Archaeology and Heritage around University of Dodoma Campus in Tanzania

By S. Krishna Rao
University of Dodoma, Dodoma, Tanzania
E-mail: sadasivuni.krishna@gmail.com

Abstract
A preliminary survey within and around the campus of the University of Dodoma (UDOM) in Tanzania in East Africa has led to the identification of few archaeological sites particularly of Pleistocene-Holocene cultural evidence. In general it is known that modern humans had crafted blade tools which are termed as Middle Stone Age (MSA) tools during upper Pleistocene. As the end of Pleistocene brought about several changes in the environment in the entire globe, the new environmental setting initiated to begin sedentary human adaptations that are found reflected in the production of tools of Late Stone Age (LSA), the Mesolithic (microlithic) and the Neolithic, the New Stone Age (NSA). The preparation of flake and blade tools and later pottery-making revealed the marked demand for specialized hunting and gathering and agricultural production by culturally evolved modern human population. There are three archaeological sites identified inside the university campus. Since they are located near Makulu, Ngo’ngo’na and Ntyuka villages adjacent to the university campus, they are named after the villages. Flake tools and levallois cores, microlithic tools such as lunates and blades, and other Neolithic bearing tools such as polished axe, grindstone slabs, hammer stones and potsherds were found spread on the surface of the laterite gravel where top humus is eroded by rain wash as evident from the sectional exposure of the soil. At the two spots of Makulu site, pottery clusters are found spread in parabolic pattern. Black ware, red ware, gray ware and red and black ware are some of the pottery types found in these scatters. At times microliths and pottery were found in the mixed condition. These clusters appear to be related to small village settlements of short duration. Field reconnaissance surveys have been conducted in these localities in several seasons during Archaeology Field Survey Exposure Programs for the undergraduate students of the UDOM to examine the geological and geomorphological features in connection with the artifact exposures in the sites. The present study is a preliminary attempt to identify archaeological sites and also to understand the geo-chronological and spatio-temporal relationships of the cultural material evidence. However excavation is required to uncover the in situ information for stratigraphic confirmation of the material evidence and chronology of the site. Since the university campus area appears to be potential for prehistoric and historical evidence there is every need to protect the sites that reflect heritage value through preservation and conservation. Such cultural resource management activity initiates tourism development. At times on-site museum establishment will have lot of advantage for research, student training and public education as well.

Keywords: Archaeological Sites, Middle Stone Age, Late Stone Age and Neolithic; University of Dodoma Campus, Tanzania

Introduction:
Ever since the beginning of scholarly research in systematic investigation of archaeological sites particularly after independence of Tanzania, more number of prehistoric and historical sites have been added to the inventory record of archaeological sites. The review off literature reveals the discovery of Stone Age and Iron Age sites on one hand and historical sites on the other. The archaeological sites from northern Tanzania include the Laetoli hominin footprints.
site (Magori and Day 1983); Pastoral Neolithic of western Kilimanjaro (Mturi 1986), Iron Age sites in Northeastern Tanzania (Soper 1967) and Engaruka (Sassoon 1966, Sutton 1978, Robertshaw 1986), Iron Age burial sites in Ngorongoro Crater (Leakey 1966, Sassoon 1968), Lake Ndutu site (Mturi 1976), Olduvai Gorge (Leakey 1971), Nasera (Mehlman 1979) and Mumba Hohle (Mehlman 1979a), rock art sites of Lake Victoria Region (Chaplin 1974) archaic Homo sapiens crania bearing sites and Middle and Later Stone Age land use sites of Lake Eyasi Basin (Mehlman 1984, 1987, Mabulla 1996), Usangi Hospital and other archaeological sites in North-Pare Mountains (Odner 1976) etc. The archaeological discoveries in Central Tanzania region include rock art sites of Kondo (Inskeep 1962), Iramba (Odner 1981) and Singida (Masao, 1976, 1979) etc. Most of these sites have been dated to LSA.

