Eastern Sudan in its Setting

The archaeology of a region far from the Nile Valley

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Cover: excavation in progress in the western cemetery of the Gash Group (c. mid-3rd-early 2nd millennium BC) at site Mahal Teglinos (K 1), with in the background the Jebel Taka.

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Preface

'We name 'archaeological cultures', 'traditions', and 'industries' with the professed intention of denoting only artifacts distributions and associations but our consciousness and these terminologies are continuously invaded by the presence of humans who produced, used, and discarded those artifacts.' (MacEachern 1998: 108)

In these words lies most of archaeological practice, and perhaps the 'invasion of humans' who are behind the objects should be regarded as natural and somehow desirable. Archaeologists certainly deal with people, although their starting point is represented by things: they reconstruct human behaviors otherwise lost forever. This is even more true when dealing with regions and peoples, who did not produce any written testimony until very recent times, as is often the case in Africa. In the case of Eastern Sudan, the region to which this book is devoted, the situation is even worst because this area -like in general the areas far from the Nile valley-, lacking both inscriptions and monumental structures, was for a longtime regarded as irrelevant or marginal in the general historical reconstruction. This book is a little token, offered to the so far silent past inhabitants of the region: I hope this will provide some preliminary insights into the contribution they gave to several crucial processes affecting the whole northeastern Africa. But the book is also dedicated to the present people of Eastern Sudan with the ambition of contributing to their awareness about the little known, but important history of the region they inhabit.

The research project in Eastern Sudan of the University 'L'Orientale' was started in 1980 by Rodolfo Fattovich. He should be thanked for his foresight. Personally, I should thank him for having introduced me to the study of the region and for allowing me to visit it in 1991 for the first time, as a student and member of the expedition he was directing. Prof. Fattovich should also be thanked for the constant encouragement, comments, and suggestions. The Expedition resumed the fieldwork after a fifteen years gap in 2010, thanks to the support of the Italian Ministry of Foreign Affairs, of the University of Naples 'L'Orientale', and of the Centro Ricerche sul Deserto Orientale. The fieldwork took place from 2012 to 2015 in the framework of the 'Futuro in Ricerca' 2012 research project code RBFR12N6WD, *Aree di transizione linguistica e culturale in Africa* (*Areas of linguistic and cultural transition in Africa*) of the Italian Ministry of Education, University and Scientific Research. I would like to express my gratitude to the granting institutions for having made this possible. I also would like to thank the Director General of the National Corporation for Antiquities and Museums of the Sudanese Government and all the Sudanese colleagues of the Corporation, as well as the Ministry of Culture, Media and Tourism of the Kassala State for their constant support and warm hospitality. In these years, the Italian Embassy in Sudan and its staff have greatly contributed to the success of the fieldwork.

This book is largely based on the fieldwork of the Italian Archaeological Expedition to the Eastern Sudan I have been directing since 2010. In addition to the important contributions made by the staff of the Expedition -some of them once students and now young colleagues-, I would like to mention that since 2014, in the framework of the Expedition, a field school made up of Sudanese and Italian students has been initiated. This book is also dedicated to these students, as a token for their passion and active participation. I would also like to remember the crucial role played by our representative and colleague from the National Corporation, Habab Idriss Ahmed.

Fieldwork is not only an exciting experience, but also prolonged absence from home. And at home too, research is often if not always a full-time job. For this reason, I would like to dedicate this work to my family and especially to Lia and Matteo for their support and patience.

Chapter 1
Introduction

1.1 The archaeological exploration of the 'marginal' areas in Sudan

A recent overview of the state of our knowledge of the Mesolithic and Neolithic phases in central Sudan complains about the fact that it is not viable to outline a settlement pattern without taking into consideration a larger area exceeding 5km to the east or to the west of the Nile (Usai 2014: 36). This very reasonable consideration can also be extended to a larger spatial scale and to the regions far away from the Nile valley such as the Western and the Eastern Desert, and Eastern Sudan as well, which is the region to which this study is devoted, and transposed to a more general level: it should be considered not viable to study the Nile valley without taking into consideration the regions east and west of it. The above referred remark is in general highly indicative of the scarce attention paid by the Nubian-Sudanese archaeology -but to some extent we may also extend it to the Egyptian archaeology- to the regions a long way from the Nile river. Even though some research projects have been launched in the deserts and marginal areas in recent years, the situation remains substantially the same today and can be certainly said that in Sudan archaeological research almost exclusively focuses on the sites and regions of the Nile valley.

This is also certainly due to environmental difficulties preventing systematic and intensive explorations of areas out of reach from the main modern centers located in the valley (Vercoutter 1994: 63-64) and consistently increasing the costs of research projects willing to focus on the regions east and west of the Nile valley as compared to research conducted near the Nile. Moreover, another factor that discourages research in the regions far from the Nile is the fact that most monumental sites are concentrated in the valley, and up to very recent times the main concern of archaeologists working in Egypt and Sudan was mainly represented by the recovery of objects relevant from an artistic point of view and of inscriptions (Welsby 2004: 12). Particularly in Sudan, archaeological research was often directly related to the construction of dams on the Nile, aimed at the production of electricity and at the improvement of the agricultural exploitation of specific areas (Mohammed Ahmed 1997: 2-3; Trigger 1994: 335-337; Welsby 2004: 14). Rescue archaeology on one hand certainly helped to extend intensive investigation to largely unexplored regions of the valley less rich in terms of monumental sites, but it also prevented the extension of the exploration of the deserts by concentrating the efforts of scholars in intensive, time-limited operations along specific traits of the Nile.

Apart from the above described factors, it should be remarked that more general cultural prejudices may have sometimes unconsciously limited research activities in places far from the Nile valley. Western scholars for many years were conditioned by the idea that civilization is an offspring of agriculture and urbanism and for this reason nothing relevant could be expected from areas today and most likely in the past mostly inhabited by nomadic livestock breeders. Interestingly, the prejudice for people living in the areas far from the river was also induced by the ancient texts -and archaeology in the Nile valley was always closely related to philology and epigraphy- depicting the inhabitants of the deserts as barbaric and uncivilized. Of course, those descriptions were the results of the highly ideological point of view of the states of the valley and of their rulers, i.e. the main producers of the texts, who always proposed themselves as guarantors of social, natural and cosmic order against the chaotic forces, often embodied in the other, in the peoples living outside of the state, i.e. outside of the valley (Barnard 2012: 6; Friedman 2002: xiii; Kuper 2002: 1, 9). Nevertheless, apart from the ideological world often depicted in the written texts, the inhabitants of the valley were always fully aware of the relevance of the relations with the desert regions and their inhabitants. This sometimes emerges from the written texts themselves: several

years ago, in a study devoted to the adaptive systems in northeastern Africa in the 1st millennium BC-1st millennium AD, I remarked that in Hellenistic and Roman sources regarding the regions south of Egypt, an overwhelming part is dedicated to the regions far away from the Nile valley, mainly because several resources crucial in ancient times were concentrated there, and because the routes crossing these lands were regarded as strategic for ancient trade (Manzo 1996: 81-82, Table 3).

Leaving the Hellenistic and Roman sources apart, the awareness of the relevance of the peripheral desert areas for a full understanding of the complexity of the history of northeastern Africa is slowly emerging even among scholars. In general, this first happened in the field of prehistory, because these studies are perhaps less conditioned by research on monuments and, of course, have nothing to do with texts. Moreover, among prehistorians there is also the awareness that before the environmental changes that led to the present situation, the marginal areas could have been densely inhabited. For these reasons, the desert areas are regarded as crucial for understanding the prehistory of the valley itself. This is clearly shown by the contribution of the desert areas not only in ideas and know-how to the cultural developments in the valley itself, but also demographically to its peopling, when the environmental conditions in the deserts became drier and drier, and their inhabitants moved closer to the river (see Barnard 2012: 4; Friedman 2002). In recent years it was also demonstrated that this contribution of the deserts to the cultures of the valley may have extended to relevant ideological aspects like e.g. the cattle-cult and perhaps some astral connotations of the religions of the inhabitants of the Nile valley (see Kuper 2002: 10; Wendorf and Schild 2002: 18-19). In the meantime, scholars focusing on later phases too started realizing the potential, in terms of knowledge of the past of the whole region, of the marginal areas, and projects on the exploration of specific sectors or of specific phases, from the Bronze Age to the Late Antique period, started both in Egypt and the Sudan. In particular, the fact that the deserts and the marginal areas are increasingly regarded as an unavoidable factor in the reconstruction of the history of northeastern Africa (see Trigger 1994: 336-337) was explicitly acknowledged with the publications of collections of papers devoted to this subject (see e.g. Friedman ed. 2002; Barnard and Duistermaat eds. 2012).

