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Valuing the Swahili Cultural Heritage: A Maritime Cultural Ecosystem Services Study from Kilwa, Tanzania

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ABSTRACT

During the second millennium CE, the medieval settlements of Kilwa in southeastern Tanzania were part of the Indian Ocean trading system that left a clear physical legacy of stone towns along with oral histories and sailing traditions. Modern developmental activities including exploration of oil and gas, house building, and establishment of tourism infrastructures have led to the reuse of heritage site, hence, an inevitable pressure upon heritage preservation. Unfortunately, despite being outdated and very colonial, legislations enacted to support protection of heritage sites are inadequately enforced. This paper looks at complementary conservation challenges by considering the value of medieval monuments and intangible heritage assets within the ecosystem services. We also provide some suggestions on how exploitation of non-material benefits in the form of Cultural Ecosystem Services from legends based on intertidal limestone features resembling boats and giants, as well as the venerated baobabs and mangroves can become sustainable.

KEYWORDS

Kilwa Kisiwani; kiswere; ecosystem services; monuments; maritime heritage

Introduction

Tanzania as part of the Swahili coast of eastern Africa possesses a unique heritage derived from the Indian Ocean trade, associated population movements, and development of a maritime oriented society over at least two millennia (Kusimba and Walz 2018; Pollard and Kinyera 2017). Socio-cultural and economic developments grew exponentially during the first half of the 2nd millennium CE marked by the building of an urban socio-economy based upon stone towns constructed from coral limestones bonded together with lime mortar (Ichumbaki 2016; Ichumbaki and Pollard 2015). Those stone towns such as Mombasa in Kenya and Zanzibar Stone Town on Unguja provide the society's most renowned reflection comprising mosques and associated graveyards, palatial residences of the rulers, imposing double-storied housing of the elite merchants, and single-storied houses, all encompassed within an urban infrastructure of town walls, streets, wells, and cisterns (Figure 1). Some of the larger stone towns such as Kilwa covered areas of up to 100 ha during the late medieval period. On the fringes and beyond the main towns lay the agricultural support villages, the fishing communities, and producers of lime from mining

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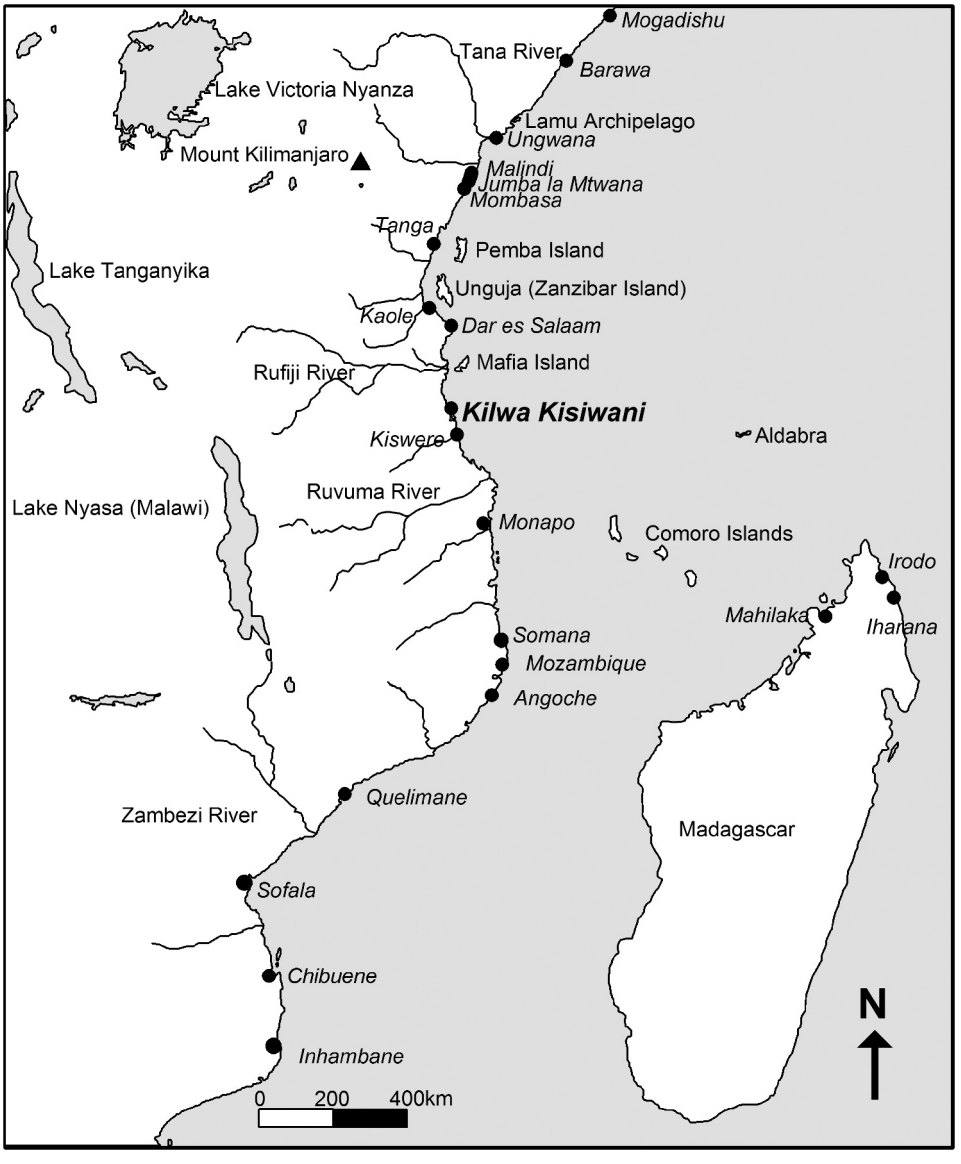


Figure 1. The location of Kilwa and other historic settlements on the east African coast (E. Pollard).

corals that all helped to provide goods and sustenance for the urban population. Generally, their housing was constructed using sticks, mud, and thatch, with the occasional mosque, house, or grave built of stone.

Subsequent post-medieval decline accompanied by limited concern for the architectural inheritance inevitably oversaw the dereliction or destruction of the built environment, particularly in formerly thriving towns like Mafia and Kilwa that became mere backwaters (Ichumbaki 2016). Even in cities like Zanzibar Stone Town that retained important trading functions from the 18th century during the period of Omani and British influence, preservation of urban heritage played only a small role in the economic

life of its inhabitants. In Kilwa, as is the case for some other East Africa coastal towns, there is a growing concern for, and pride in, cultural heritage (Ichumbaki and Lubao 2020; Ichumbaki and Mapunda 2017), hence, encouraging the urgent need to update legislative frameworks to safeguard heritage.

