



# The Tichitt Culture and the Malian Lakes Region

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**Abstract** The Tichitt culture of the Ceramic Late Stone Age is known for its large settlement sites, built from dry stone walls. It is centered on the cliffs of southeastern Mauritania, but its links to the Middle Niger and the later urban developments there have long been a topic of research. This article adds a further piece of evidence linking the two regions. The available evidence for a set of stone-walled features is presented, around 300 sites of varying sizes and complexity. They lie on and around the sandstone massifs of the Malian Lakes Region. The evidence is so far tentative as no dating or material culture is available, but the sites are presented as a research priority for the future.

**Résumé** La culture Néolithique de Tichitt est connue pour ses grands sites d’habitat, construits à partir de murs de pierres sèches. Elle est centrée sur les falaises du sud-est de la Mauritanie, mais ses liens avec le Moyen Niger et les développements urbains ultérieurs dans cette région font depuis longtemps l’objet

de recherches. Cet article présente des indices supplémentaires à l’appui d’un lien entre ces deux régions. Il présente les données disponibles d’un ensemble de murs de pierre, environ trois cents sites de taille et de complexité variables. Ils se trouvent sur et autour des massifs de grès de la région des lacs maliens. Les preuves sont jusqu’à présent provisoires car aucune datation ou culture matérielle n’est disponible, mais les sites sont présentés comme étant une priorité de recherche pour l’avenir.

**Keywords** Mali · Late Stone Age · Tichitt · Malian Lakes region · West Africa · Archaeology · Dry Stone Walls · Neolithic

## Introduction

The Tichitt culture of the Ceramic Late Stone Age (CLSA, Néolithique in French publications) is unique in pre-Common Era Africa, apart from Pharaonic Egypt, for the presence of more than a thousand villages built in stone between 4200 and 2500 BP. This exceptional archaeological complex is named for the area in southeastern Mauritania where they were first documented. The Tichitt culture looks back on a long history of research (among the most important publications are Munson, 1971; Holl, 1986; for overviews, see Amblard-Pison, 2006; MacDonald, 1993, 2015, 2020). The most recent research comes in the form of satellite-based surveys (Linares Matás & Lim, 2021;

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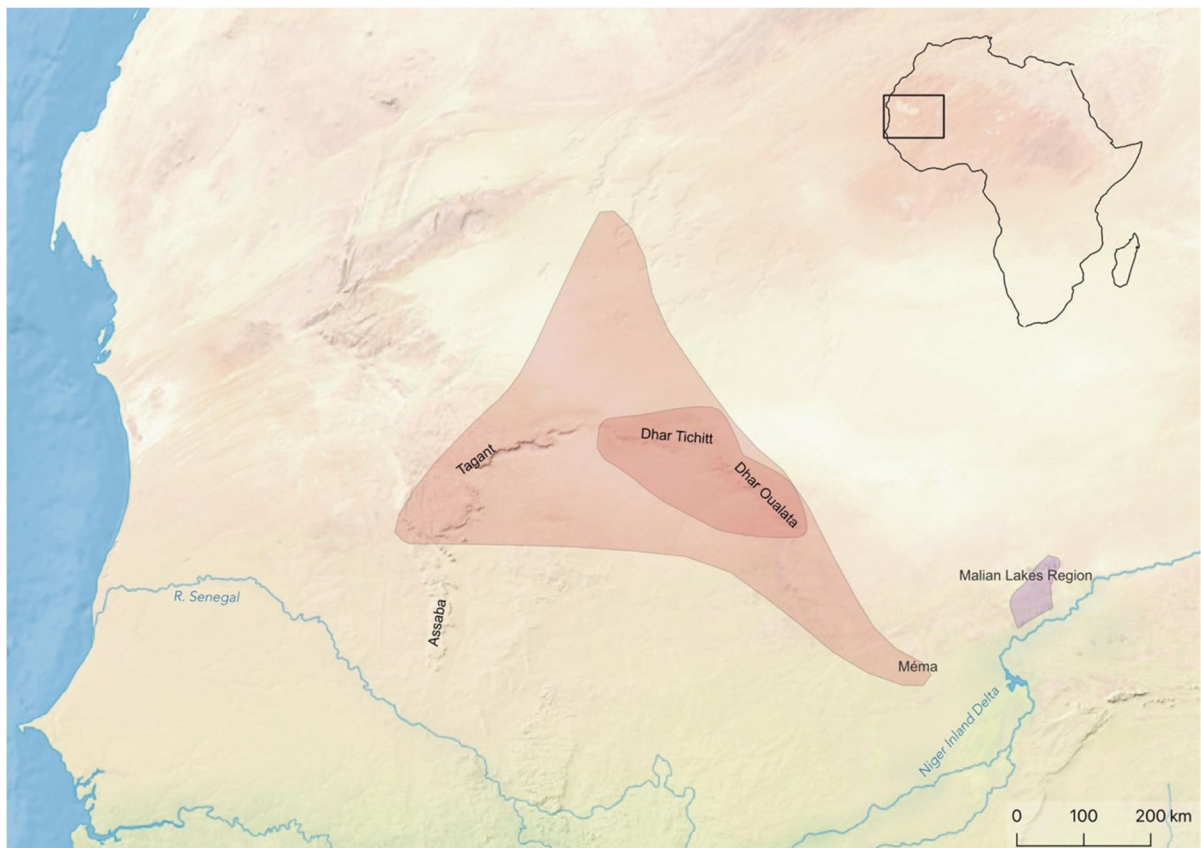
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Linares-Matás, 2022, 2023). Stone-built villages of the Tichitt tradition have so far been documented in a region stretching around 800 km on each side, between the north of the Taoudenni Basin and the Niger Bend, and from the west of the Tagant to the Mauritanian-Malian borders—covering about 600,000 km<sup>2</sup>. In this short article, however, we wish to draw attention to the possibility that its spatial extent was much wider than previously thought, reaching from Mauritania to the Niger River system in Mali (Fig. 1). We discuss a set of stone-walled sites and argue that these are largely neglected evidence for the presence of the Tichitt culture in the Malian Lakes Region. This complements other forms of evidence for the presence of the Tichitt culture on the eastern side of Niger’s Inland Delta, in the Méma region. As the area is currently inaccessible to researchers, the evidence presented is derived from satellite imagery and scant material from previous research in the region. Nevertheless, these materials

