Studies in the African Past, Volume 15, 2021: 1–34

Recasting the Sangoan Stone Age Techno-Complex in the Stone Age Nomenclature at Sango Bay, Southern Uganda

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Abstract

This paper discusses the complex use of the term 'Sangoan' and its placement between the Early Stone Age (ESA) and Middle Stone Age (MSA) using data from Simba Hill in Sango Bay. The purpose is to examine whether the Sangoan is Acheulean, Middle Stone Age, or an independent lithic industry at Sango Bay. Four specific objectives guided the study: reviewing the Stone Age terminology, Sangoan lithic typology, technology, and environmental characteristics. A detailed literature review of the Stone Age nomenclature shows patterns and trends of the Sangoan terminology. At the same time, a combined lithic assemblage from the archaeological surface survey and excavation yielded heavy and light-duty lithic tools. The 13 sites identified within the 202.6km radius surveyed yielded 73 lithic artefacts, while the excavation unit yielded 1344 lithic artefacts. The results suggest that the Sangoan typology at Sango Bay has five general lithic categories of shaped tools, backed pieces, cores, and debitage. Typologically, the conventional Sangoan lithics at Sango Bay include lanceolates, picks, cleavers, discoids, becs, points and core axes. Technologically, the *Levallois* lithic reduction strategy characterises the Sangoan with unifacial and bifacial retouch and core technology elements. The toolmakers at Sango Bay used local raw materials, suggesting they were not highly mobile in terms of raw materials. Conclusively, therefore, the Sangoan is a transitional lithic industry.

Keywords: *Sangoan Middle Stone Age, Acheulean, Sango Bay, Uganda*

Introduction and background

The Stone Age history in Uganda is part of the Stone Age of sub-Saharan Africa, like many other parts. However, unlike many parts of the world, and East Africa in particular, the Stone Age of Uganda has received limited attention, which could partially explain the controversies surrounding the Sangoan that this paper addresses. The Stone Age is a prehistoric cultural period that lasted longer in Hominin technological development (Joukowsky, 1980) "… associated with stone or rock to make and utilise tools" (Kiura, 2019: 70) in performing varied tasks by humans in the past, especially hunting and gathering. Besides using stones, humans also used other materials made out of wood and bones (Rickard, 1944). Nonetheless, since bone and wood have low conservation potentials, they are rarely identified in the archaeological record compared to stone (Bushozi, 2011).

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Stone Age nomenclature

Stone Age research in Uganda can be traced from "professionals like J.W Gregory, who, as early as 1890, collected stone tools in Uganda" (Kiura, 2019: 70). Since then, it is now over 100 years since a systematic Stone Age archaeology of Uganda was popularised by Edward James Wayland, the then Director of the Uganda Geological Survey Department, based at Entebbe, between 1919 and 1939. Wayland also "correlated cultural developments with pluvial and interpluvial cycles" (Willoughby, 1993: 8). As a result, Wayland developed a "threefold glacial-pluvial hypothesis for the later sedimentary history of Uganda" (Clark, 1988: 241). As a result, the "chronological events of the Pleistocene climatic history of Uganda were divided by Stone Age artefacts" (Wayland 1931: 40).

Therefore, the terminologies "… used regarding the Ugandan Stone Age included the Kafuan (a pebble tool culture) that antedated the Oldowan Bed1" (O'Brien, 1939: 41). The Kafuan is named after the Kafu river as the "earliest pre-Chellean pebble culture at the bottom" (Wayland, 1931: 232–234). The following Stone Age terminology is the "Magosian which is an MSA-LSA transition industry" (Bushozi, 2011: 34) named after the "type site of Magosi in northeastern Uganda" (Jones & Summers, 1946: 60). Next is the Ugandan Cromerian that preceded Pluvial 11, and is also termed as the Kamasian, which is also taken to be part of the Sangoan, Wilton and Still Bay lithic industries (Wayland & Burkitt, 1932).

The Sangoan was named after its type site in Sango hills in the extreme south-east of Uganda, following Wayland's work in the 1920s, based on surface collections at Sango Bay. Following the coinage of the term, from 1925–1926 Wayland, Bowen and Simmons undertook a "reconnaissance research in parts of northern, western, central and Eastern Uganda such as Karamoja at the Magosi late Palaeolithic transitional site; Kaiso fossils in the Albertine Graben; part of the Elgon volcanic area from Budadirito to Sipi and then continued to Tororo in eastern Uganda. On the 8th November 1929, Wayland visited the Luzira prison site and discovered the Luzira head in central Uganda" (UGSD, 1930: 12 & 16). From "1934–1935, the African Prehistoric Research expedition in Uganda under O'Brien's leadership" (UGSD, 1934–1935: 10) worked at the Nsongezi and Orichinga valley in western Uganda, where they identified two distinct industries of Levalloisian and Tumbian. As a result, the Tumbian was renamed Sangoan (Clark, 1988: 281).

However, "from the late 1940s, Stone Age nomenclature was more of a diagnostic date than a term for characterising people or society" (Kiura, 2019: 70). The "need to have an indigenous system to define the Stone Age" (Underhill, 2011: 4) led to the adoption of three successive stages identified by Goodwin (1928), and Goodwin and Van Riet Lowe (1929) that were: Early Stone Age (ESA), Middle Stone Age (MSA), and Later Stone Age (LSA) (Phillipson, 2005). Though this did not include the intermediate industries like the Sangoan, they have continued in use. Since the coinage of the term

Sangoan, it has continued in use despite controversies surrounding its identity. Although Shea (2014) and Scerri (2019) suggested abandoning the competing models of stone tool industries like the Sangaon or Named Stone Tool Industries (NASTIES), like those developed by Wayland, we are hesitant to reject 'cultural taxonomies' totally in this paper as suggested by Reynolds and Riede (2019: 1369).

The Tumbian is another lithic industrial terminology used concerning Ugandan archaeology. The term was coined by Oswald Menghin, initially as "Tumbakultur that referred to an assemblage of heavy picks" (Gabel, 1985: 256) after the site of Tumba. Van Riet Lowe (1946: 7) indicated that the term Tumbian "should not be used beyond the basins of Congo." He then recommended that the only way out of terminology challenges was to assemble a Pan-African Congress and give terminology priority on the agenda, which led to the convening of the 1947 Pan-African Congress.

Due to the "typological controversies surrounding the Stone Age, the Pan-African Congress of Prehistory and Quaternary Studies sat at Nairobi in 1947 organised by Louis and Mary Leakey to discuss terminology and comparison of regional sequences" (Kiura, 2019: 71). Consequently, the 1947 conference "dropped the term Tumbian and replaced it with Sangoan" (Clark, 1962: 71). The 1955 Pan-African conference that followed recognised the challenges of using the term Sangoan, and introduced another terminology of the First Intermediate Industry to encompass the period between the ESA and MSA (McBrearty, 1988). However, "the Burg Wartenstein symposium of 1965 recommended abandoning the age system and the intermediate periods of Africa (Clark et al., 1966; Bishop & Clark, 1967), cited by McBrearty (1988: 390–391).

Following the 1947 and 1955 Pan-African Congresses on Prehistory and Quaternary Studies (Howe, 1961) and the affirmation in Nairobi (Bushozi, 2011: 41), a consultative board formulated rules for stone tool classification in sub-Saharan Africa that shaped and adopted the South African Stone Age nomenclature. Therefore, East Africa adopted the Stone Age terminologies developed by Goodwin and Goodwin and Van Riet Lowe (1929) built for classifying the South African Stone Age (Kessy, 2005) that entailed the three Stone Ages. The three Stone Age cultural frameworks considered the local archaeological, cultural sequence and varieties in stone tool types. Being a part of East Africa, Uganda also adopted the three Stone Age nomenclature designed in South Africa. The changes in the Stone Age nomenclature suggest that "terminologies have been adopted, dropped, re-adopted, redefined, dated, redated, added to and correlated in Africa" (Basell, 2010: 15); but this paper is restricted to the Sangoan terminology.

Transitional industries

Since the adoption of the three Stone Age system, the issue of transitional industries arose and stimulated debates. At first, Kleindienst (1967) foresaw the need to incorporate the transitional industries into the East African cultural system between the ESA and MSA, just like the MSA and LSA (Bushozi, 2011: 41–42). Kleindienst proposed that the East African cultural classification comprised of the First and Second Intermediate Industries, which were the ESA, Sangoan (first intermediate) (Bushozi, 2011: 44), MSA, Magosian (second intermediate), and LSA. Van Riet Lowe (1952) suggested that a lithic industry should be defined by new technology rather than the continued use of old technology. However, the Sangoan and associated techno-complexes were determined based on surface collections (Taylor, 2016; Kempson, 2007). Therefore, defining the Sangoan from the surface cultural materials made it problematic to distinguish it from the MSA, or even the Acheulean. It was further complicated to tell if the Sangoan represented an independent lithic industry or if its typological and technological disparities from the MSA resulted from varied roles and ecological adaptations (Davies, 1976; Kuman, 2003; Hoover, 1974). The controversies surrounding the inclusion of the intermediate lithic industries like the Sangoan into the Stone Age nomenclature required the analysis of its chronological debates.

Sangoan chronological descriptions

According to Basell (2012: 3), the Sangoan remains poorly defined chronologically and technologically. Therefore, the divergent suggestions concerning the position of the Sangoan in Stone Age nomenclature are as demonstrated in Table 1.

