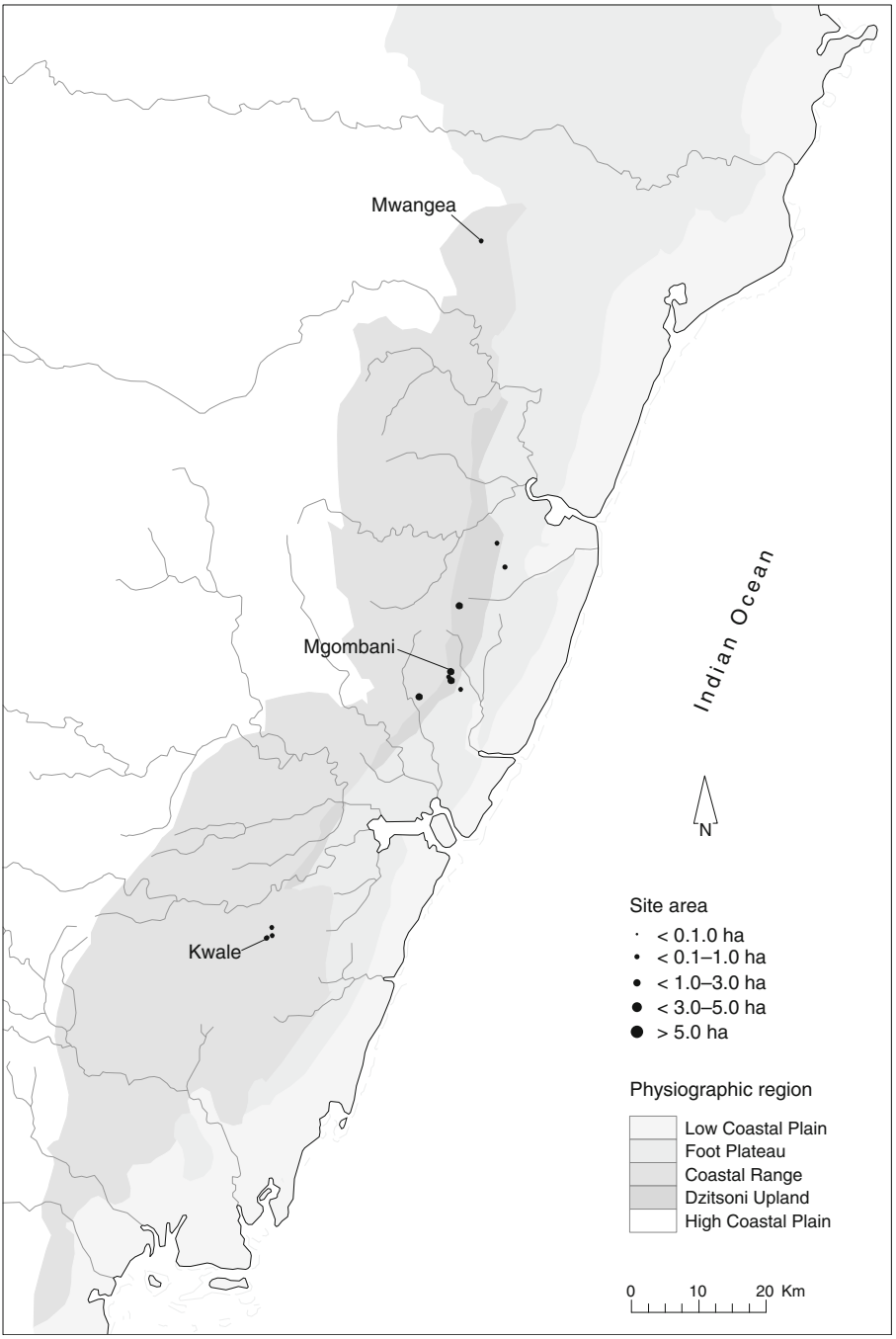

Fig. 6 Distribution of EIA sites (*ca*. AD 200–600)

portulacastrum), a small herbaceous weed, inferred to originate from the wild in India and to have been introduced as an agricultural weed across the Indian Ocean (Fuller and

