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An archaeological survey of the Lake Baringo lowlands 2014: Preliminary results

Introduction

From September to November 2014, an archaeological survey of the Lake Baringo lowlands was conducted by the author as part of a doctoral research project on the historical ecology of the Lake Baringo Basin, under the auspices of the Resilience in East African Landscapes Initial Training Network (REAL ITN; http://real-project.eu/). The REAL ITN is a Marie Skłodowska-Curie Actions funded project (PI Professor Paul Lane, Uppsala University) investigating temporal, spatial and social dynamics of human-environment interactions over the last c. 500 years. Its geographical foci are the Eastern Rift Valley and Ewaso Basin in Central and North-Central Kenya, and the Pangani and Amboseli catchments in south-eastern Kenya and north-eastern Tanzania. Through a combination of palaeoenvironmental sciences, archaeology, human geography and anthropology, combined with agent-based modelling, the REAL ITN aims to understand the relations between past and current ecosystems, livelihoods, conservation and climate change in order to assess and reinforce the social and environmental resilience of the areas studied.

An aim of the Lake Baringo archaeological project is to examine how human habitation affected and shaped the landscape and how past environments shaped the land-use of the Lake Baringo lowlands over the recent centuries. It also forms an archaeological investigation into Ilchamus oral history and their cultural and environmental resilience to the periodic droughts that the area experiences. The archaeological survey was organised with two goals in mind. The first goal was to record the effects of pastoralist homesteads (bomas in Kiswahili, Murua in Ilchamus) on the vegetation, soils, and landscape on decadal and centennial time-scales to see how they deter, stifle or encourage the rehabilitation of the land decades after abandonment. A related research question is whether these abandoned bomas, which can become landscape features visible through differential vegetation growth, can be used as indicators of archaeological sites (see Causey, 2008). This complemented the second goal of the fieldwork, which is to expand knowledge of the Late Holocene archaeology of the Lake Baringo Basin and to identify sites for future excavations. The survey was focused on the lowlands just south of the lake, on the Sokotei, Kiserian, Lorrok and Logumukum localities (Figure 1). The area is currently occupied mainly by Ilchamus, a Maa speaking ethnic group with close cultural ties to both the Samburu and the Maasai.

The study area

The Lake Baringo Basin is located in the Eastern (Gregory) Rift Valley in Central Kenya. It is an open savannah bushland/woodland environment with an elevation varying from c. 970 m at the lake surface to over 2200 m above sea level. The vegetation is characterised by Acacia spp. trees and bushes, as well as Commiphora, although two introduced species, Prosopis juliflora and Opuntia ficus indica, have become invasive and now occupy vast tracts of land in the lowlands. The basin used to support large African mammals, e.g. elephants, and large herds of buffalo and other grazers (Thomson, 1885; von Höhnel, 1894). Larger game are, however, now entirely absent from the area due to the demand for them in the 19th century, and rising population pressure and settlement expansion. A large portion of the lowlands is now used for irrigation farming and grazing. The topsoil
was formed in the early Holocene as a lakebed, during a period when Lake Baringo and Lake Bogoria (just to the south) formed a single lake (Farrand et al., 1976; Kiage and Liu, 2006). The soils are an unconsolidated silty loam, with varying contents of silt and clay, but almost no sand. These soils and the surrounding highlands are now subject to high rates of sheet, wind, and gully erosion due to a mixture of soil properties, lack of undergrowth, persistent winds and high intensity downpours (Kiage and Liu, 2009a; Snelder and Bryan, 1995). Because of this erosion, the region has been subject to many different land rehabilitation projects, which have all failed, and it attracted a lot of research from various disciplines concerned with the degradation and the palaeoecology of the environment (Hickley et al., 2004; Johansson and Svensson, 2002; Kiage and Liu, 2009a; Kiage et al., 2007; Odada et al., 2006). Anthropologists and historians have also been concerned with the social aspects of the degradation of the environment. They researched what role socio-political changes have had on the environment (Anderson, 2002), and what effects the degradation, established aid projects and socio-political changes have had on the people (Little, 1992). Hodder’s (1982) ethnoarchaeological investigation of the use of objects as symbols in social interaction between members of the three ethnic groups occupying the Baringo region has become one of the seminal studies in archaeological theory and lay many of the foundations of post-processual approaches.