The coast of eastern Africa has a tropical ecosystem that included coconut-plantation, mangroves, coral, fish, and shellfish on which the Swahili settlements traded and exploited for boat-building, trade, housing, and subsistence purposes. Growth of desires to utilise heritage for economic growth has come at a time when rapid population growth, modern urban-industrial development, and the attraction of the Swahili coast of eastern Africa for residential and tourism development have dramatically increased the scale and adverse impact of human-induced processes on the area's heritage (Pollard 2012). With such a scenario, the cultural heritage is at high risk should there be no mechanism to protect and safeguard cultural heritage within the Kilwa ecosystem. It is here where the current paper finds its place, but we begin with cultural ecosystem services concept.

Cultural Ecosystem Services and Heritage Sustainability

A conceptual analysis of cultural ecosystem services and how such services link up with landscapes, heritage sites, and socio-cultural identities continue to attract the attention of scholars globally (e.g. see Tengberg et al. 2012; Zoderer 2016). Reasons for such an increased scholarship attention on the cultural ecosystem services could be many but the major one is the ability, nature, and condition of the ecosystem to shape human culture including religion, knowledge, and daily practices (Tengberg et al. 2012). Cultural ecosystem services relate to individual wellbeing including aesthetic values, social relations, and educational values for both individual community members and groups. Because of this importance, there is a suggestion that mapping assessment of the cultural ecosystem services becomes an indispensable element in the management and protection of cultural landscapes (Plieninger et al. 2013). That cultural ecosystem services should incorporate the perceptions of local people to provide a rich basis for the development of sustainable heritage management strategies (Tengberg et al. 2012). Despite this role, however, in Africa, the importance of cultural ecosystem services and values remains less recognised especially in cultural landscape planning and cultural heritage management.

Recent studies conducted in eastern Africa through the ecosystem services approach have shown that marine and coastal ecosystems support and regulate cultural and provisioning services (Owuor et al. 2017). Despite the support these marine and coastal ecosystems provide, their sustainability is uncertain as human activities such as overfishing and uncontrolled tourism threaten them. A synthesis of scientific knowledge about the global ecosystems and their capacity to support human well-being by the Millennium Ecosystem Assessment (MA 2005) warned that the human use of marine and coastal ecosystems is expanding for there is also growth of coastal human population, hence, expansion of resource exploitation. That, there are many competing uses of marine and coastal ecosystems and their services, hence, a need to formulate and improve policies that will catalyse management efforts to reverse continued decline (Owuor et al. 2017). The Millennium Ecosystem Assessment (2005, 123–164) grouped ecosystem services into six categories: heritage values, cultural identity, spiritual services (sacred,

religious, and other forms of spiritual inspiration derived from ecosystems), inspiration (use of natural motives or artefacts in art, folklore, etc.), aesthetic appreciation of natural and cultivated landscape and, recreation and tourism. According to Tengberg and colleagues (2012, 17), however, these ecosystem services' categories are interrelated and overlapping. It is this relationship considered important to contribute to alleviating poverty and result in sustainability of both the economy and [cultural] heritage (Owuor et al. 2017).

Unfortunately, however, the specific concept of ecosystem services is mainly common in natural sciences and, though not much, in economics' paradigms. It has not been largely applied to safeguard cultural ecosystem services, particularly in eastern Africa. Consequently, the importance of cultural ecosystem services and values for the preservation of cultural heritage is still underestimated. Such underestimation and less recognition of cultural ecosystem services is unwarranted because cultural landscape planning and management could benefit much from a better understanding of the ways in which societies manipulate ecosystems and relate that ecosystems to cultural, spiritual, religious belief systems (Tengberg et al. 2012). Partly, the problem of not applying cultural ecosystem services is caused by several global conventions which pay more attention to nature than culture. Some of these conventions include: Convention on the Biological Diversity (1992), Convention to Combat Desertification (1994), Ramsar Convention on Wetlands (1971) as well as the Convention on Migratory Species (1979). All these conventions are perceived as responsible for the environmental sustainability without consideration of the culture sector. This trend of paying much attention to nature as compared to culture overlooks the reality that in addition to representation of the ecological phenomenon, cultural ecosystems are an outcome of complex and dynamic relationships between ecosystems and humans on the landscape over a long period of time. What lacks is a clear understanding of contributions of the people's perceptions, values, attitudes, and beliefs in generating more meaningful insights on the ecosystem services to human wellbeing (Martín-López et al. 2012).

The above scenario notwithstanding, however, there are some initiatives to make sure that cultural heritage conservation engages and influences discourses of the ecosystem services. Internationally, for example, there are several legal instruments for the management and protection of cultural heritage. Some of these tools under UNESCO include the Convention for the Protection of Natural and Cultural World Heritage Sites (1972), Universal Declaration of Cultural Diversity (2001), Convention for the Safeguarding of Intangible Heritage (2003), and Convention on the Protection and Promotion of Culture Expression (2005). Indeed, these legal instruments have, within the past three to four decades, revealed increased recognition of the importance of cultural heritage and cultural diversity within the conservation and heritage preservation initiatives. Unfortunately, most of these legal measures remain recognised only at the global level. Locally, they remain less recognised, not to mention their implementation.

For example, in the context of ecosystem services, the stone monuments in Kilwa are increasingly at risk from human and environmental actions, thus threatening an understanding of the past. Pollard (2012, 149–150) recorded modern buildings and lime making in Kilwa constructed from materials taken from earlier stone houses. He also documented fishermen reusing ballast from shipwrecks in walls as well as using stone anchors to weigh down their fishing baskets. What is observed in Kilwa and as it will become apparent in the next paragraphs, needs a different strategy to resolve the problem. Such a strategy to

ensure cultural heritage sustainability is the application of ecosystem services (ES); a concept that puts human needs and preferences in the centre of the ecological universe. This approach measures the health of ecosystems based on their ability to provide humans with benefits or 'services' (Gearey, Fletcher, and Fyfe 2014, 238; Hølleland, Skrede, and Holmgaard 2017, 211). In Kilwa, such services would include the provision of foods, clean water, outsourced building materials, and job opportunities.

