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# Urban network evolutions

Towards a high-  
definition archaeology

*Edited by Rubina Raja  
and Søren M. Sindbæk*

*Urban network evolutions*

*Towards a high-definition archaeology*

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Rubina Raja and Søren M. Sindbæk, UrbNet, Aarhus  
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# Dating Kilwa Kisiwani: A thousand years of East African history in an urban stratigraphy

## 1. Introduction

This chapter discusses excavations and sampling for a high-definition dating campaign at Kilwa Kisiwani, on the southern coast of Tanzania. Kilwa Kisiwani occupies an island in a drowned estuary, part of a small archipelago that includes the islands of Sanje ya Kati and Songo Mnara (Fig. 1). From around the 9<sup>th</sup> century onwards, these islands hosted a remarkable urban configuration made up of a series of stonetowns across the archipelago, now listed as a UNESCO World Heritage site. Of these, Kilwa Kisiwani is the largest and the longest-lived, having had a fluctuating urban occupation over a millennium from around 800 CE until the late 18<sup>th</sup> century. The town was extensively excavated in the 1960s (Chittick 1974) with smaller campaigns since then (Chami 2006), but only three radiocarbon dates were attempted, two of which were dismissed as stratigraphically impossible (Chittick 1974: 48-49). As one of the most enduring Swahili stonetowns, the Kilwa sequence provides a framework around which the archaeology of the coast has been shaped, and a detailed sequence of absolute dates is long overdue.

The research reported here comprised a single large exposure (4 m x 4 m) in an area of known potential immediately south of the Great Mosque. Excavations were designed explicitly to gather information for radiocarbon analyses and the quantification of artefacts: the first detailed radiocarbon chronology for any urban stratigraphy on the eastern African coast.

Excavation was undertaken as a fully stratigraphic project using the single context system, with total sieving of all the deposits together with extensive flotation to recover carbonised seeds and organic materials. The radiocarbon dating is currently underway at the Centre for Urban Network Evolutions.

## 2. Kilwa in global history

Kilwa is first mentioned on a Fatimid-period map of the East African coast, probably dating to the 1060s (Rapoport & Savage-Smith 2014). It rose to prominence during the peak in international maritime trade between the 13<sup>th</sup> and 15<sup>th</sup> centuries CE. This was



**Fig. 1.** Kilwa archipelago, showing islands of Sanje ya Kati and Songo Mnara (figure: S. Wynne-Jones).

the period when the ‘Islamic world system’ in the Indian Ocean was well established and as yet untroubled by direct incursion from European naval powers. It is widely believed that the town’s prosperity derived largely from its control of the gold trade with southern Africa, and specifically, with the African state centred on Great Zimbabwe. The Moroccan traveller Ibn Battuta visited the Swahili coast in 1331 and reported on a select few of the major towns of that time: Mogadishu, Mombasa, and Kilwa. At Kilwa, he was impressed by the beauty of the architecture, the wealth and the Islamic piety of the people, and by the strength and generosity of Kilwa’s sultan, al-Hasan bin Sulaiman (Freeman-Grenville 1962: 40). When the Portuguese arrived on the coast, having rounded the Cape in 1498, they gave similarly glowing impressions of the town of Kilwa, even as they set about subduing it with the construction of a fort and the redirection of much of the southern African gold trade by which the town had grown rich.

Portuguese travellers were also the first to transcribe the *Kilwa Chronicle*, a local history relating the dynastic succession of the town and giving an account of its chronology through the lens of its rulers (Freeman-Grenville 1962: 27-32). This is the earliest written version of an indigenous history for the coast, although it is complemented by



*The audience court of the palace of Husuni Kubwa, one of Kilwa's unique architectural gems (photo: S. Wynne-Jones).*

**Fig. 2.**

two further versions transcribed in later centuries from an oral tradition that clearly remained in circulation. These traditions relate the founding of seven towns along the eastern African coast by settlers from Shiraz (now in modern Iran). The story of the foundation of Kilwa refers to an Ali, who bought the island with cloth from a local chief and converted the population to Islam.

Although the so-called 'Shirazi myths' are common along the coast, retold in multiple locations as part of the origin stories for Swahili towns, they are now recognised as figurative rather than literal and do not imply the actual settlement of Persians (Pouwels 1984). Eastern African coastal towns have long been Islamic, through the conversion of their inhabitants, and the connections with the Gulf for trade are as old as the settlement of the littoral.