With regards to archaeological fieldwork, the Tugen Hills west and south-west of the lake have received most attention (e.g. Johnson and McBrearty, 2010; Tryon, 2003, 2002). They are rich in early hominin remains as well as Early and Middle Stone Age (ESA/MSA) tools. Other areas and the Holocene period have received very little attention in comparison. A preliminary survey with small scale excavations was undertaken by Farrand et al. (1976) on the Loboi Plains and in Logumukum, between Lake Baringo and Bogoria, and surveys were also undertaken west and south-west of the lake by a summer school led by Barthelme (1983). Hivernel (1979) excavated a Pastoral Neolithic (PN) site at Ngenyn and also undertook a survey along the Endau river. All three surveys uncovered several sites with Late Stone Age (LSA), Pastoral Neolithic (PN), and Pastoral Iron Age (PIA) material. Apart from Ngenyn, none of the sites were studied in depth. A broader aim of this study, therefore, is to address these knowledge gaps concerning the later Holocene archaeology of the basin so as to complement the environmental (Kiage and Liu, 2009a, 2009b; Scott et al., 2009, 2008) and historical (Anderson, 1988, 1989; Little, 1992) data already available. The project will aim to understand what effects humans have had on the landscape, how they shaped and survived in it, and which practices were strengthening or degrading environmental and cultural resilience (e.g. Redman and Kinzig, 2003; Walker et al., 2004) in a region that experiences droughts on a decadal scale and where water is sparse.

**Recording of boma features**

Abandoned bomas in Baringo and elsewhere in Eastern Africa develop a specific vegetation pattern after their abandonment. The different nutrient content of the soil from activities taking place within the boma, as well as the accumulation of livestock dung, which causes some places to have higher levels of nitrogen, phosphorous, and other minerals, inhibits the growth of some plants while promoting others. In Laikipia and the Amboseli abandoned bomas may develop into so-called glades, open spaces characterised by luscious grasses such as *Amaranthus graecizans*, *Tribulus terrestris*, *Zaless penutranita*, and *Cynodon plectostachyus* (Augustine et al., 2011; Muchiru et al., 2009). The glades are important features in certain landscapes as they are biodiversity hotspots attracting a variety of small and large fauna. Additionally, these glades can survive for several decades and on rare occasions even up to 600 years (Lane, 2011), making them valuable indicators of archaeological sites. In Baringo, however, the boma features are sufficiently different to warrant an investigation. Typically, these features lack undergrowth, are characterised by trees and shrubs, and the wider
ecosystem has had a different developmental trajectory to those of Laikipia and Amboseli. Moreover, the high erosion rates could also affect the formation rates and the longevity of these features in the landscape. This survey therefore investigated: a) how and which plants re-colonize abandoned bomas over several decades, b) how long these features survive in the landscape, c) whether they promote vegetation regeneration and biodiversity (as elsewhere in Eastern Africa), and d) the effects human habitation has on the soils.

As part of a desktop survey using QGIS, every occupied boma and boma impression visible in aerial photographs taken by the Overseas Survey in 1950 in the Lorrokk, Logumukum, Kiserian and Sokotei localities was geo-referenced, as were boma impression visible on satellite imagery provided by Google Earth and Bing Maps. Then, correspondences between modern boma features visible on satellite imagery and boma features and occupied bomas in the 1950 aerial photographs were sought (Figure 2). This allowed a rough categorization of the age of each boma feature visible today as: a) older than 60 years if visible as a boma impression in 1950 aerial photos, b) younger than 60 years if seen as occupied in aerial photos, and c) occupied only post-1950 if visible only on current satellite imagery. We are also able to see how common it is for abandoned bomas to develop into these features and the length of time they survive.

Modern boma features with counterparts in the aerial photographs were visited during fieldwork. The surface extent of the boma feature, any structural remains and features present (such as house walls, livestock pens, ash deposits, etc.), soil types and colours, the vegetation surrounding structural remains and features, and the vegetation within the boma on a transect were all recorded. Additionally, surface soil samples were collected from specific locations within the boma. These were: a) inside house, b) house walls, c) outside house, d) inside livestock pen, e) outside livestock pen, f) general boma area, g) outside boma (between 5 and 10 m from the edge of the boma). These places were targeted because it was observed that the vegetation grows in certain places within the boma and, as shown in other comparable studies (Shahack-Gross, 2011; Shahack-Gross et al., 2003), variations in soil properties may explain why plants prefer certain places. Small amounts of material culture were collected at each boma and the surrounding surveyed areas. This served to identify the material culture associated with bomas and to identify possible archaeological sites.

