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**Report on Fieldwork. Investigation on the Site of
Wakarida (Sa^cesi^ce Ts^cada Emba Woreda / Tigrai),
November 7th-December 6th 2013 (3rd season)**

Fabienne Dugast, Iwona Gajda

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French-Ethiopian project
of archaeological and epigraphic investigations
in Tigrai region, Ethiopia
Pre-Aksumite & Aksumite period
(8th c. BC-AD 7th c.)

REPORT ON FIELDWORK

Investigation
on the Site of Wakarida
(Sa'esi'e Ts'ada Emba *Woreda* / Tigrai)
November 7th - December 6th 2013

presented by

Dr Fabienne Dugast,
Dr Iwona Gajda,
& the team

TO THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
MINISTRY OF YOUTH, SPORT, AND CULTURE
AUTHORITY FOR RESEARCH AND CONSERVATION
OF CULTURAL HERITAGE

15 February 2014

Heads of mission

Dr Iwona **Gajda**, specialist in epigraphy and history of Ancient South Arabia and Ethiopia,
Dr Fabienne **Dugast**, Archaeologist, both from the Centre national de la recherche scientifique in France.

Title of the project

Archaeological and epigraphic investigations in Tigray region, Ethiopia (Pre-Aksumite & Aksumite period)

Dates of fieldwork

November 7th-December 6th, 2013

Field of research

Historical, archaeological and epigraphic investigations

List of field team members

<i>Name</i>	<i>Specialty</i>	<i>Institution</i>	<i>Degree</i>
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Dr Fabienne Dugast	<i>Archaeology</i>	CNRS (Orient & Méditerranée) / France	PhD
Dr Xavier Peixoto	<i>Archaeology</i>	INRAP / France	PhD
Dr Julien Charbonnier	<i>Archaeology</i>	CNRS (ArScAn) / France	PhD
Dr Sabina Antonini	<i>Archaeology & Art History</i>	University of Naples / Italy	PhD
Dr Anne Benoist	<i>Ceramology</i>	CNRS (ArchéOrient) / France	PhD
Dr Vittoria Buffa	<i>Ceramology</i>	Italian Mission to Oman / University of Pisa / Italy	PhD
Vincent Bernard	<i>Graphic Design</i>	Free lens	MA
Dr Olivier Barge	<i>Geography</i>	CNRS (ArchéOrient) / France	PhD
Emmanuelle Régagnon	<i>Cartography</i>	CNRS (ArchéOrient) / France	MA
Dr Yann Callot	<i>Geomorphology</i>	University of Lyon / France	PhD
Dr Christian Camerlynck	<i>Geophysics</i>	University of Paris VIII / France	PhD
Xavier Craperi	<i>Survey</i>	ALTEA Surveyors, Lyon / France	MA
Yohannes Gebre Sellassie	<i>History (Aksumite period)</i>	University of Paris-Sorbonne	PhD <i>to be subm.</i>
Tekle Hagos	<i>Archaeology</i>	University of Addis Ababa	MA
Amare Stetotane	<i>Driver</i>	CFEE (French Centre for Ethiopian Studies), Addis Ababa	
Simeneh Bacha	<i>Driver</i>		
Sisay Getachew	<i>Cooker</i>		
Godana Yohannes	<i>Cooker</i>		

Official representatives

Tesfaye **Asnakew**, ARCCH (Authority for Research & Conservation of Cultural Heritage), Addis Abeba.
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INTRODUCTION & BACKGROUND

F. Dugast & I. Gajda

The third season for the *Archaeological and Epigraphic Investigations in Tigray Region (Pre-Aksumite & Askumite Period)* took place from November 4th to December 7th, 2013 in Sa'esi'e Ts'ada Emba *woreda*, north-eastern Tigray. It is part of a four year research programme, headed by Dr Iwona Gajda and Dr Fabienne Dugast from the CNRS (Umr 8167 "Orient & Méditerranée" / Paris), and supported by the French Ministry of Foreign Affairs (MAEE), the French Centre for Ethiopian Studies (CFEE / Addis Ababa), and the Bureau of Culture and Tourism of the Regional State of Tigray (BCTRST / Wukro).

It comes as a result of a preliminary survey which took place in March 2010 in agreement with Ato Kebede Amare Belay, General Manager of the Tigray Culture and Tourism Agency (TCTA) at Makale, and which has been concentrated on documenting several sites first surveyed by the Ethiopian team in the region of Atsbi-De'ra, East Makale (see DUGAST & GAJDA 2010). The archaeological site of Wakarida, on the eastern edge of the highlands of Tigray near Sawena (Fig. 1), was found out in 2004 by Ato Habtamu Mekonnen from the TCTA (Makale) and Ato Tekle Hagos from Addis Ababa University (see MEKONNEN 2008). It has been chosen to start systematic archaeological investigations which began in March 2011 (see DUGAST & GAJDA 2011).

Position

Wakarida (formerly known as 'Aribara) is situated about 70 km north-east Wukro, 2 hours trail from Edaga Hamus to Mengela, east and close to Sawena, 14°16'56"4 N / 39°43'31"9 E (altitude 2,343 m). It is dependent on Sa'esi'e Ts'ada Emba administrative *woreda*, in the *tabia* of Sawena. It has been established on a rocky outcrop, which overlooks a large valley called May Ayni, surrounded by chain of mountains, respectively from north to east and south to west: Daima, Afedadae, Dagaraebe, and Arebata (Fig. 2). From now on, the place is made up of cultivated lands and farm houses, which belong to several heads of family.

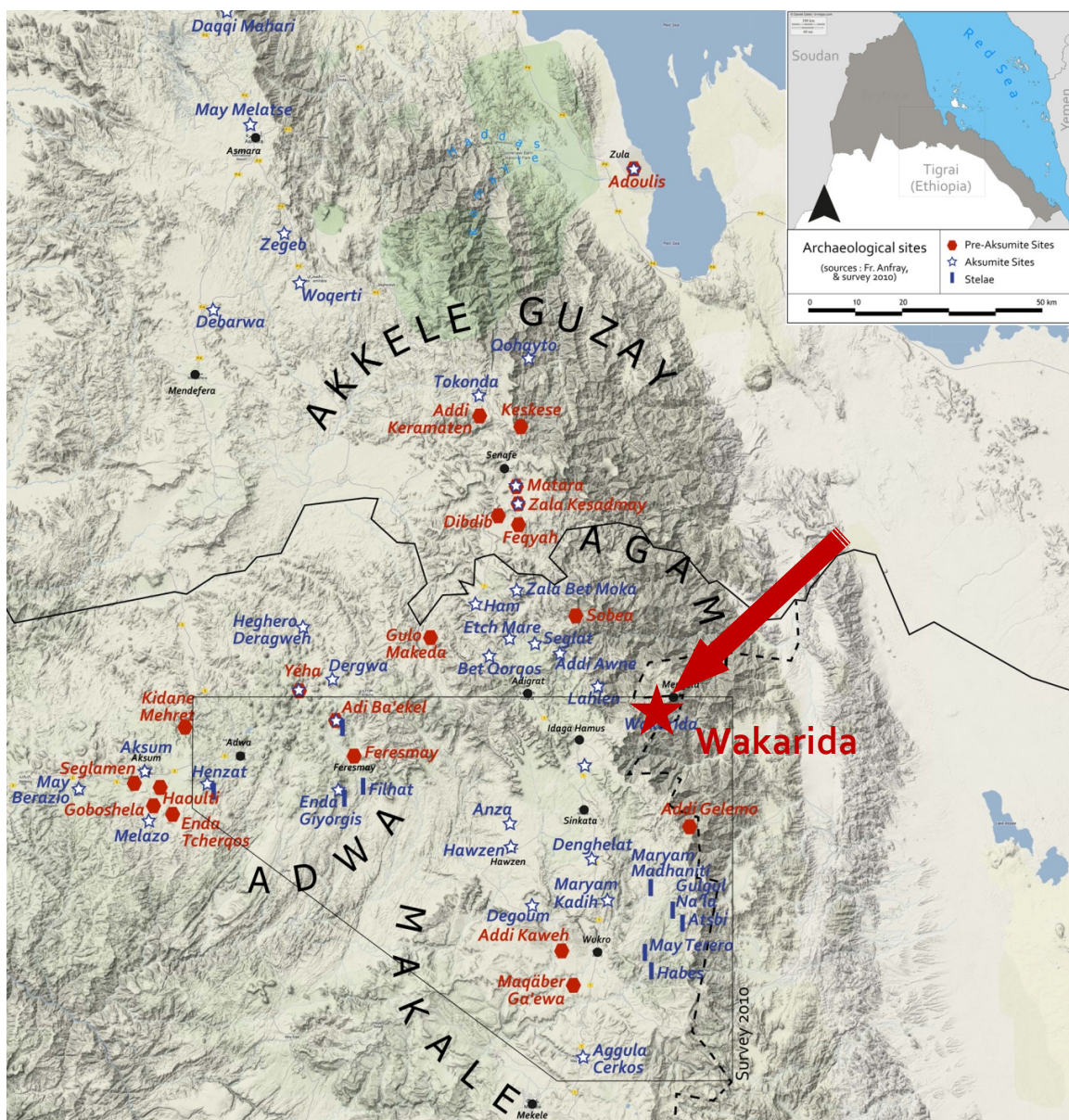
The site is concerned with three main objectives, as far as its remains are related to:

- ▶ first of all, its remote location, while open in the direction of the Red Sea, may help in considering the relations, whatever they were, between North Ethiopia and South Arabia in the early 1st millennium AD;
- ▶ on the other hand, and according to the chronological sequences, it may give us sufficient elements to make out chronological markers – especially in pottery typology – which are still lacking;

- finally, as the local landscape looks like a “fossil” one principally subjected to erosion, but ever contrasted during time by men through a patient work of slope and floor valley terracing, it may help us in considering different kind of occupation and settlement all over May Ayni valley and three other ones – Ka`ebile, May Weyni and Ambare –, which join up at Demba Bales and Sawena.

These three main objectives have therefore a common course: the organisation and evolution of settlement patterns, in both political and cultural aspects, from the time before the emergence of Aksum and after.

Fig. 1 – Wakarida, in Sa`esi'e Ts`ada Emba woreda, Tigray region (Ethiopia). Localisation: UTM 38 = 14°16'56"4 N / 39°43'31"9 E (altitude 2,343 m). Aksumite period (1st millenium AD) (GoogleEarth / F. Dugast 2012 ©).



Running & team

The project is based on the collaboration of specialists of several domains. In 2011, geophysicists and archaeologists as well as a surveyor took part in the field work. In 2012 and 2013, geographers joined the team.

It involved Ethiopian scholars: Yohannes Gebre Sellassie is member of the mission since the very beginning, and Tekle Hagos since 2011, even though they could not participate to fieldwork this year. We were helped by the French Centre for Ethiopian Studies, the ARCCH (Addis Ababa), and the BCTRST (Wukro), as well as the *Tabia's* administrator and officials from Sawena, and the local people who are still very cooperative and concerned with the investigations.

The investigations were directed by Dr Iwona Gajda and Dr Fabienne Dugast, from the Centre national de la recherche scientifique (CNRS) in Paris, and team members included this year:

- Dr Xavier Peixoto, France (archaeology),
- Dr Julien Charbonnier, France / London (archaeology),
- Dr Sabina Antonini, Italy (archaeology),
- Dr Anne Benoist, France (ceramics),
- Vincent Bernard, France (graphic design),
- Dr Olivier Barge, France (SIG & survey),
- Emmanuelle Régagnon, France (cartography & survey),
- Dr Yann Callot, France (geomorphology & survey),
- Xavier Crapery, France (mapping),
- Haylay Teklay, Wukro (interpreter, survey),
- Tesfaye Asnakew, Addis Ababa (official representative ARCCH),
- Amare Stetotane & Simeneh Bacha, Addis Ababa, CFEE (drivers),
- Sisay Getachew & Godana Yohannes, Addis Ababa, CFEE (cookers),
- Hailu Abera & Woldu Hagos, Wakarida (guardians),
- 30 workmen, Wakarida (excavation),
- Aregash Woldu & Selam Hagos, Wakarida (washing of the pottery).