Table 1: Definition of the Sangoan by Various Scholars

Author(s)	Year	Description of Sangoan
Wayland & Smith	1923: 6	"Related to the Le Moustier facies."
O'Brien	1936: 43	"Same as the Tumbian"
Davies	1957: 107	"Sangoan replaced the Acheulean."
Cooke	1962: 212	"Sangoan is the first Intermediate Stone Age"
Clark	1964: 94	"The Sangoan is a transition between the Earlier and Middle Stone Ages."
O'Brien	1969: 143	"There have been possible hints that the Sangoan never existed at all, and the material we call Sangoan may be facies of the Lupemban."
Sampson	1974: 9	"The Sangoan industry consisted of a combination of Acheulean and MSA artefacts such as hand-axes, cleavers, knives, scrapers, utilised flakes and Levallois cores."
Davies	1976: 886	"Kalambo Falls Sangoan was a late phase of the Middle Stone Age complex that developed after a hiatus of 15000 years since the late Acheulean."
Clark	1988: 236	"The Sangoan is a First Intermediate between the Earlier and Middle Stone Ages."
Isaac Clark	1982: 157–247 1982: 244	"Sangoan is a variant of the Acheulean or Middle Stone Age."
McBrearty	1988: 390	"The Sangoan is a variant of the Acheulian of MSA."
McBrearty	1993 cited by Bushozi (2011: 47)	"An independent cultural innovation represented the transition from ESA to MSA."
Willoughby	1993: 6	"The MSA used in Sub-Saharan Africa includes the first intermediate or Sangoan."
Robertshaw	1995: 60	"The Sangoan is intermediate between the ESA and MSA."
McBrearty & Brooks	2000: 485	"The Sangoan is a heavy-duty industrial variant overlying the Acheulian and underlying the MSA."

Van Peer *et al*	2003: 187	"The Sangoan is an early MSA."
Van Peer	2004: 217	"Sangoan does indeed belong to the MSA."
Bower	2006	The Sangoan as an independent technological revolution of alternation edge modification strategies and prepared core flaking techniques
Basell	2010: 15	"The Sangoan is an ESA-MSA transition."
Scerri & Spinapolica	2019: 12	"Post-Acheulean industry"

Table 1 suggests that there has been a divergence in the description of the Sangoan. For instance, Wayland and Smith (1923: 6) indicated that the Sangoan is part of the *Le Moustier* facies following their work in Uganda at Sango Bay. While Davies (1957: 107) contended this by stating that the Sangoan instead replaced the Acheulian, Cooke (1962: 212) perceived the Sangoan as the "first intermediate lithic industry;" while Clark (1964: 94) took it to be a "transition between the ESA and MSA." O'Brien (1969) even further thought that maybe the Sangoan never existed, but perhaps a facie of the Lupemban. Sampson (1974) viewed the Sangoan techno-complex as a blend of Acheulean and MSA artefacts. To Mehlman (1989) and Basell (2010 & 2012), the Sangoan was the first intermediate or transitional industry. Meanwhile, Davies (1976), at the Kalambo Falls, suggested that the Sangoan was a late MSA phase; and Clark (1988) saw it as an early MSA. On the other hand, McBrearty (1993) described the Sangoan as a sovereign cultural innovation representing the progress from the ESA to MSA; McBrearty (1991) and Van Peer (2004) contended that the Sangoan was an independent industry; while Clark (1982) suggested that it was a variant of either the Acheulean or the MSA.

Further descriptions of the Sangoan by Rots and Van-Peer (2006) indicated that the Sangoan is a taxonomic unit representing the earliest stage of the MSA. The Sangoan has also been regarded as an early MSA dependent on the proof from West Lake Turkana in Kenya from archaeological artefacts, including points, scrapers, flakes and blades dated to about 300 ka (McBrearty, 1988, 2013). However, Van-Peer et al. (2004) affirmed that the Sangoan was an early MSA dependent on their works in Sai. On the other hand, Kuman et al. (2005) additionally assigned the Sangoan (like the Fauresmith) to the last ESA industry, dated around 300,000 years of age. Nonetheless, Herries (2011) characterised the Sangoan as a transitional industry or an early MSA. Finally, Isaac (1982) believed that the Sangoan should be discarded: it is just a raw material expression of the Acheulean/MSA. All this leaves one wondering what the Sangoan is in terms of its chronological position.

Sangoan technological and typological descriptions

The Sangoan typological and technological characteristics, just like Uganda's Stone Age chronology and typology, have continued to be challenging specifically, and generally to the East African Stone Age (Grove & Blinkhorn, 2020; Kessy, 2005). Therefore, the Sangoan has remained unclear regarding its technological and typological characteristics arising from its toolkit, as illustrated in Table 2. Wayland and Smith (1923: 6) gave the original typological descriptions of the Sangoan to include "flakes, scrapers, knives, cores, points, picks and hand axes." These related the Sangoan to the Mousterier facie. The description of the Sangoan typology by subsequent authors like Davies (1954, 1957 & 1976), Kleindienst (1962), Cooke (1962), Clark (1964 & 1965), Sampson (1974), Masao (1979), McBrearty (1988), Klein (2000), Van Peer et al., (2003), Connah (2004), Bushozi (2011), Shipton (2013) and Scerri (2019) followed Wayland (1923) (Table 2). What is clear from the Sangoan typological description is that the toolkit was composed of picks, cores (core axes and core scrapers), cleavers, choppers, scrapers, points and discs, among other lithic tools. Technologically, it has heavy-duty tools characterised by the Levallois core reduction sequence.

Table 2: Sangoan typological characterisation

Author	Date of Publication and Page	Sangoan Typology	Site
Wayland and Smith	1923: 6	Large flakes, side scrapers, notched scrapers, flake knives, tortoise cores, tortoise points, discs, long picks and ovate hand axes belonging to the Le Mousterier in facies.	Msozi hill in Sango Bay, Uganda
Davies	1954: 276	Massive picks, large choppers, hollow and high side scrapers, backed and tortoise cores and faceted platforms.	Nigeria and Ghana
Davies	1954: 276	Picks, heavy scrapers and choppers	Senegal
Davies	1954: 276	Prepared disc cores, miniatures, picks, pebbles and choppers.	Morocco
Davies	1957: 107	Sangoan include picks, large hoenderbek cores, large block trimmed and battered side scrapers	Pietermaritzburg, South Africa
Kleindienst	1962: 85–100	Heavy-duty tools, including picks, choppers and core scrapers.	East Africa
Cooke	1962: 217	Hand axes rather crude: bifaces, uniface, pear-shaped, ovate, picks, flat; small points; disc cores, end scrapers, polyhedral stones or cores, pebble choppers, cleavers (hand axe like), core scrapers, burins and proto-burins.	Southern Rhodesia
Clark	1964	Sangoan shaped tools include; hand axes, cleavers, knives, picks, core-axes and choppers	Kalambo Falls
Clark	1965	Core axe, in addition to the tools suggested by Wayland and Smith (1923)	
Sampson	1974: 9	Hand axes, cleavers, knives, scrapers, utilised flakes and Levallois cores.	Southern Africa
Davies	1976: 896	Picks, not pebble-butted, often double-ended; Hand-axes, core-axes of slug-type, Core-scrapers of high rounded form; Side-scrapers; Hollow scrapers; Faceted polyhedral; Radially prepared discs; Choppers; points; Fabricators; discoidal and high-backed cores; No cleavers; but Kombewa-flakes and cleaver-flakes probably served for cutting.	Central Africa; Kalambo Falls and Luanda
Davies	1976: 885	Picks, large choppers, hollow and side scrapers, high backed and tortoise cores and miniature cleavers.	Ghana
		Picks, heavy scrapers and choppers	Senegal and Morocco

Masao	1979: 290	Sangoan, renamed Tumbian contained small pieces of crescents.	Central Tanzania
McBrearty	1988: 389	Notable tools of Sangoan include heavy-duty tools such as core axes, picks and core scrapers, hand axes and cleavers.	Muguruk, Western Kenya
Klein	2000: 112	Crude hand axe-like 'core axes' and 'picks' typify the Sangoan Culture or variant.	Southern Africa
Van Peer *et al*	2003: 193	Lower Sangoan: hand axes are absent, has blanks from discoidal and globular cores, flake tools are rare, heavy-duty tools well represented such as hammerstones, grinding stones and core axes. Middle Sangoan: quartz, core axes, quartzite cobbles, lanceolate, hand axes, sandstones flakes. Upper Sangoan: discoidal and globular cores, rare flake tools; heavy-duty tools like hammerstones, grinding stones, and core axes.	Sai B, Sudan
Connah	2004: 19	Core tools in west Africa included Sangoan picks and Sangoan artefacts dated 100,000–80,000 years.	Africa generally that he termed as Forgotten Africa
Bushozi	2011: 45	Sangoan, termed as Njarasan in Tanzania, comprises heavy-duty tools, particularly core axes, picks and core scrapers, as well as large flakes.	Lake Eyasi
Shipton	2013: 46	Large elongate bifaces Core axes, pebble cores, radial cores.	Kavirondo Gulf Yala-Alego
Scerri	2019: 12	Core axes, picks, flakes and large planes are associated with Sangoan, but many of the elements of the Sangoan are absent in North Africa.	North Africa

The presence of typological features of the Acheulean in the Sangoan toolkit, such as cleavers and flake hand axes, warrants interrogations into what constituted the Sangoan techno-complex (Clark, 1982; Klein 2009 & 1989; Tryon & McBrearty, 2002). The mixed descriptions of the Sangoan typology and technology show that, regardless of the term 'Sangoan' showing up in archaeological works for more than 60 years (Davies, 1973), it is still imperfectly characterised archaeologically (McBrearty, 1988). For instance, Clark (1988) suggested that the Sangoan toolkit, mainly in East Africa, especially around the Lake Victoria basin, comprises core axes, core scrapers, large flakes, scrapers and bifacial points made from peripheral prepared and amorphous cores. On the other hand, Cole (1965), Mehlman (1989) and Bushozi (2011) are of the view that the lithic artefacts in the Sangoan toolkit included picks, hand axes and choppers that suggest evidence of technological progress and retardation between the ESA and MSA cultures. This meant that, whereas new technological aspects were adopted and retained, others were discarded. Those that continue with the coming of recent chronological periods may be the source of debate concerning what the Sangoan constituted.

