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Pastoralism and Resilience
in Central Sahara

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In memory of my father

Preface

The main tenet of this book is the investigation of mechanisms of pastoral adaptation in hyper arid environments. Based on a field research carried out between 2003 and 2009 among the Kel Tadrart Tuareg in SW Libya in the frame of “The Archaeological Mission in the Sahara” of Sapienza University of Rome, this book explores various facets of a surprisingly successful adaptation to an extremely arid environment. My research vigorously shows that the resilience of the Kel Tadrart is the key to understand the reasons for their choice to stay and live in the almost rainless Acacus Mts., in spite of strong pressure to sedentarize in the neighboring oases.

By means of an ethnoarchaeological approach, I explore the Kel Tadrart interactions with natural resources, the settlement patterns, the campsite structures, and the formation of the pastoral archaeological landscape, focusing on variability and its causes. Through the collection of the interviews, participant observation, mapping of inhabited and abandoned campsites, remote sensing, and archival sources, I examine the various and different Kel Tadrart strategies, perceptions, and material culture to illustrate how desert pastoralism is a rather complex phenomenon, where the 12 households inhabiting a mountain region of c. 5,000 km² make different choices to optimize their survival. Rather than considering them as a marginalized, peripheral, and agonizing society, I show that the Kel Tadrart are instead an outstanding example of successful adaptation to extreme environments. This in turn leads me to reconsider the historical age frequentations in the view of the Kel Tadrart resilience, shedding light onto a quite misunderstood archaeological landscape, where the so far reported absence of evidence does not correspond to the evidence of absence.

This book is conceived as a gradual flow of concepts, elaborating a research narrative aimed at building a gradual understanding of pastoralism in the deserts in an ethnoarchaeological perspective. It is organized into eight chapters, plus a set of Slides available online. In Chap. 1, I introduce some basic theoretical issues, and focus on methodology, fieldwork procedure, and techniques of data treatment. In the following section (Chap. 2), I present an overview of the environment, in the scope of describing the environmental settings relevant to human occupations.

In Chap. 3, I reconstruct the recent history of the Kel Tadrart mainly using ethnohistorical sources and information from the neighboring mountains of the Tassili and Hoggar (both in Algeria). In the next section (Chap. 4), I discuss the Kel Tadrart settlement pattern, studying the position of settlements in relation to natural resources, status, and kinship. Chapter 5 includes a detailed study of the Kel Tadrart settlements, with emphasis on the investigation of the peculiar coexistence of different types of dwelling huts. Abandoned settlements are the subject of Chap. 6, which conveys the data discussed in the previous chapters and aims at discussing the various vestigial remains of no longer used sites, interpreted as the material evidence of different types of frequentations. The suitability of the Tadrart Acacus for pastoral occupation observed in the 'present' is the basis for a short ethnoarchaeologically inspired revision (Chap. 7) of overlooked archaeological evidence related to historic and recent (c. 1000 AC–present) frequentations erratically found in past years in the study area. The end of the book (Chap. 8) features some conclusive remarks, putting together main issues discusses in the previous sections and pinpointing some critical argument related to future development of archaeological and ethnoarchaeological research in the Sahara.

Acknowledgments

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Contents

1	Research Objectives, Materials and Methods	1
1.1	Overview	1
1.2	Introducing Ethnoarchaeology	2
1.3	The Sahara Desert: A ‘Marginal Centre’ of African Studies?	3
1.4	Types Versus Variation in the Archaeological Study of Pastoralism	4
1.5	Ethnoarchaeology of Pastoral Sites in Arid Lands	5
1.6	Research Objectives	6
1.7	Materials and Methods	8
1.7.1	Earlier Preliminary Research, Schedule and General Remarks	8
1.7.2	The ‘Regional’ Level of Analysis	8
1.7.3	The ‘Site’ and the Settlement Patterns	9
1.8	Survey of Deserted Campsites in the Acacus Mts.	10
	References	11
2	The Environment	15
2.1	The Tadrart Acacus Massif and Central Sahara	15
2.2	Geomorphology	15
2.3	Climate	16
2.4	Flora and Vegetation	18
2.5	Main Features of the Tadrart Acacus Landscape	18
2.5.1	Valleys and Pastures	18
2.5.2	Water Resources	20
2.5.3	Shelters and Caves	22
2.5.4	Paths and Passageways	23
	References	24

- 3 The Kel Tadrart Tuareg: Ethnohistorical and Ethnographic Background 27**
 - 3.1 Ethnohistorical Background 27
 - 3.1.1 The Tuareg in the SW Fazzan 27
 - 3.1.2 The Northern Tuareg and the Literature. 27
 - 3.1.3 The Kel Tadrart in the Early Ethnohistorical Accounts 29
 - 3.2 The ‘People of the Acacus’ Today. 31
 - 3.2.1 The Kel Tadrart Identity and Figures. 31
 - 3.2.2 Origins and Death. 33
 - 3.3 Livestock and Husbandry 34
 - 3.3.1 Kel Tadrart Herds 34
 - 3.3.2 Size of Herds 34
 - References 41

- 4 The Regional Level of Analysis. 43**
 - 4.1 The Settlements. 43
 - 4.1.1 Date of Settlement 43
 - 4.1.2 Physical Location of the Settlements. 43
 - 4.1.3 Soils 47
 - 4.1.4 Water 48
 - 4.1.5 Kinship 52
 - 4.2 Mobility 53
 - 4.2.1 Nomads and Sedentists 53
 - 4.2.2 Markets: An Individual Choice. 59
 - References 61

- 5 Site Specific Analysis: Composition and Layout 63**
 - 5.1 The Main Sites: Overview 63
 - 5.2 The Locations 63
 - 5.3 Site Structure 65
 - 5.4 Domestic Fixtures 66
 - 5.4.1 Dwelling Huts 66
 - 5.4.2 Northern Tuareg Hut Types 69
 - 5.4.3 Kel Tadrart Hut Types. 69
 - 5.4.4 The Roof 73
 - 5.4.5 Distribution of Type1 and 2 Dwelling Huts 73
 - 5.4.6 Shapes and Sizes 76
 - 5.4.7 The Kitchen 76
 - 5.4.8 The Diwan 79
 - 5.4.9 The Structures in Comparative Perspective: Indications of Wealth?. 83

5.5	Activity Areas	85
5.5.1	The Discards: Ashes, Charcoals, and Litter	85
5.5.2	Other Activity Areas	87
5.6	Livestock Fixtures and Dung Areas	88
5.6.1	Adult Stock Corrals	89
5.6.2	Young Stock Pens	91
5.6.3	Chicken Houses	94
5.6.4	Dung Areas	94
5.7	Layout and Space	96
	References	98
6	The Abandoned Campsites in the Tadrart Acacus	99
6.1	The Abandonment of Settlements	99
6.2	The Surveys	99
6.2.1	The Fieldworks in 2003 and 2009	99
6.2.2	The Setting of the Sites	101
6.2.3	Preservation and Use of Sites	103
6.2.4	Portable Items and Refuse	108
6.2.5	The Deserted Landscape	109
6.3	Studies of Selected Abandoned Campsites	110
6.3.1	The Sample	110
6.3.2	Geomorphological Notes on Site Locations	115
6.3.3	Domestic Fixtures	116
6.3.4	Dumps and Discard Areas	116
6.3.5	Pens, Corrals and Dung	119
6.3.6	Portable Items	124
6.3.7	Spatial Distribution of Items and Gender	125
6.3.8	Refuses, Recyclables and Other	130
6.3.9	Some Remarks	140
	References	141
7	Ethnoarchaeological Suggestions for a Review of the Last 3,000 Years in the Tadrart Acacus	143
7.1	The Tadrart Acacus in Historical Times	143
7.2	Signs in Place	144
	References	145
8	Conclusions	147
8.1	Retrospective	147
8.2	The ‘Aridity Paradigm’ in the Archaeology of Holocene Sahara: Lessons from the Present	147
8.3	Variable Landscapes Made of Locales and Lines	148
8.4	The Settlements: Traditional Assumptions and Actual Trends	149

8.5 Past and Present	150
8.6 Final Remarks	151
References	151
Index	153

About the Author

Stefano Biagetti (Ph.D. 2012, Institute of Archaeology, University College London) is an ethnoarchaeologist who has been involved in Saharan studies since 2002. He was research fellow at the ‘Sapienza’ University of Rome (until November 2012), studying the development of pastoralism in SW Libya, from prehistory to current societies. He is currently fellow of ‘The Italian Society for Ethnoarchaeology’ (Rome). In 2014 he has been awarded of a Marie Curie Intra-European Fellowship to be held at the Complexity and Socio-Ecological Dynamics Research Group (CaSEs, Universitat Pompeu Fabra, Barcelona), focusing on the study of resilience in arid lands, and on the variability of pastoralism in marginal environments. He has published in major journals such as *Nature*, *Journal of African Archaeology*, *Journal of Arid Environments*, *Azania*, and *African Archaeological Review*.

Chapter 1

Research Objectives, Materials and Methods

1.1 Overview

This book draws upon the analysis of the Kel Tadrart, a small Tuareg community living in the Tadrart Acacus massif, located at the very SW corner of Libya, in the heart of the Sahara (Fig. 1.1). Both archaeological and ethnographic landscape of this area is strongly marked by pastoral frequentations and contain a set of material evidence and other locales of interests that highlight the complexity of human–environment interaction in the last 8,000 years. Since the adoption of domesticates, roughly dated to the mid-eight millennium BP, pastoral societies developed in central Sahara, establishing a veritable network of civilizations characterized by large connections over vast regions (e.g. Smith 2005; Gifford-Gonzalez and Hanotte 2011). The hallmark of Holocene Saharans has always been—and still is—the emphasis on animal husbandry. The history of the Holocene Sahara tells of multiple occupation pulses, which often coincided with periods of higher precipitation. However, drier periods did not always lead to complete abandonment of the region. In the periods of low precipitation, which are of interest for the proposed research, humans adapted in various ways to the changing environment. Saharan civilizations did not end with the onset of current hyperarid condition during the Late Holocene. Rather, these new settings gave birth to one of the most ancient African states, the Garamantian kingdom in the Fazzan (ca. 1000BC–AD700), whose existence has only been acknowledged by a wide non-specialist audience in recent years, overtaking the stereotyped image of troglodytes, proposed by classical historians.

In this book, an ethnoarchaeological approach will be used to reconnect the present with the evidence from the past. The successful adaptation of current Kel Tadrart society, in fact, is an outstanding example of resilience of pastoral societies to hyperarid environment. The study of the Kel Tadrart is not only important per se. It broadens our spectrum of sustainable lifestyles in marginal environments.



Fig. 1.1 The central Saharan massifs (by M. Gallinaro)

In fact, due to the relative stable (and arid) environmental conditions of the Fazzan and most of the Sahara desert since the Late Holocene, the study of the present can inspire innovative and ‘different’ interpretation of the past of this region.

1.2 Introducing Ethnoarchaeology

Pasts can be created and chosen by anyone—archaeologists, historians and administrators—whoever retains some interest in them. Africa is undoubtedly the continent of our most remote pasts, mirrored in the *diverse* and *exotic* present. The ancestral character that colours the imagining of the continent where the history of mankind began denies the notion of modernity. In colonial western paradigms, Africa was associated with tradition and essentialist, normative notions about ethnicity and culture (cf. Amselle 1990). In part because of that, the ‘discipline’ termed ‘ethnoarchaeology’ was developed quite early on the African continent—whether to study hunter-gatherers as ‘unchanging’ models for the Palaeolithic, or to look at symbology in iron production, or the maintenance of ethnic boundaries with traditional crafts. Ethnoarchaeology, in its current practice, encompasses research carried out on present-day communities with archaeological aims, often with the implicit assumption of a ‘living past’ in Africa. It does not help that the (sub)discipline has traditionally held a problematic position within the anthropological sciences. Ethnoarchaeology, in fact, is hardly definable in exact terms, but it can be generally related to the study of living cultures for archaeological purposes. In fact, ‘to study the present to improve the interpretation of the past’ is the aim that bonds most practitioners. The search for a more anthropologically oriented archaeology has prompted generation of scholars to investigate almost all

the segments of the archaeological record (i.e. technology, material culture, settlement pattern, burial customs, symbolic universe) in the present, with different levels of intensity, frequency and success. As it has been recently stressed, it is likely that in the new millennium, a possible role of ethnoarchaeology is

...not in providing analogical tidbits to be used by the prehistorians but rather as an important source for those wanting to build theoretical models for the relationship between people and things. These models can then be used by prehistorians and others who are seeking to make more sophisticated inferences about the relationships between material culture and human behaviour today or in the distant past (Skibo 2009: 47).

Over the years, ethnoarchaeology has covered a wide spectrum of topics, ranging from the material culture studies to human ecology, going beyond the traditional issue of the study of the physical outcome of human behaviour (*sensu* Schiffer 1976). Here, I would restrict the scope to a particular field that has long been engaged with ethnography and ethnoarchaeology, namely the study of pastoralism in African arid lands.

1.3 The Sahara Desert: A ‘Marginal Centre’ of African Studies?

It has been stated (MacEachern 1996) that the ‘ethnographic present’ is often, in the ethnoarchaeological research, an African one. Seldom is it a Saharan one. Several causes for that can be traced: the low level of current populations has surely favoured this trend, as well as the reduced number of stable foreign archaeological missions. Fragile political situations play a role too: some areas of the desert are nowadays even less accessible than in the past. Yet, it is likely that other structural reasons exist, related to the nature of the ethnoarchaeologies practised in the second half of the twentieth century. Saharan communities, often nomadic and lightly equipped, were a low priority for scholars who wished to record complex *chaînes opératoires*, where potters and smiths make items comparable to more widespread archaeological findings. Saharan communities are often enclosed within the valleys of the Ahaggar, Tassili and Tibesti mountains and seemed to show few attractive elements for those engaged with the symbolic facets of human behaviour (e.g. Hodder 1982). In this case, it can be envisaged that the adherence to Islam by certain societies also determined their exclusion from study. Eventually, work on formation processes for archaeological sites (*sensu* Schiffer 1987) collided with the debate about the alleged invisibility—or challenging identification—of nomadic campsites whose evidence is still partially believed to be ephemeral and unsubstantial (e.g. MacDonald 1998; di Lernia 2001). All those things make the Sahara appear an Islamicized, residual, elusive, contaminated context and thus almost useless.

This situation is odd at least at archaeologist’s eye, given the outstanding role that Holocene Saharan herdsmen are likely to have played in the inception and

diffusion of cattle husbandry throughout the northern half of Africa (Clark and Brandt 1984; Blench and MacDonald 2000; Marshall and Hildebrand 2002; Hassan 2002; Gifford-Gonzales 2005; Mitchell 2005; Smith 2005). Indeed, the Holocene Sahara was a place of innovation and diffusion, where climatic changes seem to have deeply affected the development of cultural trajectories. It is worthwhile to highlight that scholars involved in Saharan studies have generally given major consideration to the impacts of climatic changes on human cultures and economies, though avoiding some kind of environmental determinism (cf. Brooks et al. 2005: 6). The study of the complex and variable interface between humans and environment also marks the recent history of prehistoric and historical archaeologies of the current Saharan desert. It has been stated that the Sahara can be considered a '*laboratory of human response to environmental change*' (Brooks et al. 2005: 6). Surely, it is right that the Sahara is a place where the role of the climate has deeply been emphasized by the archaeologists. Prehistorians and historical archaeologists have strongly relied upon climatic oscillations to model the rise and fall of Holocene Saharan cultures and ultimately Garamantian civilization (ca. 1000BC–AD700).

1.4 Types Versus Variation in the Archaeological Study of Pastoralism

Due to the peculiar nature of pastoral lifestyles, the study of pastoralism, especially prehistoric pastoralism, poses serious challenges for archaeologists. Such scholars have long been searching for clues in ethnographic accounts that will allow them to 'decode' sparse archaeological landscapes, following strategies and techniques inspired, in various ways, by current pastoral societies, nowadays to be found mainly across African and Asian grasslands. In anthropology, it appears that pastoralism itself is first of all a matter of definition. The terminology related to animal husbandry is, in fact, extremely rich and variable and has been discussed several times recently (e.g. Salzman 2004: 1–16). With the aim of focussing on the essential words to be (critically) employed, it is argued that pastoralism and nomadism are undoubtedly the most widely used terms concerning human animal husbandry as a sociocultural/economic system.

Ethnographers have been progressively realizing that the fluidity in adaptations and strategies is extremely high and that types cannot convey real dynamics (e.g. Dyson-Hudson and Dyson-Hudson 1980; Salzman 2002). In fact, pastoral societies are generally endowed with close and short-term response mechanisms rather than with predictive schemes. In fact, on the 'formal' level, the exceptions to the types proposed are rarely considered, as well as the possibility of moving across these types within a relatively short time. Furthermore, ethnographic studies indicate, implicitly or explicitly, the extreme variability—from the individual/familiar level—of pastoral societies. This variability challenges the ability of the outsiders

to cope with and interpret their observations and makes dubious the possibility of classifying whole groups or societies. This is true both in ethnographic studies that ‘produce’ classificatory systems, and in archaeology which can refer implicitly or explicitly to these models. This is obviously not to deny the heuristic usefulness of classifications: they are an inescapable tool to reduce and compare human behaviours. Yet, what I maintain is that the practice of classifying pastoral systems has prevented the investigation of the *microlevel variability* and of the *causes* of that.

1.5 Ethnoarchaeology of Pastoral Sites in Arid Lands

Humanity builds environments for itself, intentionally, within the idealized construction of natural environments preceding the material one. Intentions are reflected and substantiated in settlements which can be ‘read’ in the arrangement of a site’s features. In other words, relationships among persons, between them and the time/space have their own material correlates in a site, in addition to other peculiar attributes (duration of occupation, etc.). Assuming that ethnographic and archaeological sites are far from a merely chaotic arrangement of dwelling units, dump areas and corrals—instead of articulating the *choices* of people that inhabit them—then understanding the relevance of the study of a sites’ layout will become a necessary step.

The interpretation of past societies from spatial data has found frequent application for investigating prehistoric sedentary communities, those dwelling in permanent villages with durable architecture. Yet, the archaeology of pastoralism clashes against the problematic archaeological visibility of campsites. Several scholars (e.g. David 1971; Robbins 1973; Gifford 1978; Robertshaw 1978; Hole 1979; Smith 1980; Cribb 1991; Avni 1992; Banning and Kohler-Rollefson 1992; Bradley 1992; Shahack-Gross et al. 2003, 2008) have demonstrated how pastoral sites can be investigated via ethnoarchaeological indications. In particular, there is a relevant tradition of research in the Levantine area precisely focussed on the study of Bedouin adaptations to dry lands in the Negev area (Rosen 1994, 2002; Rosen et al. 2005) and in the Jordan desert plains (Palmer and Daly 2006, Palmer 2007). In the Sahara, studies of spatial ethnoarchaeology (Gallay 1991) and geoethnoarchaeology (Cremaschi et al. 1996) are rare. This bias looks quite relevant if one considers that the study of the emergence and development of food-producing economies in North African and the Sahara concerns herding systems rather than cultivators (Sadr 1991; di Lernia 1999; Blench and MacDonald 2000; Smith 2005), and if one looks at the role that pastoralism played in the advent of African complex societies (e.g. MacDonald 1998; di Lernia and Merighi 2006).

1.6 Research Objectives

In this book, I address the following research questions which have oriented my research on the Kel Tadrart Tuareg of the Acacus Mts. (SW Libya) since its inception (Fig. 1.2). The first one arises from most recent interpretations of human dispersal and diffusion in Africa, where population movement pulses are seen as determined by the onset of dry/arid conditions.

1. How do present-day pastoralists adapt to deserts?

Since the groundbreaking work of Hassan (1996, 1998, 2002), fast and rapid arid spells along with more gradual aridification have explicitly gained an important place in the study of Holocene Sahara and its population dynamics. In this study, I do not aim to criticize the validity of this approach which has proven to be a key argument for explaining population trajectories in diverse regions. Yet, I maintain that while aridity often implies the abandonment of given areas, human responses to the ‘worsening’ of environmental conditions does not necessarily imply abandonment. This study will therefore explore the alternative to abandonment: endurance of pastoral populations in hyperarid conditions, how they survive and in what population/settlement densities. Even in arid lands, when strategies for survival may look as limited and highly constrained, other choices exist and probably existed in the past as well.

2. How do the Kel Tadrart choose their settlement locations?

Though conceived as a particularistic study, I stress that my research on the most important elements of the Tadrart Acacus landscape includes some points relevant to the study of other disciplines/areas as well. The identification of the key features of the landscape (including water sources and grazing areas), and the way humans interact with these, is a fundamental target of my research.

3. How the Kel Tadrart campsites are organized? What kind of features are adopted?

The material outcome of pastoral occupations is surely a key issue in the study of both past and present nomads. Type and number of features, their layout and their occurrence at various types of settlement will be investigated, focussing upon both inhabited and abandoned sites.

4. How the study of the present can affect the understanding of the past in the Tadrart Acacus?

It is generally believed (e.g.: Liverani 2005) that the Tadrart Acacus in Garamantian times (ca. 1000BC–AD700) was merely crossed and not inhabited. Similarly, no evidence—but few rock art panels (Mori 1965, di Lernia and Gallinaro 2011)—has been ever reported regarding the frequentation from Islamized and mobile communities likely to have roamed and inhabited the Tadrart Acacus from the centuries following the collapse of the Garamantian kingdom and the diffusion of Islam (ca. AD700), later turning into the present

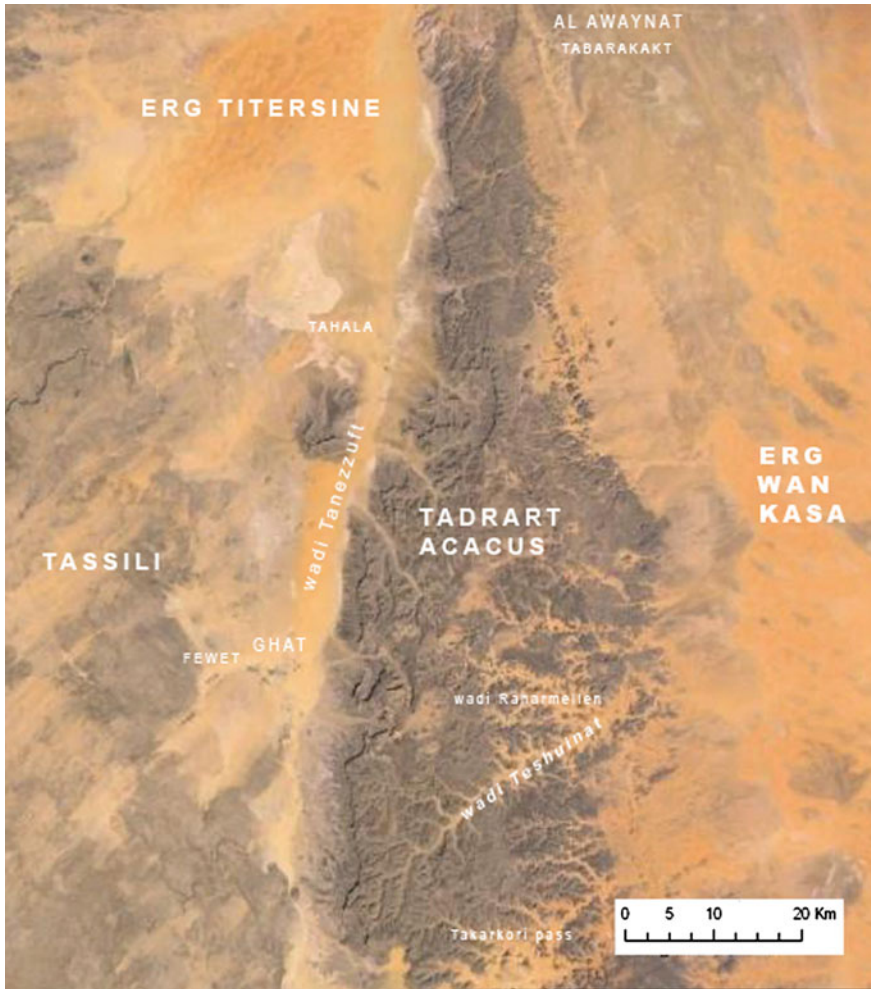


Fig. 1.2 The Tadrart Acacus and its surrounding (from GoogleEarth)

Tuareg occupation. In this book, I will re-evaluate the available data from historical times, mostly collected during past surveys by the team of 'The Italian Libyan Archaeological Mission in the Acacus and Messak' (Sapienza, University of Rome). Through data collected by myself in the present among the current Acacus dwellers, I will propose a re-evaluation and a new interpretation of the historical occurrences in the Tadrart Acacus, so far largely underestimated.

1.7 Materials and Methods

1.7.1 *Earlier Preliminary Research, Schedule and General Remarks*

Some preliminary investigations were carried out in 2003 and 2004 during the archaeological surveys and the excavations performed by ‘the Archaeological Mission in the Sahara’. Most of the data used in this research were collected during three main field seasons. The first systematic season took place in January–February 2007, while the second one occurred in October–November 2007. Additional data were gathered in 2009, when the ‘The Tifnagh rock inscriptions in the Tadrart Acacus mountains (SW Libya): an unknown endangered heritage’ project for the ‘Endangered Archives Program’ from the British Library was launched (Biagetti et al. 2012; [in press](#)). Several parts of the Tadrart Acacus were revisited in the course of the surveys for the Tifnagh inscriptions (proto-Berber alphabetic system).

All sites were located via portable gps and later projected onto a georeferenced map, a LandsatTM image. By ‘settlement’ or ‘campsite’ or ‘site’, I mean a unit, composed of different structures, inhabited by a nuclear family (two adults plus the unmarried children). Every site was given a code, including the name of the area, the year of first visit and a progressive number (e.g. ALO_07/1 indicates that the site is located in the ‘Alone’ area, it was visited for the first time in 2007, and it is the N1 of the sites located in the area). I adopted the sole geomorphological map available (by Marcolongo 1987) that has been georeferenced by ArcGISTM (v. 9.3). In total, 12 Kel Tadrart-inhabited campsites were visited and studied. My research ‘visits’ consisted of oral interviews and of the ethnoarchaeological observations. These interviews, carried out with the support of local informants and by the use of a questionnaire, were designed to collect the largest amount of data in reference to the lifestyle of the Kel Tadrart in the Acacus valleys, and the information collected constitutes a robust background that has provided a substantial contribution to the elaboration of what has been directly observed during the fieldwork. In the Acacus Mt., all the twelve settlements were visited and the inhabitants interviewed.

1.7.2 *The ‘Regional’ Level of Analysis*

This part of the research deals with the regional level of analysis (Chap. 4) of the ethnographic present. Tangible evidences of the pastoral group under study hold particular relevance also for the archaeological investigations. This section is dedicated to the regional pattern, i.e. how the campsites distribute along the Tadrart Acacus, and which rules can be deduced from their arrangement. The aim is to account for the operation of the Kel Tadrart territorial system, enlightening

the potential factors that play some role in the distribution of campsites. In a genuine ethnoarchaeological perspective, it is suggested that this analysis can throw light upon the variables involved in the process of decisions related to land use.

A specific GIS software (ArcGIS v.9.3) was used to study the distribution of Kel Tadrart settlements. I used the ‘buffer analysis’, which creates buffer polygons around input features (the inhabited Kel Tadrart sites) to a specified distance (the distance that can be covered daily by Kel Tadrart herds). Then, via the use of the ‘join’ tool, all the resources located within the buffer polygon built around a settlement were counted. Those results were then interpreted in the light of other factors, namely size of stock, access to markets and kinship. Furthermore, the definition of various type of mobility, as recorded in the interviews and directly observed in the field, will complete this section, where distances between main and secondary settlements will be accounted as well.

1.7.3 The ‘Site’ and the Settlement Patterns

All the Kel Tadrart settlements, where the interviews were recorded, were subjected to in-site ethnoarchaeological investigation (Chap. 5). Extended over large areas, with several features hidden in the rock cliffs, more or less clustered, they were hard to pin down at the beginning. The concept itself of ‘site’, as borrowed from archaeology, was not fit to cope with those loose and dispersed camps. The Kel Tadrart settlements are the focus of both male- and female-related activities. They are the place where all the structures and the removable features are situated. The campsites feature different shapes and types of dwellings. These have been classified according to a main distinction: the ‘structures’ are all those facilities that are built and fixed in the ground; the ‘features’ are all those evidences made of ‘movable’ materials (Table 1.1).

Of course, not all of those elements were recorded in every campsites. Some elements appeared to be indispensable, while others looked specifically related to some particular activities performed at those sites, whose reasons will be discussed by each case. A typology for all those elements has been elaborated (see Chap. 5). All those ‘structural’ elements were thus counted and studied. The removable items were not systematically recorded within the occupied sites. On the other hand, information about those items has indeed been collected within abandoned settlement (see Chap. 6). It has been an explicit choice not to record all the inventories of object of each household. For the sake of my research, I argue that there is no need to provide exhaustive lists of all the personal belongings within the inhabited settlements. In a genuine ethnoarchaeological perspective, I am rather interested in portable objects mostly when these are left behind and thus enter the ‘archaeological’ record. In this case, small items can deeply improve the archaeological research, showing what is likely to be found in abandoned

Table 1.1 Structures and features of Kel Tadrart campsites

	Structures	Features
Domestic	Dwelling huts	Hearth
	Diwan (guest huts)	Ash dump
	Kitchen	Wood pile
	Store	Fuel tanks/barrels
	Car parking structure	Generic dump
	Praying facilities	
Livestock	Kid pen	Dung
	Corral	

campsites. In fact, a careful recording of the items has been done in the abandoned campsites within controlled (known) conditions.

The study focused upon the most recurrent fixtures (i.e. the huts) recorded in the Kel Tadrart campsites and included the following:

1. study of the composition of campsites, by evaluating number and types of fixtures versus the number of inhabitants;
2. definition of a typology for the fixtures, and study of types' distribution;
3. study of 'activity areas';
4. study of layout of campsites.

For the first point, I used descriptive statistics (SPSS v. 19) to investigate the ratio between the number of fixtures—with emphasis on the dwelling huts—and the number of inhabitants at every campsite. Once defined a typology for the huts, the distribution of types, average sizes, shapes and orientations were discussed in a comparative perspective, trying to understand the causes of the coexistence of various forms of huts. Dumps and dung areas were then evaluated, and their size was matched against time factor (measured by the age of the settlement), by the number of inhabitants (dumps) and the size of the flocks (dung). Ultimately, some patterns regarding the layout of sites were outlined.

1.8 Survey of Deserted Campsites in the Acacus Mts.

Frequently viewed as 'ephemeral' or 'ambiguous', ancient pastoral sites have been raising many issues during the last decades due to the methods and theoretical approaches adopted by the archaeologists. However, it is since the work of Hole (1979) that the archaeological remains of animal husbandry have been seen in a different light. He recognized that the archaeological research had to be better tuned to detect pastoral sites, given that archaeologists were used to sites of sedentary communities. This statement is helpful in understanding that it is not the

light nature of material remains, by itself, that causes the invisibility of the sites, given that since the beginning, archaeologists have been routinely finding Palaeolithic hunters' campsites. The study of the material remains of abandoned pastoral campsites may shed light upon the formation processes of the archaeological record. Once a settlement is abandoned, observations about what has been left (or lost) can be made, in the scope of individuating elements of material culture, peculiar arrangements of fixtures or other evidences that can be susceptible to be found in the archaeological sites.

By means of the same techniques developed for the investigation of inhabited campsites, the deserted campsites underwent a detailed examination, in order to assess the recurrence, the type, the attributes of the fixtures and features recorded. Selected area in the north and centre of the Tadrart Acacus has been chosen to record any recent pastoral evidences related to Kel Tadrart frequentation. The surveys were undertaken by systematic field walking in order to ensure the most complete collection of data. Also the first structural terraces were explored. Special attention was paid to the dried river beds where, normally, most of sites are located. All the material evidences of modern animal husbandry were documented. A single pot was counted as a site, as well as a whole abandoned settlement. Documentation included the description of the fixtures found after the abandonment of the campsites, on the basis of the typology developed for the study of inhabited settlements research. The campsites will be classified according to the number and types of fixtures found, in order to establish whether different patterns in the use of the whole Acacus massif can be detected.

Selected sites whose past occupations were known have been documented in detail. There, all the domestic fixtures and the activity areas were studied, using the same methods and tool that were used for the research on the inhabited campsites. Furthermore, the portable items were counted and registered, in the scope of providing insights in the process of abandonment of campsites. Types, raw material and reusability of these objects were carefully noted, along with their location, in the scope of providing useful material for the understanding of pastoral 'archaeological' sites.

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Chapter 2

The Environment

2.1 The Tadrart Acacus Massif and Central Sahara

The central Saharan mountains constitute the backbone of the largest desert in the world (Fig. 1.1). Rising from west to east within sand seas, gravel areas and dune fields, these mountains all have their own landscape and history, constituting a natural reservoir of cultural and natural resources, often in discontinuity with surrounding flatlands. Situated along the eastern edge of the Tassili range, the Tadrart Acacus is a deeply dissected mountain range, composed mainly of sandstone. It extends *c.* 150 km north–south and max. 50 km east–west. Altitude ranges from 800 to 1,300 m a.s.l. on the highest peaks rising towards its western part. The Tadrart Acacus is bordered by the *wadi* (litt.: dry river beds or valley) Tanezzuft to its west. This *wadi* runs almost along the international border and divides it from the plateaux of Tassili n’Ajjjer (Algeria), and hosts some minor oases, such as Tahala, Barkat and Fewet, and Ghat, the location of a veritable small town. At the NW summit, the mountain is edged by the *erg* (dune field) of Tittersine (600 km²). The *erg* of Uan Kasa (3,500 km²) is located to the east of the massif.

2.2 Geomorphology

The geomorphology of the Tadrart Acacus has been described in detail in previous papers (Marcolongo 1987; Cremaschi and Frezzotti 1992; Cremaschi 1998). The Acacus massif stretches longitudinally, its eastern and western sides showing different characteristics. In fact, its main geologic structural pattern consists of a monocline characterized by an E–NE-tilted ridge (Cremaschi 1998). The western side features a steep profile, with a vertical slope set along a fault line. It is hardly accessible, except for some steep passageways, the *aqbas* (see Sect. 2.5.4).

Conversely, the eastern edge tends to slope off, allowing easier access to the inner valleys. The large *wadis* that deeply incise the Acacus, testify to ancient fluvial activity, and today act as channels storing runoff for some weeks after the rains (Marcolongo 1987). At the eastern margin of the Tadrart Acacus, a transitional belt separates the mountain from the dunes of the *erg* Uan Kasa (Marcolongo 1987). Here, an erosive pediment provides favourable conditions for the capture and persistence of rainwater and runoff water and for the formation of phreatic aquifers close to surface. These low areas once hosted lacustrine basins during the wet episodes of the Holocene and today hold the two artificial bored wells of Taluaut and Eminanneia (see Sect. 2.5.2). Marcolongo (1987) provides the only geomorphological map available for the study area so far. It describes some areas where 'large valley floors' feature—in principle—favourable characteristics for resource regeneration (Fig. 2.1). In particular, vegetal coverage should notionally be more developed in such large valleys, creating suitable condition for human occupation.