The *Kilwa Chronicle* does more than document the Shirazi dynasty that 'founded' Kilwa; it goes on to report on a line of rulers, and a dynastic shift to a Mahdali clan in later centuries. These histories gave the framework for the investment of significant archaeological effort into excavations at Kilwa during the 1960s, sponsored by the British Academy and what was to become the British Institute in Eastern Africa (Chittick 1974). These were seen at the time as providing confirming detail for the historical framework and for the idea that Swahili/coastal settlement was descended from Arab/Persian settler communities on the coast. Excavations focused on the largest stone monuments, which at Kilwa are extraordinary: the Great Mosque, the 14<sup>th</sup>-century palace of Husuni Kubwa (Fig. 2), and some of the larger houses and community mosques. Here, amongst

the grandeur of Kilwa's architectural legacy, the excavators found imported goods that testified to trade with the wider Islamic world, as well as a local production of silver and copper coinage that repeated some of the names in the *Kilwa Chronicle*.

### 3. Dates and implications

The original excavations at Kilwa were thus complicated by a flawed starting hypothesis, which looked to external sources for the origins and culture of the town. This has chronological implications as Chittick dated the archaeological phases by cross-referencing between the histories and the record of imported goods. Using a combination of imported sherds, archaeological indicators (like coins with named sultans), and architectural shifts thought to relate to new arrivals from the Islamic world, Chittick (1974: 18-19) ascribed the archaeology of Kilwa to seven phases (Table 1). The earliest levels were always poorly resolved in this scheme, with the first occupation of the site thought to relate to the 9<sup>th</sup> century CE but with a lack of direct dating evidence. Three charcoal samples submitted for radiocarbon dating seem not to have offered much assistance, dating a burnt layer at the start of the sequence to the 2<sup>nd</sup> (1825 ± 110 years BP) and the 7<sup>th</sup> (1370 ± 110 years BP) centuries respectively.

Since the 1960s, the idea that Swahili towns were founded by immigrants, or that they might have made up the majority of the population, has been widely demonstrated as false through a series of studies that have focused on urban origins and evolution elsewhere on the coast (Horton 1996). These studies have also challenged some of the dates assigned on the basis of imported ceramics and coins from the Kilwa mint (Horton, Oddy, & Brown 1986), and have consistently pushed back the chronology of the East African coast to encompass an earlier occupation from the 7<sup>th</sup> century CE at some coastal locations. Although the effects on Kilwa's chronology might be inferred (Chami 2006), the sequence devised by Chittick has never been directly tested.

### 4. The 2016 excavations

Fieldwork in 2016 set out to do just that. Under the aegis of the Songo Mnara Urban Landscape Project, which is exploring urban life in the Kilwa archipelago, we excavated a 4 m x 4 m trench to the south of Kilwa's Great Mosque. The trench was located directly next to Chittick's Trench ZLL, which was never backfilled and was visible as a massive slumped hole. This trench contained a more than 3 metre stratigraphy with features such as a lime kiln and other pits, with a full range of stratigraphic levels. The 2016 trench, KK001, was adjacent to ZLL, immediately to the south. The aim was to relocate the stratigraphy described by Chittick; this was one of the few places that he encountered levels dating to the earliest periods of the site.

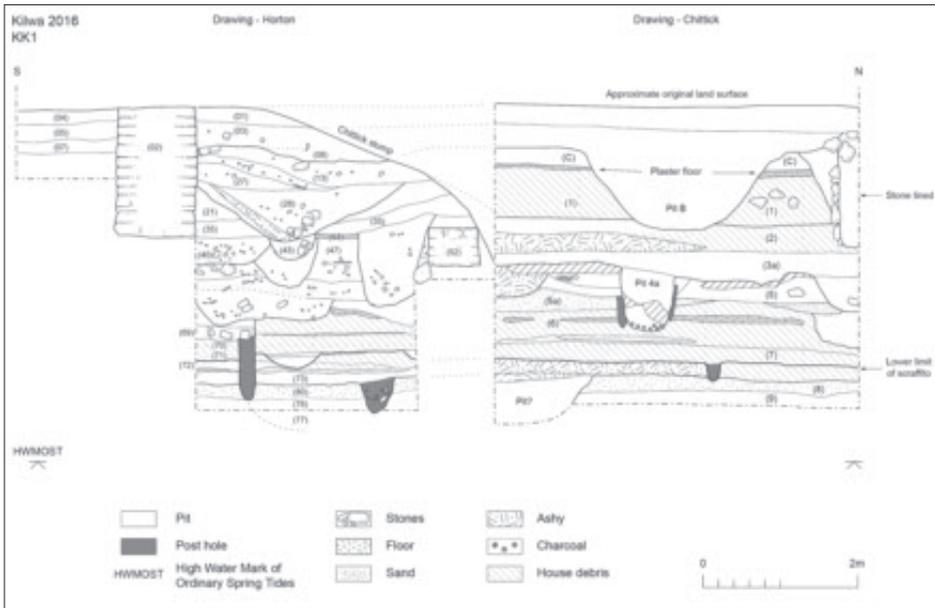
We conducted a single context, stratigraphic excavation. All sediments were both dry sieved (2 mm mesh) and wet sieved (0.5 mm mesh) to recover all artefacts and faunal material. Samples from all contexts were floated for carbonised plant remains.