make a compelling case for the importance of future research on the eastern extent of the Tichitt culture and demonstrate how much remains to be understood about this exceptional archaeological ensemble.

### The Neolithic Occupation on the Western Margins of the River Niger

The Western Sahara saw its climate deteriorate at the end of the African Humid Period (AHP), in the middle of the Holocene. The deterioration first set in gradually and then became more intense through a very arid episode lasting two centuries, for which paleoenvironmental or archaeological radiometric dating is virtually absent. This aridity provoked considerable, and often definitive, movements of Saharan populations toward the south. The region of the dhars (“cliffs”) in southeastern Mauritania was occupied after 4500 BP by a



**Fig. 1** Map showing the traditional core area of the Tichitt culture, its maximum extent from sites known thus far (see Vernet, 2022), and the Malian Lakes Region

population who built a sedentary culture with a diversified lifestyle. Their origin is poorly known. The commonly accepted view is that human groups driven out by the great drought at the end of the Middle Holocene wet period (from Adrar of Mauritania, Tanezrouft of Mali, etc.) moved southward in search of game and pasture. Here again, there is no evidence, although this type of population shift is still observed in the Sahara during arid crises. During the arid crisis of the late Middle Holocene, rainfall did not totally desert the region of the dhars, around 19°/16° N, which became a refuge for populations that had been forced to migrate. When the rains returned, Sahelian conditions flourished again and population density exploded thanks to a diversified economy—hunting, fishing, gathering, livestock, agriculture, and even iron metallurgy at the end of the CLSA. The Tichitt culture's development of semisedentary CLSA populations with apparently high sociopolitical complexity is not unique in the Sahel, as MacDonald (1998, p. 92–93) points out, with the early and middle phases of the Kerma culture developing along similar lines.

While ceramics appeared very early in the Holocene on the western bank of the Middle Niger, no trace of a permanent CLSA population prior to the Tichitt culture has yet been found (Ozainne, 2013). However, this might be about to change with further satellite discoveries made by the MAESaM project (Kevin C. MacDonald, personal communication). The existence on the northwestern side of the Inland Niger Delta (IND) of occupations linked to the Tichitt culture has long been argued for by several researchers (the most recent summary can be found in Champion, 2020). The most vocal proponent of a link between the Tichitt culture and the Neolithic occupation of the IND's western edge, the Méma region, has been MacDonald (1994, 1998, 1996, 2011). Alongside a separate occupation of hunter-gatherer-fishers with links to the Malian Sahara, named the Kobadi tradition (see Gallin, 2011), MacDonald has presented evidence for a Tichitt-linked population here from around 1300 BC. This is visible in the ceramics of the Faïta facies, whose early phase MacDonald (1996, p. 434) judges to be “one and the same” as classic Tichitt ceramics, and which is associated with stone tools, rings, and beads comparable to Tichitt assemblages. Furthermore, there is evidence of raw materials imported from the Mauritanian dhars. While the ensemble of evidence remains

a patchwork of hypotheses and scattered facts whose scarcity has been compounded by a lack of field research, the indications are so numerous and varied as to make a Tichitt-linked presence in the Méma region very likely.