Nevertheless, there is still much to be done in terms of fieldwork, particularly in Sudan. So far, only a handful of projects were specifically devoted to the exploration of the deserts and the other areas far away from the Nile there. In other cases, some sites on the fringes of the deserts were only sporadically visited and sometimes studied in the framework of projects firmly rooted in the valley (Mohammed Ahmed 1997: 5). In this perspective, the German project of the University of Cologne organized and for many years led by Rudolf Kuper, focusing on the Western Desert, in a broad area between the Wadi Howar and the Egyptian-Sudanese border, and on sites dating from prehistoric to Napatan times should be certainly mentioned (Kuper 2002: 2). On the other side of the Nile valley, the activities in the Eastern Desert were even more limited if possible, with an unsystematic survey conducted by the Centro Ricerche sul Deserto Orientale (CeRDO) of Angelo and Alfredo Castiglioni for many years (Sadr, Castiglioni and Castiglioni 1995), and the survey of the gold mines in that area conducted in the framework of a larger project also extending to the Egyptian Eastern Desert by Rosemarie and Dietrich Klemm (Klemm and Klemm 2013). It is only in recent years that an expedition of the Sudan Archaeological Research Society is revisiting some of the sites already recorded by the Castiglioni brothers in the perspective of the final publication of the data they collected (Davies 2014), a project in which I am participating (see also Manzo 2012: 79-82), and a project coordinated by the University of Khartoum started on the Red Sea coast that will certainly impact our knowledge of the Eastern Desert and Eastern Sudan.

In the same years of the German project in the Western Desert, two other projects as well, one Italian and the other American-Sudanese, started in Eastern Sudan, roughly corresponding to the present Kassala state, a region immediately east of the Atbara and delimited to the east by the southern fringes of the Red Sea hills, to the north by the Eastern Desert and to the south and southeast by the slopes of the

FIGURE 1: MAP OF NORTHEAST AFRICA SHOWING THE REGION OF EASTERN SUDAN (KASSALA STATE) INVESTIGATED BY UNIVERSITY OF NAPLES 'L'ORIENTALE' (PREVIOUSLY ISTITUTO UNIVERSITARIO ORIENTALE) TOGETHER WITH THE SOUTHERN METHODIST UNIVERSITY (DALLAS) AND UNIVERSITY OF KHARTOUM IN THE EIGHTIES, AND, IN 2010, BY THE NATIONAL CORPORATION FOR ANTIQUITIES AND MUSEUMS OF THE SUDAN.

Ethio-Eritrean highlands (Figure 1). A more detailed description of the exploration of the region -whose archaeology is the subject of this book - will follow. For the moment it is enough to remark that, at least in the case of the Italian project, the specific interest for an intermediate region between two centers of civilization characterized by very distinct cultural traditions like the Nile valley and the Ethio-Eritrean highlands, was well fitting in a more general interest typical of Italian archaeology in Asia and Africa after the Second World War, precisely focusing on apparently marginal areas. This distinctive interest led to important contributions to our knowledge of the ancient world like the discoveries of Ebla in Syria and Shar-i Sokhta in Afghanistan.

Therefore, in light of the above outlined issues related to the potential contributions the study of the 'marginal' regions and of their interaction with the valley can provide to the knowledge of the past of the whole northeastern Africa, while resuming investigations of Eastern Sudan (Manzo *et al.* 2011: 1-2, 2012: 1), I think it may be important to consider that area in a broader scenario, and to investigate it in the framework of its relationships with neighboring areas, often better known. This study, motivated by this need, is devoted to describing the main cultural changes that characterized the region in a very long period, from the 6th millennium BC to the 2nd millennium AD. It is not only to try a first attempt at a synthesis and to discuss the many debated issues to be confronted in the future with further research, but also to show the relevant contribution to our understanding of the past of the middle Nile valley and of the whole northeastern Africa, that the admittedly still limited evidence available for Eastern Sudan is already offering.

1.2 The archaeological exploration of Eastern Sudan

As already emphasized, the systematic archaeological exploration of Eastern Sudan is quite recent. The region was practically unexplored from an archaeological point of view until 1967. At that time an American team led by Joel Shiner conducted preliminary investigations in the Khashm el-Girba area, immediately East of the Atbara (Shiner *et al.* 1971; see also Fattovich, Marks and Mohammed Ali 1984: 176; Marks and Mohammed Ali 1980: 32-33). Before then, the only known ancient sites in the region were 'Mahal Daqlianus', presently known as Mahal Teglinos, near the town of Kassala, where in 1917 Crowfoot collected some surface materials that he considered to be mostly Aksumite, and which he published in an article in Journal of Egyptian Archaeology (Crowfoot 1928), and some sites with possible Islamic remains recorded there in the late 19th-early 20th century (Conti Rossini 1903; Crowfoot 1922). Later on, Mahal Teglinos and a handful of sites were visited by British residents and amateur archaeologists, but also by Kirwan, Wellcome and Sandison, as shown by several entries in the register of the Sudan National Museum and by files in the archives of the National Corporation for Antiquities and Museums (Costantini *et al.* 1982: 31; Fattovich 1989b: 223, 1989e: 90, 1993a: 228-229; Fattovich, Marks and Mohammed Ali 1984: 174). Nevertheless, Dandaneit, Shabeit, Kokan and Ntanei, four sites near the Eritrean town of Agordat, just across the border, visited by Arkell, are the only ones whose general description and collected materials were published: among the finds, some were correctly related to the Nubian 2nd millennium BC cultures (Arkell 1954).

The first large program of systematic archaeological exploration of Eastern Sudan only started in 1980, when a research project aimed at investigating the relationships between the Nile valley and the Ethio-Eritrean highlands in ancient times was started by the Istituto Universitario Orientale -presently University of Naples 'L'Orientale'-, and the Butana Archaeological Project, jointly sponsored by the University of Khartoum and Southern Methodist University (Dallas), was begun with the aim of studying the relationships between Eastern Sudan and the Nile valley in the 'Neolithic' phase, without overlooking other possible links to more southern regions in prehistoric times (Fattovich, Marks and Mohammed Ali 1984: 173-174; see also Fattovich 1982, 1989e: 91-93, Marks and Fattovich 1989: 451; Marks and Mohammed Ali 1980: 34-35). The two teams were conducting a systematic extensive survey of the area (Sadr 1990: 66-67) in the framework of a close collaboration established since the very beginning of their activities (Marks and Fattovich 1989: 451) (Figure 2). They were able to considerably increase the number of the known sites, and this part of the collaborative work resulted in one of the very few examples of territorial studies in the Nubian-Sudanese archaeology (Sadr 1988, 1991), together with the earlier study of the Lower Nubian settlement pattern (Trigger 1965), the investigation of the settlement pattern in the Wadi Howar (Keding 2004), and, in more recent times, similar studies conducted in specific areas of Upper Nubia (Welsby ed. 2001), in the region of the Third Cataract (Edwards, Osman *et al.* 2011) and for Meroitic Upper Nubia (Edwards 1989). The 256 sites surveyed in Eastern Sudan were labeled according to the sector where they were located, in turn named after local toponyms (Sadr

1988: 389-390, Fig. 7, 1991: 36-37) (see again Figure 2). The name of each site resulted from the capital abbreviation of the name of the sector followed by the progressive number of the sites recorded in the sector itself. Excavations, in most cases limited test pits, were conducted at 17 sites, both with the aim of evaluating the depth of the stratified deposit as well as in order to establish the relative chronology among the cultural units which were defined (Marks and Fattovich 1989: 453; Sadr 1988: 391, 1991: 37-38). In particular, the Italian expedition contributed to the reconstruction of the history of the region, especially through a more extensive excavation of some sectors of the site of Mahal Teglinos, since then labeled according to the name of the sector where it was located as Kassala (abbreviation K) 1 (Fattovich 1989b, 1991a, 1993a).

