



Authority, Anarchy and Equity: Explaining Agrarian Change
in the Algerian Sahara

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Abstract

This thesis charts and theorises a general transition from authoritarian to participatory forms of governance and natural resource management, as viewed from the locale of a Saharan oasis town situated within wider temporal and spatial change processes. Ostrom's (2014) work on the ability of communities to regulate access to the commons hinges on resource users jointly agreeing on and conforming to rules of use. Similarly, recent theoretical developments related to *Social Ecological Systems* and adaptive management also emphasise group consensus as a prerequisite for adaptation. These approaches presume a degree of equality in social relations across the group. In Beni Isguen, Algeria, by contrast, the management of water commons is complicated by class inequalities. This region has recently seen a shift from religion to capital as the dominant ideology behind ruling factions, entailing the contraction of a theocratic influence, with the accession of a secular merchant class. This latter faction has achieved this by ideologically and pragmatically positioning themselves within the hierarchical administration of the nation-state, and thus conforming to national laws. This key shift in political alignment followed a long period of local resistance to over-arching ruling powers. I argue that this conformation has entailed a displacement of a localised 'social contract' whereby welfare, labour and regulation were previously achieved through the 'moral economy' of reciprocal relations, to a citizen-state contract based on the assumption of rights and certain services (e.g. protection of private property, creation and maintenance of infrastructure), and a reliance on the market to provide goods and other services (e.g. labour). These historical social changes have implications for theoretical developments regarding the role of the citizen-state relationship in terms of the protection of private property vs. protection of communal property, of anthropological perspectives of legal pluralism, and social contract theory.

Furthermore, the thesis describes mixed modes of resource management involving new voluntary associations as alternative forms of local governance from below, alongside customary regulatory officials in charge of water. The emancipatory idea of some regarding civil society has received thorough critique by anthropologists (Bentham 2000; Comaroff & Comaroff 1999), yet along with Butcher (2014), I argue that despite this, the recent opening of the civic sector has created an opening for new forms of activity within the Algerian political landscape. However, the informal agreements of voluntary associations appear to lack the 'teeth' necessary to regulate uncooperative individuals. Authority today is locally perceived as the prerogative of the state, and so some state regulation appears necessary. The study thus views these processes from the viewpoint of the crucial determinant of life in the desert: water, and from there its social dependents, and how they organise themselves.

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¹ Ingold 2011. *Being Alive: Essays on movement, knowledge and description*. London: Routledge. Quote: page xii.

Note on transliterations

All transliteration of Arabic words was done according to the *Journal of International Middle Eastern Studies* format. Certain words were kept according to the phonetic representation to reflect usage in the local dialect (for example, *l'oumna*). When citing from other texts I have kept the spelling used by the author. Tumzabt words were also written phonetically as there is no exact standard transliteration for the Tamazight language which can be written in Tifinagh, Arabic or Latin. At times, phrases combine Arabic, Tumzabt and/or French, reflecting local ways of speaking.

1. Introduction: Anthropological research in the Algerian Sahara

The difference between the desert and the oasis is man.
~ Saharan saying.

This thesis investigates the role of micro social movements in managing unstable natural resources in the midst of socio-political change in Algeria. The focus of my study is on the micro-level of how changes from authoritarian to inclusive forms of governance are negotiated at the everyday level in the Algerian Sahara. The so-called Arab revolts, and the challenge by populations of autocratic rule in Muslim-majority countries have met with mixed success, and arguably failure across the Maghreb and Mashriq. In Algeria, the impact of this ‘Arab Spring’ (2010 onwards) was subdued. Algerians, who experienced the turbulence that resulted from aborted attempts at democracy in 1989, a violent civil war during the 1990s, and a tumultuous ‘Berber Spring’ in 2001, are wary of the violent instability commonly associated with political transitions. In 2012, the Algerian state, nervously watching the social foment on its borders, quelled discontent through largely superficial stop-gap policies, from shipping football supporters to nearby countries to watch international matches, to cash hand-outs, drawing on funds from its considerable gas reserves.

Zooming in to the desert region of the M’zab valley, Ghardaïa (see figure 3.1), this *wilāya* (province) has been navigating a parallel shift in governance practices but over several decades, and for different reasons. Since Algerian independence in

1962, traditional theocratic authority over the Mozabite Berber community has waned, while the activity of small social movements, or associations (e.g. neighbourhood associations, farmer associations, employment associations), has increased dramatically. Many of these associations have taken over the roles that previous social institutions fulfilled, albeit from a consensual perspective, rather than led by traditional hierarchies (such as gender, age, wealth, family social standing and piety). Hierarchical structures continue to be formally replicated in new forms, although civil society leaders do not have any significant coercive power over other members as their religious forebears did; their role is rather that of coordinator and instigator of activity. Minor conflicts are still resolved through recourse to traditional means (the family, and larger kinship groups), but for more serious conflicts the state is now the ultimate arbiter. The ensuing degree of removal in the governance of the oasis community and its resources has resulted in mis-management by central authorities (i.e. the Algerian state), which lack the fine-grained understanding of local socio-ecological complexities. The state has historically been extremely heavy-handed in quashing dissent, especially during the 'black decade' of the 1990s, and also during the 2001 'Berber Spring'. Not long before this was the violent war of independence from colonial France, 1954-1962, revealing cycles of political unrest and resistance and these memories remain within the present day Algerian imagination. Of interest to this study, is how micro-social movements have been rallying to manage the oasis resources of Beni Isguen despite the erosion of traditional organisations and interference by the state. While they may not be able to address all their ecological, political and economic issues alone, small-scale agricultural communities are more suited to dealing with many of their own problems. At issue, then, is finding the balance of power between central and local direction, decision-making and solutions. Complicating this matter

is that many Berber activists have long pushed for political autonomy in the region, although the Mozabites – the subjects of this study – while not inactive, have been quieter than other groups on this front.

In this introductory chapter, I assess the general conceptual framework of the thesis, including a brief but critical introduction to the theoretical framework under analysis (systems theory). I present the rationale for the study, followed by an introduction to my field site and study methods, and discuss the wider relevance of the findings. The final section gives a synopsis of the thesis chapters.