Further north of Méma, the Malian Lakes Region (MLR) and the adjoining Daounas have seen sporadic archaeological research on the Late Stone Age period. Raimbault & Sanogo (1991, p. 205–207) noted that while the flatter area toward the current Mauritanian frontier had few signs of LSA occupation, the closer one gets to the Daounas and the lakes, the more numerous the sites became. As part of the inventories carried out during the early 1980s, they report on quartzite knapping workshops and stone stelae cemetery sites. Following these surveys in the Daounas, Jousse et al. (2009) have published four sites that might have a Late Stone Age component at the western end of the Faguibine Depression. All available radiocarbon dates from them fall into the first millennium AD. However, some of their ceramic assemblages have affinities to the LSA Méma sites, especially to the Kobadi tradition—therefore, to a population considered separate from the Tichitt culture. The site of Bangoukoro (Person & Jousse, 2005) is a necropolis with standing stelae marking graves that appear to be mostly in N–S orientation. Here, an excavated skeleton was dated to 4132 ± 83 BP (Maurer et al., 2014).

The link between the Tichitt culture and the Neolithic occupations on the edges of the IND had, despite the amount of circumstantial evidence at the time, been described as spurious by Amblard-Pison (2006, p. 292). MacDonald wrote in reply:

The only elements for which there is no link are dry stone walls and schist grain bin pillars, the distinctive Tichitt architectural tradition upon which Amblard-Pison (2006, 53118) focuses a good deal of attention. However, if this is to be her criterion, given that the Méma is a floodplain and without native stone resources comparable to those of the Tichitt escarpment, it would be rather difficult to ever prove an archaeological link on that evidential basis. (MacDonald, 2011, p. 59)

We follow MacDonald's argument: these architectural elements are distinctive in the Mauritanian dhars. However, it does not follow that their absence should exclude

sites from being considered part of the Tichitt culture, especially in areas without such resources. Where stone is abundant, however, we might reasonably expect architectural similarities. While the research carried out by Alain Person and colleagues in the MLR was explicitly aimed at elucidating connections between Tichitt and the margins of the IND, they appear to have missed the presence of dry-stone sites on the sandstone massifs on the other side of the Faguibine Depression, and thus a potentially central piece in the answer to this question. Those sites, however, appear to have been known to researchers for a relatively long time, and their traces can be found sporadically in the literature. Desplagnes (1907, p. 67), who was very much interested in dry stone-walled sites, mentions “the ruins of Hodh and Tagant”—which we take to mean the Mauritanian Tichitt culture sites—in the same sentence as “those of the mountains of Goundam”—the MLR massifs. Some years later, M. de Loppinot reports a discovery made during a tour in the Bankor massif by Lake Faguibine: an enclosure several hundred meters in circumference, more than 4 m high, made of dry stones piled up with remarkable regularity. Loppinot reports seeing the remains of rooms and a building of 6 to 7 m in diameter inside the enclosure, which he interprets as a cistern. There are two cemeteries of which we are not given further details. Local people claim no relation to the builders, who they believe to have been giants (de Loppinot, 1920, p. 567).

Following Loppinot’s report, Dupuis-Yacouba, a civil servant in the French colonial government at Timbuktu, was commissioned to make a more detailed study (Dupuis-Yacouba, 1922). His findings show the existence of various dry stone structures just north of the village of Bintagougou on the eastern edge of Lake Faguibine. One of these is a large rectilinear enclosure, described as having the outline of a mosque, while others are various types and sizes of structures. Cemeteries with stones marking the head and toe positions are also reported. Parallel examination of satellite imagery from the area Dupuis-Yacouba reports on gives the impression that the stone walls in this area might belong to several different periods, as there are very different forms and sizes of enclosures. It also demonstrates how much of the nearby stone-walled sites he missed. Figure 2 shows the satellite image alongside the main area of stone structures mapped by Dupuis Yacouba. The image shows that the area “Abris” is larger than he indicated. Closer inspection shows that these enclosures appear to contain small circular structures. The cross

on the map to the east of the noted structures, along the path, indicates the place where a carved stone was discovered, but the report does not indicate that this was part of a larger complex of structures, which are easily visible on the satellite image.

In his major publication on the “medieval” period in West Africa, Mauny (1961, p. 111) points out Loppinot and Dupuis-Yacouba publications without much further comment. He further notes that Y. Urvoy and H. Lhote had visited the place and that Th. Monod had seen a large enclosure near Tondigame from an airplane. Unfortunately, the references to the documents cited by Mauny in the holdings of the IFAN in Dakar are no longer traceable. Nevertheless, Mauny’s mentions show that evidence of stone-built enclosures on the massifs of the MLR had already accumulated in the first half of the twentieth century.