Fig. 2 – The archaeological site of Wakarida and its surroundin:
fifth title R2C2 window centred on Wakarida site (satellite image, Digital Globe 2011 ©).

I. FIELD OBJECTIVES

F. Dugast

The third season took place after preliminary investigations carried out in 2011 and 2012 on the site of Wakarida, the main tasks of which were then to estimate and evaluate the archaeological potential of the site, its area and organization (see DUGAST & GAJDA 2011; 2012a).

Abundant resources, mainly of the soil, appeared at first sight to be sufficient to explain any human settlements. Though, even if the region seems to have first been arranged for agricultural purpose, the remains on the site of Wakarida showed the setting up of a town, as small as it may be, which would indicate the presence of a wealthy and more or less numerous people, even hierarchically structured. The main task is hence to understand the reason why this kind of remote territory could have been developed.

Implementation

Together with the technical data the first seasons provided (2011-2012), several implements and analysis were started to insure a plain efficiency of the next seasons to be involved.

► Prerequisite to the third season (2013)

Specific fieldwork objectives were first to implement a sampling design which employed geomantic techniques including GPS (Global Positioning System) and GIS (Geographic Information System), and to initiate a systematic survey which employed specific techniques including geophysical methods, which consisted of electrodes resistivity and reflectometry measurements (Chr. Camerlinck & Q. Vitale, Sisyphé, University Paris VI / France). Both resulted in a basic instrument mapping the site on- and under-ground.

Besides, a sampling of each type of pottery has been collected in order to produce a new typology with, as far as possible, chronological references. A systematic collection of artefacts with a systematic register and stratigraphic localization has been initiated and developed into the basis of a preliminary typological study and chronological markers (A. Benoist & C. Verdellet, CNRS, Archéorient / France).

The complete register of the archaeological data – stratigraphic units (SU), pottery typology – has been set up thanks to a geo-referenced cartographic medium connected to several items and using ArcGIS software (O. Barge & E. Régagnon, CNRS, Archéorient / France). The numerical system is concerned with either the archaeological data from the site itself or the ones from the

different field investigations, among them the geophysical survey. It will help us to understand the territory's organization and the communication routes, as well as the natural environment and its agricultural exploitation.

► Former season supply (2011-2012)

A preliminary analysis of the natural environment has been performed thanks to a satellite image from Digital Globe 2011, pointing out geomorphologic elements, on the site itself and in its surrounding (B. Marcolongo, CNR, IRPI / Italy). This geomorphologic analysis supported the idea of a controlled development of the region, for a long time ago – resulting in a kind of “fossil landscape”. Archaeological survey reinforced this idea, since ancient remains have been observed in both May Ayni and Ka'ebile valleys, next to the site of Wakarida, part of these remains being obviously earlier than the ones presently excavated at Wakarida.

On the other hand, the excavations carried out on the site of Wakarida reinforced the idea of a build-up area, dated back to the 3rd-6th centuries – the chronology of which has been supported by ¹⁴C analysis (AD 245-389 [-1725 +/- 25 cal. BP] on top of the hill, AD 380-537 [-1625 +/- 30 cal. BP] on the north-eastern side).

In fact, the development of such a remote settlement has been obviously in connection with the kingdom of Aksum. The unearthed structures both on the eastern border of the outcrop – square D2 – and on top of it – square B2 – show a plain resemblance with Aksumite architectural techniques. The walls are of stacking work, steadily scattered with levelling courses of large stone slabs, which bring to mind the architectural techniques used either at the so-called “Dongur Palace” near Aksum or at Matarā in Eritrea (see ANFRAY 1963a & 1974).

Though, even if architecture refers to what occurred at that time in the kingdom of Aksum and its cities, commercial trails are not plainly identifiable, and potteries do not seem to indicate any commercial trade as one may usually understand it: only a few Aksumite coins have been collected.

Working hypothesis

After the second season (2012), several conclusions have been put forward, and the first hypotheses have been reinforced as far as the site and the landscape are concerned.

► Wakarida, a valuable site

The two buildings (D2 and B2) are so much close to those of Matarā or Aksum, as regards their shape and even the architectural techniques, that one has to take into chief consideration their organization and identification as well as their function within the site of Wakarida, and even the whole valley of May Ayni.

This kind of architectural complex is usually connected to the residence of wealthy people. It has a central main building raised on a platform and surrounded by a kind of courtyard enclosed in a row of regular rooms. These are usually identified with service rooms, though nothing really makes it available except the formal system. Neither the use nor the contemporaneity of the surrounding rooms has yet been recognized at Wakarida. Were they sheltering people linked

to the running of the central building? Or were they independent housing? And if so, were they built up before the Aksumite building?

Yet, the identification of the latter is still uncertain. Two – among three, maybe more – of them have been erected at Wakarida but none seem to be fully alike. Only one (B2 on top of the hill) shows actually a complete scheme which consists of a nearly square building about 13 x 13 m, divided into 9 rooms arranged three by three – very similar to the one at Matarā on hillock B or C (see ANFRAY 1965 & 1967). The other one is partly preserved, but seems to be less ordered and may be similar to the one at Matarā on hillock A (see ANFRAY 1963a & 1967). Though, the pottery collection on each area appears to be slightly different: have they been built in the same time or sequentially? Were they really the residence of wealthy people – or even “palaces”? And if so, were they related to an urban complex – since several other architectural remains are visible on the surface and may have been of housing environments.

The precise identification of these complexes is clearly connected to the reasons of their construction on a remote site as it is, on the western edges of the highlands. Their architectural specificities give evidence of the development of a kind of hierarchical organisation of a human group, closely linked to the central power of Aksum. Though, it makes difficult to see if the expansion of May Ayni valley – and probably as well those of Ka’ebile, Tabina and May Weyni – occurred in a political and economic will of the kingdom of Aksum or merely in a local movement which took advantage of the emergence of the kingdom.

► A fossil landscape

The geomorphologic approach already supports the thesis of a voluntarily worked area, fitted out by man on agricultural purpose. The identification of the site of Wakarida is in this very context closely linked to the implementation of the landscape and its chronology. Two hypotheses can be put forward:

- the succession of terraces intended for agricultural purpose and erosion control was set up in the Aksumite period – in this very case, from mid-3rd century onward –, and Wakarida would have been the support of it;
- the landscape was already formed before the construction of the Aksumite complexes at Wakarida, and other settlements are to be found which could have preceded them, maybe on the same site, more probably in its surrounding, applying another model of settlement.

The current landscape could be qualified as a “fossil” one. It may in fact have been formed by previous communities settled there in former periods, the following generations had only to maintain in balance or to slightly develop it. Though, even if the relief of the valley would have been generated in ancient times – pre-Aksumite eg –, Wakarida’s settlement could have resulted of a development either by native or at least previous communities (endogenous) or by people summoned by the kingdom (exogenous), when extending for economic purpose. Relations with the kingdom are obvious in the 3rd-6th centuries: were there any relations with the highlands before? The transition between both types of inhabitants is then to be found out: was it of transfers, associations, transformations, movements...

► Economic links between valleys

The archaeological survey completes the description of such a developed area in the Aksumite period. Several sites have been noticed in both valleys, May Ayni and Ka'ebile, some of which seem to have preceded Wakarida's settlement. An important one (SAZ-42) looks very like Wakarida and may have had a similar arrangement, checking Ka'ebile valley. In other words, Wakarida may not have been as isolated as it first appears – at least in the 3rd century – even though no commercial exchange really comes out from pottery collection.

Indeed, each valley – May Ayni, Ka'ebile, Tabina and May Weyni – divided the territory into coherent topographic units, which obviously defined the organisation of different communities. Each of them seemingly developed agricultural purposes, the products of which – as well as other activities – would have been concentrated on a chief site like the one at Wakarida in May Ayni valley. Each valley may have developed selected activities in a specific way, so as inevitably relations occurred between the different communities.

As much as one can infer from the pottery collection, the region would have been more or less away from the great commercial axes: there were though obviously networks of interregional exchanges, and maybe a kind of hierarchical organization between the valleys, according to their specific position in the geographic area. But there were evolutions: towards what kind of politico-economic model? At what time did it occur: before or with the emergence of Aksum?

Agenda

These issues allow taking out the reason why this kind of remote territory could have been developed. Abundant resources, mainly of the soil, may be sufficient to explain such human settlements. Though, even if the region seems to have been first arranged for agricultural purpose, the site of Wakarida shows the setting up of an urban complex, as small as it may be, which indicates the presence of wealthy people, and at least treated on hierarchical bases. The development of such a remote complex may be in connection with the kingdom of Aksum. Architecture refers in fact to what occurred at that time in the kingdom and its cities, Aksum and Matarā, even if commercial routes are not plainly identifiable; even if potteries do not seem to indicate any large-scale trade – even if a few Aksumite coins have been collected. On the other hand, the evidence of earlier settlements allows thinking of a previous organisation to consider as a “first round”.

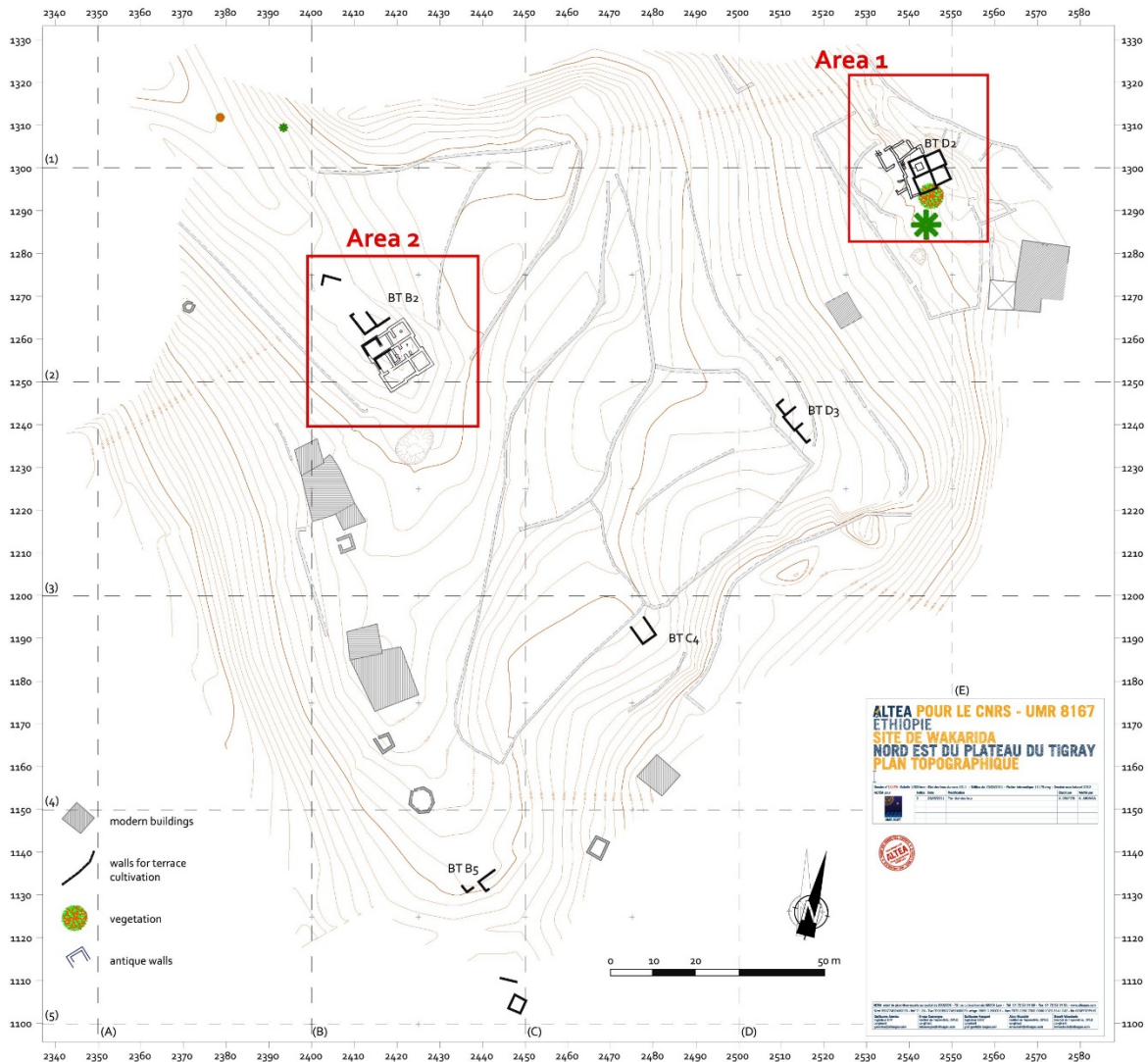
Few more issues came forward next to a careful examination of these new elements. They have been completed with other investigations which have been undertaken this 3rd season: excavations in order to make clear the occupation levels; buildings' mapping in order to identify them; archaeological survey in order to take a more precise course according to the first issues. Pottery classification has to be continued and supported by ¹⁴C analysis in the following months in order to fix the chronology.