In southern Tanzania, there are sites discovered from different localities of Southern Highlands. One of the famous Early Stone Age (ESA) sites is from Isimila district (Howell et al. 1962). Another Palaeolithic site was recovered from Kilwa in southeast Tanzania (Karoma 1982). Actually majority of the studies in the south dealt with later Prehistory or the Iron Age. Scholars like Barandon (1992) and Mapunda (1995) have studied on the traditional iron working areas. Fagan and Yellen have studied on the salt works at Ivuna. Willoughby (1993, 2001) has studied Middle Stone Age (MSA) and LSA sites in the above area. Other evidences include an early iron working at Limbo in Southeast Tanzania and Holocene culture baring sites on Ronde and Makonde Plateaus of the Southern Coast of Tanzania (Kwekason 2011).

There are prehistoric and historical sites identified from the rest of the Tanzania coast including Central and Northern Coastal areas. There are continued archaeological investigations on the coast since the arrival of Tanzania Independence. They include investigations by Freeman-Grenville (1958, 1960), Chami (1994) etc. Very elaborate MSA assemblages have been reported from archaeological surveys and excavations at Kilwa Kizimbani, Kilwa Kisiwani, Kilwa Kiwinje, Mpara Hill and Lindi (Karoma 1982; Schmidt et al. 1992).

So far as the island archaeological explorations are concerned, there are both historical and prehistoric cultural evidences. In Prehistoric account, there are ceramic LSA cave sites identified in the coastal and inland areas. Kiwangwa near Bagamoyo (Chami 1996), Machaga cave in Zanzibar (Chami 2001, Chami and Wafula 1999) are some of the sites which are prominent. In Mafia archipelago, some cave sites have yielded material of Neolithic tradition which includes LSA material cultural evidence (Chami 2000).

An overview of the above investigations in the whole of Tanzania reveals the widespread distribution of prehistoric and historical evidence. It spreads from Early Paleolithic evidence up to Historical sites and monuments. They include early Paleolithic, MSA, Neolithic, Iron Age and historical evidence. They are well spread from north to south including coastal and island areas. More specifically MSA flake and blade tools, LSA microliths and pottery are found spread either independently or in mixed condition. It is evident from different usages of their antiquity. Ceramic LSA, Neolithic, Pastoral Neolithic are some of the cultural traditions that seem to have pottery correlations with those of Nderit and Narosura.

As to the lithic materials are concerned the flake and blade tool components of the previous periods seem to have continued in the LSA sites. The occurrence of flake scrapers and blade tools in association with LSA materials in Tanzania sites itself supports the continuity of the earlier techniques of subsistence. In certain cases LSA material culture is found associated with pottery. In the present investigation, MSA, LSA, and pottery are found scattered in the mixed matrix.
Dodoma region in Central Tanzania is left blank which need an attention of archaeologists for the recovery of evidence. The present investigation is a preliminary survey which might help understand the complex situation of the cultural evidence. It further promotes to assess the type of habitat, economy and society or societies in their spatio-temporal relationships.

**Flake and blade tools, Microliths and Ground stone industry:** University of Dodoma Campus is located at the distance of about 7 km from Dodoma (6° 10’ 23” S., 35°44’31” E), the capital of Tanzania in East Africa. The Dodoma region is spread in 2576 Km², and the total population is 410,956. The area is studded with thicket landscape with hillocks and dry streams and valleys exposing red soil as a result of erosion of top humus. Seasonal rains convert the whole landscape into green. Actually rainfall in Dodoma Municipality is below 500 mm and was poorly distributed. Because of such semi-arid condition, and dependence of rain-fed agriculture, the area suffers from surplus crop production. Deforestation in different forms such as cutting trees for charcoal, firewood and building materials for sale etc has resulted in soil erosion, scarcity of firewood and building materials and drying up of water sources. There are few village settlements like Makulu, Ng’ong’ona and Ntyuka where indigenous communities like Gogo / Wagogo inhabiting. They grow agricultural crops like maize, groundnut, cassava, sunflower etc by using traditional hand hoe, plough and bush knife. Some families grow vegetables like tomato, cabbage, chilly with the help of tank water and dugout wells. Extensive agriculture does not yield good harvest because of sand soils and scarcity of rains in the area.