This research activity resulted in the establishment of a long regional cultural sequence starting in the 6th millennium BC and ending in the 2nd millennium AD (Fattovich, Marks and Mohammed Ali 1984; Fattovich 1989a: 481, 1989b: 226-227, 1991a: 117-118, 1990a: 11, 1993a: 226-227; Fattovich, Sadr and Vitagliano 1988-1989: 333-335; Marks and Fattovich 1989) (Figure 3). Its main phases, conventionally

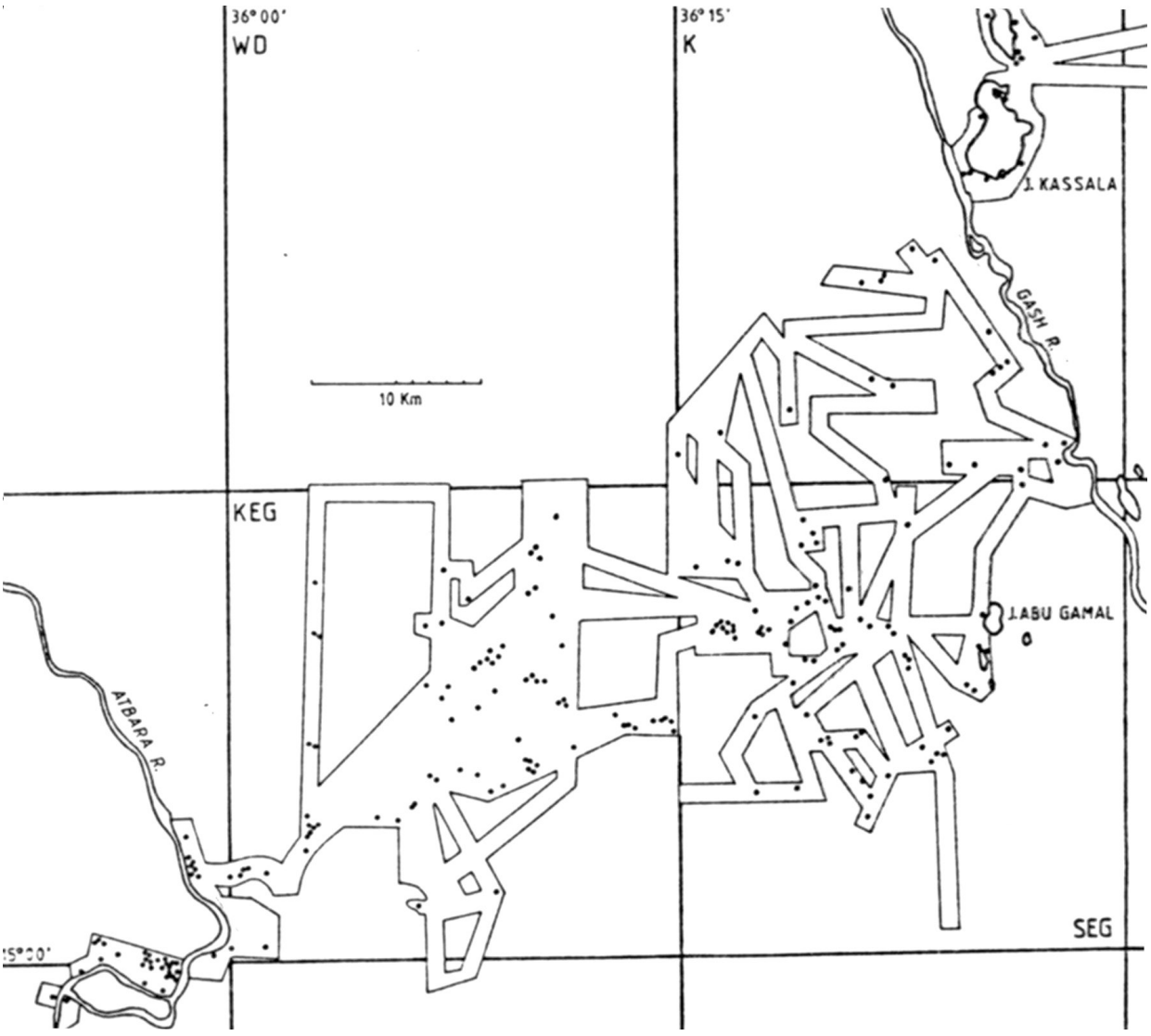


Figure 2: map of the region between the Gash and the Atbara rivers investigated in the Eighties by the Italian and American-Sudanese teams showing the recorded sites and the surveyed areas in the four sectors named after local toponyms (from Sadr 1991).

labeled with names of places in the region are as follows:

- Pre-Saroba Phase roughly dating to the 6th millennium BC and represented by some sites between the Gash and the Atbara rivers and by the sites of the Amm Adam Group in the Gash delta;

- Saroba Phase roughly dating to the 5th millennium BC and represented by the sites of the Malawiya Group located between the Gash and the Atbara rivers;

- Kassala Phase dating to the 4th-early 1st millennia BC and represented by three successive groups of sites labeled as Butana Group, Gash Group and Jebel Mokram Group all occurring between the Atbara and the Gash rivers, and, in the case of the Gash Group, also extending to the Gash delta;

- Taka Phase dating to the early 1st millennium BC-late 1st millennium AD and represented by the sites of the Hagiz Group between the Gash and the Atbara rivers and by a handful of Khatmiya Group sites east of Kassala, where there are also some tumuli likely dating to this phase, as well as a couple of Post-Meroitic sites near Jebel Ofreik and in the region between the Gash and the Atbara, and by a few Christian sites north of Kassala.

The Taka Phase is followed by the Gergaf Group, whose sites occur between the Gash and the Atbara rivers and which is dated around the mid-2nd millennium AD.

The features characterizing each phase, as well as the main issues in terms of results of the research as well as of ongoing scientific debate and perspective of research will be discussed more systematically and with more details in the following chapters.

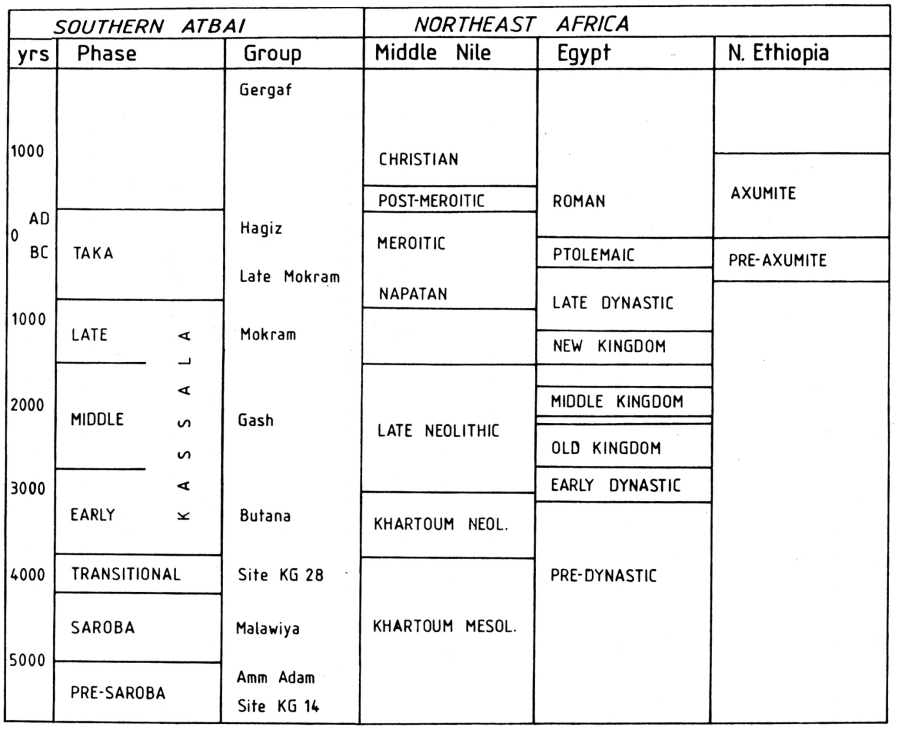


Figure 3: regional cultural sequence as it was reconstructed after the investigations conducted in the Eighties compared with the cultural sequence of the Middle Nile Valley, Egypt and northern Ethiopia (modified from Sadr 1991).