II. ARCHAEOLOGICAL EXCAVATIONS

X. Peixoto, J. Charbonnier & S. Antonini

Following the previous seasons and excavations, the archaeological investigations focused on the general organisation of the site of Wakarida itself – that is on the north-eastern side of the hillock (area 1) and on top of it (area 2) (Fig. 3).

Fig. 3 – Topography of the site of Wakarida & location of the excavated areas (X. Craperi 2011-2013 ©).



Since each main building from both area 1 and 2 brought to mind the architectural techniques used either at Matarā or Aksum, and has hence been related to a wealthy population from the Aksumite period, the excavations have been further undertaken in order to complete their planning and to understand their function.

D2 Building and adjacent housing (Area 1)

X. Peixoto

The excavation in area 1 has been continued and extended. As regards the very first results, the task was to complete both the main building and the housing plan nearby, and to try to understand the accurate relations between the different constructions.

► D2 Building (loci 7, 8, 9, 10, 15, 16)

D2 Building comprised four rooms (loci 7, 8, 9, 10), three of them having being rebuilt and reused as water tank by the local population. Two periods of construction are noticeable, and two more rooms on the south-eastern side have been partly excavated.

• First occupation phase (M 1047)

The construction levelled a previous one, the only remain being the basement of a large wall (M 1047) (Fig. 4). It seems to have been an important building, the construction of which may have occurred at the same time as the first stage of the housing nearby (Fig. 5).



Fig. 4 – Area 1, a large wall basement of an unknown structure (X. Peixoto 2013 ©).

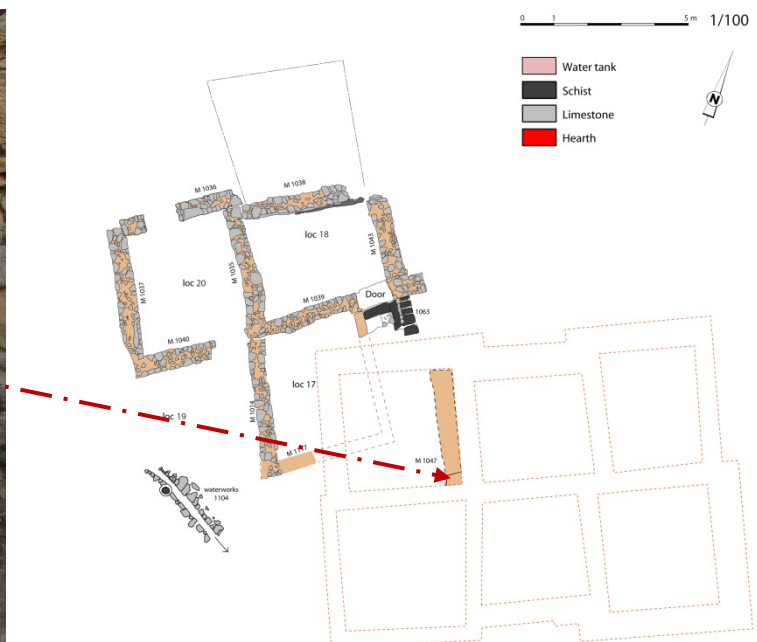


Fig. 5 – Area 1, first occupation phase (X. Peixoto 2013 ©).

• Second occupation phase

As noticed in 2011 and 2012, D2 Building comprises several elements which are plainly related to the Aksumite architecture: the wall planes were alternatively set back and in projection, and the façade was composed with regular levelling courses set up with slabs of schist in such a way as to bring out small steps.

Four rooms have been identified during the previous seasons (loci 7, 8, 9, 10). They consisted of a square building about 9 m aside, the north-western corner of which was uncovered. Three test excavations have been open on the three other corners: two more rooms have been recognised on the eastern side of the building (loci 14 & 16), but actually none on the southern one. The original plan may have been hence about 12 x 9 m, consisting of six rooms arranged in two rows of three rooms each (Fig. 6).

Fig. 6 – Area 1, ground plan of D2 Building
(X. Peixoto 2013 ©)

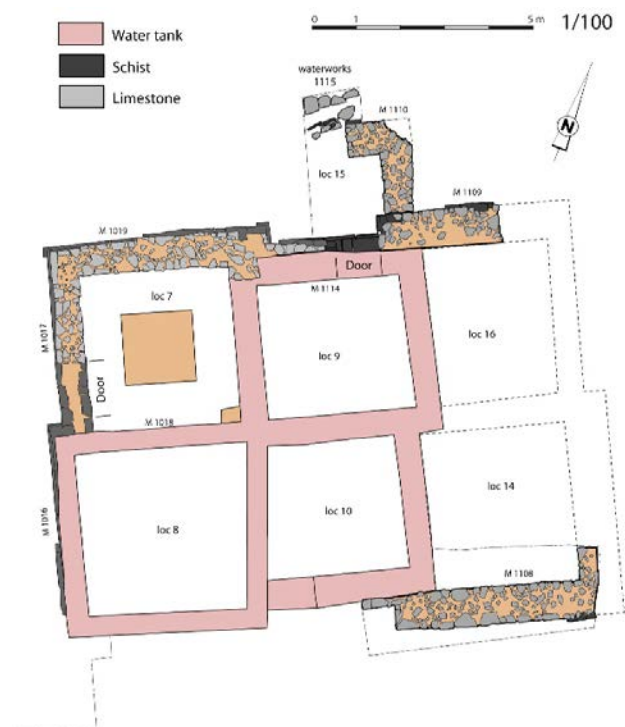


Fig. 7 – Area 1, D2 Building:
a/ the south-western corner;
b/ the south-eastern wall
(X. Peixoto 2013 ©).



These coupled rooms newly discovered have been slightly unearthed, and do not seem to have been recently reordered like the four others, in such a way that no ground level related to the Aksumite period could have been recognized in 2012 season: three of them were dug in order to be renovated into tanks, and the stonework made-up pillar erected in the middle of the last one has been quite damaged.

An entrance door has been recognized in 2012 season, on the western side of the building, allowing the access to the corner room with the central pillar (locus 7). A second small door has been uncovered on the northern side of the axial room (locus 9), which has been walled up recently (**Fig. 8**). A test excavation revealed the presence of a small room in front of this axial door (locus 14), which has been added later on to the building, like a kind of small hall (locus 15).

The main access would thus have been open on the southern side, but has to be probed.



Fig. 8 – Area 1, D2 Building and its access – recently walled up – on the northern side (X. Peixoto 2013 ©).

► The surrounding housing (loci 1-6, 11-13, 17)

On the western side of D2 Building, opposite to a small lane, six different rooms were excavated in 2012 season (loci 1 to 6). Another one has been completely unearthed this year – next to locus 6, on its northern side (locus 12) –, and test excavations enabled to identify three other ones – two of them next to D2 Building, on its northern (locus 15) and southern side (locus 13), the third one next to locus 5 (locus 11) (**Fig. 13**).

Loci 1 to 6 have been though completely excavated as a priority, in order to determine the chronology of the housing. Two phases have been distinguished: one preceded the construction of D2 Building, the other one was contemporary to its use.

▪ *First occupation phase*

Loci 18, 19 and 20 preceded the construction of D2 Building, as well as locus 17, which has partly been destroyed by the lane (locus 1) and D2 northern corner (**Fig. 5**). In 2012, these three loci did not reveal any occupation levels related to the first phase, since their structures were covered by the second phase levels.

Though, in this very first phase, locus 18 seems to have been a living space, the access of which was a staircase (1063) leading to a door which has been walled up in the next phase (**Fig. 5 & 9**).

This first building had a courtyard on the south-western side (locus 19), the lower levels of which gave a significant amount of pottery. Two floor levels can be related to this phase: a basic stony soil covered by two layers of wind-borne sediments. The oldest one displays a waterworks in order to canalize runoff water (**Fig. 5 & 10**). On the second floor was a half-buried storage vase covered by a circular lid made of schist.



Fig. 9 – Area 1, stairway giving access to locus 6
(X. Peixoto 2013 ©).



Fig. 10 – Area 1, waterworks in locus 4
(X. Peixoto 2013 ©).

▪Second occupation phase

The second occupation phase of the housing was directly linked to D2 Building. Locus 17 was cleaned out by a small lane (locus 1) which bypassed the main building on its northern and western sides, and provided access on both sides, to the courtyard (locus 4) and locus 6, and to the north-western room of D2 Building (locus 7).

The lane was levelled with an embankment, on top of which occurred a sequence of four muddy floors with two small hearths (1076 and 1084) (**Fig. 11**).



Fig. 11 – Area 1, locus 1 as a small lane (X. Peixoto 2013 ©).

Fig. 12 – Area 1, locus 6 as a storeroom (X. Peixoto 2013 ©).



During this second occupation phase, locus 18 has been changed into a storeroom (locus 6) and its previous door has been walled up. Seven storage jars were found in situ (**Fig. 12**). The floor of the living space has been moved over the ceiling of the storeroom, and a new stairway has been constructed on top of the slope, giving a straight access to it (**Fig. 13**). Locus 5, on the western side, has been completely excavated, and displayed grinding stones, pestles and pottery.

The courtyard (locus 4) was still in use, and was divided into two parts by a low wall (1013). A hearth with a pit (1032), a dump of pottery and several grinding stones indicate that the place was used for cookery. Coupled schist slabs set on their edge might have consisted of two storage structures (1042, 1031). A sample of charcoal, collected in 2012 in the hearth 1032, ca. 0,40 m under the soil, gave a radiocarbon date between 380 and 537 AD (-1625 +/- 30 cal. BP).



Fig. 13 – Area 1, second occupation phase
(X. Peixoto 2013 ©).

On the northern part of the housing was a storeroom (locus 12). As in locus 6, five jars, with their own schist lids, have been found in their original position (**Fig. 14**).

On the southern part, an uncovered and open space (locus 13) obviously suffered significant erosion due to runoff water: we suppose therefore that there were no buildings in this area, since there seems to have been no obstacle for the flow of rainwater.

After the abandonment of D2 Building, and in the western corner of locus 15, a grave has been dug and covered with slabs of schist.



Fig. 14 – Area 1, locus 12 as a storeroom
(X. Peixoto 2013 ©).



Fig. 15 – Area 1, locus 15 and its grave
(X. Peixoto 2013 ©).