Table 1 Radiocarbon results from the Nyali Coast [calibrated using OxCal 3.10 with the Reimer *et al.* (2009) atmospheric calibration curve]

Site	Laboratory number	Depth (m)	Context	Material	Uncalibrated C-14 age BP	1-sigma range of calibrated date	2-sigma range of calibrated date
Mgombani	Pta-7957	0.56	TP03, context 16	Charcoal	1300±50	AD 660–770	AD 640–870
Chombo	Pta-7978	0.65	TP04, context 18	Charcoal	1180±60	AD 770–950	AD 680–990
Mteza	Pta-7955	0.48	TP01, context 25	Charcoal	1190±50	AD 770–940	AD 680–970
Mtsengo	Pta-7956	0.77	TP01, context 57	Charcoal	580±50	AD 1300–1420	AD 1310–1452 cal. 1290–1430
Mbuyuni	Pta-7965	1.76	TP01, context 23	Charcoal	350±50	AD 1470–1640	AD 1450–1650

Boivin 2009). However, due the presence throughout the same sequence (trench 2) of uncharred, likely modern intrusive seeds, including recent introductions from the Americas such as papaya (*Carica papaya*), the horse purslane may also be a recent intrusion; this will require direct radiocarbon dating to resolve.

Excavated faunal remains from Mgombani demonstrate that while transitional EIA-MIA communities kept some domestic livestock, including sheep/goat and some cattle, their subsistence was also dependent on wild mammals (Table 2; see also Helm 2000). As with the LSA sites, finds of marine shell indicate that these communities accessed maritime environments.

Settlement on the Nyali Coast was seen to intensify from the late first millennium AD, with some 24 sites with MIA ceramic assemblages now recorded (Fig. 7). The distribution, while likely under-representative, demonstrates that alongside the continued occupation of the earlier EIA settlements and intensification of existing land-use patterns, there was a corresponding expansion into the adjacent physiographic regions, with settlement moving beyond the Dzitsoni Uplands into the Lutsangani and Kaloleni Uplands, and from the Shimba Plateau into the surrounding Kwale Uplands. This period also has the first evidence for settlement on the beach terraces of the Low Coastal Plain and marks the establishment of the pre-urban foundations of the later Swahili coastal towns.

Excavations have been conducted at two MIA sites in the Coastal Uplands, Chombo and Mteza, both of which have calibrated date ranges between the early eighth to early eleventh centuries AD (Pta-7978 and Pta-7955, respectively, Table 1). At present no archaeobotanical data have been recovered from these settlements; however, faunal data (Table 2) indicate no major shift in subsistence from the EIA, with communities continuing to keep sheep/goat and some cattle and utilising a wide range of hunted species (Helm 2000). Both settlements consumed marine resources, including both near- and off-shore fish species, indicating specialised knowledge of and access to maritime resources (Helm 2000). Engagement between communities occupying the coastal

Table 2 Faunal remains (NISP) from Iron Age sites on the Nyali Coast (from Helm 2000, 270)

Category	Mgombani	Chombo	Mteza	Mtsengo	Mbuyuni	Total
Bird		11	2	55	25	93
Fish (fresh water)			4		12	16
Fish (marine)		9		66	4	79
Shell fish (marine)		6	1	15	26	48
Land mollusc	22	33	62	2	10	129
Domestic chicken	4	6		38	16	64
Domestic sheep/goat	21	156	9	429	92	707
Domestic cattle	9	16	1	906	486	1,418
Mammal (small)	6	133	17	109	89	354
Mammal (medium)	2	358	35	278	219	892
Mammal (large)		13	1	1	58	73
Grand total	64	741	132	1,899	1,037	3,873