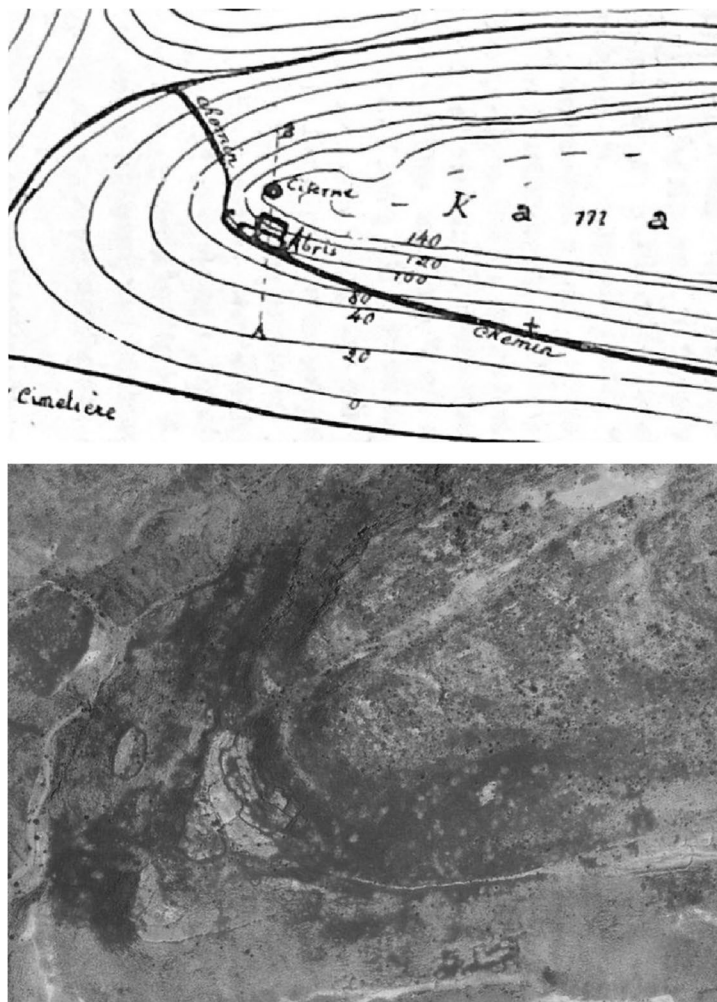
The Austrian researcher Franz Trost visited the chain of hills east of Lake Tele twice in the 1980s and wrote an article on the rock art he found there (Trost, 1997). However, he also mentions other sites of archaeological interest:

Quelques structures lithiques constituées, pour la plupart, de petits cercles de pierres simples avec un diamètre d’environ 2 m. Quelques unes ont été construites de pierres basses et verticales, aujourd’hui renversées. Une autre construction présentait au centre du cercle quatre ou cinq pierres verticales. Les fouilles archéologiques de surface ont mis en évidence différents matériels lithiques, surtout des fragments de meules et de broyeurs, ainsi que des tessons de poterie décorés.” (Trost, 1997, p. 52). Translation:

A few stone structures consisting mostly of small circles of simple stones with a diameter of about 2 m. Some were built of low, vertical stones, now overturned. Another construction, in the center of the circle, has four or five vertical stones. Archaeological survey has brought to light various lithic materials, especially fragments of millstones and grinders, as well as decorated potsherds.

We reached out to Trost for further information on these finds, but he informed us that the records of this visit are now lost.

During the inventories of archaeological sites in the area in the 1980s, published by Raimbault & Sanogo



**Fig. 2** Above: section of a map from Dupuis-Yacouba, 1922, p. 404. Below: corresponding satellite image (copyright: 2022 Maxar)

(1991), there is a rare mention of stonewalled sites. Mamadi Dembélé mentions explicitly only one stone wall (Hoggo Hayré) near Tondidarou, described as a field boundary (Raimbault & Sanogo, p. 65.; see Fig. 3 for an example of a field boundary in the MLR). Stone circles and stone tumuli are mentioned on several sites, but these are interpreted as cemeteries. Two sites are mentioned as having dry stone remains of fortifications. These remains are not specifically connected to any period. The closest we get to a CLSA connection is a site of stone tools with ceramics called Mobangou on the eastern side of Lac Tele. In the 1983–1984 campaign, another site near Mobangou was documented as BGM 1 near Bougoumera village. The text does not mention anything, but the table (Raimbault

& Sanogo, 1991, p. 184) cites “butte, structures en pierres.” The differences in the sites marked on the maps and those in the tables of that volume suggest that not all sites inventoried were published. It might be that some of the stone structures we report below were seen but not thought worthy of further mention. They were not featured in the interpretations of LSA occupation in the area.

The only recent author to mention the sites in detail is P. R. Coutros (2017, p. 482–83, figs. 8–9). In his typology of sites on the eastern side of Lake Fati, he has category 4, whose locations were:

...limited to the summits [and the edges] of the massifs [...]. Organised in large compounds,



**Fig. 3** Field boundary on the western shore of Lake Fati (image P. R. Coutros 2011)

they are composed of dozens of interconnected circular structures[...]. These compounds are constructed of dry stone masonry, lack surface material and have left no immediate clues as to their use or period of occupation. A revision of satellite imagery revealed that these complexes exist throughout the massif that extends 74 km north to the eastern shores of Lake Faguibine.