2.3 Climate

The climate of the Tadrart Acacus is extremely arid. Here, as in the entire northern Africa, climate variability depends on low-altitude pressure and winds over the continents, which are surface expressions of the upper air circulation (Gasse 2000). The climate and palaeoclimate are governed by the seasonal migration of the intertropical convergence zone (ITCZ) in response to changes in the location of maximum solar heating, resulting in the distinctive, fluctuating environmental belts in Africa, ranging from bands of monsoonal climate with summer rains and winter drought in the south, to the increasingly arid Sahel and Sahara.

Few recent historical meteorological data have been recorded for our region. Ghat is the closest village to the Acacus mountains. Here, (Latitude 24°55'N, Longitude 10°12'E; 561 m asl) the mean annual temperature is between 25 and 30 °C, and the mean annual rainfall is between 0 and 20 mm (Fantoli 1937; Walther and Lieth 1960). In the region, precipitations are mostly distributed in spring and summer and regional average annual relative humidity is 17 %; a strong wind activity is registered all over the year, and especially in spring; occasional rainstorms are recorded also in the winter season (Fantoli 1937). However, the concept of mean annual rainfall holds scarce significance in these desert areas: rain frequency is very uneven, and precipitation does not occur every year. A proper alternation between real rainy and dry seasons cannot be envisaged. Generally speaking, almost completely dry years can occur and have occurred in the course of the last 20 years. The erratic degree of the collection of those facts prevents a fully informed reconstruction of the rainfall pattern; it is therefore difficult to match precise precipitation levels with the oral traditions registered, although major events are generally remembered in the region, as well as the rough amount (high or low) of rainfall occurring every year.

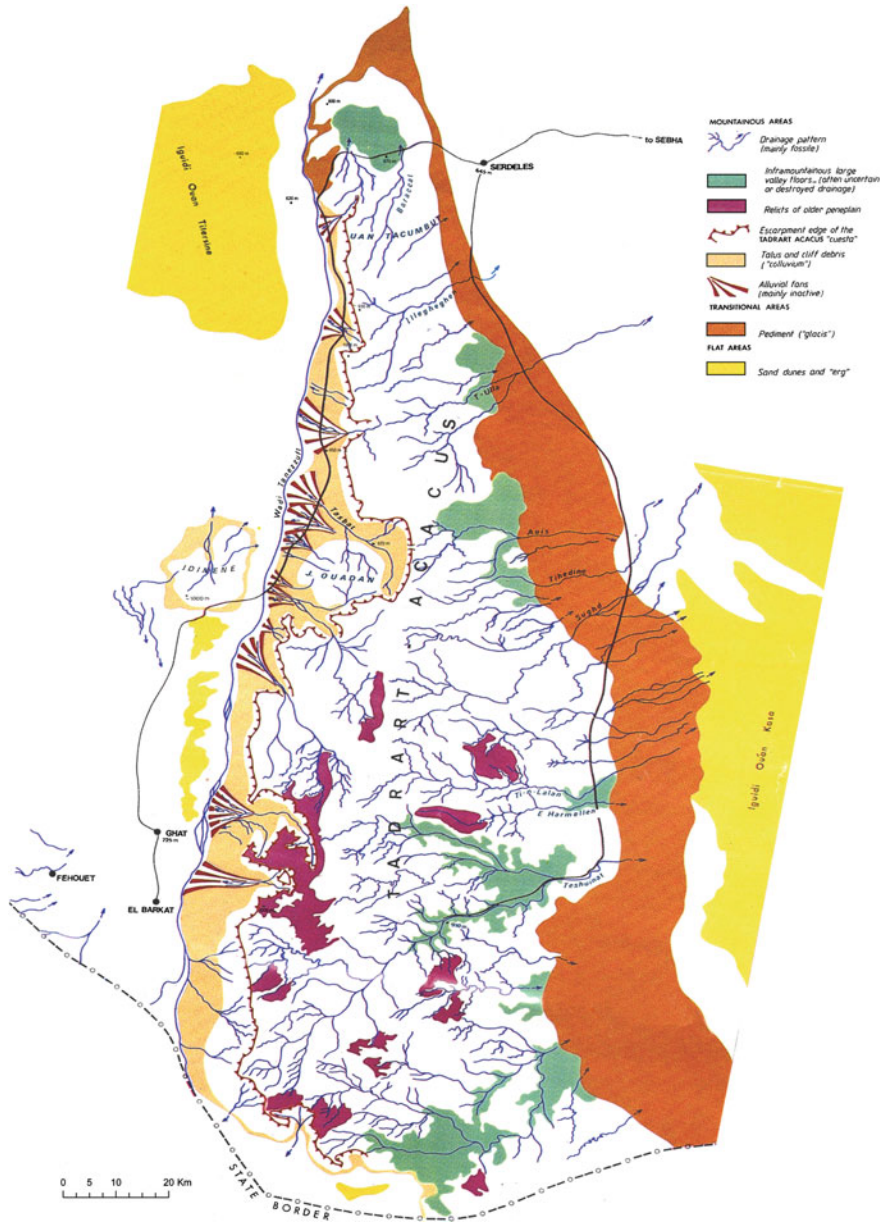


Fig. 2.1 The geomorphological map of the Tadrart Acacus (used with permission from Marcolongo 1987)

2.4 Flora and Vegetation

Despite the low rains, permanent plant cover can still be recorded all year-round along the *wadi* floors, allowing human and animal presence. Even in dry years, water is stored at shallow depths allow vegetation to survive in severe conditions. Mercuri (2008) notes that in the study area both *wadi* vegetation and Saharomontane vegetation, typical of the Saharan Transitional zone (White 1983), are prevalent. In the *wadi* Teshuinat—one of the main valleys of the Acacus—the *Acacia–Panicum* and *Acacia–Panicum–Zilla* permanent communities (Schmidt 2003: 122–123) are well developed, though their consistency varies from year to year due to the inconstant rain. Hygrophilous vegetation concentrates around the *gueltas* (rock pools where rainwater collects) which are widespread in the area. Generally speaking, it has to be recalled that *wadis* represent one of the main ecosystems in the desert: they acts as drainage systems, collecting water from extensive catchments areas. The water flows underground along sections, surfacing periodically in the *wadi* bed. Steep slopes and surrounding land influence water movement and storage so that water gathers in *wadi* beds.

2.5 Main Features of the Tadrart Acacus Landscape

2.5.1 Valleys and Pastures

In the Tadrart Acacus, drainage systems have formed deep canyons, characterized by different morphologies. Acacus canyons are of widely differing scales. The large valley floors are generally broad (up to 3 km, on the average 1 km), marked by wide stream beds. Yet, smaller *wadis* are widespread as well, shaping the net of minor branches of greater streams (less than 500 m). The width of valleys do not seem to correspond with the height of adjoining cliffs, varying between *c.* 20 and *c.* 100 m. One or more flat structures ('intermediate', 1st and 2nd terraces, Cremaschi 1998) are normally located on the top of those cliffs. The Acacus valleys, in fact, normally feature a step-like profile. Similarly, the slope gradients of cliffs are highly variable. These geomorphological facets of the Acacus *wadis* affect present day human occupation, as will be discussed in Chap. 5. Naturally, these valley refugia of vegetation host Kel Tadrart herds and provide indispensable supply of forage for sheep, goats and camels (Fig. 2.2).

The Kel Tadrart Tuareg stock breeding is based mostly upon a few perennial plants whose nutritional value is greatest at specific stages of development. Some plants, in fact, can be used as fodder only when green. This is the case of *tullut* (*Aristida pungens*) grass, and *afezu* (*Panicum turgidum*) likely to be the most common shrubs to be found in the sandy river beds of the Acacus massif. When



Fig. 2.2 *Wadi* Teshuinat seen from the first structural terrace (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

withered, both plants are of little value as fodder. Communities of *aftzen* (*Zilla spinosa*) are important as well, as the leaves of this herb can be eaten by domestic stock. However, herbs are not the most important fodder species for the Kel Tadrart livestock. Acacia trees are believed to be most effective food for sheep and goats, in the form of their fruits. Both *tamat* (*Acacia seyal*) and *abser* (*Acacia raddiana*) perennially produce very nourishing pods that are eaten by all domestic animals. I have often seen Kel Tadrart herdsman lowering acacia branches to facilitate herd’s browsing. Acacias pods are frequently collected, along with other tender annual plants, and brought to kids, lambs and calves. In Tadrart Acacus, the most important saliferous plant is *Tamarix* (various species), which is quite common in the *wadis* of the massif.

To date, no actual difference in vegetation has been recorded from one *wadi* to another in the Tadrart Acacus. Beside the above-described ‘large valley floors’ where geomorphological conditions are potentially favourable for the regeneration of plants, no definite diversification in type of plant coverage has been observed by Mercuri (2008) and Massamba (pers. comm.). This finds some kind of confirmation in the names of places of the Tadrart Acacus: *wadi* names rarely feature terms specifically related to their environmental/vegetation characteristics. Variations in the development of vegetation seem largely determined by the annual distribution of rainfall, which can fall quite unevenly on some different spots of the massif.

2.5.2 Water Resources

It is certainly true that Saharan stock can survive without water for several days, but in arid environments, the management of water resources holds a primary place among the tasks of pastoralists. Two different types of water point can be found throughout the Tadrart Acacus, namely *gueltas* and wells. A first comprehensive study has been recently published (di Lernia et al. 2012). According to this recent paper based on fieldwork in the Tadrart Acacus, *gueltas* are ponds where rainfall accumulates. They are generally located at the beginning of the *wadis*, in their most elevated and narrow part. These pools feature several shapes and sizes, being the result of long-erosional processes. In the Acacus massif, every *wadi* features an interconnected system of irregularly superimposed *gueltas*, created by the action of water flowing from the highest plateaux down to *wadi* bottoms in rainy times. Several falls, cascades, fractures and rock cracks have been shaped by weather effects, mostly in the late Tertiary and early Quaternary, when wet conditions determined the formation of present meander-like morphology (Cremaschi 1998; di Lernia et al. 2012). Water falling from the top of the plateaux has thus created a step-like profile, where several basins can be called *gueltas* but cannot be exploited as water reservoir, due to their inaccessibility. Normally, only the lowest in a series of basins is used by Kel Tadrart, who often dig and enlarge the ponds by hands. From the geomorphological point of view, *gueltas* are almost ubiquitous in the Tadrart Acacus. Yet, Kel Tadrart know what are most reliable in terms of water supply. Indeed while two or three *gueltas* are generally considered to be 'almost perennial', their fill still depends on effective rains. Shaded morphology and a large basin impede evaporation of water. Ephemeral *gueltas* can thus be very important if they are located in a zone where precipitations have occurred. In this perspective, *gueltas* behave not dissimilarly to pastures.

In the mid-eighties, after two major episodes of drought that occurred in the Sahel and the Sahara between late 1960s and early 1980s, the Libyan government bored two wells in the eastern fringes of Tadrart Acacus. The wells of Eminanneia and Taluaut were the first artificial water sources not dependant on rainfall to be used by Kel Tadrart and doubtlessly had a strongly positive impact on their lives. These wells are served by generators that activate mechanical pumps, extracting water from c. 400 m. Currently, both wells are used also by tourists and travellers, and host military checkpoints. On a more general level, modern technology has increased the exploitation of (early Holocene) ground water in many other areas of the Fazzan, where pumping allowed the irrigation of crop fields. This intensive use of water raises several issues about the sustainability of the deep aquifers across time, as has recently been stressed by Brooks et al. (2005).

Not far from the well of Taluaut, along the *wadi* of the same name, the natural well of Sughd constitutes another important water source for the Kel Tadrart (Fig. 2.3). It is less than 10 m deep, currently endowed with a concrete edge at its top, erected a few years ago to protect it from being dirtied by the sand. Differently from the artificial wells, it is strongly affected by rainfall. It is believed to be able



Fig. 2.3 Well of Sughd (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

to supply water for a maximum of three dry years. This place holds major relevance in the Acacus landscape, as demonstrated by the huge amount of Tifinagh engravings that extend over the rocky hillside coming to within a few metres of the well itself (Biagetti et al. 2012). According to the elders (di Lernia pers. comm.), it seems that in a recent past the well was closer to the rock, whose surface indicates the depth of the aquifer. Vertical rows of small circular dots (kind of engraved cups of *c.* 5 cm of diameter) carved in the stone, roughly indicate how many ‘men’ one should excavate to find water. Unfortunately, it is not possible to date such rock marks with certainty. However, this type of signal is used wherever water is to be found at relatively shallow depths. It can be occasionally observed within small *gueltas* and, perhaps more surprisingly, other rock walls. This is precisely the case of some places where shallow aquifers can quickly rise up to surface if one digs only slightly in the sand. Such water concentration can occur in a large number of places, once peculiar drainages favour the concentration of rainfall running down the cliffs. Although it seems that some locations are quite renown for being particularly affected by this phenomenon, in case of necessity, Kel Tadrart know where these small ‘holes in the sand’ can be made if needed. However, this system supplies only a limited quantity of water, and such puddles are by no means surrogates of *gueltas* nor wells. Therefore, this kind of measure can be undertaken by a small group of travellers, or one man and few stock needing urgent supply of water, and not by a herder leading a flock at graze. In other words, these ephemeral sources cannot affect the configuration of seasonal movement, as these puddles are not to be considered as veritable water points.

2.5.3 Shelters and Caves

Hundreds of caves and rock shelters open onto the cliffs of the Tadrart Acacus, where human occupation has been intermittently present since at least Middle Pleistocene. These have been the *foci* of archaeological investigation since the mid-1900s (e.g.,: Mori 1965; Barich 1987; Cremaschi and di Lernia 1998; di Lernia 1999; Garcea 2001; Biagetti and di Lernia 2013). Used as dwelling spaces since prehistorical times, rock shelters and caves have been the natural refugia of humans (Fig. 2.4). Yet, many caves and rock shelters bear no other signs of recent use, beside ubiquitous pens and some modern graffiti. Then, there are locations where archaeological deposits (including material debris and burials) seem more visible and immediately recognizable. Such spots are almost inevitably avoided by modern pastoral populations either due to superstition or because they are considered as ‘unclean’. This is not trivial as archaeological sites thus ‘reduce’ the landscape of contemporary pastoralists, excluding a large number of key geographic locations where settlement seems de facto denied. It is therefore important to note that evidence of the past can contribute to shape the perception of the landscape and, consequently, its habitation. For instance, peculiar rock art scenes or exposed Pastoral burials within rock shelters give names to such places and serve as places of ‘memory’, and geographic landmarks.



Fig. 2.4 The rock shelter of Uan Muhuggiag is one of the most renowned archaeological site in the area (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

2.5.4 Paths and Passageways

Although contemporary mobility is primarily focused on the dry river valleys of the Acacus, this must be considered as a very recent shift, mainly due to the introduction of cars. The Tadrart Acacus is crossed by hundreds of narrow paths that develop above the *wadis*, on structural terraces. This network of paths is clearly visible and still used nowadays for livestock transhumances. However, two types of paths exist in addition to the wide dried river valleys, namely the *aqbas* (litt. mountain passageways) and the flat trails.

The term '*aqba*' means 'passage', always implying some difference in altitude. Consequently, hundreds of *aqbas* exist in the Tadrart Acacus, where valleys alternate with higher terraces and peaks. Not differently than *gueltas*, in fact, *aqbas* are ubiquitous features of the Tadrart Acacus. Yet, the *aqbas* of the Tadrart Acacus are those located on the western escarpment (Fig. 2.5), the only routes connecting the *wadi* Tanezzuft and its oases (especially Ghat and Tahala) to the Acacus *wadis*. A systematic survey of all known *aqbas* was performed in 2009 by di Lernia and colleagues (see Biagetti et al. 2012), following previous rapid surveys done in the 1990s (Cremaschi and di Lernia 1998). It has been ascertained that the sloping portions of those trails require continuous maintenance, and it can occur that some



Fig. 2.5 The western escarpment of the Tadrart Acacus seen from the *wadi* Tanezzuft (photo the author, used with permission from 'The Archaeological Mission in the Sahara', Sapienza University of Rome)

tracks become unusable after heavy rains. Both types of paths are often endowed with adjoining archaeological and historical remains, in the form of stone cairns (burials), *Tifnagh* inscriptions, rock art scenes and stone mounds (landmarks). A dozen *aqbas* are generally recognized to have been used in the past, although it has been very difficult to place them precisely on a map. This is due merely to the fact that the *aqbas* on the western escarpment of the Acacus indicate well-defined areas where the geomorphological characteristics of the terrain allow the passage of humans and livestock, rather than precise trails. It is quite common to see the trails leading to the escarpment splitting at the bottom of the cliff and then rejoining on a higher terrace.

Hundreds of flat trails also constitute an important network of paths, extending over the top of all the structural terraces of the Acacus massif. These paths are nowadays used to reach *gueltas* and other locations, but basically this is the system of routes that since prehistorical times allowed men and livestock to move through the massif, implementing the lower *wadi* connections (di Lernia et al. 2012). Evidence of past tracks along the higher morphologies of the massif were firstly reported in the 1990s (see Cremaschi and di Lernia 1998: 248, Fig. 3). However, it is worth noting that before the introduction of cars, mobility mainly developed along these paths and not merely by dried river valleys. Important trails have been told to exist, for instance, to connect the western edges of *wadi* Teshuinat with the *aqba* of *wadi* Djelco, and farther with the oasis of Ghat. Although modern satellite imagery (Google Earth™) allows the observation of several paths, systematic and informed research is needed to better read this crucial element of the Tadrart Acacus landscape, which is likely to have deeply shaped the landscape perception of its inhabitants.

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Chapter 3

The Kel Tadrart Tuareg: Ethnohistorical and Ethnographic Background

3.1 Ethnohistorical Background

3.1.1 *The Tuareg in the SW Fazzan*

Certainly, few ‘non-western’ societies have received as much scholarly and public attention as the Tuareg. A number of European travellers (Lyon 1821; Richardson 1848; Barth 1857; Duveyrier 1864; Rohlf’s 1874; Nachtigal 1879; Denham and Clapperton 1965; Bruce-Lockart and Wright 2000) had already crossed this part of the desert in the nineteenth century and reported those ‘fierce warriors and camel riders’, paving the way to the construction of the Tuareg myth. The Fazzan lies at the very margin, both geographical and political, of the Libyan state, and represents a minor appendix in the Tuareg world, cut off by the international border between Libya and Algeria. Most of the 1.5 million Tuareg live in Algeria, Niger, and Mali. The rest of them are to be found in limited number in Burkina Faso and Libya. Other ‘circum-Saharan’ states feature very small Tuareg communities, such as Sudan and Nigeria. The south-western Fazzan is a small fraction of the Kel Ajjer territory, yet it includes the oasis of Ghat, an important center for the Kel Ajjer. The latter, along with the Kel Hoggar, constitute the so called ‘Northern Tuareg’, while the other groups living in the Sudanese savannah are considered ‘Southern Tuareg’. Both Kel Ajjer and Kel Hoggar dwell in similar environments, respectively the massifs of Tassili n’Ajjer and the Hoggar, situated in the central Sahara. The Kel Tadrart are a minor component of the Kel Ajjer group.

3.1.2 *The Northern Tuareg and the Literature*

It may be argued that all the past interest in the Tuareg has generated a vast literature about them, and this is indeed true. However, there is a consistent lack of

useful hard-data-reports regarding the Northern Tuareg, with the exception of that from the Nicolaisens (1963, 1997) who have compiled the most important ethnography of the Kel Hoggar, presenting a deal of well-substantiated data. For the sake of this study, another relevant research was carried out by Gast (1968, 2000). As Keenan (1977: 10) noticed more than 30 years ago, the whole published material related to the Tuareg is surprisingly confusing, perpetuating many misconceptions about them. Similarly, Nicolaisen and Nicolaisen (1997: 31) state that “*the literature on the Tuareg is indeed comprehensive, yet a number of these publications are of limited value*”. After the 1960s many ‘modern’ studies were published, boosted by the dramatic droughts that affected the Sahara and the Sahel in the 1970s and 1980s. Although some Hoggar groups have been studied (see Nicolaisen and Nicolaisen 1997: 32 for an overview), most of the research focused on the Sahel and the Southern Tuareg.

The Tuareg world is a complex mosaic of different ethnicities and lifestyles. It is worth outlining the elements of the Tuareg universe that have major relevance to this book, with specific reference to the Northern Tuareg.

The Tuareg divide themselves into social classes. The most important of those include the so called ‘nobles’ (*Ihaggaren, Imajeren*), the ‘vassals’ (*Imrad* or *Kel Ulli*), the religious class (*Ineslemen*) and slaves (*Iklan*). The terms used in the literature seem to reflect a kind of feudal imprint that the Europeans have long been emphasizing, since the ‘pacification’ of the Sahara in the early 1900s. This is not the place to pronounce in detail on the reliability of the early European visions on the Tuareg society. Yet it is worth focussing on the so called ‘vassals’. Those, often named as *Kel Ulli*, literally ‘those having goats,’ constitute the basis of the primary economic production in the whole of Tuareg society. The relationship of those vassals with their ‘masters’ has several nuances, including the protection of the *Kel Ulli* by the *Iheggaran*, compensated by a formal political subordination and a number of tributary payments. However, both Keenan (1977, 2002) and Nicolaisen and Nicolaisen (1997) have stressed that the social structure of Tuareg has altered since the 1920s. The cessation of nineteenth century hostilities in the Sahara, the new power-relations in the colonial age, and the famines of the early 1900s have all deeply modified the Tuareg social system. Indeed, the fundamental (pre-colonial) balance of power between nobles and vassals underwent a major shift. Keenan (1977, 2002) argues that in the 1920s the *Kel Ulli* in the Hoggar and Ajjer had gained an unprecedented level of self sufficiency and political power. According to him, many vassals in the north had begun to acquire greater military and economic power by the end of nineteenth century. Keenan (1977: 82) stresses that the *Kel Ulli* are likely to have obtained at that time the right of owning camels (*Camelus dromedarius*) and weapons; the most distinguishable features of the warrior noble class, a feature that can still be observed among the Kel Tadrart as well. The possession of camels, in particular, could have permitted a reorganization of some of the ‘vassal’ subsistence system, allowing the organisation of minor caravans and a remunerative small-scale camel trade (Keenan 1977: 122). This could have also prompted the establishment of a greater level of cooperation between the members of the camps, possibly creating ‘new’ kin ties (Keenan 1977:

125), which might have contributed to the shift from a matrilineal to a patrilineal/mixed system of descent.

Early travellers and ethnographers tended to emphasize the role of woman in Tuareg society and, subsequently, may have overestimated the effective role of the matrilineal system in both transmitting the ‘wealth’ and in the choice of the residence. The overall flexibility of the pastoral system prevents any a priori classification of Tuareg residence, in spite of the strict ‘steps’ given by Nicolaisen (1963: 42), who foresaw a series of rules and behaviours to be followed after the marriage by the husband and his wife. Keenan (1977: 112) adds that it is likely that many things have changed in the last century and that even a mixed system, i.e. allowing both matrilineal and patrilineal residence, may serve as an ideal reference rather than an effective rule. Regarding the inheritance of the livestock, the prescriptions of the Koran have historically applied, whereby the patrilineal mode of transmission is favoured while preserving a quota for the women. Furthermore, it is likely that we are rarely dealing with one single principle of descent or residence, but rather a whole complex of rights and their respective rules of transmission (Keenan 2002: 105). Regarding marriage customs, the preferred choice involves the wedding between close cousins, with a remarkable tendency toward endogamy within the *tawsit* (matrilineal lineage). What is new here, is that some cases of polygamy have been reported in the last 20 years. This is certainly a recent phenomenon, prompted by the ‘arabization’ of the northern Tuareg territories, at least in Algeria, which is surely affecting the traditional role of the woman (Keenan 2002).

3.1.3 The Kel Tadrart in the Early Ethnohistorical Accounts

The Kel Tadrart were among those ‘vassals’ that gained the right of weapon and camel use, at least since the beginning of twentieth century. This relatively recent transformation of the Kel *Ulli*, from mere goat-keeper to semi-independent armed trader and dromedary owners fits in very well with the information collected in the field and with colonial accounts.

The rigid need of figures that is characteristic of the military administration in the colonies provide us with valuable information about the Kel Tadrart in the 1930s. Gigliarelli (1932) reported an overview of the Tuareg Kel Ajjer living in the Italian Fazzan. In particular, he noted among the noble ‘tribes’ the Oràghen, the Imangàsàten, the Ifogàs and the Imanàn, an unspecified number of vassal ‘tribes’ linked to those nobles. He briefly reported the geographical distribution of such groups, stating that the Oràghen were to be found in Awaynat, the Tadrart (Tadrart Acacus), the western edges of the Tassili n’Ajjer, and the Ghat basin (Table 3.1).

The same author (Gigliarelli 1932: 158–159) stresses that 78 Kel Tadrart were counted in the Ghat area, all of them practising a nomadic lifestyle. Furthermore, valuable indications about the quantity of livestock were reported (Table 3.2).

Table 3.1 Data on SW Fazzan Tuareg set under the Italian colonial rule in 1930s

	Nobles Oràghen	Est. pop.
Ihehàuen	Marabouts	–
Kel Izabàn	Nobles. Few families; some of them have servants and live in the area of Awaynat and the Messak, attached to the Oràghen. A sedentarised branch of them dwells in Tunin, close to Ghat	c 70
Kel Indènden	Nobles. Few families; they live between Awaynat, the Messaks (Settafet and Mellet), and wadi Esseyen. They have some servants from the Ifilàlen tribe mainly dwelling the Tassili, in a undefined zone between Ghat and Taràt	c 70
Kel Erriken (Arikine)	Nobles. The most important fraction of the Kel Ajjer	–
Kel Fèwat	Nobles. Once nomads, nowadays sedentary dwelling the Fewet oasis	–
	Vassals attached to the Oràghen (mainly to the Kel Erriken)	
Mgargàsen	Divided in Ezikekàten, dwelling the area of Esseyen-Messak-Tadrart; and ‘true’ Mgargàsen, dwelling both the Tassili (uncertain locations) and the western wadi el Ajal (130 individuals). A fraction of the latter (c 60 individuals) dwells the wadis Berjui and Etba	–
Kel Ebàda (Abada)	These include the Ifaràccanen and Iuàruaren. They normally live in the area of the erg Tetersin and in that of Takiümet-Ubari. They can occasionally graze into the wadi el Ajal	–
Kel Tàdrart	These include two fractions. One is displaced in the area of the Tadrart and Messak. The other live in wadi Etba	c 150
Kel Tin Alcum (Alkum)	They own 20 camels and live in the wadi el Ajal and in the wadi Etba	c 100
Ibattanàten	Vassals. They have 18 camels and dwell the area of el-Greifa (wadi el Ajal) and the Messak. Five more families live beyond the border	c 30 (+the others in Algeria)
Saccàra	Vassals. They have 40 camels	c 60
Haiauan	Vassals. They have 7 camels and dwell in the wadi el Ajal	c 100
Ifilàlen	Vassals. Attached to the Kel Erriken	

Adapted from Gigliarelli (1932: 92–93)

According to these ethnohistorical sources, it derives that the Kel Tadrart were very possibly of vassal origin (i); they had already gained access to camels and weapons by the early twentieth century, a state of affairs which continues today (ii); they were the only Tuareg group ‘normally’ found in their region with no other tribes documented to have grazed their livestock there (iii). Obviously, this does not exclude that other groups could have had access to the pastures in the Tadrart Acacus, yet it establishes a favourite/traditional/customary area for the Kel Tadrart.

Table 3.2 Data on the nomads living in the surrounding of Ghat under the Italian colonial rule in 1930s

	Ethnic group	No. of individuals	Camels	Horses	Cattle	Donkeys	O/C
	Kel Erriken	47	226	2	22	16	250
Ihaggàren (nobles)	Kel Indènden	23	30		1		50
	Kel Izabàn	27	59	1		10	60
	Total nobles	97	315 (43.3 %)	3 (0.4 %)	23 (3.2 %)	26 (3.6 %)	360 (49.5 %)
	Kel Mgargàsen	74	45		2	50	200
	Kel Ifilàlen	147	23			100	60
	Kel Tàdrart	78	27			10	337
Imgàd (vassals)	Ifaràccanen	113	52			86	130
	Iuàruaren	8	47			33	50
	Mgata (herders of the Bubaker Lègui’s family)	40					
	Total vassals	460	194 (15.5 %)	0 (0 %)	2 (0.2 %)	279 (22.3 %)	777 (62.1)
	Grand total	557	509	3	25	305	1.137

Adapted from Gigliarelli (1932: 138–139)

3.2 The ‘People of the Acacus’ Today

3.2.1 The Kel Tadrart Identity and Figures

The Kel Tadrart will be treated here as a ‘lineage’, since all of them acknowledge belonging to the same kinship group. They are, in fact, so deeply inter-related that attempts to build a kinship diagram has proved a difficult task (see Chap. 4). In fact, almost all the Kel Tadrart have ‘common’ ancestor that can be reached over three generations from most adults. It is worth noting, however, that all the male ‘elders’ (>50 years old) in the Acacus are self-identified genetic brothers or first cousins. The Kel Tadrart lineage can thus be rightly considered as a kind of extended family. A high degree of endogamy has been observed within women as well. I have listened to some discussion among elders regarding ‘the search for a suitable wife’ for some young adults, and the solution was always searched within Kel Tadrart daughters dwelling in the Acacus. This issues goes along with the patrilocal/patrilineal nature of Kel Tadrart society, where the original role of the women attributed in the early ethnographies, appears here largely superseded by

Islamic prescriptions (see Rasmussen 1998; Smith 2005: 127). Among the Kel Tadrart, in fact, patrilocality and patrilineality appear the dominant forms of residence and inheritance. Although nobody in principle declared himself contrary to any union with a non Kel Tadrart man or woman, I have never recorded any evidences of marriages contracted by a Kel Tadrart and a non Kel Tadrart, regardless of sex and age. It is largely questionable whether this applies also to the Kel Tadrart living in the oases surrounding the Tadrart Acacus, who are far more inserted in the oases, populated by various lineages and ethnic groups. According to non Kel Tadrart informants, the total number of Kel Tadrart found in the Acacus, in the village of Tabarakkat, and in the small oases of Tahala, is approximately 300 people. This figure is probably overly optimistic. I add that no precise estimates about their numbers have been recorded in the course of the fieldwork within the Tadrart Acacus, the Kel Tadrart generally referring to ‘many’ of the others in their lineage living elsewhere.

Table 3.3 shows that the current (2007) inhabitants of the Acacus are few, and the density of inhabitants per km² is extremely low (c. 0.008). Table 3.3 is divided into five main age classes, according to what I observed and learned through interviews. The ‘children’ do not take part in the daily duties/labour tasks, whilst the ‘youngsters’ actively collaborate in these ordinary tasks. The ‘young adults’ are at an age where they may formally enter Libyan society: they are normally registered for military service and spend some years serving in the SW Fazzan in the ‘tourism police’ or in the regular army. The girls of this class are normally married to ‘adult’ males, and can generate a new family. The ‘elders’ are at the edge of Kel Tadrart society, and their authority is still taken into considerable account. A pair of age classes (Table 3.3), namely the ‘youngsters’ (6) and the ‘young adults’ (10) appear slightly under-represented if matched against ‘children’ (20) and the older age categories, since young people tend to move away in search of labour in the villages. Achieving a basic school degree prompts some families to send their children to relatives in settled villages, even if several elders admitted they would rather have their children sharing herding duties with them in the ‘desert’. The Libyan government also encourages the Tuareg to join the army, given their remarkable skills for desert survival. On the other side, a strong pressure toward Kel Tadrart (and other nomadic Tuareg) sedentarization has been uninterruptedly pursued by the Gaddafi government. Aiming at encouraging nomads to adopt a more sedentary lifestyle, concrete houses for the Kel Tadrart were built in the 1980s close to Al-Awaynat, in the village of Tabarakkat (Fig. 3.1). There, many Kel Tadrart actually migrated in the following years. Some of them, however, sold the house donated to them by the government and returned to the ‘desert’. Generally speaking, most of the Kel Tadrart dwelling in the Acacus Mts. now have some relatives in Tabarakkat.

Table 3.3 Kel Tadrart occupation recorded in 2007

Site	Child	Youngster	Young adult	Adult	Elder	Total
	(0–11)	(12–17)	(18–25)	(26–49)	(>50)	
ALO_07/1	–	1	–	2	1	4
IMH_07/1	–	–	1	1	1	3
IMH_07/2	1	1	1	1	1	5
EID_09/1	1	1	1	1	1	5
IMH_07/4	3	–	–	1	1	5
IMM_07/1	3	1	1	2	–	7
RAH_07/1	–	–	2	1	1	4
SUG_07/1	5	1	–	2	1	9
SUG_07/2	2	–	–	2	–	4
TES_07/1	–	–	2	–	2	4
TIB_07/1	1	1	2	1	1	6
TIH_07/1	4	–	–	2	2	8
Total	20	6	10	16	12	64



Fig. 3.1 Tabarakkat, where some Kel Tadrart settled in the last decades. Notice the co-existence of squared concrete house with traditional huts (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

3.2.2 Origins and Death

Virtually all males interviewed stated that they were born in the Tadrart Acacus (Table 3.4). Only in two cases was an extra-Acacus origin recorded. Significantly, those localities are located in the Algerian Tadrart, south of the Acacus.

The argument of the Kel Tadrart’ origin finds its natural counterpart in the domain of burial practices, with specific relation to their placement. In the Kel Tadrart practice “*when one dies, (s)he will be buried where he died*”. The Kel Tadrart grave is extremely visible, and consists of an oval-shaped stone platform. Some of these may be found in proximity to currently inhabited sites and are

Table 3.4 Main facts about the Kel Tadrart elders subjected to interview

Site	Name	Sex	Age	Place of birth
ALO_07/1	Mariam	F	Adult	Tadrart Acacus
IMH_07/1	Ibrahim	M	Elder	Tadrart Acacus
IMH_07/2	Macca	M	Elder	n.a.
EID_09/1	Mohammed A.	M	Elder	n.a.
IMH_07/4	Suleiman	M	Elder	Tadrart Acacus
IMM_07/1	Indellen	M	Adult	Takasit (Algerian Tadrart)
RAH_07/1	Hamid	M and F	Elder and adult	w. Imha (T.A)
SUG_07/1	Mohammed H.	M	Elder	Tadrart Acacus
SUG_07/2	Hacca	M	Adult	w. Teshuinat (T.A.)
TES_07/1	Amghar H.	M	Elder	Tadrart Acacus
TIB_07/1	Mohammed S.	M	Elder	Ariken (Algerian Tadrart)
TIH_07/1	Musa	M	Elder	Tadrart Acacus

normally recognized as such by the inhabitants. In a long-term perspective, the study of the distribution of the graves remembered by the current people may add insights to the spatial dynamics of the Tadrart over the course of—say—the past two or three generations. Preliminary observations have been made in some of the abandoned campsites (see Chap. 6), showing the potentiality of this segment of the material record and its implication for the archaeological research.