Gearey et al. (2014, 238–239) gave an example of peatland conservation offering potential message for preserving archaeological sites in situ. It should remain clear that, however, areas of established archaeological potential are those most heavily disturbed by drainage, desiccation, and peat cutting, hence, remain problematic to preserve. Hølleland and colleagues (2017, 220–221) looked at how cultural heritage fits within the field of ES research showing that tangible cultural heritage such as an overgrown abandoned building or shipwreck could be considered as part of the ecosystems. However, Hølleland, Skrede, and Holmgaard (2017) remarked that the role of safeguarding cultural objects often has no direct connection to ecosystems. They define Cultural Ecosystem Services (CES) to mean non-material benefits people obtain from ecosystems through their cultural background including spiritual enrichment, folklore, religion, cognitive development, art, identity, reflection, recreation, and aesthetic experiences (*ibid*. 213, 218; Baulcomb et al. 2015, 128–129). The key argument here is that the services needed by local communities must demonstrate a direct relationship to ecosystem functions. Notably, it is difficult to integrate sites and objects other than cultural landscapes (Hølleland, Skrede, and Holmgaard 2017, 224). From several fieldwork visits by the authors to the Indian Ocean coast of southeastern Tanzania, this paper offers some clues to avoid the loss of heritage in Kilwa, hence, future sustainable conservation.

Settings and Historical Contexts of Kilwa and Vicinity

The ocean-facing exposed coast of southeastern Tanzania exhibits raised coral limestone cliffs with wave-cut platform, lagoon and fringing reef, or closer to river mouths sandy bays. Kilwa is in one of several rias and estuaries along this coast, other examples being Kiswere and Dar es Salaam (Pollard and Ichumbaki 2016; Figure 1). Dense mangrove-lined waterways are widespread in these sheltered areas. Kilwa has several islands within the ria, the largest being Kilwa Kisiwani and Songo Mnara to the south (Figure 2). Today the ruins of Kilwa Kisiwani and Songo Mnara are a UNESCO World Heritage Site.

During the medieval period stone towns developed on the East African Swahili coast, which had extensive maritime trading links north to the Arabian Peninsula and east to India and China (Figure 1). Trade consisted essentially of exchange of raw materials (including gold, mangrove and ivory) and slaves from the interior of Africa, for finished goods (particularly ceramics, textiles, glass, and beads). In the Late Medieval period, Kilwa became the most important stone town influencing trade from Unguja (Zanzibar Island) to Sofala in Mozambique (Figure 2; Pollard and Ichumbaki 2016, 462).

Kilwa Kisiwani, as the centre of the medieval Kilwa settlement as known today, is a 6 by 5 km island situated in the Kilwa district of Lindi Region in southern Tanzania. There is evidence of occupation in the Kilwa area from the Middle Stone Age (Isaac 1974; Kwekason 2011; Sasi 2006) but only in the early 2nd millennium, CE did Kilwa become the most important port along the East African coast (Chittick 1974). While Ibn al-Mujawir,

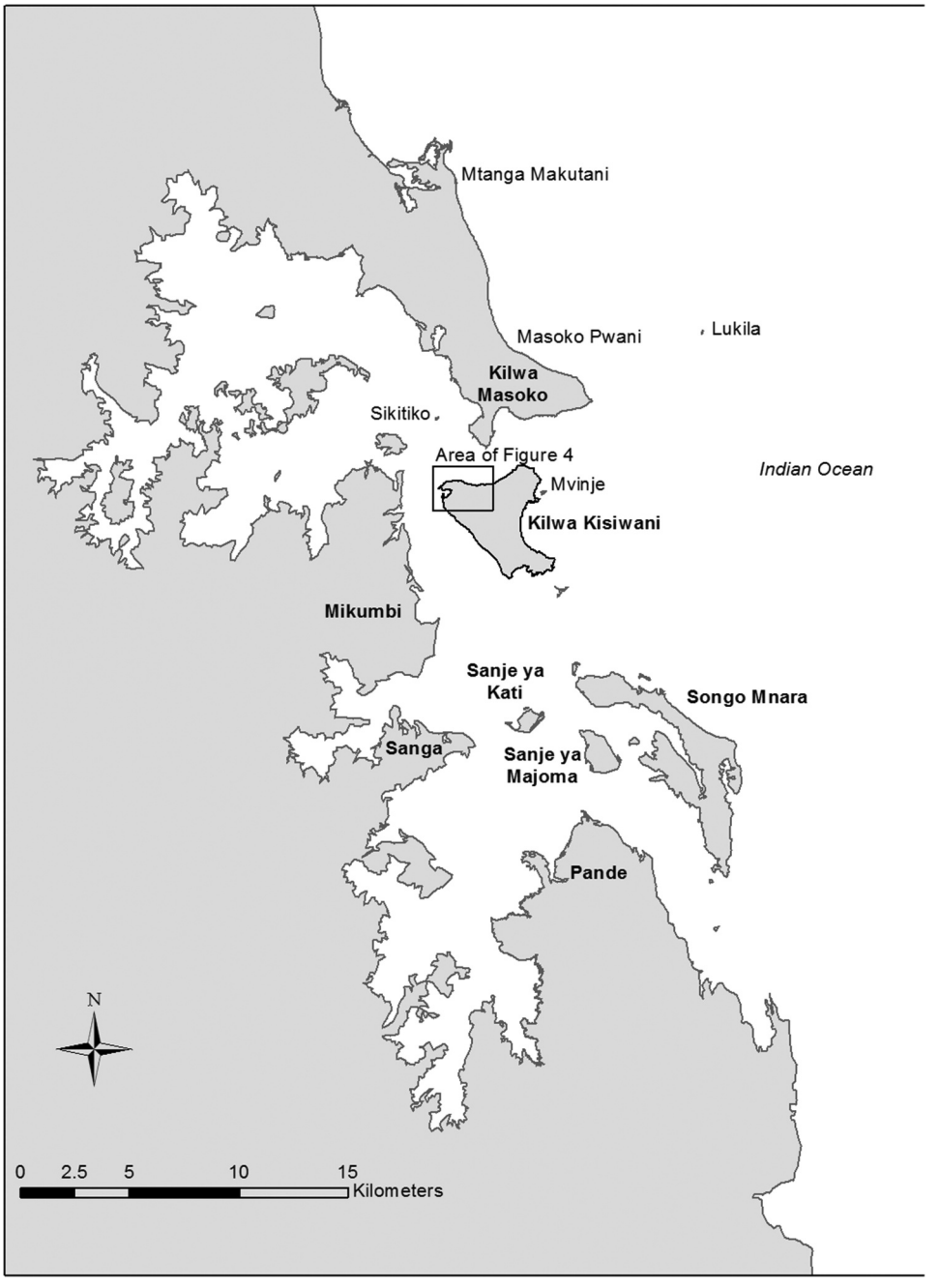


Figure 2. Kilwa ria showing places and sites mentioned in text (E. Pollard).

writing in 1232/33, described Kilwa as an important stage on the route to al-Qumr (Madagascar) (Trimingham 1975, 127–128), Chittick's (1974, 237–238) excavations identified an increase in wealth at that time with the appearance of stone buildings and industrial activity. In the late 13th to 14th century, Kilwa secured a virtual monopoly on

the gold trade at Sofala in modern Mozambique. Increased commerce and wealth were reflected in the renovation and extension of the Great Mosque (Figure 3), the palace emporium of Husuni Kubwa (Figure 4) and related stone towns on Songo Mnara and Sanje ya Majoma.