1.1 General conceptual framework: social and ecological change in the M'zab

Significant social changes over the last five decades affecting the M'zab oasis have come from integration with the wider Algerian nation-state and its juridical system continued from the colonial era, the market system and engagement with global media by the younger generations. Such changes have resulted in a more gradual, quiet 'revolution' and experimentation with political change rather than the recent explosive change in the surrounding countries such as Tunisia, Egypt, Libya and Syria. Ecological change is also apparent, such as greater temperatures, increased drought, and yet more severe flash floods, as global climate change is predicted to make weather patterns even more unstable across North Africa (Ward et al. 1999). Institutions and cultural practices have been developed in many regions to deal with such unpredictability, yet as social and ecological changes occur at increasing rates and in complex ways, small communities may actually be disempowered in their ability to cope. Many studies have addressed the manners in which communities use cultural practices as a buffer to change (e.g. Paumgarten &

Shackleton 2011; Berman et al. 2012; Bryan et al. 2013), but few address how through process of conflict and rupture, communities may find new solutions.

The seemingly remote Sahara has not been immune to the foment of dynamic political change. The Sahara desert is more than a static backdrop to social life; the Sahara is a dynamic system itself. Deserts cover 30 per cent of the earth's terrestrial surface (Mares 1999: xxix). Deserts are often referred to as marginal, liminal spaces on the edge of civilisation, terra incognita where unknown, mythologised monsters lie, a hotbed of anti-social activity, training grounds for terrorists who plan to murder us in our sleep. Yet, humans have adjusted their lifeways to harsh, arid environments for millennia, with ingenuity involving considerably detailed ecological knowledge, technology and husbandry of plant and animal species. Husbandry has included the date palm, (*Phoenix dactylifera* Linn.), a cultural keystone species (*sensu* Garibaldi 2009) for oasis dwellers, which is a likely contender for the mythical "tree of life" (Zaid & De Wet 1999), the domesticate originating from somewhere between Egypt and the Levant. Date palms require only minimal upkeep, usually only twice a year during pollination and harvest time, and so fit well with both nomadic and sedentary forms of subsistence. Alternatively, they can be cultivated intensively, for greater date production. Furthermore, every part of the palm tree may be utilised in human subsistence, for construction, food, firewood, baskets and more. Date palm oases provide an alternative example challenging limited views of the recentness of globalisation, for research shows that they have always connected historical migration and trade routes, serving as hubs of cosmopolitan life (Battesti 2005: 13). Yet oases, along with deserts, are today perceived to exist in virtual isolation from the rest of the world (Scheele & McDougall 2012). This study reveals how a particular society actually tried to seek

isolation on a rocky desert plateau to practice their religion free from other political influences, akin to a monastic order. They were forced, however, by the same environment to travel as merchants in order to feed their families in the homeland. Yet, their oases continued to be developed, transforming the barren rocky valley known today as the M'zab into a lush green vegetated space through ingenious manipulation of underground water reserves by means of artisanal wells, large dams and complex irrigation canals.

As well as being notoriously harsh places to live in, desert ecosystems and climates are usually extremely variable; consequently they are sometimes described as 'non-equilibrium systems' (von Wehrden et al. 2012), whereby these ecosystems have multiple or chaotic states from barren to full vegetative cover. This unpredictability has resulted in a range of livelihood strategies and means to buffer against risk. For example, once perceived as bad management, overstocking of herds is actually a strategy for managing disequilibrium (Homewood 2004), whereby larger herd sizes act as a buffer. In terms of settled livelihoods, Park (1992) has described how in Mauritania, communities manage chaotic flood plains through a hierarchical society; once the seasonal flood waters settle, lands are then redistributed as parcels according to family status. In Tunisia, oasis farmers may reduce or expand the number of plots farmed in a particular year according to water availability (Battesti 2005: 151). The management of social change has entailed both 'traditional' and innovative measures, and different forms of change have necessitated different approaches. Yet, large-scale processes, such as climate change and increasing globalisation have accelerated changes in the past decades. This has made it harder for communities to keep up, or attempt to manage or even 'slow down' such developments. Commenting on recent Amazigh (Berber) social movements in

Algeria, Roberts (pers. comm.), a Berber specialist has suggested that such movements are better equipped to deal with progressive social change than are traditional political structures, which rely on more routine forms of governance. While questioning the inflexibility of traditional government (see chapter seven on the flexibility of *urf* or customary law), I develop this general theme by viewing associational life as an innovative political development based on inclusion rather than hierarchy.

Recent agrarian studies have been dominated by a resurgence in systems approaches (e.g. Kremen & Miles 2012; Giller et al. 2011; Nemecek et al. 2011). This framework has been suggested to address the ‘soft’ side of agricultural studies, to complement classical ‘hard’ approaches (such as analyses of biophysical properties and rational economic theory that aims for optimal production through technical innovation and integration into commodity markets). ‘Soft’ aspects include farmers’ decision-making, such as preferences and perceptions based on socio-cultural backgrounds (Darnhofer et al. 2012). The classical approach may work in certain contexts (such as large, homogenous farming environments), but not all, due to heterogeneous environments and varying socio-cultural preferences. Practitioners of this approach have proposed *adaptive management* (Milestad et al. 2012) (among others) as an innovative and more appropriate framework. Adaptive management is said to be a more suitable framework for dealing with complexity and uncertainty in integrated socio-ecological landscapes (Fabricius & Cundill 2014). As desert oases clearly fit the description of complex socio-ecological systems, I tested this framework in the context of the Algerian Sahara.

1.2 Rationale for the study

I carried out preliminary research into the feasibility of adaptive management theory to explain how farmers deal with change in Morocco (Benessaiah 2011). Specifically, the study examined the role of knowledge production, and its effect on perceptions of an aspect of ecological change, the deadly palm tree disease, *bayoud* (the soil-born fungus *Fusarium oxysporum* f.sp. *albedinis*). I found that the dissemination of ecological knowledge was related to status. This meant that knowledge within the population as a whole, such as that of the disease was uneven, resulting in a limited ability to successfully diagnose and treat the disease. Individuals of lower stature often had less access to knowledge, and likewise their knowledge was not circulated. As social learning is suggested as a key feature of adaptive management, I further examined the relationship of scientific knowledge (through agricultural extension agencies) to local knowledge. I found that people were generally proud of their traditional knowledge and while they didn't refuse scientific knowledge, they sought a realignment of the two as complementary, for they perceived that agronomists positioned themselves as superior, when really they held theoretical as opposed to practical understanding.