3.3 Livestock and Husbandry

3.3.1 *Kel Tadrart Herds*

Kel Tadrart practice livestock husbandry, owning mainly goats and sheep (see Tables 3.5, 3.6). Small ruminants constitute the basis of their economy (Fig. 3.2). This stock is essential for subsistence and as a source of income. Dromedaries (*C. dromedarius*), locally referred to as ‘camels’ are herded and allowed to graze freely. Although all the Kel Tadrart household have one 4WD car, donkeys are still valued as beasts of burden, extremely useful to transport water for the *gueltas* to the settlements. Dogs help in herding activities and only a few chickens have been recently introduced.

3.3.2 *Size of Herds*

Capot-Rey stated (1953: 265) that the average number of goats *per household* among the Kel Hoggar should be 15. Unfortunately such a mean value is not very useful, given the relatively high number of Kel Hoggar and the different internal

Table 3.5 Total number of livestock owned (*source* direct observation)

Total SSU ^a	o/c	Camels	Total SSU ^a	Donkeys	Chickens	Inhabitants	Ratio SSU	Ratio o/c
1326,50	1,200	21	1,326.50	6	Yes	64	20:73	18,75

^a SSU standard stock unit, a FAO system (1 cow = 6.5 small stock units; 1 camel = 10 small stock units ex FAO)

Table 3.6 Ratio between inhabitants and stock in the Tadrart Acacus

SITE	Inhabitants	O/C	Camels	Donkeys	Chickens	Ratio
ALO_07/1	4	80				20,00
IMH_07/1	3	80				26,67
IMH_07/2	5	90				18,00
EID_09/1	5	90		1		18,00
IMH_07/4	5	70		1		14,00
IMM_07/1	7	130	9		Yes	18,57
RAH_07/1	4	90	3	1		22,50
SUG_07/1	9	60			Yes	4,44
SUG_07/2	4	40			Yes	15,00
TES_07/1	4	110	5			27,50
TIB_07/1	6	130	4	1		21,67
TIH_07/1	8	230		2	Yes	28,75
Total	64	1,200	21	6		18,75

status of the tribes included in that large ‘confederation’, many of them owning large herds of camels. On a similar scale, Lhote (1951: 9) asserted that the ideal number of goats *per person* (regardless of his/her age) in the Hoggar should be 35–40. One may agree with Nicolaisen and Nicolaisen (1997), Gast (1968), and Keenan (1977) that such an estimate is at least theoretically feasible but would be attained in ideal conditions among some of the wealthier Kel Hoggar. Nicolaisen and Nicolaisen (1997: 94) are more explicit when they state that among the Dag Rali, a vassal—yet wealthy—Tuareg tribe living in the Hoggar, many households are said to possess from 100 to 200 goats, and such families are considered very rich in goats. They further add that sixty to seventy goats per household is a widespread average in times of good pastures. Furthermore, Gast (1968) reports that a household composed by two adults and two children owning 40 goats and two camels was rich, considering that twenty goats was the minimum quantity of stock necessary for such family’s survival.

Those numbers should be integrated by the reduced presence of sheep in the flocks. Unlikely the southern Tuareg, in the central Saharan massifs the sheep in the Acacus, Tassili and Hoggar is of little importance for the Tuareg. Nicolaisen and Nicolaisen (1997: 97) estimates that the ratio of sheep versus goats among the



Fig. 3.2 Kel Tadrart herd leaving the campsite in the morning (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

northern Tuareg is 1:10. Other authors (e.g.: Keenan 1977; Lhote 1951) do not consider the sheep at all. In this study, I shall normally refer to the more general o/c (ovicaprids).

The average of owned ovicaprids is around 19.5 units per person. At the household level, the average of 99.1 ovicaprids per family have been recorded. Those figure generally fit with the above mentioned facts related to the size of the flocks. These figures are the result of direct observation, reducing at its best the potential risk of misinformation. Kel Tadrart are, in fact, generally reluctant to talk or give facts about their livestock, and every direct question about cattle is considered impolite (e.g. Keenan 1977: 217; Nicolaisen and Nicolaisen 1997: 94–95). Yet, I have spotted (and roughly counted) almost all the grazing herds and the oral questions generally confirmed the figures recorded ‘in the field’. Camels are rare, yet they still hold a special place in the Kel Tadrart society. In recent years, camels have been a good source of revenue also thanks to the tourism in the area. Chickens are occasionally kept, along with some donkeys.

Camels and ovicaprids constitute the marketable ‘capital’ of Kel Tadrart households. On a statistical basis, the herds belonging to every household can be divided in three groups (Figs. 3.3, 3.4, and Table 3.7). There is a noticeable degree of unevenness in the size of the flocks owned by the Kel Tadrart of the Acacus. The scenario slightly changes if we take into account the camels as well, given

Fig. 3.3 Classification of households by number of flocks (SPSS v.19, Italian language)

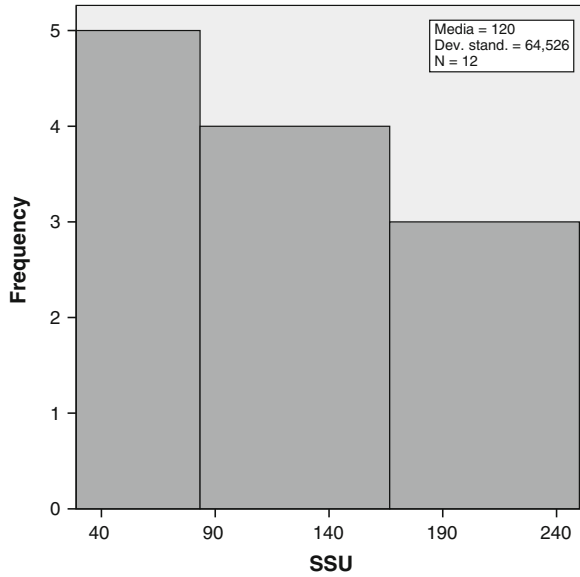
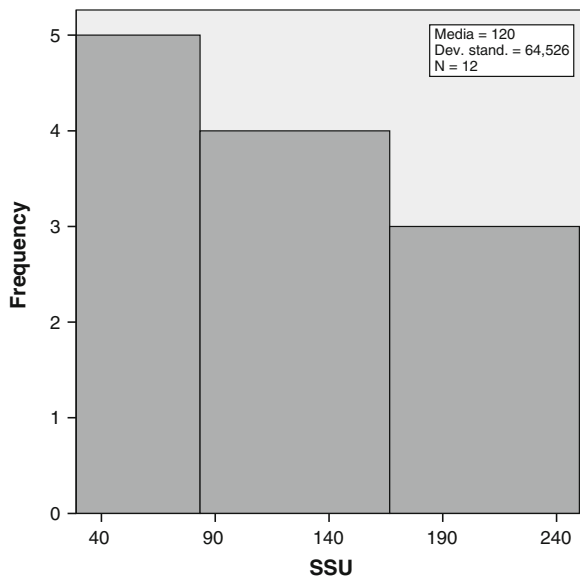


Fig. 3.4 Classification of households by number of standard stock units (SPSS v.19, Italian language)



their few numbers. From Table 3.7, the presence of some large stock affects the distribution of the sample into three statistical classes.

Those numbers allow to establish that some households are ‘wealthier’ than others. Obviously, the above mentioned has to be compared to further data, primarily the number of persons living off the stocks (Table 3.8).

Table 3.7 Classification of households by class of number of flocks (O/C) and by number of standard stock units (SSU)

SITE	O/C	Class	SSU	Class
SUG_07/2	40	1	40	1
SUG_07/1	60	1	60	1
IMH_07/4	70	1	70	1
ALO_07/1	80	1	80	1
IMH_07/1	80	1	80	1
IMH_07/2	90	1	80	1
EID_09/1	90	1	90	1
RAH_07/1	90	1	120	2
TES_07/1	110	2	160	2
IMM_07/1	130	2	220	3
TIB_07/1	130	2	170	2
TIH_07/1	230	3	230	3

Table 3.8 Kel Tadrart inhabitants and stock

SITE	Inhabitants	O/C	Camels	Donkeys	Chickens	Ratio
ALO_07/1	4	80				20,00
IMH_07/1	3	80				26,67
IMH_07/2	5	90				18,00
EID_09/1	5	90		1		18,00
IMH_07/4	5	70		1		14,00
IMM_07/1	7	130	9		Yes	18,57
RAH_07/1	4	90	3	1		22,50
SUG_07/1	9	60			Yes	4,44
SUG_07/2	4	40			Yes	15,00
TES_07/1	4	110	5			27,50
TIB_07/1	6	130	4	1		21,67
TIH_07/1	8	230		2	Yes	28,75
Total	64	1,200	21	6		18,75

The size of the flock can be related to the number of adults, indicating that the livestock cannot be seen as fluctuating in response to contingent factors (e.g. the number of children). For the sake of our argument, it helps in confirming that a certain degree of wealth differentiation does exist among the Kel Tadrart of the Acacus, being the size of flock not strictly correlated with the overall size of the household.

In fact, if we consider Figs. 3.5, and 3.6, we can argue that in all the cases the household TIH_07/1 is outstanding when compared to the others and appears as an

Fig. 3.5 No. of ovicaprids versus the inhabitants (by household). It includes a fit line and average confidence intervals to isolate outstanding values. The coefficient of determination (R2) is indicated at the top right. (SPSS v.19, Italian language)

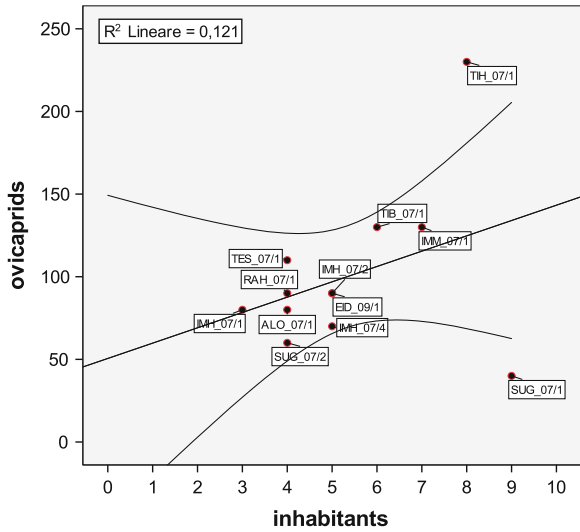
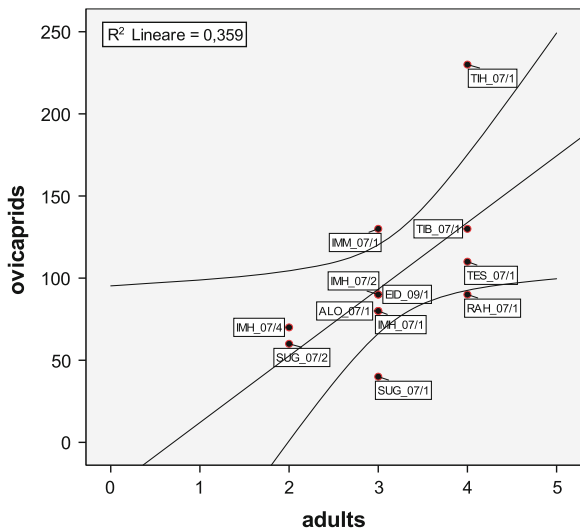


Fig. 3.6 No. of ovicaprids versus adults (by household). It includes a fit line and average confidence intervals to isolate outstanding values. The coefficient of determination (R2) is indicated at the top right. (SPSS v.19, Italian language)



exception to the average. The two households SUG_07/1 and 2 showed to be the at the lowest rank in almost all the charts. Further data come from Figs. 3.7 and 3.8. The inclusion of the camels in the charts remarks the poor statistical relation between the whole of the inhabitants and the SSU as well. In fact, the households outlying the regression prediction lines are the same. This confirms the minor role of the few camels in shaping the sample’s stocks distribution.

In a historical perspective, the amount of small stock owned by the Kel Tadrart increased in the course of the twentieth century (Table 3.9).

Fig. 3.7 No. of standard stock units versus inhabitants (by household). It includes a fit line and average confidence intervals to isolate outstanding values. The coefficient of determination (R2) is indicated at the top right. (SPSS v.19, Italian language)

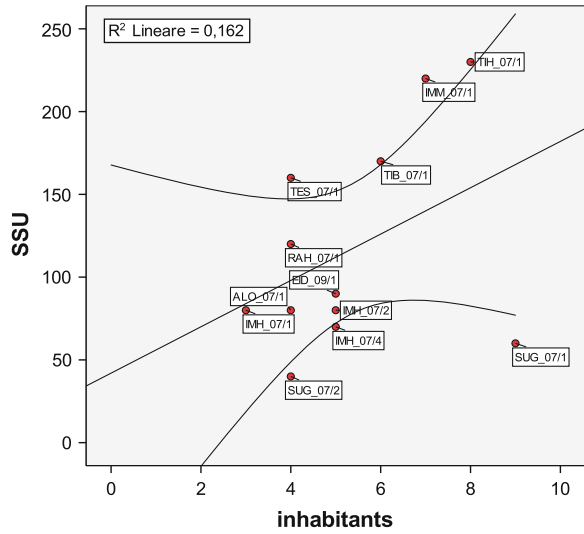


Fig. 3.8 No. of standard stock units versus adults (by household). It includes a fit line and average confidence intervals to isolate outstanding values. The coefficient of determination (R2) is indicated at the top right. (SPSS v.19, Italian language)

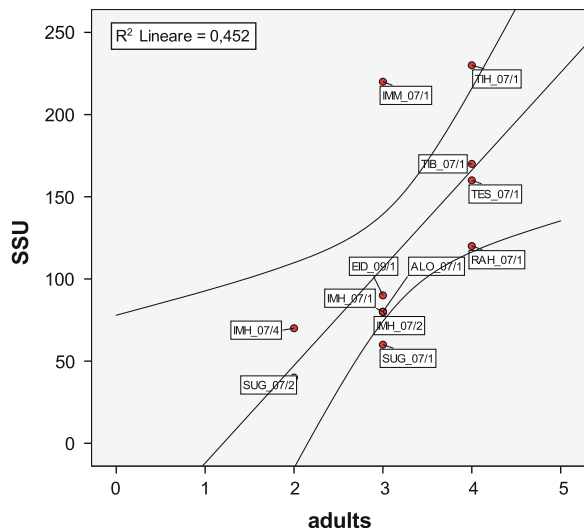


Table 3.9 Past and present Kel Tadrart stocks

	Individuals	O/C	Camels	Donkeys
1930s	78	337	27	10
2007	64	1,200	21	6
Diff.	-14	+863	-6	-4

The comparison with the current situation highlights a large enhancement in the Kel Tadrarts' management of the livestock. Such a 'successful' achievement is extremely interesting and should be due to a specific and successful adaptation strategy pursued by the Kel Tadrart, which will be the subject of the following chapter.

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Chapter 4

The Regional Level of Analysis

4.1 The Settlements

4.1.1 *Date of Settlement*

The date of the settlement of the Kel Tadrart inhabited campsites is rather uneven. Two cases of relatively long residence (15–10 years) and a 7-year stay recorded at site SUG_07/2 were documented. Other sites tell of shorter residential spans. In the latter cases, the location of former (now abandoned) main settlements of households (see Table 4.1) was directly ascertained.

Two cases of extra-Tadrart Acacus birth in Table 4.1 were noticed. Both of those *wadis*, namely Takasit and Ariken, are to be found in the Algerian Tadrart, which is the southern extension of the Acacus, few kilometres beyond the international border.

4.1.2 *Physical Location of the Settlements*

Site location has been studied in the terms of the physical constraints, geomorphological features and soil types, access to water and markets. The 12 sites under study spread along the Acacus valleys (Fig. 4.1). The site ALO_07/1 is quite exceptional because it represents an isolated case of Kel Tadrart's exploitation of the desert outside of the Acacus, in the middle of a totally depopulated area. This unusual location has been explained as being owed to an important rainfall that occurred in that area, prompting that household to move there.

Table 4.1 Interviewed heads of households, their age, their place of birth and present settlement

Site	Name	Sex	Age	Place of birth	Present location	Date of settlement
ALO_07/1	Mariam	F	Adult	T.A.	wadi Alone	3 years ago (2004)
IMH_07/1	Ibrahim	M	Elder	T.A.	wadi Imha	2, 5 years ago (2005)
IMH_07/2	Macca	M	Elder	Unknown	wadi Imha	Unknown
EID_09/1	Musa	M	Elder	Unknown	In Eidi	Unknown
IMH_07/4	Suleiman	M	Elder	T.A.	wadi Imha	2 years ago (2005)
IMM_07/1	Indellen	M	Adult	Takasit (Algeria)	wadi Immerca	15 years ago (1992)
RAH_07/1	Hamid and Aisha	F	Elder	T.A.	wadi Raharmellen	10 years ago (1997)
SUG_07/1	Hacca A.	M	Adult	W. Teshuinat (T.A.)	wadi Sughd	7 yrs ago (2000)
SUG_07/2	Mohammed	M	Elder	T.A.	wadi Sughd	'Always'
TES_07/1	H. Hammadani	M	Elder	T.A.	wadi Teshuinat	'Always'
TIB_07/1	Mohammed S.	M	Elder	Ariken (Algeria)	wadi Tibestiwen	4 years ago (2003)
TIH_07/1	Musa	M	Elder	T.A.	wadi Tihedine	15 years ago (1992)

TA = Tadrart Acacus (*source* direct observation and interviews)

Every settlement, with the exception of ALO_07/1, was located beside the stone cliffs at the edges of the river valleys. No 'open air' settlements occur, for instance, in the pediment area east of the Acacus, nor in the middle of the large valleys of the massif (see Sect. 5.2). Currently, no site is located on the first structural terraces. The rugged high plateaux running over the valleys' edges do not supply enough pasture to allow for long or permanent settlement. Notwithstanding, those places do host short-term herd displacements. In fact, in 2009, a small campsite (GAR_09/1) was set up on the first terrace of *wadi* Gargor, in the northern sector of the Acacus massif (see Figs. 4.2 and 4.3). Being interviewed, the household head stated that he intended to remain there for almost a week, taking advantage of the remote location, where the pasture was apparently untouched. They were camping in the vicinity of a rocky outcrop, where pre-existing dwelling facilities (circular stone made huts with no roofs) were set. Only a small, green *wadi* was visible in the vicinity, its vegetation breaking the monotony of a hilly, gravel landscape. This represents the viable use of such higher parts of the Tadrart Acacus, where 'permanent' or longer settlement is almost impossible.

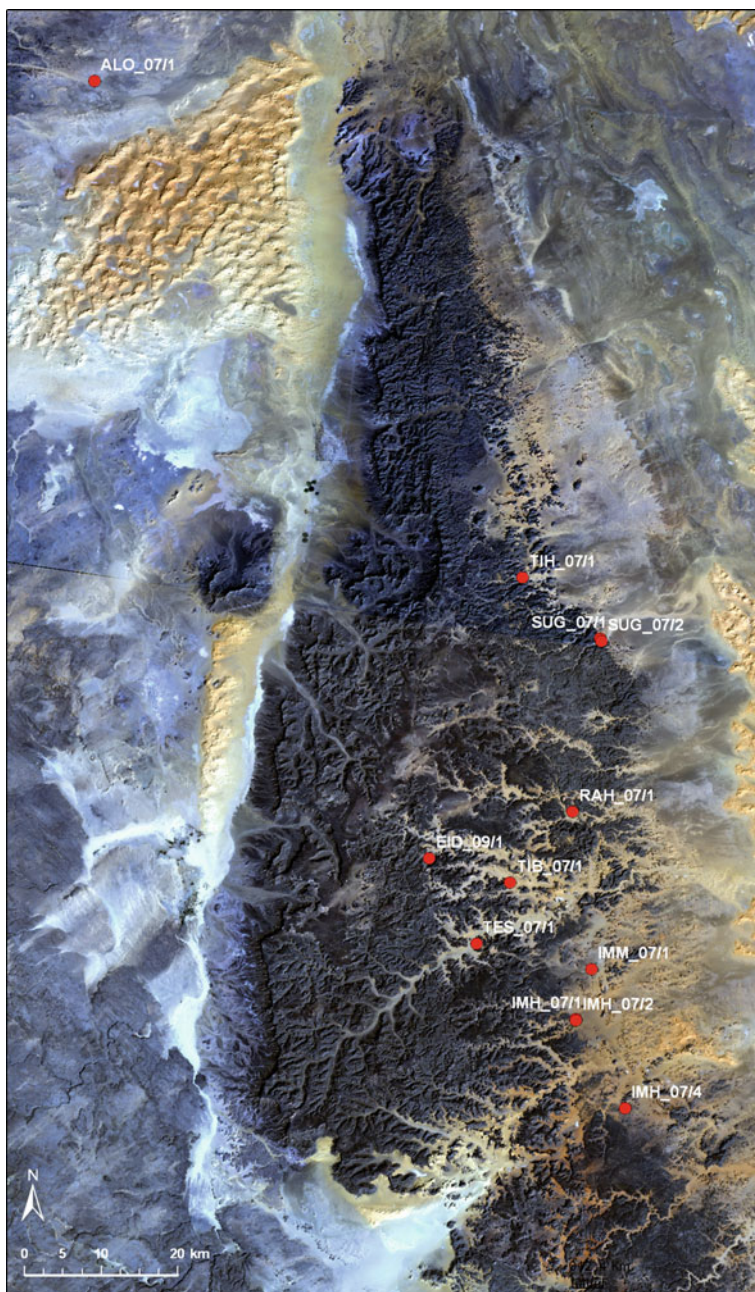


Fig. 4.1 The inhabited Kel Tadrart settlements under study



Fig. 4.2 The site GAR_09/1, located on the first structural terrace, on a ‘hammada-like’ soil, where thin *wadis* can provide ephemeral pastures for limited time (*Photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)



Fig. 4.3 The site GAR_09/1, view from SW. *White arrow* indicates the outcrop where the site is located (*Photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

4.1.3 Soils

In this research, a basic tool to investigate land use by the Kel Tadrart has been developed on the basis of data collected in the field. The ‘grazing radius’ measures the approximate distance that can be covered by flocks at graze on a daily basis. A maximum of 10 km seemed to be a shared limit for the daily grazing of the flocks.

The only geomorphological map available (see Fig. 2.1) has been adopted in the study of resource availability, namely pasture and water. It indicates some locations where the regeneration of vegetation occurs faster, due to the water retention capacity of the ‘large valley floors’ and, to a lesser extent, ‘pediment’ soils. In other words, this map is not aimed at showing the real occurrence of vegetation, being focused upon the soil regenerative capacity. It seems that the most favourable areas indeed attract a large part of the Acacus dwellers, where three drainage/soil choices exist. The map does not feature a very high degree of detail, but it surely records the major facts summarized in Table 4.2. It can be stressed that the majority of sites are located in close contact with the most favourable soils. Only the two sites SUG_07/1 and 2 are quite distant from good soils. Yet, those are set in the immediate surroundings of a well (see next par.), and in this case, so apparently water availability plays a strong role in these location choices.

The ‘grazing radius’ can be used to evaluate the area *around* settlements, which serves as grazing land for the household stock. Figure 4.4 contains information about the daily ‘grazing radius’ versus the main geomorphological features.

Table 4.2 Main geomorphological features (following Marcolongo 1987) and location of settlements

Site	Large valley floors	Flat areas at the east of the massif	Tight valleys	Other
ALO_07/1				√
IMH_07/1	√			
IMH_07/2	√			
EID_09/1			√	
IMH_07/4	√			
IMM_07/1		√		
RAH_07/1			√	
SUG_07/1			√	
SUG_07/2			√	
TES_07/1	√			
TIB_07/1	√			
TIH_07/1	√			
Total	6	1	4	1

Table 4.3 Ratio between the number of ovicaprids and squared kilometres of good soils included within the standard grazing radius

Site	O/C	Square kilometre of good soil within standard grazing radius (10 km)	Ratio (O/C vs. std g.r.)
SUG_07/2	40	2	20
SUG_07/1	60	2	30
IMH_07/4	70	40	1,75
ALO_07/1	80	Unknown	Unknown
IMH_07/1	80	12	6,6
IMH_07/2	90	12	7,5
EID_09/1	90	10	9
RAH_07/1	90	8	11,25
TES_07/1	110	15	7,3
IMM_07/1	130	5	26
TIB_07/1	130	20	6,5
TIH_07/1	230	18	12,7

The daily grazing radius is illustrated in the map by a buffer zone built on the basis of the radius itself.

Table 4.3 shows a great deal of variability in the square kilometres available within the daily grazing radius from the Kel Tadrart campsites. However, Fig. 4.4 clearly shows how the grazing areas of the studied sites overlap to a variable extent. This yields a decrease in the grazing land capacity, which affects the households sharing a given area. If a given area is, in fact, shared by two (or more) household, it is necessary to divide its extent by two (or more) the square kilometres of good soils included within the two (or more) buffers, in order to take into account the coexistence of multiple herds sharing the same areas. This is indicated in Table 4.4, where the 'normalized' standard grazing radius is introduced.

Figure 4.5 represents some correlation between the size of herds and the size of the good soils available within the 10 km grazing radius. Therefore, a relationship between the amount of pasture available near settlements with the quantity of stock can be stressed. In spite of the irregular distribution of good soils throughout the Acacus, this geological indicator should be taken into account to evaluate the distribution of households in the valleys.

4.1.4 Water

The other crucial factor to be considered is access to the water, either from wells or *gueltas*. Presently, three wells are normally available throughout the year, bir Taluaut, bir Sughd, and bir Eminanneia, providing a constant supply of water for

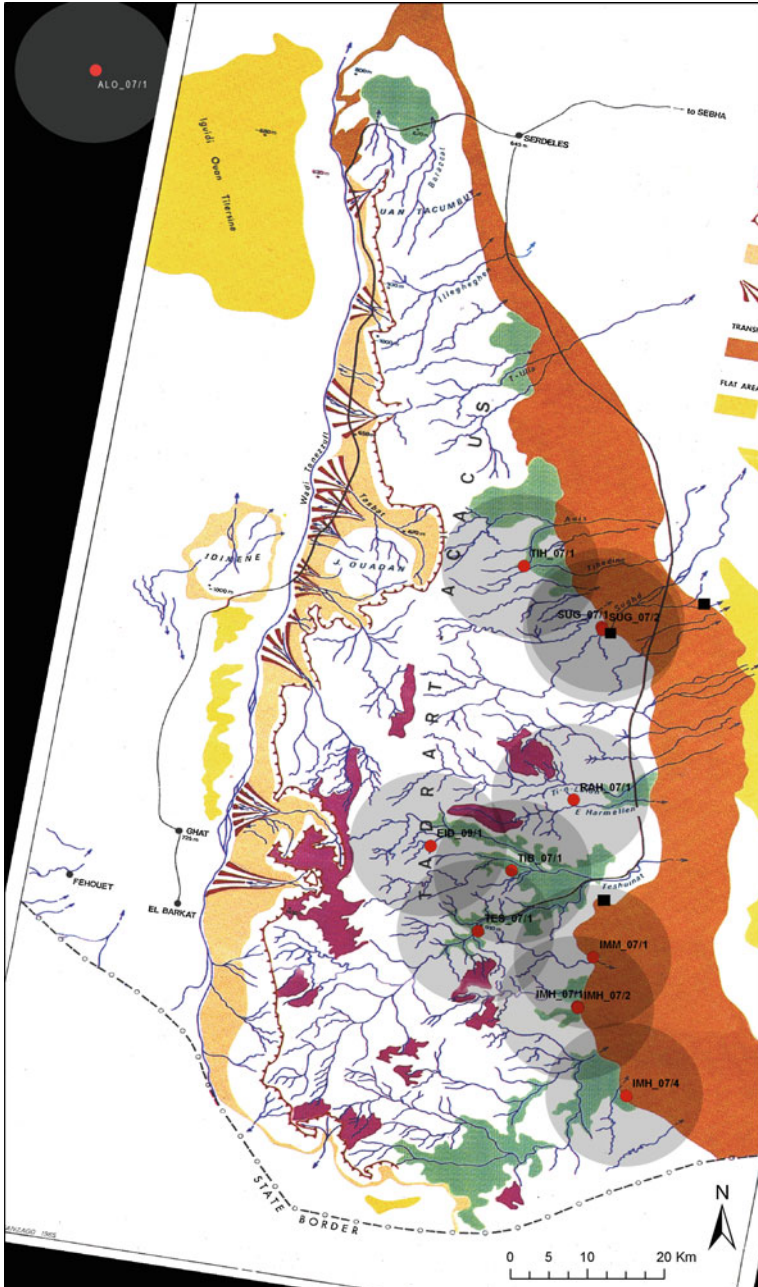


Fig. 4.4 The geomorphological map, featuring the Kel Tadrart sites (dots), the 10 km (buffers) grazing areas, and wells (squares) (source Marcolongo 1987)

Table 4.4 Difference in ratios between the number of O/C versus standard grazing radius (second column) and versus normalized grazing radius (fourth column)

Site	Ratio (O/C vs. standard grazing radius)	Kilometre square of good within std grazing radius soils after reduction by overlapping radius	Ratio (O/C vs. normalized standard grazing radius)	Difference
SUG_07/2	20	1	40	+20
SUG_07/1	30	1	60	+30
IMH_07/4	1,75	22	3,2	+1,45
ALO_07/1	Unknown	Unknown	Unknown	Unknown
IMH_07/1	6,6	3,3	24,2	+17,6
IMH_07/2	7,5	3,3	27,3	+19,8
EID_09/1	9	5	18	+9
RAH_07/1	11,25	6	15	+3,75
TES_07/1	7,3	6	18,3	+11
IMM_07/1	26	1,6	81,25	+55,25
TIB_07/1	6,5	10	13	+6,5
TIH_07/1	12,7	15	15,3	+2,6

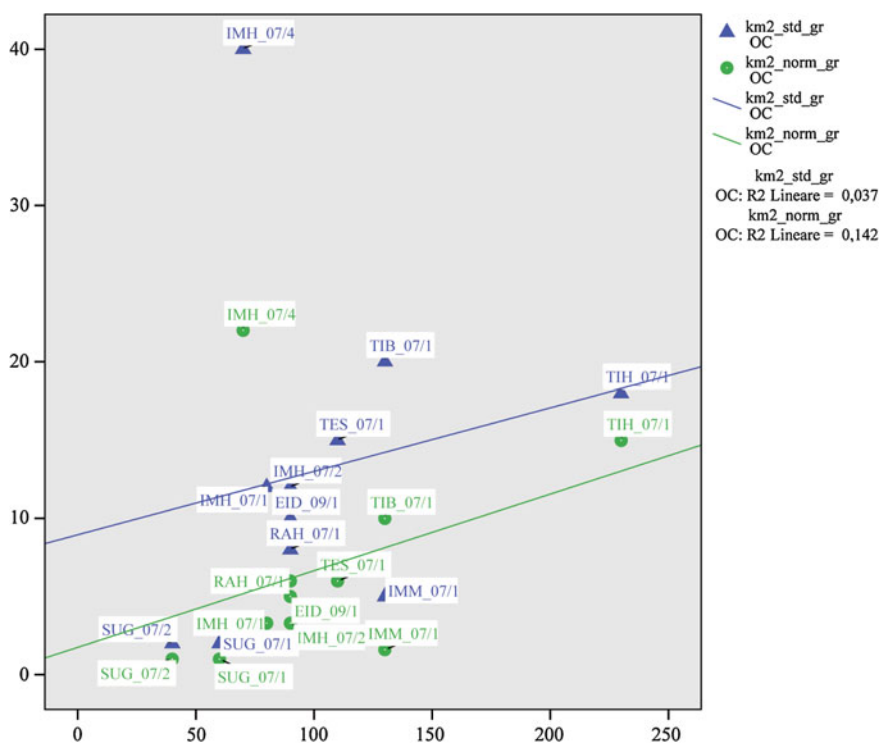


Fig. 4.5 Correlation between the N of stock (O/C) and the km² of good soil available within the standard grazing radius; blue dots standard km², green triangles normalized km²

Table 4.5 Relative distance from wells (ALO_07/1 only goes to bir el Masr)

Site	Bir Taluaut	Bir Eminanneia	Bir Sughd
IMH_07/1	73	12	62
IMH_07/2	73	12	62
EID_09/1	44	21	34
IMH_07/4	73	25	62
IMM_07/1	58	7	50
RAH_07/1	30	16	24
SUG_07/1	12	38	1
SUG_07/2	12	38	1
TES_07/1	50	13	42
TIB_07/1	43	13	37
TIH_07/1	22	49	13

the inhabitants of the Acacus and for the many tourists and travellers that cross the area. Another well, named by the Kel Tadrart ‘bir el-Masr’, should be located not very far from the site ALO_07/1. Also, in the Sughd area, there are two settlements very close to a well; in other cases, a variable distance has to be covered (Table. 4.5). Other wells are not close to the settlements.

The distances indicated in Table 4.5 generally imply either the use of cars to transport water to the settlements, or the exploitation of *gueltas*, particularly as the livestock can normally reach the *gueltas* on their own. While the wells are located on lowlands, *gueltas* are often set on the first structural terrace, so that accessibility can be conditioned by the morphology of the terrain. As stated in Chap. 2 (Sect. 2.5.2), *gueltas* water capacity is almost impossible to evaluate in detail, given the variable factors which impact upon their water level. *Gueltas* are simply a geomorphological feature—and not ‘artefacts’ of human action as are the wells. There are some rocky pools that are assumed to be almost permanently full of water, while others have a more ephemeral nature (di Lernia 2012). Generally speaking, the main *gueltas* can retain water for up to 3 years. It is rare to have 3 years without rain in a row, so that these *gueltas* are considered to provide a reliable water supply. The *gueltas* that retain more importance for the Kel Tadrart, in the frame of the research carried out by di Lernia and colleagues (di Lernia 2012, Fig. 4.1), are indicated as ‘main *gueltas*’ (see also Biagetti and Chalcraft 2012, Fig. 5.4).

Table 4.6 shows that all sites are located within 10 km (daily grazing radius) from a water point. However, important differences exist. Only three sites have no reliable *gueltas* in their vicinity: but if ALO_07/1 and IMM_07/1 have a well in the nearby, IMH_07/4 is likewise endowed with a single ‘minor’ *guelta*. Thus, it is reasonable to conclude that *guelta* location, i.e. the possibility of access to a *guelta* with affordable water supply, located within 10 km, strongly affects the settlement pattern.