B2 Building and prior structures (Area 2)

J. Charbonnier & S. Antonini

During the 2012 archaeological season, excavations were carried out for the first time on top of the hill crop (area 2). The investigation led to unearth a wide building (B2) – partially visible on the surface (**Fig. 16**) –, dating back to the Aksumite period. A sample of charcoal collected in one of the rooms' soil gave a radiocarbon date between AD 245 and 389 (-1725 +/- 25 cal. BP).



Fig. 16 – Area 2,
B2 building
(J. Charbonnier 2013 ©).

The main task of the 2013 field season was to continue the excavations on B2 Building, completing its plan, finding the entrance, and clarifying the use and function of wood in the architectural technique. The aim was also to examine the different occupation layers and to unearth the structures the main building covered (phase 1 & 2).

► B2 Building

B2 Building was nearly square in plan and ca. 13 m each side (**Fig. 17**). It showed a typical Aksumite scheme, with wall planes alternatively set back and in projection, the latter ones located at each corners. The external facade showed levelling courses set up with slabs of schist in such a way as to get small steps: the walls were therefore thicker at their base, between 0.62 and 0.72 m.

The building consisted of 9 rooms of different size, and arranged in three rows. During the 2012 season, three of them have been excavated: the central one and two others located north and north-east; in November 2013, the six remaining rooms were excavated down to their original floor. As already stated in 2012, only one occupation layer and one architectural phase have been recorded, although some arrangements were added to each room over time. Floors were made of hard-packed earth and were covered with 5 cm thick occupation layers consisting of silt, ash and debris. Every room was rectangular in shape apart from the one located at the eastern corner of the building (locus 6).

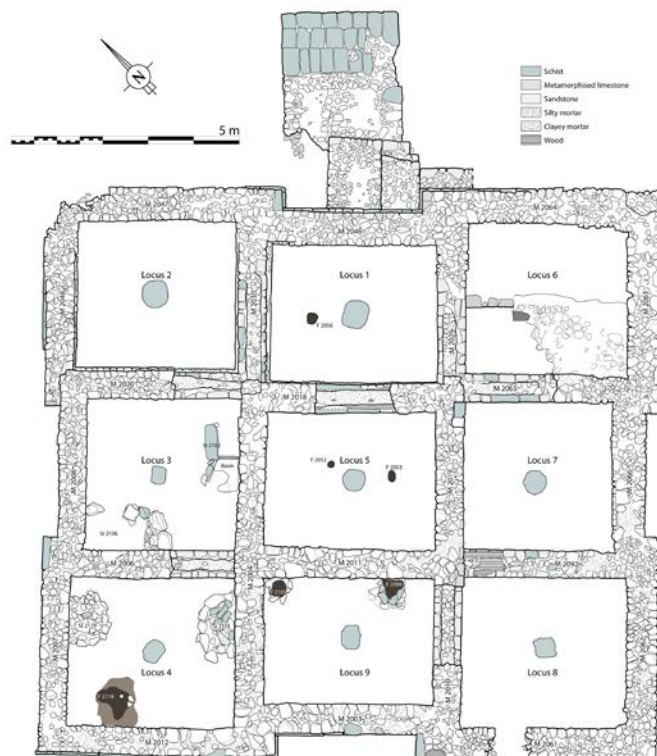


Fig. 17 – Area 2, ground plan of B2 building (J. Charbonnier 2013 ©).

Fig. 18 – Area 2, B2 building: the stairway on the north-eastern façade (J. Charbonnier 2013 ©).



▪ *The main door*

B2 Building has been built on a low platform: floors and thresholds were located 0.60 to 0.70 m above the bedrock. No entrance could be seen in 2012, neither on the north-western and south-western sides, nor on the two other sides eroded below the floor level. Nevertheless, we suspected the presence of an entrance on the north-eastern side, looking all over the site. A test excavation about 5 m wide was therefore carried out at the centre of the façade. It led to the discovery of a stairway about 4.30 m long, built on top of the bedrock (**Fig. 18**). The steps have been constructed in several phases, and made of several structures lying against each other or stacked. Three of them are still visible at the bottom while the top part of the structure was partly destroyed. It was leading to a small platform (2 x 1.10 m) ending at the façade.

▪ *Circulation plan and function of the rooms*

Locus 1 seems to have been a kind of vestibule since the stairway was leading to it and opened in all the other rooms. Indeed, three doors gave way into that space: one opened in the central room (locus 5): this door was located in the axis of the main entrance; another was giving access to the eastern room (locus 6) from which it was possible to reach the southern adjoining rooms (loc. 7 to 9); from the last door one could get to the rooms located on the north-western side of the building (loc. 2 to 4).

The function of the rooms is yet not clear. It seems though that locus 4 was used as a kitchen: many bones remains, some of them burned, have been found, and a large fireplace set up over the floor against wall 2012. Bones and ashes were as well recovered in the occupation layer of locus 7. Domestic activities are likely to have taken place in the opposite one (locus 3): a kneading trough (?) made of six dressed stone slabs was located against the south-eastern wall (**Fig. 19**). A complete grinding stone was found inside. A small enclosure, roughly made, was built in the western corner of the room, after a small hearth was abandoned. Locus 3 could therefore have been devoted to grinding, grain storage (although no silo or storage jar was recovered) as well as cooking. In locus 9, two small hearths were set up above the ground level, on top of stone structures. The central room (locus 5), the door of which is in the axis of the main entrance of the building, might have been used for the reception of guests.



Fig. 19 – Area 2, B2 building: kneading trough in locus 3 (J. Charbonnier 2013 ©).

▪ *A second floor?*

Locus 6, at the eastern side of the building, was unfortunately damaged by erosion: its floor was only preserved in the western corner, near the doors leading to the neighbouring rooms (loc. 1 and 7). The remains of a possible threshold, perpendicular to the door leading to locus 1, have been unearthed in the middle of the room, suggesting that this space was actually divided. A big

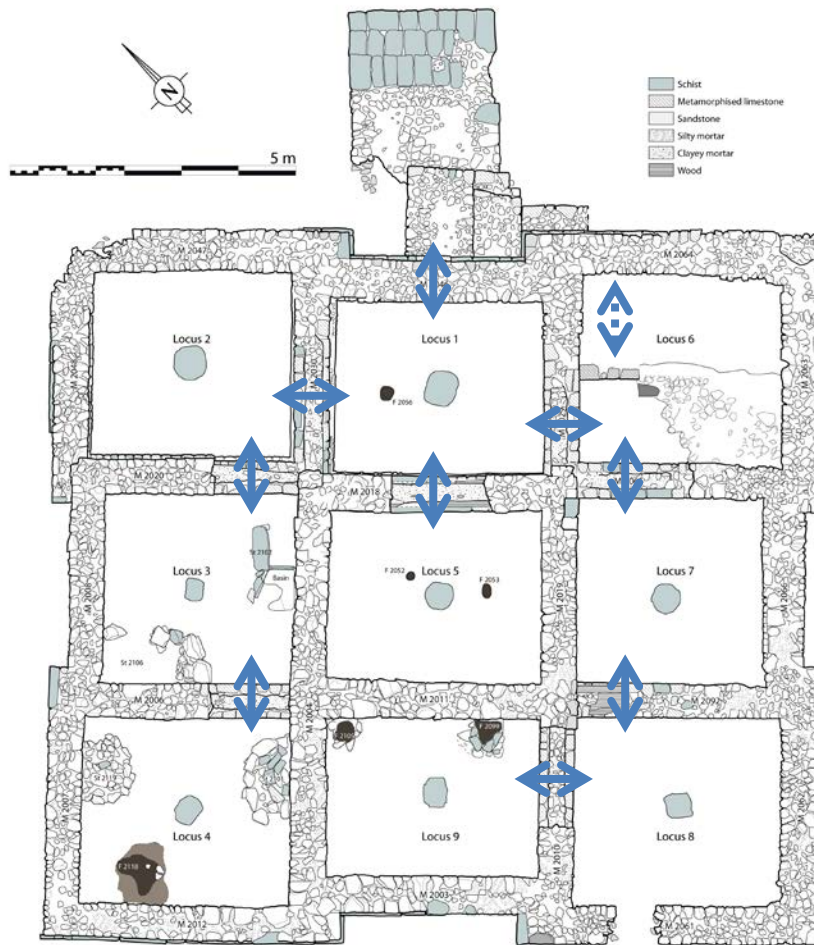


Fig. 20 – Area 2, use and circulation plan of B2 building (J. Charbonnier 2013 ©).

stone block (0.40-0.50 m in length), that formed its substructure up to the bedrock suggests so far that a heavy structure had to be maintained, like a staircase. The threshold located in the middle of the room could hence have consisted of the first step of a staircase that led to the roof or maybe a first floor (see ANFRAY & ANNEQUIN 1965: 54).

Furthermore, in every room, apart from locus 6, we came across a 0.15 to 0.40 m thick layer within the occupation and destruction layers, made of a mid-brown silt mixed with many small stones and shards: it might be related to the remains of the occupation layer from a second floor.

-The use of wood

During the 2013 campaign, the thresholds of all the internal doors of the building have been unearthed. They consisted of small slabs, of metamorphic limestone or schist, supporting horizontal wooden beams. As in modern houses in Tigray, thresholds were actually set a few centimetres above the floor and were made of two horizontal beams, one on each side of the doorway, topped by a third horizontal one (Fig. 20). The doors were 1.73 to 1.80 m wide. Apart from the access leading to the central room, all the other doors appear to have been open at the inside corner of the rooms.

Wood has been used in association with stone since the pre-Aksumite period in Tigray (BRETON 2011: 63). On B2 Building, the use of wood seems to have been limited to doorframes and posts. It is highly possible in fact that doorjambes were also made of wood as it is the case nowadays and as it was usual in Aksumite time, as far as the sculpted stelae from Aksum are concerned.

Except in locus 6, piles of masonry were built in the middle of every room, bolstering the floors. They were topped by a horizontal slab of schist situated at the floor level or slightly beneath: these structures were to support pillars – or wooden posts, since no stone pillar has been found around.



Fig. 21 – Area 2, B2 building: threshold between loci 7 and 8 (J. Charbonnier 2013 ©).

► Structures under B2 Building (phase 1)

Remains of walls set up below and before B2 Building (phase 1) were discovered in 2012 under the floors of its central rooms (loc. 1 and 5) (Fig. 22). During 2013 season, the south-eastern halves of its eastern rooms (loc. 6 to 9) were excavated up to the bedrock and locus 2 was entirely excavated. Remains of similar structures were discovered in all of these rooms apart from locus 6. They displayed the same orientation as B2 Building but looked different, as small stone slabs (0.10-0.20 m long) arranged horizontally were dominating in the masonry (Fig. 23).

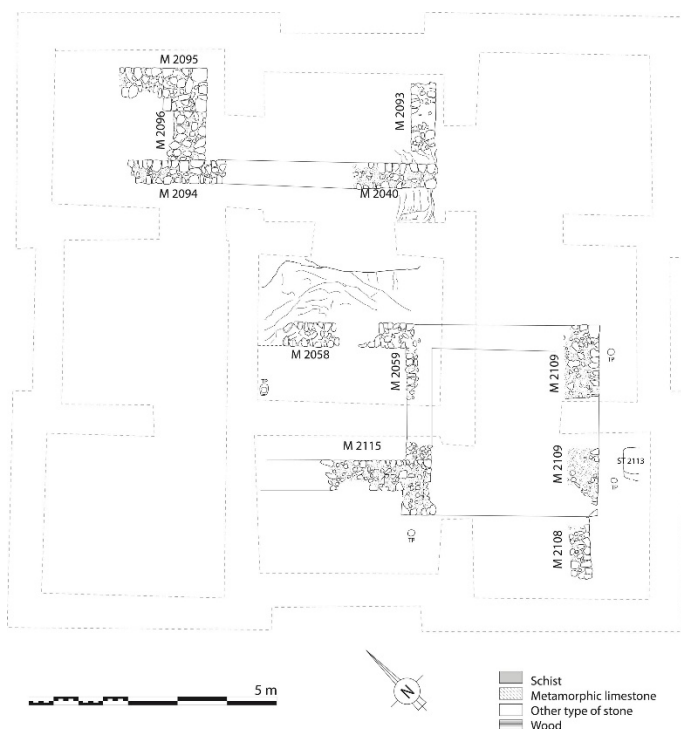


Fig. 22 – Area 2, prior housing to B2 Building (J. Charbonnier 2013 ©).