In addition to outlining the general cultural sequence of Eastern Atbai, some major turning points in the history of the region too, were already identified in the 1980s (Fattovich 1991a: 128-129, 1990a: 30-31, 1993b: 443-444; Fattovich, Sadr and Vitagliano 1988-1989: 348-352; Marks and Sadr 1988; Sadr 1987, 1988, 1990): the process of adopting domestic livestock in the region, and of cultivating plants took place at least from the 4th millennium BC, while the progressive shift to a nomadic and pastoral style of life started in the mid-2nd millennium BC; the rise of hierarchic societies in the region as well as the progressive inclusion of the region in a broad network of relations extending from Egypt to the Yemeni highlands characterizing the 3rd and 2nd millennia BC were outlined. Moreover, a regional ceramic tradition, labeled Atbai Ceramic Tradition and characterized, from its origins in the 5th millennium BC up to its end in the late 1st millennium AD, by the occurrence of scraped ware -a distinctive treatment of the surfaces of the vessels which were combed both on the inside and outside- was defined (Fattovich, Marks and Mohammed Ali 1984: 176-178; Fattovich 1990a: 10-11; Marks and Fattovich 1989: 453; Marks and Sadr 1988: 71).

In 2010 the Italian Archaeological Expedition to the Eastern Sudan of the University of Naples 'L'Orientale' resumed the fieldwork after a gap of fifteen years (see Manzo *et al.* 2011: 1-2, 2012: 1) in order to get a better knowledge of the relationships between Eastern Sudan and Upper Nubia, to investigate the possible relationships between the cultures of Eastern Sudan, the Red Sea coast and the Eastern Desert, to increase our knowledge of some phases in the cultural sequence of the area which were only marginally investigated, to elaborate a broader palaeoenvironmental model for the whole region to be related with archaeological remains by means of systematic geo-archaeological studies, as well as to continue the archaeozoological and palaeobotanical studies aimed at getting a better definition of the ancient economy and man-environment relationships in the region.

In addition to those tasks, the Italian Archaeological Expedition to the Eastern Sudan had to face a further and more urgent challenge related to rescue archaeology. Actually, when the decision of resuming the fieldwork was taken in 2010, it become clear that the cultural heritage of the region under investigation was going to be heavily affected by the ongoing construction of new dams on the Atbara and Setit rivers and by an irrigated agricultural scheme in the whole area between the Gash and the Atbara (Upper Atbara Agricultural Irrigated Scheme). Already, before the fieldwork of the Italian expedition was resumed, in June 2010 the National Corporation for Antiquities and Museums of the Sudan surveyed the endangered area and recorded 136 sites which were labeled with the abbreviation UA (Upper Atbara) followed by a progressive number. To this number, starting from 2011, other twenty-one sites were added by the Italian expedition (see Manzo *et. al.* 2012: 123; Manzo 2015: 234). It should be stressed that these salvage archaeological activities are also contributing to the overall archaeological research in the region, as the area affected by the irrigation scheme and surveyed in 2010 by the National Corporation for Antiquities and Museums largely complements the one surveyed in the 1980s by the Italian and American-Sudanese teams (Manzo *et al.* 2012: 1) (Figure 4).

Since 2010 the Italian Archaeological Expedition to the Eastern Sudan has conducted six field seasons and started investigations in new sectors of the site of Mahal Teglinos (K1), at the site of Jebel Abu Gamal (JAG) 1, as well as at several sites endangered by the irrigation scheme such as UA14 (previously labeled as KG23), UA53, UA50, UA126, UA129, and UA143 (Manzo *et al.* 2011, 2012; Manzo 2013, 2014a, 2015, 2016).

1.3 The present and past environment

Eastern Sudan is the region also labeled as southern Atbai located east of the Atbara river, the last big tributary of the Nile. It is bordered to the south and south-east by the Eritrean-Ethiopian highlands, to the north and north-east by the southern fringes of the Eastern Desert and the Red Sea hills (Barbour 1961: 219, 222) (Figure 5). The region is almost completely flat (see e.g. Figure 6, a-c, f) except for a few granite hill masses, such as the Jebel Taka (Figure 6 d), near Kassala and Jebel Abu Gamal south-west of it (Figure 6 e), and it is traditionally inhabited mainly by groups of livestock breeders who periodically