During his short period of survey, Coutros visited only one of these sites, where the height of stone walls remained up to about a meter. The site was not visible from the plain below the massif, which might explain why previous researchers missed the sites. No surface artifacts were found on the surveyed site. Coutros had intended to continue and deepen archaeological work in this region as the foundation for a Ph.D. dissertation. However, geopolitical developments precluded any further visits to the area. In the end, he had to content himself with publishing an article with the data from the single short preliminary survey. In it, the connection with the Tichitt culture is made, though it remains tentative due to the paucity of data. While the connection to Tichitt rests partly on the similarity

of the category 4 sites to Tichitt culture sites on the Mauritanian dhars, Coutros also documented ceramics on tell-type sites in the area that bears at least some resemblance to late Fata ceramics (MacDonald, 2011) in their thickened rims and folded strip roulettes (Coutros, 2017, Fig. 9), though they lack some distinctive elements.

### Space-Age Archaeology

The content of this article is intentionally as cautious as possible. We have brought together the elements already known about a considerable group of stonebuilt villages, concentrated on the rocky massifs north and west of the Niger Bend, over a distance of about 110×50 km from northeast to southwest. We have extended and updated the original satellite survey by Coutros to include all visible structures in the MLR and beyond. We have documented approximately 180 villages (we arbitrarily refer to settlements of more than ten concessions as villages) and numerous ancillary structures, hamlets, isolated concessions, enclosures, and walls in a limited area northwest of the Niger River.

Recent advances in freely available satellite imagery have allowed this progress in the knowledge of regional settlement. The method used is proven (Lasaponara & Masini, 2012; Parcak, 2009), though perfectly insufficient: it consists of using freely available high-resolution satellite imagery (mainly Google Earth and Bing Maps) to detect visible built structures, hydrographic networks, paleolakes, shell clusters, or other archaeological sites. This method is particularly effective in the Sahara and the Sahel. Concerning Mauritania, several articles dedicated to funerary monuments have been published (Gauthier, 2015; Gauthier & Gauthier, 2008; Linares Matás & Lim, 2021; Maley & Vernet, 2015, and numerous pages on Vernet’s blog). On the Internet, databases are numerous and give insights into the rich archaeological landscape of immense regions that are not currently conducive to archaeological research due to geopolitical disturbances (two large current projects, <https://eamena.org/> and <https://maeam.org/>, cover large parts of the African continent).

Nevertheless, these innumerable locations (in Mauritania, probably already more than 20,000) pose problems that need to be discussed—not to mention the ethical aspects. Can one use data recovered by satellite without ever having been to the area, without the authorization of the “owner”—the State, the institution managing the heritage and research, the “heirs” of the monument (see Linares Matás & Lim, 2021 for a discussion)? The main problem is the method, which has many pitfalls. One should not have illusions about the applications of satellite imagery for the general public: the resolution of the currently best available images, taken from an altitude of 600 km (WorldView Satellite Missions, European Space Agency *n.d.*), does not allow an accurate interpretation of many of the features. The archaeological material is not quite visible. The context is limited to the nearby visible structures and an approximation of the environment—rock, sand, water systems, altitude, and distance from other archaeological elements. In recent years, satellite imagery has made it possible to locate and classify almost all the stone villages of the Neolithic culture of Tichitt and its successors. However, many sites, including the many habitats established on the sand, without walls, but sometimes with stone pillars (never from very far away), cannot be located with satellite imagery applications for use by the general public. Satellite imagery is thus a fantastic tool as a complement to fieldwork. Though there are increasing attempts to statistically

maximize the information that can be gained from it (for this region, e.g., Linares-Matás, 2022), it remains impossible to conduct archaeological research solely from outer space. We nevertheless wish to point out these discoveries, accompanied by all the supporting evidence we could find, in order to establish a baseline and mark this as a priority for future field research.