The densest area of continuous occupation in the ria lies in the north-west part of the island around the Great Mosque (Figure 5). In the surrounding area, on the islands and mainland, are small-scale hinterland settlements, probably acting as agricultural and marine resource suppliers for the town but also marking the approach to Kilwa (Wynne-Jones 2005, 116; Pollard 2008; Pollard and Ichumbaki 2016). The traces of larger stone settlements are located on Mafia Island to the north and in Kiswere Harbour to the south (Figure 1). The smaller settlements may be identified today by the remains of a stone mosque, a graveyard, and/or a stone house such as at Sikitiko, Mvinje, and Mtanga Makutani. If no standing buildings remain, the same small settlement in the ecosystem is marked by a surface scatter of ceramics and shells as is the case at Sanga or Masoko Pwani (Figure 2; Pollard and Ichumbaki 2016, 470).

At the turn of the 16th century, the Portuguese discovery of the sea route to East Africa and India via the Cape of Good Hope gave Europeans new opportunities to obtain spices and gold from the East African region (Ichumbaki 2020; Freeman-Grenville 1962, 52; Horton and Middleton 2000, 83). The Portuguese are thought to have contributed to the decline of the Swahili city-states in the 16th century (Kusimba 1999, 156) but speculation has also included environmental degradation, wells' salination and ethnic conflict. In the late 15th and 16th century, the Kilwa Chronicle reports succession conflicts whereby Kilwa itself, Angoche, and Sofala (both in Mozambique) competed for gold and ivory from



Figure 3. Aerial view of the Great Mosque in Kilwa Kisiwani (E. Ichumbaki).



Figure 4. Aerial view of the Husuni Kubwa palace in Kilwa Kisiwani (E. Ichumbaki).

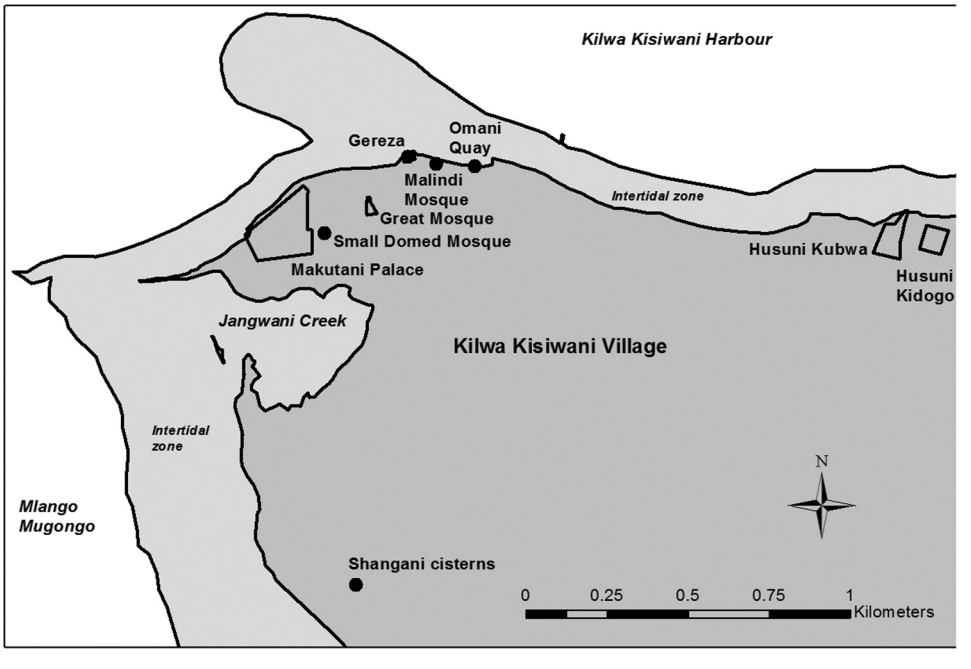


Figure 5. Sites mentioned in the text around Kilwa Kisiwani Village (E. Pollard).

Great Zimbabwe (Kusimba 1999, 158–159; Newitt 1972, 398–399). In 1505, Kilwa was plundered by Portuguese after failing to pay tribute and a fort known today as the *Gereza* (from *Igreja* for church in Portuguese but means prison in Swahili) was built in Kilwa Kisiwani Port to control trade (Kusimba 1999, 161). Horton and Middleton (2000, 84) say the Portuguese had little impact on other coastal towns as many mosques, houses, and

tombs dated to this period and the Swahili still traded in materials such as timber, ambergris, animal skins, slaves, coconut, and copra. Nevertheless, Kusimba (1999, 164) maintains that Portuguese's severe regulations ensured the demise of trade networks.

In the late 17th century, Oman took control of the northern Swahili coast pushing the Portuguese south near to what later became the country of Mozambique (Kusimba 1999, 171). In the late 18th century, Kilwa must have been able to exert some independence between Oman and Portuguese hegemonies as Freeman-Grenville (1965, 10–16) records slave trading at Kilwa for labour on sugar plantations on the French Indian Ocean island of Mauritius. Several buildings in the Kilwa area could date to this period including the Makutani Palace to the west of the Great Mosque where slaves could have been kept in the high walled grounds, and a house complex at Mikumbi on the mainland that may have been the beginning of a caravan route into the interior. The slave trade and coconut plantations continued into the 19th century (Croucher 2014) as the Omani Arabs took control of the area with Kilwa Kivinje to the north becoming the main port (Biginagwa and Mapunda 2018, 541). A 19th-century Arab settlement is also located around the northwest corner of Kiswere Harbour at Mtumbu (Figure 6). At the end of the 19th century, the German colonial presence is felt in Kilwa with a Customs House on Kilwa Kisiwani with further traces of their presence with a place name on Songo Mnara called Shermani (place of the German in Swahili), the Boma in Kilwa Kivinje (Lwoga and Mwitondi 2018), and an abandoned German lighthouse on Njove Island to the north between Kilwa and Mafia island (Figure 7; Pollard, Fleisher, and Wynne-Jones 2012, 50; Pollard and Ichumbaki 2016, 473).

