



Stones and pots along the East African coast: Digital recording and conservation of East African Archaeology



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Aims of the project

- To help preserve archaeological sites under threat of coastal erosion through 3D digitisation
- To contribute to databases focused upon digitally cataloguing East African pottery
- To highlight the risks East African archaeology faces from the changing climate
- To make East African Archaeology more accessible to the public and academics alike

The Swahili Coast

The area referred to as the Swahili coast stretches from southern Somalia to northern Mozambique. The culture that developed here was very distinct from the people living further inland. One of the most significant differences is the adoption of Islam by the Swahili. The religion had reached the east African coast via a far-reaching trade network spanning the Indian Ocean from East Africa via the Islamic World all the way to India and China. And while Arabic influences are present, the indigenous origins of the culture can clearly be seen in the archaeological record. Crucial evidence for this is the Early Tana Tradition pottery that can be found on sites across the region. It was in use between about 600-900 CE.

The Pottery

Losing The Past

Digitisation is vital for preserving archaeological data in East Africa due to poor preservation conditions in the area. Artefacts stored in plastic bags within wooden crates are particularly at risk as the tropical climate breaks down these materials, leaving a pile of broken pottery with no information as to where or in what context it was found. Therefore, digitisation is essential in creating a permanent record of these artefacts.

Nairobi National Museum

Working at the National Museum of Kenya Philipp analysed pottery from a site in the delta of the Tana River in Kenya. The site was excavated by Yanis Mokri, a PhD student at the Université Paris 1 Panthéon-Sorbonne. Philipp focused on diagnostic pottery sherds, meaning those that have decorations or are from either the rim or base of the vessel. These pieces can give the most information about the characteristics, origin and time period of the pottery.



Crucial to the analysis of the sherds was working with the methodology and typology used by Wynne-Jones and Fleisher in their Tana Tradition Pottery database from 2013. By using this shared database, pottery sherds recorded by Philipp are now accessible to a range of scholars researching Swahili archaeology

Databases

Photogrammetry

What is it?

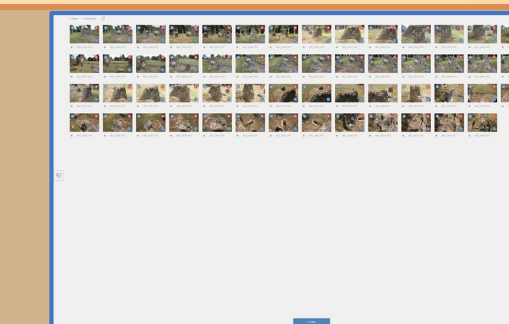
Photogrammetry is the use of multiple overlapping photos to create a 3D model with computer software. It's used in many different medias such as film, video games, 3D printing, surveying and archaeology.

The threat of coastal erosion

Jacob spoke to Dr. Stephen Rucina, a senior research scientist in the palynology and palaeobotany laboratory at the Nairobi National Museum about the visibility of climate change in pollen samples from various sites in Kenya as well as how the effects of climate change could be seen on the coast. In Mombasa, at the famous site of Fort Jesus, the Kenyan government has invested 497 million Kenyan shillings (£3,950,000) into a sea wall to protect the foundations of the site as sea levels rise.



On the Zanzibar archipelago, sea levels rising have accelerated the rate of coastal erosion. In addition to this, the increased scope of tropical storms' is having an effect upon the rate at which archaeological sites are being eroded. Here also, seawalls are being built to protect the coastline of Zanzibar.



How photogrammetry helps archaeologists

Photogrammetry can be used by archaeologists to review a site after excavation. The site can then be analysed after a season of excavation. In this post excavation analysis, the layout of the site can be explored more thoroughly and new perspectives can be found for interpreting sites. In addition to this, it helps archaeologists in the next season of excavations to recall what the site looks like so proper planning can take place. This is very important if an excavation has a time limit, as many do, and assures that archaeologists time is used efficiently.

The 3D models created by Jacob serve a different but equally important role in archaeology in the preservation of heritage. As the changing climate has an effect on sea levels and frequency as well as the ferocity of storms in Zanzibar, it is important to preserve archaeological sites before they are destroyed. The 3D models created can be compared to previous photos to monitor the rate of decay and thus highlight the need for action to take place in protecting heritage sites.



The future of photogrammetry in archaeology and heritage

Photogrammetry is an incredibly useful technology in the age of digitisation. Hopefully, as equipment gets cheaper and the technique becomes more accessible, the technology will continue to develop in archaeology. Not only will this technique help the work of archaeologist in the field, as well as academics, but 3D images of heritage sites make archaeology more accessible to the public too. In some museums such as the National Archaeology Museum in Madrid, photogrammetry has been paired with virtual reality technology to create an exciting new way to experience the past. Heritage sites that are expensive and difficult to travel to can also be experienced at home through the technology with sites such as the Zamani Project creating a database where you can view and explore many 3D models of sites in Africa.



Conclusions

- Our project has contributed to the digitisation of standing structures and pottery from coastal sites in East Africa so they may be preserved and explored further.
- East African Archaeology is just another victim to the effects of climate change. We hope that the need for further work in ensuring its survival has been highlighted by this poster.