Table 4.6 Water points within 10 km grazing radius from settlements

Site	Gueltas	Main gueltas	Wells
ALO_07/1	0	0	1 (not visited)
IMH_07/1	8	1	0
IMH_07/2	8	1	0
EID_09/1	10	1	0
IMH_07/4	1	0	0
IMM_07/1	2	0	1
RAH_07/1	6	2	0
SUG_07/1	0	1	1
SUG_07/2	0	1	1
TES_07/1	2	2	0
TIB_07/1	10	2	0
TIH_07/1	7	1	0

4.1.5 Kinship

Beside some differences in wealth (see Chap. 3), the Kel Tadrart are an egalitarian society. A tentative and simplified kinship diagram has been built (Fig. 4.6), with the aim of examining kinship as a factor influencing the settlement location. This diagram does not represent all the 64 individuals that were inhabiting the Tadrart Acacus at the time of the fieldwork. Yet, in conformity with this research, it includes all the interviewed adults.

Beside the very close ties that connect all the households, I identified several branching in the family tree (Table 4.7), which at its origins divides into two main lines. The other main radiation produces four branches, in two cases further

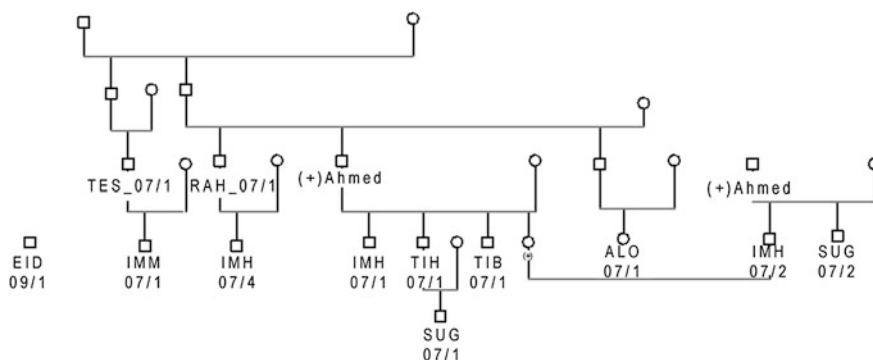


Fig. 4.6 Kel Tadrart kinship diagram (2007). Squares men; circles women

Table 4.7 Kel Tadrart kinship

Site	Lineage branches
IMH_07/4	B1
TIB_07/1	B2
RAH_07/1	B1
TIH_07/1	B2
EID_09/1	B2
TES_07/1	A
IMH_07/1	B2
IMH_07/2	B4
SUG_07/2	B4
SUG_07/1	B2
IMM_07/1	A
ALO_07/1	B3

connected via marriage. Yet, the spatial distribution of the households throughout the Acacus range does not feature any coincident physical clustering, as all the branches of the Kel Tadrart lineage look rather dispersed across the landscape (see Fig. 4.7).

4.2 Mobility

4.2.1 *Nomads and Sedentists*

The choice of the location of Kel Tadrart campsites is also affected by the duration of periods of residence and the intra-annual degree of mobility (Table 4.8). Only two Kel Tadrart households claim to never move nor relocate in the course of a year. They are, noticeably, the households (TES_07/1) of the *amghar* (litt.: elder), namely the leader of the Kel Tadrart, mostly a moral authority, playing no more than an informal role, and his son (IMM_07/1), formally entrusted by the Libyan government with some official duties. In other words, only the households belonging to the branch B of the Kel Tadrart lineage are fully sedentary. The rest of the lineage branches (A1–4) seem to move with unforeseeable frequency, and we may only highlight some recurrences.

Only the household dwelling at site ALO_07/1 features a regular (i.e. strictly seasonal) transhumance, while six households flexibly use ‘alternative’ campsites. The term ‘alternative’ is to be preferred to ‘seasonal’, as the character of seasonality cannot be attributed to the pattern of the exploitation of those sites. In fact, the use of such sites has proven to be irregular and intermittent.

As stated, the ALO_07/1 household practices a regular, seasonal, transhumance every summer, involving a short displacement of 12 km to the seasonal site ALO_07/2 (Fig. 4.8), making them the only Kel Tadrart regularly living outside of

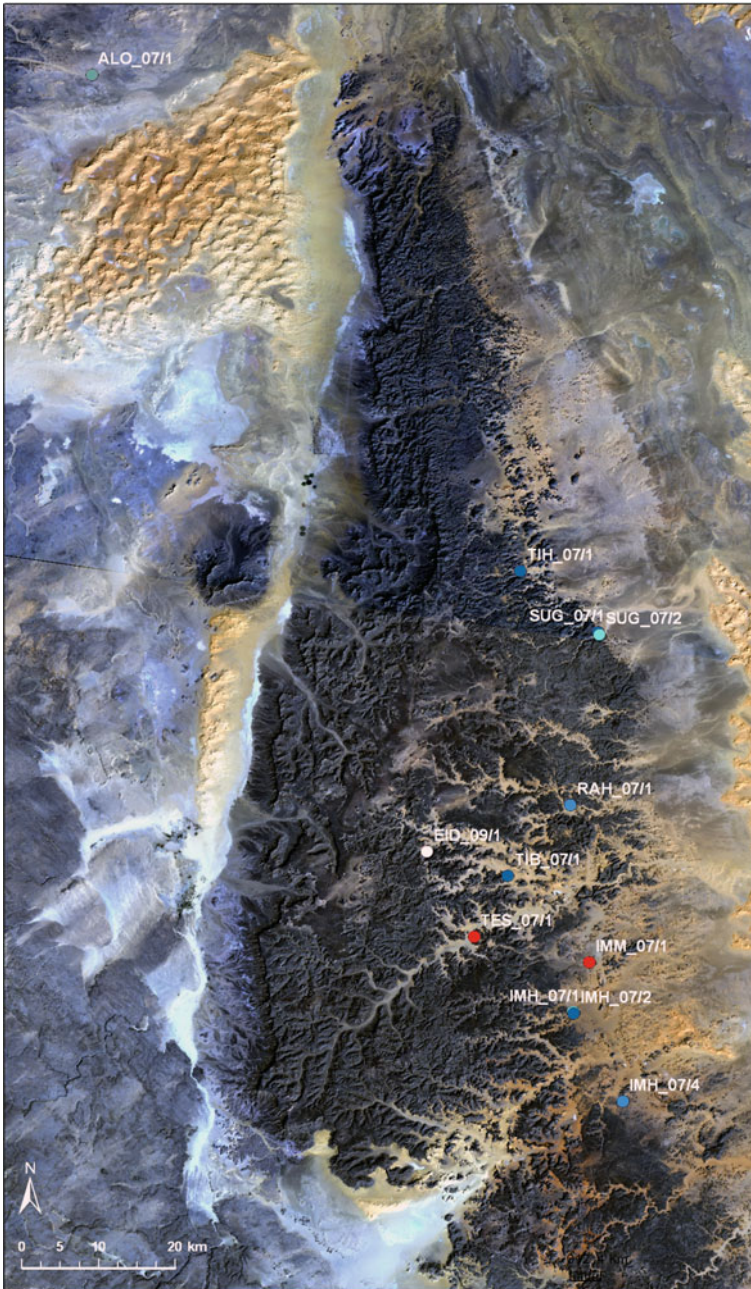
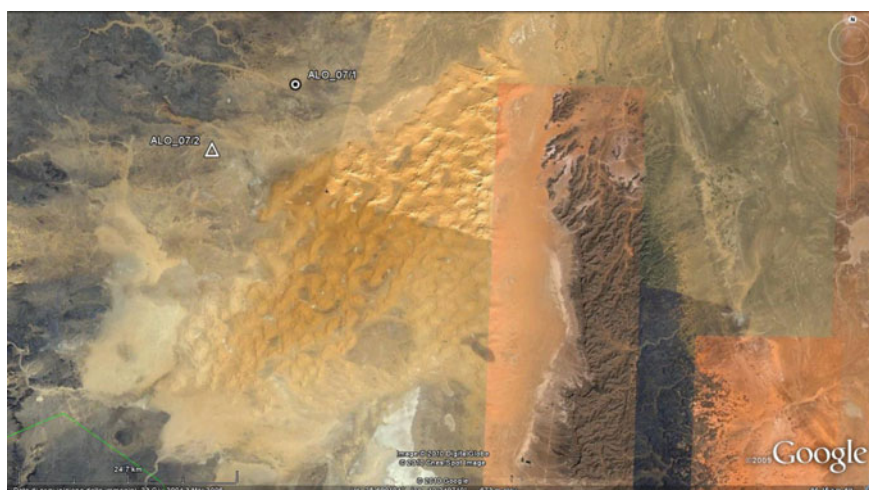


Fig. 4.7 The lineage branches of the Kel Tadrart shown on a map. The same colour corresponds to a branch. *Red* and *blue* distinguish the two main branches (A and B), while *blue* gradations highlight brotherhoods of households heads of 'B' (same *blue* = brothers). *White* dots = no data

Table 4.8 Degree of mobility of Kel Tadrart households

	Date of settlement	Transhumance site	Alternative sites	Short-term sites
ALO_07/1	2004	ALO_07/2		
IMH_07/1	2005		AFA_04/1	
IMH_07/2	n.a.	n.a.	n.a.	n.a.
EID_09/1	n.a.	n.a.	n.a.	GAR_09/1 (2009)
IMH_07/4	2005		TIK_09/1	
IMM_07/1	1992	Sedentary		
RAH_07/1	1997		IMH_07/3, RAH_09/1	
SUG_07/1	2001		TES_09/1 (guest)	
SUG_07/2	Always		TES_07/2	
TES_07/1	Always	Sedentary		
TIB_07/1	2003		TES_09/1	LAL_09/1, TAK_06/1
TIH_07/1	1992		(wadi Teshuinat)	

**Fig. 4.8** The transhumance of ALO_09/1. The dot indicates the main campsite, and the *triangle* indicates the transhumance site (from GoogleEarth)

the mountain range. We can thus expect different behaviour from them than from the other households studied. Worthy of note, this family settled into their current main residence just in 2004, following a good rainfall in that area. Before that they stated they were always moving between *wadi* Teshuinat and the northern part of the Acacus.

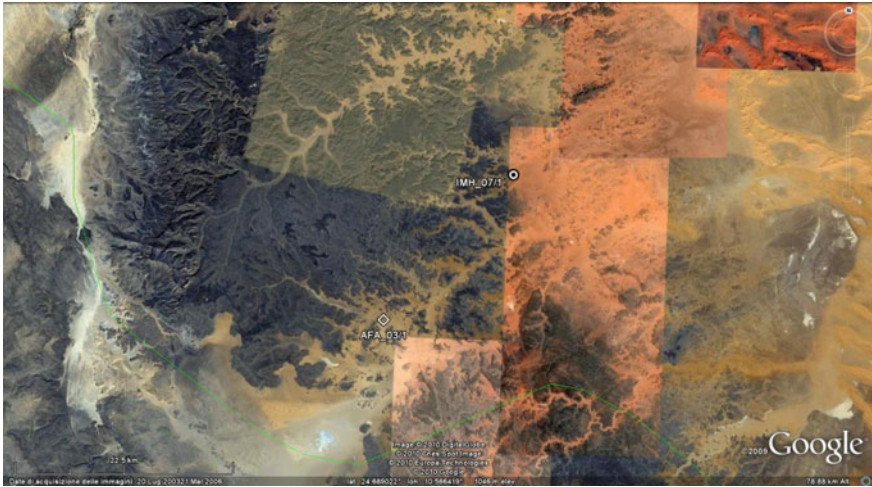


Fig. 4.9 The movements of IMH_07/1. The dot indicates the main campsite, and the diamond indicates the alternative site



Fig. 4.10 The movements of IMH_07/4. The dot indicates the main campsite, and the diamond indicates the alternative site

A different kind of pattern can be observed for seven other households, i.e. the main part of the sample. These seven households practice an opportunistic, irregular and unpredictable displacement throughout the Acacus valleys. Most of them, with the sole exception of TIH_07/1, have an established secondary settlement. Some of them (AFA_04/1, IMH_07/3, RAH_09/1, TES_09/1) have been recorded in this project, while two (TIK_09/1 and TES_07/2) have not been visited

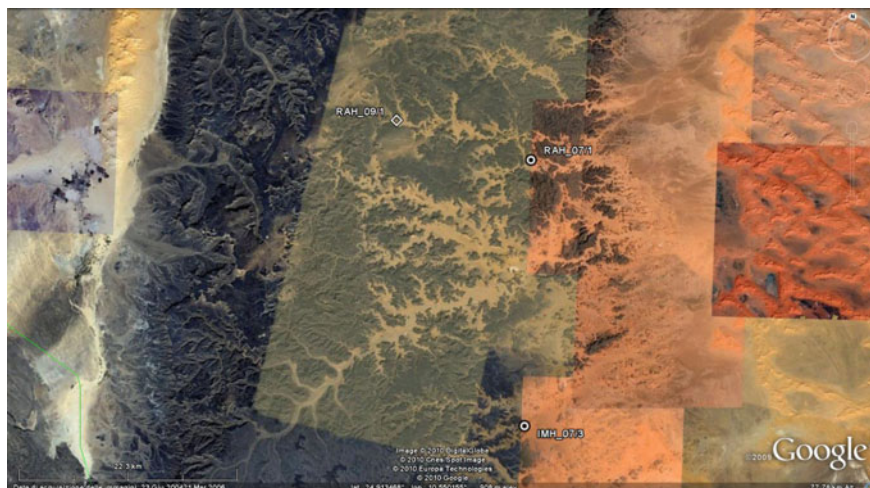


Fig. 4.11 The movements and polygamy of RAH_07/1. The *dot* indicates the main campsite, and the *diamond* indicates the alternative site

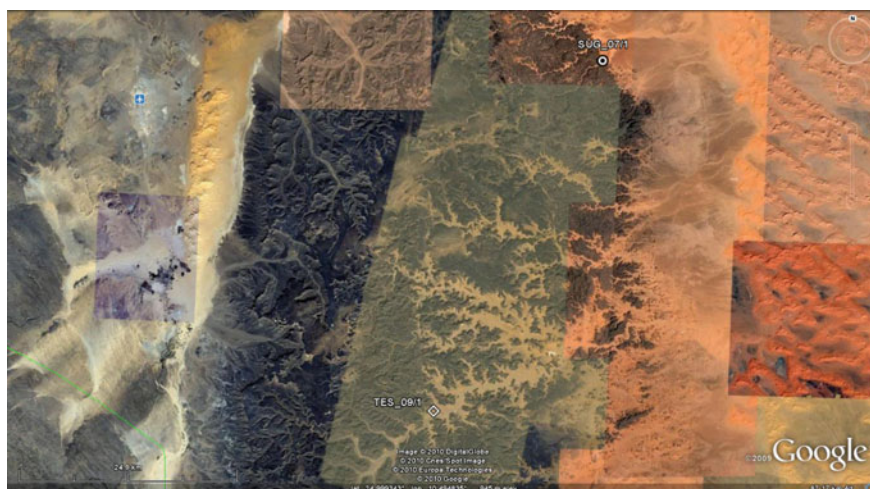


Fig. 4.12 The movements of SUG_07/1. The *dot* indicates the main campsite, and the *diamond* indicates the alternative site

(Figs. 4.9, 4.10, 4.11, 4.12, 4.13 and 4.14). Their locations have, however, been indicated on a map during the interviews. Table 4.9 dedicated to these households indicates another peculiar trait of the Kel Tadrart movements: their displacements are usually quite short (between 10–40 km), as opposed to the transhumance of 100+ km practiced by more Sahelian pastoral groups (e.g. Barral 1967; Gallais 1967; Smith 1980).

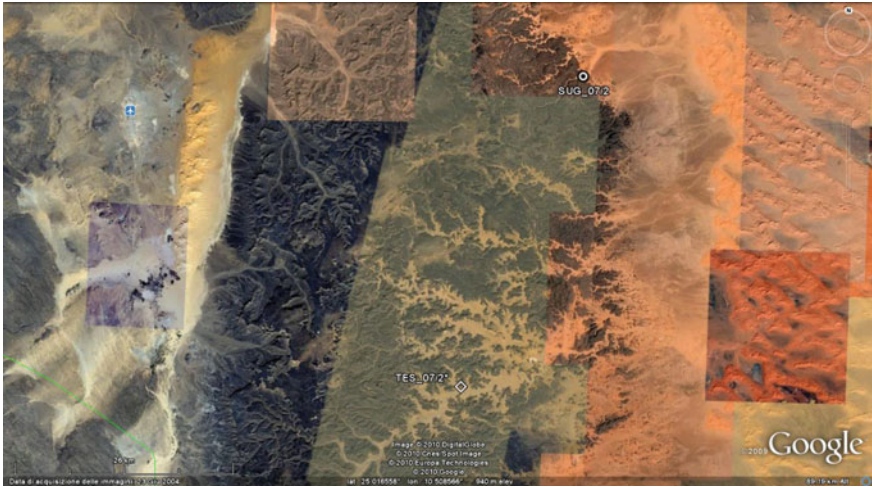


Fig. 4.13 The movements of SUG_07/2. The *dot* indicates the main campsite, and the *diamond* indicates the alternative site

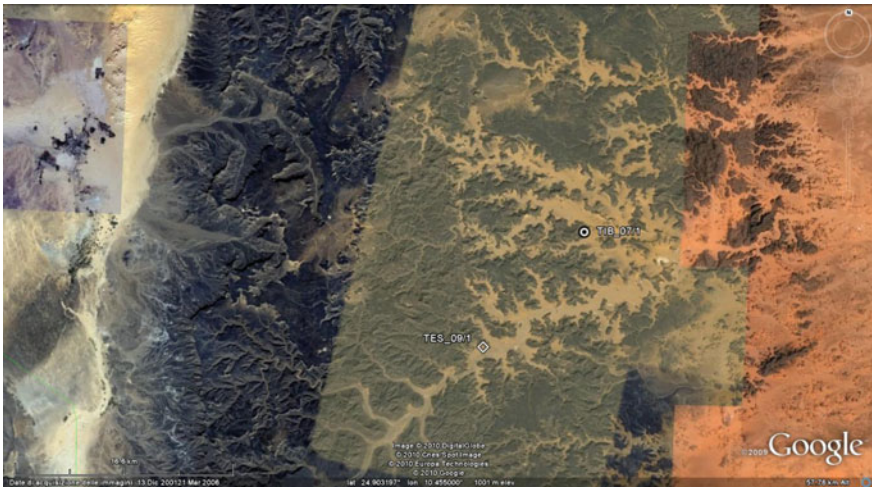


Fig. 4.14 The movements of TIB_07/1. The *dot* indicates the main campsite, and the *diamond* indicates the alternative site

This naturally does not prevent the exploitation of *other* additional localities for short-term displacements. For instance, in the course of autumn 2009, heavy rains in the northern sector prompted the movement of two households, TIB_07/1 (in that period living in TES_09/1) and RAH_07/1 to the *wadi* Taluaut, in the northern Acacus. In both cases, long distances were covered to get there, as the two settlements are located in the central range of the Acacus. Yet, the availability of

Table 4.9 Overview of the alternative sites and their distance from main settlements

Main settlement	Alternative sites	Distance (km)
IMH_07/1	AFA_04/1	20
IMH_07/4	TIK_09/1	37
RAH_07/1	IMH_07/3 RAH 09/1	28/13
SUG_07/1	TES_09/1 (as a guest)	44
SUG_07/2	TES_07/2	37
TIB_07/1	TES_09/1	11
TIH_07/1	wadi Teshuinat	>40

green grass after a short and intense rainfall led to a quick movement to the Taluaut area: a short-term response to sudden favourable conditions.

The inhabitants of two of the northernmost settlements (SUG_07/1 and TIH_07/1) also occasionally move south to *wadi* Teshuinat. They have no camps nor houses there, but can count upon their relatives to act as hosts. In particular, the site TES_09/1 is a suitable option for the inhabitants of SUG_07/1, whose elders are brothers.

A very special situation is represented by the only case of polygamy ascertained among the Kel Tadrart, occurring in the household RAH_07/1, where two wives inhabit two different sites. The husband, an elder in the Tadrart Acacus, usually moves from one wife to the other: in 2007, one was living in RAH_07/1 and the other in IMA_07/3. In autumn 2009, this situation changed, with the wife once settled in RAH_07/1 having relocated to RAH_09/1; the other wife, once in IMH_07/3, was with her husband in the northern sector of the Tadrart Acacus, near *wadi* Taluaut, chasing the rainfall. Opportunist and short-term displacement, operated by the split of a member of the family with all (or part of) the stock can be pursued by every household, in the case of necessity. The ‘short-term sites’ indicated in the Table 4.8 provide such examples.

4.2.2 Markets: An Individual Choice

The only market, at least the closest one, where the Kel Tadrart go regularly is located in the oasis of Al Awaynat (Fig. 2.1). This small village is situated at the northern fringes of the Acacus Mountains and is mainly populated by Tuareg peoples of diverse lineages and ‘tribes’. In Al Awaynat, many items and goods can be purchased, and livestock and secondary products sold. Almost all of the Kel Tadrart living in the Acacus massif have some kind of relatives settled in Awaynat or in the small adjoining village of Tabarakkat (Fig. 2.1). Constant visits facilitate the exchange of goods from the desert to the oasis and vice versa. Irrigated fields have been increasing since the mid-1990s in Awaynat surroundings, and fodder can be bought there in case of necessity. This point is of interest, as it reflects the

Table 4.10 Frequency of the trips to the market versus the amount of good soil within the daily grazing radius and the ratio of O/C per km²

Site	Annual trips to market	O/C	Km ² of good soil within normalized grazing radius (10 km)	Ratio O/C per km ²
SUG_07/2	Occasional	40	1	40
SUG_07/1	Regular (6 + times)	60	1	60
IMH_07/4	Occasional	70	22	3:2
ALO_07/1	None	80	n.a.	n.a.
IMH_07/1	Regular (6 + times)	80	3,3	24:2
IMH_07/2	n.a.	90	3,3	27:3
EID_09/1	n.a.	90	5	18
RAH_07/1	Occasional	90	6	15
TES_07/1	Occasional	110	6	18:3
IMM_07/1	Regular (6 + times)	130	1,6	81,25
TIB_07/1	Occasional	130	10	13
TIH_07/1	None	230	15	15,3

real carrying capacity of the territory of the Kel Tadrart. Some of them have in fact stated that they can ‘occasionally’ buy fodder in the market when they need to increase the herd size and the year is a very dry one (see Table 4.10). A couple of Kel Tadrart herdsman declared making ‘regular’ trips to the market. Three of them did not consider the opportunity at all.

Table 4.10 shows that no clear-cut relations seem to exist between the trips to the market and the variables discussed so far, and it should be asked whether the purchasing of fodder is mainly influenced by individual herd management strategies, aimed at increasing herd size. Furthermore, no direct connection has been found within my sample between the number of the inhabitants divided by age classes at a given site and their trips to markets. This allows to exclude that age class needs or desires for specific goods, such as powder milk for infants or ‘western-like’ clothes for the youngsters, drive the trips to market. Social events, such as marriages, can indeed prompt these trips to the oases from the Acacus and thus stimulate the purchase of other goods. In other words, the purchase of fodder is dependent on individual needs, based on choices related to the herd management. Yet, unlike the terrain, the pasture and the water points that play a major role in shaping the Kel Tadrart settlement pattern, the access to market more often seems to be less dependent on universal needs and rather connected to particular social events or consumer choices.

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Chapter 5

Site Specific Analysis: Composition and Layout

5.1 The Main Sites: Overview

This section focuses on the ‘main’ campsites that have been visited in the course of fieldwork and largely corresponds to the sites whose distribution was analysed in the previous chapter. ‘Secondary’ settlements, namely the only one regular summer camp (ALO_07/2) and other sites to be used for occasional displacement will be discussed in the Chap. 6, along with abandoned sites. Table 5.1 shows the ‘main’ settlements to be considered in this analysis. In contrast to the sites discussed in this chapter, the site EID_09/1 is not mentioned since it was not mapped. The detailed sketch of every campsite is available online (<http://extras.springer.com>).

5.2 The Locations

In every campsite, a visitor can suddenly feel the impression that the distribution of features is strongly influenced by natural supports (see 4.1.2). Settlements are always located in physical connection with the rocky flanks of valleys’ edges.

Table 5.2 shows that most of the sites (nine) are protected to their northern or north-western sides by the rocky flanks. This is consistent with the direction of the prevailing winter wind which comes from the north (see 2.3). The only departure from this occurs in the case of TES_07/1, the site of the *amghar* (the eldest). Its location is fairly surprising, if we further consider that this is one of only two fully sedentary sites. Worthy of note, this site is located very close to other smaller camps, currently abandoned, yet formally belonging to close relatives of the head

Electronic supplementary material: The online version of this chapter (doi:[10.1007/978-3-319-08530-2_5](https://doi.org/10.1007/978-3-319-08530-2_5)) contains supplementary material, which is available to authorized users.

Table 5.1 Kel Tadrart ‘main sites’ analysed in this chapter; ‘further reference’ field is related to the extra materials available online only

Site	Inhabitants	Present location	Further reference
ALO_07/1	4	Wadi Alone	Slide 1
IMH_07/1	3	Wadi Imha	Slide 2
IMH_07/3	2	Wadi Imha	Slide 3
IMH_07/4	5	Wadi Imha	Slide 4
IMM_07/1	7	Wadi Immerca	Slide 5
RAH_07/1	4	Wadi Raharmellen	Slide 6
SUG_07/1	9	Sughd	Slide 7
SUG_07/2	4	Sughd	Slide 8
TES_07/1	4	Wadi Teshuinat	Slide 9
TIB_07/1	6	Wadi Tibestiwen	Slide 10
TIH_07/1	8	Wadi Tihedine	Slide 11

of TES_07/1. Their anomalous position, which is fairly prominent and visible from the large *wadi* Teshuinat, can be read as the representation of ‘authority’ of the *amghar*. This may be a singular case of the overriding normal procedures amongst the Kel Tadrart.

Table 5.2 similarly indicates that the Kel Tadrartsites are necessarily close to the *wadi*, whose stream bed is evidenced by rows of bushes growing in an irregular line running along broader valleys. In order to avoid occasional floods, the settlements are generally set onto low and flat terraces naturally rising between the actual and temporary stream bed of the *wadis* and the proper rocky flanks. This topography creates smooth spots where Kel Tadrart normally set up their camps. Table 5.2 shows that a minimum distance of 40 m from the *wadi* edge, increasing

Table 5.2 Physical location of Kel Tadrart main sites in relation to geomorphological features of surrounding environment

Site	Position of cliff	Distance from the closest wadi edge	Distance from the closest stream bed	Altitude difference (sites/closest stream bed)
ALO_07/1	NW	70	70	14
IMH_07/1	SW	70	100	6
IMH_07/3	N	70	140	7
IMH_07/4	N	110	150	10
IMM_07/1	N	50	130	3
RAH_07/1	N	140	270	1
SUG_07/1	NW	50	100	3
SUG_07/2	W	130	190	7
TES_07/1	N	130	250	12
TIB_07/1	N	450	520	13
TIH_07/1	N	40	50	3

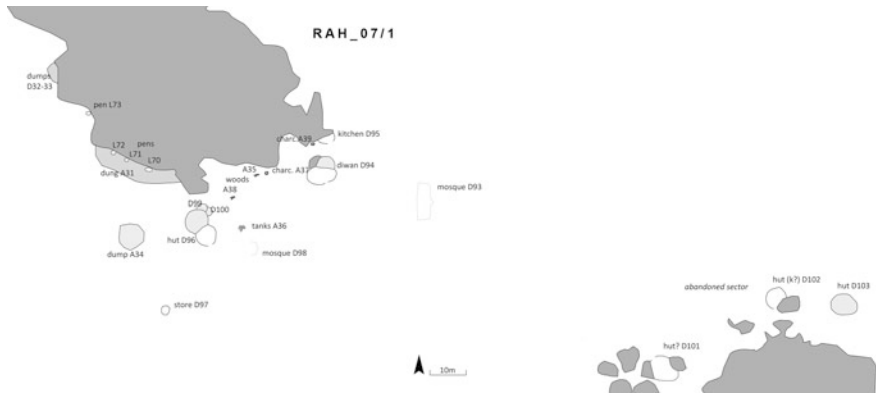


Fig. 5.1 Sketch of settlement RAH_07/1. Every feature has its own ID. (for full details see electronic supplementary materials (<http://extras.springer.com>))

up to fifty metres from the potentially active stream bed, is normally respected. A certain elevation above the stream bed of *wadis* provides an acceptable degree of security from floods. In general, protection from wind and *wadis* overflow combined with the availability of a smooth terrain configure as basic conditions for the settlements. And if the choice of the location—on the large scale—is influenced by the resources availability (see Chap. 4), the very place of settlement is determined by these small patches of relatively level and protected ground, where the structures can be more or less concentrated (Fig. 5.1).

5.3 Site Structure

Every main settlement is normally provided with a number of domestic structures and facilities (domestic fixtures), such as dwelling huts, kitchen, storage areas, along with the livestock pens and corrals (livestock fixtures). Some of these fixtures can be recorded in all the campsites, some occur sporadically. Similarly, their number and type can vary from site to site (Table 5.3).

Table 5.3 includes all the ‘active’ features of campsites and thus not includes occasional evidence of abandoned features. By ‘active’ I mean every facility that can be potentially used, even if not in actual use at the time of my visit. Kel Tadrart, in fact, might refer to a given structure as ‘the hut of (e.g.) Mohammed’. This applies even if ‘Mohammed’ is nowadays living in some other place. Actually, the huts of a campsite can belong to some relative, generally an unmarried young adult/adult son or daughter of the elder living at the site. She/he may have left the campsite but can return to visit and use his or her hut. Similarly, also in the case of married offspring, the same hut can be used when needed by its original owner. In fact, higher numbers of domestic fixtures have been recorded in the ‘oldest’ campsites (Table 5.4).

Table 5.3 Classes of features recorded in the Kel Tadrart main sites

Site	Domestic fixtures (dwelling huts, diwans, kitchens, storage areas)	Livestock fixtures (pens, corrals)	Activity areas (dumps, dungDung)	Total
ALO_07/1	6	6	2	14
IMH_07/1	7	2	4	12
IMH_07/3	6	6	7	19
IMH_07/4	5	5	6	16
IMM_07/1	10	3	4	17
RAH_07/1	11	4	9	24
SUG_07/1	9	2	3	14
SUG_07/2	9	3	3	15
TES_07/1	13	2	9	24
TIB_07/1	4	2	7	13
TIH_07/1	11	4	5	20
Total	91	39	59	188

Table 5.4 No. of domestic fixtures versus No. of inhabitants, date of foundation of settlement, and degree of mobility

Site	Domestic fixtures	Inhabitants (adults)	Ratio	Foundation of settlement	Mobility
TIB_07/1	4	4	1,0	4	Opportunistic
IMH_07/4	5	2	2,5	2	Opportunistic
ALO_07/1	6	3	2,0	3	Regular transhumance
IMH_07/3	6	2	3,0	n.a.	opportunistic
IMH_07/1	7	3	2,3	2,5	Opportunistic
SUG_07/1	9	3	3,0	7	Opportunistic
SUG_07/2	9	2	4,5	Always	Opportunistic
IMM_07/1	10	3	3,3	15	Fully sedentary
RAH_07/1	11	4	2,8	10	Opportunistic
TIH_07/1	11	4	2,8	15	Opportunistic
TES_07/1	13	4	3,3	Always	Fully sedentary

5.4 Domestic Fixtures

5.4.1 Dwelling Huts

The most recurrent features at Kel Tadrart campsites (Table 5.5) are dwelling huts and kitchens. Dwelling huts are the focal point of every Kel Tadrart campsite.

Table 5.5 Classes of domestic fixtures recorded at Kel Tadrart main sites

Site	Huts	Kitchens	Diwan	Garage	Bath.	Mosque	Other	Store	Susp. store	Total
ALO_07/1	2	2						1	1	6
IMH_07/1	3	1	1	1					1	7
IMH_07/3	1	1	1			1		2		6
IMH_07/4	1	1	1			1		1		5
IMM_07/1	3	2	1			1	1	2		10
RAH_07/1	4	1	1		1	2		2		11
SUG_07/1	4	2		2				1	1	10
SUG_07/2	2	1	1	1		2	1		1	9
TES_07/1	7	2	1				2	1		13
TIB_07/1	2	1		1						4
TIH_07/1	3	1	1	1				4	1	11
Total	32	15	8	6	1	7	4	14	5	92

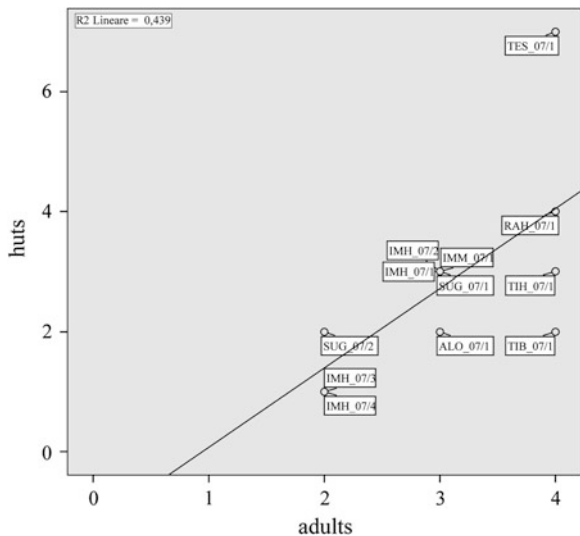
Table 5.6 No. of dwelling huts versus No. of adults

Site	Huts	Adults	Ratio
ALO_07/1	2	3	0,7
IMH_07/1	3	3	1,0
IMH_07/3	1	2	0,5
IMH_07/4	1	2	0,5
IMM_07/1	3	3	1,0
RAH_07/1	4	4	1,0
SUG_07/1	4	3	1,3
SUG_07/2	2	2	1,0
TES_07/1	7	4	1,8
TIB_07/1	2	4	0,5
TIH_07/1	3	4	0,8

They hold the whole set of items belonging to households and represent the domestic space *par excellence*. *Diwans* (guest houses) are common as well, along with the stores, which are sometimes elevated. Some ‘garages’—a tangible sign of modernity—have been erected in recent times for 4WD vehicles. Bathing areas are normally included within the hut and only in rare cases separated facilities have been noticed. Finally, some stone mosques have been recorded.

In spite of the age of settlements and its impact on the number of *fixtures*, the number of dwelling huts corresponds to the number of adult inhabitants (Table 5.6; Fig. 5.2). Unexpected values recorded at campsite TES_07/1 are due to the presence of huts destined to host young adults no longer living there, yet occasionally coming to spend some time with their family. At the opposite extreme, we can notice the site TIB_07/1, characterized by a lower number of huts, when compared to the rest of the sites. This is probably due to the fact that this camp was reoccupied in the months before my visit, after weeks of abandonment. The household had

Fig. 5.2 Scatterplot illustrating the ratio between No. of dwelling huts and No. of adults in Kel Tadrart campsites



moved, in fact, to their secondary settlement (see Chap. 6) previous to the resettlement of their main site. This is likely to have led to a reorganization of the settlement itself, that, at the time of my visiting was not completed.