By specifically targeting boma features as part of an archaeological survey, the team identified three archaeological sites from 66 locations visited. Two sites are well known in Ilchamus oral history, with one dating to the early twentieth century while the dates of the second site are currently unknown. Preliminary results suggest therefore that in Baringo, boma features can survive for around a century. While there are indications that they can survive for longer (see Oltioki below), the assumption is yet to be tested and observations suggest that most features survive only for a few decades. The team also observed that certain plant species are associated with certain structures/features within the boma, which helped identify other abandoned bomas during the intensive walkover survey. *Kalanchoe diesiflorum* (*raraiti* in Ilchamus) prefers to grow inside and on the edge/walls of former houses, *Solanum incanum* is often seen growing in former cattle pens, and *Prosopis juliflora* prefers to grow on the edges of structures/features, such as house walls, cattle pens, and on the edge of the boma itself.

**Archaeological survey**

To complement the above survey an intensive walkover survey of a 5 km$^2$ area was undertaken, which covered the Sokotei locality, located between the Ol Arabal and the Molo Rivers just south of Lake Baringo. Parts of Lorrokk and Kiserian were also surveyed. The survey concentrated on areas that were largely devoid of dense vegetation in the 1950 aerial photographs and that are still largely
open today. This allowed the team to spread out at c. 20 m apart and walk in straight lines north-to-south. Focusing on largely open areas also ensured that we recorded any occurrences of abandoned bomas, which were not visible on satellite imagery due to the lack of vegetation cover. It also guaranteed the logging of modern counterparts of bomas and boma features from 1950, which did not develop vegetation patterns or have since lost them.

During the survey, an additional 322 abandoned bomas were recorded, which were not visible on Google Earth. The survey also recorded 150 pottery, 179 obsidian and 150 worked stone scatters. The area surveyed proved very rich in surface finds, which might be due to heavy erosion in the previous decades and the transportation of finds from areas higher up to locations closer to the lake. Day-long surveys of Lorrok, Kiserian and Logumukum also indicated that these areas are archaeologically rich, however, due to time and safety restrictions the team was unable to dedicate more resources. Lorrok is suspected to be a ‘hotspot’ of archaeological sites, as the team found artefacts from the ESA, MSA, LSA, PN, and PIA all within an area of less than 1 km². Due to the consistent presence of finds on the surface, only places with a high density of material were investigated further using shovel test pits (STPs) to confirm the presence of sub-surface deposits and to assess their preservation status.

Identified and recorded archaeological sites
A total of 16 archaeological sites were identified and recorded (Figure 1). Most of these sites were shovel-tested.

Ilchamus Leabori/SASES: GoJi 11 (E36.05514, N0.47868): Ilchamus Leabori, also known as Njamps Mkubwa, is a famous nineteenth and early twentieth century settlement with an extensive irrigation system. It is well known to the local population, as it features extensively in the Ilchamus oral history, and Anderson (1989, 1988) and nineteenth century travellers have also written about it (Thomson, 1885; von Höhnel, 1894). The site was home to around a 1000 people, with a central cattle enclosure, and was a stopping point for caravans searching for ivory. A large part of the site is now under the Perkerra Irrigation Scheme, while another part is thickly overgrown with Prosopis juliflora. The central livestock enclosure is still clearly visible and irrigation canals and house impressions were also observed. A quick survey of the area recovered a large amount of pottery, beads, earrings, and worked cowrie shells. An STP set in the livestock enclosure exposed a large collection of bones. Il Chamus Leabori is visible in the 1950 aerial photographs as a large, 200 m wide, boma impression, which has since disappeared because of the Prosopis juliflora invasion, floods and the neighbouring irrigation scheme.

Ilchamus Lekeper/SASES: GoJi 12 (E36.02773, N0.44131): Ilchamus Lekeper is contemporary with Ilchamus Leabori and is consistently mentioned alongside it in oral history and in publications and diaries. Like Leabori it also had a large irrigation system. No channels were observed, but these are visible in the 1950 aerial photographs. The site is well preserved. Three STPs were dug at the site which showed a clear sedimentation, and the STP set at the centre of the cattle pen proved to be rich in faunal remains and had an interesting stratigraphy consisting of decomposed dung and ash layers. Pottery, metal, slag, beads and worked cowries were also found at the site. The site is slowly being re-occupied and extensive charcoal burning is taking place.

Murua Olkileku/ SASES: GnJi 41 (E36.09362, N0.50050): The team was led to this location by local residents, who told us that the Ilchamus occupied this boma after they abandoned Ilchamus Lekeper and Leabori. The site bears the same name as an age set initiated c. 1901 (Anderson, 2002, p. 301), and hence most likely dates to the beginning of the twentieth century. The site is a large boma
feature with a central cattle pen, which forms a mound. It is now clearly visible in satellite imagery but is not apparent on aerial photos due to the lack of vegetation in the area. Miniscule bone fragments and pot sherds surround the cattle enclosure. Ten STPs were dug here, one of which revealed a possible hearth. There has been little sedimentation as most finds were found in the initial 3 cm of every STP.