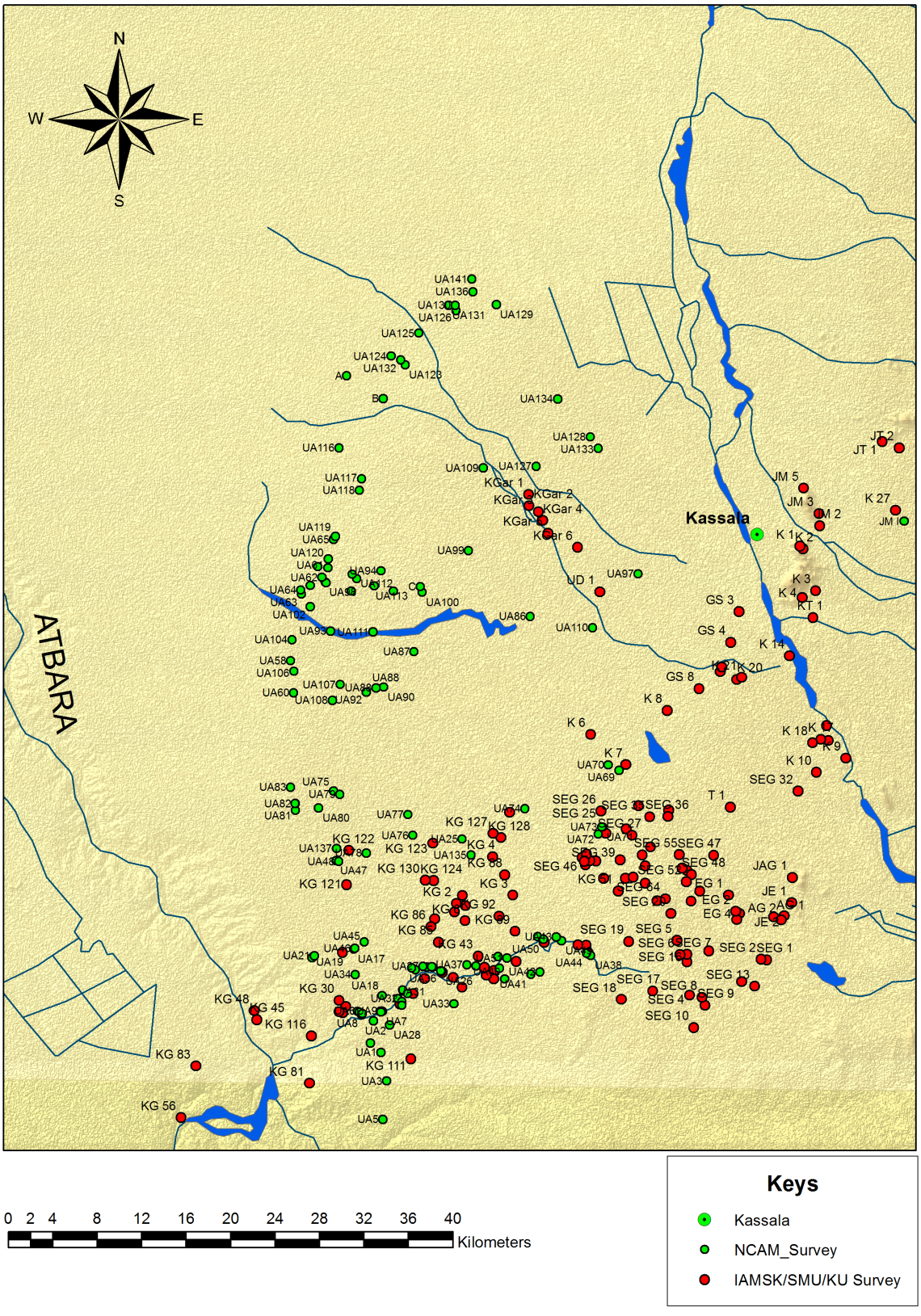


Figure 4: map showing the sites surveyed in the Eighties and the ones recorded by the National Corporation for Antiquities and Museums of the Sudan in 2010, also showing the complementarity of the two surveys (elaborated by V. Zoppi).

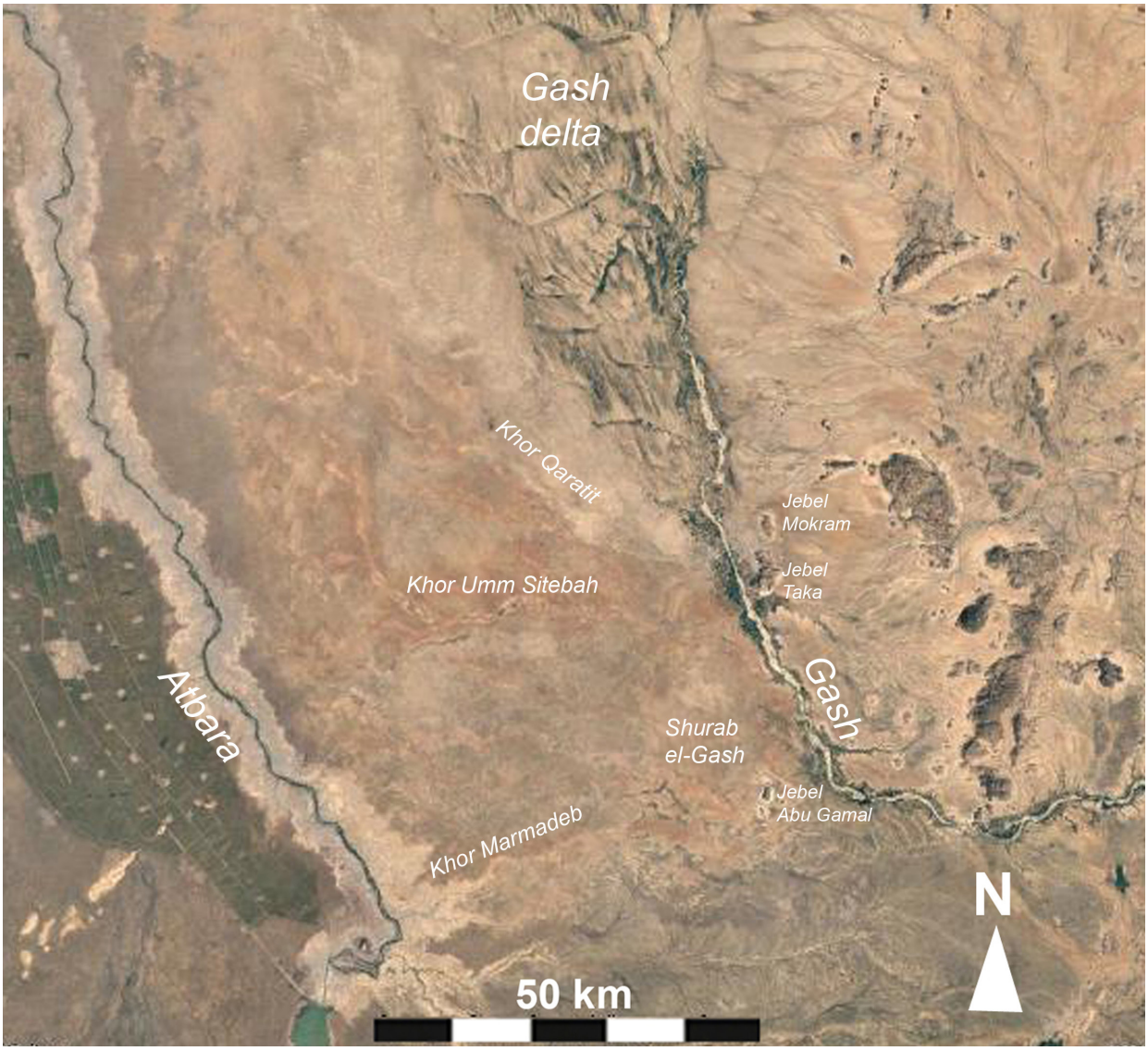
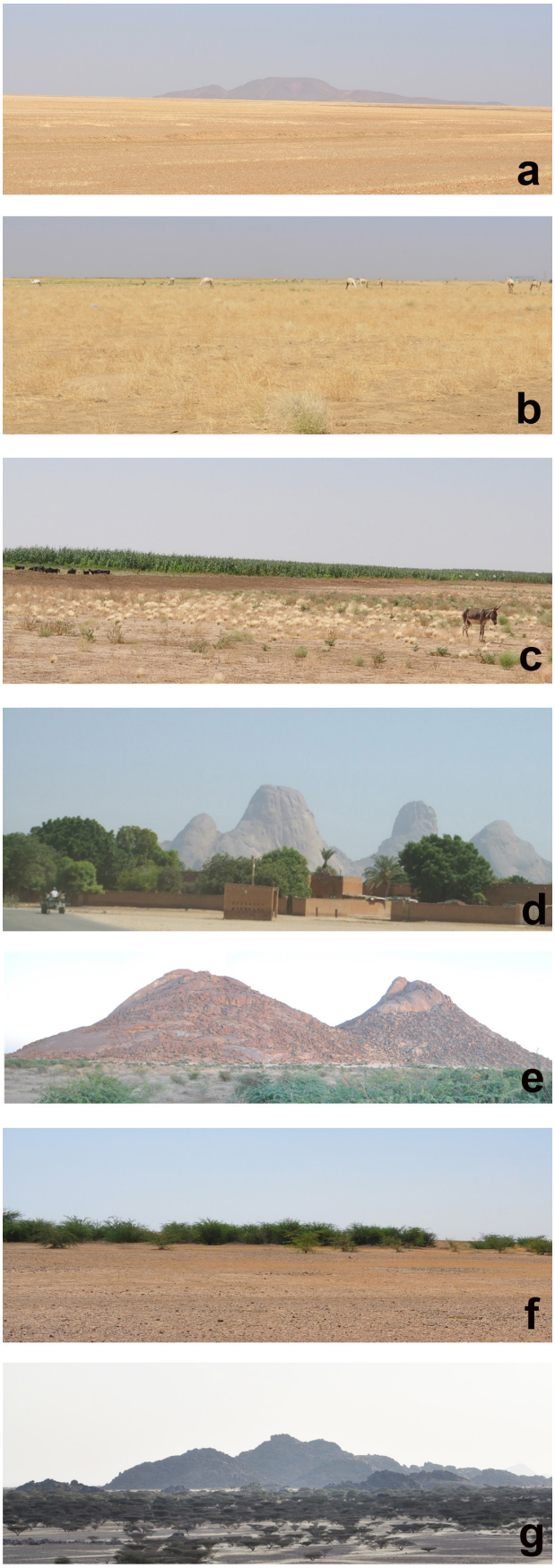