5.4.2 Northern Tuareg Hut Types

In his ‘What is a tent?’ (from *Nomads in Archaeology*, 1991: 85), Roger Cribb discussed the difficulties in defining the Bedouin tent. Similarly, it is by no means easy to approach the Tuareg huts typologically as they feature considerable morphological types and inner variations. Nicolaisen and Nicolaisen (1997: 405) probably offer the most complete survey of Tuareg dwelling types, ranging from goat skin tents to veritable stone huts, including regional variations. It is reported that such variability may not be merely explained by reference to environmental factors. Rather, the Danish scholars explicitly address the issue of ‘cultural influences’ from the ‘outside’ in shaping architectural features. While the use of the term ‘outside’ may be intrinsically problematic, it is true that the large intermixing that is typical of ‘Tuareg culture(s)’ is reflected in the adoption of different structures. The authors divide dwelling types into non-portable and portable, where the first category includes mainly the houses of the sedentary Tuareg living in the oases or proper towns. However, some non portable types refers also to smaller conical huts to be found in the Hoggar and Tassili, with some occurrences reported in the Fazzan as well. In fact, in the Tadrart Acacus I have observed what the Nicolaisens classify as type ‘A.6’ (1997: 416)—round huts or houses with a conical roof. With particular reference to our study area, Scarin (1937: 520) describes the huts of the Ajjer nomads living in the Ghat and Ghadames range as ‘cylindrical huts with hemispherical roof, supported by tamarisk posts and covered by acacia shrubs’ (Fig. 5.3) as confirmed by Despois (1946: 83). It resembles the so-called Fazzani house (Mattingly 2003: 160–176), whose diffusion is also recorded among non Tuareg groups in the Fazzan area. It is likely that Henry Lhote had the chance to spot something similar, as he wrote that the Ajjer Toareg could live in “huttes de paille” (1955: 257) in summertime, definitely cooler than the most common tents, and saving on goatskins as well. The famous French *Saharien* inserted a picture (1944, pp. 352, 353) whose commentary describes the “*gourbis de pierres et de paille*” recorded by the author in the Hoggar in the early 1940s. Nowadays, ‘Fazzani huts’ can easily be spotted around modern concrete houses in almost all the oasis around the Tadrart Acacus, up to Ubari in the north east.

5.4.3 Kel Tadrart Hut Types

I have distinguished two main types of dwelling huts in the Tadrart Acacus, with some sub-variants. Type 1 is characterized by the hut made of stone slabs piled to form a circular dry wall, normally covered by thatched roof, often provided with

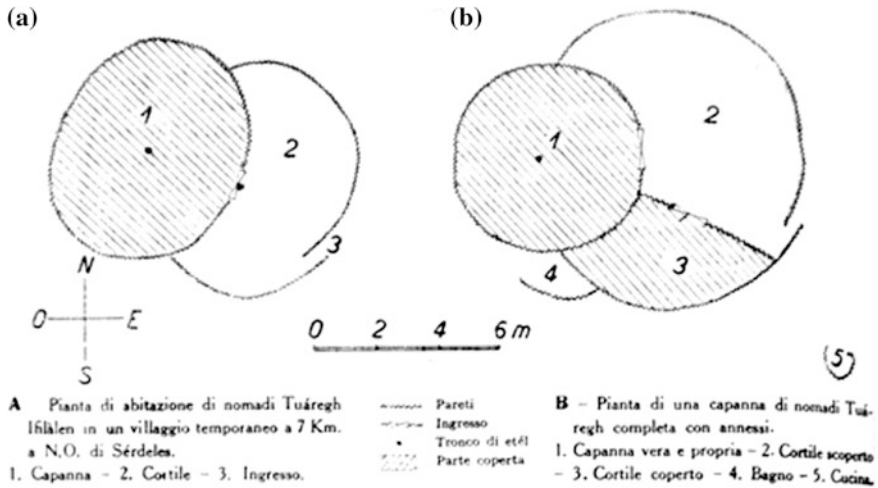


Fig. 5.3 Sketch of plant material dwelling hut from the nomadic Ifilalen Tuareg, recorded in 1930s close to Awaynat, and a dwelling hut from nomadic (unspecified) Tuareg with partially covered courtyard (adapted from Scarin 1937: 522)

courtyard. Type 2 includes the huts built with plant material, strictly connected to the already mentioned ‘Fazzani house’, round huts with conical roof. Type 1 (circular dry walled hut) is made of local sandstone slabs, selected on the basis of their shape (Figs. 5.4, 5.5). Flat rocks are preferred, ranging from 30 to 60 cm in length, and from 20 to 30 in width. They are set one on top of the other, carefully alternating the vertical topping of the slabs, creating a solid set of overlapping layers, whose height adds up to more than 1 m. I have been repeatedly told that one of the recognized Kel Tadrart skills is precisely that of dry wall building. In the course of fieldwork I have become able to distinguish the carefully executed Kel Tadrart dry wall technique from that of less experienced hands (e.g. the policemen at the checkpoints) who set up stone shelters in the Acacus which may be interpreted as abandoned Kel Tadrart structures. This type of dwelling hut is normally characterized by a vegetal conical topping, the above mentioned roof.

I have further described Type 1 dwelling huts on the basis of other supplementary features, which complement the main body of the hut, plus the presence/absence of a roof. The ‘roof + stone courtyard’ type (1a) is by far the most recurrent, whilst the type ‘roof + plant material courtyard’ (1b) features only once in our sample. This kind of dwelling features a circular shaped fence that ‘protects’ the entrance, by providing an almost round shield in front of the dwelling hut. The size of the courtyard strictly reflects that of the hut. In addition, courtyards can be partially roofed as well. The Kel Tadrart use these courtyards as a kind of interface between the veritable private space (the main body of the hut) and the external space. It is not unusual, in fact, for a foreigner to be received within such spaces, especially when there is no *diwan* in the settlement. Naturally, courtyards can be used as multi-purpose annexes (storerooms, bedding area in hot summer nights,



Fig. 5.4 Type 1b dwelling hut in site IMH_07/1 (*photo* A. Monaco, used with permission from 'The Archaeological Mission in the Sahara', Sapienza University of Rome)



Fig. 5.5 Same hut as in 5.4 (*photo* A. Monaco, used with permission from 'The Archaeological Mission in the Sahara', Sapienza University of Rome)



Fig. 5.6 Type 2a dwelling hut in SUG_07/1 (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

etc.). Type 1c (roof + no courtyard) are quite rare, along with Type 1d, where both roof and courtyard are not present. The latter type may well refer to structures that are only occasionally in use. Worthy of note, several huts in secondary, and thus often deserted, settlements are characterized by such features.

Type 2 walls are built with bunches of *tullut* grass, leaning on vertical sticks, bound to these by cords and supported by further small branches whose aim is to keep this straw material densely packed. Modern plastic cords have partially replaced traditional goat’s hair ropes which, however, have been observed as well. The thick layer of *tullut* grass provides optimal protection for inhabitants. From my personal observation, I have found no clear evidence of the adoption of the rule reported by the Nicolaisens (1997: 417) in the Tassili n’Ajjjer regarding the use of nine vertical posts supporting nine horizontal sticks tied to the central pole. For that matter, Scarin (1937: 521) does not refer to any fixed number of these vertical posts in use by the Tuareg nomads for this study area. The main body of the hut is generally completed by a courtyard (Type 2a, roof + plant material courtyard), and in few cases, a very small ‘access’ has been recorded. This ‘access’ consists of a short (max 50 cm) elongation of the dwelling’s wall, to protect both sides of the entrance. Similarly, a few Type 2 dwelling are simply made using the main body of the structure, featuring no supplementary architectural element. I have not recorded any Type 2 dwelling without some kind of roof within the inhabited campsites, although this has been documented (if rarely) in abandoned campsites (see Chap. 6) (Fig. 5.7).



Fig. 5.7 Same hut of 5.6 (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

5.4.4 The Roof

Both dwelling types share the presence of the conical roof, supported by heavy central forked tamarisk pole, strongly buried into the ground (Fig. 5.8). The roof is made of *tullut* grass, fixed on sticks and bound by cords. The central pole has a diameter of up to 20 cm. The roof is positioned directly over the circular stone wall in the case of type 1 hut, yet some vertical posts may be necessary as well to secure it. Similarly, a larger and variable number of smaller forked sticks fixed around the central pole sustain the cover in type 2 huts. In both types the central pole is tied in its top to a number of sticks resting on the stone wall (type 1) or on the prong of vertical sticks (type 2).

5.4.5 Distribution of Type1 and 2 Dwelling Huts

Five Kel Tadrart sites feature type 2 huts only, while, conversely, three settlements are characterized by the sole use of type 1 (Table 5.7; Fig. 5.9). Four sites show a combination of both types, where the plant material huts generally exceed those of stone.

The Nicolaisens (1997) stress that at least some huts have two entrances (N and S) to allow the circulation of air. Kel Tadrart huts always feature a single entrance, whose orientation is generally south-facing. Scarin adds (1937: 522) that this is the



Fig. 5.8 View of the inner space of a Type 2 dwelling hut. Notice the central post supporting the roof (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

very type he observed among Tuareg nomads in our area. Every Kel Tadrart campsite features at least one hut provided with a courtyard. The latter can be partially covered or fully uncovered and it is built following the techniques already described for the two main types of huts, respectively for the wall in stone and in plant material courtyards. The covered part of the courtyard features one or two tamarisk poles that support the *tullut* roof. Yet, it can be noticed that among the type 2 huts, there is a slight prevalence of the sub-type featuring a courtyard (2a), rather than among the type 1 huts (Table 5.7; Fig. 5.9).

Courtyards outline a veritable extra space to be used to store water (either in skin bag or in bottles), tea and other foodstuffs. The courtyards are generally kept clean and tidy and may well serve as summer sleeping place when the hut is too hot. Further shelter from natural phenomena is obtained by setting the huts in physical connection with the rocky flanks of the valleys or with large boulders. These kinds of natural supports serve as architectural support for the dwellings as well, generating additional support for the roof and the perimeter wall. Table 5.8 clearly indicates that type 1 huts often (5 out of 12) lean directly against the rock. Conversely, type 2 huts are normally self-supporting.

Table 5.7 Distribution of dwelling hut types in the settlements

Site	1a Roof + stone courtyard	1b Roof + plant material courtyard	1c Roof (no roof no courtyard)	1d (no roof no courtyard)	Total type 1	2a Roof + plant material courtyard	2b Roof + small access	2c Roof (no courtyard)	Total type 2	Total
ALO_07/1	1		1							2
IMH_07/1		1				2				3
IMH_07/3	1									1
IMH_07/4						1				1
IMM_07/1						3				3
RAH_07/1	1		1	2						4
SUG_07/1	1					3				4
SUG_07/2	2									2
TES_07/1						7				7
TIB_07/1							1	1		2
TIH_07/1						1	1	1		3
Total	6	1	2	2	11	17	2	2	21	32

Fig. 5.9 Distribution of type 1 and 2 dwelling huts in Kel Tadrart main sites

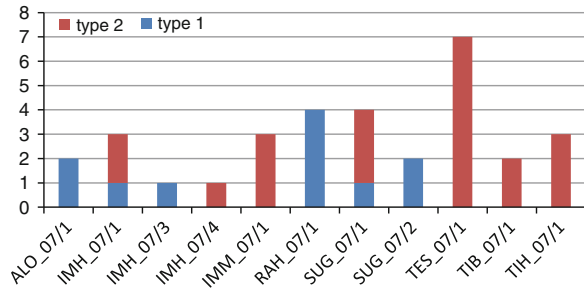


Table 5.8 Types of huts and natural supports

Type	Boulder	Flanks	None	Total
1a	2	0	3	5
1b	0	0	2	2
1c	1	0	1	2
1d	2	0	0	2
Total type 1	5	0	6	11
2a	0	0	17	17
2b	1	0	1	2
2c	0	1	1	2
Total type 2	1	1	19	21
Total	6	1	25	32

5.4.6 Shapes and Sizes

Rounded hut shapes are the most common, with just two huts featuring an irregular profile and one being square shaped. However, the size of the dwellings seems to be more varied (Table 5.9).

Kel Tadrart dwelling huts can be classified by their size (Fig. 5.10). Beside a single case of very large huts (class 4), few remarkably big floor plans have been recorded (class 3). The bulk of the sample fall into class 1 and 2, which fits well with the average sizes described by Scarin (1937: 522) more than 80 years ago. Type 1 huts include larger structures than those of type 2 (Fig. 5.11). In general, if it can be argued that some in some sites there is a preference for larger or smaller huts (Fig. 5.12). The site RAH_07/1 features, for instance largest huts, while others, like SUG_07/2 stands at the opposite extreme. Yet, both of the sites have only stone huts, demonstrating the difficulties of a direct functional approach.

5.4.7 The Kitchen

In the Kel Tadrart society the 'kitchen' cannot be merely considered as the place where the hearth is set, normally containing three round stones to support the

Table 5.9 Shapes and sizes of Kel Tadrart dwelling huts

Site	Id_fixture	Type	Shape	Size (m ²)	Diam./sides (m)
TIH_07/1	11	2a	Round	21.2	5.2
TIH_07/1	12	2c	Round	33.2	6.5
TIH_07/1	18	2b	Round	19.6	5
SUG_07/1	44	2a	Round	18.1	4.8
SUG_07/1	45	1a	Round	17.3	4.7
SUG_07/1	50	2a	Round	28.3	6
SUG_07/1	51	2a	Round	13.8	4.2
SUG_07/2	60	1a	Round	18.8	4.9
SUG_07/2	63	1a	Round	13.8	4.2
IMM_07/1	73	2a	Round	28.3	6
IMM_07/1	74	2a	Round	28.3	6
TES_07/1	79	2a	Round	38.5	7
TES_07/1	84	2a	Round	36.3	6.8
TES_07/1	85	2a	Round	29.2	6.1
TES_07/1	86	2a	Round	28.3	6
TES_07/1	87	2a	Round	19.6	5
TES_07/1	89	2a	Irregular	28.3	5.3 × 5.4
TES_07/1	92	2a	Round	28.3	6
RAH_07/1	96	1a	Round	30.2	6.2
RAH_07/1	101	1d	Round	38.5	7
RAH_07/1	102	1d	Round	38.5	7
RAH_07/1	103	1c	Round	59.4	8.7
ALO_07/1	106	1a	Irregular	42	7 × 6
ALO_07/1	107	1c	Round	19.6	5
IMH_07/1	117	2a	Round	21.2	5,2
IMM_07/1	119	2a	Round	28.3	6
IMH_07/1	121	1b	Round	21.2	5.2
IMH_07/3	135	1a	Round	23.7	5.5
TIB_07/1	141	2b	Round	19.6	5
TIB_07/1	143	2c	Squared	16	0
IMH_07/4	144	2a	Round	23.7	5.5
IMH_07/1	149	2a	Round	19.6	5

Fig. 5.10 Histogram classing dwelling huts' surface areas, courtyards not included

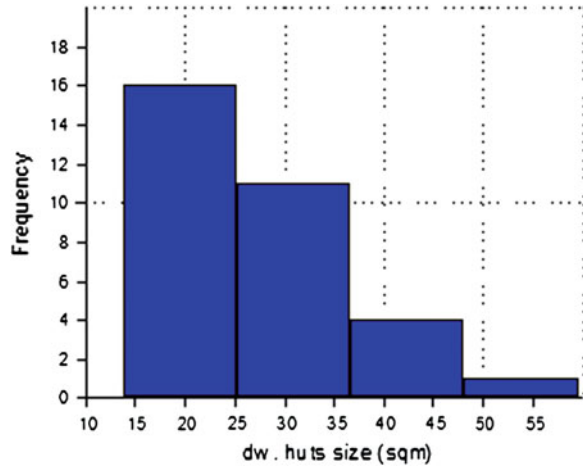
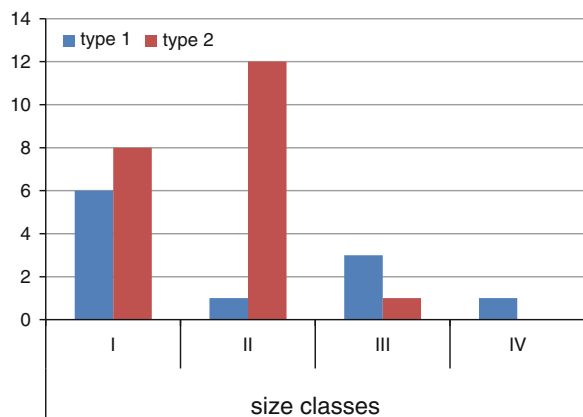


Fig. 5.11 Size classes (I-IV) versus types of dwelling huts (1-2)



stove. The kitchen may play often the role of shelter for the children among the Kel Tadrart of the Acacus. Notably, the kitchen seems to be a peculiar feature of the contemporary Kel Tadrart, as no mention of it can be found in the already cited publications about Tuareg architecture in the Fazzan.

In the Kel Tadrart sites, the stone kitchens are twice as frequent as those of plant material and the formal ratio between type 1 and 2 is symmetrically opposite to that recorded for the dwelling huts (Table 5.10; Fig. 5.13). The need of protection from accidental fires obviously plays some role in this choice. Four campsites feature two kitchens. This is related to the presence of one adult (normally married adult son) who chooses to live separately from their parents yet inhabit in the same physical location.

Kel Tadrart kitchens are generally connected to the surrounding natural supports (Table 5.11). In this case, we can advocate an activity-related requirement of supplementary shield, apparently regardless of the building material of the dwellings.

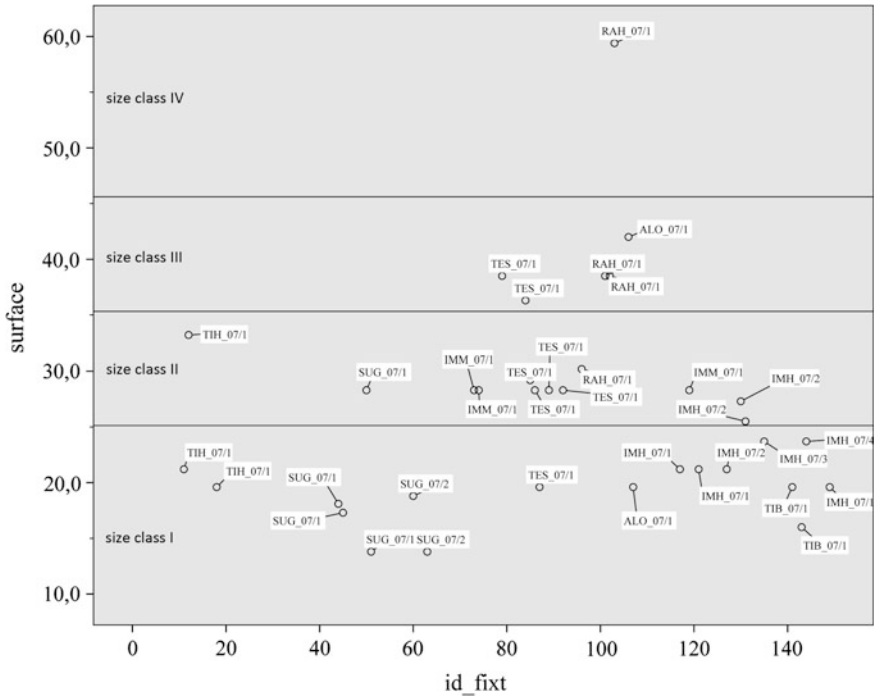


Fig. 5.12 Distribution of dwelling huts in four (I–IV) size classes. In the x axis (‘Id_fixt’) values represents the identification number given to every single dwelling hut

A factor that differentiates kitchens from huts is their shape, featuring larger variability. The half-round shape appears determined by the choice to build close to the rock, but the squared shape also occurs, along with some irregular shapes (Fig. 5.14).

Kitchens are also generally smaller than the huts, most of these structural features being no larger than 25 m². Classification of kitchens by size appears quite similar to that proposed for the huts (Fig. 5.15). Noticeably, an outstandingly large structure has been recorded in the site SUG_07/2. This is exceptional indeed, and it is surely due to unknown contingencies. In fact, the mean surface of the kitchen is 20.7 m², whilst for the dwelling huts is 26.4 (Table 5.12).

5.4.8 The Diwan

This dwelling is specifically built for social moments in the case of group meetings or festivities, and it has been the place where I have spent most of my time with Kel Tadrart. The *diwans* are also the place for hosting guests during the night. From an architectural perspective the *diwan* fully resembles the dwelling hut. The

Table 5.10 Types of kitchen in Kel Tadrart Main sites

Site	1a Roof + stone courtyard	1b Roof + plant material courtyard	1c Roof (no courtyard)	1d (no roof no courtyard)	2a Roof + plant material courtyard	2b Roof + small access	2c Roof (no courtyard)	Total
ALO_07/1			1	1				2
IMH_07/1			1					1
IMH_07/3		1						1
IMH_07/4					1			1
IMM_07/1			2					2
RAH_07/1				1				1
SUG_07/1			1	1				2
SUG_07/2			1 ^a					1
TES_07/1						1	1	2
TIB_07/1							1	1
TIH_07/1						1		1
Total		1	6	3	1	2	2	15

The ^a marks the case of one hut characterized by both stone and grass wall, possibly a further enlargement of the main stone structure

Fig. 5.13 Distribution of kitchen types (1 and 2) in Kel Tadrart sites

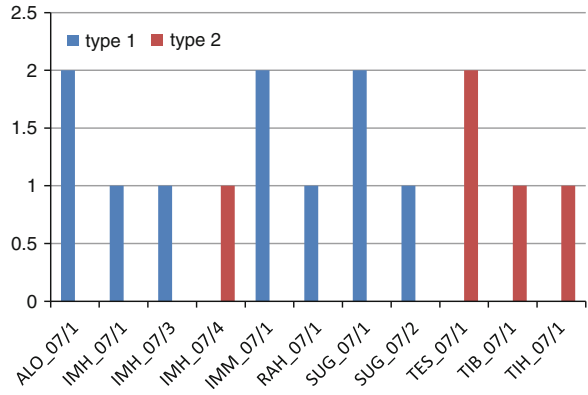


Table 5.11 Types of kitchens and natural supports

Type	Boulder	Flanks	None	Total
1a	0	0	0	0
1b	0	1	0	1
1c	0	3	3	6
1d	1	1	1	3
Total type 1	1	5	5	10
2a	0	1	0	1
2b	0	1	1	2
2c	0	0	2	2
Total type 2	0	2	3	5
Total	1	7	8	15

Fig. 5.14 Variability in kitchen shape

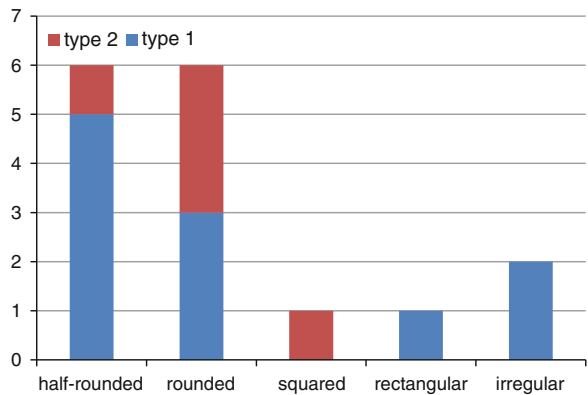


Fig. 5.15 Histogram classing kitchens' surface areas

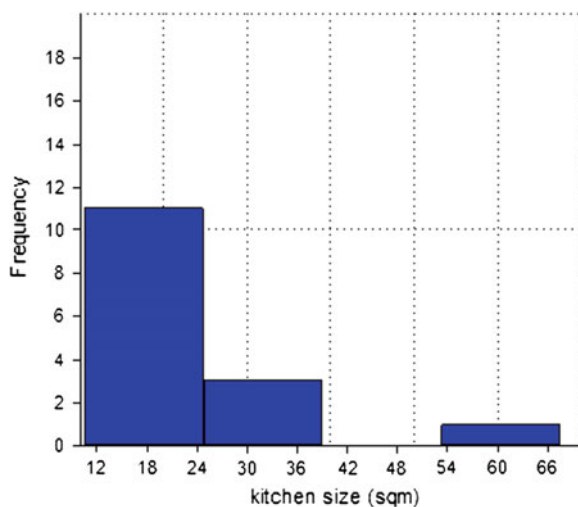


Table 5.12 Kitchen surfaces in Kel Tadrart main sites

ID site	ID_fixture	Surface (m ²)
SUG_07/1	55	10.5
RAH_07/1	95	12.0
ALO_07/1	111	12.0
ALO_07/1	114	12.0
IMM_07/1	120	12.0
SUG_07/1	47	13.2
TES_07/1	90	13.5
IMM_07/1	68	14.0
IMH_07/3	136	16.6
TIB_07/1	140	19.6
IMH_07/1	115	22.1
IMH_07/4	145	25.0
TIH_07/1	16	28.3
TES_07/1	83	38.5
SUG_07/2	64	67.5

majority of Kel Tadrart settlements herein considered are provided with a *diwan* (Table 5.5). Being no more than one in each site, a simple table can condense the related data (Table 5.13).

The eight *diwans* of the sample are almost evenly divided into the two main type classes of Kel Tadrart huts, namely those of stone (type 1) and plant material

Table 5.13 Main facts about *diwans* in Kel Tadrart main sites

Site	Type	Courtyard's coverage	Natural support	Shape	Entrance orientation	Size (m ²)
RAH_07/1	1a Roof + stone courtyard	None	None	Round	S	19.6
SUG_07/2	1c Roof (no courtyard)		None	Squared	SE	36.0
IMM_07/1	2c Roof (no courtyard)		None	Rectang.	S	50.0
TES_07/1	2a Roof + plant material courtyard	Partial	None	Round	S	33.2
IMH_07/1	1a Roof + stone courtyard	None	None	Round	SE	39.6
TIH_07/1	2a Roof + plant material courtyard	None	None	Round	W	28.3
IMH_07/3	1a Roof + stone courtyard	Partial	None	Round	S	35.2
IMH_07/4	2b Roof + small access		Flanks	Round	SE	19.6

(type 2). In fact, the case of SUG_07/2 is interesting as it features a structure characterized by the use of both stones and plant material for the construction of the perimeter wall. Likewise, the use of a courtyard seems to be a constant features for both of the types of *diwan* recorded, although with a variable degree in roof coverage, the latter being only partially roofed or fully open. Finally, only the *diwan* of the site IMH_07/4 has been built in physical connection with the rocky flanks. Most of the *diwans* show a round shape and a south facing entrance. The exceptional rectangular shape of the *diwan* in IMM_07/1 goes along with its outstanding size, while that in the site SUG_07/2 features a squared shape but average size. At a glimpse, the average size of these *diwans* add up to 33.4 m², sensibly larger than that of the normal huts (26.4 m²) or kitchens (20.7 m²).

5.4.9 The Structures in Comparative Perspective: Indications of Wealth?

Figure 5.16 summarizes the trends that have been shown in the previous paragraphs regarding the characteristics of huts, kitchens, and *diwans*. Although the Kel Tadrart society is weakly ranked, some differences in wealth (i.e. the size of stock) do occur (Chap. 4). It is interesting to notice that the wealthiest households (Table 5.14) feature mostly plant material huts (type 2, 3 cases) or both types of hut (1 case).

In general, it is common to associate mobility with light and portable structures. This sample challenges the typical archaeological perspective, where sedentism is

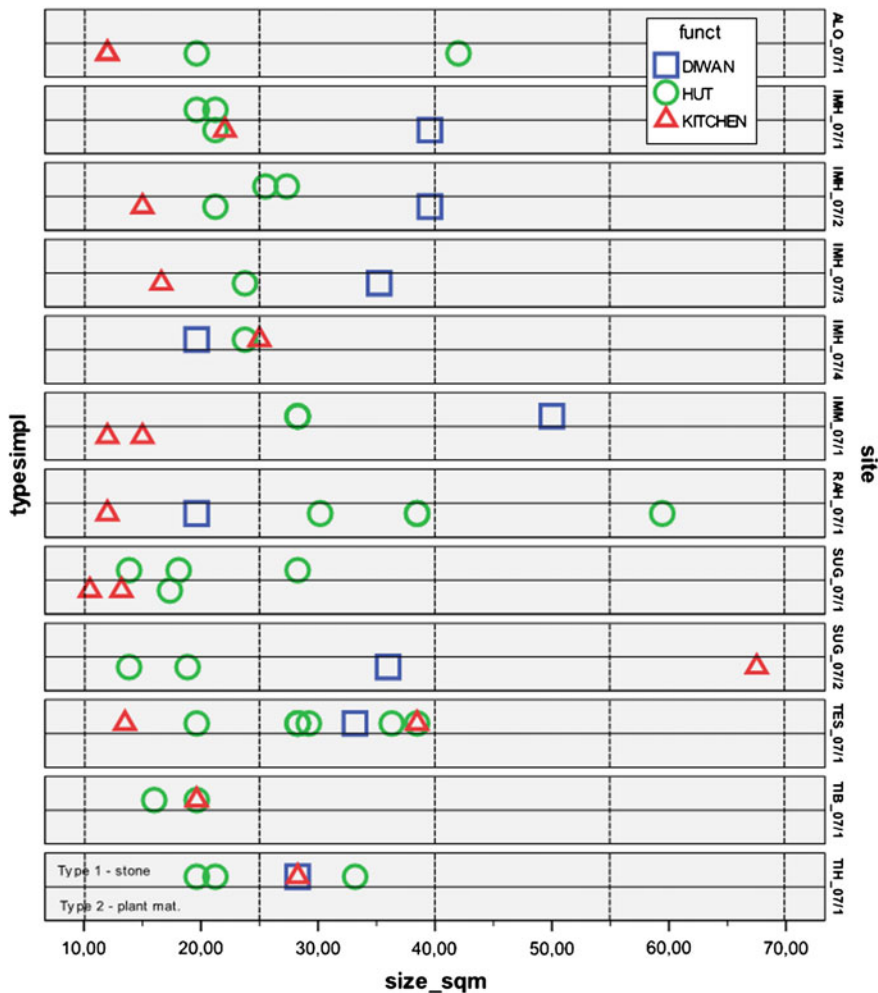


Fig. 5.16 Comparative chart of domestic fixtures, their types and sizes. All *diwans* (blue squares), dwelling huts (green circles), and kitchens (red triangles) recorded are displayed and sorted according to the types (1–2)

often associated with heavy structures and mobility with lighter ones. The only two fully sedentary households, namely IMM_07/1 and TES_07/1 features plant material structures – with the exception of the two kitchens in IMM_07/1. Following an historical perspective, the use of plant material, namely *tullut* grass, has been already identified as the most traditional for the study area and was also reported by the colonial age accounts. Type 2 (vegetal) dwellings are, in general more standardized and are concentrated in size class II. This is likely related to the existence of an original prototype, ‘shared’ by the member of the groups. Conversely, the use of stone (type 1) seems to date back to more recent times, and

Table 5.14 Average size and occurrence of type of dwellings per site versus size of stock and degree of mobility

Site	Average size of huts (m ²)	Type of huts	Size of stock (class)	Mobility
SUG_07/1	16.87	Both	1	Opportunistic
TIB_07/1	18.41	Type 2 (plant mat.)	2	Opportunistic
ALO_07/1	21.4	Type 1 (stone)	1	Transhumant
IMH_07/4	22.79	Type 2 (plant mat.)	1	Opportunistic
IMH_07/1	24.74	Both	1	Opportunistic
IMH_07/3	25.2	Type 1 (stone)	1	n.a.
TIH_07/1	26.1	Type 2 (plant mat.)	3	Opportunistic
IMM_07/1	26.96	Both	2	Sedentary
TES_07/1	29.35	Type 2 (plant mat.)	2	Sedentary
RAH_07/1	33.02	Type 1 (stone)	1	Opportunistic
SUG_07/2	34.05	Both	1	Opportunistic

appears less related to an original template. Rather, influence from the neighbouring oases of Awaynat and Ghat, where in the last two decades new model square-shaped houses have largely adopted, might have played a role in the diffusion of this type in the Tadrart Acacus as well. The role of such ‘new’ types of dwelling must not be underestimated, given the intervention of the government to stimulate the sedentarization of the Kel Tadrart and other mobile Tuareg groups of the area. The supply of new houses may have influenced the adoption of rectilinear structures, once limited to the sedentary people of the oases. The adoption of a very large, square shaped type 2 *diwan* in the site IMM_07/1 may well exemplify such a process. The household used the ‘traditional’ material to build an outstandingly spacious structure, showing an unprecedented degree of ostentatious hospitality for the Kel Tadrart. In this case, it can be clearly connected to the quasi-formal role that the chief of the household plays for the Libyan government, controlling the state of the well of Eminanneia, testifying, in turn, to his full sedentism. Thus, the use of grass structures, even by sedentary households, is more a testament to the endurance of traditional forms than to issues of mobility.

5.5 Activity Areas

5.5.1 *The Discards: Ashes, Charcoals, and Litter*

The Kel Tadrart pay much attention to the disposal of organic raw items. The need for hygiene is an elementary requirement within Kel Tadrart sites. For example all meal leftovers are used to feed livestock. It is thus almost impossible to find any remains of food throughout these settlements, but for very occasional bones displaced by the dogs.

Fig. 5.17 Occurrence of ash, charcoal and generic dumps in Kel Tadrart main sites

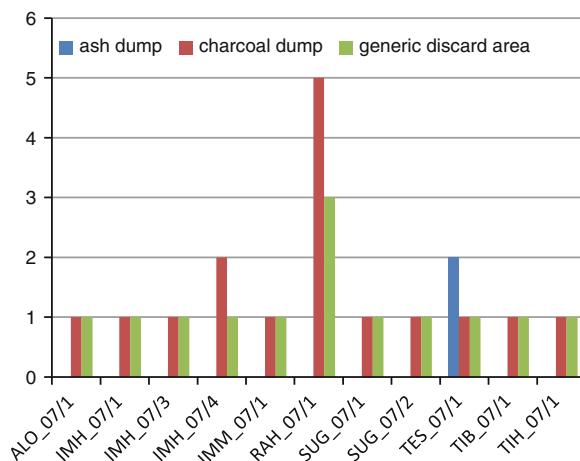


Table 5.15 Total size of dumping areas versus mobility and life time of settlements

Site	Total surface of dump areas (m ²)	Mobility	Life time of the settlement
SUG_07/1	12	Opportunistic	7
ALO_07/1	18	Transhumant	3
IMH_07/4	18	Opportunistic	2
IMH_07/3	21	n.a.	n.a.
IMM_07/1	25	Sedentary	15
TIB_07/1	32.5	Opportunistic	4
TIH_07/1	35	Opportunistic	15
IMH_07/1	38	Opportunistic	2.5
SUG_07/2	49	Opportunistic	Always
IMH_07/2	59.22	Opportunistic	n.a.
TES_07/1	59.66	Sedentary	Always
RAH_07/1	76.72	Opportunistic	10

Figure 5.17 shows that some sites feature a large number of spots for refuse disposal. On the other hand, every site is provided with at least one discard area, where charcoal, ash and other items are dumped. Ash dumps are rare, since these are the leftover of domestic fires, after the collection of reusable charcoal lumps. Wind is likely to disperse them in a very short time. Beside the remains of the combustion, the refuse largely reflects the recent introduction of metal and plastic items: cans, shoes, packaging, and batteries.