Bushozi (2011: 45) suggested that "the first Intermediate Industry in which the Sangoan belongs comprises flakes, scrapers, points, burins, blades, bladelets, large backed pieces, and crescents." While Kessy (2005) and Klein (2009 & 1989) supplement the Sangoan toolkit with other cultural materials—e.g., ostrich and land snail shells, beads and ochre—Ambrose (2002), Bower et al. (1985), Mehlman (1989) and Skinner et al. (2003) are of the view that these were not common in typical MSA assemblages. Moreover, to Goren-Inbar and Saragusti (1996: 15), "technological and morphometric comparison between tools manufactured by the different techniques does not demonstrate any bimodal patterning of the end product." Therefore, there were technological and behavioural connections between the Acheulean, Sangoan and MSA based on the toolkit presented in Table 2. The late MSA culture, or the Second Intermediate Industry, was a formative stage for the changes in toolmaking expertise, adaptation and behavioural patterns that culminated into the Sangoan (Ssemulende, 2017). The Sangoan typology identified by Wayland and Smith (1923) in Uganda, Clark (1988) at Kalambo Falls, and Rots and Van Peer (2006) in Sai-Sudan constituted core axes, scrapers, flakes and bifacially modified pieces that infrequently depicted *Levallois* and disc core flaking strategies. The Sangoan artefacts' discovery at the Nsongezi rock shelter chronologically underneath the MSA suggested that the Sangoan was much older than the MSA, but with evidence of 'post-Acheulean' presence (Masao, 1983: 118).

Technologically, O'Brien (1939) accepted that the Sangoan techno-complex was a distinct technological development of the *Levallois* technology that involved preparing the platform. Bower (2006) portrayed the Sangoan technology as an independent, technological revolution that entailed core platform modification strategies and prepared core flaking techniques, which had a typological and technological relationship with the traditional MSA industries. O'Brien's perceptions, based on the ongoing revelations in South Africa, concur with Bower (2006)'s suggestion of *Levallois* technology. The *Levallois* technology included projectile weapons and radiometrically short weapons dating around 500 ka (Clark et al., 2001; McBrearty, 2013).

Sangoan palaeoenvironmental descriptions

Another area of contention concerning the Sangoan is the palaeoenvironmental context of the area where the Sangoan existed. Scholars like Janmart (1953) suggested that the Sangoan was associated with the end of the desert conditions. Clark (1965: 85) believed that "the Sangoan existed in heavy vegetation zones, specifically the forested areas." However, McBrearty (1992: 9), at Simbi, suggested that "the Sangoan was associated with open Savanna," while Scerri (2019: 12) attributes the "Sangoan to the equatorial region" (Table 3).

Table 3: Palaeoecological Contexts of the Sangoan

Author	Year & Pg.	Environmental description of the Sangoan
Janmart	1953:20	Middle-Upper Sangoan marked the desert conditions during the Kanjeran-Gamblian Interpluvial.
Clark	1965:85	Forested areas of the equatorial, west and south-east Africa were habitats of the Sangoan.
MacBrearty	1992:9	The Sangoan at Simbi, western Kenya, is associated with fauna indicative of open savanna conditions
Scerri	2019:12	The Sangoan is associated with equatorial and southeastern Africa.

Therefore, a detailed analysis of the diverse descriptions of the geographical characteristics inhabited by the Sangoan toolmakers and users will be the subject of another paper. Still, at least this shows the brief controversy.

Besides the typology, technology and paleoenvironmental controversies of the Sangoan, are the chronological challenges. The chronological difficulties stem from relating the Sangoan to a long-life expectancy of around 1.4mya (Davies, 1976). Another controversy surrounding the Sangoan chronology or dating is the assignment of wrong and long-dating sequences to its toolkit. For instance, 285,000 years ago has been assigned in Africa, while the Sangoan in Europe and parts of western Asia is dated 250,000–200,000 years (Tyron & McBrearty, 2002). Such a long dating sequence may suggest a conservative tradition that was not changing, which may be far from reality.

However, the Sangoan sometimes falls within the radiocarbon dating or outside, and being in the interior. It is also hard to have reliable dates using molluscs. Peer et al. (2003) gave the oldest Optically Stimulated Luminescence (OSL) Sangoan date from Sai Island as 182 ± 20kyr. Since the vast majority of the Sangoan faultfinders depended on the absence of chronological evidence from the excavation, an attempt was made to excavate at Sango Bay, the type site. Still, unfortunately, there was no dating done. Before this research, most Sangoan evidence was either from reworked river terraces characterised by Cahen's (1978) pseudo-industries, or based on surface materials (Ssemulende, 2017). This paper, therefore, examines Stone Age terminology to situate the Sangoan and the typological, technological and environmental attributes of the Sangoan techno-complex at Simba Hill in southern Uganda.

Topographical and social characteristics of the study area

Sango Bay is an archaeological site located in present-day Kyotera District, Southern Uganda. It has around 2,500km^2 and lies near the Lake Victoria basin (Figure 1).

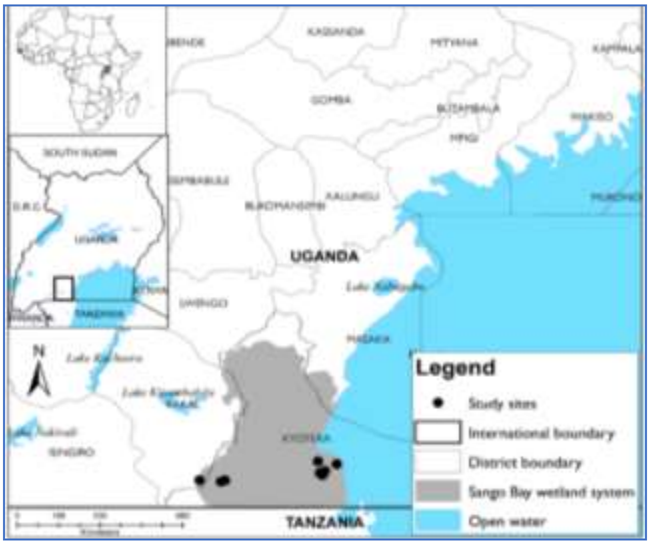

Figure 1: Location of Simba Hill within Sango Bay and Uganda

Source: Sango Bay field data, 2015

Materials and methods

The purpose of this study was to examine the intricate use of the term 'Sangoan' and its placement between the ESA and the MSA. In 2015 there was an archaeology survey in Sango Bay and excavation at Simba hill to examine the technological characteristics of the Sangoan. More data collected in 2020 incorporated studying the controversies surrounding using the term Sangoan in Stone Age nomenclature. The data was collected from a detailed literature review of lithic terminologies such as by Kichard (1944), Goodwin (1946) and Goodwin (1929). Interestingly, documentary information obtained from library records at Makerere University, Kyambogo University, and Dar es Salaam enhanced the archaeological survey and excavation data.

Lithic survey methodology

Field research involved an archaeological surface survey. The two phases of the archaeological survey encompassed about 202.6km (see Figure 2).

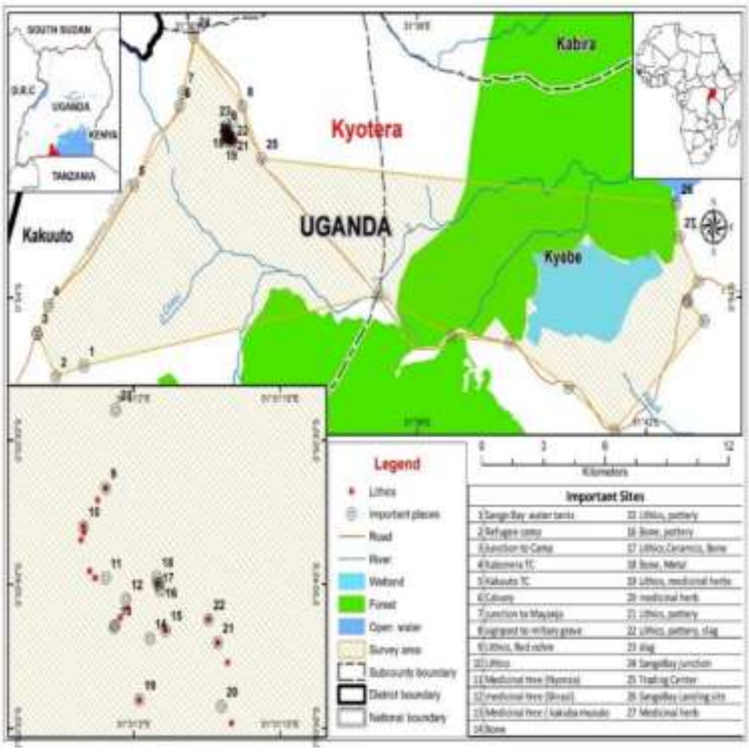

Figure 2: Archaeological survey coverage
Source: Sango Bay field data, 2015

The archaeological survey was unsystematic due to the nature of the terrain and vegetation cover. However, the archaeological survey prompted a deliberate choice of Simba Hill for a detailed field study and test excavation to get primary data. The sample size was comprised of the recovered lithic materials from the archaeological surface survey and excavation at Simba Hill. The archaeological survey's motivation was to delineate areas with thick surface scatters (refer to the scatter around point 23 on Figure 1) across Sango Bay to locate excavation sites. The archaeological materials, particularly lithic artefacts, were picked and bagged for additional investigation. The undiagnostic and non-portable cultural materials were photographed and mapped utilising the Global Positioning System (GPS) and left *in situ*. Thirteen archaeological sites were recorded through the archaeological survey (Figures 2 and 3).