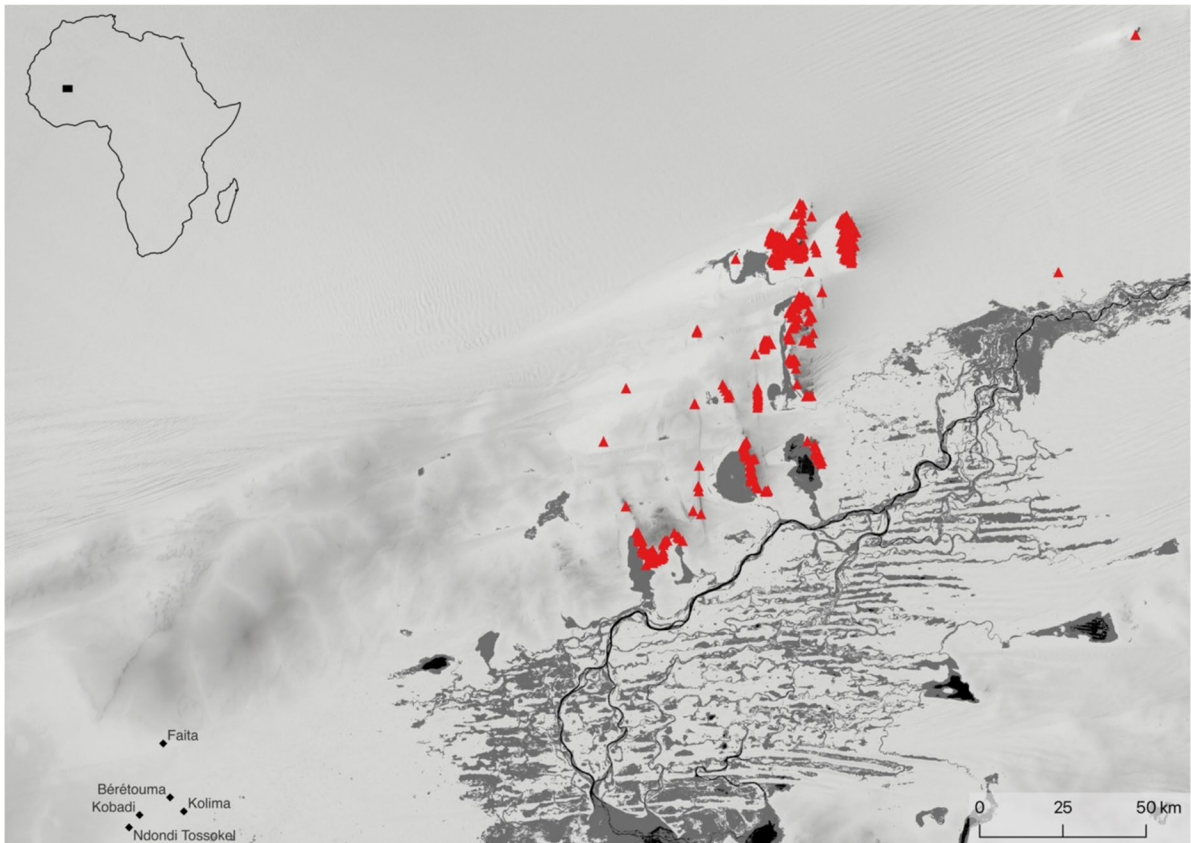
### Stone-Walled Sites of the Malian Lakes Region

In liaison with Malian heritage authorities, it has been decided that the exact locations of the sites should not be published here. This is because the area, though belonging to the Republic of Mali, is currently outside its control, and the armed conflict of the last ten years has led to a situation in which the looting of archaeological sites continues to prosper. A catalog of site locations is, however, available for future researchers and will be deposited both in Mali and at the Frobenius Institute in Frankfurt, Germany.

The sites documented in this survey differ from those known to be coeval with the Tichitt tradition in the Méma region. The distribution map in Fig. 4 also questions the blank spaces in between. Documented by the 1980s inventory mission, working with little time and a few personnel for the vast regions it covered, much may have been missed. As we do not have new materials, our inferences are necessarily limited, but we will attempt to present what we can extract from them. One of us has made a cursory visit to the sites and found no materials that might help assign a date or provide further context.

Assuming, for argument’s sake, that the villages are coeval, the density of their occupation of the space indicates a large and structured population. This population appears to have mainly been installed on rocky massifs overlooking the plain but close to the lakes. Figure 5 shows how sites appear to favor specific locations on rocky outcrops or high-lying terrain adjacent to water. The water in the map shows permanent (black) and impermanent (gray) water areas between 1984 and 2021 (source: EC JRC/Google).

The positioning of the settlements may offer a clue to their antiquity, as the pattern suggests ancient lakes with significantly high water levels, some of which are now devoid of permanent water. In Lake Fati, drier conditions set in around 4500 BP (Coutros & Douglas, 2015). Following this arid phase, high water levels in the Middle Niger system (“Megalake Timbuktu”) peaked



**Fig. 4** Location of documented sites. Permanent water (1984–2021) in black, impermanent water in grey (Source: EC JRC/Google)