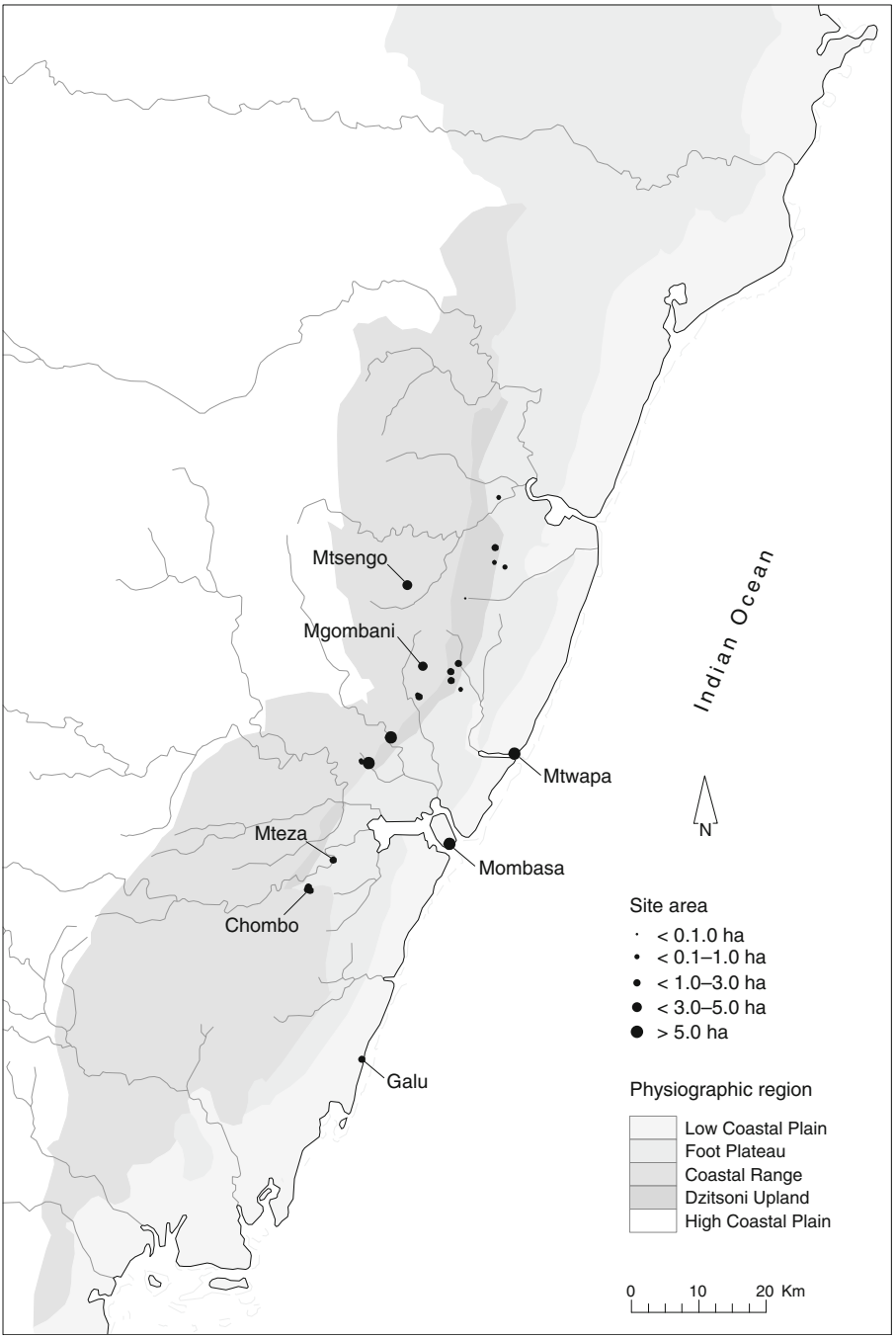

Fig. 7 Distribution of MIA sites (*ca.* AD 600–1000)

uplands and those emerging on the low coastal plain is confirmed by the identification of imported goods. These include glass beads from the MIA levels at Mgombani and Chombo, eighth century AD blue-green glazed Sasanian pottery from Mgombani, and

ninth to twelfth-century AD Chinese Yue stoneware and eleventh-century AD hatched Sgraffiato from Mteza.