The number of dumping grounds can be connected with their extent (Table 5.15). The size of all these activity areas have been recorded, but this data can be considered a partial representation of the time/frequency of use, insofar I could not perform test excavation on every features to assess the real thickness of

Table 5.16 Frequency of tanks and wood piles in Kel Tadrart main sites

Site	Tanks	Wood piles	Total
ALO_07/1	0	1	1
IMH_07/1	1	1	2
IMH_07/3	2	2	4
IMH_07/4	2	0	2
IMM_07/1	1	1	2
RAH_07/1	1	2	3
SUG_07/1	0	2	2
SUG_07/2	1	0	1
TES_07/1	3	2	5
TIB_07/1	2	1	3
TIH_07/1	0	1	1
Total	13	13	26

the ‘deposit’. Given this, the size of charcoal and ash dumps, and that of the discard areas, must be cautiously taken as an indicator of their use. After that caveat, there is some correspondence between the total surface of dumps with the age of the settlement. In fact the longer lasting camps feature larger quantity of refuse (Table 5.15). Conversely, the association between the mobility and the amount of discarded ashes, charcoals or other items, shows less definite results. However, it is worth noting that the only one transhumant household (in ALO_07/1) features a low dump size, and also that the only two sedentary households (IMM_07/1 and TES_07/1) do not show similar sizes.

5.5.2 Other Activity Areas

Fuel reserves are another widespread feature recorded within the Kel Tadrart campsites. Although these do not represent veritable ‘activity areas’, wood and fuel tanks are an ubiquitous feature of the Kel Tadrart campsites. Tanks have to be refilled and are moved frequently to the oasis of Awaynat. Similarly, wood can be collected and accumulated on the basis of contingent needs. Table 5.16 summarizes the occurrence of fuel tanks and wood piles in the Kel Tadrart campsites. The relative size of both types of activity areas seems not relevant given the nature of these activity areas.

Table 5.17 Livestock enclosures recorded at Kel Tadrart main sites

Site	O/C	Young O/C	Chicken	Total
ALO_07/1	0	6	0	6
IMH_07/1	0	2	0	2
IMH_07/3	1	5	0	6
IMH_07/4	0	4	1	5
IMM_07/1	0	2	1	3
RAH_07/1	0	4	0	4
SUG_07/1	0	2	0	2
SUG_07/2	0	3	0	3
TES_07/1	0	2	0	2
TIB_07/1	1	1	0	2
TIH_07/1	1	2	1	4
Total	3	33	3	39

5.6 Livestock Fixtures and Dung Areas

One of the most striking gaps of data with regards to the Tuareg world concerns the in-site spatial management of livestock, even if many pages have been written about stock breeding, techniques of *élevage*, and the whole set of items related at any level with those activities (Lhote 1955; Barral 1967; Nicolaisen 1963; Bernus 1977; Nicolaisen and Nicolaisen 1997—see also papers in Monod 1975, and in Equipe Ecologie 1979). Indeed, very little is known about the structures used to keep the domestic animals in the campsites.

Only rarely have the Kel Tadrart of the Acacus built large corrals aimed at enclosing the adult stock during the night. As a result, expansive fenced areas are rare in the Tadrart Acacus. On the other hand, the small pens for young stock are among the most common fixtures to be found throughout the massif. Likewise, large areas of ovicaprid droppings can be easily found in the campsites, indicating the use of specific areas for the stock keeping, in absence of any other physical elements.

A total of 39 livestock fixtures have been counted (Table 5.17), mainly (85 %) composed by young sheep and goats pens. Only three (7 %) corrals for adult ovicaprids have been recorded, along with four (8 %) chicken houses. Young

Table 5.18 Adult stock fences in Kel Tadrart main sites, sorted by 'size'

site	ID	Type	Environment	Shape	Size (sq2)
TIH_07/1	52	Barbed wire	Flanks	Half-rounded	32
TIB_07/1	103	Barbed wire	None	Rounded	50.2
IMH_07/3	90	Reused material	Cave	Irregular	60



Fig. 5.18 Large cave used as corral at IMH_07/3. Notice the ovicaprid excrement near the entrance (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

ovicaprines’ facilities are to be found within every campsite, while the rest are less common.

5.6.1 Adult Stock Corrals

Being normally kept along the cliffs, partially protected by the natural overhangs of the rocky flanks, proper corrals are very rare in the Tadrart Acacus. However, three large fences have been recorded in the course of the field survey (Table 5.18). These are different in type, two consisting of a veritable barbed wire fences, and the other consisting of a closed off natural cave in IMH_07/3 closed by flattened oil tanks and other reused metal panels (Fig. 5.18). The use of barbed wire is surely a recent introduction, related to the increasing availability in Awaynat of ‘new’ materials.

The emergence of similar structures can be tentatively related to the quantity of stock owned. In fact, the household of TIH_07/1 is the wealthiest in the whole massif featuring 230 units of small livestock, followed by TIB_07/1, having 130 sheep/goats. The other household (IMH_07/3) providing a corral for adult stock features herds of average 90 units (see Chap. 3).

Table 5.19 Characteristics of young stock pens in Kel Tadrart main sites

Site	ID	Type	Natural supports	Shape	Size (m ²)	Size class	Type (simpl.)
SUG_07/1	59	1c Stone uncovered	Boulder	H-rounded	1.5	I	1
ALO_07/1	81	1c Stone uncovered	None	Rounded	1.8	I	1
IMH_07/3	91	1c Stone uncovered	Flanks	Rounded	1.8	I	1
IMH_07/3	92	1c Stone uncovered	Flanks	Rounded	1.8	I	1
IMH_07/3	93	1c Stone uncovered	Flanks	Rounded	1.8	I	1
IMH_07/4	106	1b Stone covered by stone slabs	Flanks	Rounded	1.8	I	1
RAH_07/1	73	1c Stone uncovered	Flanks	Rounded	1.8	I	1
IMH_07/4	105	1c Stone uncovered	Flanks	Rounded	2.3	I	1
SUG_07/1	60	1c Stone uncovered	Boulder	Rounded	2.4	I	1
ALO_07/1	80	1c Stone uncovered	Boulder	Rounded	3.1	I	1
IMM_07/1	67	1c Stone uncovered	Flanks	Rounded	3.1	I	1
RAH_07/1	70	1c Stone uncovered	Flanks	Subrounded	3.1	I	1
RAH_07/1	71	1c Stone uncovered	Flanks	Rounded	3.1	I	1
RAH_07/1	72	1c Stone uncovered	Flanks	Rounded	3.1	I	1
TES_07/1	68	1c Stone uncovered	Shelter	Rounded	3.1	I	1
TES_07/1	69	1c Stone uncovered	Shelter	Rounded	3.1	I	1
IMH_07/3	100	1b Stone covered by stone slabs	Shelter	H-rounded	6	II	1
ALO_07/1	76	1a Stone cov by tullut grass	None	Rounded	7.1	II	1
ALO_07/1	77	1a Stone cov by tullut grass	None	Rounded	7.1	II	1
ALO_07/1	78	1c Stone uncovered	Boulder	Rounded	7.1	II	1
IMM_07/1	66	1c Stone uncovered	Flanks	Rounded	7.1	II	1
SUG_07/2	63	6 Tanks	Niche	Irregular	10	III	6
SUG_07/2	61	1c Stone uncovered	Boulder	Rounded	10.2	III	1
ALO_07/1	79	1b Stone covered by stone slabs	Boulder	Rounded	12.6	III	1
TIB_07/1	102	6 Tanks	None	Rounded	12.6	III	6
IMH_07/1	96	1c Stone uncovered	Niche	Irregular	15	IV	1
IMH_07/4	107	6 Tanks	Flanks	H-rounded	15	IV	6
IMH_07/3	101	1c Stone uncovered	Shelter	H-rounded	18	IV	1
TIH_07/1	55	5 Barbed wires	Flanks	H-rounded	18	IV	5
SUG_07/2	62	4 Tabarakkat (vertical posts) + tanks	Shelter	H-rounded	21	IV	4
IMH_07/4	104	6 Tanks	Niche	Irregular	35	V	6
TIH_07/1	53	5 Barbed wires	Flanks	H-rounded	50	V	5

Fig. 5.19 The prototype of Kel Tadrart young stock pen, recorded at site LAL_09/1 (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)



5.6.2 Young Stock Pens

More than thirty (33) structures for young sheep and goats have been recorded in the inhabited sites of the Tadrart Acacus. Small pens protect the livestock from cold wind and sun exposure, and prevent unwanted suckling by kid sheep and goats. Young stock pens are different in type and size, as illustrated by the Table 5.19. Actually, the small *adror* (“pen” in Tamacheq), made of dry stone slabs, is surely the most widespread evidence of the human presence in the whole Tadrart Acacus massif (Fig. 5.19), and it is indicated as ‘type 1’ in Table 5.19. It is quick to set up, and can be built during a short term movement if needed, whilst other types are rarer and require more labor.

This type of feature can be covered by *tullut* grass (type 1a), stone slabs (type 1b), or uncovered (type 1c). No evidence of pens made with tamarisk branches (type 2), observed in the surroundings of the Tadrart Acacus, or samples made of *tullut* grass and sticks (type 3), have been recorded within the Kel Tadrart main sites. Conversely, type 4, flattened tanks supported by acacia sticks, barbed wire fences (type 5) and flattened tanks, or petrol barrels (type 6) occur in few cases.

The difference in types seems to be reflected in the distribution of size classes. A veritable link can be traced between the type 1 (a, b, c) and the smallest two size classes (I–II). Table 5.19 exemplifies this, showing that the majority of type 1 pens is actually placed in the I (67 %) and in the II (18 %) size classes, where no other types of livestock features have been recorded. Consequently, larger structures are connected to the other types. It seems that a genuine prototype can be envisaged in the type 1 structures, given their high incidence. Among pens of III–V class size (see Table 5.19), we can record the use of flattened tanks, adopted to close a natural niche opening onto the rocky cliffs. An unusual fixture made of wooden vertical posts supporting flattened tanks has been noticed in SUG_07/2. However, the most

Table 5.20 Frequency and types of young stock pens/corrals in Kel Tadrart main sites

Site	1a—Stone covered by tullut	1b—Stone covered by stone slabs	1c—Stone uncovered	Type 4—wooden posts	Type 5—barbed wire	6 Flattened tanks	Total
ALO_07/1	2	1	3	0	0	0	6
IMH_07/1	0	0	2	0	0	0	2
IMH_07/3	0	1	4	0	0	0	5
IMH_07/4	0	1	1	0	0	2	4
IMM_07/1	0	0	2	0	0	0	2
RAH_07/1	0	0	4	0	0	0	4
SUG_07/1	0	0	2	0	0	0	2
SUG_07/2	0	0	1	1	0	1	3
TES_07/1	0	0	2	0	0	0	2
TIB_07/1	0	0	0	0	0	1	1
TIH_07/1	0	0	0	0	2	0	2
Total	2	3	21	1	2	4	33

Table 5.21 Shape of young stock pens/corrals in Kel Tadrart main sites

	Frequency	Percentage
Rounded	23	67.6
Subrounded	1	2.9
Half rounded	7	20.6
Irregular	3	8.8
Total	34	100.0

Table 5.22 Natural supports for young stock pens/corrals in Kel Tadrart main sites

	Frequency	Percentage	Cumulative percentage
Boulder	6	17.6	
Flanks	16	47.1	88.2
Niche	3	8.8	
Shelter	5	14.7	
None	4	11.8	11.8
Total	34	100.0	100.0

striking features are situated in TIH_07/1. It is surely of interest to notice that the largest structure for young stock is located in TIH_07/1, where another similar facility (N. 55) has been recorded as well. In TIH_07/1, I have already discussed in the previous paragraph the relevance of such a structure for adult heads. In the case of the structure N. 53 and N: 55 (TIH_07/1), I add that the significance lies not only in their size, but also in their type. The use of barbed wire fence does not provide any sheltering from sun or wind for kid stock. The use of these feature is quite exceptional, and it contrasts with the above statement regarding the function of pens for young livestock. Likewise, we can stress that the largest structure has been recorded in the site TIH_07/1, occupied by the wealthiest household.

Only two sites do not feature any type 1 structures, TIB_07/1 and TIH_07/1, namely those adopting barbed wire fence for adult (both) and young (only TIH_07/1) stock pens (Table 5.20). The case of TIH_07/1, is therefore outstanding insofar it shows a deliberate and exclusive use of 'new' materials for livestock facilities.

The shape of corrals and pens is mostly rounded, with some half rounded specimens. Irregular shapes are related to the exploitation of natural niches on the

Table 5.23 Chicken houses at Kel Tadrart sites

Site	ID feature	Type	Natural supports	Shape	Size (m ²)
TIH_07/1	54	5 Barbed wires	Flanks	Half-rounded	4
IMM_07/1	65	3a Tullut uncovered	None	Subrectangular	20
IMH_07/2	99	4 Tabarakat (vertical posts)	None	Rectangular	3



Fig. 5.20 Dung area at IMH_07/3 (photo A. Monaco, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

cliffs. No squared shapes have been recorded to date (Table 5.21). On the other hand, the natural supports seem to play an important role in the choice of the location of livestock fixtures (Table 5.22). Only four structures are actually set not in physical connection with some element of the landscape. The use of adjacent rocky walls saves on building materials and construction time as well.

5.6.3 Chicken Houses

Three households are endowed with structures for chicken raising. Poultry has been recently introduced in the area, being not mentioned in the reports from the colonial age (Gigliarelli 1932; Scarin 1937). The three structures recorded are different in shape and size, and feature three different types as well. The unevenness of these facilities is likely to be related to the relatively new adoption of chicken breeding (Table 5.23).

5.6.4 Dung Areas

The areas where prolonged and repeated stock keeping generated concentrations of ovicaprid droppings are among the most visible features of the Kel Tadrart campsites (Fig. 5.20). Often mixed with some fodder and other occasional small waste, these areas are the distinctive elements of any pastoral landscape.

Table 5.24 Natural supports and size of dropping areas in Kel Tadrart main sites

Site	ID_feature	Environment	Size (m ²)
ALO_07/1	95	None	390 ^a
IMH_07/1	62	Flanks	285
IMH_07/3	61	Flanks	285
IMH_07/4	87	Flanks	270
IMM_07/1	21	Flanks	160
RAH_07/1	31	Shelter	154
SUG_07/1	16	Flanks	15
SUG_07/2	19	Flanks	192
TES_07/1	28	Shelter	360
TIB_07/1	81	Shelter	253
TIH_07/1	17	Flanks	382 (450)

^a Refers to the only case where the dung area was not related to any natural support

Table 5.25 Frequency and percentage of natural supports for dropping areas in Kel Tadrart main sites

	Frequency	Percentage
Flanks	7	64
Shelter	3	27
None	1	9
Total	11	100.0

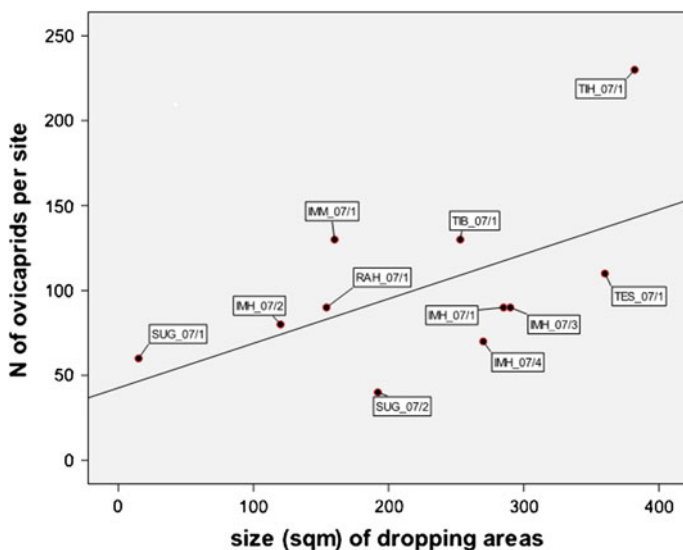


Fig. 5.21 Scatterplot between number of ovicaprids per site and size of dung areas

In the Kel Tadrart settlements, generally resting on yellow sand, these dark spots are extremely recognizable. According Table 5.24, every campsites is characterized by one dung area.

The case of the site ALO_07/1 is anomalous insofar it is the only location where the geomorphology of the terrain features no cliffs nor flanks. As a result, the droppings are diffused over a very large surface, with visibly minor density (Table 5.25).

The size of these dispersions of dung can be correlated with a number of factors. Obviously the time factor is crucial in this discussion, in terms of both the duration of settlement and its intensity (depending on the degree of mobility). Furthermore, the ‘size of dropping areas’ provides an indication of the surface covered by dung in mere horizontal scale. Naturally, thickness of dung layers may vary and thus affect the real quantity of excrement at any site. Thus, the size of dropping areas is a rough indicator of livestock presence. The chart in Fig. 5.21 shows that there is a link between the size of herds and that of dung areas. It is quite reasonable indeed to establish a relationship between the quantity of dung and the number of sheep and goat at a given site, with the above mentioned caveats. However, this calls into question the durability of dung layers over time. This issue will be further explored in the following chapter.

5.7 Layout and Space

Some kind of patterning in spatial distribution of features can be isolated (see online Slides. Married sons can shift away from the original settlement but stay in

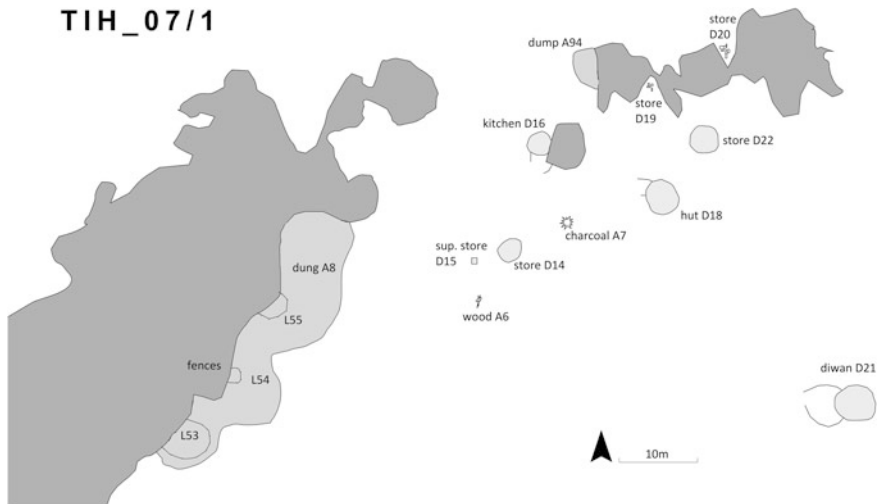


Fig. 5.22 Site TIH_07/1. Kitchen, huts and stores, and the *diwan* are set onto three virtual parallel lines or layers. Livestock area is located at the west of the domestic features

the surrounding of the camp, introducing an element of spatial seclusion, yet preventing any ultimate splitting from the main camp. The overall area occupied by a single household camp is extremely large. Structures can be dispersed over huge surfaces, adding up to 2 ha, not including the young married sons who relocate slightly away. This generates patchy and loose scatters of fixtures, where number of small dispersed items or artefacts are generally very low. In fact, several 'empty' areas can be recognized within campsites. Furthermore, in 9 settlements out of 11 the habitation area is spatially separated from that of livestock. Site TIH_07/1 (Fig. 5.22) exemplifies this very well, showing how pens for young livestock and dung areas are located at a certain distance from the huts. No matter what the degree of clustering is, physical separation between livestock and inhabitants occurs in the majority of sites. Furthermore, if we turn our attention to the three settlements where livestock and dwelling facilities are not physically separated, we will find that one of those IMH_07/3 is located in *wadi* Imha, where this household shares the same spot with IMH_07/1. In this case, we can hypothesize that the choice of living together overrides the 'normal' dispersion of Kel Tadrart households.

Taking into account only domestic space, we shall consider the position of the fixtures. Kel Tadrart campsites are generally of a 'crescent-like' shape, constituted by one or more parallel 'alignments' of domestic structures. Three different layers can be recognized, arranged into linear spaces, in principle not too dissimilarly from Yellen's ring model (1977: 125–131). In his research among the Bushmen, John Yellen noticed the the !Kung camps were characterized by concentric circles denoting zones associated with different activities. Being set on rocky flanks, Kel Tadrart sites develop from the cliff to the *wadi*, resulting in irregular lines of features gradually moving away from the rocky flanks. The first layer refers to the kitchen and related stores and discard areas, often set in physical contact with cliffs, in some of cases set at the centre of sites. The second is the core area of the campsite, constituted by dwelling huts, and eventually stores and small dump areas related to fire use. The third 'line' is constituted by the *diwan*, often set in advanced position than the rest of the huts. In fact, *diwans* are generally set 'outside' the very core areas of the settlements, constituted by living huts. This spatial seclusion of the *diwan* is probably related to the concept of privacy that is extremely valued by every household in the Kel Tadrart society. The first line, which includes the kitchen, may be cautiously identified as the women's space, while the *diwan*, set onto the third line, corresponds to male domain. The second line or arrangement may well correspond to the 'family' (or married couple) space in its broader sense. In particular, the distribution in rows finds counterparts in other pastoral settlements (Smith 1980; Cribb 1991), where this rule seems to apply. The arrangement in row(s) is likely the most suited pattern for all the tasks related to animal husbandry and in the case of the Kel Tadrart it applies to sedentary households as well.

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Chapter 6

The Abandoned Campsites in the Tadrart Acacus

6.1 The Abandonment of Settlements

This chapter is concerned with the abandonment of settlements. I will not focus upon the abandonment of ‘regions’ nor upon the abandonment of individual structures within an occupied site. Rather, I shall account for sites where material remains testify to relatively recent occupation, at the scale of decades rather than centuries. Abandonment is an ongoing process for all socio-economic groups. As Schiffer noted (1987: 89–98), abandonment processes involve a range of behaviours, such as curation/caching of items, partial or total dismantling of structures, and interruption of disposal patterns. Among mobile herders, abandonment is often logistically included in the normal seasonal cycle. The opportunistic ecological adaptation of the Kel Tadrart usually prevents regular patterns of seasonal displacement, implying that Kel Tadrart settlements could be subject to irregular abandonments, whether final or temporary, short or long.

6.2 The Surveys

6.2.1 *The Fieldworks in 2003 and 2009*

In 2003, I was part of a small team whose aim was to survey the northernmost region of the Tadrart Acacus. Three areas were selected for rock art and archaeological research. These areas were numbered from 1 to 3, starting from the southernmost one (Fig. 6.1). Some years later, in 2009, I coordinated a field survey

Electronic supplementary material: The online version of this chapter (doi:[10.1007/978-3-319-08530-2_6](https://doi.org/10.1007/978-3-319-08530-2_6)) contains supplementary material, which is available to authorized users.

Fig. 6.1 The areas subjected to ethnoarchaeological surveys in 2003 (1–3) and 2009 (4–6) (from Google Earth)



for the mapping and recording of the inscriptions in Tifinagh characters in the frame of the ‘Endangered Archive Programme EAP 265’, funded by British Library and directed by S. di Lernia (Biagetti et al. 2012). Those areas where numbered from 4

Table 6.1 Size, No. of sites and density (site \times km²) of surveyed areas in 2003 and 2009

	Year	Area (km ²)	No. of sites	Density per km ²
Area 1	2003	41.4	17	0.4
Area 2	2003	2.0	5	2.5
Area 3	2003	18.6	13	0.7
Total 1–3	2003	62	35	0.6
Area 4	2009	39.0	11	0.3
Area 5	2009	43.3	6	0.1
Area 6	2009	5.3	0	0.0
Total 4–6	2009	87.6	17	0.2
Total	2003–2009	149.6	52	0.3

to 6. Every area is different in size, since the surveys were not built on the concept of equivalent ‘transects’, nor on the exploration of areas of predetermined fixed size. The six areas are thus not analytical units and serve only as geographical frames of reference. Both valleys and higher morphologies were investigated, exploring all cliffs at the edge of the *wadi* and ranging along the flat tops of first terraces. Kel Tadrart elders, serving as guides, accompanied me and were occasionally able to recognize and identify the past occupants of abandoned sites.

From a mere geomorphological perspective, it has to be recalled that the western side of the Acacus differs significantly from the majority of the massif (Chap. 2). While the 2003 surveyed areas (1–3) included eastern wide valleys, the 2009 surveys were carried out along deeply incised *wadis*, roughly dissecting along on E/W axis the western slope of the Tadrart Acacus. The three areas (areas 4, 5 and 6) of the 2009 surveys were, in fact, selected with the aim of investigating the western face of the Tadrart Acacus massif, where few steep passageways (*aqbas*) allow the transit of men and small livestock. Given the peculiar morphology of this side of the mountain, where second terraces suddenly drop some 150 m onto low *wadis*, evidence of human occupations was expected to be found only along *wadi* bottoms. No real cliffs exist in those areas, rather boulders and steep debris flows run down into the dry valleys. In other words, the 2009 areas feature real physical differences when compared to the locations visited in 2003. Due to their morphology, the 2009 areas were completely inaccessible by car and the surveys were conducted entirely on foot.

6.2.2 The Setting of the Sites

Almost 150 km² were explored in the course of the fieldworks, and 52 sites were recorded (Table 6.1). A site could consist of a single feature (e.g. a kid pen) or multiple features whose contemporaneity of use could be reasonably suggested,

Table 6.2 Distributions of sites on different geomorphologies

Topography	No. of sites	Percentage
Wadi bottom	31	59.6
Intermediate	13	25.0
1st terrace	8	15.4
Total	52	100.0

after the evaluation of relative preservation and overall physical condition. All sites were recognized by my guides to have been built and inhabited by Kel Tadrart. For that matter, no other ethnic groups have resided in the Acacus range within the living memory of current inhabitants (as stated in Chap. 4).

Table 6.2 shows that more than half of the sites were recorded along *wadi* bottoms. Thirteen sites were located at ‘intermediate’ areas, which include some peculiar locations where campsites were set on an ‘intermediate terrace’, characterized by a very low elevation on the *wadi* bottom, normally only some 5–20 m above the *wadi* bed.

Density of sites is rather variable throughout the six areas, ranging from zero sites in area 6, up to 2.5 sites per square kilometre in area 2. However, the eastern areas (1–3) of the massif have been more intensively frequented than the western part, which features lower settlement densities. On a very general level, this can be explained by the absence of wide valleys in the west. Another interesting datum is related to the position of sites within surveyed areas. Within the first three polygons (areas 1–3), site distribution is quite regular and covers the whole rectangle surfaces (Fig. 6.2). Differently, areas 4–6 seem to be marked by a very uneven distribution of sites. Besides the case of area 6, totally deprived of any occupation evidence, sites show some degree of clustering in the innermost and recessed parts of areas 4 and 5.

In the absence of any clear geomorphological nor soil difference, this is likely to be read as a deliberate choice of habitat location. As previously stated, all these sites were ‘founded’ by members of Kel Tadrart community, normally living along the main *wadis* of the Acacus mountains, located in the eastern side of the massif. I maintain that it is precisely this proximity to the ‘core areas’ of the Kel Tadrart universe, namely the eastern valleys of the massif, that has determined the location of areas 4 and 5 sites. To the west, the extremely rugged nature of the terrain, and the almost total absence of soil along the *wadi* bottom, may explain the sparseness of both present and past human activity.

The orientation of abandoned sites resembles that of those currently inhabited (see Chap. 5). More than half of the abandoned sites are south-facing (Table 6.3), probably due to prevailing winter winds, coming from the north. However, some differences exist within the sample, as 2003 sites show marked trend towards south-oriented locations, while 2009 sites feature a surprisingly random distribution. This can be preliminary attributed to the overall physiographic aspect of areas 4 and 5, featuring irregular valley edges, where the total absence of sheltered locations alongside the ragged nature of the slopes does not leave many options for human settlement.

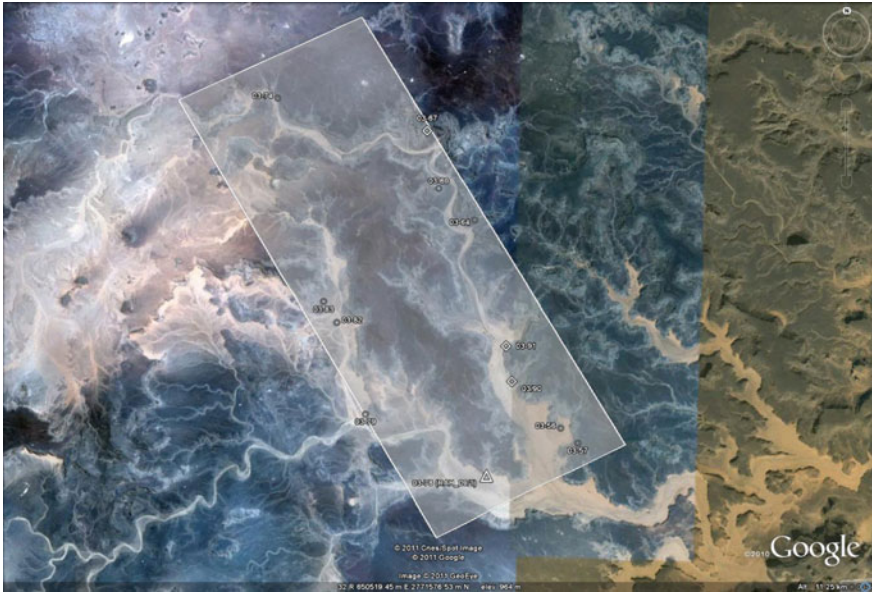


Fig. 6.2 Site in area 3. For the key, see also Table 6.4: *triangles*, type A sites; *diamonds*, type B sites; *dots*, type C sites

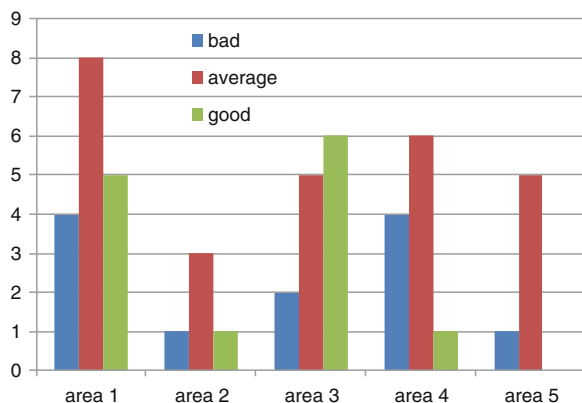
Table 6.3 Orientation of sites with respect to rocky cliffs

	North	East	South	West	Total
2003 sites (areas 1–3)	7	0	25	3	35
Percentage	20	0	71	9	100
2009 sites (areas 4–6)	4	4	4	5	17
Percentage	24	24	24	28	100
No. (total) of sites	11	4	29	8	52
Percentage	21	8	56	15	100

6.2.3 Preservation and Use of Sites

Naturally, not all sites were contemporarily in use, nor is it likely that they were occupied for the same duration of time. Within the sample, several differences exist both in site structure and in site preservation. Although both aspects may be to some extent reciprocally linked (i.e. permanent sites may feature higher degree of preservation than short-term and ephemeral campsites), it is important to evaluate the recorded degree of preservation of the abandoned sites. In some cases, the guides knew very well the time of use and the duration of occupation that occurred at certain sites, and these settlements will be analysed in a further section of this chapter. For the rest of the sample, the physical state of the sites and the

Fig. 6.3 State of preservation of sites within the surveyed areas



type of fixtures recorded are the sole elements we can use to infer a coarse differentiation in age.

Figure 6.3 shows that in both area 4 and area 5 the overall degree of preservation is lower than in areas 1 and 3, where more well-preserved sites were recorded. To be fully significant, as stated, this data must be compared with the use of settlements.

In Chap. 5, the concept of ‘transhumance sites’ (seasonally exploited settlements) has been introduced, as opposed to ‘alternative’ sites (irregularly and intermittently used sites). In 2003 and 2009, I recorded also smaller sites, made of few fixtures, when compared to main settlements. In particular, many sites are characterized by one or two small pens for kid goats and cannot be considered as veritable occupation sites like those discussed in Chap. 5.

In Table 6.4, abandoned sites have been classified and labelled ‘A’, ‘B’ and ‘C’, according to the fixtures recorded. Type ‘A’ sites are those endowed with a full set of fixtures, allowing the presence of one household for an unlimited time. These ‘A’ sites correspond—on the basis of site composition and layout—to the ‘main settlements’ that are the object of Chap. 5 and could have been—in principle—used for long time spans. Type ‘B’ sites are provided with only one or two huts, thus allowing a temporary stay for one household or a part of it. This type of site is expected to have served as an ‘alternative site’ for a relatively short time span (e.g. a few weeks). Finally, we have type ‘C’ sites, representing virtually ‘overnight’ camps, likely to have been occupied by single herders for one or few days. These are constituted by a few pens for young calves, useful to protect newborns from cold winds and from the heat of the sun. Type ‘C’ sites represent the lightest remains of animal husbandry in the Acacus range and are a typical feature of the pastoral landscape of arid and rocky environments. It is not surprising, then, that these are the most represented type within the abandoned sites. Nonetheless, type ‘C’ sites are very common in areas 1 and 3, and comparatively underrepresented in areas 4 and 5. Conversely, type ‘A’ sites, representing the most stable form of human habitation, are more frequent in areas 4 and 5, while almost absent (just one case) in areas 1–3 (Fig. 6.4).