From Morocco it was a natural step to follow the spread of *bayoud* disease eastward to the limits of its range in the M'zab valley, central Algeria. The present study expands on these findings to study oasis management in its entirety, looking at date palm farming methods, irrigation systems, local management institutions and the cultural background that informed management practice. My key question that emerged was: did oasis dwellers use adaptive techniques to manage their dynamic social and ecological resources? By drawing on a theoretical conceptualization of adaptive management in the literature, this then became my primary research

question. I critically review this literature in the next chapter. The following sub-questions were formulated to orient the research:

1. How is knowledge produced and contextualised about date palm growing and irrigation management?
2. How are ecological disturbances conceptualised?
3. What cultural practices exist to manage disturbance and risk?
4. How are sociological changes framed within local understanding?
5. What institutions exist for regulating social processes?
6. How does private and communal land tenure affect oasis management?
7. How are conflicts resolved?
8. Are farmers able to respond to new or extreme change?
9. To what extent do changing government development policies and scientific management methods affect management of date palm oases?

These questions aimed to inform my understanding of how local governance practices have changed in response to local and wider transformative dynamics at different scales. I utilised various approaches aimed at conceptualising these processes, as I will now explain.

1.3 Introduction to systems approaches

Many scholars urge that social and ecological processes should be studied as integrated total systems (Rappaport 1968; Bateson 1972; Lansing 1987; Berkes et al. 2000). This trend, common to environmental anthropology and similar disciplines, seeks a human-in-ecosystem approach (Davidson-Hunt et al. 2003: 2; Ingold 2000: 5). Recent investigations in this genre have been inspired largely by a reevaluation of humanity's place in the world through exposure to alternative ontologies and cosmologies of indigenous people, also inspired by continental philosophers such as Deleuze. This view is laudable in opposing the long-held dichotomy of Nature and Culture, or Body and Mind, emblematic of European

enlightenment thinking. Several questions emerge from this integration, however. Many societies do see other species as persons (Viveiros de Castro 2012), thus stretching the idea of society to include non-human domains, while a symbolic distinction between humans and non-humans does still occur (Descola 2013: 38). For example, certain societies may live within forests, yet they maintain clear symbolic divisions between the human village and the surrounding natural landscape (Ellen 1996: 110). Analytically conflating social and ecological systems and processes may serve to highlight their similarities, while playing down their differences. This study explores these issues and more.

A theoretical question that follows then is: is it possible to link social and ecological systems into an entire overarching system, considering the differences between them? In order to talk about the system as a whole, are social processes perhaps oversimplified in order to fit with ecological concepts? Furthermore, there is a danger of reifying social structures (Vayda & Walters 2011: 7) which only exist as continually negotiated agreements in the minds of individuals, for “it is people who are the initiators and receivers, the agents and patients, and not their culture, however you might define culture” (Carrithers et al. 2010: 163). Some argue that biological systems should be differentiated for they have distinct ontological status and can be measured, as opposed to social systems (Andersson 2009). Indeed, on the one hand, some theorists suggest that humanity should be set apart due to its capacity for reflection, symbolic communication and thus intentionality and agency. Westley (2002), for instance, argues that because only humans possess the capacity for meaningful symbolic communication, then they cannot be considered as belonging to the same sphere as biological systems. Thus, when considering human–environment interactions as a whole, the human sphere of action should

perhaps be understood aside due to the ability of humans to rapidly reflect and thus modify their actions (as opposed to the 'blind' interactions of non-human components); or indeed in contrast to action, lack of action and will, due to a multitude of factors from ignorance to political oppression. Thus agency and power differentiate the human factor from the ecological, at least in terms of complexity and direction. Actor network theorists and others, however, do ascribe agency to non-humans, or at least to the interaction between humans and non-humans. Yet, in connecting lines or networks of matter and semiotics in this way (see for example Latour 2005; Ingold 2011; 2013), one wonders how far physical metaphors can be pushed when applied to social themes. Furthermore, actor network theory has been criticised, for while it can describe positive accounts of the stabilisation of networks, it is less useful for providing critique, in a way that can recognise the "unfolding nature of reality, consider the limits of knowledge and seek to challenge structures of domination" (Whittle & Spicer 2008).

The coupled social-ecological systems (SES) framework known as 'resilience' theory (which has largely replaced the earlier sustainability paradigm) has attempted to incorporate and address these issues in pragmatic and theoretical ways, with varying degrees of success. The resilience approach has dominated environmental governance discourse, policy and funding structures over the past decade. It has been used to try to understand complex human-environment interactions from global fisheries, conservation management of species, and range management to agricultural landscapes (Janssen et al. 2000; Folke et al. 2005; González et al. 2008). These often involve livelihoods which are directly reliant on ecosystems, while others involve ecosystems that are affected by a human component in a less direct form. To summarise, the resilience framework attempts

to depict processes of continuity, change and resistance that goes beyond simple, measurable linear interactions, to qualitatively consider a greater complexity. The concept of the ecosystem has been widened to include human actions. This more broadly conceived human-ecosystem is conceived to exist within a state of dynamic equilibrium (as opposed to previously held conceptions of static homeostatic regulation). The resilience approach aims to identify the ability of a socio-ecological 'state' to buffer against the forces of change, which may destabilise and force it to decompose. Following a breakdown, the state may recombine (or 'flip') into another known or new state. Thus, resilience aims to theorise shocks, the buffers against these shocks, and how much these buffers can take until the state breaks down. At the pragmatic level, due to the complexity of multiple interactions, uncertainty is incorporated into the theory. To deal with uncertainty, management actions, aimed at increasing stability (or conversely to assist with change), should be 'adaptive', that is, reflexive, through formalised, systematic experimentation aimed at increased understanding of system-wide dynamics. This is termed *adaptive management*.

Social ecological systems theory involves the important notion of self-regulation. Further to the problematic notion of social "systems", largely left behind by anthropology in the 1970s (although the concept has seen something of a comeback, see chapter two), the idea of self-regulation is problematic. This idea is central to neoliberal ideology, which has led certain economists and bankers to (successfully) urge for near total deregulation by governments, instead to be guided by the invisible hand of market logic. Indeed, some authors point to a similarity between neoliberal economics and SES theory (Walker & Cooper 2011). It has often been suggested (e.g. Schlager & Ostrom 1992) that small-scale societies possess the

capacity to self-regulate for various reasons. Such a view of regulatory dynamism could have implications for legal anthropology and environmental law more generally. For instance, in this thesis I argue that in the political era of nation-states, the autonomous capacity of small societies is limited through imbrication with the state. In chapter seven I discuss issues relevant to legal anthropology, particularly the literature on legal pluralism to analyse the presence of multiple, potentially conflicting local and state systems of control, regulation and management of natural resources and people. The environmental management literature still abounds with uncritical studies on co-governance (Ackerman 2004; Armitage et al. 2008; Berkes 2009), although the literature on the anthropology of development does address this problem considerably (Ferguson 1990; Escobar 1995; Agrawal 2005). I further discuss and problematise the idea of self-regulation in chapter nine.