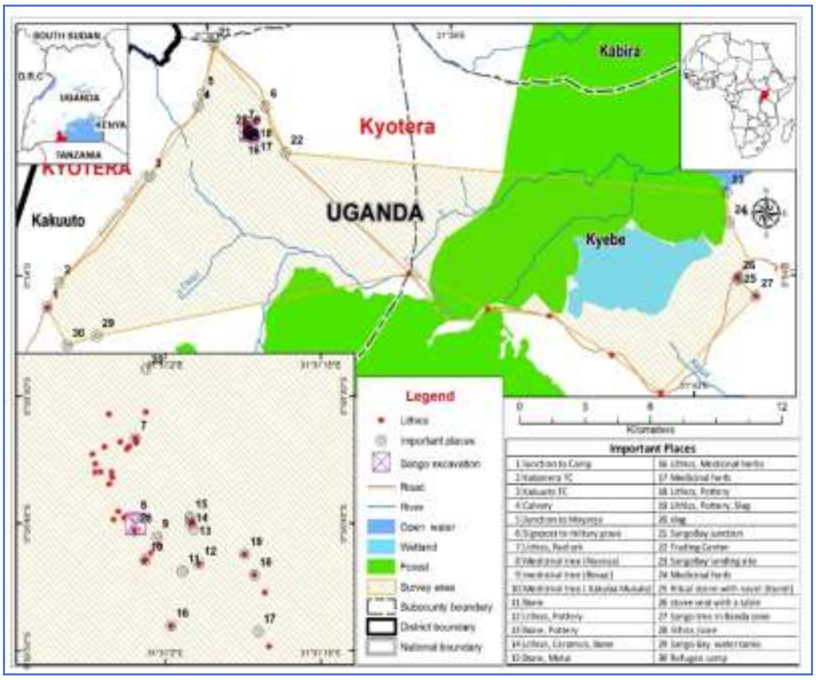

Figure 3: Location of the excavation unit at Simba Hill

Source: Sango Bay field data, 2015

Lithic excavation methodology

From the 13 sites identified during the archaeological survey of Sango Bay, one excavation unit was established at Simba Hill. Several factors determined the excavation at Simba: the plateau landscape, dense concentration of archaeological materials, and materials being in their primary context due to being at a hilltop in comparison to valleys where materials may have been affected by cultural and natural site formation processes such as erosion and agriculture, respectively. Therefore, a 2 × 2m² unit was established at Simba Hill in the most undisturbed context (Figure 3). In addition, the excavation utilised arbitrary spit levels of 10cm to allow interpretation between levels, avoid contamination, enhance highly commendable control (Pavel, 2012), and adequately manage the stratigraphic occurrence of the materials.

Lithic analysis methodology

The recovered artefacts from the surface surveys and excavation were broken down typologically and technologically utilising the lithic analysis schemes of Mehlman (1989) and Kyazike (2016). The lithic metric attributes of length, breadth and thickness of each artefact, in millimetres, were taken utilising a computerised electronic vernier calliper (MacAllister model 0–150mm). In terms of measurement for all the shaped tools made from flakes, the length measurement was done between the proximal and distal. Measuring the breadth was made by taking the broadest point, yet the thickness was measured along the ventral face of the flake (Kessy, 2015). The lithic artefacts without a striking platform were measured depending on the observer's worked edge orientation, with the lithic tool's length being the greatest edge component that runs corresponding to the eyewitness. At the same time, the width was taken at the right angle of the length. Thus, the maximum length was perpendicular to the striking platform and parallel to the flake release face, while the breadth was measured at the widest point at right angles to the length in the case of cores. However, multiplatform and peripherally worked cores had length estimates taken focusing on the maximum projection.

On the other hand, the breadth was at the right angle to the length. The thickness was the maximum dimension estimated perpendicular to the flake release face at the right angles (Kessy, 2005, cited by Ssemulende, 2017). Therefore, the emphasis on metric attributes concerns a series of different metric measurements in stone tool assemblages that answer several common archaeological questions, such as the procurement of raw materials (Clarkson, 2010). Other than the metric attributes, other aspects examined during the analysis included platform type, flake terminations, retouch nature, and the type of raw material. To achieve the technological goal, attributes associated with retouching patterns such as types of retouch and extent of retouch were explicitly examined alongside flake termination attributes, stage of core abandonment, metric attributes, and platform type and size. Metric measurements and modification of edges were intended to investigate strategies required for making a particular artefact type.

Results

The results stem from the research objectives that include locating the Sangoan within the Stone Age nomenclature through examining its typology, technology and geographical characteristics (raw material utilisation). The Sangoan lithic types and technological characteristics are derived from the recovered lithic artefacts at both the surface and sub-surface levels. Although the artefacts recovered from Sango Bay included lithics, pottery, iron slag, and red ochre, emphasis was on the lithics that constituted the Sangoan culture. The archaeological surface survey yielded 73 lithic artefacts, including 63 shaped tools, one core, five debitage and four nonflaked stones, as detailed in Table 4.

Table 4: General lithic types

General Lithic Type	Total	Percentage
Shaped tools	63	86.3
Cores	1	1.4
Debitage	5	6.8
Nonflaked stones	4	5.5
Grand Total	**73**	**100**

The dominant shaped tools were 30 scrapers (41.1%). Other shaped tools included 10 discoids (13.7%), 3 lanceolate (4.1%), 10 hand axes (13.7%), 3 cleavers (2.7%), 1 pickaxe (1.4%) and 7 core axes (9.6%) (Table 5). All these lithic collections were from the surface. Other than the shaped tools, the surface survey yielded nonflaked stones, and in this category were four hammerstones (5.5%). The last category of lithics from the survey was a single core that constituted 1.4% (Table 5) of the total lithic collection from the surface survey at Sango Bay. All four (4) nonflaked stone tools belonged to hammerstones. The hammerstones were all produced using quartz raw material and were recovered from the surface survey, with an average length of 86mm, a breadth of 73mm, and a thickness of 62mm.

Table 5: Specific Lithic types from Sango Bay surface collections

Lithic type	Total	Percentage
Scrapers	30	41.1
Discoid	10	13.7
Lanceolate	3	4.1
Hand axe	10	13.7
Cleaver	2	2.7
Pickaxe	1	1.4
Core axe	7	9.6
Flake	5	6.8
Hammerstone	4	5.5
Radial core	1	1.4
Grand Total	**73**	**100**

Other than the surface survey was the excavation of one unit at Simba Hill in Sango Bay. The excavation unit surface yielded 20 artefacts. Level 1 (0–15cm) had 365 artefacts; Level 2 (15–25cm) had 311 artefacts, Level 3 (25–35cm) had 339 artefacts, Level 4 (35–45cm) had 195 artefacts, Level 5 (45–55cm) had 54 artefacts, Level 6 (55–65cm) had 50 artefacts, and Level 7 (65–75cm) yielded ten lithic artefacts (Figure 4). Other than the lithics, two (2) red ochre pieces were obtained from Level 1 (0–15cm) and Level 3 (25–35cm), with one sample in each level.

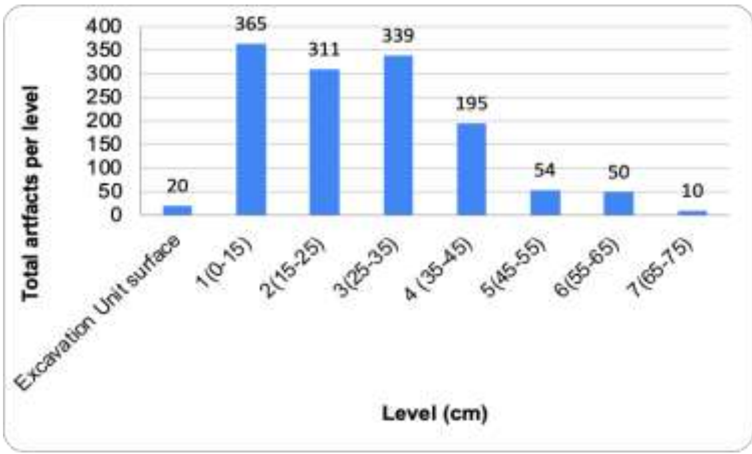

Figure 4: Excavation Unit 1 material per level
Source: Sango Bay field data, 2015

Conventionally, the stratigraphic profiles examined in the excavation unit along the western wall (Figure 5) and the southern wall (Figure 6) at Simba Hill comprised three stratigraphic layers generated from the levels illustrated in Figure 4. Layer 1 consisted of Levels 1 and 2, that is 0–25cm; Layer 2 was stretched from 25–55cm, meaning that it was composed of Levels 3, 4 and 5 (Figure 5), and Layer 3 was 55–75cm encompassing Levels 6 and 7 as indicated in Figures 5 and 6.