Fig. 23 – Area 2, the earlier masonry (J. Charbonnier 2013 ©).



These walls were based on the bedrock and were quite destroyed by the foundation of B2 Building, which was also based upon the bedrock. Two adjacent rooms are visible in the southern part and made up the angle of a former building: one is located under B2 Building's loci 5 and 7 to 9, and the other one under loci 1 and 2. The external and internal walls of this ancient building were respectively ca. 0.60 (W 2115) and 0.50 m (W 2058 and W 2059) in thickness. The ones discovered north were architecturally similar: they had the same width (ca. 0.50 m) and displayed the same orientation. They could therefore correspond to the same building. Under B2 Building's locus 2, a square platform of 0.90 m each side was also unearthed (W 2095) that could have been the foundation of a pillar.

Part of the staircase which gave access to B2 Building might have been built so far during this first phase. Indeed, the northernmost part of it shows a very similar masonry to the one of the previous building. Furthermore, the staircase is out of alignment with the north-eastern façade of building B2 and is slightly slanting.

Occupation strata from the first phase have been excavated, but most of them correspond to external layers located along the south-eastern and south-western façades of the ancient building. Two occupation phases have been recorded under B2 Building's loci 7 to 9. Phase 1B is a yellowish layer associated to a hearth dug below the ground under locus 8, and seems to postdate the abandonment of the former building since it covered wall 2109. Phase 1A corresponds to occupation layers right under the yellowish one, and is contemporary with the ancient building. They correspond to a thick brown layer of silt and clay visible under the same B2 Building's loci 7 to 9. This external layer has gradually accumulated over the bedrock in which three oval post-holes (along walls 2109 and 2115), and a 0.70 m long hearth behind (at the basis of walls 2062 and 2092) were dug (Fig. 24).



Fig. 24 – Area 2, prior housing to B2 Building with post-holes and a long hearth (J. Charbonnier 2013 ©).

Under the floor of B2 Building's central room, an internal occupation layer of the ancient building has been excavated along walls 2058 and 2059. It corresponded to a 5 to 10 cm thick brown layer of silt. Conversely, no occupation layer has been preserved under the floors of B2 Building's north-western rooms (loc. 1 and 2). They seem to have been mostly removed and replaced with backfills maintaining the floors of the latter.

Artefacts

S. Antonini, J. Charbonnier

Most of the objects that were found in both sectors are associated with plant processing or other household activities. A large number of grinding stones of different size have in fact been recovered in both areas and buildings. They were fragmentary for the most part and found in the destruction layers: they hence are likely to have been reemployed in the further masonry. Several however have been found over the floors, in both buildings – area 1 and 2 –, roughly in their original position.

Among the 163 artefacts collected during both 2012 and 2013 seasons, 85 include grindstones (rectangular, sub-rectangular, or oval with either a flat or a concave-convex profile), top stones (generally oval in shape), hand stones (generally round in shape and biconvex in cross-section), pounding stones and pestles, polishers and whetstones. The stone material consisted of a dense, fine-textured basalt, vascular basalt, quartzite and “granitic stones”. As Laurel Phillipson clearly explains in studying the grindstones and related artefacts from Pre-Aksumite Seglamen (see PHILLIPSON 2012), the preference for a specific stone material depended on the type of grain that had to be ground into flour or paste.

The number of lithic artefacts obtained from obsidian is conspicuous. Together with the manufacturing debris – the most important group of artefacts, many of which appear to have been used – there are tools, including scrapers (**Fig. 25**). The nature of these artefacts is consistent with the archaeological typology described by Laurel Phillipson for the Aksumite period (see PHILLIPSON 2000, 2009).¹

Lots of pottery were also found, both complete and in fragments, the analysis of which is to be undertaken in the following months. Among them, several storing jars were complete and still in position, the best part of which coming from the housing next to D2 Building. Their content, including macro-plant, pollen and micro-faunal remains, will be sieved and studied next season.

Apart from these, few artefacts are to be noticed, among them two circular terracotta objects of unknown function, discovered in two of B2 Building’s rooms (loc. 3 and 9) (**Fig. 26**). These objects look like a spool since a kind of gutter runs along their lateral side. Their dorsal faces exhibit a checked pattern (parallels are to be found in MUNRO HAY).



Fig. 25 – Lithic artefacts in obsidian – scale 5 cm
(J. Charbonnier 2013 ©).



Fig. 26 – Circular terracotta objects – scale 5 cm
(J. Charbonnier 2013 ©).

1. I am indebted to Professor Francesco Fedele for his preliminary observations of the obsidian artefacts.

Regarding objects for personal ornamentation, a large number of beads of different shapes and materials were found. The most usual material was glass paste, mostly black, but also blue, green, yellow and red in the shape of barrels, cylindrical disks and tubes (Fig. 27). Other bead types include a truncated biconic carnelian bead, a spherical quartz bead and an ellipsoidal glass mosaic bead with eye-spots. *Cypraea moneta* shells were also used as ornamental beads *per se*, or for decorating leather goods. Finally – and apart from a short iron blade – metallic ornaments include a bracelet and a small ring in bronze (Fig. 28).

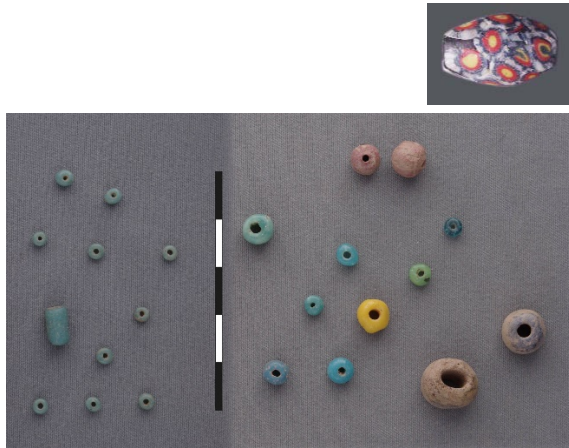


Fig. 27 – Beads made of glass – scale 5 cm
(J. Charbonnier 2013 ©).



Fig. 28 – Metallic artefacts – scale 5 cm
(J. Charbonnier 2013 ©).

Anthropomorphic and zoomorphic terracotta figurines were found at the surface of the site and during the excavations. The zoomorphic clay fragments are rather small and not easily identifiable. One of them may be a camel (Fig. 29). Among the anthropomorphic exemplars, stands a female head preserved to the base of the neck showing stylized features. It has been found in a dump next to the staircase of B2 Building (Fig. 30). A series of etched dots decorate the chin and the base of the neck and may represent tattoos and a necklace. The head might have been attached to the body with a peg of wood inserted at the base of the neck.



Fig. 29 – Camel (?) head and body – scale 5 cm (J. Charbonnier 2013 ©).



Fig. 30 – Human (female?) head in terracotta – scale 5 cm (J. Charbonnier 2013 ©).

Another anthropomorphic terracotta figurine of a headless womanlike figure, reminiscent of the so-called stylized, steatopygic mother-goddess (**Fig. 31**), with large breasts and folds of abdominal fat. The figurine is similar in structure to the one found at the Mai Adrasha site (FINNERAN *et al.* 2005: 21-22, Fig. 6).



Fig. 31 – Headless female figurine in terracotta (J. Charbonnier 2013 ©).

Finally, it is worth describing in detail a feminine headless statuette in limestone, found in the stone block filling under the floor of locus 6 in B2 Building (**Fig. 32**). The figurine is 8.0 cm in height and represents a standing nude female with her right arm stretched out along the side; her left arm is bent back at a right angle and rests on her back. Both hands are open. The figure is intact to the knees. The head was attached with a peg in a hole at the base of the neck. The curves of the body and the sex are emphasized. The

Fig. 32 – Headless statuette in limestone – scale 5 cm (J. Charbonnier 2013 ©).



jewels carved in low relief around the neck, wrists and waist are strikingly accentuated. A double thick necklace holds, on the front, a heavy diamond-shaped pendant placed between the figure's breasts, and on the back, a fan-like structure between the shoulder blades. The wrists are decorated with a double cuff and the waist with a double belt depicted as dashed lines. At present, we are unable to find typological similarities with other Aksumite statues, especially regarding the peculiar position of the woman's left arm – except for a statuette (7.0 cm H), excavated at Matarā (Eritrea), and identified by Francis Anfray as of "prehistoric type" and dated from the 6th-8th centuries AD (ANFRAY 1968: Pl. 7, Fig. 3).

It is worth mentioning the remarkable necklace characterized by a heavy pendant on the back that seems to be designed to offset the large ornament on the front. The necklace is reminiscent of the jewel depicted on a statue of a seated woman found at Haulti (DE CONTENSON 1962: pl. Va), exhibited at the National Museum of Ethiopia in Addis Ababa. The statue is dated back to the pre-Aksumite era (7th century BC). A very similar woman, of smaller dimensions but with the same kind of necklace, has been found in one of the numerous archaeological sites of the Wādī Jawf, in Yemen, and is kept at the National Museum of Oriental Art in Rome. This figurine is also dated to the first half of the 1st millennium BC (ANTONINI, D'AMORE, JUNG 2012: 249, nb. 87).

Therefore, the detail on this jewellery suggests a long iconographic and symbolic local tradition, the meaning of which is at present obscure.

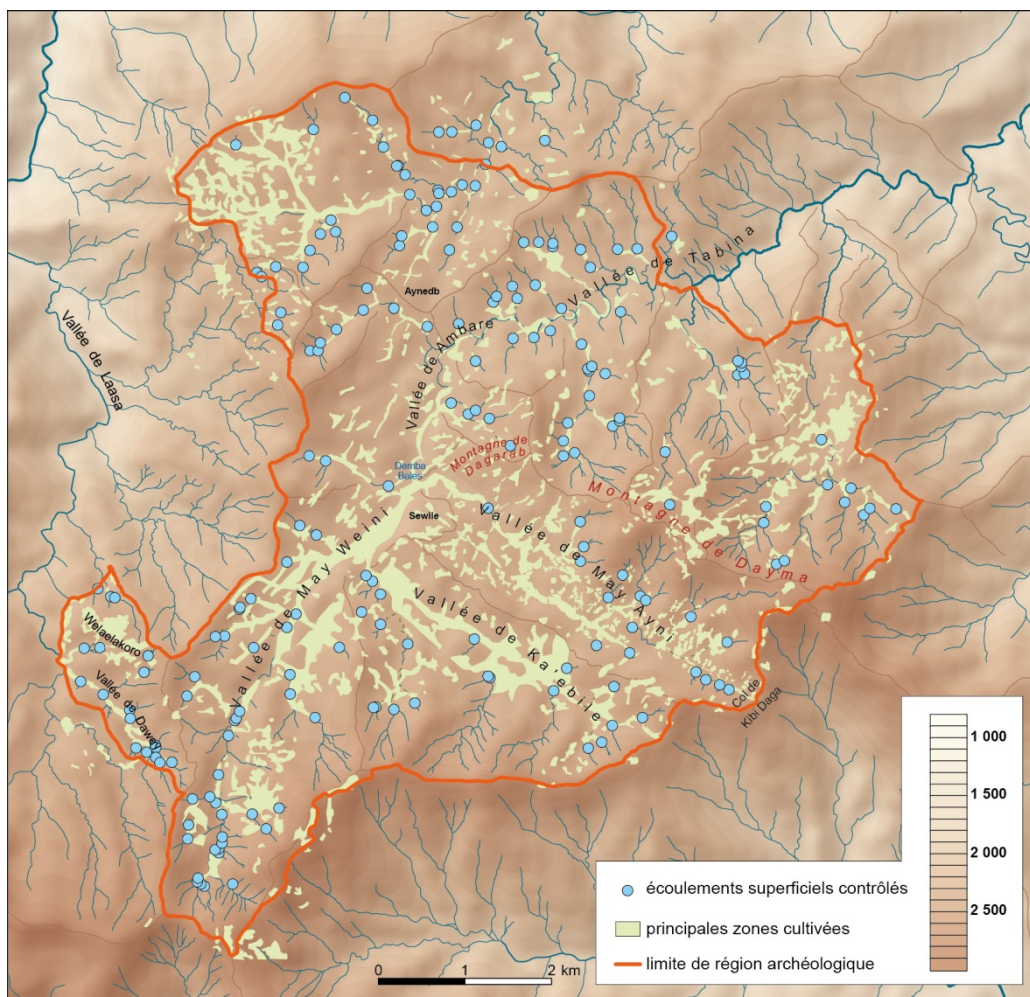
The archaeological context at Wakarida would date the small figurine back to the 4th century AD: at that period, Ethiopia was already Christianised – a cultural context that would exclude the identification of the image with a “mother goddess” of prehistoric traditional meaning. A naked female figure, characterized by a particular gesture and by items of personal ornamentation, would rather suggest that it was the image of woman linked to a specific feminine ceremony (native rituals?) within the social and religious context of the time.