The excavations revealed a sequence of structures apparently covering the entire pre-

Chittick's Periods	Archaeological indicators	Histories	Trench ZLL	Trench KK001	Possible revised dates
1a c. 800–1000	Early Gulf ceramics (white glazed wares, Turquoise Glazed Wares) Timber buildings		Strat 8/9: white sand, scatter of human bone, water hole, overlying grey midden. Above, born soils, ashy levels, pits and slots. Early Tana Tradition pottery, Plain ware.	1 73-77, 80: grey brown sandy layers 30 cm, fish bones, ash spreads, small pits, Early Tana Tradition, 1 x white glaze import	800–850
				2 60–72: multiple floor ash spreads, daub walls and post holes, at least 6 buildings, 85 cm. Plain wares, white glaze, SI, Siraf jars	850–1000
1b 1000–1150/1200	Sgraffiato pottery, timber and daub architecture	Earliest reference to Kilwa c. 1060. Kilwa letters – Ibadhi presence c. 1115?	Strat 5/6/7: multiple red earth and ash spreads, post holes and slots suggesting 2 x rectangular buildings. Pottery mostly Plain wares	3 52, 54, 56–9: construction of tower, associated daub spread 20 cm. Hatched sgraffiato. Single silver coin.	1000–1050
2 1200–290	Later sgraffiato pottery. Earliest coins and stone buildings	Shirazi dynasty The Matamandalin interregnum	Strat 2/3/4: construction of 4 phases of super-imposed lime kilns, 1022–1329 cal AD. Miniature coins of Ali in flue. Green sgraffiato, Qingbai and white wares	5 36–42: infill of space around kiln/tower with rubbish, ash and daub spreads, lots of fish bones. Later sgraff pottery, Qingbai, early celadon.	1150–1200
3a c. 1290–1400	Later sgraffiato/ BY pottery Mahdali coins, Husunis and Gt Mosque extension. Husuni modelled wares, celadons	Madhali dynasty, visit of Ibn Battuta in 1331	Strat 1: upper layer of midden. Husuni modelled wares, celadon. Plaster floor of c. 1300, cut by pits and coins of Sulaiman al-Hasan and al-Hasan b. Sulaiman. Construction of Gt House	6 17–38: construction of enclosure wall, using porites blocks, early levels late scraff/ Qingbai. Use of area includes dumps and spreads with pits, with BY / celadon (post 1250) against wall.	1200–1350
3b c. 1400–1500	Monochrome pottery, wheeled wares, Blue on white. Large scale coral houses	The 'New Rain' period of Amirs and disputed sultans	Deposits removed or never present.	7 6-16: plaster floor level with mofa oven ash spreads, large pits. Associated with Gt House. Green and Blue Monochromes, celadons etc.	1350–1500
4 1500–1700	General period of decline, although little changes in material culture	Portuguese occupation 1498/1505–1513			
5 1700–1800	Generally late 18th century, rebuilding associated with the revival of the slave trade	Omani occupation, c. 1700; French treaty 1776			