Few localities in the campus have been found evident with archaeological material culture (see Map). Particularly two localities have been identified to be rich in artifacts concentrations. One of them is a foot-hill site. Microlithic artifacts, hammer stones, flakes, cores and pottery were found either separately or in the mixed condition. Some sample material collections and surface finds scatters including unfinished tools and other artifacts and potsherds of various colors with shapes and designs have been shown in the tables (Tables 1&2) given below. It must be noted that the quantity of unfinished finds mentioned in the tables is based on the physical counting of the finds within a limited archaeological site survey. Also the pottery with various shapes and designs on different types such as black ware, red ware, gray ware etc only were counted and mentioned in the Table-2. These sites are described as follows.
The following Map shows the three archaeological sites:

A. Makulu site (MKL): The site is located (GPS UTM 36 N 0807885, East 9312662 and Elevation 1155 M) in between School of Humanities building complex and Makulu village. This site for the first time was identified in the year 2011 when the author led the first year students of archaeology of the UDOM as part of the Field archaeology sites exposure. Reconnaissance survey in the area has yielded substantive evidence which includes microliths, pottery, quartz flakes, hammer stones, grindstones etc. On the northern end of the site, lot of vegetation is grown. Agricultural crops and vegetable farms are found developed in the area. There is a big water tank near to the Makulu village supporting cultivation.

The general topography of the site consists of plains landscape with gently sloping toward north, and scraped top humus mostly exposing red soil and laterite gravel. There are small hill streams that flow seasonally orienting north to south; rain wash seems causing the intensive erosion on down slope to result in the exposure of bedrock which is weathered. I have conducted field survey and transect survey in different seasons using compass, GPS, tapes etc. Radial mapping was undertaken at artifacts concentrated spots.

Stratigraphy of a couple of sections of soil profile shows that the top red soil of 120 cm thickness was devoid of humus by erosion, and was laid on brown soil of 40 cm thickness. This brown soil is found deposited on bedrock. In another case, red soil of 20 cm thickness is found laid on brown soil of 45 cm thickness. Finally the laterite is found laid on weathered bedrock. In either case, the top humus layer is found washed off.

Material culture (Photo-1): From the top of the exposed red soil and in some cases brown soil, artifacts like microliths, grindstone pieces, round stone hammers, flakes, cores and pottery pieces were found spread. Although fewer microlithic blade tools appear, flakes and cores are found in clusters. They are found spread on pelety gravel patches exposed on either
red or brown soil. Mostly quartz as raw material is found used in microlithic tool production. However chert and quartzite can also be seen used in the microlithic tool manufacture and other implements like grindstones, hammer stones and scrapers. Interestingly some scrapers and blades belonging to MSA are also found. It seems that there was cultural continuity from the end of MSA up to Neolithic culture of Holocene time. Few examples of the material culture are described as follows.

Middle Stone Age (MSA): MSA is characterized by flake and blade tools.

**Specimen example 1:** Round scraper (Fig. 1): It measures length, width and thickness of 9 cm, 6 cm and 1.3 cm respectively. It was made on an elongated flake of a fine grained chert of dark brown color. A continuous working edge can be seen all round the periphery except the distal end where an attempt to remove the flake from the sizable levallois core seems to have done. On ventral side of the flake there is a flat surface with a depression toward distal end. The tool is fresh although few limestone marks indicating calcium carbonate effect are found. The scraper may have been used in scraping, cutting etc.

**Specimen example 2:** Round scraper (Fig. 2): It is a small round scraper made on fine grained brown chert piece. Very fine retouch is made to achieve a sharp cutting edge. The dimensions of the tool are 4.5 x 3.5 x 0.7 cm. On the ventral surface, bulb of percussion can be seen at the distal end of the tool. Half portion of the ventral surface is patinated to yellow tinge. Also the periphery of the dorsal surface is found with similar patination. The function of the tool may be likely scraping the skin and cutting the flesh of the animal after being hunted.