The study presented here aims to clarify and resolve some of these theoretical ambiguities. I wished to interrogate the *adaptive management* procedure, by asking how local people managed complex, dynamic socio-ecological change in the Algerian Sahara. In particular, I investigated human-environment based problems of flooding, land ownership and labour relationships in the context of changing political, legal and economic conditions at local and global levels. To do this I utilised an historical event-based analysis (*sensu* Walters & Vayda 2009) in order to attempt to disentangle causal drivers of current problems, thus challenging the more abstract, virtually untestable systems framework. The event-based approach offers a historical view that contrasts with the synchronic structure and function given by systems theory, by focusing on observable, contingent human-

environment interactions through time and space. The historical ethnography that I present below has emerged from this event approach.

1.4 Berber governance: an introduction to Beni Isguen

My fieldwork was carried out among an oasis community of Mozabite Berbers, a conservative religious minority widely renowned for their honesty, business acumen, hard work and capacity for autonomous governance. This community is now facing the challenge of global integration while maintaining certain core values and practices. Mozabites are not primarily agrarian based, but rather a merchant society. A sub-section of the population does engage in farming, however, and furthermore, the extreme vagaries of the desert environment are such that ecological pressures such as heat stress, drought and also flooding must be managed for they affect the population as a whole. The sociological differentiation between the peasant class and merchants (and now an additional sub-class in the form of Sahelian migrant workers) has resulted in increasing local inequality which furthers social exclusionary practices, despite religious claims and practices aimed at achieving equality among believers. The fissuring of proclaimed unity and social differentiation would perhaps not be such an issue in a less severe environment, which requires, if not Durkheimian social *cohesion* as such, then at least minimal *coordination* between households to prevent the destruction of life and property by regular catastrophic flooding. This common need was brought especially to the fore of local consciousness following the recent devastating flood of 2008, which I deal with in chapter eight.

Studies on Berber governance typically involve a greater analysis on Berber or *Amazigh* (lit: 'free men', pl. *Imazighen*) identity politics and the 'Berber question'. I

have not elaborated on this at length in this thesis, for Mozabites do not participate strongly in wider Amazigh social movements, even though they are very aware of them. Although the colonial French admired and ideologically differentiated the Mozabites from Arab populations as they did Kabyles, Chaouia and other Berbers for their political organisation (which also served their divide and rule policy), they did not attribute to them *la genie Berber*, which invested and projected upon them notions of republican rule and secularism. By contrast, Mozabites were organised according to a theocratic form of government (rather than the democratic Kabyle *djem'aa*), thus instantly confounding both of these fantasies at once. The M'zab has not had any in-depth ethnographic description since the late nineteenth century (Masqueray 1886; Amat 1888), while much anthropological work continues to be done on the Kabyles (Scheele 2009; Roberts 2014). Furthermore, I am less interested in continuing colonial tropes, preferring to inspect the M'zab in the light of the postcolonial nationalist situation, in that while they rejected French rule, they accepted its laws under the alternative but structurally similar Algerian rule. This forms the primary thesis of my wider historical analysis of the reasons for many of the sociological changes discussed in this thesis, which involve the interplay of local and global forces. I outline this new theory of Mozabite social change in chapter nine.

I chose the M'zab for my field site because I was interested in the issue of social organisation of natural resource management, and thus in forms of constraints and cooperation, and looking at how identity politics and values play into this. I was inspired by Sahlins' (2008) investigation into political philosophy regarding 'Western' concepts of human 'nature', and the consequences of the latter on the former. Sahlins argues that social organisation can be hierarchical (top-down,

authoritarian), equitable (bottom-up, self-organising), or individualist (anarchic), or have elements of either. He posits that Western political theorists such as Hobbes and John Adams believed that human nature unchecked would result in anarchy². As a result, sociological forces were needed to govern this unruly nature, whether by top-down force in Hobbes famous case, or according to Adams via a balance of power among relatively equal political entities (though Sahlins is quick to point out the difference between equality for all and equality reserved only for the elite – known as “*isonomia*” (2008: 20)). This latter principle can be related to the notion of self-regulation, found in economics as the “invisible hand” as opposed to the interventionism of Keynesian theory, or in ecology including resilience theory. Anarchist writers, by contrast, prefer to appeal to an inherent goodness in human nature, whereby people can organise socially without the need for authority (Kropotkin 2002: 288; Graeber 2004: 76). I will return to this important conceptualisation regarding politics, individual and group morality, in chapter nine.

North African Islamic political and religious ideology, based on the same Semitic root that has affected European Christian thought, involves similar conceptions of human nature that must be governed by authoritarian means to ensure sociality. Beni Isguen constituted an ideal site to investigate such changes in political ideology, due to changes in how its hydraulic system has been managed. This system requires cooperation by all parties to keep channels clear in order for the circuit of irrigation water to flow, so that all plots may have water for their farm

² A semantic clarification here is needed, in reference to my use of the term ‘anarchy’. Here, Sahlins is clearly reflecting the use of anarchy as given by political thinkers such as Thucydids, Plato and Hobbes, as a metaphysical lack of order, needing an authoritative force to regulate them: “all things composed in whole or in part of matter, or all visible things, have a natural tendency to fall into "discordant and disorderly motion," thus their original state is one of anarchy, until they are taken in hand by god” (Sahlins 2008: 29-30). This is very different from my later discussions about ‘anarchism’, which is an ideological movement opposed to the state, but not to small-scale forms of organisation.

plants and trees. Challenges to the management of this system came from the insertion of immersion pumps and state built wells, resulting in a disregard for the need for flood irrigation; a disregard for local water guards due to a shift in power to the state and a national legal code. Many blame a change in local values from community-oriented, Islamic ones to 'Western', individualist values inherited largely from the effects of mass media and emigration, as playing a disruptive role. Further, 'traditional' notions of authority have been challenged. Other issues include the loss of farming knowledge, and the devaluation of agriculture in general, which have their own causes and histories.

The catastrophic 2008 flood caused many to reassess the need for cooperation. Blocked channels cause floodwater to pool and quickly erode adobe buildings, which can be two-stories high. Some proponents of a return to a community-based ethic argue that appeals for cooperation must be made to individuals based on their various different motivations (or fears), highlighting a strategy focused on self-interest. For example, religiously-minded individuals should be persuaded through that channel or discourse. The practically-oriented may be reminded about the ecological benefits, such as of the silt nutrients of the flood waters from the mountains, the leaching of the soils or the build-up of salt in the soil. Those more concerned with material wealth can be shown how damaging a lack of cooperation can be to property. The already community-oriented can be persuaded of the intangible benefits of cooperation, such as shared sense of identity and place, a sense of inclusion and good-will among neighbours, and the social capital that comes from being able to rely on each other in times of need.