Settlement increased exponentially from the second millennium AD, with 123 sites yielding LIA pottery now identified (Fig. 8). Contemporary with this growth, was the emergence of a more marked settlement hierarchy, with a number of large, multi-component settlements located in the coastal uplands (Helm 2000; Mutoro 1987) (Fig. 9), and a comparable growth of urbanised settlements on the low coastal plain (Kusimba 1999; Wilson 1980). The development of these regional centres did not appear to coincide with a depopulation of the surrounding regions as occurred on the island of Pemba (Fleisher 2010a). Instead, as the frequency of sites increased, their average size remained the same, but the variance in size increased dramatically (Table 3 and Fig. 9). Hence, the emerging settlement pattern would indicate the growth of large regional centres surrounded by an expanding number of smaller settlement units (Mutoro 1987; 1988). Whilst this was most evident along the Low Coastal Plain, where the construction of stone towns has been taken to indicate the emergence of urban elites and a cosmopolitan culture (LaViolette 2008), it is now clear that contemporaneous changes were occurring in the settlement hierarchy of the coastal uplands.

The distribution of settlements from the early second millennium AD would suggest that occupation intensified in the regions already occupied in the MIA. At the same time, these LIA farming communities moved into new territories, expanding beyond the fertile soils of the eastern Kaloleni, Dzitsoni and Lutsangani Uplands into the drier, less agriculturally productive soils of the Rabai and Kinango Uplands, and west into the high coastal plain. Similarly, there is evidence for settlement of the northern regions, with LIA sites present along the fertile alluvial soils of the Sabaki River valley. These communities interacted with the producers of a distinctive wavy-line pottery, which was recorded at the site of Marafa on the northern side of the Sabaki River valley (Collett 1985; Tinga, unpublished paper). This pottery was found in conjunction with late Tana Tradition pottery at Shanga in the Lamu Archipelago (Horton 1996) and occurred at the eleventh- to seventeenth-century coastal town site of Gedi, south of Malindi (Kirkman 1954; Pradines 2010). The wavy-line tradition is commonly identified with an agro-pastoralist group, possibly speaking an Eastern Cushitic language (Collett 1985; Tinga, unpublished paper).

With the expansion of settlement into the drier ecological zones to the west and north, there was a corresponding shift in the general subsistence production of LIA farming communities. Faunal data from the large 7.56 ha site of Mtsengo (calibrated date range between the early fourteenth and fifteenth century AD, Pta-7956, Table 1) indicates a growing dependence on domestic livestock over hunted species, with cattle remains forming over 47 % of the faunal assemblage and caprines 23 % (Table 2). At the same time, evidence for marine fish and shellfish species suggests access to food products from the coast, a distance of at least 30 km. At the 4.32 ha site of Mbuyuni, with a calibrated date range between the fifteenth to sixteenth century AD (Pta-7965, Table 1), a shift towards cattle is evident, paralleling the transition at Mtsengo. Included among the cattle remains was a specimen of zebu (*Bos indicus*) whose adaptations to aridity may have assisted the expansion onto the high coastal plain (Blench 1993a, b, 77–78; Clutton-Brock 1993, 66–67), although a larger data set is clearly needed to test this hypothesis further. It seems that the expansion into new ecological zones was