**Specimen example 3:** Double side scraper (Fig. 3): It looks like a levallois flake scraper made on fine grained black chert. On both sides of the flake, fine retouch for working purpose is made vertically. Its ventral surface is flat. The length, width and thickness of the scraper are 4.3 x 3.5 x 1 cm respectively.

**Specimen example 4:** Blade (Fig. 4): It measures 5.6 x 3 x 0.7 cm. It may have been worked both as blade for cutting purpose and borer as well for making holes or such kind of function. It is made on brown chert. The shape of the tool is semi circular with one side vertical and the other side converged to the proximal end of the vertical side giving a beak-like point.

**Specimen example 5:** Levellois cores (See Photo : Page 8): There are about half a dozen small levellois cores found in the site. They are in the pyramid shape. The removal of small vertical flakes can be seen from the top to the bottom of the core all around the external surface. The base of the core is flat in all cores. The raw material that was used is mainly chert.

Late Stone Age (LSA): Microlithic artifact is the characteristic element of LSA. It is also known as Mesolithic culture. With an onset of Holocene, modern subsistence activities and techniques had been introduced to exploit new environmental pursuits. That’s why global situation is changed after the end of Pleistocene. Small tiny tools called microliths were introduced. Semi precious stones were found pertinent to manufacture such tiny tools through reduction technology. In the Makulu site, quartz microliths are predominant. Flakes and other debitage were found spread in clusters here and there. As far as finished forms of microlithic
tools are concerned, few were found on the eroded surface exposures. They include lunates and blades.

**Example 1:** Lunate (Fig. 1): The dimensions of this backed blade are 3.3 x 2 x 0.4 cm. It is found made on quartz which is slightly patinated to red. Working edge is sharpened with fine retouch, and the other side is converted into blunted back for holding it firmly. Lunates would have been used in cutting the animal flesh and other such works.

**Example 2:** Blade (Fig. 2): It is a rectangular blade with dimensions of 2.8 x 1.8 x 0.8 cm. It is made on milky quartz. The working edge is straight and the other lateral side has blunted back which might have resulted by the removal of thin flakes. Lower surface is flat with a small depression toward proximal end. Working edge seems to have been made by tapering both the surfaces along the length of the vertical edge. That is how sharp functional edge is resulted.

**Example 3:** Blade Knife/ Backed Knife (7.7 x 2.3 x 1 cm) (Fig. 3): It is made on fine chert and its thin back surface of the left side is blunted and thus formed into a blunted back blade. Working edge is in convex shape. Few small flakes were found removed from the upper surface of the tool as indicated by the flake-scars. Continuous retouch marks all along the functional edge can be seen from the ventral surface. There is bulbar surface at the proximal end of the blade and its distal end has pointed tip like pen knife. It may have been used for cutting meat and other such functions.

**Neolithic evidence of ground stone industry:** The time span that was taken to advance from one cultural phase to another during Holocene epoch is not as much longer as the time interval between various Paleolithic phases of Pleistocene epoch. This situation occurred because of cultural advancement and attitude of people that had moved toward sedentary life and socialization. That’s how people had shifted to pastoralism and food production from foraging activities such as hunting, fishing and plant collection. Thus after a couple of millennia years, domestication of animals and plants began. In Tanzania both Pastoral Neolithic and Food Producing Neolithic evidences were identified. Ground and polished tools, grindstones and hammer stones / pounding stones, hand hoe, digging stick and pottery became the constituents of food producing, processing and storage. Makulu site has yielded the evidence of grindstones, hammer stones and pottery in clusters resembling individual settlement patches in the locality. Three settlement localities are identified. The first two settlements have access for interaction while the third group of settlements is located at about 200m away from the previous settlements.

**Settlement- 1** (GPS UTM 36N 0807885, E 9312662, Elevation 1155 m): It occupies an area of about 20 m² on the south side of the site. There are eight concentrated pottery patches. There are various pottery types. Black ware pottery is predominant. A rim pottery fragment with design of vertical strokes on the external part (see figure) is interesting. Red ware and gray ware are also present. Radial mapping of this settlement patch revealed to us some broad location analysis of settlements (see graph). Broadly, the overall pattern of the spread of households in a settlement is in oval shape.