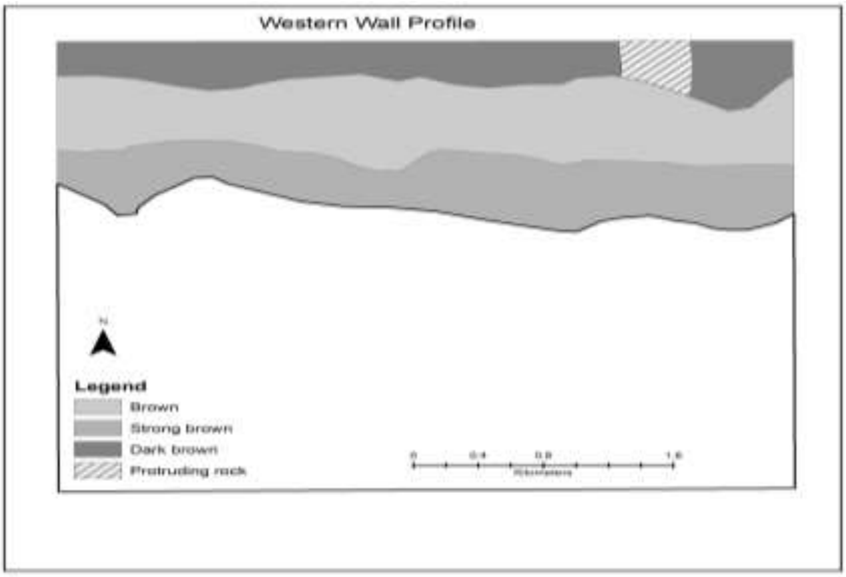

Figure 5: Western wall stratigraphic layers of the excavation unit
Source: Sango Bay field data, 2015

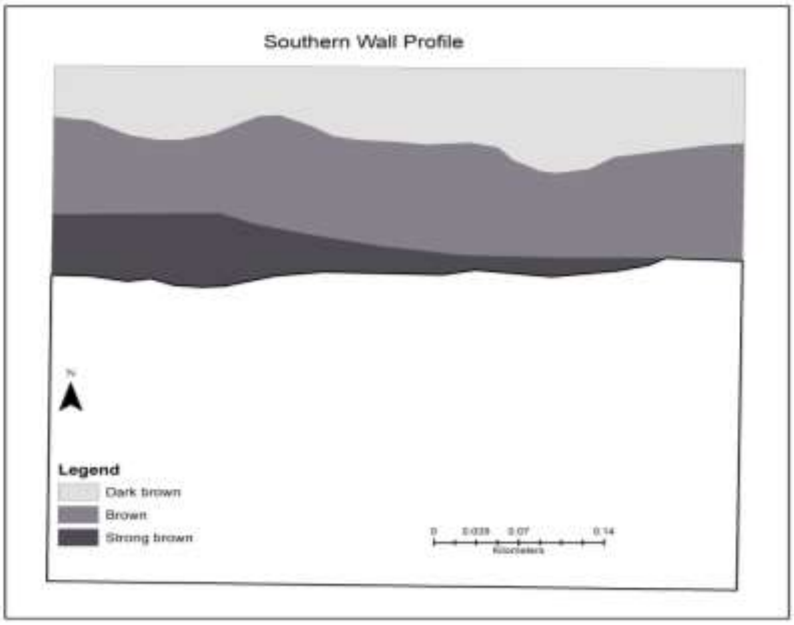

Figure 6: Southern wall stratigraphic layers of the Simba Excavation Unit
Source: Sango Bay field data, 2015

The entire excavation unit yielded 1346 artefacts: 1344 were lithics, and 2 were ochre pieces. Therefore, stratigraphic Layer 1 (0–25cm), comprising dark brown soils with loose and lateritic texture, yielded 385 lithic artefacts that included 76 cores, 418 shaped tools, 65 debitage, and seven backed pieces. Layer 1 (0–25cm) also produced one piece of red ochre. Layer 2 (25–55cm) had loose brown soils with coarse laterite. This layer yielded 846 lithic artefacts that included 167 cores, 206 debitage, and 323 shaped tools. The layer also had one piece of red ochre obtained between 25–35cm. Layer 3 (55–75cm) had strong brown soils with coarse, gravelly soil texture. This layer had the most negligible production of artefacts, generating only 114 lithic artefacts. The artefacts included 23 cores, 18 debitage, and 41 shaped tools (Table 6). The excavation unit became unproductive at 75cm below the surface, marking the end of the excavation. The excavation assemblage constitutes the data for discussion in this paper.

Table 6: Material inventory of the Excavation Unit

Lithic artefact type	Layer 1	Layer 2	Layer 3	Total	Percentage
Cores	76	167	23	266	19.8
Debitage	65	206	18	289	21.5
Shaped Tools	418	323	41	782	58.1
Backed pieces	7			7	0.5
Ochre	1	1		2	0.1
Total	**386**	**846**	**114**	**1346**	**100**

Sangoan lithic typology from Simba Hill

The Sangoan lithic typology discussed belonged to four broad categories, including 782 retouched/shaped tools (58.1%); 289 debitage (21.5%); 266 cores (19.8%); and 7 backed pieces (0.5%) from the excavation unit (Table 4). In addition, the red ochre piece from the same layer constituted 0.1% of the artefact collection from the excavation unit. Therefore, the shaped tools dominated the lithic typology at Sango Bay with 58.1%. In comparison, the rest of the lithic artefacts amounted to 41.9% of the total lithic collection of 1344 items from the excavation unit.

Retouched tools

The 782 retouched or shaped tools from the excavation unit included 597 scrapers (76.3%), 119 discoids (15.2%), 19 lanceolate (2.4%), 15 core axes (1.9%), 10 cleavers (1.3%), 7 becs (0.9%), 6 points (0.8%), 4 hand axes (0.5%), 3 choppers (0.4%), 2 burins (0.3%), 2 pickaxes (0.3%) and 1 preform (0.1%) as detailed in Table 7.

Table 7: Shaped tool typology from the Simba Hill Excavation

Retouched Tools	Layer 1 (0–25cm)	Layer 2 (25–55cm)	Layer 3 (55–75cm)	Total	%age
Scrapers	318	244	35	597	76.3
Discoid	67	49	3	119	15.2
Lanceolate	13	5	1	19	2.4
Core axe	4	10	1	15	1.9
Cleavers	7	3		10	1.3
Bec	3	3	1	7	0.9
Points	3			6	0.8
Hand axes		4		4	0.5
Chopper	2	1		3	0.4
Burin	1	1		2	0.3
Pickaxe		2		2	0.3
Preform		1		1	0.1
Total	**418**	**323**	**41**	**782**	**100**

Scrapers

The 597 scrapers from Simba Hill belonged to 14 categories; Layer 1 (0–25cm) had 318; while Layer 2 (25–55cm) yielded 244, and the least was from Layer 3 (55–75cm) with 35 scrapers (Table 8). The specific scraper types identified from the excavation unit included 1 irregular or sundry side scraper (0.2%) (Figure 7), 1 concave side (0.2%) (Figure 8), two convex and straight-sided (0.3%), 2 straight-sided and end (0.3%), 3 concave-convex combination (0.5%), 7 straight-sided (1.2%), 8 concavity (1.3%), 23 convex end (3.9%), 27 convex double (4.5%), 37 straight double (6.2%), 70 convex side and end (11.7%), 96 core scrapers (16.1%), 99 convex side (16.6%) and 221 circular scrapers (37.0%) (Table 8). The 597 scrapers were mainly made from rhyolite raw material, with 347 scrapers, leading to 58.1%. This was followed by 187 in quartz (31.3%), 40 from quartzite (6.7%), 17 with milky quartz (2.8%), one on clear quartz (0.2%), three in granite (0.5%), and two from shale (0.3%) lithic raw materials. The circular scrapers were the predominant scraper categories from the excavation, with a total of 221 scrapers. Of the 221 scrapers, 109 were amassed in Layer 1 (0-25)cm, 102 from Layer 2 (25-55)cm and 10 from Layer 3 (55-75)cm (Table 8).