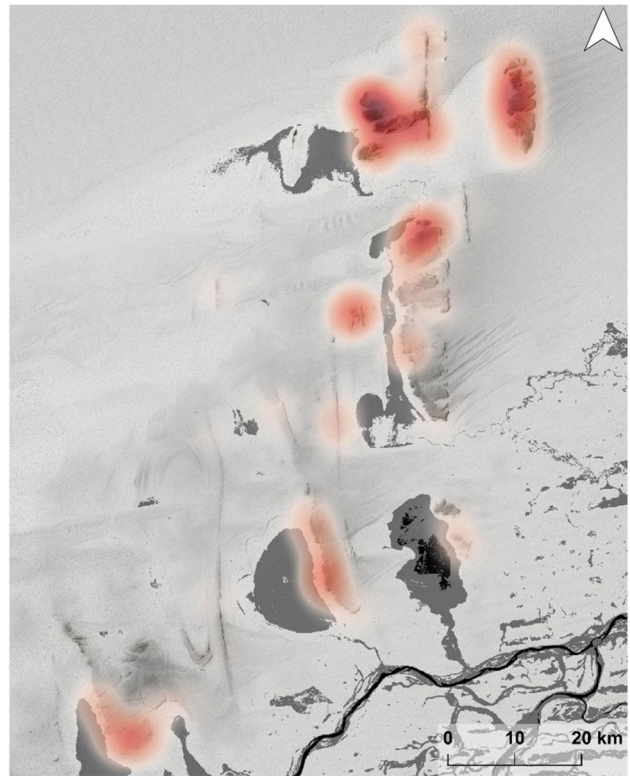
around 3.9 ka, at about 264 m, and declined from around 3.3 ka (Drake et al., 2022). These water table changes are related to more humid conditions that peaked in the first half of the fourth millennium BP. There was a second, but less pronounced, peak in the second half of the same millennium (Vernet, 2021, p. 47–48). This is when the human occupation of the wider region underwent profound changes. There was an explosion of cattle keeping, agriculture appeared, populations became sedentary—of which the large Tichitt culture sites are the most impressive monuments, exchange intensified, particularly along the rivers, and, finally, metallurgy appeared. We suggest that the occupation of the high-lying ground on the lakes, especially on their eastern shores, occurred when significantly more water was available in the lakes than today. However, the region was likely already in a drying climate phase, hence the attraction of human populations to these lakes and other permanent water bodies. The geographic similarities to the situation in which the Tichitt culture developed in

Mauritania, on the endorheic remnants of former lakes of the early and middle Holocene, are striking. The Tondidarou area is located significantly further south than the villages on the plateaus. The first millennium AD earthen tells are located in the plain, preferentially on the edges of watercourses or, more commonly, in the Niger's floodplain. We might therefore be seeing a gradual shift in the settlement location linked to a relatively abrupt change in humidity and floodwater regimes. Though these are only indications, they make a date of the first and second millennia BC for the stone-built village sites possible.

The distribution of settlements on the sandstone escarpments is strikingly similar to that which can also be discerned in those sites of the Tichitt tradition in Mauritania, which are visible on satellite imagery. There, this sample of visible stone-built sites obscures a far more complex settlement pattern both on the escarpments and below them, which has seen sporadic research, albeit of mixed quality and so far inconclusive. In the MLR,



**Fig. 5** Location densities of sites, showing clear preferences for sandstone escarpments [following the wishes of Malian cultural heritage authorities, the precise locations of sites are not shown]. Permanent water (1984–2021) in black, impermanent water in grey (Source: EC JRC/Google)