**Settlement-2:** This group of residential patches of the settlement-2 occupies a small area of about 10 m². It is located 10 m north from the previous settlement cluster. Five pottery
patches have been identified in this cluster. The Pottery includes black ware, gray ware and red ware.

**Settlement-3:** The GPS UTM coordinates of the settlement are 36 N 0807756, E 9312 988, Elevation 1221 m). It has occupied the area of about 40 m². The residential patches as evident from the spread of potsherd clusters are found scattered in the north-south direction with an entrance probably on the south. At about 200 m away from the locale-2, this present settlement is situated on the north. The patch-wise distribution of potsherds forms into an oval shape with an entrance on the south as that of the previous one. There are about a dozen pottery patches. Radial mapping is drawn in order to identify the settlement form (see graph). Pottery types include thick gray ware, red and black ware, medium grained black ware and red ware. On the south side of the settlement five grindstone pieces, few hammer stones of dolomite and quartz (Personal examination of Dr. Sankaranna of Earth Sciences department, UDOM on 09-02-2015) were also found. These objects may have been used in food processing.

The pottery patches are found spread on the surface of the red soil where top humus (brown soil) is eroded. The red soil is found laid on the bedrock which is weathered.

**Radial Mapping at the pottery concentrated spot (Makulu site):**

![Radial Mapping](image)

**B. Ngo‘ng’ona Site (Photo-2):** This is a foot-hill site located (36 N 0812674, E 9310568) at about half a kilometer north of the village Ng‘ong’ona. The site is actually situated on the left side of the bridge road leading to the central administration of the UDOM. The topography of the site comprises of thorny bushes with red soil exposures and dry hill streams. Seasonal rain wash removed the top brown soil. In some places of the site bedrock is exposed due to erosion of both humus and red bed. Pottery pieces are scattered on the surface of the red soil. Thick black ware, red ware and gray ware pottery are found in the assemblage. Few pottery rims were found to have horizontal line designs on the external surface.

Quartz flakes and cores were found spread on laterite gravel patches. Few round hammer stones were also found on the surface. Interestingly, a flake scraper and a polished axe made on chert were found on the surface.
Example 1: Polished axe (Fig. 1): These are the tools which are popular in Neolithic period to use in agricultural activity. The distal end opposite to the medial working edge is usually set in an wooden handle in order to use it as a digging stick, a multi functional tool. Digging, weeding and other such agricultural activities may have been undertaken with such chisel edged artifacts. The polished axe is made on brown chert. Techniques of stone hammer and grinding and polishing must have been used in the preparation of such tool. Medial edge is achieved by tapering the edge at the end from both upper and lower surfaces. Because of repeated grinding the tool possess smooth surface all over. The tool measures maximum length, width and thickness of 9 x 7.5 x 3 cm respectively.

Example 2: Flake scraper (Fig. 2): The specimen is a side scraper made on fine grained brown chert. The working edge on one side was found made on an elongated flake. There is also retouch to sharpen the working edge. The measurements of the scraper are 8 x 4.6 x 1.5 cm. Such tools generally used in scraping animal skin or cutting the flesh etc. They are more in MSA.

C. Ntyuka site (Photos-3 a, b, c & d): The site (36 M 0806819 UTM 9312435 and Elevation 1220 m) is located adjacent to Makulu site. Like Makulu and Ng‘ong‘ona villages, Ntyuka village is also occupied by the majority of the Gogo community which is more traditional and even their mortuary practices are very close to the ancient megaliths like stone circles (photos). Apart from pastoralism, the Gogo nowadays practice agriculture and raise crops like maize, beans, millet and vegetables.