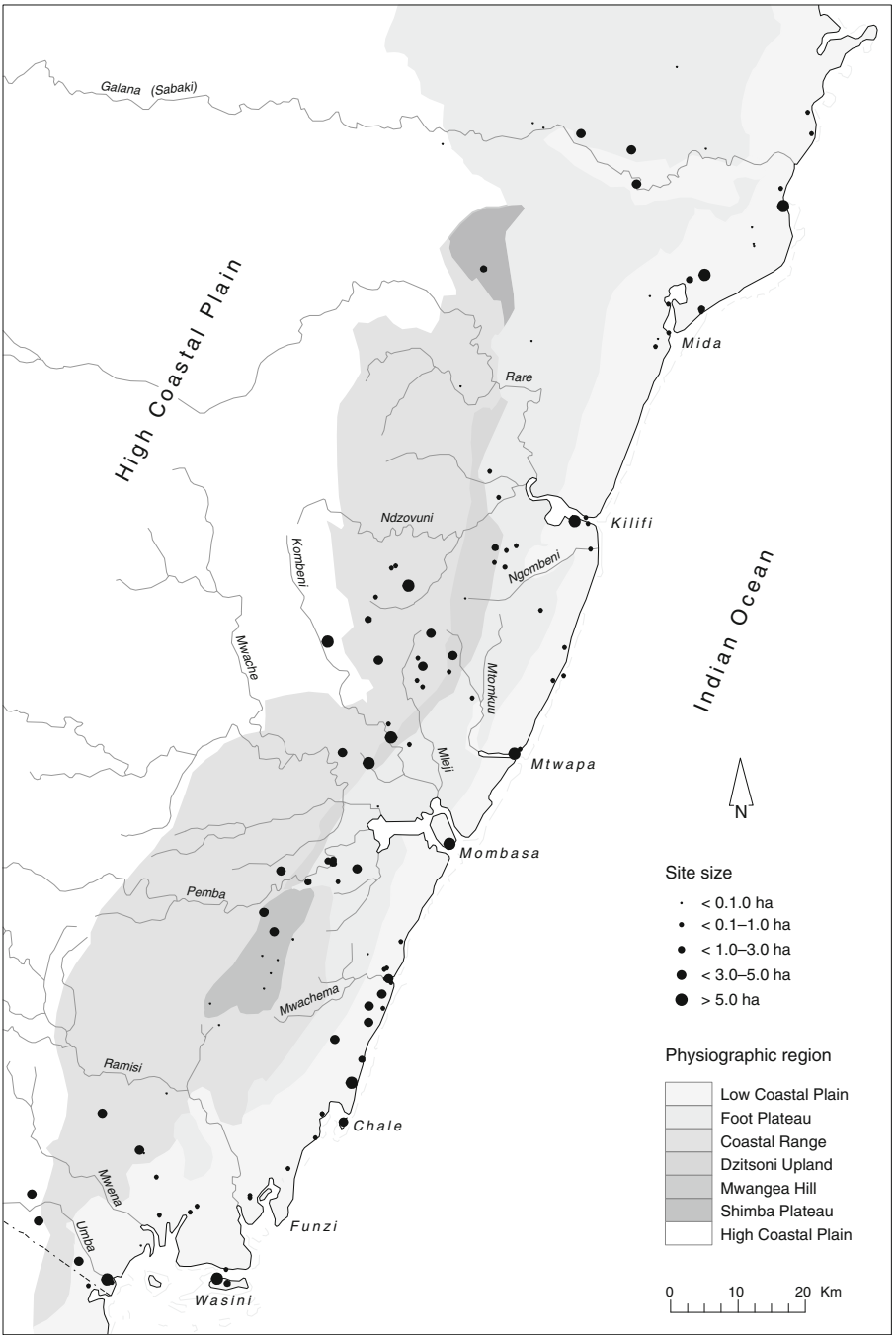

Fig. 8 Distribution of LIA sites (*ca.* AD 1000–1650)

enabled by the adoption of different subsistence economies, perhaps as a result of contact with neighbouring groups, and by exchange networks that mediated access to distant resources.