Figure 5: satellite image of the region between the Gash and the Atbara; to be remarked the East-West oriented streams crossing the area draining towards the Atbara, the agricultural areas along the Gash, in the Gash delta and in the Shurab el-Gash sector, the eroded stripes bordering the banks of the Atbara (modified Google Earth image).

move across it, following the availability of resources determined by the monsoon rains affecting the area in the summer, in a generally arid climate, and by the seasonal water made available by the two rivers crossing the region and draining from the Ethio-Eritrean highlands, i.e. the Atbara and the Gash (Barbour 1961: 26-29, 38-39, 219, 225-226; Sadr 1991: 25-26; Shiner *et al.* 1971: 294). Interestingly too is the fact that the rains are not homogeneously distributed, but more abundant in places closer to the slopes of the Ethio-Eritrean highlands i.e. in the southeastern parts of the region (Barbour 1961: 38-39, Fig. 21, 22) (Figure 6 g). The areas along the banks of the Gash, and in the Gash delta as well as some specific spots between the Gash and the Atbara rivers, like the Shurab el-Gash area, are richer in water and soil resources and are therefore more suitable for agricultural exploitation (Figure 6 c-d), while the rest of the region offers more or less rich grazing (Barbour 1961: 37, 128, 219; Cumming 1937: 1-2; Sadr 1991: 27-29; Worrall 1960: 108-109) (Figure 6 b). The flora of the region is mainly characterized by annual grasses, bushes and acacia trees (Wickens 1982). The economic potential of the area between Gash and Atbara is also enhanced by the



six major streams with an east-west orientation crossing it and flowing towards the basin of the Atbara due to the terrain's gentle inclination down from the east, where the Red Sea hills and the footslopes of the Ethio-Eritrean plateau are located, to the west (Shiner *et al.* 1971: 296) (Figure 6 f). On the contrary, the banks of the Atbara were affected by severe erosion that brought to light older terraces very poor in terms of productive land (Shiner *et al.* 1971: 293-294).

These general conditions determining the distribution of resources such as fertile land and grazing areas clearly affect the life style and economic activities of the present inhabitants of the region (Barbour 1961: 221-226; Cumming 1937: 2-3; Sadr 1991: 26-30). They belong to several different groups, mainly represented by the Hadendowa, Halenga and Beni Amer. All are part of the broader Beja family, and traditionally nomadic herdsmen. Then, the Rashaida, who arrived recently from Arabia and are basically devoted to camel breeding, and the Nubians, farmers, traders and administrators, mainly concentrating in the towns and in the areas more suitable for agriculture. Numerically smaller groups are represented by the Barya (Nara) and the Kunama, farmers and livestock breeders: they were regarded as a very recent presence in the region as several of them moved in from Eritrea in the last decades, but these groups may have been present in Eastern Sudan in ancient times too (Fattovich 1994: 36-42). From the linguistic point of view, these people speak Semitic (Arabic), Cushitic (Beja) and Nilo-Saharan (Nara and Kunama) languages (Thompson 1976: 598-600).

Figure 6: the environmental variety of Eastern Sudan: a) the dry plain north of the Gash delta; b) the grassland west of the Gash delta; c) a cultivated area in the Gash delta; d) the outskirts of Kassala, in the cultivated area along the Gash river, with the Jebel Taka on the background; e) the Jebel Abu Gamal in the southern sector of the plain between the Atbara and the Gash rivers; f) the northern bank, marked by a strip of bushes, of the khor Marmadeb, a stream crossing the plain between the Atbara and the Gash rivers; g) the hills bordering the foot of the Ethio-Eritrean highlands to the east of the region.

The environmental conditions of the region certainly underwent several changes through the period dealt with in this book. In general, the region was involved in the climatic trends affecting the whole northeastern Africa, with wetter conditions in the earliest part of the Holocene, later some drier oscillations around the mid-Holocene -a relevant one perhaps started at the beginning of the 6th millennium BC-, and more arid conditions set by the mid-3rd millennium BC ca., although sensible differences were remarked from north to south in the moment when the change of the trend towards drier condition became evident (Bubenzer *et al.* 2007; Kuper and Kröpelin 2006; Nicoll 2001, 2004 see also Williams *et al.* 2015: 85-87; Lesur *et al.* 2013: 149). In Eastern Sudan, this presumably entailed the southward and eastward shift of the deciduous savanna woodland as it was previously proposed (Wickens 1975: 52; see also Sadr 1991: 30, Fig. 3.6). Nevertheless, it is likely that this was a progressively slow and not coherent process, and it seems very possible that our region, like central Sudan, was only affected by the general climatic trend very gradually, and likely not from its very beginning (Williams 2009; Williams *et al.* 2010).

The palaeoenvironmental studies undertaken after 2010 are presently in progress and will certainly enrich our reconstruction, adding insights into the complexity that characterized the process. Nevertheless, the above outlined general trend also seems to be confirmed by few geoarchaeological observations conducted recently in some of the sites under investigation in Eastern Sudan such as Mahal Teglinos (K 1), UA 53 and UA 50. In particular, at UA 50, in a site located in the flat area between the Gash and the Atbara whose investigation is still in progress, clay strata originating from the activity of a stream near the site covered a living surface dated to ca. 5000 BC where traces of exploitation of land snails, clearly compatible with humid environment, were recorded (see Manzo 2016: 194). The fact that some of the materials dating back to that phase, had moved and embedded in later clay strata may even suggest that the site was periodically flooded after 5000 BC. Later on graves, possibly dating back to the 2nd millennium BC, were excavated in these strata, but an intense erosive phase suggesting reduced wadi activity and prevailing wind erosion led to the destruction of the upper part of their pits, also bringing to light the 5000 BC living floor (Figure 7). At UA 53, the formation of thick clay strata possibly related to the intense activity of a nearby stream continued after the early 4th millennium BC, while an impressive erosion suggesting a reduced activity of the stream, in turn related to the decrease of the rains, seems to have already affected the site in the 2nd millennium BC and led to the almost complete erosion of the clay strata covering an early 4th millennium BC living surface as well as of the upper pits of the late 4th millennium BC graves excavated in these clay strata (Manzo *et al.* 2012: 9, 106; Manzo 2014a: 386) (Figure 8). At Mahal Teglinos (K 1), a small lake in the western sector of the site progressively dried up to a complete disappearance around 2000 BC (Manzo 2014a: 386, 2015: 235).

Interestingly, both the evidence from UA 50 and UA 53 may suggests that the drier oscillations around the mid-Holocene well known in the Nile valley may not have been so relevant in our region, and that more humid conditions may have locally continued longer. Actually, drier conditions may have been evident from the 3rd millennium BC onwards, but their effects were again gradual, as suggested by the drying of the small lake at Mahal Teglinos (K 1) only in the early 2nd millennium BC. Nevertheless, already in the 2nd millennium BC intense erosive processes suggesting drier climatic conditions had taken place at UA 53. This specific palaeoenvironmental trend may perhaps not be related only to the latitude of our region, but also to the geographic closeness between Eastern Sudan and the Ethio-Eritrean highlands: this may have somehow mitigated the effects of the general trend towards increasing aridity in the region, with the connected later disappearance of internal basins and lakes, as compared to regions to the west and to the north. Moreover, the presence of the foothills of the Red Sea hills and of the Ethio-Eritrean highlands up to date still justifies the occurrence of more intense rains in the eastern sector of the region (see above), and this pattern may have also been so in ancient times, and may have determined the continuation of local wetter condition in that sector.

Figure 7: A 2nd millennium BC grave brought to light by the heavy erosion affecting the site UA 50 when the arid conditions prevailed; to be remarked the late Mesolithic materials from the strata cut by the grave scattered among the bones.