When we look at the site we don’t find much change in physiography from that of the Makulu site except that the top humus is mostly eroded. Wherever the laterite is exposed, the artifacts were found scattered on the top of it. These artifacts include flake tools and blade tools. Microliths such as backed blades made on glassy quartz were also found in the scatters. The backed blades include lunates and trapeze (see photo). In the collection there is one blade tool which needs special attention. It is described as follows.

Example 1: Chisel edged blade (Fig. 1): Ntyuka site (Photo No. 5): The length, width and thickness of the tool are 6 x 4 x 0.8 cm respectively. It is an interesting tool with full working on the entire surface of the tool including the functional edge. The proximal end of the tool is pointed which seems to have been achieved by tapering the tool from the centre toward the functional edge. The whole work on the tool exhibits an impressive finishing touch. This tool may have been used either directly or as a chisel by setting it in a wooden shaft or a bamboo stick. Such chisel edged tools are fit to remove soft material/pulp of the vegetable gourd during the preparation of various storage / drinking water containers.

Stratigraphy and Geomorphology (Photos-6, 7 & 8): Geomorphological understanding of the archaeological site has lot of significance in the assessment of spacio-temporal relationship of the spread of artifacts in different surfacial and sub-surfacial soil contexts. More over the nature of distribution of artifacts or other archaeological material remains including faunal and vegetative evidence in their geomorphological contexts cannot be understood without landscape and geomorphology studies. Study of soil sections or profile is therefore important. Stratigraphic exposure in the soil profile in the absence of excavation shall throw some knowledge in the evaluation of the habitat or living floor or surface of concerned ancient
The general topography of the Makulu site consists of a red bed exposure with intermittent breaks by gray soil and laterite gravel. There are few narrow seasonal streams. During my field survey bedrock exposure was found, and it seems that an intensive monsoonal effect caused the cut of the stream bed exposing bedrock. The bushy environment with thorny shrub jungle and cactus plants is spread all over. At few spots the top red soil is totally washed off probably by rains. Red color appearance appears to have caused by the oxidation of elements like hematite. As a result ferrous and ferric oxides are formed as evident from the red coloration.

At one of the spots, a section facing north reveals that the red soil of the thickness of about 120 cm is found laid on grey soil of 40 cm thick that rests on weathered bedrock.

<table>
<thead>
<tr>
<th></th>
<th>Layer Type</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gray soil</td>
<td>60 cm</td>
</tr>
<tr>
<td>2</td>
<td>Laterite</td>
<td>22 cm</td>
</tr>
<tr>
<td>3</td>
<td>Gray soil</td>
<td>42 cm</td>
</tr>
<tr>
<td>4</td>
<td>Laterite</td>
<td>36 cm</td>
</tr>
</tbody>
</table>

On the other, the bed of the stream has exposed two types of sections at two spots. Two soil layers, the grey soil and laterite gravel have been exposed where the former layer laid on the later. At another spot, there is an exposure of three stratified soil layers laid sequentially on bedrock. They are gray soil layer, laterite, gray soil and laterite gravel layer (2nd laterite layer) respectively found one over another from the top to the bottom is found resting on the weathered bedrock.

In the site the dominant raw materials that may have been used to prepare different tools identified (Dr. Sankaranna of Earth Sciences, UDOM visited the site for identification of raw material) as quartz, quartzite, chert and greenstone. According to the geological expertise the microlithic blades are mostly found made on quartz. Levellois flakes and cores are found manufactured on either quartzite or chert. Prof. Vasudev of Earth Sciences and Groundwater Engineering of the University of Trinidad and Tobago, Saint Augustine Campus, West Indies viewed the geomorphological features of the Makulu site as follows. He explained that the study site is an undulating area being carved by the surface processes, especially rain and wind. From an elevated place, when a traverse was made along the course of a stream, layering was observed in the soil. There are five layers as shown in the fig (no. 1) described in the table below.
In the present study, the artifacts were found concentrated on the top lateritic soil (2\textsuperscript{nd} layer from top). Further investigation revealed that they were concentrated because the soil from that area was removed by surface processes like rain wash and wind and they were in fact impregnated in the laterite. The presence of artifacts in the laterite, obviously suggest that both the lateritic soil and the artifacts are not in situ. They were transported from some other place and deposited in the area suggesting that the laterite is secondary and not primary. Also the artifacts are not worn; they were with fresh faces and edges suggesting that they were transported to this area from a place very close to the present site of deposition.