The Cultural Heritage of Kilwa

From the foregoing discussion, one notes that Kilwa Kisiwani island and the nearby vicinity have received a considerable research attention. The undertaken research projects have documented and described a number of cultural heritage sites and monuments ranging from large palaces and mosques such as Husuni Kubwa, Great Mosque, and Makutani Palace to other isolated single constructions such as stone-built tombs. Several undertaken archaeological surveys and excavations have documented cultural materials including beads, ceramics, glass, and metallurgical assemblages. The nature of monumental structures found in Kilwa as well as the cultural materials recovered from excavations has made scholars working in the area to conclude that the town of Kilwa was a cosmopolitan player in the Islamic Indian ocean trading activities (Wynne-Jones 2018, 258). The importance of the cultural heritage in Kilwa, however, has not been looked at in a broader perspective. There have not been many studies to consider the cultural heritage presented earlier as part of the larger ecosystem that support communities' livelihoods. Being guided by the cultural ecosystem service approach, in this paper, we present the cultural heritage of Kilwa and its vicinity, an existing legal protection of the sites and means through which these assets can become beneficial to local communities.

Kilwa has no major rivers entering the ria leading to a large proportion of the coast-edge sediment formed from erosion of the conglomerate and sandstone bedrock with shells from the marine environment. Pollard (2012) noted the vulnerability of structures such as wells, cisterns, and mosques to coastal erosion. Some of



Figure 6. The Arab house at Mtumbu (E. Pollard).



Figure 7. Njove Island German lighthouse (E. Pollard).

the cliff edges at the port of Kilwa Kisiwani has since been reverted to control erosion especially around the Malindi Mosque (seaward of which Pollard (2008, 94) had recorded human bones on the foreshore) though the stonework further east continues to be under erosion. The Bandari Hussein area of the port as it is today, was in medieval times, the most heavily used landing place, which is supported by the presence of the 14th- to 15th-century seawall known as the Omani Quay and the height of the reclamation and 4 m-midden cliff, which is at its maximum in this area, though this important maritime evidence continues to be under erosion (Figure 8).

On Songo Mnara the stone town is stable as the harbour area has silted up with mangroves. A section of these mangroves must be cleared so tourists can view the intertidal mosque today (Figure 9). Further vegetation growth around the high-water mark has displaced what were probably steps that led along a reef coral walkway from the shore to another mosque (Figure 10) and remains of a tower on a cliff edge overlooking Sangarungu Harbour to the west but now in ruinous condition. South of Songo Mnara ruins, on the Indian Ocean coast, an 18th to 19th century stone house is eroding at Msanapanda showing some settlement had moved eastwards after the stone town landing place had silted up. The access to this small settlement could only have been at high tide due to the tidal fringing reef and lagoon but would have been occupied by people who exploited and/or owned the marine resources.

Furthermore, a square well was recorded above the cliff to the east of Husuni Kubwa in an area rich in Middle and Late Stone Age artefacts. The area is less inhabited in the island today but also prone to soil erosion during the rainy season. This erosion down the cliff



Figure 8. Omani Quay under erosion at Kilwa Kisiwani Port (E. Pollard).



Figure 9. The inter-tidal mosque of Songo Mnara ruins (E. Ichumbaki).

slope has resulted in reverse stratigraphy on the beach terrace below the cliff where excavations conducted in 2010 recorded medieval glass beads and pottery below worked quartz and chert materials. The square stone well was dated to the late 13th to 14th century due to presence of Husuni Modelled Ware, a distinctive local type of pottery,



Figure 10. Walkway and disturbed steps by tree roots at Songo Mnara, which lead from inter-tidal zone to a mosque (E. Pollard).

found to the east and landward of this well. The area was also under use in the 19th century as two copper Zanzibari one-Pysa coins with the date of ١٢٩٩ (AH1299 = *c*. 1882 CE) and a carinated potsherd were found eroding out of the soil near a baobab. Recovery of these cultural materials from an eroding cliff is an indication of the possibility that a large part of Kilwa ecological landscape is culturally important.

Abandonment needing recording and associated conservation of remote sites is clear at Mtumbu, which lies at the mouth of a river flowing into Kiswere Harbour. On the opposite side of the river to the Arab settlement at *Waarabu Weusi* (Black Arabs) is a coconut plantation where coastal erosion is also occurring. Place name evidence suggests there was a connection with the Arab settlement as the name means Black Arabs and may result from close African-Omani connections settling and trading. The survey team did not enter the Arab house as it was unstable but local knowledge informed us the house is divided into living quarters below and a mosque upstairs. Surrounding the house there is a well, possible cistern, around 10 graves, and eroding on the foreshore below a quay, are 19th-century glass, local pot, and European ware. A platform of coral blocks landward of the quay, which would also have made a space for unloaded/loaded goods, and south of another building locally named as the Arab house has a stone drain leading to the intertidal zone. Also, an overgrown in the area of baobabs is a large flat concrete space, which may have been where goods were stored. Traces of corrugated iron could be identified as casts into the grey-shell concrete walls (corrugated galvanised iron was invented in the 1820s) and there is a further wall on a rise overlooking and possibly guarding the structure.

At the shore and general coastal ecosystem, stones from abandoned buildings and ballast from boats are continually utilised for other construction work and specific maritime purposes such as anchors and fishing weights (Pollard et al. 2016, 64–67). On the intertidal zone east of the modern pier at Kilwa, we recorded a dressed medieval stone anchor similar to others recorded in medieval Siraf in the Persian Gulf (Chittick 1974, 414). The Kilwa example has been recently moved landward in order to ornament a tourist café that has not yet appeared. Shifting the anchor from the shore to ornament an anticipated tourist café is not only an evidence that local people in Kilwa consider maritime heritage as tourists' attractions but also a testimony of exploiting resources in the Kilwa ecosystem to improve their livelihoods. Unfortunately, such economic activities damage heritage. For example, the anchor was broken in the process of moving it from the shore to the anticipated café (Pollard et al. 2016, 361).

Another particularly long-standing economic activity leading to damage of the built heritage within the Kilwa ecosystem is lime-making and the associated quarrying of limestone. This reuse of older buildings extends into antiquity as Chittick (1974) uncovered the remains of a succession of limekilns near the Great Mosque dating from *c*. 1200–1300 AD. This limekiln probably reused older coral buildings to make the lime as the usual area of lime making today is close to the reef coral source on the eastern coast of the island. An example of very recent lime making from ancient ruins is to the south of Kilwa Kisiwani village in the Shangani area where 15th-century rectangular and octagonal cistern, a possible house, and a well have been recorded (Chittick 1974, 228–230; Pollard 2008, 253). A 2015 visit in the area recorded the remains of two cisterns within a densely forested area south of the medieval town.