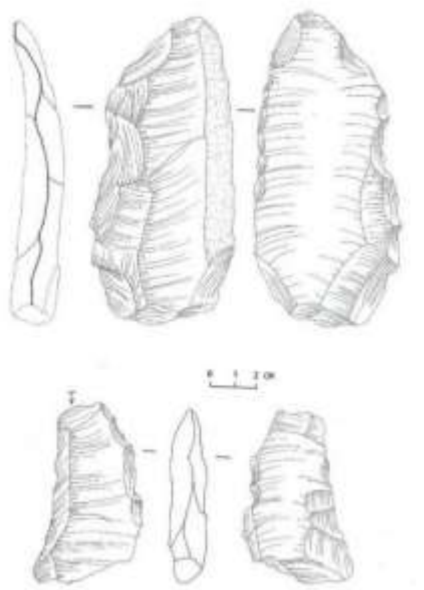

Figure 7: Side and end (top) and Sundry side scrapers (bottom)
Source: Sango Bay field data, 2015

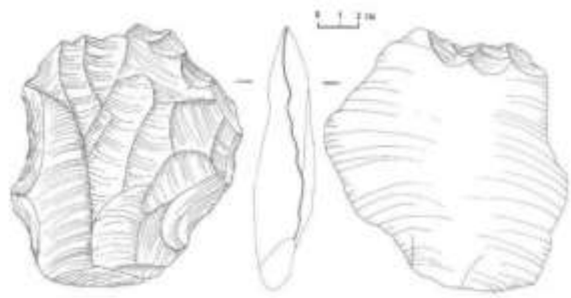

Figure 8: Concave side and end scraper
Source: Sango Bay field data, 2015

Table 8: Scraper types at Sango Bay

	Layers (cm)				
Scraper types	**Layer 1 (0–25cm)**	**Layer 2 (25–55cm)**	**Layer 3 (55–75cm)**	**Total**	**Percentage**
Irregular side	1			1	0.2
Concave side		1		1	0.2
Convex and straight side	1	1		2	0.3
Straight side and end	1	1		2	0.3
Convex-concave combination	2		1	3	0.5
Straight side	7			7	1.2
Concavity	6	2		8	1.3
Convex end scrapers	12	9	2	23	3.9
Convex double	9	15	3	27	4.5
Straight double side	28	9		37	6.2
Convex side and end	44	20	6	70	11.7
Core scrapers	38	50	8	96	16.1
Convex side	60	34	5	99	16.6
Circular	109	102	10	221	37.0
Total	**318**	**244**	**35**	**597**	**100**

This investigation viewed the core scrapers as modified lithic tools regardless of Mehlman's proposal (1989) that categorising them under scrapers would swell the scraper varieties. In this paper, since the core scrapers exhibited an angle of retouch between 30º–90º, they qualified as scrapers. Further measurable tests uncovered that the average scraper length was 43.3mm, breadth was 39.6mm, and thickness was 15.7mm. Five platform types informed the identification of the Sangoan technology. The Levallois was the dominant platform type identified on 457 scrapers. This is in line with Wilkins et al. (2010) at Kudu Koppie, who suggested that both the late ESA and MSA toolmakers employed the Levallois Volumetric concept. Other than the Levallois, the different platforms included the 48 crushed platforms, 48 dihedrals, 41 undetermined, and three trihedral platforms. The presence of the Levallois platforms does not warrant grouping the Sangoan at Sango Bay as MSA, as recommended by Van Peer et al. (2003) and Rots and Van Peer (2006), because there is a need to think about the other characteristics before making such a conclusion.

Other than scrapers, the other shaped tools totalled 185 lithic artefacts from the excavation unit. The shaped tools included 119 discoids, as shown in Figures 9 and 10; followed by 15 core axes, 19 lanceolates, ten cleavers, 4 hand axes (Figure 7); 7 becs, 3 points, 2 pickaxes (Figure 11), 3 choppers (Figure 10), and 2 burins. Aside from becs, points, and lanceolates, the investigation of shaped tools featured rhyolite as the primary raw material. For the becs, only one was of rhyolite, and the other six were of quartz raw material. In the lanceolates, rhyolite was the prevailing raw material for 11 artefacts, while 9 were quartzite raw material.

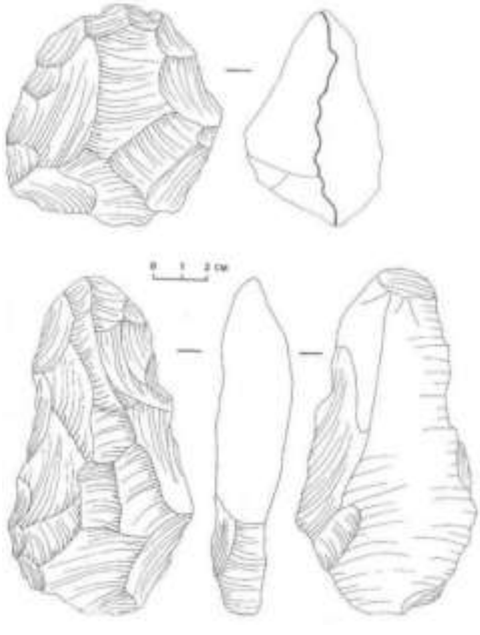

Figure 9: Discoid (top) and hand axe (bottom)

Source: Sango Bay field data, **2015**

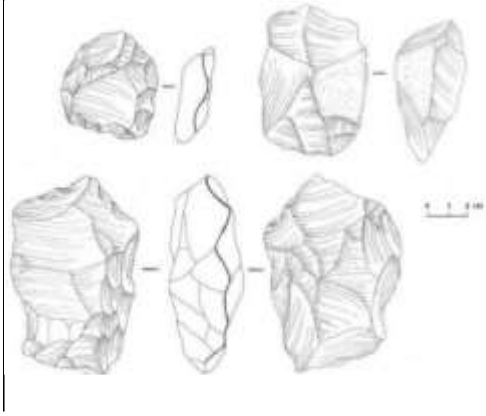

Figure 10: Discoid (top) and chopper (bottom)

Source: Sango Bay field data, 2015

One of the points regarded as a point rough out in this paper served as an example of incomplete lithic tools named a preform moving towards a bifacial point's morphology. Most lithic artefacts found at Simba Hill—for instance, scrapers, points, becs, discoids and burins—are generally accepted as part of the MSA lithic industry over the East African region (Mehlman, 1989; Willoughby, 2007). Typical MSA artefacts in the Sangoan contexts at Sango Bay, like at the other sites, suggest that the MSA people who made and used the Sangoan artefacts adapted to varied ecological environments, including tropical environments, forests, grassland and that of coastal regions. However, the occurrence of a new technological industry did not mean a complete abandonment of the previous culture. Instead, the coexistence of the latest and old cultures made this an early MSA lithic industry.

Notwithstanding, unlike the typical Acheulean, the Sangoan at Sango Bay had four-hand axes in the stratigraphic collection of 1344 lithic artefacts. Their average length was 117.2mm, 68.2mm breadth, and 31.2mm thickness; making them appear elongated. Despite having the four-hand axes, the assemblage at Sango Bay cannot be classified as Acheulean but an early MSA, where some of the technological characteristics of the Acheulean persisted into the MSA. As noted earlier, the Sango Bay assemblage had becs, pickaxes (Figure 11), points and point preform, burin, chopper, cleaver, core axes, discoids and lanceolate that confirm the transition. It should be noted that the 119 discoids had 44.5mm average length, 41.3mm breadth and 15.9mm average thickness. In terms of raw materials, the discoids were made mainly in rhyolite with 68 artefacts, followed by quartz on 39, quartzite on 7, clear and milky quartz on 2 each, and 1 on basalt. The utilisation of locally available raw materials within the vicinity rather than imported raw materials means that the Sangoan environmental conditions provided sufficient means for their survival, limiting their mobility. While 88 discoids were made bifacially, the 31 were unifacially retouched. The dominance of the bifacial technology that started in the Acheulean further confirms that the Sangoan was an early MSA that utilised rejuvenated tools previously regarded as Acheulean.

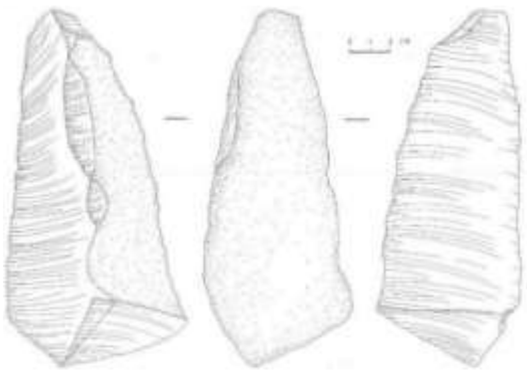

Figure 10: Pickaxe

Source: Sango Bay field data, 2015

From the total of 266 lithics in Layer 1 (0–25cm), 143 in Layer 2 (25–55cm), and 114 in Layer 3 (55–75cm), only 9 cores existed. The cores were subdivided further into three categories as follows: 42 patterned platform cores, 169 periphery worked cores, and 26 amorphous cores, and 29 core fragments (Figure 12). The patterned platform cores also had other divisions, including 10 adjacent double platform cores, 17 multiplatform cores, and 15 opposed double platforms. The quantity of cores per categorisation shows that the predominant core category was periphery worked cores. The periphery worked core typology had further subtypes that included 27 part periphery cores, 66 radial cores, 16 disc cores, and 59 Levallois cores. The last core typological category of amorphous cores had 26 cores that accounted for 9.8% of the entire core collection at Sango Bay. The last type was for the unclassified 29 core fragments. Shockingly, information uncovered by this paper indicated that even though rhyolite had the highest number of lithic shaped tool manufacture in the entire study site, the predominant raw material for the manufacture of core artefacts was quartz, with 186 core artefacts. However, it still shows locally available raw materials: rhyolite raw material with 51 cores, milky quartz had 12, quartzite with 11, granite had 3, and clear quartz also had 3 cores made from it.