Table 6.4 Synoptic view of main characteristics of sites

Site	Area	Topography	Type of site	Huts/kitchens/diwans	Other dwellings	Dung	Dumps	Other fixtures	Pens	Graves	Portable items	Overall preservation
09-14	5	w.b.	A	8	2			1 mosque	1	3	Several	Average
09-12	5	w.b.	A	4	3				1		Several	Average
09-11	5	w.b.	A	4			Yes	1 mosque	5		Several	Average
03-78 (RAH_09/1)	3	Intermediate	A	3	1	Yes			2		Several	Good
09-17	4	w.b.	A	3					3			
09-08	4	w.b.	A	3	1	Yes	Yes					Good
09-01	4	w.b.	A	3					2		1 leather bag, 1 stick, 1 glass, some refuse	Average
03/100 (TAZ_03/1)	2	w.b.	B	2		Yes	Yes	1	2		Many	Good
09-10	5	w.b.	B	2				1 store	2			Average
09-09	4	w.b.	B	2								Bad
09-07	4	w.b.	B	2								Bad
09-04	4	w.b.	B	2					6			Bad
09-16	4	w.b.	B	1								Bad
09-13	5	w.b.	B	1								Bad
03-08	1	w.b.	B	1	2						1 leather bag	Average

(continued)

Table 6.4 (continued)

Site	Area	Topography	Type of site	Huts/ kitchens/ diwans	Other dwellings	Dung	Dumps	Other fixtures	Pens	Graves	Portable items	Overall preservation
09-06	4	1st t.	B	1								Average
09-05	4	w.b.	B	1					2			Average
03/91	3	w.b.	B	1								Average
03/90	3	w.b.	B	1								Average
03-67	3	Intermediate	B	1					1		1 wood pile, 1 vessel	Good
03-27	1	1st t.	C						1			Average
03-25	1	w.b.	C		3				2			Average
03-02	1	w.b.	C		2							Bad
03-19	1	1st t.	C						2			Bad
03-16	1	w.b.	C						2			Good
09-15	5	w.b.	C						6			Average
03-11	1	Intermediate	C						3			Good
03-09	1	w.b.	C						1			Average
03-07	1	w.b.	C						1			Bad
03-06	1	w.b.	C						2			Average
03-05	1	1st t.	C						3			Average
03-04	1	1st t.	C		1				2			Average
09-03	4	w.b.	C						1			Average
09-02	4	w.b.	C						3			Average

(continued)

Table 6.4 (continued)

Site	Area	Topography	Type of site	Huts/ kitchens/ diwans	Other dwellings	Dung	Dumps	Other fixtures	Pens	Graves	Portable items	Overall preservation
03-83	3	Intermediate	C		Some				2			Bad
03-82	3	Intermediate	C		3				4			Good
03-81	3	Intermediate	C						1			Average
03-79	3	Intermediate	C						1			Average
03-74	3	Intermediate	C						1			Average
03-69	3	Intermediate	C						1			Bad
03-64	3	Intermediate	C						2			Good
03-57	3	1st t.	C						2			Good
03-56	3	Intermediate	C						3			Good
03-55	2	w.b.	C						1			Average
03-53	2	w.b.	C						2	1		Bad
03-52	2	w.b.	C						1			Average
03-51	2	Intermediate	C							1		Average
03-46	1	1st t.	C		1						1 donkey saddle	Average
03-42	1	1st t.	C						2			Bad
03-34	1	w.b.	C		1				4			Good
03-33	1	Intermediate	C						1			Good
03-32	1	w.b.	C						4			Good

'Topography' includes *wadi* bottom (w.b.), first terrace (1st t.) and also an intermediate structure (intermed.); type of site: 'A' main, 'B' alternative and 'C' overnight camps

Fig. 6.4 Bar chart featuring site types (A–C) and surveyed areas (1–6)

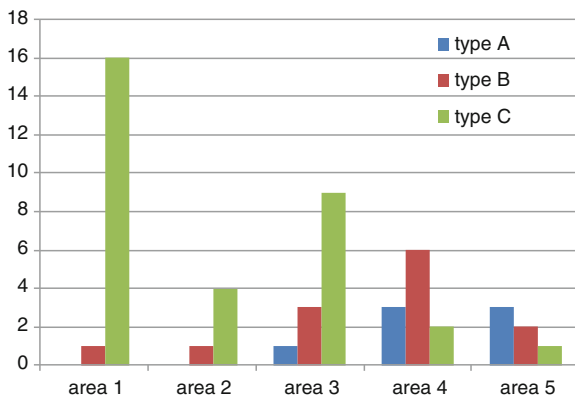
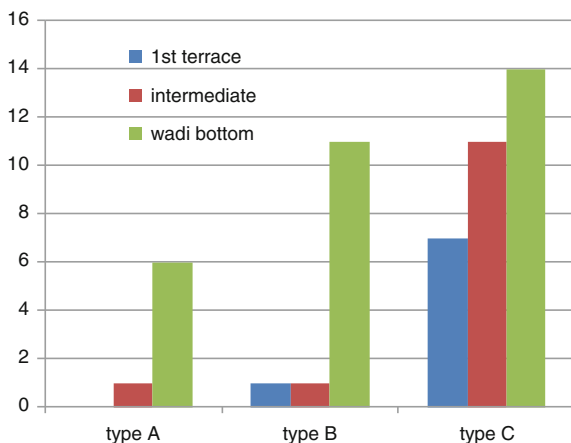


Fig. 6.5 Bar chart featuring site types (A–C) and geomorphological settings (1–6)



As we would expect, type ‘A’ sites are mostly to be found along the *wadi* bottoms (Fig. 6.5). It is also interesting to notice that on higher terraces, type ‘C’ sites are well represented (7), pointing to occasional exploitation of first terraces. This seems to replicate what we have observed concerning current settlements in Chaps. 4 and 5.

6.2.4 Portable Items and Refuse

In the course of my visit to the inhabited sites, I was struck by the amount of small and portable items, apparently discarded throughout the settlements. Conversely, the Kel Tadrart abandoned sites have proven to feature relatively low quantities of portable items.

According to Table 6.5, the catalogue of items recorded from type A abandoned sites are fairly consistent. Several artefacts were commonly spotted within

Table 6.5 Synoptic table of quantity of sites (by site type), where portable items were recorded

	None	Percentage	Few (1–3)	Percentage	Several (>3)	Percentage	Total
Type A (7 sites)	2	5	1	25	4	80	7
Type B (13 sites)	10	23	2	50	1	20	13
Type C (32 sites)	31	72	1	25	0	0	32
Total	43	100	4	100	5	100	52

the sand soils. These include batteries, string, rope, hunting traps, teapots, cooking pots, leather items, textiles and wooden elements of huts. Within type A abandoned campsites, dumps and dung areas are occasionally visible as well. Only light equipment is required for short-term movement and is not usually to be found, in types ‘B’ and ‘C’ sites. The few items recorded at these more ephemeral sites consisted of two leather bags (water flasks), one whole vessel, one broken glass item (unrecognizable), one wooden stick and, finally, one donkey saddle made of palm wood. Indeed, no dumps nor discard areas were found within types ‘B’ and ‘C’ abandoned sites. At a glance, the quantity of portable items recorded at these sites supports the initial idea that type ‘A’ sites could have been used as ‘residential’ (main) places, while the others (types ‘B’ and ‘C’) represent shorter occupations. It derives that the *use* of the settlements seems a major factor affecting the distribution and quantity of portable items found at abandoned campsites.

6.2.5 *The Deserted Landscape*

The 2003 and 2009 surveys demonstrated the potential durability of some elements of Kel Tadrart material culture. Small pen areas with rocky foundations are, for instance, unequivocal evidence of animal husbandry. The distribution of abandoned sites stresses that the eastern valleys of the mountains represent a rather diverse landscape than the western side of the massif, where more resources are available. In this perspective, it becomes reasonable that in the more frequented eastern valleys of the Acacus, the number of short-term sites (type ‘C’) are higher than that of more permanent camps (type ‘A’). This outlines a kind of horizontal palimpsest where, beside few important locations, a plethora of satellite sites exists and creates an informal system of land use, whose material outcome is ultimately visible on the ground. In fact, the intensity of land use can be read in the *co-presence of diverse types (A–C) of sites*, as this is a good indicator of opportunistic, flexible and repeated use of territory. Conversely, a concentration of type ‘A’ sites may well indicate some specific areas provided with good resources, to be

exploited in time of necessity, but the concurrent rarity of smaller sites indicates a precise function of these locations. In this framework, we can better place the above-mentioned arguments regarding lower state of preservation of sites in areas 4 and 5, possibly due to an erratic use of these locations, preventing their long-term maintenance.

6.3 Studies of Selected Abandoned Campsites

6.3.1 *The Sample*

This part of the chapter is focused on certain well-preserved abandoned campsites, whose past occupations were known by the informants. These were documented in detail during in the course of the fieldwork (Table 6.6). Previous sections have emphasized the role of architectural fixtures, which are certainly the most relevant element of abandoned campsites, having noted that portable items seem to occur only in a few cases. The detailed sketch of every campsite is available online (<http://extras.springer.com>).

Some sites were visited twice and possibly found in different situation (occupied or abandoned). Time and duration of occupation were either known by informants or suggested by them during or after our evaluation of a site's physical state. Overall, these were the sole abandoned settlements that I visited endowed with reliable data as to the length and moment of occupation (Fig. 6.6).

Site RAH_09/1 is certainly one of the most interesting settlements. It was first visited in 2003 and then found reoccupied in 2009. Located along *wadi* Raharmellen, one of the most frequented *wadis* of the massif, it belongs to the household living in RAH_07/1 in 2007. Some strong similarities can be observed in its well-executed constructions, which are a hallmark of the family led by Hamid, one of the oldest Kel Tadrart of the Acacus. A specific selection tendency for flat and large sandstone slabs is easily recognizable at both sites. Another peculiar trait is the size of the huts, as these are generally larger than in other sites (see Sect. 5.4.7). The excellent state of preservation of RAH_09/1 confirms the quality of construction, linked to the individual capacity of a single builder (Fig. 6.7).

Site AFA_04/1 is a small settlement located in a remote area of the southern Acacus. It was first visited in 2004, when it was inhabited, and later in 2006, when no one was living there. The head of the family, Ibrahim, died in 2009. Not only was this site seen inhabited, without roofs on the huts, but generally fixtures are coarser here, made of stone of various sizes. Notably, one of these was found partially collapsed in 2006 (Fig. 6.8).

The sites LAL_09/1 and 09/11 (this site was already catalogued as 9/11, and I kept that ID) both belonged to Mohammed Ahmed. These sites were occupied in

Table 6.6 Main data regarding the sample under study

Site	Date of 1st visit	State of site	Time of last occupation	Duration of last occupation (approx.) (months)	Date of 2nd visit (if applicable)	State of site	Time of last occupation	Duration of last occupation (approx.) (months)	2007 location of previous household	Remembered household occupants	Further reference
LAL_09/1	Fall 2009	Aband.	2005	9					TTB_07/1	6	Slide 12
09/11	Fall 2009	Aband.	2005	3					TTB_07/1	6	Slide 13
TAK_06/1	Winter 2004	Aband.	Before 2002	6	Fall 2006	Aband.					Slide 14
RAH_09/1 (03/78)	Fall 2003	Aband.	Before 2002	9	Fall 2009	Inhab.			RAH_07/1	3	Slide 15
TAZ_03/1	Fall 2003	Aband.	2003	6			2003	6		4 (in 2003)	Slide 16
AFA_04/1	Fall 2004	Inhab.		9	Fall 2006	Aband.	2005	6	IMH_07/1	3	Slide 17
ALO_07/2	Fall 2007	Aband.	Early 2007	3			Early 2007	3	ALO_07/1	4	Slide 18

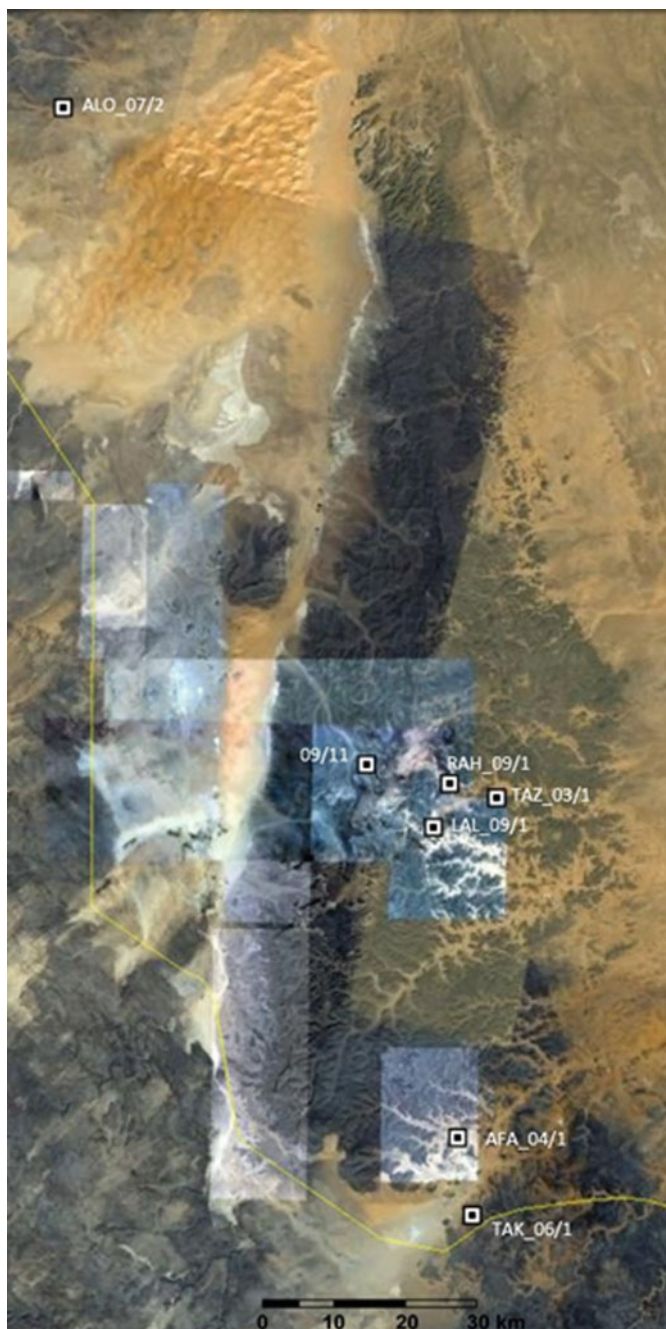


Fig. 6.6 Position of abandoned campsites which were studied in detail



Fig. 6.7 Hut from site RAH_09/1 (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)



Fig. 6.8 Hut from site AFA_04/1 when in use (2004—left) and abandoned (2006—right) (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

the course of 2005. The former is located along a large valley in central Acacus, while the latter is to be found in the western fringes of the massif. Mohammed explained to me that he leads his family towards western *wadis* only in case of heavy rain there, as the valleys are narrow and do not allow long stays. Site 09/11 is characterized not only by a lack of dung areas but also by the state of the roofs, featuring signs of deterioration. All huts were of type 1 (stone) and thus dissimilar from the other settlement of Mohammed Ahmed (TIB_07/1), where the two huts recorded were made of plant material (Sect. 5.4.2). According to the owner of site 09/11, it is extremely unlikely that they will come to dwell again in this zone, mainly due to logistical problem (cars cannot penetrate up to this settlement).



Fig. 6.9 View of site TAZ_03/1 (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

TAK_06/1 is situated in the southernmost edge of Libya, virtually on the international border with Algeria. The area is believed to be one of the greenest of the Acacus after the rain, but it is also affected by continuous quarrels between Libyan and Algerian border guards. This site is the only one where some degree of alteration determined by non-Kel Tadrart use, due to the military checkpoint, some 300 m on the other side of the valley, has been identified. In this perspective, it seems that the sole alimentary remains and most other portable items (see Table 6.21) are to be attributed to soldiers from the nearby checkpoint. This is why the overall aspect of the site seems to suggest that it was not inhabited since some years, although extremely fresh goods were recorded (e.g. some glass jars filled with oil and salt). No longer occupied since 2002, it features no focused dropping areas, with ovicaprid excrement quite dispersed over a large surface. The recent transformation of the military checkpoint in a veritable outpost, with increase of effectives on duty, makes extremely unlikely any further Kel Tadrart occupations.

Site ALO_07/2 is the only regular transhumance site recorded so far in the Acacus range. It is occupied for some months every year, by means of movable tents. No fixtures were noticed, except for two small pens for kid goats. Portable items were lacking as well. Inhabitants of ALO_07/1 do not use stone huts in this site and adopt traditional goat skin tents to dwell there during the time of transhumance. Unfortunately, I had no chance to examine such facilities that to my knowledge had long been disappeared from the whole Acacus range. This would

Table 6.7 Physical location of Kel Tadrart abandoned sites in relation to geomorphological features of surrounding environment

Site	Position of cliff	Distance from the closest wadi edge (m)	Distance from the closest stream bed (m)	Altitude difference (sites/closest stream bed) (m)
RAH_09/1	N	250	350	13
AFA_04/1	NW	150	200	10
LAL_09/1	NW	55	95	13
09/11	NE	0	30	2
TAK_06/1	NE	130	140	15
ALO_07/2	N	340	420	11
TAZ_03/1	N	60	130	7

be the sole case of tent use by the Kel Tadrart recorded so far, a case that surely deserves further investigation.

TAZ_03/1 is somewhat anomalous (Fig. 6.9) as it is likely that this site was abandoned only for a very short time before our visit. Almost everything was in place. Many sacks and boxes full of goods were recorded in the kitchen and in the store. In this case, it was ‘abandoned’ only for a short time and with the clear expectation of reoccupation. Following the type of features, it cannot be defined as a ‘main site’, and rather as a ‘Type B’ settlement. All sacks were hanging from the ground, preventing rodents attack, and the site was extraordinarily neat and clean. Although many items were stuffed into niches and fractures of the cliff, no loose objects were noticed outside of domestic structures. As a note, huts were mainly of the type 2 (plant material).

6.3.2 Geomorphological Notes on Site Locations

Environmental constraints seem to strongly affect site layouts and the distribution of features as well. Similar to inhabited sites, the abandoned settlements considered in this section were located in physical connection with the rocky flanks of valleys’ edges (Table 6.7).

All these sites protected their northern side by rocky flanks, as noticed in the study of the inhabited campsites. This is no doubt related to the prevailing direction of winter winds. Abandoned campsites are set at variable distance from *wadi* edges and beds, just like inhabited campsites (see Table 5.2), with the exception of site 09/11, which is set unusually close to the dry river bed. This may be due to the particular morphology of valleys cutting the western escarpment of the Tadrart Acacus, characterized by steep slopes and narrow *wadis*.

6.3.3 Domestic Fixtures

Except for ALO_07/2, the rest of the abandoned settlements feature an average number of huts and a kitchen (Table 6.8). The average number (2, 5) of huts/*diwans* (impossible to distinguish here abandoned dwelling huts from *diwans*) in these sites is remarkably lower than that observed within the inhabited campsites (see Chap. 5), which consist of up to 3, 6 huts/*diwans* per site. Instead, the average number of livestock facilities per abandoned site (3) is quite similar to that recorded within the inhabited settlements (Sect. 3.5).

The overall low number of plant material huts (Table 6.9) point out to the likely removal of (at least a part of) plant material huts and annexes such as courtyards (Table 6.10).

It is worth noting that almost all huts recorded at abandoned campsites feature no trace of roofs (Table 6.11). According to the informants, this is because thatches and poles of the roofs can be transported when moving from one site to another. However, I stress that when site AFA_04/1 was inhabited in 2004, no roof was recorded at all. Conversely, when site RAH_09/1 was visited in 2009, roofs were covering almost all the huts, in spite of what observed in 2003, when the site was abandoned and there were no roofs.

Other differences between inhabited and abandoned sites lie in the widespread lack of courtyards at abandoned campsites; this makes structures look architecturally ‘simpler’ than those of the inhabited sites and would imply a faster building processes.

The average size of huts recorded at abandoned campsites is smaller than that of inhabited dwellings. Table 6.12 shows that the average size of huts (plus those of *diwans*) in inhabited campsites almost doubles that recorded at abandoned campsites. *Diwans* are normally larger than huts (see Chap. 6), but even if we take into account the sole huts recorded at inhabited sites, we shall realize that these are definitely bigger than those at the abandoned settlements. This is true also for the sites for which we know the owners (see Table 6.13).

All kitchens were made in stone, a trend which was observed at inhabited sites as well. Regarding size, kitchens follow the same trend, being far smaller at abandoned campsites (Table 6.12). Table 6.14 shows that the average size of kitchens is markedly reduced, although in this case of RAH_09/1, the larger kitchen is located in the abandoned campsite. This, however, is the sole exception.

6.3.4 Dumps and Discard Areas

Dumps have been extensively analysed in Chap. 5, where these features were, to some extent, metrically related to the age of the settlement. In the case of abandoned campsites, it is more difficult to establish such correlations. Following Table 6.15, it seems that only the duration of the last occupation coarsely matches

Table 6.8 Distribution of fixtures within abandoned sites

	Huts/ divans	Kitchens	Mosque	Stores	Other	Corrals	Pens	Character/ash dumps	Generic dumps	Dung
RAH_09/1	3	1	1	0	1	0	2	1	0	1
AFA_04/1	2	1	0	1	0	0	1	1	0	1
LAL_09/1	1	1	1	0	0	1	1	0	2	1
09/11	4	1	0	0	0	0	5	1	0	0
TAK_06/1	3	1	1	0	0	0	4	2	0	0
ALO_07/2	0	0	0	0	0	0	2	0	0	3
TAZ_03/1	2	1	0	1	0	0	2	1	0	1

Table 6.9 Frequency of hut types at the listed abandoned sites; stone huts (type 1) are 13, plant material (type 2) 2

	1a roof + stone courtyard	1b roof + plant material courtyard	1c roof (no courtyard)	1d (no roof no courtyard)	2a roof + plant material courtyard	2b roof + small access	2c roof (no courtyard)	2d (no roof no courtyard)	Total
RAH_09/1	0	0	0	3	0	0	0	0	3
AFA_04/1	0	0	0	2	0	0	0	0	2
LAL_09/1	0	0	1	0	0	0	0	0	1
09/11	1	0	0	3	0	0	0	0	4
TAK_06/1	0	0	0	3	0	0	0	0	3
ALO_07/2	0	0	0	0	0	0	0	0	0
TAZ_03/1	0	0	0	0	0	0	1	1	2

Table 6.10 Frequency and percentage of hut types in inhabited and abandoned sites

	Inhabited settlements	Abandoned settlements
Stone huts/diwans	12 (34 %)	13 (87 %)
Plant material huts/diwans	23 (66 %)	2 (13 %)
Total	35 (100 %)	15 (100 %)

Table 6.11 Occurrence of roofs and courtyards in inhabited and abandoned sites

	Inhabited settlements	Abandoned settlements
Roof	33 (94 %)	3 (20 %)
No roof	2 (6 %)	12 (80 %)
Total	35 (100 %)	15 (100 %)
Courtyard	26 (74 %)	2 (13 %)
No courtyard	9 (26)	13 (87 %)
Total	35 (100 %)	15 (100 %)

Table 6.12 Average size of huts and kitchens in inhabited and abandoned sites

	Inhabited settlements	Abandoned settlements
Average surface huts + diwans (m ²)	29.3	14.8
Average surface kitchens (m ²)	22.4	8.7

the size of dump areas. However, this data should be treated cautiously, as the accumulation of dumps is not connected merely to the last episode of occupation. Rather, we should alter this argument, and hypothesize that, on the basis of inhabited campsites (see Chap. 5), age *and* frequency of visitation of abandoned settlements may be measured by the size of dumps.

Conversely, the date of the last occupation does not seem to affect the extent of discard areas (Table 6.15, field ‘last occupation since’). It is likely that the *preservation* of dumps may not be a function of time elapsed since the last occupation. Surely, all these sites have been occupied for the last time quite ‘recently’, i.e. within the past 5 years or so. This is too short to properly evaluate the impact of taphonomic processes on these features in our sample.

6.3.5 Pens, Corrals and Dung

Unlike domestic fixtures, the average number of livestock facilities does not differ very much between inhabited and abandoned campsites. Corrals were rare within inhabited campsites, and quite significantly, the only one recorded at inhabited settlements comes from site LAL_09/1, inhabited by the same household which had previously dwelt at TIB_07/1, where one of the three abandoned corrals was set (Table 6.16). Pens were of the usual type and size, i.e. small stone circle

Table 6.13 Synoptic view of huts' average size by site. Sites owned by the same household are set on the same line

Inhabited sites	No. of huts	Mean huts' surface by site (sqm)	Abandoned sites	No. of huts	Mean huts' surface by site (sqm)	Abandoned sites	No. of huts	Mean huts' surface by site (sqm)	No. of huts	Mean huts' surface by site (m ²)
SUG_07/2	2	16.3								
TIB_07/1	2	17.8	LAL_09/1	1	8.0	09/11	4	16.0		
SUG_07/1	4	19.3								
IMH_07/1	3	20.6	AFA_04/1	2	12.0					
IMH_07/3	1	23.7								
IMH_07/4	1	23.7								
IMH_07/2	3	24.6								
TIH_07/1	3	24.6								
IMM_07/1	3	28.3								
TES_07/1	7	29.7								
ALO_07/1	2	30.8								
RAH_07/1	4	41.6	RAH_09/1	3	24.4					
			TAK_06/1	3	9.8					
			TAZ_03/1	2	9.9					
			ALO_07/2	0	0					

Table 6.14 Synoptic view of kitchens' average size by site

Inhabited sites	No. of kitch.	Mean kitchens' surface by site (sqm)	Abandoned sites	No. of kitch.	Mean kitchens' surface by site (sqm)	Abandoned sites	No. of kitch.	Mean kitchens' surface by site (sqm)
SUG_07/1	2	11.8						
RAH_07/1	1	12	RAH_09/1	1	15.6			
ALO_07/1	2	12	ALO_07/2	0				
IMM_07/1	2	13						
TES_07/1	2	26						
IMH_07/2	1	15						
IMH_07/3	1	16.6						
TIB_07/1	1	19.6	LAL_09/1	1	6.6		09/11	6
IMH_07/1	1	22.1	AFA_04/1	1	9.6			
IMH_07/4	1	25						
TIH_07/1	1	28.3						
SUG_07/2	1	67.5						
			TAK_06/1	1	4			
			TAZ_03/1	1	Kitchen in rockshelter			

Sites owned by the same household are set on the same line

Table 6.15 Synoptic view of dumps and discard areas, featuring sites' main information regarding their occupation

	Character/ash dumps	Total size (sqm)	Duration of last occupation (approx.) (months)	Last occupation since (years)	Type of site	Expectancy of reoccupation
ALO_07/2	0	0	3	>1	Transhumance	Transhumance
09/11	1	3	3	4	A	No
TAZ_03/1	1	4	6	0	B	Yes
RAH_09/1	1	6	9	1	A	Yes
TAK_06/1	3	6	6	5	A	No
LAL_09/1	3	7	9	4	B	Yes
AFA_04/1	1	10	9	1	B	Yes

Table 6.16 Frequency and percentage of livestock features in both inhabited and abandoned campsites

	Inhabited settlements (frequency)	Abandoned settlements (frequency)	Inhabited settlements (percentage)	Abandoned settlements (percentage)
No. of corrals (O/C)	3	1	0.3	0.2
No. of pens (y. O/C)	35	17	2.9	2.8
No. of fowl houses	4	0	0.3	0.0
Total	42	18	3.5	3.0

foundations of *c.* 1 m of height. Only one corral was partially collapsed, featuring some wooden posts still standing.

On the other hand, two sites (09/11, TAK_06/1) had no traces of dropping areas (Table 6.17). This is quite striking, considering the thickness and extension of dung layers observed in the inhabited settlements. As discussed in Chap. 5, Kel Tadrart generally keep their livestock in sheltered locations and this generates large areas (av. *c.* 200 m²) where excrement concentrates. Furthermore, dung has always been widely recorded within inhabited settlements. Clearly, the absence of visible ovicaprid excrements raises relevant issues, with reference to post-depositional disturbances, combined with reduced use of site through time.

Following Table 6.17, we notice that those sites featuring both short and not very recent occupations appear to feature no dung areas. Furthermore, any reuse of dung (e.g. use as fertilizer for gardens or burnt as fuel) has ever been recorded in

Table 6.17 Synoptic view of dung areas' size, featuring sites' main information regarding their occupation

	Total dung area (sqm)	Duration of last occupation (approx.) (months)	Last occupation since (years)	Expectancy of reoccupation
09/11	0	3	4	No
TAK_06/1	0	6	5	No
ALO_07/2	14	3	>1	Transhumance
TAZ_03/1	50	6	0	Yes
LAL_09/1	80	9	4	Yes
AFA_04/1	90	9	1	Yes
RAH_09/1	300	9	1	Yes



Fig. 6.10 Dung areas at AFA_04/1 when in use (2004—*left*) and abandoned (2006—*right*) (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

the area. The most reasonable hypothesis is related to both length and intensity of occupation. In fact, it is well known that the thickness and compactness of dung layers is strictly linked to the repeated and prolonged use of a given site and that trampling and urine play a major role in the formation of hardened manure surfaces, whose resistance to post-depositional processes has been largely stressed (for the study area, see Cremaschi et. al. 1996; di Lernia 2001). Conversely, short episodes of occupation rarely lead to the formation of veritable ‘cemented’ layers of dung. With this in mind, it is reasonable that poorly compacted ovicaprid excrement may well have been dispersed by strong winds or by rainfall. The absence of physical barriers—in the form of fences or corrals—preventing the dispersion of coprolites—facilitates the disappearance of dung in less frequented Kel Tadrart settlements (Fig. 6.10).

6.3.6 Portable Items

Several items were found in abandoned settlements in the Acacus range. With the exceptions of ALO_07/2 and 09/11, the rest of the samples featured larger inventories of artefacts. Items were classified on the basis of their raw material. There are thirteen different ‘classes’, ranging from preserved alimentary goods to stone items.

Other than some anomalies like the unusually large amount of alimentary goods in TAK_06/1 and the high number of cartons and sacks (textiles) in TAZ_03/1, portable items and materials found in the abandoned sites seem to follow a similar trend (Table 6.18). Textiles, metal and plastic items are the most represented categories of items. Textiles include strips of cloth, sacks, blankets, clothes, laces and canvas shoes. The plastic class includes jars and containers of various type and

size, lids, boxes and rubber shoes/sandals. Metal items generally consist of kettles, tin cups, pot lids and exhausted batteries (Fig. 6.11).

Scavenging in abandoned sites is socially condemned by the Kel Tadrart and, according to the informants, almost non-existent in the Acacus massif. Every Kel Tadrart knows, in fact, who lived there and always consider the possibility that the owners may come and occupy the site again. Following Tomka (1993: 16), we can suggest that the process can be defined as ‘delayed curation’ occurring at Kel Tadrart sites, implying that after primary abandonment, the majority of ‘left items’ are progressively recollected by their original owners during further passages in the vicinity of deserted campsites. In his study, Tomka (1993: 21) referred to agro-pastoralist mobile groups, where mobility occurs regularly. The Kel Tadrart, being variably mobile, can still pass through (their) abandoned campsites in the course of daily movements or seasonal relocations, picking up artefacts when necessary. According to what Tomka stressed (see also Schiffer 1987), artefact picking up through time determines the reduction (in terms of quantity) of the assemblages. In this perspective, the smaller the assemblages, the longer delayed curation episodes may be. In other words, in the lifetime of a given site, delayed curation operates between site abandonment and site reoccupation, and it is governed by the site’s owners.

Delayed curation is responsible for the diminishment of item numbers, combined with the lowering of occupation episodes (Table 6.19). In fact, every occupation potentially generates by-products, which are successively and gradually withdrawn from sites. When the frequentation of a site becomes less recurrent, it is likely that (i) the assemblage is not renewed and that (ii) delayed curation mechanism increasingly determines the (increasingly reduced) removal of further items. Furthermore, it is likely that delayed curation intensifies when the probability of reoccupation becomes lower and then becomes improbable. Size of assemblage is significant in order to evaluate site use, precisely because of the above-described process. Small assemblages can be taken as an indicator of a longer non-use (abandonment) of sites and a concurrently high number of delayed curation. Conversely, larger inventories testify to recent use of sites and few—if any—curation (withdrawal) episodes. Furthermore, delayed curation processes apply regardless of type (A–B) of sites, substantiating the hypothesis that repeated passes through sites are those determining their actual state. The exception of site ALO_07/2, where reoccupation is almost sure and last frequentation was very recent, has to be seen in the scope of its vicinity (*c.* 10 km) to a main settlement ALO_07/1. In this case, we can rely upon the absence of fixtures—which has not been observed elsewhere, to define this site as outstanding within the above-discussed framework.

6.3.7 Spatial Distribution of Items and Gender

Having examined the time frame and its implications, let us now turn our attention towards space and physical distribution of items within abandoned campsites. So far, we have tried to reconnect time and type of site use to the items recorded on

Table 6.18 Portable items recorded at abandoned sites, divided by raw material

	Aliment.	Bones	Cardboard cartons	Textiles	Leather	Cords	Wood items	Plastic	Pots	Glass	Metal	Fuel barrels/tanks	Stone	Total
RAH_09/1	0	0	0	4	0	2	4	10	2	2	11	2	6	43
AFA_04/1	0	1	4	18	3	2	0	8	0	4	19	0	1	60
LAL_09/1	0	0	1	7	0	3	0	11	0	6	11	1	2	42
09/11	0	0	0	1	1	0	1	1	0	1	6	0	0	11
TAK_06/1	15	2	0	1	5	0	0	2	0	4	2	3	0	34
TAZ_03/1	0	0	12	22	0	3	0	5	0	3	22	8	2	77
ALO_07/2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	15	3	17	53	9	10	5	37	2	20	71	14	11	267

Fig. 6.11 Chart of portable items recorded at abandoned sites, divided by raw material

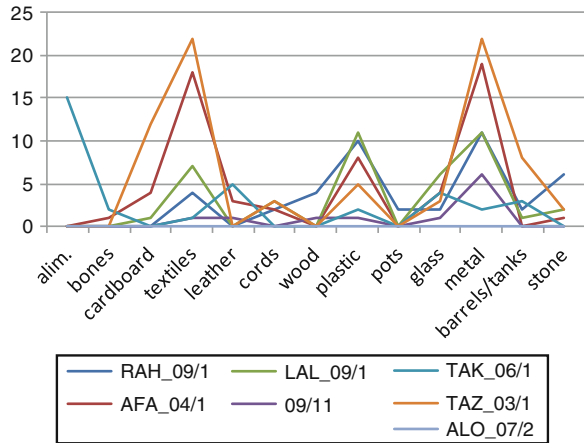


Table 6.19 Number of portable items recorded at abandoned sites, featuring sites’ main information regarding their occupation

Site	Duration of last occupation (months)	Last occupation since (years)	No. of item total	Type of site	Expectancy of reoccupation
ALO_07/2	3	>1	0	Transhumance	Transhumance
09/11	3	4	11	A	No
TAK_06/1	6	5	34	A	No
LAL_09/1	9	4	42	B	Yes
RAH_09/1	6	1	43	A	Yes
AFA_04/1	9	1	60	B	Yes
TAZ_03/1	6	0	77	B	Yes

the ground, without establishing unambiguous correlates between these and the quantity and quality of artefacts. Having thus stressed that categories of materials are quite evenly represented in the site, we can look at the places where these finds occur (Table 6.20).