III. ARCHAEOLOGICAL SURVEY AND GEOMORPHOLOGICAL ANALYSIS

Y. Callot, O. Barge & E. Régagnon

The archaeological survey area has been outlined in the course of the 2012 season. It was based on orographic criteria and model units of the territory's development. It is concerned within a 6-km radius around the site of Wakarida and has been divided in equal proportion as regards both administrative areas of Tigray and Afar (**Fig. 33**).

Fig. 33 – Wakarida and its archaeological areas (O. Barge & E. Régagnon 2013 ©).



The main task was to complete the previous studies, in order to better understand the founding and development of the landscape, since it has obviously involved important modifications of anthropogenic origin – especially the terraced hillsides – which seem to go back a very long time.

Archaeological survey

O. Barge & E. Régagnon

The archaeological survey around Wakarida has been completed all over the administrative zone of Tigray, except from a few small areas that were hard to get to. Since no administrative agreement has been ordered, the other zone, on the northern and Afar's side, has still not been investigated this year (**Fig. 34**).

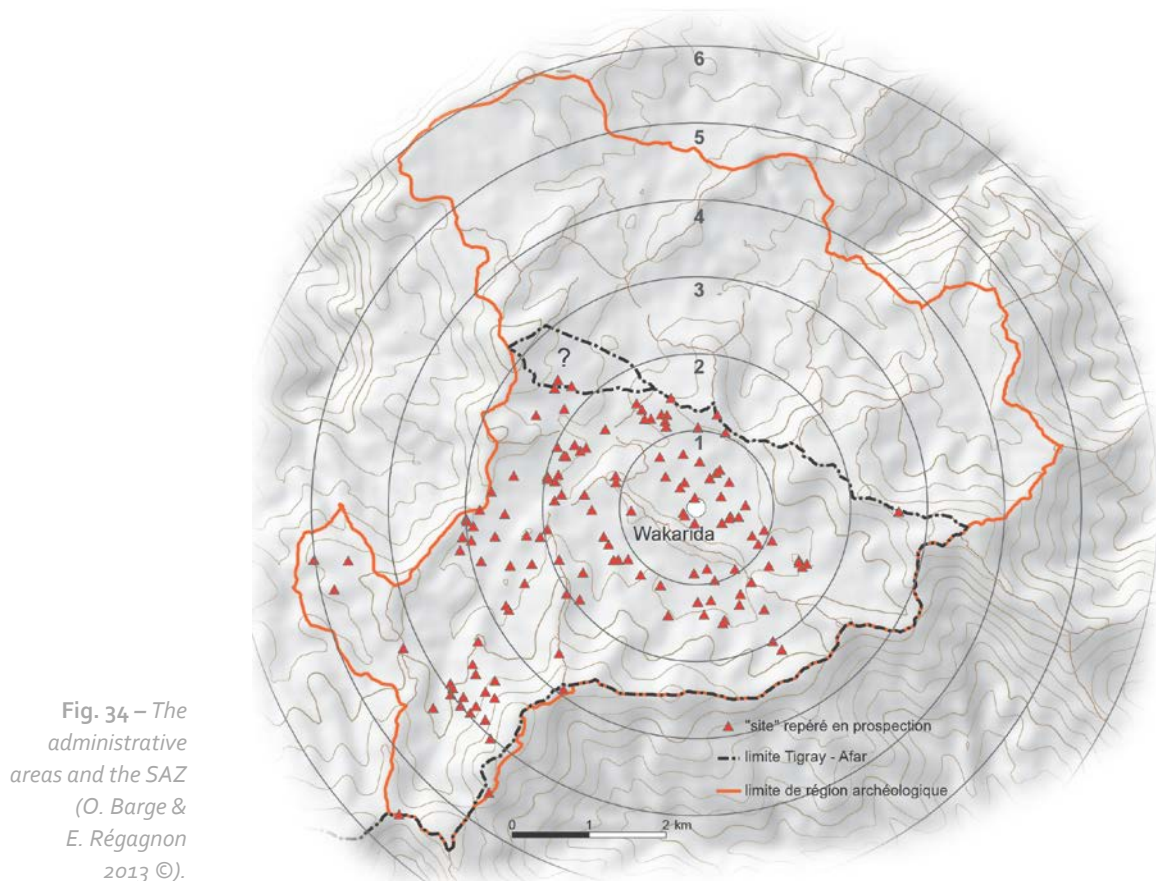


Fig. 34 – The administrative areas and the SAZ (O. Barge & E. Régagnon 2013 ©).

In the same way as in 2012 season, artefact scatters' areas have been identified as "Surface Artefact Zone" (SAZ) in collecting pottery shards. They have been systematically registered and mapped with a GPS receiver, numbered and outlined using ArcGIS software: 42 SAZ have been recognised in 2012, 96 more in 2013.

As it has already been documented in 2012 season, the modern houses recover often, if not always, the previous ones and support scattered settlements. Most of the SAZ are situated on outcrops but also at the bottoms of the valley, and even some of the slopes have been densely

occupied (for instance Area 4). By contrast, there is nearly no settlement on the upper part of Ka'ebile and May Ayni valleys. The analysis of the collected pottery is to be undertaken in the following months in order to have some elements of dating. The use of these settlements is difficult to determine since hardly any remains have been observed except for pottery. Only two sites have a square building and are therefore supposed to have been outposts or relay stations situated on trade routes.

► The different surveyed areas

Six different areas have been delimited as regards the collecting pottery, and the geomorphological specificities – valleys, slopes, watershed's limits (Fig. 35).

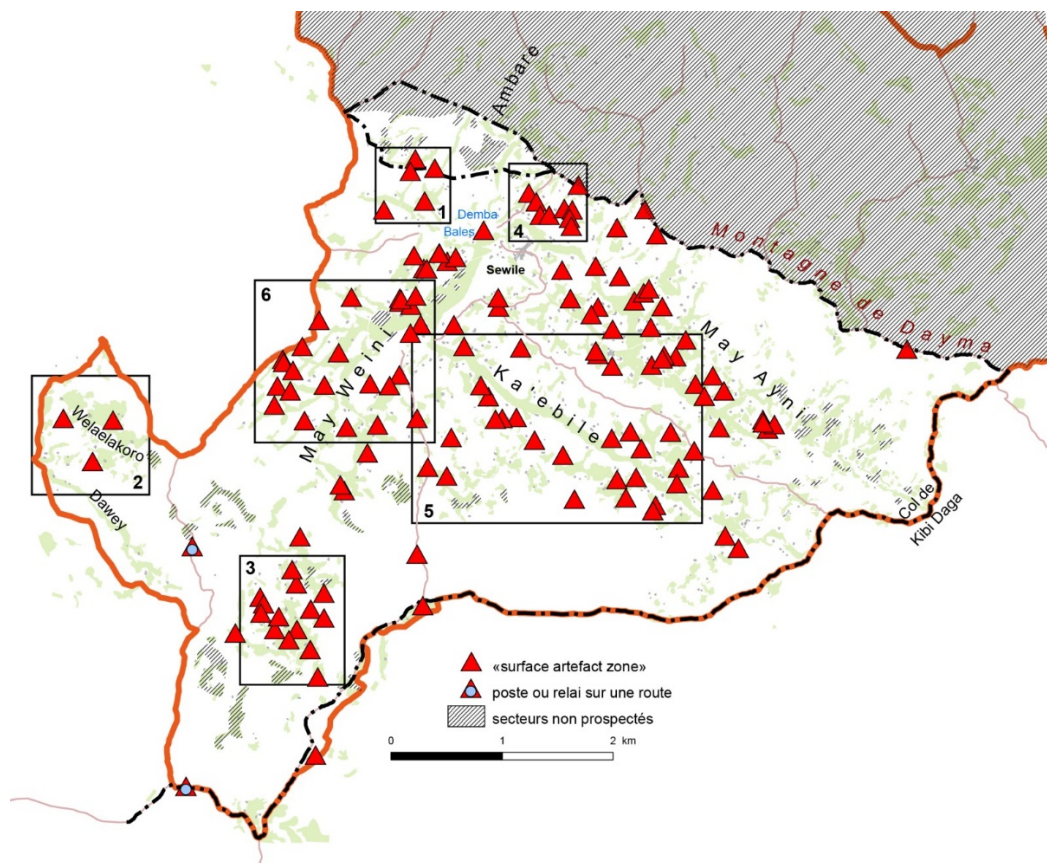


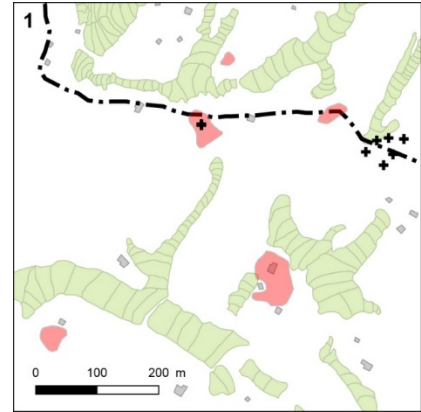
Fig. 35 – Different areas
(O. Barge & E. Régagnon 2013 ©).

Symbols on each map below give the following caption:

- | | | |
|-------------------------------|------------|-----------------|
| ■ SAZ | ■ terraces | ■ today housing |
| ◆ remains of ancient building | + tombs | |

- *Area 1* has been considered by its steeply slopes and the irregularity of its relief (**Fig. 36**). The density of pottery shards is though quite high. Several tombs have been also identified.

Fig. 36 – *Area 1*
(O. Barge & E. Régagnon 2013 ©).



- *Area 2* is a small area on the western part of the region which covers the top of the hills overlooking the deep valley of Dawey, west. Today, the hilltops are cultivated, by contrast with the steep surrounding slopes which are difficult to work (**Fig. 37**). Merely a few small areas have been found with scattered pottery. Even so, it is sufficient to show that this area was inhabited in ancient times.