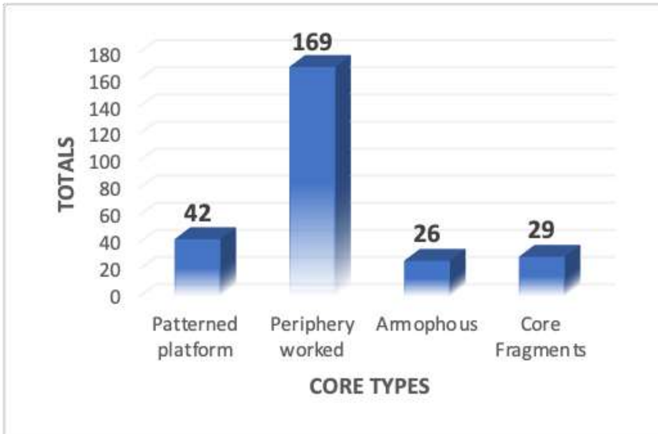

Figure 11: Broad core types at Sango Bay
Source: Sango Bay field data, 2015

It was crucial to examine the stage at which lithic cores were abandoned to understand the availability of raw materials at Sango Bay. Among the findings, 153 cores were completely exhausted before discard, while 80 had evidence of premature abandonment. However, only 19 were abandoned early, though 14 could not be established as to what state they were abandoned (Table 9). The predominance of the exhausted cores proposes a shortage of raw materials and reuse of typical ones of the Sangoan industry. The quantity of cores recognised endorses a core technology at Sango Bay, making the Sangoan an MSA industry. The core reduction yielded scrapers as supported by Clark and Kleindienst (2001): that Sangoan has a much higher percentage of light-duty tools, particularly scrapers; and further suggests that this stage represents the beginning of the MSA and the disappearance of the Acheulian industry. The average length of all the cores was 42.9mm, the breadth was 35.1mm, and the thickness was 22.6mm. This suggests a heavy-duty sector at the same time.

Table 9: State of Core Abandonment

State of abandonment	Total	Percentage
Exhausted	153	57.5
Premature	80	30.1
Too early	19	7.1
Undetermined	14	5.3
Total	**266**	**100**

Debitage

Debitage encompassed all results of lithic toolmaking except for cores, shaped tools, and backed pieces. The dominant type was the flake. Following Mehlman (1989), the Sangoan flakes are defined here as non-shaped chipped stones with some part of flake talon, except for specialised flakes. The 7 Sangoan blades, on the other hand, were regarded as such depending on measurements, whereby any non-modified lithic piece whose length was twice as much as its width qualified as a blade. The 289 debitage types recovered included: 263 flakes, seven blades, and 19 angular fragments. The 263 flakes that belonged to the debitage comprised 68 flake talon fragments, 13 Kombewa flakes, 47 utilised flakes (Figure 13), and 135 whole flakes. Therefore, the debitage had a smaller fraction of 21.5%, compared to the shaped tools with 58.1%; hence implying a unique behaviour of the Sangoan lithic industry at Sango Bay of limited waste, or suggesting manufacture away from the point of utilisation.

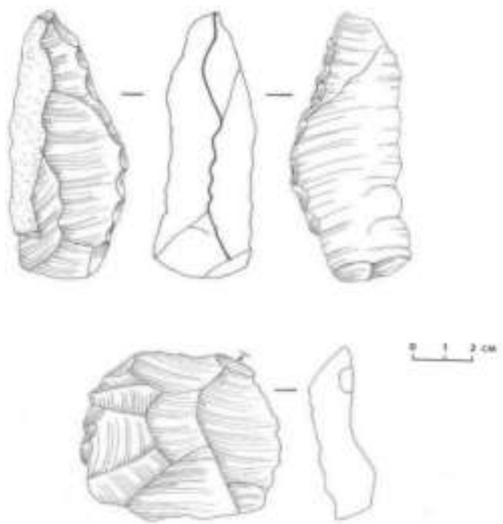

Figure 12: Utilised flake (top)

Source: Sango Bay field data, 2015

The Kombewa flakes recovered in Sango Bay stress the Sangoan culture in Sango Bay, based on how comparative artefacts have been distinguished in various parts all around the world appended to this industry. According to Agam et al. (2015), Kombewa flakes suggest a flake with a double ventral from a giant flake's ventral face, comprising two separate trajectories: one for regular production, and the other for recycling. Even though Kombewa flakes hardly appear in most MSA sites in the East Africa region (Mehlman, 1989), their occurrence at Sango Bay shows localised technological developments that may propose a transitional industry that stretches to the MSA. The debitage was 40.4mm in length, 35.8mm broad, and 13.9mm thick in terms of measurement.

Sangoan technological characteristics

The ESA and MSA artefacts have remarkable technological characteristics across the region as an initial stage for developing cultural identity in Africa (Clark, 1988). Bushozi (2011) suggested that the tools at Sango Bay—such as picks, hand axes, and choppers—symbolise technological connectivity features between the ESA and MSA cultures. Several attributes helped to examine the Sangoan technological characteristics at Sango Bay. The first technological attribute examined was the retouch pattern, while others were the kind of retouch made and the degree of retouch. This implied that we reviewed the type of flake termination, the stage at which the cores were discarded, the lithic artefact platform (especially the cores), the kind of platform, and the platform metric measurements that encompassed length, breadth and thickness.

While prepared core technology was a technological hallmark for the MSA (Tryon & Faith, 2013), it originated in the late ESA, and thus continued into the Sangoan period. Technologically, the platform type for the 1284 lithic artefacts, whose platforms were analysed, suggested that the dominant platform reduction strategy was the Levallois, with 872 lithic artefacts and 67.9% of the platform types. The Levallois were followed by 198 undetermined (15.4%); 101 dihedrals and crushed platforms, each with 7.9%; 8 trihedral (0.6%); and the least were four cortical platforms constituting 0.3% of the platform types at Sango Bay (Table 10). The dominance of the Levallois platform types would further confirm that the Sangoan are a transition between the ESA and MSA, where the Levallois technology is traced.

Table 10: Lithic platform types at Sango Bay

Platform Type	Total	Percentage
Levallois	872	67.9
Undetermined	198	15.4
Dihedral	101	7.9
Crushed	101	7.9
Trihedral	8	0.6
Cortical	4	0.3
Total	**1284**	**100**

Most lithic tools identified by this research were from flakes, suggesting platform preparation technologies for Simba Hill. The Sangoan lithic assemblage at Sango Bay exhibited the dominance of bifacial retouches that constituted 75.6% on 591 shaped tools, while two were not determined. The unifacial retouched tools included 24.2% of the 189 artefacts. Therefore, having more bifacially retouched tools meant that the Sangoan lithic tools were preserved, redesigned and reused before being discarded. The Sangoan flake termination patterns at Simba Hill included 737 feather termination, 309 overshoot, 6 hinges, and 1 crushed flake termination pattern (Figure 14).

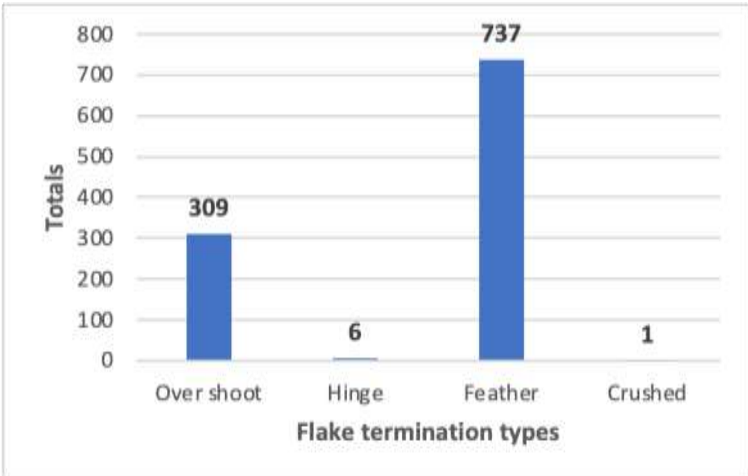

Figure 13: Lithic flake termination at Sango Bay
Source: Sango Bay Field data, 2015

The site's raw materials identified as per objective three highlighted a localised subsistence strategy of the toolmakers at Sango Bay. Secondly, the raw materials also gave clues for examining the mobility patterns of the Sangoan. Subsequently, the need to comprehend Sango Bay's environmental conditions may have set off early people to choose such an area for settlement and human exploitation. Accordingly, the adaptability frameworks of individuals are determined by the ecological determinism hypothesis. For Bond (1948), the choice of raw materials affected the Sangoan typology more than the Acheulean, hence specialisation before the Sangoan lithic industry, such as in Congo (Tryon & Faith, 2013; O'Brien, 1966). Therefore, the evidence from this research confirmed local, rather than exotic, raw materials at Sango Bay. The local raw materials were particularly rhyolite, quartz, quartzite, and granite. The dominant raw material used by the Sangoan toolmakers was rhyolite, which comprised 48.3% of 649 artefacts. Quartz was relatively a popular raw material with 39.4% on 529 artefacts. Nevertheless, quartzite appeared on 99 artefacts with 7.4%; granite constituted 0.7% with 10 artefacts; and the least was shale with 3 artefacts at 0.2% of raw material occurrence (Table 11).

Table 11: Lithic raw material types

Raw Material	Total	Percentage
Basalt	2	0.1
Clear quartz	8	0.6
Granite	10	0.7
Milky quartz	44	3.3
Quartz	529	39.4
Quartzite	99	7.4
Rhyolite	649	48.3
Shale	3	0.2
Total	**1344**	**100.0**

Discussion

According to Goodwin (1946: 91), the "… classic system of archaeological terminology evolved in a limited field (parts of France only) at a time when the ethnic intricacies of ethnology and prehistory were incompletely understood, and the problems that would eventually arise were by no means fully appreciated." Therefore, issues concerning terminology have been at the heart of archaeological work since the 1920s but have not been concluded. Kleindienst (1967: 882) advances that it seemed "… the prehistorians were asked to play a game of terminology without being told the rules." There is a possibility that the archaeological terminology was another way of spreading European culture and colonisation to distant lands (Goodwin, 1946: 91). However, this cannot be corrected by simple decolonisation, which has no clear guidelines. For instance, unhappy with the term Tumbian outside the Congo Basin, Davies (Lowe, 1946) demanded a prefix 'African' to distinguish it from the European counterpart concerning Acheulean. Therefore, Van Riet Lowe's terminology, which dominated in the first 30 years of Stone Age research, aimed at a distinction from the European—and specifically French terminology—to establish the African emancipation nomenclature (Schlanger, 2005: 14; cited by Underhill, 2011: 11)

Like the Burg Wartenstein symposium of 1965, the recommendations of the 1947 and 1955 Pan-African Congresses to abandon the intermediate industries in archaeological terminology cannot be sustained anymore. Godwin (1946: 93, 99) had even suggested leaving the description of lithic terminology based on "town, village or farm and instead of taking periodic terminologies that are workable, adaptable, permit continuity, plain, simple in connotation, don't mislead, typical and consistent." But all this is not giving clear guidance. What is clear is that lithic terminology could be categorised "functionally into four types: periodic terms, cultural terms, and terms describing techniques and implements" (Goodwin, 1946: 92). Therefore, could the Sangoan be lithics from a Sango Bay site, or do we have a clear category of lithic tools that belong to a period referred to as Sangoan?