Despite Kilwa Kisiwani's designation as a World Heritage Site, a visit in 2015 revealed that the square cistern is in the process of being dismantled for stones to use in building new houses. This destructive activity has resulted in the removal of the stone leaving only the old mortar fill beside the ruin (Figure 11a). Two modern stone mounds corresponding to the stone from the cistern were found in the more open area to the east at the end of a path from the cistern (Figure 11b). In 2019, the existence of stone wall mining was noticed to be more extensive especially to the east of the main port in the Nguruni area. Here, clearings of the bush had been occurring at a complex of stone building overlooking the harbour dating from the 12th to 14th century that covers at least 200 m length of coast. This mining leaves a narrow channel between opposing cliffs of artefacts in soil that used to be contained within the buried walls. The increase in stone wall mining appears to be associated with a recent change in house construction in the village to be more stone-built as opposed to previously wattle and daub. The unregulated destruction of the built heritage in areas away from the tourist trails of the town is a sign of opportunism in exploiting the closest source of already worked corals. Although the east coast has plentiful supplies of coral limestone, it otherwise needs to be quarried, shaped, and transported. In the probable absence of understanding of the significance of such structures together with any unlikely sanction, the opportunity is taken to exploit a less well-known site (ecosystem service) that is easily accessible to the modern village.

There are traces of this destruction in other even remoter areas of the ria that had not previously been recorded including the Sanga area on the mainland on the southern part of the ria (see Figure 2). The main site has the place name Somanilo though the explored



Figure 11. (a) Destruction of the square cistern on Kilwa Kisiwani with the stone removed leaving the soil that has infilled the building (E. Pollard). (b) Mound of stones from the cistern on Kilwa Kisiwani gathered for re-use. Scale 1 m (E. Pollard).

area shows that local and imported pottery can be found scattered for 1 ha. Somanilo has quartz hammerstones, local undecorated pottery, and Chinese ceramics dating between the 15th and 18th centuries. Carved porites coral blocks were found on the top and base of

the cliff suggesting there were previously well-decorated stone buildings. Along the beach, there is imported pot that has eroded out of the cliffs. The headman from a fishing camp 200 m west confirmed that this was where ruins once stood. There is no well or fresh water here, according to fishermen, and the site is overgrown today so was probably a convenient mainland landing place for the settlements on close-by islands to the east.

In the same ecosystem, a mound was recorded at the top of the cliff. Out of cliff, artefacts including a Chinese bowl, bead, fishbone and cowrie shell were eroding down the slope. The site also includes undetermined depressions *c*. 5 m diameter and 0.8 m deep above the cliff overlooking port, which could have been where the stone walls from structures such as wells or cisterns have been removed leaving the sides to collapse. Blue drawn beads were collected from the shore dating to between 16th and 18th centuries though test pits excavated above the cliff put the occupation and trade in the 11th century and would have been in existence during coral stone and reef coral building at Kilwa. However, stone buildings have disappeared; only the unidentified depressions remain today. Certainly, either the coral buildings have been burnt for lime or all the coral stones have been mined to build new houses.

The above-ground and buried stone ruins with associated midden and occupation deposits may not demonstrate an obvious beneficial ecosystem service. This is partly to do with little archaeological investigation to date of the buildings purpose in this area of the island, and a perception that there are other more impressive (still-standing) ruins elsewhere to show tourists. This leads to local views that these could be used for stone building with no repercussions as the land until recent clearing was dense tree scrubland exploited by goats and chickens with a few paths used by fishermen accessing the shore. However, forage availability and livestock abundance are two possible ecosystem services from this landscape (Kaye-Zwiebel and King 2014). Furthermore, cultural deposits on abandoned pastoralist settlements in the Amboseli ecosystem, southern Kenya have been shown to contain higher soil nutrients, herbaceous standing biomass, and plant species, along with changing species composition (Muchirua, Westerna, and Reid 2009). This biodiversity in the landscape can give needed localised nutrient and plant diversity hotspots in the ecosystem that supports the wider local community.

Heritage Conservation and Management in Kilwa and Vicinity

Human actions exacerbate the natural destructive forces that impact upon the tropical Swahili coast. The external fabric of buildings would, in any case, require constant maintenance due to the combination of high temperature and high humidity, salt winds, vegetation growth, and insect activity, particularly that of termites. The recycling of lime mortar and stone for later building work is an additional hazard likely to have constantly occurred over the centuries, but which is particularly final in its effect. This section discusses attempts at heritage management in the light of the conditions that pertain in Tanzania.

Recognition of building deterioration goes back many centuries. The Great Mosque or Friday Mosque of Kilwa Kisiwani, for instance, had become dilapidated by the 14th century. The Kilwa Chronicle, first written down in the 16th century, reported repair work taking place at that time. Garlake (1966) and Chittick (1974) refer to the work as rebuilding and extension of the mosque due to population increase, but Ichumbaki (2016)

is of the view that conservation, restoration, and repair work were parallel motives. Likewise, the Gereza had deteriorated by the mid-19th century such that when the explorer Richard Burton visited in 1857, it was in a state of collapse. Four decades later, in 1900, the German colonial government showed interest to conserve the building. Consequently, in 1902, the Kilwa District Officer investigated the ownership of Kilwa ruins to determine a better conservation plan followed by the conservation of few monuments by then regarded as 'important properties'. These properties included an area between the cemetery near the Makutani Palace enclosure to the cemetery adjacent to Malindi mosque, and another area around Husuni Ndogo and Husuni Kubwa (Ichumbaki 2016). Unfortunately, many of the conservation initiatives that had started in the early 1910s stopped due to the outbreak of the First World War.

Fortunately, once the war ended, some renovation works at Kilwa started again during the 1930s. For example, the Gereza, Great Mosque, and Small Domed Mosques were rehabilitated in 1936. Appreciatively, the monuments renovation activities went hand in hand with the enactment of a law: Monument Preservation Ordinance (1937) that was also amended in 1949. These initiatives notwithstanding, however, destruction and plundering of monumental heritage along the coast of Tanzania continued. Such a destruction was reported in the Science Newsletter by Mortimer Wheeler, the then Secretary of the British Academy (Wheeler 1954; Ichumbaki 2016). Today, the management of archaeological sites and the related cultural heritage in Tanzania mainland is governed by legislation and policies which operate within the legal and administrative frameworks established by the government of Tanzania.

The 1937 Ordinances was replaced by the Antiquities Act No. 10 of 1964 Cap 550 with its amendment Act No. 22 of 1979 (URT 1964, 1979). The combination of these Acts is cited as Cap 333, the principal Act for managing archaeological sites in the country. Regrettably, the Act operated without a policy until 1997 when the 'Cultural Policy' was put in place. This policy, however, does not explicitly mention anything of archaeological value, something which called for another 'cultural heritage policy' in 2008 (Ichumbaki 2013). Both the Act and the Policy provide general protection to the objects and structures that are of palaeontological, archaeological, artistic, architectural, historical, scientific, aesthetic, and ethnological importance. According to Cap 333, the protected cultural heritage covers relics, monuments, and protected objects. The ruins of Kilwa Kisiwani, and other architectural heritage in the ecosystem, fall under the category of monuments. The Act defines a monument as any building, structure, rock painting or carving, earthwork formed, built, painted, excavated, or otherwise engineered by human agency before 1886.