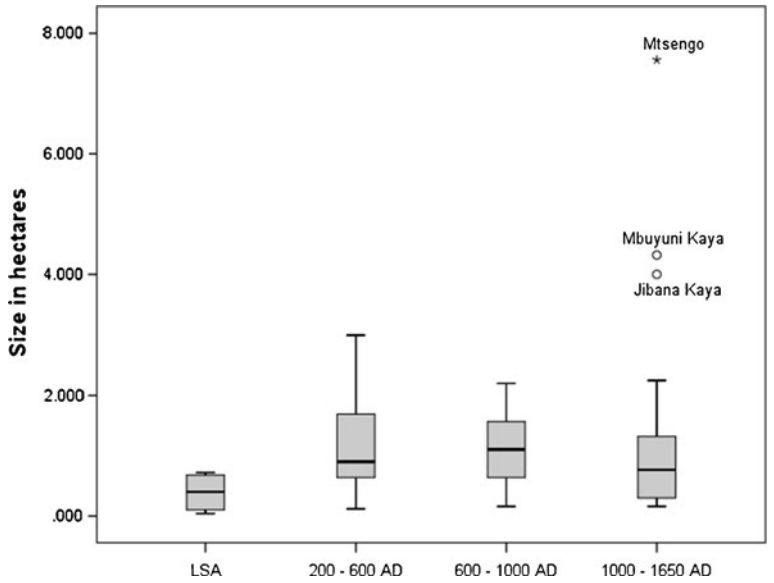

Fig. 9 Boxplot of settlement sizes

A network of economic ties seems to have encouraged the production of a communal surplus for regional exchange. This is illustrated by the intensity of non-subsistence production at Mtsengo. Ironworking at Mtsengo took place on a considerable scale in the LIA, with over 63 kg of iron slag as well as several clay tuyere fragments identified. Copper artefacts were also present, and there is some indication for the onsite smithing of copper, as copper slag was found in association with tuyere fragments (Helm 2000, 186). Trade with the coast brought exotic items into the hinterland, for example, a varied selection of imported glass beads were collected from Mtsengo, while Chinese white porcelain, Middle Eastern Gudulia water jars and Islamic monochrome wares were recovered at Mbuyuni.

Interactions with the Wider Indian Ocean Sphere

Trade between East Africa and the Arabian Peninsula is documented in the second century AD *Periplus of the Erythraean Sea* (Casson 1989; *PME*), which describes regular contacts between Middle Eastern merchants and East African populations, extending even to intermarriage. Archaeological investigations however, have so far failed to recover any trading settlements of the relevant time period, with the earliest

Table 3 Mean, median, standard deviation (SD) and Mann–Whitney *U* test results comparing settlement size between the early and late TIW periods

	Mean	Median	SD	*N*	Mean rank	*U*	Significance
Early TIW AD 600–1000	1.123	1.105	0.654	12	19.04	113.5	0.504
Late TIW AD 1000–1650	1.389	0.765	1.779	22	16.66		

concrete evidence for intensive and regular overseas contact extending back so far only to the fifth/sixth century AD (Chami and Msemwa 1997a; Juma 2004). While the trading port of Rhapta reported in the *Periplus* may yet be conclusively identified archaeologically, it also seems likely that much of the earliest trade involved direct contact between foreign sailors and local hunter-gatherers and pastoralists rather than with settled, urbanised intermediaries. Save a possible, but disputed, reference to "tillers of the soil" on the East African coast (*PME* 16), the *Periplus* seems largely to describe maritime-oriented foraging communities on the low coastal plain. Indeed, the products sought from Africa in the early first millennium AD are not those of settled agricultural societies but of hunters and foragers, including ivory, rhinoceros horn and turtle shell. These may well have been supplied to overseas traders by local mobile populations embedded within wider exchange networks, of which settled agricultural communities in the hinterland were also a part. Recent analyses emphasise the importance of such small-scale, mobile societies in the establishment of trading links in the wider Indian Ocean (Boivin and Fuller 2009; Boivin *et al.* 2009; Fuller *et al.* 2011), while various studies have highlighted the role of mobile societies in providing products for international trade (*e.g.*, Brosius 1995; Stiles 1993).