*Chittick's chronology, with finds from KK001 cross-referenced.*

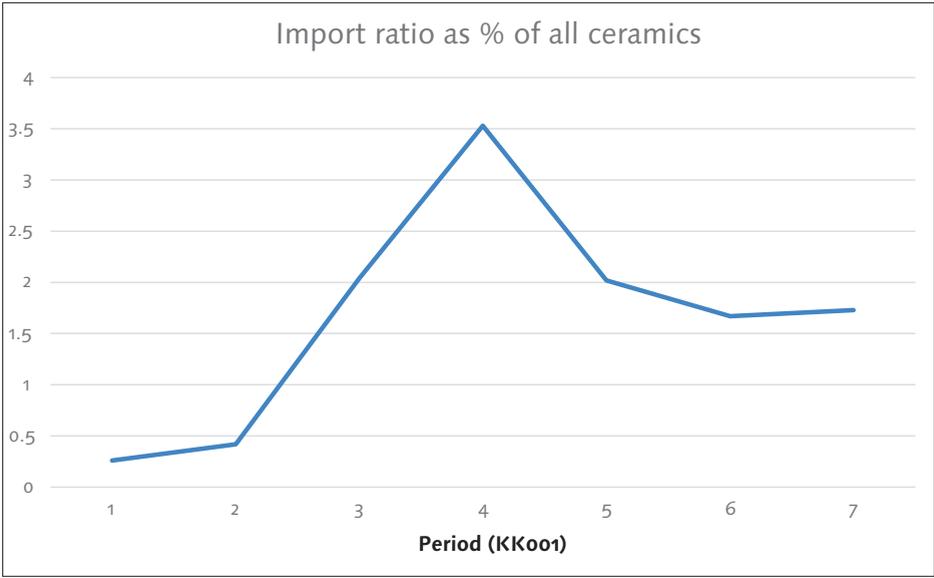
**Table 1.**



**Fig. 3.** Section drawing of KK001, showing multiple phases (figure: M. Horton).

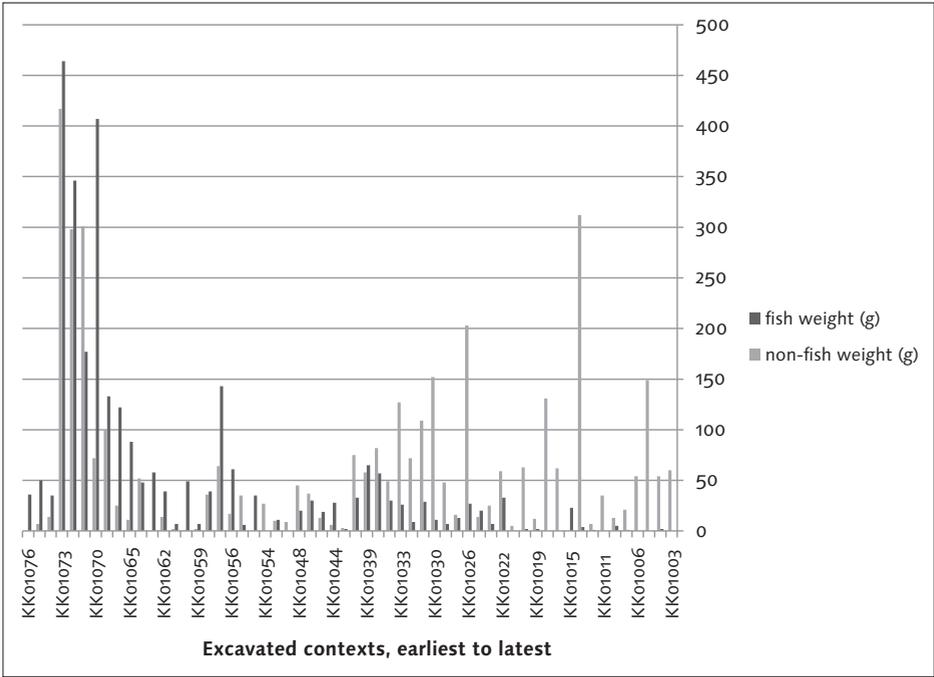
colonial chronology of the site (Table 1 & Fig. 3). The upper layers relate to coral-built structures of the 14<sup>th</sup> to 15<sup>th</sup> centuries. These were built above the foundations of an enigmatic circular structure in porites, coral blocks that had been reduced down to the foundations. A preliminary interpretation of this foundation might be that it represents an earlier minaret, destroyed during a change of sectarian allegiance. The 14<sup>th</sup>-century mosques of Kilwa do not possess minarets. Beneath this configuration of stones lay a sequence of packed-earth floors relating to wattle and daub structures.

In general, the artefact record confirms some patterns known from elsewhere, yet Kilwa has some unique aspects. As in Chittick's excavations, the imported pottery recovered provides a general chronological estimate: The post-1100 CE period is indicated by Persian late sgraffiato and blue/green monochrome pottery, and Chinese Qingbai and celadon pottery; the pre-1100 CE period is indicated by Persian pottery types: hatched sgraffiato, white glaze, and Sasanian Islamic pottery. At Kilwa, only low levels of imported ceramics are found before the 11<sup>th</sup> century. Chittick noted this and linked it to the arrival of the Shirazi at that time. Although we might now disagree with this line of argument, it is notable that Kilwa was not part of the early flourishing of trade seen at sites elsewhere from the 7<sup>th</sup> century. Instead, it had only few imported ceramics until the second millennium. The exact moment at which Kilwa was incorporated into significant trading relationships will be calibrated by dating this sequence; there is a marked upswing in import ratio (Fig. 4) in what we take to be the late 12<sup>th</sup> century CE. This will need explanation. Otherwise, we can see a more familiar pattern of shifting subsistence priorities from a diet rich in fish to one rich in non-fish protein sources