Whether to cooperate is not just based on rational calculation, however, but is driven by local histories and each individual's sense of themselves in relation to others, in other words, politics. For example, trust and therefore actions may be affected by perception of injustice or corruption in community dealings. Water guards or other officials may be devalued if they are seen to give favours to relatives or to others to whom they owe a debt of bondage. On the other hand, community values and religious teachings about service, selflessness and the devaluation of calculation play an important role in continued cooperation. Religious identity is an essential glue to Mozabite society, and continued animosity between them and cohabiting *Sh'amba* Arabs further solidifies this³.

Recent calls for enhanced cooperation to effectively manage the local oasis resources has resulted in the formation of various environmental organisations, involving farmers, date palm specialists, local and non-local agronomists, ecological specialists and concerned citizens. Environmental management may be defined as the controlled use of an environment by humans in a way that is sustainable (Nath 1998: 45); here, this involves various forms of date palm agriculture and water management, by individual and collective action. A managerial emphasis may falsely imply overly strong collective planning activities, however. As is likely the case in other environmental contexts, this study shows that the state of the oasis may be more the result of a hodgepodge, or collective, of individually negotiated and contested actions based on local political histories regarding the navigation of environmental conditions, uncooperative neighbours, strong behavioural norms,

³ Identity can at times be more fluid however depending on the situation, in a relational fashion, depending to who the 'opponent' is: in the world cup soccer competition, Mozabites are Algerian. At other times there is a unity with all Muslims. At home, they are Ibadite Muslims, differentiated from other sects.

semi-formal customary and formal state law, and experimentation with new agronomic techniques. The ethnographic method is ideally suited to address and capture this complex messiness, of contingent negotiations as well as the more adept organisational practices of locals. I found that social adaptation to ecological problems in Beni Isguen is indeed a compositional picture of planning and mistakes, of individual anarchic as well as group cooperative action, of mixed economic, legal and political modes of practice. These diverse elements may or may not constitute an adaptive adjustment of the human-oasis system as a whole, if it can be addressed as such, to change that is at once conscious and blind in its direction.

1.5 Significance of the study

At the substantive level, the study documents the history of the oasis and date palm management in central Algeria, and describes contemporary Mozabite life and economy, focusing on the variation in oasis and date palm management among farmers. Methodologically, I tested, and found support for, the power of historical event analysis as a tool to adequately explain local changes in subsistence practices and management decisions. At the theoretical level I have interrogated the notion of adaptive management and social-ecological systems (SES) theory more generally, by my use of ethnographic methods, with attention to moral values, local environmental knowledge, social institutions and unequal power structures within the town and between the town and central power. The analysis presented here reveals additional complexity in these human environment relationships, and challenges essentialist notions of farmer adaptation in oases ecosystems. At the applied level, the study is significant because it critiques adaptive management as a

policy tool in natural resource management, whether by government bodies or non-governmental organizations.

With a micro-level focus that incorporates wider political processes, the study not only questions the static structure of ecological systems, but also interrogates the relationship between agency and broader social structures. Critiques of steady-state systems are not new, and arose as soon as Rappaport's *Pigs for the Ancestors* (1968) monograph was published (Vayda & McCay 1975; Friedman 1974; Ellen 1982), which Rappaport acknowledged in the second edition of his book (Rappaport 2000: 427). This study not only interrogates the static systems approach but deals with new SES approaches, adaptive dynamics and resilience by resituating a critique within a new theory of contested dynamic or chaotic environs. I argue that chaotic environmental systems such as those of Saharan North Africa demand dynamic social responses, and that such dynamic social and ecological spheres evolve in concert, as human actions in turn have environmental consequences. This is not to state that all human institutions are environmentally determined, however. Such dynamics have been documented among pastoralists, but not among small-scale farmers, who actively manipulate their environment. The study highlights dynamic social processes, which reflect unpredictable ecological change, by emphasising the role of intergenerational conflict and change as opposed to cohesion, and its mediation and resolution within dynamic notions of identity.

1.6 Thesis structure

The primary question of this thesis is: do oasis dwellers in Beni Isguen use adaptive management to manage their resources? Chapter two presents a critical review of the key literature underpinning the adaptive management concept, with a

look at systems ecology in anthropological and ecological theory. After setting out the theoretical background of adaptive management, chapter three outlines my aims and objectives of how I tested for the presence of adaptive management in Beni Isguen. This is followed by a discussion of the methods I chose to achieve those aims. Chapter four provides an extensive historical background to my chosen field site, the M'zab valley, and then critically reviews key literature on the Mozabites of the region. After this in chapter five we enter the contemporary oasis of Beni Isguen, one of the five cities or *qsūr* of the M'zab, entailing a detailed account of farming life in the region, including adaptive strategies. The next three chapters (six to eight) present an in-depth analysis of specific problems identified with the aid of local actors. Thus chapter six investigates the economics of labour practices in the valley and how these have shifted over time, through an historical analysis. Chapter seven explores land tenure regimes, beginning with the observation of (apparently) abandoned land and investigation of inheritance disputes, with a view to the colonial hangover still present in Algerian policy and law, despite attempts to affect structural change. Chapter eight investigates the politics of communal resources management, continuing the theme of property from private to communal, entailing further legal and political considerations.

Throughout the research I used mixed methods, combining participant observation with interviews, field surveys and an *abductive* investigation of causal events (i.e., using a type of multiple working hypothesis approach, as developed by Vayda and Walters 2011). I chose the causal event approach as an explicit counterpoint and means to challenge the systems framework. The causal event approach entails the use of partial explanations, by starting with concrete events in the present and subsequently adding layers of contextualisation through the linkage of (potentially

multiple) causal events through time. Systems, on the other hand, involve the pre-existing idea of the presence of such systems before demonstrating that they actually exist. Thus, in chapter nine, I first provide a meta-analysis of the previous three main problems (which combine causal histories of change, involving how the fields of economy, law and politics have been negotiated from a local perspective). I then test the framework for adaptive management developed by Fabricius et al. (2007) against my own ethnographic data to assess my research question: is adaptive management actually practised in the M'zab. Finally, I pit the event approach against the systems modelling to analyse the pros and cons of each. In the concluding chapter I summarise the key findings and discuss the relevance for expanding current understanding. I outline the coding used in my notes in Appendix I, an example of a farm survey is given in Appendix II, and in Appendix III I present the results of the resilience analysis.