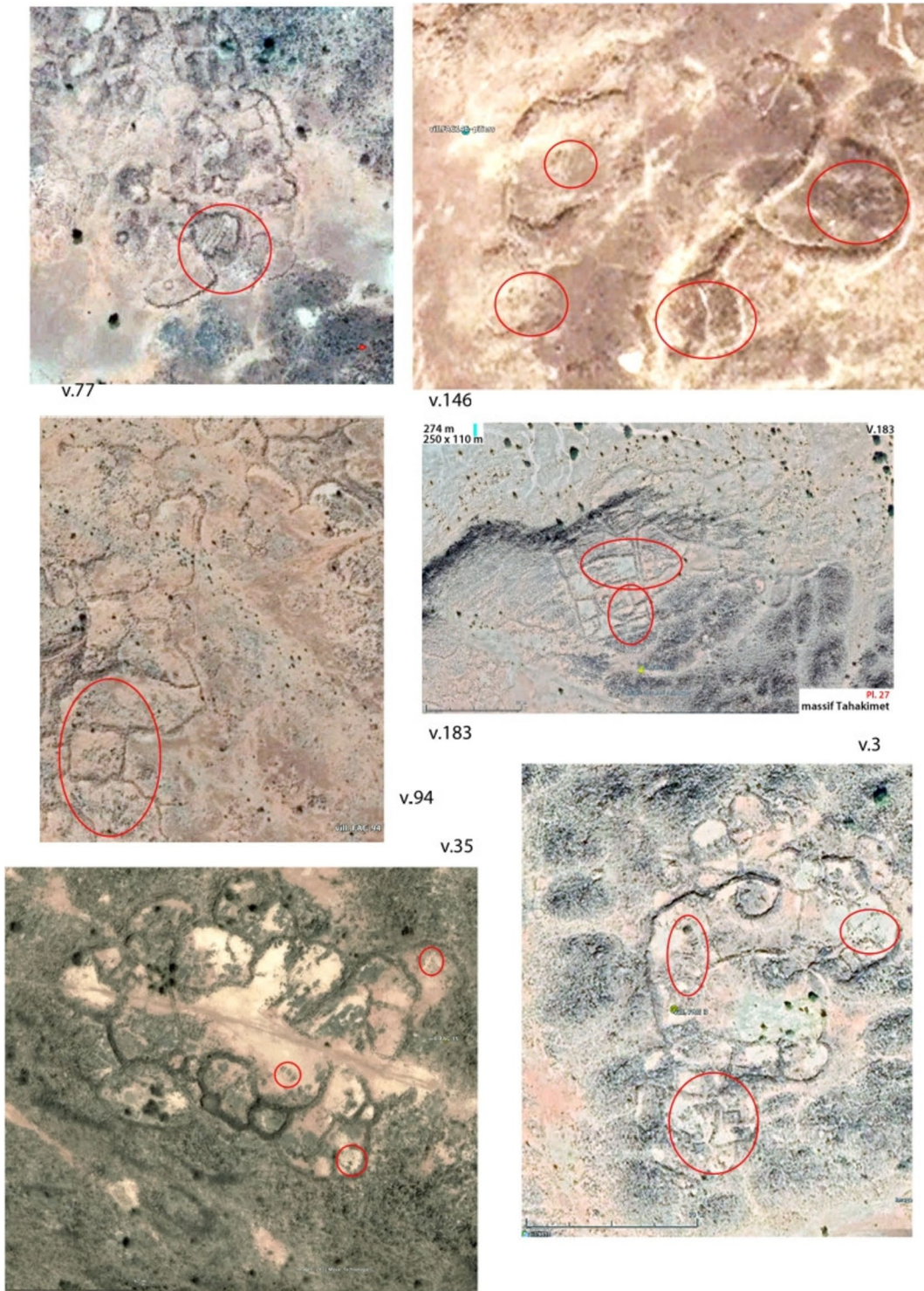
we may suggest a similar case. Several types of villages can be distinguished (Coutros, 2017). Coupled with their altitude and the possibility of pillar structures, one can see different periods: at least some of the habitats could be of the “Tichitt tradition,” while others are more recent, some undoubtedly using earthen building materials. Coutros (2017) has pointed to the diversity of sites in the region, including tell-type sites with dry stone features; the well-known tell-type sites without stone features, indicative of earthen architecture; and surface artifact scatters. It is tempting to think that these different sites are partly due to temporal developments, particularly toward the earthen habitation mounds, some of which are known to have been occupied in the first millennium AD. To what extent the different site types are part of a synchronous settlement system is also a crucial question that should be at the forefront of archaeological investigation when work resumes in the region.

About 30 villages show possible signs—with all due caution, as the risk of over-interpretation is very real—of pillar structures inside the concessions, which would be a sign of belonging to the Tichitt culture (Fig. 6). However, we cannot verify this from satellite imagery, despite considerable field

experience. The closest indication so far comes from the site of Fati 6, where Coutros documented stone pillar structures analogous to those known from the Tichitt culture (see Fig. 7). Fati 6 is a fascinating site: a tell, but seemingly built mostly of dry-stone features, its architecture seems to occupy a middle ground between the dry-stone sites and the area’s later earthen tells. On the basis of its surface pottery, however, Coutros roughly classifies it as dating to the first millennium AD.

## Outlook

Our interpretation cannot go further than this. We do not know the construction methods, archaeological materials, ways of life, or chronology associated with these sites. We must therefore leave it at that until the sites have been physically surveyed—but the images included in this article certainly present one more strengthening element indicating the presence of Tichitt-style “urbanized” settlement ensembles beyond the Mauritanian border. It adds to the evidence that indicates the presence of groups originating from the



**Fig. 6** Possible pillar structures in village sites of the MLR



**Fig. 7** Stone pillar structure at Fati 6 (image: P.R. Coutros 2011)

Mauritanian dhars or, directly, from the north of Mali, which were key in the cultural development of the Inland Niger Delta region in the Late Neolithic, and later.

It is not surprising to find drystone structures here, as the building material is abundant, and this stone building technology is certainly not unknown to Sahelian and Saharan West Africa. The fact that the sandstone escarpments of the MLR should be chosen as an area for settlement is not surprising either since they are the only elevations rising high, up to 200 m, above the Niger's former floodplain on its western side. They thus provide natural focus points on the landscape. If the findings from the satellite surveys presented here turn out indeed to be Tichitt culture sites, then the Malian Lakes Region contains an important proportion of this tradition and should be considered a second Tichitt population center. These sites, above all, have the potential of being the missing link in the relationship between the Tichitt culture, the CLSA in the Méma, and the remarkable cultural developments of the Middle Niger in the first millennia BC and AD. As we show, almost nothing is known about these sites. But they exist, waiting to be studied on the ground.

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