In responding to this situation, the Department of Antiquities in the then Tanganyika (now Tanzania) and the British School of History and Archaeology (now British Institute in Eastern Africa) were formed. Whereas the Department of Antiquities was formed in 1957, in its budget for the 1959 year, the British Government included subvention of £6,500 for the School of History and Archaeology in East Africa (URT 1958). The Department of Antiquities was created to undertake two tasks: to ensure the security and preservation of the monuments and other remains in its care, and to investigate the history of Tanganyika (URT 1959).

Considering cultural ecosystem services, we argue that the problems facing cultural heritage in Kilwa and probably along the entire coast of Tanzania also extend to mangroves trees declared by the Government of Tanzania as protected areas and forest

reserves. Enforcement of prohibition on mangrove harvesting by local people aims to preserve biodiversity. Regrettably, harvesting of the mangrove forests (utilisation of the ecosystem services) still continues for different purposes such as gathering firewood and building materials, and burning charcoal (McNally, Uchida, and Gold 2011). Along the Kilwa area, people have long lived close to the intertidal mangrove forests with their exploitation continuing for building houses, boatbuilding, fishing-gear, firewood, medicine, fodder, and making toys. The coastal environment where these mangroves grow is also used by local people as fishing grounds, sea transportation routes, salt panning, beekeeping grounds, and wind and wave breaks (Nakamura 2010). Gladly, as distinguished from other places along the Swahili coast, harvesting of mangroves and coral reefs has been minimal, hence, causing little harm to the ecosystem, particularly coastal biodiversity and environment.

Furthermore, the maritime environment of the Kilwa area has inspired CES in the form of folklore such as the footprint of the giant Nyengakumbi in Kiswere, and the place name *Jiwe la Jahazi* (Swahili for stone of the dhow) in Mvinje. *Jiwe la Jahazi* is a 3 m high islet on the reef crest which is 38 m long (Pollard 2008, 137–140; Pollard et al. 2016, 357–359). The islet is encircled by a wave-cut notch into the coral limestone cliff making it look like it has a bow and stern of a boat from a distance (Figure 12). The site is associated with the legend of a ship carrying enemies that was turned into a stone. Another folklore concerns a giant man by the name Nyangakumbi. Oral tradition recorded from local collaborators during our surveys in Kiswere Harbour revealed stories associated with the Kilwa maritime landscape. One of these was about the giant called Nyengakumbi:

> Nyengakumbi lived a very long time ago. He stepped in one stride from Mtumbu to *Jiwe la Mzungu* (Swahili for stone of the white person, 12-13km away) on the south entrance to Kiswere Harbour leaving a footprint on each site.[1] On the way he reached down and picked a fish from the sea and held them up against the sun to cook. Nyengakumbi was so strong such that, with one stretch, he would push ships heading to Zanzibar and drag them back (to Kiswere or Kilwa). He disappeared into the mud of the Black Sea and has not been back since then.
> (Field Notes from Kiswere survey, 2012)

The survey team recorded the south-orientated 'footprint' at Mtumbu at 0.4 m long and 0.18 m wide at widest point (Figure 13). The footprint is in weathered and eroded limestone causing many small pits and channels that the locals said were more recent. It looks less convincing than remembered but they were adamant that the giant story was true. This locally popular legend is part of a flourishing maritime culture important to local people that, although ascribes the CES to supernatural origins, reveals a traditional cultural association with ecological services of fish to the community; the ria of Kiswere Harbour linking surrounding settlements; and winds that support historic trading voyages to Unguja. The local people in Kiswere did also inform about another footprint at *Jiwe la Mzungu*. When asked about the origin of the name *Jiwe la Mzungu*, local collaborators narrated that the rock was named to mean a location where Portugal wanted the border between German and Portuguese East Africa. Currently, this border (now between Tanzania and Mozambique) is further south at the Ruvuma River.

On the shore in front of Kiswere village, a large mangrove tree, which infers old, was recorded with a broken pot in between the roots at the base of the trunk (Figure 14). The presence of pot deliberately placed at the base of an old mangrove suggests a maritime



Figure 12. Jiwe la Jahazi in the Mvinje area of Kilwa (E. Pollard).



Figure 13. The footprint of Nyengakumbi, Kiswere Harbour (E. Pollard).

tradition that may involve offerings to spirits, prayer for safe and bountiful voyages, and medicine from a traditional healer. This CES of mangrove traditional healing is a marine parallel with that found above the intertidal zone where long-living baobab trees are



Figure 14. Forazani Mangrove with a broken pot among the roots at base of trunk, Kiswere village (E. Pollard).

found, and are good markers of where some historic settlements were located (Ichumbaki 2015; Pollard 2008, 12). Today, in secluded places, the baobabs can have modern pieces of cloth, bottles, and pottery sherds in the surroundings all of which mark spiritual practices (Ichumbaki 2015). Local inhabitants described them as places associated with their ancestors, and where traditional healers conduct ritual practices.

Discussion and Conclusion

Lane (2011) has summarised the threats to the archaeological resource in the region as the inadequacy of legislation, the lack of archaeological impact assessments prior to development, ignorance, and poverty (also see Ichumbaki and Mjema 2018). He suggests efforts must be intensified at international and national levels by the entire archaeological community to ensure that international funding agencies, and the Western companies that undertake project design and construction work abide by the international standards. Furthermore, Lane (2011) encourage African governments to update existing heritage legislation and put in place mechanisms for its effective implementation and enforcement. To support this, in this paper, we have provided examples of cultural heritage found in the Kilwa ecosystems that also need protection consideration.

The maritime ecosystem around Kilwa, including coral reefs and mangrove forests, is a habitat for many marine species, providing humans with food, medicine, materials for building, and are natural self-repairing coastal barriers to erosion (Francis, Mahongo, and Semesi 2001: 31, 34). Mangrove protection authorities have put limits on how many can

be cut down for building, firewood and what landing places can be cleared (Nakamura 2010). Although there has not been a conscious replanting of mangrove forest around Kilwa, the reduction in trade and population size has led to decrease in the area of beach. According to local collaborators, such mangrove forested areas need clearance for boats leading to mangrove encroachment on landing places such as the intertidal mosque of Songo Mnara (see Figure 9) and a pier below Husuni Kubwa (see Figure 4). It is also possible that such clearance will expose unknown archaeology including shipwrecks and fish traps below the mangrove sediment. The encroachment of mangroves on Kilwa Kisiwani Port is still occurring today and is referred to by residents and can be compared with earlier aerial photographs around the Gereza (e.g. Chittick 1974). On Songo Mnara, the stone town is stable on a sand terrace as the harbour area has silted up with mangrove, but the non-logging of mangroves is having its own effect in silting the harbour changing how seafarers access the site and therefore their understanding of the site's significance. The mangroves must be regularly cut back around the intertidal mosque and a lesser known reef coral walkway to the mosque continues to be disturbed by vegetation growth. The harbour area of Songo Mnara ruins can no longer be accessed. Fishermen and tourists usually land at the sand bar of Sangarungu situated to the north and either walk or use a canoe at high tide, along a mangrove channel to access the ruins area.