According to Kempson (2007: 2), the Sangaon constituted a small number of typical Acheulean bifaces and picks, and enormous other heavy- and light-duty scrapers. Practically, each of those archaeological collections depicted as Sangoan from Sub-

Saharan Africa hails from comparable climatic situations that identify with tropical Africa's high precipitation and thicker vegetation. Lithic artefacts eminent at Sango Bay were either light- or heavy-duty tools: the former mainly from flake blanks or pieces that did not surpass 100mm; while the latter was from cores with more than 100mm length. This data from Sango Bay implied similarity with the typology utilised at Kalambo Falls (Clark & Kleindienst, 2001).

The Sangoan lithic typology from Sango Bay included points, scrapers, pickaxes, lanceolates, hand axes, discoids, core axes, cleavers, becs, burins and choppers. Therefore, the lithic typology at Sango Bay was similar to that excavated by Van Peer (2004), McBrearty (1988), and Salunke (2018) in terms of tool types. The tools identified integrate into the Acheulean and MSA, depicting continuities. Therefore, the Sangoan lithic tools were made for specific functions and environments, as points required for spears were significantly more extensive than those for arrows (Brooks et al., 2006; Shea, 2006). According to Nygaard and Talbot (1984), no drastic changes existed between the various tool types, but one evolved into another gradually. Technologically, the breadth of several artefacts was more prominent than the length of the same artefact, which implied the use of the side-striking technique in flake termination. The flaking strategies were mainly Levallois, and for this reason, the assemblage assigned to the Sangoan culture with the semblance of the Acheulean and MSA qualifies it as an early MSA. However, Ki-Zerbo (1990) suggested that the Sangoan industry evolved independently from the local Acheulean culture. As the Sangoan evolved, these tools became small, and flaking techniques came closer to perfection, which is explained by the dominance of more exhausted cores. The origin of Levallois was cemented by Phillipson (2005) when he noted that "… industries designated MSA display a stone tool technology derived from that illustrated by final Acheulean/Sangoan artefacts often based upon elaborations (eventually with reduced size) of prepared core technique."

According to Hughes (1998), the distribution of artefacts in Sango Bay reflected patterns of adaptations and lithic utilisation by our ancestors using raw material with high compression strengths and right fracture mechanisms. The utilisation of local raw materials and minimisation of wastage is another clear indicator that the Sangoan was local.

The retouch patterns and platform preparations were vital in examining the Sangoan technology. According to Shott and Ballenger (2007), stone tool typology views artefacts as discrete products of their makers' design. It downplays the process that created, used, reshaped, and discarded them, as well as the reduction process. To go beyond typology, we examined most of the descriptions of the Sangoan that were based on retouch patterns. A retouch is a refinement done by removing small chips from flake edges for rejuvenating or transforming an artefact into a better form to provide a fresh, sharp cutting edge (Andrefsky, 2008), which can be done during tool-manufacturing, or later during tool maintenance. The primary aim of retouch was to transform a flake blank into a tool (ibid.), but sometimes a secondary retouch during maintenance involved tool modification, leading to the typological description. The Sangoan retouch patterns identified in Sango Bay were unifacial or bifacial, and were categorised based on provenience and morphological attributes. The retouch patterns suggested a preference for functional requirements rather than style. Balme and O'Connor (2016) state that unifacial and bifacial retouches are continuous. Therefore, bifacially retouched tools are likely to be derived from unifacially retouched tools. This suggests that the Sangoan tools were reused and multi-functional, as confirmed by the exhausted cores.

The Levallois technology at Sango Bay indicated a more complex reduction strategy, where controlled knapping with the use of a soft hammer removed small chips of flakes (Kuhn, 1995) from one surface, or both faces, and an edge on the core. Sometimes, core platforms may have been modified by removing a big piece from one edge to form a plain surface. This strategy usually included symmetric and more perfect geometric cores, such as single, double, and Levallois cores. There was no significant difference between broad and restricted platforms regarding striking platform size, suggesting that this was not a limiting factor in selecting primary blank for points (Bushozi, 2011). Technologically, hafting required much investment in time and skills as choosing raw materials, preparing blanks, and retouching involved a well-organised mind with sophisticated skills.

As per objective three of the study, the findings suggested using locally available raw materials rather than exotic ones. In addition, to Shepherd and Kleindienst (1996), the Sangoan culture is incredibly concerned with selecting raw material on the part of toolmakers. Therefore, as elsewhere, site catchment analysis reveals that tools made of exotic raw materials were for long-time use due to the distance involved (Rolland & Dibble, 1990), and the various reworking stages, repairing and maintenance processes. However, toolmakers at Sango Bay were too acquainted with the immediate environment. Therefore, their survival strategies were much localised, as revealed from the analysed samples where rhyolite predominated the raw material types, followed by quartz, quartzite, granite, and shale specimens. The choice of locally available raw materials depended on their ability to form tools with sharp edges and durability against unintentional breakage (Bushozi, 2011).

Conclusion

Though Uganda was the first country in East Africa to receive archaeological attention in the 1920s (Cole, 1963; Robertshaw, 1990), an assessment of its status shows that it still lags behind in terms of archaeological research in the East Africa region. Other than the low levels of general archaeological research trends in Uganda specifically, there is still limited research that has been undertaken on the Sangoan techno-complex within Uganda still. Despite that, Uganda was lucky that the Geological Survey Department's works under Wayland identified the Sangoan industry based on the surface collections at Sango Bay, which gave this lithic industry a name. McBrearty (1988: 390) suggests that "the material upon which these schemes are based is for the most part from surface or geologic contexts." Since the

1920s not much had been done in Uganda until the current research intervention that examined the typology, technology and raw material utilisation that contributed to the debate concerning what constituted a typical Sangoan industry. Typologically, the Sangoan lithic artefacts from Sango Bay belong to the major categories of shaped tools, cores, blades/flakes and debitage. The nonflaked tools only appear under the surface survey materials, and none was obtained in the excavation unit. The shaped tools and nonflaked tools suggest that the Sangoan lithic typology included mainly bifacially shaped tools since they reused them, including points, scrapers, and lanceolates hand axe pickaxe, burins and discoids that cannot be categorised as distinctly Sangoan since some continued from and onto the Acheulean and MSA. This implied that the Sangoan tools were both heavy- and light-duty. Other than the shaped tools, the dominant core types were periphery worked cores, since out of the total cores, they had 169 cores in this category compared to the amorphous and platform ones. Technologically, the light-duty tools made from flakes and those made from cores suggested a core technology. Though the core technology is rooted in the ESA, the core technology at Sango Bay should not be used to conclude that the Sangoan were part of the Acheulean, but continued with the Acheulean characteristics even after. The Levallois technology of core preparation also characterised the Sangoan techno-complex at Sango Bay. This showed that the Levallois technology had been used earlier than the MSA. The Sangoan toolmakers at Sango Bay preferred locally available raw materials like rhyolite, quartz, quartzite, granite and shale. Though the raw materials were available locally, Sangoan toolmakers were very economical since many lithic cores were utterly exhausted.

Therefore, the Sangoan was a transitional industry spilling from the Acheulean into the MSA, with some typological and technological characteristics starting in the Acheulean and spilling over to the MSA. For instance, the hand axes, picks, and core scrapers indicate that technological succession from early to late cultures passed through a gradual process. The change of a cultural period did not ultimately imply total abandonment of the previous civilisation. This means that there is a need to revise the Stone Age vocabulary to accommodate intermediate industries. In addition, the periodic terms covering the broad 'ages' of man's local story need more careful analysis (Goodwin, 1946: 92). Like the cited previous studies, the chronological characteristics of the Sangoan that are vital in concluding the nature of the Sangoan techno-complex are not addressed, and thus should be the focus of future research.

Acknowledgements

We acknowledge the generous scholarship from the Paleontological Scientific Trust (PAST) that supported the data collection in 2015 and Gerda Henkel for the 2020 data. We also acknowledge the support of the 2015 and 2020 research teams: Kiwanuka Paul, Mutudi Gonza, Ssebuyungo Christopher, Ssemwogerere Abubaker and the Sango Bay community. Special gratitude goes to the Uganda National Museum, which permitted us to access the site. In a special way, we thank Mr Klindo Said and Oteyo Gilbert for making the lithic illustrations. However, any opinions, conclusions or recommendations expressed in this paper are those of the authors, and the sponsors do not accept any liability in this regard.

Declaration of conflict of interest
The authors have no interests to declare.

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