2. Are systems really systems? A review of systems approaches in ecological anthropology

Resilience and systems approaches dominate current management approaches to natural resource management. When I began this study my belief was that the social dimension of the systems approach was lacking in sophistication. Hadn't anthropology already left this behind in the 1960s? It appears that the concept has seen renewed attention in anthropological studies, some critical, and some not. Yet, before dismissing this scholarship we must understand its recent trajectories. What I present below, therefore, is a critical analysis of systems as they have been used in anthropology, followed by a review of the recent resilience scholarship and adaptive management theory.

2.1 Combining social systems and ecosystems

2.1.1 Anthropology and ecological approaches

Here, I describe the historical usage of the ecosystem approach in ecological anthropology. Glacken (1976) documents the dis-articulation of nature and society in 'Western' thought following the industrial revolution. Many disciplines have followed this divide into the humanities and the sciences, yet some have attempted to join them. Marx provided early attempts to model human-nature relationships in the 19th century (Wolf 1982: 74). During the 20th century, various disciplines have attempted to link environment and society, consolidating into half a dozen sub-disciplines. These include Robert Park's human ecology, (1936), Julian Steward's

cultural ecology (1955), the ecological anthropology of Rappaport (1968), Bateson (1972), Netting (1974) and Vayda and McCay (1975); the human geography of Carl Sauer (1956) and others; the ethnoecology of Conklin (1957) and Berlin (1992); William Cronon (1983) and Donald Worster's (1977) environmental history; Darrell Posey (1985), William Balée (1998) and Carol Crumley's (2007) historical ecology; and the more recent emerging political ecology of Blakie (1985) and Greenberg and Parks (1994).

The 'new ecology' (Scoones 1999) (to be discussed here as relating to arid or semi-arid non-equilibrium systems) radically departed from the traditional ecology of equilibrial, climax ecosystems, a concept originally conceived by Sir Arthur Tansley (1935). While the systems approach was championed earlier by Bateson (1972), the ecosystems framework was first introduced into anthropology by Clifford Geertz in *Agricultural Involution* (1963). This usage was to ameliorate the tension of *environmental determinism*, such as of anthropogeography, and the historical possibilism and diffusionism that arose from the Boas school (Geertz 1963; Moran 1990). Deterministic theories propose that human behaviour and social systems in general are caused by environmental features. Such ideas were ethnocentrically used to justify political domination over other populations, by stating that a temperate or balanced climate gave rise to more virtuous qualities whose inhabitants were thus destined to rule over 'lesser' peoples (Moran 2009: 28). According to the competing paradigm of *environmental possibilism*, however, the environment only plays a passive role that limits the options available to societies, but in no way shapes emerging cultural properties (Moran 1990: 10). To counteract environmental determinism, the concept of culture was seen as the unit defining human adaptation. Emphasis was given to diffusion and historical processes. The

“culture areas” approach of Ford and Kroeber was inclusive of this trend, wherein geographical regions were divided into culture areas based on shared traits (*Ibid.*). The balance now shifted to culture, becoming a “superorganic entity” that relegated individual choice to its patterns (Davidson-Hunt & Berkes 2000: 4).

Possibilism and culture areas could be used to describe historical processes of a particular area, but they could not be used to generalise beyond this. Julian Steward (1955) was interested in cross-cultural comparisons of the interactions of social structures and subsistence methods. The focus was not on environmental or cultural determination, but the means of resource utilization. Steward was interested in whether a society's adjustment to their environment required specific behaviour, or whether there was room for variation. His methods involved three components: 1) analysis of environment and subsistence method, 2) analysis of subsistence technology and any associated behaviours, and 3) describing the extent to which such behaviour patterns affected other elements of culture (Steward 1955: 40-41). Steward emphasised that the environment only affects certain aspects of culture known as the “cultural core”, while other elements are conditioned by historical processes. He differed from the social evolutionists by formulating the idea of multi-linear evolution; yet he also differed from the British functionalists by emphasising the relation of a variable to limited set of variables, rather than to the whole social system (Moran 1990). Steward, more than anyone before, merged the field of human-environment interactions. He went beyond the generalisations of environmental determinism and the particularism of the possibilists to formulate a method of research that “paid careful attention to empirical details that causally linked the cognized environment, social organisation, and the behavioural expressions of human resource use” (Moran 1990:10). Steward's cultural core was

found to underestimate the complexity, subtlety, and scope of social and environmental systems, and the emphasis on subsistence as the organising factor of social systems was shown to be debatable (Geertz 1963). Too much weight was given to culture as the unit of analysis (Vayda & Rappaport 1968). Furthermore, the identification of what constituted the “cultural core” and the “effective environment” was seen as subjective (Ellen 1982: 61).

2.1.2 The rise of systems approaches

Tansley’s formulation of the ecosystem concept rested on the idea that biological communities would reach equilibrium through succession, until arriving at a ‘climax’ community, and was strongly influenced by the work of F. E. Clements (1916). Before this, the physical environment was seen as just a backdrop to biotic activity, yet Tansley felt that the relationship between the two was far more involved (Golly 1993). The same would be theorised within anthropology regarding human activity. During the 1940s and 1950s the concept gained more widespread use, and with Odum’s *Fundamentals of Ecology* (1971), the ecosystem as an analytic unit was firmly established. Geertz (1963) is significant in that he postulated the combination of humans and their environment as a single analytical unit. This theoretical approach focuses on the elements of systems in terms of structure, equilibrium and change, rather than on paired points, as in the nature-culture dichotomy of Steward’s approach. This reduced the number of variables in what Geertz saw as a more complex system of interactions, and that change is not only predicated on ecological processes, but includes political, economic and intellectual developments (1963). Although Geertz first used the ecosystem concept in anthropology, Rappaport is widely held to have produced the first comprehensive study of the ecosystem studies in the analysis of human behaviour,

in *Pigs for the Ancestors* (1968). Where Steward viewed humans as an external factor to the environment, Vayda and Rappaport (1968) argued that humans should be considered as integral to ecological systems. They started to use the units of ecology: individuals, populations and ecosystems, as a unified field of ecology. As Geertz's broad ecosystem concept involving ecological, social and political elements proved hard to operationalize, Vayda and Rappaport moved to a study of adaptation using biological ecology methods.