Adverse to services, Gearey and fellows (2014, 241) report how the roots of re-established intertidal plants can damage fragile organic archaeological remains so wetland schemes. Thus, archaeological guidance to ensure account is taken of the landscape, the vulnerability of the record, and mitigation should be considered for the sustainability of entire ecosystems. The larger mangrove forests can also lead to other discomforts as dense mosquito swarms make surveys and tourism activities uncomfortable especially during and around the rainy seasons (November to March) on Songo Mnara. Furthermore, overgrowth at Mtumbu in Kiswere Harbour includes *Mucuna pruriens* (velvet bean or cowitch) making clearance difficult as seeds of this plant when disturbed cause a painful skin irritation.

Interviews by Baulcomb and colleagues (2015, 132) identified points of culture-environment linkages between Turkey and the Black Sea including maintaining fishing because it is important to local's sense of identity. Locals felt that their Turkish identity related the overall health of the Black Sea with the preparation and consumption of meals featuring anchovies thought of as part of Turkish culture, which is important to transfer between generations. The exploitation of mangrove and reef corals, as well as the reuse of stones from the ruins, is part of utilising what the ecosystem offers. Added to these benefits is non-material welfares that locals obtain from the landscape including legends of shipwrecks and giants. Baulcomb and fellows (2015, 133) say overfishing in the Black Sea off Turkey causes jellyfish blooms impacting two CESs: recreation and aesthetic information. Similarly, surveying the landing places and fishing practices on the remoter eastern shore of Kilwa at Mvinje, the authors recorded the presence of turtle bones beside fishing campfires. Turtle, like the now rare dugong, is a protected species in Tanzania with their exploitation having the potential to affect the tourism industry.

Although not directly associated with ecology, some features such as the no longer working German lighthouse on Njove (see Figure 7) still provide important navigational services due to its height to fishermen who use the island today as an important fishing

settlement. A medieval tower once stood beside the mosque on Songo Mnara (*Mnara* is Swahili for tower) that marked the landing place and settlement though this had collapsed by the early 19th century. Access to fresh groundwater is another valuable service along the East African coast that is dependent on the climate, vegetation cover, geology, and sea level. On Kilwa Kisiwani, this vital resource of fresh groundwater is a limited service due to variations in the water table (Comte et al. 2014, 2016). The medieval wells on the islands are probably the only stone-built features still used today for their original purpose (apart from graves) in the Kilwa area.

In Kiswere village, in the SW corner of Kiswere Harbour there are at least four-square stone wells like those of Kilwa and, by association, indicate habitation dating to the late 13th to 15th century (Pollard and Ichumbaki 2016, 277). Kisima cha Barabarani (Swahili for 'a well along the road') and Kisima cha Mskitini (a well at the mosque) have indents for buckets and circular depressions on the top of the well wall, which is like the most important well on Kilwa Kisiwani called Kisima Kikuu (the great well) indicating further links. Although many wells at Kiswere and Kilwa hold salty water today, they can still be used for washing; water for cooking is fetched from further inland. However, these limestone wells probably indicate that further stone buildings once existed in Kiswere, but only the wells which remained in use have survived. Such a scenario is an indication that local people in Kiswere do mine stones from abandoned wells and buildings for the purpose of building new houses.

On Kilwa Kisiwani, the removal of stone material from the historic abandoned buildings is located away from the modern village in overgrown bush. Our discussion and interviews with some members of the local community in Kilwa Kisiwani revealed that these remote areas are visited occasionally, if any. During our research conducted in the area between 2015 and 2019, we noted that, with the exception of fishermen making paths to their canoe landing places or fish traps, these abandoned monuments and ruins are not known to antiquities' officials in Kilwa. Because of remoteness, the destruction of ruins is purely a casual circumstance based upon minimising effort to acquire building materials and access to limestone being otherwise readily available for stone or lime-making in natural outcrops at multiple locations throughout the island.

Part of the responsibility for removal of stone monuments rests with those concerned for its conservation, either through failure to post notices as required by the legislation or limited oversight of properties subject to conservation. The Antiquities Office in Kilwa Masoko is not far from Kilwa Kisiwani or Songo Mnara and travel is relatively easy by boat. Furthermore, south Kiswere can only be visited by car during the dry season as the roads erode during the rains. Unfortunately, official visits are rare. The incentive for the better conservation of heritage and some investment in its protection can be readily seen in its role as a tourism resource. Kilwa is already a tourist destination largely dependent upon its status as a UNESCO World Heritage site with increasing visitor numbers. Kilwa Kisiwani and Songo Mnara are usually accessed by tourists from Kilwa Masoko on the mainland to the north using dhows or motorboat though visits by Indian Ocean cruise ships have started becoming more common. The preparation of archaeological maps and pamphlets on remoter areas for hotels guides to offer to tourists would also be a helpful support. Hotels might also display artefacts from their online sites or broader locality to emphasise the individuality of their offering and to encourage the interest of visitors. Opportunities

exist in legislation for artefacts to be displayed on site though still owned by the relevant Government department.

This cultural and ecological importance of fresh water, mangroves, and coral to local communities supports future combined habitat and archaeological conservation projects. As CES include the recreation of exploring the landscape and built heritage as well as spiritual enrichment from natural eroded shapes in limestone, communities can be more involved in recording stories and uses of local plants with a view to produce a broader understanding of their heritage. The role of schools is central to this in developing an understanding of their pupils' inheritance. The knowledge of the environment can be combined with artefacts found locally, which could be retained by the community for display, and the broader local community might be encouraged to donate artefacts discovered in their fields or found eroding along the coastline. Community involvement is particularly valuable insofar as people who associate themselves with their heritage are more likely to protect it for reasons of personal ownership and pride in their history, a stimulation of interest in the past, as well as linking with more immaterial matters such as respect for ancestors and spirits. Provided that feelings of involvement exist (Ichumbaki and Lubao 2020; Ichumbaki and Mapunda 2017), the community as a key stakeholder can act to keep sites accessible and in a state of good preservation.

Note

1. Allegedly the footprint was 1 m long.

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