**Oltioki/SASES: Goji 9 (E36.10706, N0.49589):** This is one of the three archaeological sites that was initially visited as a boma feature to be recorded. Information gained from nearby residents suggests that this is the site where the Ilchamus lived before settling at Ilchamus Leabori and Ilchamus Lekeper, however this is yet to be confirmed through excavations and interviews with elders. Moreover, planned future excavations will reveal if the boma feature on the site is directly associated with the initial occupation of the Ilchamus or if it belongs to a later period. This site is almost completely intact and is rich in worked obsidian and pottery. The surface scatter through which the site was identified is restricted to the boma itself. A series of STPs all produced a rich artefact assemblage. Most of the pottery was undecorated, but some of it had a very distinctive decorative style, including bands of rectangular grooves (Figure 3).

**Sokotei 1/SASES: GnJi 31 (E36.09855, N0.52795):** Like Oltioki, Sokotei 1 was identified through boma recording. Shovel-testing later revealed, though, that the finds are not associated with the boma, but have been transported there through erosion from a terrace higher up. At the latter location, two STPs hit on a fish bone midden (made up of catfish) also containing pottery. An elaborately decorated sherd was identified as Narosura ware. In the lining of an irrigation channel crossing the site crudely made choppers were found, likely belonging to the ESA. The site is in immediate danger of becoming cultivated.

**Sokotei 2/SASES: GnJi 32 (E36.09425, N0.52753):** This is another site that was found during the boma recording. However, the area was cleared for farming (not yet ploughed) before we were able to securely establish through shovel testing if the boma feature is associated with the finds. Since a midden of faunal remains and pottery was found in the exact spot where the boma was located it is likely that they were associated with each other. The pottery from this site is undecorated but contains a range of fabrics. Animal burrows also exposed large deposits of charcoal c. 30 m from the midden, but the STPs set next to the charcoal were devoid of archaeology.

**Sokotei 3/SASES: GnJi 33 (E36.09771, N0.52986):** Sokotei 3 is characterised by three circular features of consolidated light grey silt which are 4-6 m in diameter. An erosion gully running through these features exposed a large concentration of bivalve shells, collected from the lake. Pottery and bone was also eroding out. Shovel testing recovered shell, bone, pottery and worked stone. One STP, which contained no finds, was stratigraphically more diverse, containing darker layers not observed in other STPs. This implies that there is more to the site than the grey features. Like Sokotei 4, this site is/was also subject to erosion, as the bases of plants are c. 50 cm above the soil patches which are currently exposed.

**Sokotei 4/SASES: GnJi 35 (E36.10052, N0.52894):** Sokotei 4 has a rich surface scatter of elaborately decorated pottery with fine comb stamping and incisions. The pottery is still pending identification. Nine STPs were dug at the site, and the STPs were almost devoid of cultural material after the initial 3 cm. It was established that the site is completely eroded away, as the base of plant root systems typically lie c. 30 cm higher than the general area.

**Sokotei 5/SASES: GnJi 36 (E36.11188, N0.51961):** The site Sokotei 5 has three distinct high concentration scatters of worked stone, which included bladelets and crescents, and pottery, which
also included bead grinders, and a scatter of medium density concentration. *Achatina* sp. shell was also found. When the site was re-visited after two weeks of heavy rains, the concentration of archaeological material was much less dense, showing the effects of sheet and raindrop erosion in the area. Nevertheless, STPs recovered worked stone and pottery from intact contexts. One STP in particular had an extremely high density of flaked stone. The relative proportion of pottery and worked stone observed on the surface was different to the proportions recovered from STPs. Various factors could contribute to this, but one explanation could be that the pottery-rich layers have been or are eroding away, while stone-rich layers are still comparatively intact.

**Sokotei 6/SASES: GnJi 37 (E36.11363, N0.52247):** Sokotei 6 has a high density surface scatter of worked obsidian and a few crude choppers and scrapers, possibly belonging to the ESA. Six STPs were dug at the site. One STP revealed a crudely worked stone, and another provided pottery and obsidian flakes.

**Sokotei 7/SASES: GnJi 38 (E36.11767, N0.52716):** Sokotei 7 was a high density scatter of chert bladelets, crescents and flakes close to a very large erosion gully. Heavy rains have washed most of the scatter into the gully and only a handful of flakes remained. A number of STPs were dug but no material was recovered. Based on the observations made, it appears that this was a single-occupation site. It was short lived and a large amount of knapping happened in a limited timeframe.