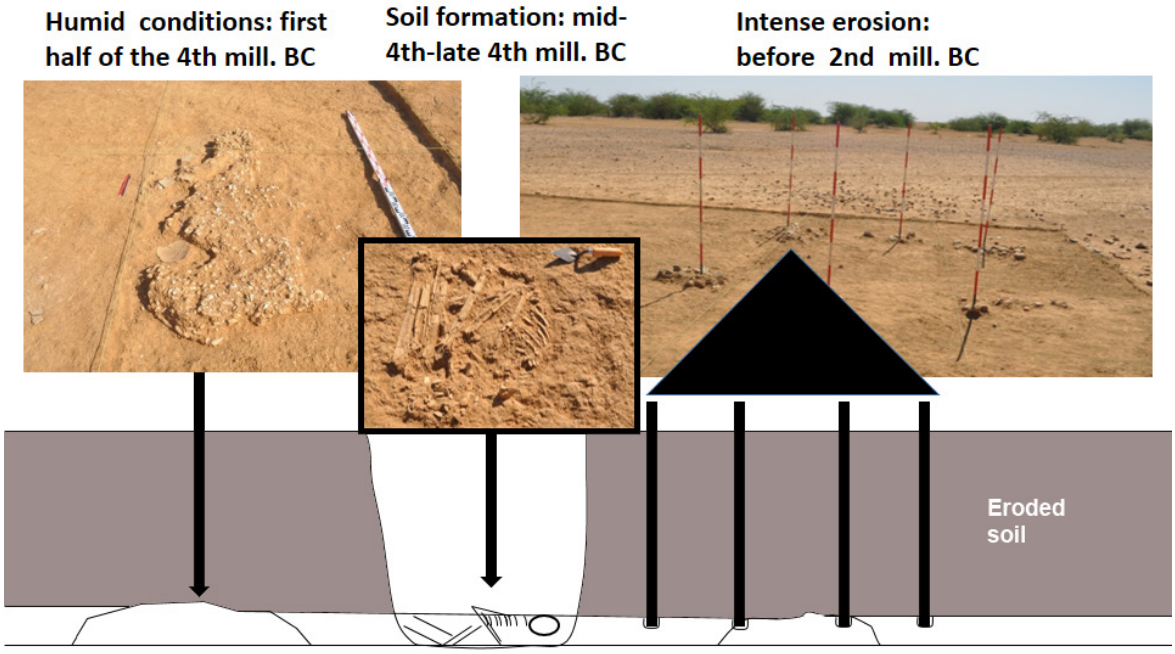


Figure 8: Schematic stratigraphy of site UA 53 showing the relationship between different cultural and climatic phases, as well as the environmental factors affecting the site formation processes; the soil eroded when arid conditions prevailed is highlighted by the gray colour.

In this dynamically changing environment, it was hypothesized that the change in the course of the Gash river also affected the region and its inhabitants. Actually, it was suggested that the course of the Gash river, thought to have originally reached the Atbara, may have progressively moved north up to its present location, and that the streams crossing the region between the Gash and the Atbara rivers may be palaeo-channels of the Gash (see e.g. Sadr 1991: 33, Fig. 3.7) (Figures 5, 6 f). But this model does not seem to be supported by recent investigations, and the streams previously considered as palaeo-channels of the Gash are now interpreted as autonomous water courses, most likely already crossing the region in ancient times.[1] Indeed, the above described thick sediment strata covering at a certain point some of the archaeological sites of the region like UA 50 and UA 53 may have been originated by the action of those streams prevailing in more humid phases on the wind erosion (Manzo 2015: 235).

1.4 The resources

In addition to agricultural land and grazing areas, that represented the basic resources sustaining the subsistence economy of the region, Eastern Sudan is also extremely rich in minerals, vegetation and animal resources relevant for the ancient trade. Other resources are also occurring just southeast and south of the region, on the slopes of the Ethio-Eritrean highlands. This makes the Eastern Sudan and the Eritrean lowlands traditionally crucial for the supply of commodities such as African ebony, ivory, aromatic resins and even gold, all available in the region or its immediate vicinity (Manzo 1999: 6-9, 13) (Figure 9).

A large variety of plant and animal species occur in the number of rich and different ecological niches characterizing the slopes and the foothills of the Ethio-Eritrean highlands, mainly due to the variation in altitude and in the availability of water. Actually, in terms of animal resources, ostriches, whose feathers and eggshell were both appreciated in ancient times, widely occurred in Eastern Sudan as well as in more northern regions up to the beginning of the last century (Dardano and Riccardi 1936: 20-21; Mackworth-Praed and Grant 1981: 1-3; Munzinger 1890: 104; see also Phillips 2000: 332). Also, giraffes (Dardano and Riccardi 1936: 20-21; Grasse 1955: 606) and leopards (Corbet 1978: 71; Maydon 1924), that may have provided prized animal skins (see Osborn and Osbornová 1998: 121, 150; Van Driel-Murray 2000: 302), but could also be traded alive already in very ancient times, as shown in several Egyptian scenes representing the paying of tribute by foreign lands south of Egypt (see e.g. Osborn and Osbornová 1998: 150-151), were common in Eastern Sudan up to very recent times. Although extinct today in the region, the rhino too occurred there and certainly was also present in ancient times (Dardano and Riccardi 1936: 20-21; Grasse 1955: 1123-1126; Osborn and Osbornová 1998: 139-140). On the contrary, baboons that were exported to Egypt as pets as well as for their religious significance (Osborn and Osbornová 1998: 35-36, 39) still occur in Eastern Sudan (Corbet 1978: 65; Osborn and Osbornová 1998: 33, 38). Elephants provided ivory, but were also needed alive in the 3rd-early 2nd century BC, and despite their heavy exploitation, occurred in Eastern Sudan well after the mid-19th century (Maydon 1924; Munzinger 1890: 100-104; see also Krzyszowska and Morkot 2000: 323-326; Osborn and Osbornová 1998: 126).

Eastern Sudan and in general the lower slopes of the Ethio-Eritrean highlands are characterized by the occurrence of several plant species highly appreciated in ancient times, both for the production of furniture and for aromatic resins. Both *Boswellia* spp. (Hepper 1969; Manetti 1936: 104; Scaweinfurth 1891; Serpico 2000: 438-439) and *Commiphora* (Hepper 1969; Manetti 1936: 168; Scaweinfurth 1891; Serpico 2000: 439-442), exploited for the aromatic substances originating from their resin, occur in the region. Other plant species such as *Dalbergia melonoxylon* and *Dyospiros mespiliformis*, whose hard and dark brown or black wood was appreciated since ancient times for the production of furniture, inlay, veneer and sculpture (see Gale *et al.* 2000: pp. 338-340), occur in the region, where they were exploited up to recent times (Booth

[1] M. Cremaschi is in charge of these investigations. These remarks are based on the preliminary results of his analyses.