Early exchange networks that brought together small-scale hunter-gatherers and foreign traders may have provided the basis for the emergence of settled Swahili intermediaries around the seventh century AD. That the first Swahili settlements were from the outset part of the Indian Ocean world is indicated by the presence, right from the beginning of occupation, of imported material culture, including ceramics and glass beads. These finds suggest exchanges initially with the Gulf region, with subsequent introductions of Chinese and Indian ceramics and other forms of material culture indicating contacts further afield, though for many centuries only via the Arab world. The timing of the introduction of Asian crops and animals, indicated by biogeographical, archaeological and genetic studies, remains to be clarified. Initial patterns, in particular from excavations on Pemba and Zanzibar, by ourselves and others (Fleisher 2010b; Juma 2004; Walshaw 2010) would seem to suggest that plants were introduced more slowly than artefacts, with a lag time of several hundred years before exotic ceramics were joined in any quantity by foreign foods (Boivin *et al.* 2012). This contrasts with some other regions of the Indian Ocean (*e.g.*, the Africa-to-India crop transfers of the Bronze Age, which significantly precede material evidence for contact). Given low archaeobotanical recovery rates, this could also simply reflect a period of low quantities of food imports prior to import substitution, or very limited initial cultivation of exotic plants. Data reviewed in Boivin *et al.* (2012) suggest that Old World food globalisation frequently featured a significant delay, of centuries if not millennia, between the import of an exotic plant crop and its growth on a significant scale. On the East African coast, the adoption of rice and other exotic crops may have been encouraged by gradual processes of Islamisation that saw the emergence of new culinary practices (LaViolette 2008; Walshaw 2010).

Initial engagement between the communities of the East African coast and the wider Indian Ocean need not have been a highly formal affair. Description of trade on the coast of the Horn of Africa as late as the mid-nineteenth century AD, suggests that trade imperatives could lead to the creation of substantial seasonal trading settlements that emerged and disappeared in a period of months or weeks (Sherriff 2010, 134). There is little in the description of the Azania coast in the *Periplus* to suggest the

presence of substantial, cosmopolitan ports. Description of wine and grain imported by traders for the "goodwill of the Barbaroi" (*PME* 17), do not suggest the provision of trader colonies or the regular import of exotic crops to agricultural societies. Until systematic excavation of relevant coastal forager sites is undertaken, it is difficult to assess the possibility of direct Indian Ocean trade with foragers prior to the establishment of Swahili towns. Too much rests on the interpretation of a few passages in one historical text and systematic excavation, botanical recovery and chronometric dating are all needed to explore further the possibility of forager involvement in the earliest phases of Indian Ocean trade on the East African coast. Our evidence shows that in the northern Nyali Coast there was no import of exotic items at LSA sites until the appearance of early TT/TIW pottery at the sites and the advent of Swahili settlements on the coast. This may indicate that earlier trade with hunter-gatherers took place elsewhere on the coast, or occurred at very low levels.

Conclusion

Much of the uncertainty in the recent East African archaeological record may arise from the complex pattern of intersections between human groups, which was a feature of this region's past. The adoption and abandonment of subsistence practices, ceramic styles and languages by different groups as they moved and interacted created a complex material record that requires assessment on local, regional and inter-regional scales to be understood. In this article we have attempted a multi-scale analysis for the Nyali Coast and are able to offer some interpretations.