**Lorrok 1/ SASES: GnJi 34 (E36.10826, N0.50066):** Lorrok 1 is located a few hundred metres from Oltioki and has the same pottery assemblage. The site has a livestock enclosure and possible traces of a house. Twenty-one STPs were dug at the site and the great majority only provided archaeological material from the first 5 cm, which is in stark contrast with Oltioki. It appears that the site mostly exists as a dense surface scatter. As the site was shortly due to be turned into a field, a more detailed surface collection and mapping by 10 x 10 m squares was undertaken.

**Lorrok 2/ SASES: GnJi 39 (E36.11269, N0.50029):** Lorrok 2 is an area rich in surface finds which are mostly made up of dense scatters of obsidian and chert flakes, as well as some crude basalt choppers and scrapers. Most significantly an Acheulean handaxe (Figure 4) and a micro handaxe were found on the surface. Small quantities of pottery were scattered around and were eroding out of a mound, which appeared to be a boma. Out of nine STPs that were dug in the area, a few produced some basalt and obsidian flakes. Two STPs that were set close to the centre of the suspected boma also produced some undecorated pottery. Lorrok 2 is located in a 2 km² area, which was designated as a land rehabilitation project in the late 1980s, but failed by the early 1990s. Much of the area was ploughed and terraced and it is littered with obsidian, chert, and basalt tools and flakes. Some places, including Lorrok 2, have been spared so far and many scatters appear to still be intact.

**Lorrok 3/ SASES: GnJi 40 (E36.11069, N0.50049):** This site is located in the same area as Lorrok 2, but like Lorrok 2 it does not appear to have been damaged in the rehabilitation project. The site has a very high density of flaked chert and obsidian. Among the observed finds were also drills and ostrich eggshell beads, both finished and in the process of production, suggesting the presence of an occupation or production site nearby. Due to time and research constraints no STPs were dug at this site.

**Lorrok 4/SASES: GoJi 10 (E36.10727, N0.49917):** Residents of Lorrok told the team about this site, which is almost completely eroded away. The site contained large amounts of ESA and MSA stone tools from basalt, as well as smaller obsidian flakes. A mound of reddish brown sediment at the centre of the site was the only location where pottery was observed. Unfortunately, the pottery was
found only on the surface of the base of the mound, implying that the pottery-bearing layers are gone. Alongside the pottery was a large amount of smashed bone, some of which was still eroding out of the small mound. The area has not been shovel-tested, but intact places are most likely found north of the eroded area.

Kiserian 1/SASES: GnJ 42 (E36.12545, N0.54181): Kiserian 1 is a boma feature of particular importance to the residents of Kiserian village. The boma apparently belonged to the family that first settled in the Kiserian area and was only abandoned sometime in the past 20 years. The boma is characterised by a large livestock enclosure and a few houses built over a former livestock pen.

Conclusion

The Lake Baringo Basin is archaeologically very rich, though aspects of this archaeology are not well researched. As the above description of sites show, many are endangered or have been damaged already by erosion in combination with heavy seasonal rains. Within a couple of weeks, the appearance of sites Sokotei 5 and Sokotei 7 on the surface was completely different to that initially observed, while sites Lorrok 4, Sokotei 4, and Lorrok 1 have been almost completely eroded away. Sokotei 3 is also in danger of disappearing, as the gully that runs through the site will likely get bigger.

The majority of the data and material culture collected still need to be analysed in detail to be able to relate it to the specific archaeology of Baringo and the wider archaeology of East Africa. Data on the development of boma features also need to be examined and the soil chemistry of the soil from the boma features will be analysed at a later stage. In the future, excavations will focus on sites associated with the Ilchamus: Ilchamus Leabori, Ilchamus Lekeper, Murua Olkileku and Oltioki. The Ilchamus sites will allow the expansion of the time depth of the boma-vegetation interaction analysis and provide the understanding of how and why such features survive over centuries. The excavations will also provide information on Ilchamus cultural change and resilience as well as the effects of their livelihood practices on the environment. Sokotei 1 and Sokotei 2 will also be excavated because of the danger that farming poses to these sites.

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Bibliography


Figure 1 Map of area under investigation and of archaeological sites recorded. The digital elevation model was made using ASTER GDEM, a product of METI and NASA.
Figure 2 Image showing an occupied boma in 1950 visible from an aerial photograph, as visible on Google Earth, photographed with a drone, and the house walls and hearth seen on the ground.
Figure 3 Diagnostic pottery from Oltioki/Goji 9
Figure 4 An Acheulean handaxe found at Lorrok 2/Gnii 39