**Discussion and Interpretation:**

The archaeological material evidence of the three sites such as Makulu, Ng’ong’na and Ntyuka reveals that there are three characteristic assemblages. According to the typo-technological analysis, one group belongs to the Middle Stone Age as evident from the flake tools and levallois cores and flakes. The second characteristic assemblage is related to the Late Stone Age as seen from microlithic quartz blades while the third category consists of polished axe, grindstones, hammer stones and innumerable number of potsherds that resemble Neolithic culture. Specifically in the MSA cluster scrapers made on flakes and blades were found. In addition to them, small levallois cores were also found associated with the assemblage. These cores which display regular and thin flake scars indicate the trend towards shifting from large flake tool production to microlithic tool preparation. This development may have been influenced by slow changing environments at the end of the Pleistocene.

The onset of Holocene immediately after the Pleistocene brought about several changes in the subsistence and survival strategies of modern man. Specialized hunting and other foraging Activities along with the incipient agriculture had been practiced. Geometric and other simple tool production had become the workshop of economic strategies. That is the reason perhaps microlithic blade tools made on chert and quartz were found particularly in the sites of Makulu and Ntyuka.

With regard to Neolithic tool assemblage, polished axe, round stone hammers, grindstones and extensive number of potsherds were found in the sites. Makulu site is potential for pottery evidence. Some flake tools and microlithic blade tools were also found mixed with the pottery evidence in few instances. Perhaps pastoral Neolithic people during tough environmental conditions and relative ecological variability depended on microlithic tools including backed blades (Goldstein and Shaffer 2017; Ambrose 2002) as evident from Makulu material matrix. Whether the association of Microlithic tools with Neolithic evidence represents any Neolithic tradition (Chami 2000) or not is yet to be clear. There is also possibility to understand the association of microliths of Later Stone Age lithic technology and ceramic vessels probably along with more dependence on domestic stock as Pastoral Neolithic in East Africa (Bower et al. 1977).

Interestingly pottery is found scattered as settlement patches in certain spots of the Makulu site. As to the pottery designs, they exhibit patterns of incision, sigmas in horizontal
line, single line and double line punctuation. Incision patterns similar to the Narosura style typical of Nile Valley Neolithic sites (Robertson 1991: 146 & 149). It was argued elsewhere that among the Negroid populations existing in the Rift valley region and East African coast during the Neolithic, Bantu speakers should have been among them (Chami and Kwekason 2003: 78). It was also possible that during the spread of Negroid or Nilotic Bantu (Gramly and Rightmire 1973: 578) from Kenyan Rift to the Rift Valley of Northern Tanzania and further East coast, some Bantu population could have spread to some parts of Central Tanzania too.

It is possible that the Bantu speakers were in the region before the coming of iron technology and beveled and fluted pottery as well (Chami and Kwekason 2003: 78). This suggests that prior to these innovations, the farming techniques, domestication of animals like goat/sheep, chicken, and cat, and pottery making had been popular on the East African coast and also in South Africa. Similar situations seem to be occurred in the Central Tanzania including Dodoma region. The geomorphology and soil sectional profile studies revealed to understand the stratigraphy of the archaeological sites. The presence of MSA, LSA and Neolithic tool matrix especially in the Makulu and the adjacent Ntyuka sites suggest that they belong to secondary laterites. Present preliminary survey throws a lot of hope to probe in future for tracing the spread of human habitation and cultural development in the Dodoma region as well. The present study and the identification of archaeological sites in the region therefore promote an encouraging view for further in-depth survey and excavation.