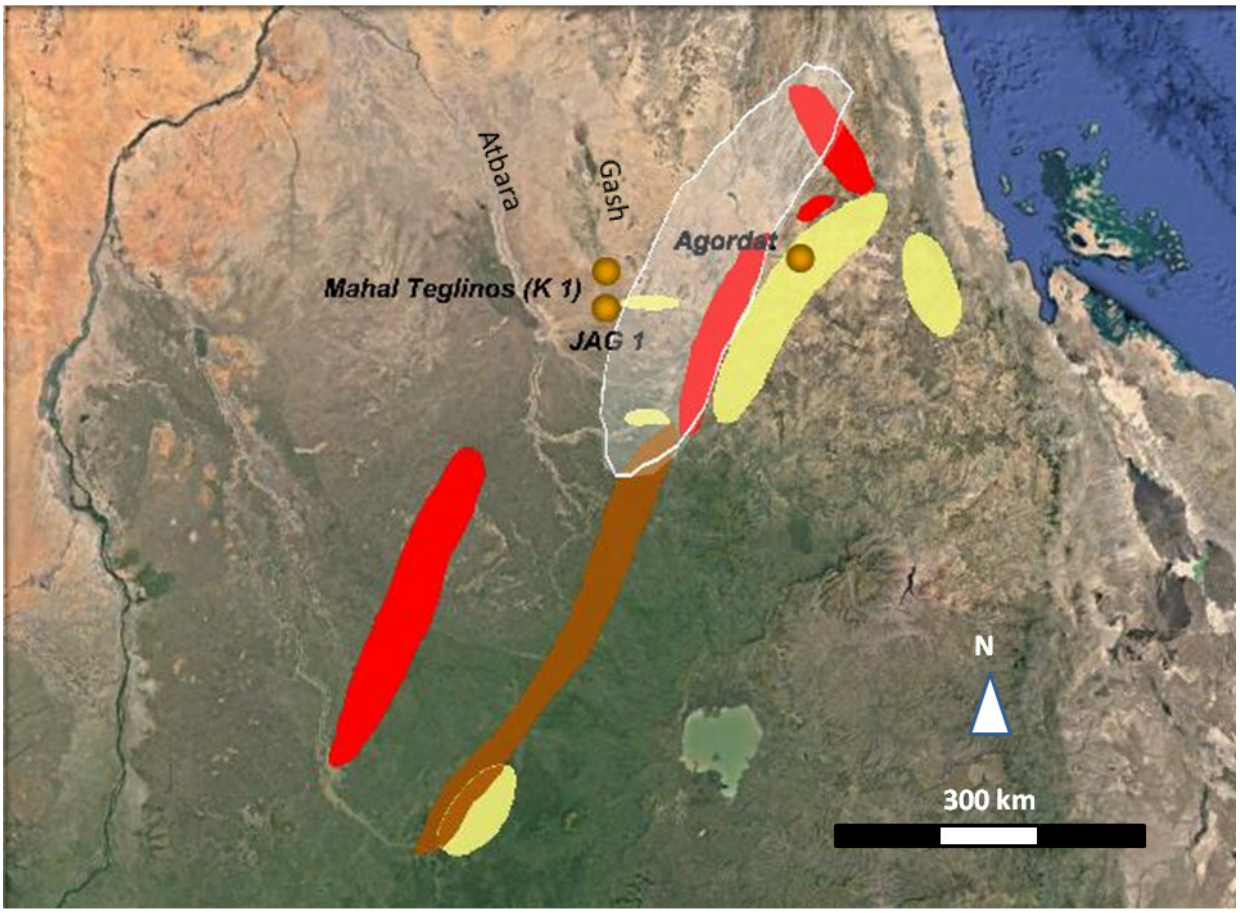


Figure 9: map showing the occurrence of raw materials in the region and nearby as well as the main archaeological sites; aromatic resins occur in the areas highlighted in red, ebony in the brown ones, gold in the yellow ones, while white colour shows where elephants were recorded well after the mid-19th century (based on Fattovich 1991d).

1952; Scaweinfurth 1891).

As far as mineral resources are concerned, generally the region on both sides of the present Sudanese-Eritrean border, and in particular in the basin of the Gash river is characterized by the occurrence of gold sources, as well as by traces of their possible ancient exploitation (Whiteman 1971: 224-225 see also Ogden 2000: 161-162). Other prized mineral resources such as agate, chalcedony and cornelian, highly appreciated in ancient times for the production of beads and jewelry (see e.g. Aston, Harrell and Shaw 2000: 25-26), are naturally present in the gravels of the Atbara (Whiteman 1971: 257-258).

1.5 Communications

As emphasized earlier, Eastern Sudan is located between several different eco-cultural regions of northeastern Africa such as the Eastern Desert and the Red Sea hills, the middle Nile valley, the Butana and the Ethio-Eritrean highlands. Therefore, the region is traditionally crossed by routes linking these different areas. Actually, given the above described great ecological diversity of the region, and the seasonal variability in the availability of resources, periodical displacements and migrations of animals -including human beings- took place since the earliest times. Moreover, the above described availability of appreciated raw materials in the region itself and in its immediate environs may have also favored the development and utilization of an articulated network of tracks (Manzo 1999: 12-13).

In general, it should be remarked that the mobility within Eastern Sudan, and between it and the neighboring regions, was facilitated by the availability of water due to the monsoon rains affecting the area, a crucial factor even in drier climatic phases (see above 1.3 *Present and past environment*). Nevertheless, it should also be remarked that on the other hand, the rainy season may also have posed periodical problems to mobility, such as the formation of muddy areas, pools and the increased water level in rivers with the consequent difficulties in wading across the Atbara and the Gash (James 1867: 49-50; Munzinger 1890: 25).

As previously mentioned, the emergence of some specific routes was perhaps facilitated precisely by the seasonal availability of resources such as water and grass. The areas closer to the slopes of the Ethio-Eritrean highlands along the southeastern and southern fringes of Eastern Sudan, and the ones near the rivers are characterized by a constant availability of resources throughout the year, while the central part of the region is mainly characterized by a concentration of resources in summer and immediately after it, as their availability is related to the seasonal monsoon rains. Therefore, the location of the Atbara and the Gash respectively on the western and eastern fringes of the region may have determined east-west movements from the rivers to the inner part of the region and vice versa. Nevertheless, it should be remarked that the occurrence of badly eroded terraces and very poor soils along the Atbara may have limited the use of that area as shelter in the dry season, at least from a certain point onwards. On the other hand, the north-south, or more precisely north/west-south/east movements may have been favored by the presence of the Ethio-Eritrean highlands to the south and south-east of the region, and in this case the movements also had to overcome some differences in altitude. Finally, to the north, the region is open towards the Eastern Desert, and no clear-cut ecological borders are marked by rivers or altitude. North of the region, in the Eastern Desert itself, a not less relevant invisible line is marked around latitude 22° N (this may have fluctuated in the different climatic phases): two climatic zones, one characterized by winter rains to the north and the other affected by summer rains to the south meet there (Bintliff and Barnard 2012: 438; see also Barbour 1961: 38). This invisible line was crossed two times every year in opposite directions by several animal species -also in this case including man- to exploit the resources available north and south of it in different periods of the year, due to the two opposite climatic regimes. Some of these north-south movements may have extended up to the northern fringes of Eastern Sudan.

As far as the main known tracks and routes traditionally used by the caravans and often in the seasonal movements of the livestock breeders are concerned, some of them put our region in communication with the Red Sea coast and the Ethio-Eritrean highlands. Towards the sea, those tracks, also used by Muslim pilgrims, point to the north-east and lead to the coast near Aidab, Swakin and, later into the sector of the littoral where Port Sudan is located (Hurst 1952: 87; James 1867: 112-116; Monneret de Villard 1938). A further track to the north-east reached the coast through Maman and the valley of the Barca river (Monneret de Villard 1938).

Other tracks pointing to the south and south-east reached the highlands by crossing the area between the Gash and the Barka: the valley of the Gash there may have represented a natural corridor to the highlands (Maydon 1924; Morrice 1949). A further track, through Metemma and following in part the Atbara, also leads to the highlands (James 1867: 112-116; Maydon 1924).

From the region of Kassala, some tracks heading to the north-west reached the Butana by crossing the Atbara at the ford of Goz Regeb and were connected through it to the wide network of tracks crossing the Butana, following the Nile and also crossing the Bayuda to avoid the big meander of the Nile (Hurst 1952: 76-77; Morrice 1949; Monneret de Villard 1938).

Thus, if the previously outlined natural factors may have determined periodical north-south and east-west movements in the region, specific routes emerged from the distribution of the watering points, of the passes overcoming hills, and of fords where the rivers could be crossed or simply from more economic, i.e. less energy consuming, itineraries. Of course, this does not exclude the possibility of other factors affecting the development of the network of routes, and also the abandonment of some of them in certain moments: these are mainly represented by socio-economic circumstances. Some of these circumstances will emerge in the following chapters.