Most of items are found within kitchens or dwelling huts. On the contrary, objects left outside to any architectural feature were quite few. Rather than ‘lost’ or ‘discarded’ items, many of these objects seem to be ready for reuse or, if their primary use is definitely compromised, recycled. This is likely to be indicated by the type of dump areas I recorded within these abandoned campsites. The majority of dumps (five) were filled merely by ash and charcoal and only in one case

Table 6.20 Spatial distribution of portable items recorded, divided by raw material

	Aliment.	Bones	Cardboard cartons	Textiles	Leather	Cords	Wooden/ straw items	Plastic	Pots	Glass	Metal	Fuel barrels/ tanks	Stone	Total
Kitchen	0	0	10	24	2	5	3	8	2	11	23	7	3	98
Huts	15	1	3	9	1	1	2	17	0	3	24	2	5	83
Stores	0	0	1	11	0	0	0	0	0	0	5	2	1	20
Livestock	0	0	1	2	0	0	0	1	0	0	1	0	0	5
Outside	0	2	2	1	6	1	0	1	0	0	7	3	2	25
Dumps	0	0	0	6	0	3	0	10	0	6	11	0	0	36
Total	15	3	17	53	9	10	5	37	2	20	71	14	11	267

Fig. 6.12 Chart of spatial distribution of portable items recorded, divided by raw material

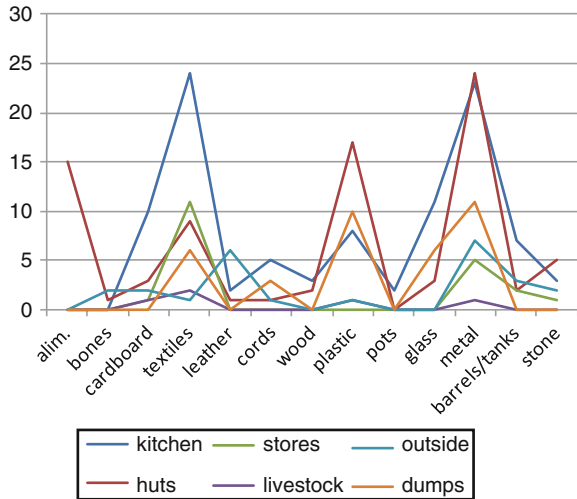


Table 6.21 Overall spatial distribution of portable items recorded, frequency and percentage

Kitchen/huts/stores (domestic fixtures)	201	76 %
Livestock fixtures	5	2 %
Dumps	36	13 %
Outside areas	25	9 %

(LAL_09/1) were dumps with discarded items, mixed with charcoal and ashes, recorded (Fig. 6.12).

In summary, only 9 % of items have been found in the outside areas (Table 6.21). Most items (76 %) have been recorded within or in the close surrounding of kitchens, huts and stores. Only 2 % of items are related to livestock fixtures, when 13 % were found within the two dumps, both found in LAL_09/1.

Some remarkable differences can be recognized within the materials of items left within huts and kitchens. Textiles (mostly grain sacks) are particularly abundant in kitchens, along with cords, glasses and wooden/straw items. Pottery has also been exclusively found there. On the other hand, plastic is significantly more common within huts, where stone items are also common. Alimentary goods are well represented in the huts, but this has to be explained by stressing the significant presence of pollution already noticed in TAK_06/1 (Table 6.22).

Although the sample is limited in terms of absolute numbers of items, we can draw upon it to make some generalizations. First of all, the actual type range of items is quite limited; some raw materials categories are composed of only one or two types of artefacts. Although no systematic record of the assemblages at inhabited campsites has been made in this research, it is clear that several items—relying upon what I have observed during my visits—are strikingly missing. Drinking glasses, cutlery, hardware, metal tools, car spare parts of all kinds,

personal ornaments, weapons and carpets, just to mention some, have never been recorded within abandoned campsites. Second, some items appear strictly linked to the functional/activity area where they were originally used. All stoves, cooking and serving vessels, and related utensils like a cheese tool, have been almost always in kitchens, as illustrated in Tables 6.22 and 6.23. Furthermore, the majority of wraps and clothes—not often distinguishable—have been recorded in the kitchen as well. Conversely, items recorded within huts are more uneven, but we can mention batteries and tea boxes, mostly found within dwellings.

6.3.8 *Refuses, Recyclables and Other*

After having discussed their frequencies, we shall now consider whether these objects are refuse or still-in-use artefacts. Relying upon behavioural archaeology (sensu Schiffer 1976), we can distinguish between operating and no longer operating items. Considering that Schiffer's arguments were developed mainly for sedentary groups, where abandonment cannot be considered a normal process and where the expectation of reoccupation of sites is a marginal occurrence, it seems appropriate to readapt Schiffer's categories for this case study. Therefore, I may surely accept relevant arguments concerning 'de facto refuse'. These are basically items left at a given place at the moment of departure from a given site (Fig. 6.13).

De facto refuse are, in Schiffer's view, still functional artefacts, that, along with 'de facto remains' (huts, pens, stores), can be observed on the ground. For the sake of this study, I shall refer to these as 'usable'. They are precisely the items whose primary use can be still pursued, without any alteration of their physical shape. A good example of these is represented by metal kitchen utensils. Secondly, in Kel Tadrart milieu, there is a widespread tendency towards 'recycling' items. This generally occurs via some alterations to the original physical state of the artefact, although a veritable recycle can be achieved without modifying artefacts. In this perspective, cloth strips can be turned into lace, cartons can be adapted to store various items or to reinforce the wind protection of hut walls, plastic and glass jars may contain other liquids or solid substances, inner tubes can be transformed into string, and many others. Similarly, plastic and metal containers can still be used when their manufactured content is finished. Of course, some artefacts, once worn, cannot be used any longer. This includes bones (though in earlier times, these may have been worked) and well-fragmented or broken items, such as exhausted batteries. These are defined here as 'worn'. Obviously, it is the state of the artefact *per se* that can offer some insight about its life cycle. The case of cans is quite emblematic. In fact, some rusted cans can be found in dumps (worn and discarded), while clean ones were recorded within huts (recyclable). Most categories of items feature only a single status (usable, recyclable and worn), and only three types of artefacts feature multiple status.

Usable items form the major part (66 %) of inventories shown in Table 6.24, whereas recycled items are more rare (18 %) and those worn are even less

Table 6.22 Detailed spatial distribution of portable items recorded, divided by raw material, featuring descriptions of items

	Alimentary	Bones	Cartons	Cardboard	Textiles	Leather	Cords	Wooden/ straw items	Plastic	Pots	Glass	Metal	Fuel barrel/ tanks	Stone	Subtotal
RAH_09/1															
Kitchen inside							2 cords					1 bowl		2 querns	
Kitchen outside					1 wrap			1 cheese tool, 2 large bowls	1 bucket	2 vessels		2 bowls			
Hut A inside					2 wraps			1 haft (shovel)	1 rubber sandal, 4 lids, 2 jars		2 jars	6 cans	2 tanks	2 querns, 1 grinding stone, 1 weight of trap	
Hut A outside									1 rubber sandal						
Hut B inside															
Hut B outside									1 lid			1 can			
Outside area					1 wrap							1 enamel cup			
Total					4		2	4	11	2	2	11	2	6	44
Site AFA_04/1															
Hut A inside		1 small bone	2 tea boxes						1 lighter, 1 frag item			2 cans			
Hut A outside					3 wraps, 2 shoes		1 cord		1 bottle		1 jar	5 batteries, 1 large			

(continued)

Table 6.22 (continued)

	Alimentary	Bones	Cartons Cardboard	Textiles	Leather	Cords	Wooden/ straw items	Plastic	Pots	Glass	Metal	Fuel barrel/ tanks	Stone	Subtotal
Hut B inside								1 box (alim.)			lid (for tea)			
Hut B outside														
Kitchen inside				13 wraps/ clothes	2 leath shoes			2 plastic shoes, 1 lid, 1 tube		3 jars	5 cans		1 quern	
Kitchen outside														
Outside area			2 boxes		1 shoe	1 cord					6 cans			
Total		1	4	18	3	2	0	8	0	4	19		1	60
LAL_09/1														
Kitchen inside														
Kitchen outside												1 oil tank		
Corral inside														
Corral outside			1 box					1 shoe						
Pen inside														
Pen outside				1 wrap										
Dump A										4 jars	6 cans			

(continued)

Table 6.22 (continued)

	Alimentary	Bones	Cartons	Textiles	Leather	Cords	Wooden/ straw items	Plastic	Pots	Glass	Metal	Fuel barrel/ tanks	Stone	Subtotal
				3 frg clothes, 2 wraps		3 cords		1 bottle, 2 lids, 2 jars, 1 frag.						
Dump B				1 wrap				4 jars		2 jars	5 cans			
Outside area													2 stone axes	
Total		1		7		3		11		6	11	1	2	42
Site 09/11														
Hut A inside														
Hut A outside														
Kitchen inside				1 lace						1 broken jar	1 kettle			
Kitchen outside														
Hut B inside					1 water flask		1 trap	1 half- tank			3 cans, 1 battery, 1 bowl			
Hut B outside														
Total				1	1		1	1		1	6			11
Site TAK_06/1														
Kitchen ins.										4 jars	1 lid			

(continued)

Table 6.22 (continued)

	Alimentary	Bones	Cartons		Textiles	Leather	Cords	Wooden/ straw items	Plastic	Pots	Glass	Metal	Fuel barrel/ tanks	Stone	Subtotal	
			Cardboard													
Kitchen out.																
Hut B inside																
Hut B outside	15 onions								1 bag							
Pen B				1 wrap												
Pen D												1 can				
Outside area		2 goat bones				2 boots, 2 shoes, 1 water flask			1 rubber sandal				3			
Total	15	2		1	1	5			2		4	2	3			34
Site TAZ_03/1																
Hut A inside			1 box		1 lace							4 cans		1 quem		
Hut A outside																
Hut B inside					1 lace				1 bottle, 1 tube							
Hut B outside																
Kitchen/ store A (niche)			10 boxes		3 wraps, 6 sacks		3 cords		3 bottles			13 cans	6 tanks			
			1 box									5 cans		1 quem		

(continued)

Table 6.22 (continued)

	Alimentary	Bones	Cartons	Textiles	Leather	Cords	Wooden/ straw items	Plastic	Pots	Glass	Metal	Fuel barrel/ tanks	Stone	Subtotal
			Cardboard											
Store B (niche)				6 wraps, 5 sacks								2 tanks		
Total			12	22		3		5		3	22	8	2	77
	Alimentary	Bones	Cartons	Textiles	Leather	Cords	Wooden/ straw items	Plastic	Pots	Glass	Metal	Fuel barrel/ tanks	Stone	Total
Gran total	15	3	17	53	9	10	5	38	2	20	71	14	11	267

Table 6.23 Spatial distribution of portable items recorded, divided by raw material

Category	Type	Total	Kitchen	Huts	Stores	Dump	Outside areas	Livestock fxt.
Carton	Tea boxes	2	0	2	0	0	0	0
	Boxes	15	10	1	1	0	2	1
Textiles	Wraps	28	14	4	3	4	1	2
Wood/ straw	Hafts	1	0	1	0	0	0	0
	Cheese tool	1	1	0	0	0	0	0
	Bowls/ trays	2	2	0	0	0	0	0
Plastic	Traps	1	0	1	0	0	0	0
	Lighters	1	0	1	0	0	0	0
	Buckets	1	1	0	0	0	0	0
Pottery	Pottery vessel	2	2	0	0	0	0	0
Metal	Kettles/ stove	1	1	0	0	0	0	0
	Batteries	6	0	6	0	0	0	0

**Fig. 6.13** Items left at site RAH_09/1 (photo the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

Table 6.24 Frequency and percentages of portable items

Category	Type	Frequency				Percentage			
		Total	Usab.	Recycl.	Worn	Usab.	Recycl.	Worn	
Alimentary	Onions	15	15	0	0	100	0	0	
	Bones	3	0	0	3	0	0	100	
	Tea boxes	2	0	2	0	0	100	0	
	Carton	15	15	0	0	100	0	0	
	Textiles	Wraps	28	25	3	0	89	11	0
		Clothes	9	6	3	0	66	33	0
		Laces	3	3	0	0	100	0	0
		Shoes	2	0	0	2	0	0	100
		Sacks	11	11	0	0	100	0	0
Leather	Water flask	2	1	0	1	50	0	50	
	Shoes	5	0	0	5	0	0	100	
	Boots	2	0	0	2	0	0	100	
	Cords	10	10	0	0	100	0	0	
Wood/straw	Hafts	1	1	0	0	100	0	0	
	Cheese tool	1	1	0	0	100	0	0	
	Bowls/trays	2	2	0	0	100	0	0	
	Traps	1	1	0	0	100	0	0	
	Lighters	1	0	0	1	0	0	100	
Plastic	Lids	8	0	8	0	0	100	0	

(continued)

Table 6.24 (continued)

Category	Type	Frequency			Percentage		
		Total	Usab.	Recycl.	Usab.	Recycl.	Worm
	Tubes	2	0	2	0	100	0
	Jars	8	0	8	0	100	0
	Bottles	6	6	0	100	0	0
	Buckets	1	1	0	100	0	0
	Sandals	3	0	0	0	0	100
	Shoes	3	0	0	0	0	100
	Tanks/half tanks	1	0	1	0	100	0
	Bags	1	1	0	100	0	0
	Boxes	1	0	1	0	100	0
	Unrec. frags	2	0	0	0	0	100
Pottery	Vessel	2	2	0	100	0	0
Glass	Jars	19	0	19	0	100	0
	Unrec. frags	1	0	0	1	0	100
Metal	Cans	57	46	0	81	0	19
	Kettles/stove	1	1	0	100	0	0
	Lids	2	2	0	100	0	0
	Enamel cups	1	1	0	100	0	0
	Bowls/trays	4	0	0	0	0	100
	Batteries	6	0	0	6	0	100

(continued)

Table 6.24 (continued)

Category	Type	Frequency		Percentage		Worm		Recycl.	
		Total	Usab.	Usab.	Worm	Worm	Recycl.	Recycl.	Worm
Stone	Jerry cans/tanks	14	14	100	0	0	0	0	0
	Querns	7	7	100	0	0	0	0	0
	Grinding st.	1	1	100	0	0	0	0	0
	Trap's weights	1	1	100	0	0	0	0	0
	Axes	2	0	0	0	0	100	0	0
Total		267	174	66	44	18	16		

Bold items have multiple statuses

Table 6.25 Synoptic view of frequency and percentage of status of portable items

	Frequency			Percentage			Type of site
	Usab.	Recycl.	Disc.	Usab.	Recycl.	Disc.	
09/11	7	2	2	64	18	18	A
LAL_09/1	23	15	4	54	36	10	B
TAK_06/1	25	3	6	73	18	9	A
RAH_09/1	30	11	2	69	26	5	A
AFA_04/1	31	21	8	52	35	13	B
TAZ_03/1	53	24	0	69	31	0	B

represented (16 %). Taking into account each site, some degree of variability in the number of items' status can be observed (Table 6.25). A widespread prevalence of artefacts in good condition left at the abandoned campsites seems to highlight a general trend. This favours possible future occupation or delayed curation.

We have already pointed out that what diminishes, in fact, is the quantity of items, being similar to the distribution of items within 'usable', 'recyclable' and 'worn' categories. This indicates that delayed curation mechanisms roughly operate throughout all the various categories of items and is not affected by the type of site.

6.3.9 Some Remarks

In the Acacus mountains, as in other regions inhabited by mobile people, abandonment is a rather *normal* process, not determined by sudden or catastrophic events. As such, abandonment can be defined, as Tomka and Stevenson (1993: 192) suggested, as an ongoing site formation process, and not as a single event. Abandoned sites are, in a mobile pastoral context, still viable opportunities. The whole Acacus landscape seems to be punctuated by tangible evidences of 'recent' animal husbandry 'architecture'. Although hard to date with precision, abandoned campsites of the Acacus range demonstrate that important information can be extracted from the evidence on the ground. In this study, almost every site has proven to include durable fixtures, made of stone. Surely, stone hut foundations may collapse, but these remain extremely visible. Post-abandonment deterioration may affect plant material huts, exclusively made with wooden sticks, posts and branches, and reduce their visibility. Yet, plant material huts do not disappear quickly. For instance, a plant material corral observed at LAL_09/1 although deteriorating 4 years was still extremely recognizable. Surely, wooden huts can be removed and transported to the new settlement, as may happen with (plant material) roofs.

Quite surprisingly, recent accumulations of livestock excrements do not produce, in the medium term, those thick dung layers recorded at many archaeological



Fig. 6.14 Site LAL_09/1, notice the washing of ovicaprid excrement (*photo* the author, used with permission from ‘The Archaeological Mission in the Sahara’, Sapienza University of Rome)

sites in the region (Cremaschi and di Lernia 1998). Absence of droppings may testify to a surprisingly low preservation capacity in the current hyperarid Acacus massif region, due to wind erosion and rainfall, combined with the lack of fences or corrals (Fig. 6.14). Finally, considering the abandoned sites discussed in the second part of this chapter, almost half of their material culture derives from (eventually) perishable items: (alimentary, cartons) add up to 32 items (12 %), slightly less perishable items (textiles, leather, cord, wooden/straw) are 77 (29 %), with 158 counts (59 %) for the most durable ones.

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Chapter 7

Ethnoarchaeological Suggestions for a Review of the Last 3,000 Years in the Tadrart Acacus

7.1 The Tadrart Acacus in Historical Times

The Fazzan, the south-western region of Libya, is one of the few areas in the Sahara where the archaeology of historical and modern times has been carried out so far. In this region, several areas have been systematically investigated in the last twenty years (e.g. Mattingly 2003, 2007, 2010; Liverani 2005; Mori 2013), mainly focusing of the development of the Garamantian kingdom (c. 1000 BC–700 AD). The Fazzan lies at the very centre of trans-Saharan connections that developed in historical times and continued to modern times (e.g. Edwards 2001; Liverani 2006; Wilson 2012). It has emerged that in spite of the arid conditions that characterized the last 3,000 years, this regions hosted different communities that developed patterns of successful adaptation to patchy and erratic natural resources.

However, data from the Acacus massif for late prehistoric and historic times, when compared with the adjoining regions such as the *Wadi el Ajal* (e.g. Mattingly 2003, 2007, 2010) or the *Wadi Tanezzuft* (di Lernia and Manzi 2002; Liverani 2005; Mori 2013), are still few. Actually, in the early 1990s, when the first systematic surveys (Cremaschi and di Lernia 1998) were conducted in the Tadrart Acacus, the historical archaeology was still poorly known. Yet, although not published, Garamantian and other later materials were collected and stored (di Lernia pers. comm). It is worth to stress that the top of the Holocene layers of the Acacus caves and rock-shelters are often characterized by layers of ovicaprid dung of variable thickness dating to the Late Pastoral (c. 3900–1950 BC) and, rarely, to the Final Pastoral (c. 1950–850 BC) horizons (e.g. di Lernia and Manzi 2002; di Lernia and Merighi 2006). The uppermost levels of dung were dated as well. Three C14 dates from upper dung deposits within three rock-shelters (Cremaschi and di Lernia 1998; Cremaschi and Zerboni 2011) fall between 2800 and 1200 uncalibrated years bp, which roughly means a span between c. 900 BC–1000 AD, testifying to post-Pastoral period occupations. This implies that, in principle, other tops of the sequences may give similar dates.

Beside this erratic evidence, rock art emerges as the clearest indicator of human frequentation in the Tadrart Acacus in historical times. Recent research by di Lernia and Gallinaro (di Lernia and Gallinaro 2011; Gallinaro 2013) provided new maps of the distribution of the two later ‘styles’ or ‘phases’ of Acacus rock art, namely the Horse (c. 3rd–2nd millennia BP) and the Camel phases (c. 2nd—present). The Camel phase may partially overlap with Horse style subjects, and endures until the very recent past, and, perhaps in the Tadrart Acacus, to the present. Similarly, fresh investigations on textual inscriptions in *Tifinagh* characters discussed the spatial distribution of those peculiar written evidence (Biagetti et al. 2012, in press). The *Tifinagh* alphabet is to be found throughout the Sahara and North Africa, including the Canary islands and the Sahelian belt. The origin and the development of *Tifinagh* characters is still unclear (Camps 1978; Galand 2001). Similarly, the decipherment of *Tifinagh* texts is not an easy task, and most attempts have proven to be extremely difficult (Casajus 2011). *Tifinagh* texts in the Acacus Mts. range from a single, very short line, to large rock walls covered by hundreds of characters. Notably, most complex sites configure real palimpsests (Ait Kaci 2007), where different techniques, size of characters, and varnish sensibly varies (Biagetti et al. 2012). Only few inscriptions have been dated so far, and, beside the exceptional site of Irlarlaren in the Acacus Mts. (Ait Kaci 2007; Biagetti et al. in press), which features lines of Garamantian age, the overall impression is that most of these inscriptions are relatively recent, and date back only to the ‘Islamic’ age, (from seventh to nineteenth century AD), in partial contemporaneity with rock art of the Camel phase.

7.2 Signs in Place

Being aware of the problems of dating and decipherment, the ‘place’ of such ‘signs’ on the landscape can be considered. The overall distribution of both *Tifinagh* and rock art can be read as tangible evidence of human frequentation in historical times in the Tadrart Acacus. Density analysis reported in di Lernia and Gallinaro (2011, Fig. 7) hints at some clusters of historical rock art, roughly reproducing the distribution of *Tifinagh* sites (Biagetti et al. 2012, Fig. 8). It is worth noting that those areas, where ‘signs’ from historical ages are concentrated hosts the Kel Tadrart main sites described in this book. It is likely that future research will highlight possible paths the development of historical frequentation in the Tadrart Acacus. However, since that natural settings and resources have not been subjected to radical alterations since proto-historical times, by analogical reasoning, we can assume that the reasons that drive the current choice of settlement are not that dissimilar to historical ones. Thus, favourable areas for human settlement—whatever permanent or transient—may be comparatively considered over the last 3,000 years. The widespread occurrence of *Tifinagh* and rock art sites appear well suited to a scenario where small groups of herders have continued to exploit the Tadrart Acacus valleys from late prehistory up to present days. In this

perspective, an ethnoarchaeologically informed review of the past allows to postulate a kind of continuity in human occupation from historical times, and improve our understanding of a so far neglected archaeological landscape. Rather than being abandoned, it is likely that the Tadrart Acacus hosted small communities of herdsman, who left tangible evidence of both their passage and permanence. The most intriguing point lies in the ethnic composition of the inhabitants of the Tadrart Acacus in historical times. Was a single lineage dwelling the massif in the past, as it is today, or was there greater diversity? Were there any wealth/cast divisions? Do we read the battle scenes of the Camel phase (di Lernia and Gallinaro 2011; Gallinaro 2013) as portrayals of real fights between rival populations? Likewise, it might be suggested that *Tifnagh* scripts, represent signs of physical possession of parts of the Acacus landscape in times of territorial competition, which is definitely lacking today. What we have discussed so far is surely a good starting point for further research aimed at refining our knowledge of such interesting centuries when the Tadrart Acacus is the sole place where texts, rock art, and archaeological sites are to be found together in the south-western Fazzan.

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Chapter 8

Conclusions

8.1 Retrospective

Archaeologists as westerners have a long-lasting liaison with nomadic people. Hunter-gatherers and pastoralists have attracted generations of scientists that seek to explain the nature of lightly equipped and mobile societies worldwide. This is likely to continue in the coming decades, as the study of mobile societies is going through some kind of revivalism (e.g. Sellet et al. 2006; Barnard and Wendrich 2008), consolidating traditional avenues of research and highlighting some new proposals. Ethnoarchaeology is a constant source of ideas, models and cautionary tales that are affecting the archaeological study of nomadism, to be used by archaeologists for the interpretation of material occurrences.

8.2 The ‘Aridity Paradigm’ in the Archaeology of Holocene Sahara: Lessons from the Present

Climatic history of the Holocene presents broad regional and temporal variability, within the general framework of global oscillations between arid/dry and wet/warm. In the study of Saharan prehistory and history, reconstructions of cultural dynamics are generally made in strict connection with climatic oscillation and subsequent environmental modifications. Interdisciplinarity is, in fact, an important characteristic of contemporary Saharan archaeology. Several local trajectories have contributed to sketching out regional schemes, matching cultural and environmental sequences over vast regions. In the present study, I have not denied the intrinsic strength of this concept, which focuses upon the idea that cultural trajectories develop synchronously with the modification of the environment. However, in a genuine anthropological perspective, this research questions the validity of ‘universal’ or ‘optimal’ responses of humans to environmental events, such as

decadal climatic oscillations and extreme aridity. Specific adaptive practices might have developed in certain contexts, given that the uniqueness of every (pastoral) society is the outcome of unrepeatably historical circumstances. In fact, the Kel Tadrart have deliberately chosen to live and to remain in the Acacus, in spite of a highly marginal environment and government pressure to sedentarize them. On an initial and simplistic level, it shows that under hyperarid conditions, humans do not necessarily move away. Taking a wider perspective, it challenges the reconstruction of migrations and movements on the basis of the solely environmental circumstances. I think we should be (better) equipped with studies demonstrating the enormous cultural capacity of Holocene Saharans (like other populations) to adapt to harsh environments, promoting their own cultural variability and dynamism. In this sense, we still lack a large and unambiguous dataset regarding current and past adaptation to increasing aridity during the Holocene arid environment that include (at least archaeologically) ‘successful’ examples of desert adaptation, and not merely a breaking away from ‘deteriorating’ environments. The rise of a Saharan Garamantian state is an example of a remarkable exception, and it has only been universally acknowledged in recent years. Precisely from this perspective, and considering the ethnohistorical data collected, we must stress that in the Tadrart Acacus, continuity in occupation can be recognized since late prehistoric times, in spite of the arid environment. This is in part thanks to an ethnoarchaeologically inspired reinterpretation of material evidence from over of the last three millennia.

8.3 Variable Landscapes Made of Locales and Lines

In Chap. 4, we addressed the issue of the settlement pattern of the Kel Tadrart. Main settlements are those where the household members spend most of their time and where they return after seasonal displacement. Transhumance occurs unevenly in the Tadrart Acacus, if at all, as a proper alternance between wet and dry season cannot be envisaged. Generally, movements occur after rainfall, according to temporary needs. Mobility is, in principle, an option available to every Kel Tadrart household, yet not everyone has moved in the course of the past years. Some households have one or two secondary and generally smaller settlements that can be used when the resources around the main campsites become scarce. Short-term displacement occurs as well, towards higher pastures, located in more recessed areas of the Acacus massif. In this case, Kel Tadrart tend to exploit existing shelters or build simple windbreaks. On the other hand, some households are characterized by a lower degree of mobility, being almost sedentary. These integrate the naturally available resources by buying extra fodder in the market of Al-Awaynat, where Kel Tadrart sell the by-products of animal husbandry.

In the course of my investigations, it has emerged that various real options exist, both for settlement location and for strategies of mobility. In fact, although some rules in the choice of the place for settlement have been identified, their

physical connection to resources is subject to some variation. Having identified some potentially better pasture areas, we have analysed the position of settlements, arguing that the quantity of good ‘soils’ available in the vicinity of the settlement varies considerably. We have further stressed that there is no clear interconnection between the most relevant factors, namely type of mobility, herd size, area of ‘good soils’ in the vicinity of settlement and trips to the market. It has led us to suggest that such an approach, although taking into account the variables that are most likely to affect the settlement pattern, does not provide any straightforward or predictive insight into the definition of the factors shaping the distribution of Kel Tadrart settlement in the Tadrart Acacus. Rather, if we consider the time factor as well, we are then able to identify some mechanisms that are driving Kel Tadrart choices. In fact, I have demonstrated that most of sites are close to water points and that those water points are generally *gueltas*. On a very short-term basis, every annual cycle is likely to be different, according to the quantity and localization of rainfall, and subsequent exploitation by pastoralists of greener zones. This implies—across the *long-durée*—that we can only reconstruct a more refined picture where certain geomorphological features allow a regeneration of resources to counterbalance year-to-year variability. Clearly, the time factor is extremely relevant to our discourse. Therefore, even in this variable scenario, some locales have more frequently favourable conditions for human occupation, and this can be recovered on the ground.

On the basis of the Tifinagh and late rock art distribution throughout the massif, some sites of interests can be identified, where the engraved and painted evidence is concentrated. In some cases, such places correspond to those of actual Kel Tadrart settlement, in other cases not. Clearly, the historic time depth given by the analysis of Tifinagh and rock art, plus the identification of better soils and *gueltas* potential, may mark some areas as being foci, where past and current occupations have repeatedly occurred. It is not by chance, in fact, that some areas are richer in both inhabited and abandoned campsites, highlighting some long-term favourable spots for human settlement in the Tadrart Acacus.

8.4 The Settlements: Traditional Assumptions and Actual Trends

Kel Tadrart sites have been the main subject of Chaps. 5–6. The study of huts and other fixtures has shown interesting trends in Kel Tadrart architecture. I identified a standard prototype of the Kel Tadrart house in the Fazzani circular straw hut. Then, I analysed the occurrence of these plant material huts versus stone huts, stressing that the wealthiest households use exclusively straw huts. Indeed, mobility affects the choice of building materials, but not in the typical perspective where stone constructions are the sign of sedentism. Here, it is really the opposite, as stone huts or shelters are purposely built in sites inhabited only for short periods, as several secondary or shortly occupied ‘main’ sites (e.g. those located

on the western side of the Acacus) have demonstrated. I have also claimed that the issue of identity and self-identification is likely to play some role in the choice of plant material huts. Stone huts, on the other hand, appear characterized by a large degree of unevenness in both size and shape, demonstrating low degree of standardization, possibly due to their recent adoption or even reinvention.

The distribution of features within Kel Tadrart campsites has been further analysed, showing how hard it is to detect spatial patterns. Extending over large areas, Kel Tadrart facilities are positioned in close relation to surrounding physical and environmental settings. Likewise, they are characterized by a spatial separation between 'domestic' and livestock areas, although with some variability. There are thus varieties of internal settlement patterns that can be recognized from the household level, up to that of the whole community. This variety generates different types of settlement that, once abandoned, can be generally identified, on the basis of what is observed in the present. We have shown that the linear arrangement of feature is very suited for the stock management and related duties, and it is widespread among the Kel Tadrart households, regardless of their comparative mobility.

Nevertheless, even abandoned settlements are dynamic: subject to the retrieval of cached objects and features, with occasional modifications and adjustments in their structures due to subsequent reoccupation. Although, the distribution and nature of features within campsites are far from being static evidence of past occupation, crucial insights for the interpretation of these have come from our study. In fact, the study of selected areas, coupling abandoned settlements with the detailed analysis of occupied sites, provides us with some ideas regarding the factors driving formation processes at Kel Tadrart sites. On the basis of the quantity and quality of architectural features, we have successfully looked for tangible evidence of the types of mobility described in Chap. 4. We have then discussed the nature of the portable items to be found at Kel Tadrart abandoned sites and interpreted it as evidence of a 'delayed curation' mechanism. Isolated elements of the Acacus pastoral landscape have thus been reconnected in light of the observations made in the present, enhancing the comprehension of previously sparse and undifferentiated evidence.

8.5 Past and Present

As acutely argued by Cunningham (2009), it is precisely the contribution coming from the other's perspective that assists us in going beyond a mere recognition of objectified environmental and geomorphological characteristics of a given study area. Surely, the ethnoarchaeological study of pastoral landscapes may well hold high relevance in cases of regional continuity, especially when limited time has passed between archaeological and ethnographic evidence. However, I have repeatedly stressed that my idea is not to map the present onto the past, rather to uncover in the present regularities and anomalies that can help in the comprehension

of key elements of the landscape. I have aimed at defining the steps of an analytical procedure that may reveal the critical element of interaction between the cultural and natural environment and a small lineage of pastoralists. I have not only taken into account some of the most traditional topics of nomadic ethnoarchaeology, but also tried to focus on their landscape as a dynamic entity where productive, social and cultural issues are enfolded. My hope is to have built a ‘working model’ that may aid in the discovery of the factors that affect (or produce) the regularities or the anomalies that have been discussed. Surely, the historical depth of the whole process remains somewhat problematic. The inclusion of some ethnohistorical sources can only mitigate an objective lack of information for earlier times. But, the idea is that only archaeology can monitor change over long time spans. The role of ethnoarchaeology is rather to identify the processes (and their causes) operating in the present, yet placing those in the longest possible frame. In other words, we have for instance observed some different choices in dwelling types and strategies of mobility. These are important per se, especially having established some potential rationales for their development, but it is likely that these can be set in the frame of larger transformation of the whole Kel Tadrart society (where some households are progressively falling into the orbit of Al-Awaynat, while others are reinforcing their ties with the mountain). In this case, as discussed in Chap. 4, we have been able to place our sample in a regional long-term process of sedentarization (in the oasis) and nomadization (in the Acacus).

8.6 Final Remarks

The future of ethnoarchaeology in the Sahara remains uncertain. Fieldwork is currently difficult in the region and its surroundings as well. It is too early to figure out new scenarios for Libya and the whole Sahara. On the other hand, the archaeology of the Sahara has gained a more important position in the academic world in the past two decades. Similarly, recent results in ethnoarchaeology of mobile people seem brighter, at least in the terms of renewed interest in this subfield. In this situation, there is still plenty of room for particularistic studies aimed at understanding the variability (and flexibility) of pastoral communities as they progressively inscribe themselves on the landscape.

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Index

A

Al Awaynat, 32, 59, 148, 151

B

Burial, 3, 33

C

Camels, 28, 30, 35, 36, 39

Campsites, 34, 63, 65, 66, 72, 78, 87, 88, 94,
96, 97, 99, 102, 103, 109, 110, 112,
115, 116, 119, 125, 127, 129, 130, 137

Cave, 89, 143

Climate, 4, 145

D

Diwan, 70, 79, 82, 83, 85, 96, 97

Dromedary, 29

Dung, 10, 88, 94–97, 109, 113, 119, 123, 124,
140, 143

F

Fazzan, 1, 2, 27, 29, 30, 32, 69, 78, 143, 145

G

Garamantes, *see* Garamantian Kingdom, 1, 6,
143

Garamantian Kingdom, 1, 6, 143

Ghat, 27, 29–31, 69, 85

Guelta, 18, 20, 23, 24, 34, 48, 51, 52, 149

H

Herding strategies, 5, 32, 34

Hoggar, 27, 28, 34, 35, 69

Husbandry, 1, 4, 10, 11, 34, 97, 104, 109, 148

Huts, 10, 33, 65, 66, 68–70, 72–74, 76, 78, 79,
82–84, 96, 97, 104, 109, 110, 113–116,
118–120, 129, 130, 140

K

Kel ajjer, 27, 29, 30

Kel tadrart, 1, 6, 8–11, 27–34, 36, 38–41,
63–66, 68–70, 73, 74, 76, 78, 79, 82,
83, 85–88, 91, 94, 96–99, 101, 102,
108–110, 114, 115, 123–125, 130

Kitchen, 65, 76, 78, 79, 81, 96, 97, 115, 116,
130

M

Mobility, 9, 83–85, 87, 96, 125

Mosque, 105

N

Natural resources, 143

O

Ovicaprids, 36, 39, 88, 95

R

Rock art, 6, 99, 144

Rock-shelter, 143

S

Settlements, 5, 8, 9, 11, 34, 63–65, 68, 72, 73,
82, 85, 96–99, 103, 104, 108–110, 115,
116, 119, 123, 124

Stores, 68, 96, 97, 129, 130

Structural terraces, 11

T

Tabarakkat, 32, 33

Tadrart acacus, 1, 6–8, 11, 29, 30, 32, 33, 35,
69, 85, 88, 89, 91, 99, 101, 115, 143,
144

Tassili n' Ajjer, 27, 29, 72

Tifinagh, 100, 144

Transhumance, 114, 148

V

Vegetation, 18, 19, 44, 47

W

Wadi, 30, 64, 97, 101, 102, 107, 108, 110, 115,
143

Well, 3, 4, 6, 9, 11, 28, 29, 31, 36, 39, 68–70,
72–74, 76, 85, 93, 94, 97, 103, 104,
108–110, 114–116, 124, 129, 130, 143,
144