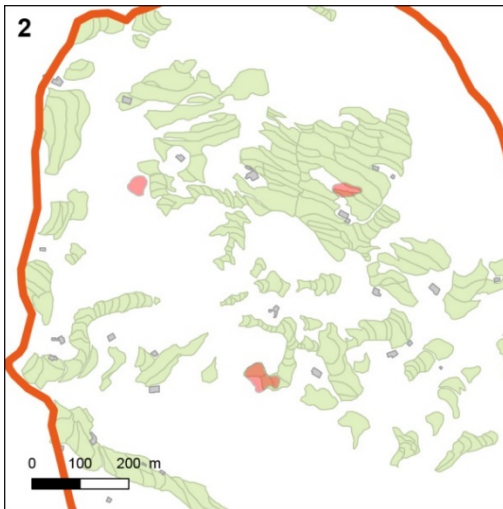


Fig. 37 – *Area 2 and the top of the hills overlooking Dawey valley* (O. Barge & E. Régagnon 2013 ©).

- *Area 3* is on the southern part of the region, and situated on the right bank of the upper May Weini valley. It is today an extensively populated and cultivated area. Terraces are particularly well-kept and located on a steep slope, where soils, black in colour, seem to have been more fertile (**Fig. 38**). Many olive-trees grow there. This area seems to have also been very much valued in ancient times: several zones with scattered pottery shards have been registered, some of them being very wide and in some cases exceptionally covered with shards.

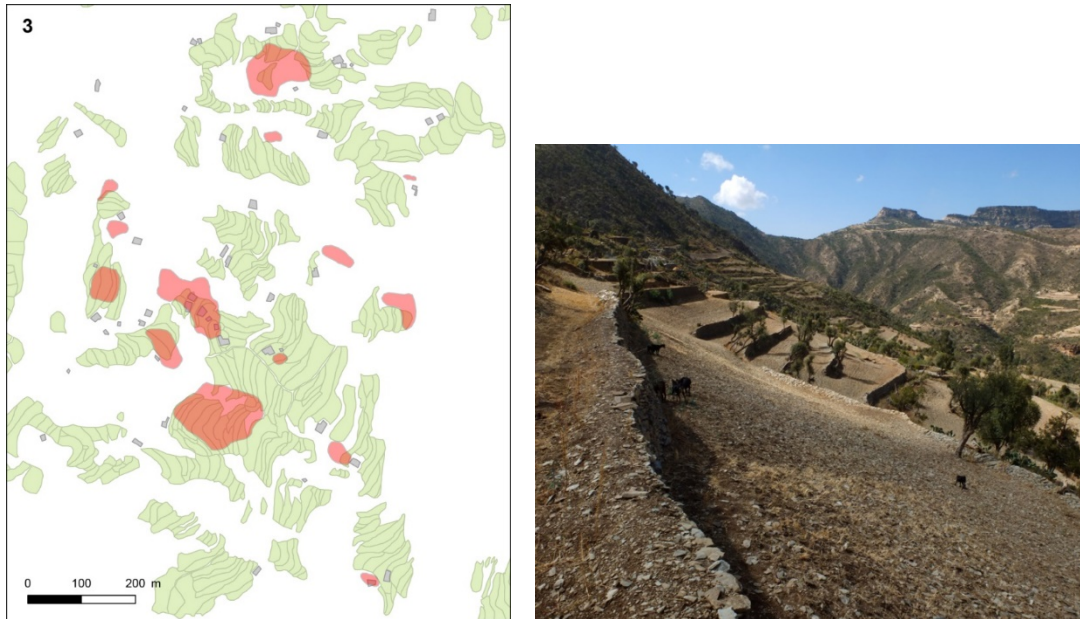
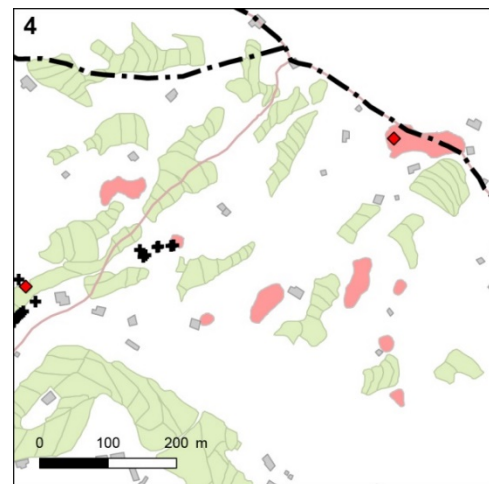


Fig. 38 – Area 3 and the steep terraced slop (O. Barge & E. Régagnon 2013 ©).

- *Area 4* reveals a large number of ancient settlements, located on the hilltops of the watershed's limit (Fig. 39). They are situated close to Demba Bales spring. Several tombs have been found, which are concentrated in the zone extending next to the necropolis discovered below in 2012.

Fig. 39 – Area 4
(O. Barge & E. Régagnon 2013 ©).



- *Area 5* corresponds to Ka'ebile valley, twin of May Ayni valley, but narrower (Fig. 40). One visit in 2012 was enough to reveal several interesting sites. The valley has been completely surveyed in 2013: as the one of May Ayni, it is densely populated today. Pottery shards have been found, scattered on the hilltops, sometimes quite high in the watershed.



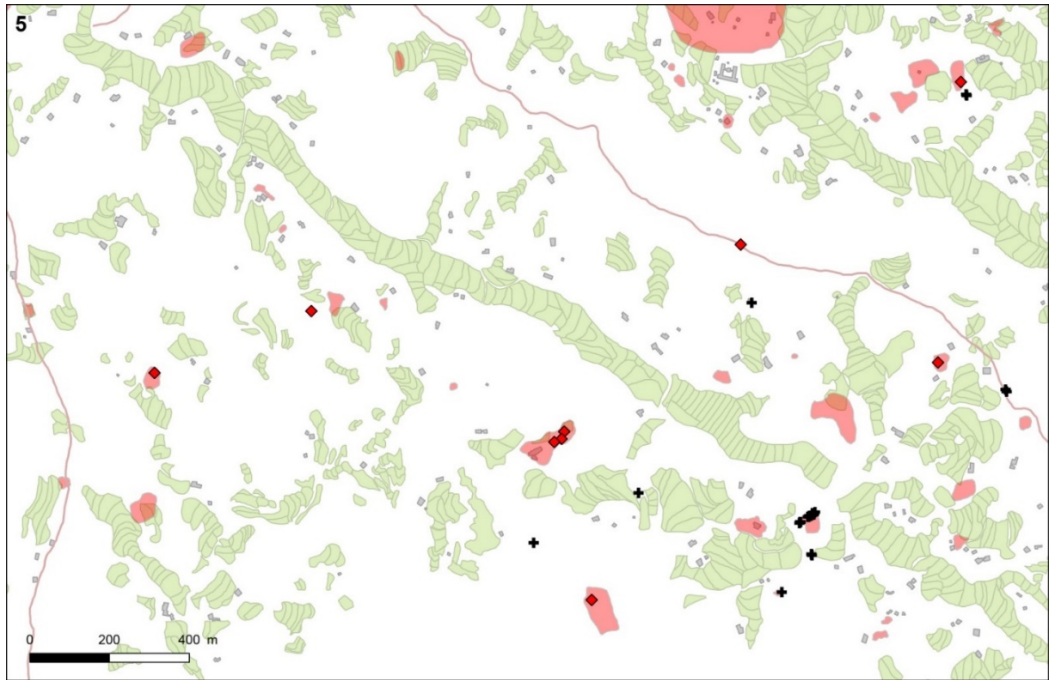


Fig. 40 – Area 5 (O. Barge & E. Régagnon 2013 ©).

- Area 6 covers the middle part of May Weini valley, on the right and left banks of the watersheds. This area has been very densely inhabited, since pottery shards are scattered in many and often quite large zones (Fig. 41). Surprisingly, no shards have been collected at the bottom of the valley, but were concentrated on the hilltops, especially those situated on the ridges.

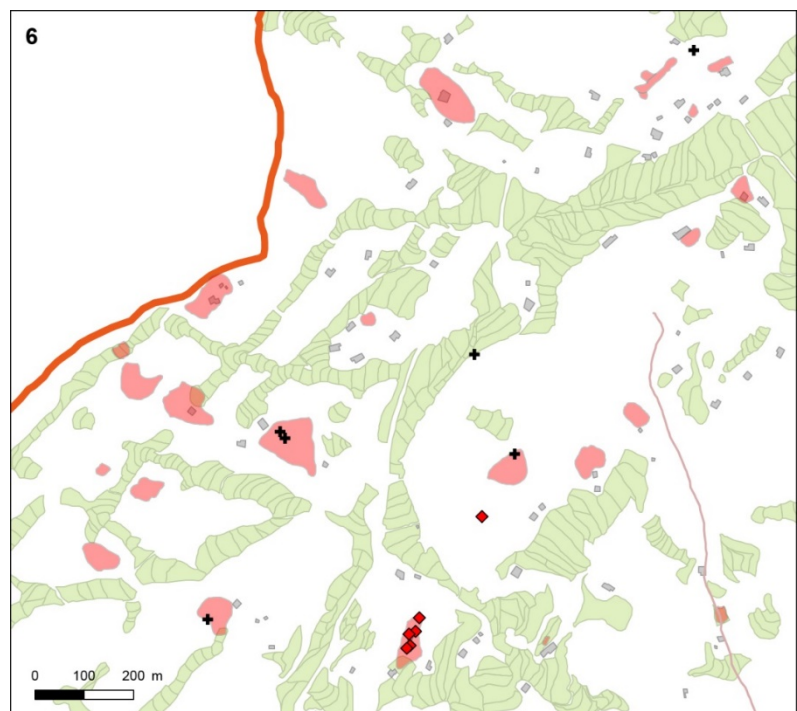
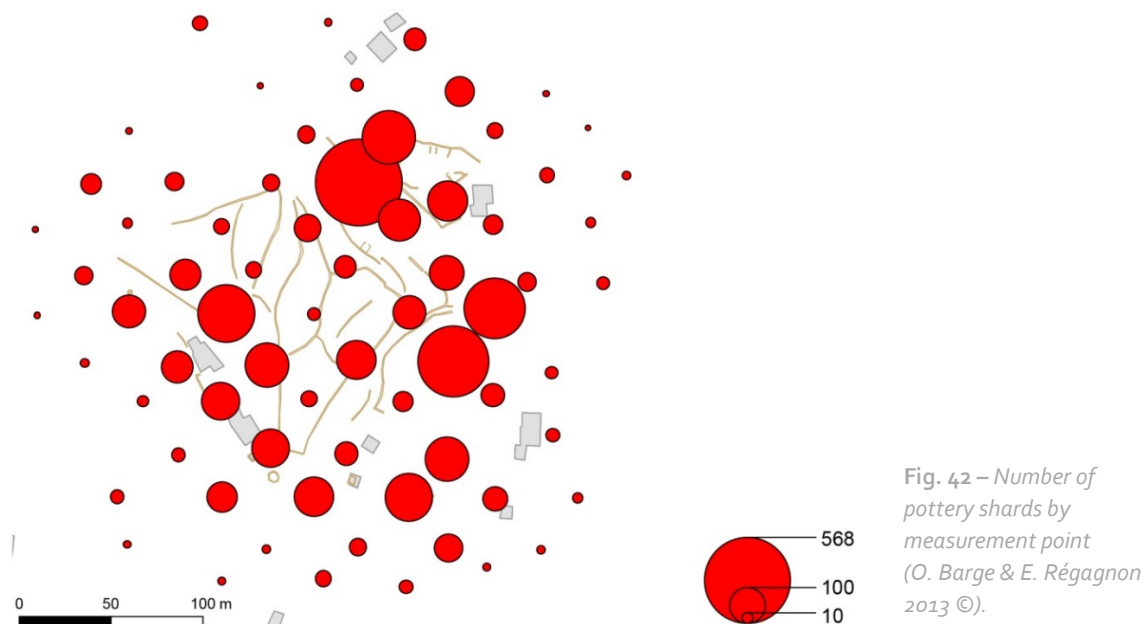


Fig. 41 – Area 6 (O. Barge & E. Régagnon 2013 ©).