On present evidence it appears that around the eighth century AD, following a pioneer phase of colonisation, Bantu populations on the Nyali Coast began to expand, and interactions between hunter-gatherers, farmers and pastoralists intensified. M'Mbogori (2011) has argued that the MIA early TT/TIW pottery that emerged at this time is a Bantu tradition, but with extensive borrowings from Cushitic ceramics in the decoration and coiled rims. While decoration could simply be copied through trading interactions, ethnographic evidence indicates that the combination of different manufacturing techniques requires long-term interactions such as through intermarriage (M'Mbogori 2011). Many Swahili settlements on the East African coast were also founded in the late first millennium AD. Excavations at Shanga show that in the early levels of the site different areas were settled by peoples with different subsistence practices, perhaps indicating a role for more intensive engagement between different populations in the origins of Swahili towns (Horton 1996). The limited mobility and reach of settled Swahili populations rendered them inherently reliant on more mobile groups, who provided goods for onward trade. Maritime and overland networks linked such mobile groups indirectly with a web of commercial and cultural trade connections that spread across the Old World (McNeill and McNeill 2003).

In the ensuing centuries the emergent settlement hierarchy, the import of rare exotic items and the construction of stone buildings suggests the presence of elites in these growing populations. By the late first millennium AD, cowrie shells and other items from the coast were reaching as far inland as the Great Lakes region (Giblin *et al.* 2010). The Swahili coast had matured into the interface between two vast trade networks: the overland network of Africa and the maritime trading sphere of the

Indian Ocean. The appetite of the newly formed Islamic empire undoubtedly catalysed trade networks (Chaudhuri 1985), although it is clear that on the Nyali Coast both the Swahili towns and the Mijikenda settlements of the hinterland had a common origin in EIA communities. Interaction with the LSA hunter-gatherer occupants of the region was an integral feature of trade networks, as demonstrated by finds of agricultural produce, ceramics and imported glass beads at LSA sites. The late first millennium timing of the appearance of these exotic items at LSA sites suggests hunter-gatherer interaction with the Indian Ocean world was mediated by Swahili settlements and that earlier Indian Ocean trade may not have taken place on this part of the coast. Further inland, and later in time, trade between hunter-gatherers and coastal societies has been observed, for example in the form of European glass beads and a sheet-metal arrowhead from Kisio rockshelter in the Tsavo region (Kusimba 2003). Foragers, pastoralists and other mobile and small-scale societies became increasingly specialised features in a fabric of connections that would come to be known as globalisation.

Interaction between hunter-gatherers and farmers in the Nyali Coast upland may be characterised as symbiosis (Kusimba 2003), as it reflects two groups occupying the same area but pursuing divergent modes of subsistence. A parallel may be drawn between the Nyali Coastal Upland forest and the rainforest of central Africa where symbiotic relations between pygmy hunter-gatherers and Bantu farmers have been documented (Grinker 1994). It may be that it takes longer in forested regions for a farming way of life to proliferate, allowing for symbiotic relations with hunter-gatherers in the interim.

Intergroup interactions are an important factor in engendering cultural change and producing cultural complexity, in part through the acquisition of new technologies, subsistence practices and items of value, and also through social and cosmological transformations engendered by new relationships with external communities. It is not useful to conceptualise past groups as rigid entities with a discrete package of congruent culture, subsistence and language. Instead, we need to recognise the fluid nature of these traits and how relationships with other groups influence their adoption and transformation. In this regard, it is interesting to note that the Oromo Cushitic pastoralists held taboos against intermarriage and communal residence with hunter-gatherer groups, but the absence of such taboos among the Mijikenda seems to have led to greater assimilation. The importance of culturally variable attitudes to outsiders may have been overlooked in explanations of broader scale patterns in prehistory due to their archaeological elusiveness. The Bantu expansion is no longer characterised as an unstoppable package of iron, cattle and agriculture, but is instead thought to reflect a continual process of adaptation to new environments and the adoption of new traits as Bantu speakers came into contact with new people (Ehret 1998; Kusimba and Kusimba 2005). The willingness of the Bantu to adopt new technologies and subsistence practices and assimilate with local groups may have been key to their success. On the Nyali Coast the Bantu established themselves as farmers in the coastal uplands, as pastoralists in the high coastal plain, and as merchants on the low coastal plain.

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