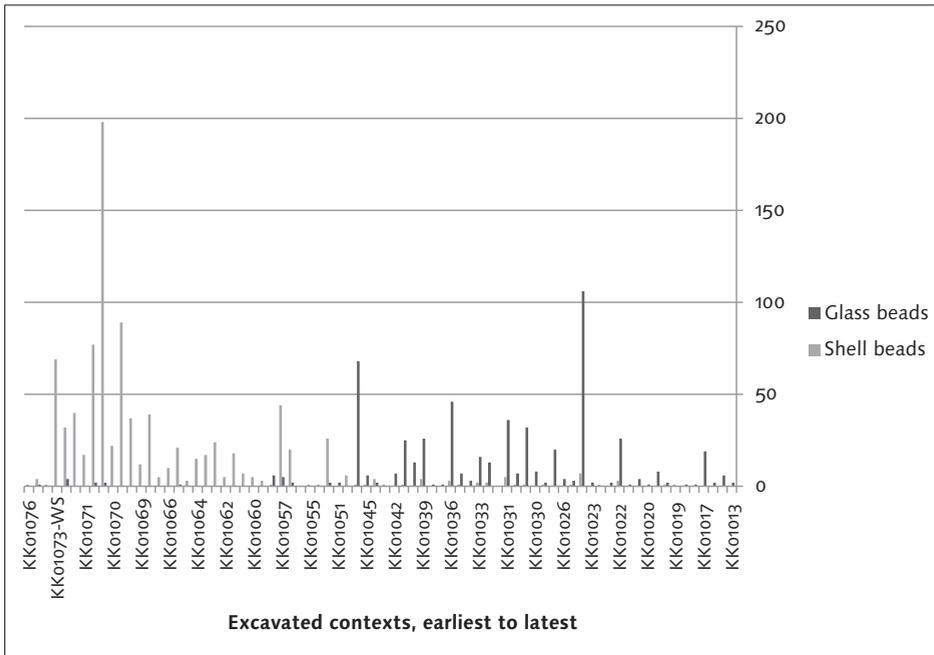
Imported sherd ratios (as % of ceramic assemblage) over time at Kilwa (figure: M. Horton).

Fig. 4.



Ratios of fish to non-fish bones in contexts recovered from KK001 (figure: M. Horton).

Fig. 5.



**Fig. 6.** Quantities of shell and glass beads in contexts recovered from KK001 (figure: M. Horton).

as the town grew in size and wealth (Fig. 5). A clear transition from the abundance of shell beads to a similar abundance of (imported) glass beads can be seen through the sequence (Fig. 6). These are trends that can be seen at a coastal scale; here we can for the first time assign them a precise chronology.

### 5. High-definition dating at Kilwa

Samples have been chosen from across the range of contexts excavated in KKoor. These are all tightly controlled archaeological strata, representing sealed deposits such as pit fills, foundation and destruction levels. We have targeted key moments in the sequence that we see, such as the strata where we see the first instances of particular import types, the silver coin, as well as several samples from the earliest layers. We will begin with a series of ten dates from the unit, with the possibility of as many as forty radiocarbon determinations if the results justify it. This will be not only the best-dated urban sequence in Africa, but also a unique experiment in exploring possibilities for a high-definition urban chronology.

All contexts were also chosen such that they offered paired samples of marine and terrestrial carbon sources, such as fish vs. animal bone. This will also allow us to calibrate the marine reservoir effect for this region, where there is almost no information on this crucial factor affecting carbon dating in coastal contexts.

The questions that can be approached through this dating programme are of both regional and global importance. At an eastern African scale, this will offer answers to key questions about the origins and timing of coastal urban development; in combination with the data from Unguja Ukuu it will allow insights into regional variation as well. At an Indian Ocean scale, the chronological resolution will enable us to explore object flows, comparing eastern African coastal trajectories to those of the trading societies with which they were in contact. More generally, this will be the first experiment in high-resolution radiocarbon dating in a tropical, sub-Saharan African context, and will provide an important methodological case study for global archaeologies. The ability to add precision to calibration of the marine reservoir effect for the western Indian Ocean will also ensure that the work has a broad application. Kilwa's urban story thus has the opportunity once more to act on a global stage.

## 6. Acknowledgements

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