► Pottery shards distribution on the site of Wakarida

A complete survey has been conducted also all over the site of Wakarida. The distribution and density of pottery shards found on surface vary from one point to another. The density has been calculated in 70 points, which were uniformly distributed and distant, about 35 m from each other. In each point, a 3 x 3 m square has been delimited on the soil, and all shards have been collected and counted by type.

Map on **Fig. 42** confirms the empirical observations: the highest density equals 566 shards per 9 m², while in some squares no more than ten shards have been found.



Continuities can be noticed, which make us conclude that the chosen spacing between the points is not too big and that the image obtained is quite consistent with real densities.

At the expense of higher precision in each point (but lower between the points), calculation of density enables to obtain measures in each point of the area and thus to give a continuous image close to the reality (**Fig. 43**).

The cartography of each type of pottery can be elaborated in different ways. We can use as an example type 5 (common pottery), and intend mapping its quantity in comparison with the total number of shards for each point (**Fig. 44**); we can also intend mapping the over- or under-representations in comparison with an average pattern (**Fig. 45**), highlighting the “specialized” points. The analysis of various possibilities of mapping is going on.

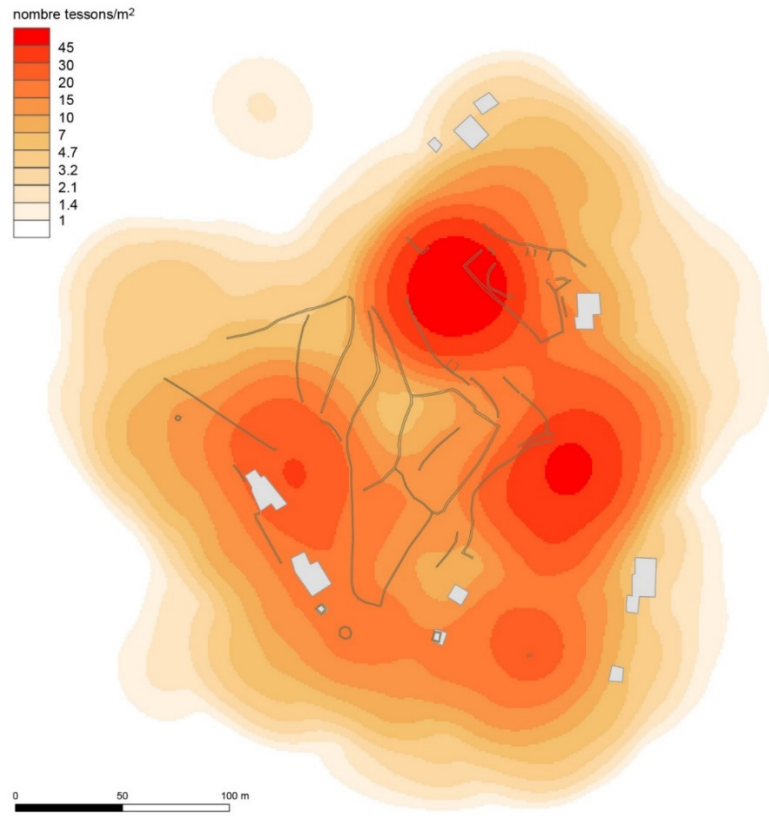


Fig. 43 – Pottery shards density
(O. Barge & E. Régagnon 2013 ©).

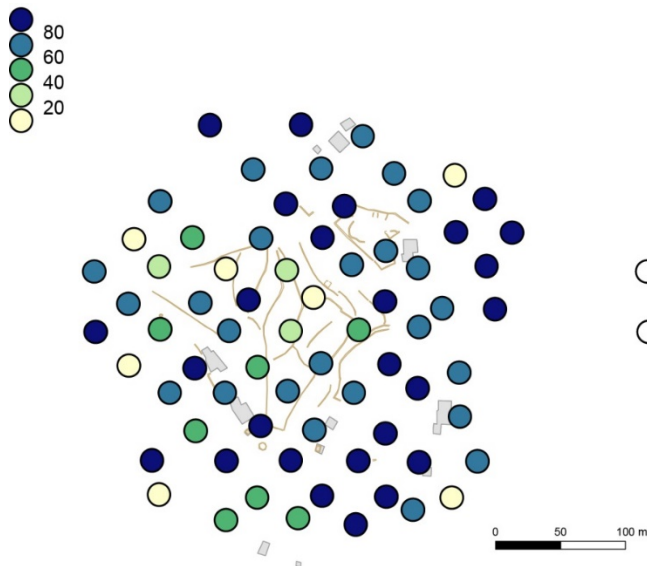


Fig. 44 – Quantity of type 5 (%)
(O. Barge & E. Régagnon 2013 ©).

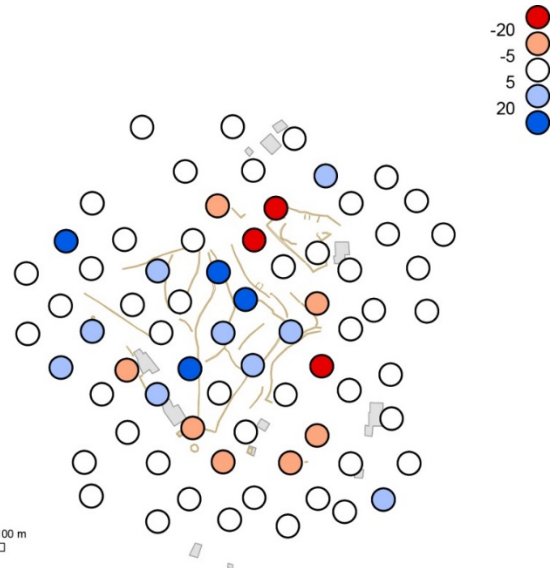


Fig. 45 – Spreading differences of type 5

Geomorphological analysis

Y. Callot

A very short survey (21-26/11/2013) focused on the founding and development of the landscape, thanks to the work already achieved by Olivier Barge and Emmanuelle Regagnon. During their survey, they described the nature of the terrace system and registered several areas interesting from the geo-archaeological point of view.

► Geographical context

Further to the previous studies, several geographical features appear as important for our understanding of the landscapes.

- Orographic originality and unity

The region of Wakarida is located on a kind of extension of the highlands of Tigray, at a lower altitude, but clearly dominating the Afar depression to the east. Only one pass is available for cars by trail at 2,860 m. Altitudes vary between 2,200 and 2,800 m, and the country side of mountains is arranged along a water course draining water from the whole area before entering the Afar region through gorges. The geology is a Paleozoic shelf of various facies which give poor soils, and covered in the northern part of the study area by Permian sandstone. The most interesting sites we know to help investigating the ancient and modern landscapes are located in the main valley and in the tributary of Ka'ebile, on the right bank, just upstream from May Ayni valley (Wakarida). Each valley consists of an alternating pattern of broad parts, with terraces, which are in some cases quite large, and many short parts in narrow gorges (Fig. 46). The latter are often connected to an outcrop of hard rock, steeply dipping opposite to the flow direction, obstructing water and pushing it up and then splitting it.

The region is inhabited by Tigraean people in its central part, and mostly by Afar people in its periphery. Both use terrace cultivation, which seems to go back a very long time but we do not know when. One of the aims of the geo-archaeological research in this region is to determine the origin of this type of exploitation. Terraces are currently fast-expanding, up to very high and isolated sites, because of demographic growth and State incentives. Slopes are so steep and communication routes



Fig. 46 – The gorge downstream, under the last terraces (Y. Callot 2013 ©)

so limited, except for uneven trails, that wheel is not used in the region, only in the central village and on the major trail. In the main valleys, thalwegs are removed by an unbroken succession of terraces filled up with fine sediments.

► Geomorphology and geo-archaeology

The region shows obviously a unit and original landscape that allow identifying specific questions to be studied in detail. This study should consider both relations upstream and downstream in each valley within a highly manmade system in spite of modest technical means.

▪ *Inventory of main landscape features*

- 1– Climate data are completely unknown. The overhang of the plateau of Wakarida, at a slightly lower altitude than the highlands of Tigrai, put down questions on geographic scale. The rainfalls coming from the east, and rising from the Afar region by orographic effects, are surprising: the summits to the east should cause winds flowing down the leeward sides of the mountains which should stop this air flow, but we are so close to the outlet area that the air continues to rise and results in rainfalls on the leeward slope as if the scale of the orographic effect were larger than the scale of the descent effect. This makes us suppose that there may be a slightly more humid microclimate on the outcrop, which could have encouraged human population to settle down in this more advantaged area. An automatic weather station may give information on these rainfalls within a few years.
- 2– The importance of deforestation is especially visible on the upstream parts of the sector and the most mountainous areas, since the forest has almost completely disappeared in the lower parts. The most important questions for geo-archaeology are: the date of beginning of deforestation, its rapidity, the



Fig. 47 – Cross section [D] in May
Ayni valley (Y. Callot 2013 ©).

Fig. 48 – Cross section [A] upstream
of May Weini valley
(Y. Callot 2013 ©).





Fig. 49 – Cross section at the downstream end of the valley, a fine level with charcoal at the base (Y. Callot 2013 ©).

possible phases of slow-down and even the extension of forest cover, in relation with human settlements, including those of the site of Wakarida. The presence of charcoal in several cross sections should enable a thorough study of these questions (Fig. 47-49).

- 3– The importance of watersheds denudation is precisely related to the question of deforestation. In majority of cases, slopes are covered with a very thin soil. In places, some trees have large exposed root system which may be dated. Terraces have been built on many slopes in order to reduce erosion, but they are recent.
- 4– The importance of the superficial formations that fill in the thalweg terraces, may be related to the questions mentioned above. This essential point has to be treated in a special section.
- 5– The flows have almost disappeared downstream, where the recent derivation and irrigation channels are now inactive. According to oral indication locally collected, they were still in function during the rainy season until thirty years ago. This degradation requires complex interpretation: we have to take into consideration the anthropic activity and the changes of climate (Fig. 50).



Fig. 50 – The downstream end C6 of May Weini valley (Y. Callot 2013 ©).

► Closing stage

The region around Wakarida suggests great possibilities for geo-archaeological and landscape studies; special attention should be paid to interactions between man and environment. In many cross-sections, fine levels alternate with coarse levels containing rolled material that should enable to find “quiet” phases of hydrologic cycle and more violent ones. The reasons of these

alternations will be the main question of next season research: are they natural (because of extremely strong flooding, and/or varying precipitations)? Or are they the result of human activity (after the agricultural systems were left, the natural circulation of materials starting again)? Or both? These questions shall be solved thanks to precise cross sections, sedimentological analysis and field surveys among local population that will be carried out next season: the subject deserves in fact a thorough study resulting in a PhD thesis.

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At this stage of the 2013 field season, the data set clearly raises the question of the role of the site of Wakarida and its organization within the kingdom of Aksum, but also that of its anteriority and of the activity of its territory as regards its remote location. The natural resources could make the grouping of people a relevant explanation; furthermore, the construction of important buildings – like B2 and D2 – might reflect the presence of a rich and hierarchically structured community. Architecture features strongly remind what occurred within the kingdom and its major cities, at the same period. On the other hand, the landscaping and the terrace field seem to indicate previous agricultural activities.

It will consequently be important to document the current environment so as to better understand the origin and the extension of the land-use, but also the key elements of economic, social and cultural relations which have defined the architectural features.

Excavations on the site of Wakarida should be continued on next season: another area will be open in order to better understand the configuration of the site and its chronology; to this end, buildings' mapping will be essential in order to identify each of them. Pottery classification has also to be continued and supported by ¹⁴C analysis in order to fix the chronology. At the other level, the environment requires further study involving archaeological and geomorphological survey: though, this part of the study will depend on the permission to enter the area belonging to the Afar region.

The next field season is planned in November-December 2014.

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