**Importance of Cultural heritage:** The above archaeological investigations show the potential nature of the prehistoric settlements around Dodoma University campus. There is also possibility to discover some more prehistoric and historical sites in the region. It is therefore necessary to preserve these sites for further intensive research studies and also for public education. It will benefit to present and future generations. Selective sample collections need to be preserved in the museum which is yet to be established with full strength. In fact Dodoma region in general is rich in archaeological heritage. Kondoa rock art sites of LSA period and some other historical sites of the region have shown marked importance of cultural heritage (Temu, 2016). In the wake of such archaeological and historical importance, the present exploration of sites around the University of Dodoma campus will have lot of significance. Since the university campus area yields sufficient prehistoric and historical evidence, there is every need to protect the sites that reflect heritage value through preservation and conservation. On-site museum establishment will have lot of advantage for research, student training and public education as well.

Three types of archaeological evidence such as MSA, LSA and Neolithic were found around the university campus. They represent three different settlement types. Material culture is also different. Flake and blade tools like scrapers were found made on chert and quartz in Makulu and Ntyuka sites. Particularly quartz blade tools such as lunates and chisel edged blade tools show skillful workmanship. Pottery evidence that was found at times mixed with blades represents pastoral Neolithic settlements. Such ancient episodes of heritage attraction need to be protected by heritage specialists. Continuation of Neolithic handmade pottery as evident from the Ntyuka villagers, the Gogo is great opportunity to the heritage specialists to preserve pottery craftsmanship of the present day communities. Such examples of historical continuity of the heritage support the fact that present learns from the past. Such episodes of cultural traits initiate to develop tourism.
Acknowledgement: The author wishes to thank the University of Dodoma and the Dean of School of Humanities, University of Dodoma, Tanzania for encouraging research in the area by providing technical and other infrastructural facilities. He also expresses deep sense of gratitude to Prof. K. Vasudev, University of Trinidad and Tobago, West Indies for his comments on the site topography and sedimentation process involved in the archaeological artifacts distribution. Finally the author is thankful to Dr. Sankaranna of Geology department, University of Dodoma for visiting the Makulu site personally to confirm the geomorphology of the sites.
References


---------------


---------------


---------------


---------------


---------------


---------------


Table 1:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Site</th>
<th>Finished Tools</th>
<th>Unfinished Tools</th>
<th>Other Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Flake Tools</td>
<td>Blade Tools</td>
<td>Gro und Ston e tool s</td>
</tr>
<tr>
<td>1</td>
<td>Maku lu (MKL)</td>
<td>Ch ert Quartz</td>
<td>Ch ert Quartz</td>
<td>Ch ert Quartz</td>
</tr>
<tr>
<td>2</td>
<td>Ng’ong’ona (NGN)</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Ntyuka (NTK)</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>10</td>
<td>14</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 2:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Site</th>
<th>Black ware</th>
<th>Red ware</th>
<th>Gray ware</th>
<th>Black and Red ware</th>
<th>Red and Black ware</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Makulu (MKL)</td>
<td>26</td>
<td>28</td>
<td>13</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Ng’ong’ona</td>
<td>16</td>
<td>12</td>
<td>5</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>3</td>
<td>Ntyuka (NTK)</td>
<td>8</td>
<td>3</td>
<td>6</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
<td>43</td>
<td>24</td>
<td>14</td>
<td>7</td>
</tr>
</tbody>
</table>

Photo-1

Elongated Blade Knife (Photo)

Grindstone piece at Makulu Site (Photo):

Evidence of Pottery with different shapes and sizes:

Pottery designs:

Photo-2
Photos-3: Ntyuka village graves looking like Prehistoric Megalithic Circles (a, b, c and d):

Photo-4 (Flake tools and Blade tools):
Blade

Photo No.5 (Chisel edged Quartz from Ntyuka Site):

Photo-6 (Makulu site section):

Photo-7 (Flake scraper in the Makulu site):

Photo-8 (Makulu site):

Drawings: Middle Stone Age tools:

Makulu site

Drawings: Neolithic Polished axe (top); Gogo settlement
Flake tool (bottom left) & Quartz blade chisel (right).
Gogo hand-made pottery (from the stage of raw material collection), Ntyuka Village