Following this progression, a number of ecological anthropologists started to use the ecosystem as the unit of analysis, with humans as one aspect, one species among many involved in self-regulation. Odum was one to call for a new field of ecoenergetics. This was criticised by some as a "caloric obsession", a single focus on energy flow through human populations. During the same period a number of studies began to query why human behaviours such as religious actions seemed to contradict what would be expected from a self-regulating ecosystem. This type of ecological anthropology was heavily criticised for being overly functional and reductionistic (see for example Ellen 1982: 118). Such reactions to these new, perhaps naïve neo-functionalist developments caused a dearth in use of the ecosystem concept in social anthropology in the 1980s.

1982 saw the organisation of a session by Emilio Moran at the American Association for the Advancement of Science Meetings to discuss the benefits and limitations of the ecosystem concept in anthropology. This session made it into a book in 1984, which was revised considerably in a 1990 edition. The ecosystem concept was seen to add greater holism, adding the physical and biological components to the study of human societies, and was seen as bringing to an end the

conflicting environmental and cultural determinisms. Limitations drawn from the conference were that the ecosystem could be reified and conceived as a biological organism; time and structural change were ignored; boundaries were poorly defined; adaptation was conceived in only energetic terms; there were problems with shifting levels from ethnography to analysis; and there was a lack of accounting of individual agency in such systems (Moran 1990: 16–24). It is not clear that these limitations have been overcome by current systems approaches, such as in resilience theory, as I discuss below.

In the social realm, anthropologists have used the notion of systems to talk about cultural life, such as kinship systems, political systems, economic systems, symbolic systems and more (e.g. Leach 1970; Keesing 1974). Milton (1996: 15–17) critiques the notion of systems in discussing cultures, by highlighting the problem of boundedness: “cultural exchange and integration appear relatively straightforward processes. This is not the case if a culture is a system.” She argues further, by representing cultures as systems or boxes, that this would make exchange between systems highly disruptive, when in fact it is relatively fluid, and so theory does not match empirical observation of global flows. The last decade has seen a resurgence of the systems concept, especially within ecological anthropology. Before describing the new turn in ecosystems thinking, centred on social-ecological ‘resilience,’ I first describe a different view of stability, equilibrium and change in ecological theory, of so-called ‘non-equilibrium’ states upon which the new theories of resilience are based. The conceptualisation of non-equilibrium appears to be far more relevant to our understanding of the variability of environments such as deserts, and how people have learned to adjust their behaviour accordingly, involving a cultural component, including for example subsistence behaviour, technology, sociological

practices to spread risk, and local ecological knowledge of plant and animal husbandry as well as climate systems. Investigation of this cultural knowledge of ecological dynamism is central to understanding how people have adapted to change in Beni Isguen.

2.1.3 Non-equilibrium ecosystems

A major shift in ecological thinking occurred in the late 1970s concerning ecosystems, and this would challenge in turn, the basis of the concept in anthropological theory. Holling (1973) began questioning the notion of equilibrium in ecosystems, arguing instead that such systems are in a constant transient, but persistent state. Holling conceived of a system that could withstand shocks and remain resilient. Vayda and McCay (1975) were the first to use this conception in ecological anthropology, stating that the focus should be on how societies responded to natural hazards and maintained their essential structure, rather than on homeostatic self-regulation.

Ecological theory has conventionally assumed a drive toward stability of ecological 'systems'. Such ideas were strongly based on the community ecology of Clements (1916), where biological communities go through stages of succession towards a climax, and change is a deviation from the stable state or balance. This view of equilibrium systems came from advances in thermodynamics, where equilibrium is seen as the energetic balance between a system of particles and its external environment. Equilibrium in thermodynamics is based on final macro, aggregate states, rather than on the multiple pathways that can achieve this state (Grabbatin & Rossi 2012). Such thinking remained in ecology until the 1970s, which saw an explosion of mathematical ecology and insight into the instability of real and

model systems (e.g. May 1977, in Scoones 1999). These systems involve non-linear interactions and high temporal and spatial variability. Where previous systems ecology implied that environments tend toward equilibrium, newly emerging concepts emphasised multiple stable states, the recognition of the sensitivity of non-linear dynamics to initial conditions and thus lacking long-term predictability, and truly chaotic systems dominated by stochasticity that have no “simple regulatory feedback mechanisms” (Scoones 1999: 482).

The ‘balance in nature’ approach has been attacked generally by many, in what has been dubbed the ‘new ecology’ (Blumler 1996; Scoones 1999; Zimmerer 1994). The ecosystem concept was challenged by empirical evidence on forests in the northeastern United States (Drury & Nisbet 1973), upon which the authors charged that there was no concept of succession, at least in temperate climates. This lack of succession challenged the idea of a mature forest, and thus an equilibrium idea of ecosystems in many cases. Such succession to climax processes in ecology may only be certain in the tropics where rain is constant and height is an advantage (Blumler 1996). Furthermore, the equilibrium model for tropical rainforest ecology promoted by Richards is now widely regarded as problematic (see Ellen 2007: 56). Further research, specifically on arid, desert lands, has shown that in such regions climate is more important as a determining factor than biological communities, first pointed out by Noy-Mier (1973). Wiens’ (1977) work has been pivotal in non-equilibrium theory. He found that in arid and semi-arid environments equilibrium interactions begin to break down, and that populations are strongly influenced by abiotic factors, not by species density or limited resources. Wiens importantly proposed that natural communities exist along a continuum, where low environmental variation results in equilibrium interactions,

whereas areas with unpredictable environmental variation result in non-equilibrium communities. Evidence from other arid lands such as Australia confirm these findings: for example Caughley et al. (1987) proposed that non-equilibrium systems will be found where the coefficient of variance for rainfall exceeds 30 per cent. These conditions are also typical for the Sahara, where rainfall variability is extreme, receiving only 10-100 mm per year at quite unpredictable times (King & Thomas 2014).

Despite these new theoretical developments in ecosystem theory, management and policy geared toward tackling desertification continues to be based on the equilibrium model. Notwithstanding heavy stresses, for example in Turkana, Kenya, of frequent droughts and raids on cattle, nutritional deficiencies and emigration, such dynamic ecosystems are seen to persist in a relatively stable form (Ellis & Swift 1988). In these systems, policy and management intervention based on inappropriate equilibrium models has damaged herder livelihoods (Westoby et al. 1989). Further research on pastoral-rangeland interactions has revealed that both equilibrium and non-equilibrium dynamics occur in arid environments at different times or in different areas of the resource (Vetter 2005). Management actions have not been updated to reflect the new findings.

Concerning agriculture in arid lands, Thompson & Scoones (2009) suggest that:

Such static, equilibrium-centred views, we argue, provide inadequate insight into the dynamic character of agri-food systems, particularly in an era of global economic and environmental change, where factors such as climate change, rapid land use shifts and uncertain political economic conditions in agricultural economies all impinge on the day-to-day realities of poorer producers and consumers in the developing world. [Thompson & Scoones 2009: 387]

Much work has been done on how Sahelian pastoralists manage in dis-equilibrial ecosystems, such as opportunistic stocking (Sandford 1983), but little has been done on farmers who live in areas of high variability in rainfall. Some farming practices make sense in this light, such as mixed cropping, opportunistic weeding and extensive planting (Mortimore & Adams 2001). Farmers in Morocco tend to plant extra fields further from rivers during a wet year, concentrating only on the core areas during a dry year (Benessaiah 2011).

Partridge (2005), a critic of non-equilibrium theory, points out that even the proponents of classic ecosystem ecology such as Clements, Elton and Odum never believed in perfect balance, but that systems rather *tended* toward equilibrium:

Even the most stable association is never in complete equilibrium, nor is it free from disturbed areas in which secondary succession is evident. [Clements 1916: 1, cited in Partridge 2005]

The 'balance of nature' does not exist and perhaps never has existed. The numbers of wild animals are constantly varying to a greater or less extent, and the variations are usually irregular in period and always irregular in amplitude. [Elton 1930: 17, cited in Partridge 2005]

An ecosystem is a thermodynamically open, far from equilibrium, system... In hierarchical organization of ecosystems, species interactions that tend to be unstable, nonequilibrium, or even chaotic are constrained by the slower interactions that characterize large systems... [Odum 1992:542, cited in Partridge 2005]

Partridge rather suggests an equilibrium to non-equilibrium dialectic, of an on-going pattern of ecosystem disturbance and recovery, which Partridge compares to the checks and balances required for the process of walking. He argues that such rhythmic fall-and-recovery is first order disequilibrium, yet the overall activity of walking is stable, and thus shows second-order equilibrium. Partridge concedes that some systems require disturbance to drive them, such as chaparral, which requires fire for seed germination. Partridge's (2000) examples of self-repairing

systems remain unconvincing, however, with reference to a simple binary interaction (the Canadian lynx-hare cycle), or to single-purpose group interactions such as a football team (2000: 87), or similarly goal-driven mechanistic systems such as a thermostat. In nature, there is no such demonstrable unity of purpose.

It may be seen, therefore, that a geographic region can exhibit a spectrum of equilibrium to non-equilibrium properties (Grabbatin & Rossi 2012), and in arid and semi-arid areas this is dependent on climatic conditions. Farmers may or may not have institutions in place to deal with these situations, depending on the scale of regularity or uncertainty. During my time with farmers in Beni Isguen, I found an example of this in the form of emergency rules for the sharing of water from private wells during drought periods with those whose wells are dry.

2.1.4 Socio-ecological systems

SES theory explained

Systems ecology has survived, thus far, by embracing and incorporating the notion of change, combining dynamism with structure. The question may be then, which parts of the structure persist, and which are subject to change, beyond previous formulations such as Stewart's cultural core? A unique approach to this problem was postulated in the 1970s by C. S. Holling (1973).

Holling's (1973) work was originally firmly based in ecology, rejecting equilibrium-based models, asserting instead that ecosystems are *complex adaptive systems*. Due to the complexity of multiple non-linear interactions in an ecosystem, Holling emphasised that uncertainty is the primary condition of such systems. Thus, the conventional prescriptive, 'command and control' method of natural resource

management is not useful as prediction is impossible (Walker & Salt 2006: 25). Rather than sustainability, Holling argued that ecological *resilience* is to be sought, which may be defined as the capacity to absorb disturbance without causing significant changes in system behaviour. Thus the opposite of resilience in a system is vulnerability. Ecological resilience is differentiated from engineering resilience, which focuses on the time it takes for a system to bounce back from a shock, whereas in the case of ecological resilience, it is the *magnitude* of shock that can be experienced before the system transforms (Holling 1996: 33).

Addressing the issue of risk in the management of natural resources, Holling (1973) originally wrote against the conventional prescription of maximum sustained yield based on equilibrium systems. This method maintains that a surplus of production can be continually harvested, such as of cod stocks without depleting the population. He argued such sustained pressure over the long-term can in fact make the system's complex factors extremely fragile, losing overall system resilience. Thus, the focus for conservation managers should not be on simple linear interactions alone, such as sustained yield, but on general ecological resilience to multiple factors including economic pressures (Walker & Cooper 2011). An emphasis on uncertainty led to the formulation of adaptive management theory, discussed in the following section (Walters 1986).

With the establishment of the Resilience Alliance in Stockholm in 1999 (Resalliance 2016), scholarly work progressed to increase the scope of ecological management to include the social realm, whereby social and ecological processes could be analysed as a complex whole (Folke 2006). For this, similar trends and patterns would need to occur within the two spheres of influence, and it seems that economic theory has

played a part since early on in resilience thinking, as these disciplines have often borrowed concepts from each other. This conceptual leap involved a shift from the idea that some ecosystems undergo extreme perturbations, or that maximum sustain yield causes stress on all ecosystems, to the idea that all socio-ecological systems can be thought about as non-linear, complex adaptive systems. These ideas can be summarised in two key concepts of resilience thinking: 1) ecological resilience, and 2) the adaptive cycle.

An exemplary method of illustrating ecological resilience by resilience scholars is the model of a ball in a basin (Gunderson 2000) (figs 2.1 a & b). The ball represents that state of the system (as defined by key variables), and the surface is the forces acting to change the state. A pit in the surface represents a stable state, which is kept in place by mutually reinforcing structures and processes. These feedbacks keep the system state from the edge of the basin, which is the threshold after which the system flips into an alternative state. A deep basin represents a system with high resilience. The ball tends to roll to the bottom of the basin due to feedbacks, yet due to disturbances it rolls around, and can thus be described as tending toward equilibrium, which is seen as a moving target. Therefore it follows that a system with a shallow basin is vulnerable to disturbance, and may easily be pushed into a different state, which has its own equilibrium tendencies. A classic example is that of a clear lake (state 1). A threshold is crossed when too much phosphorus enters the lake from agricultural runoff, transforming the lake into a murky one (state 2). State 1 is resilient to shocks of phosphorus when a low level of phosphorus is retained in the lake sediment. In this situation, the sediment mops up excess phosphorus, keeping the lake clear. If phosphorus input is continuous however, it accumulates in the sediment, making the system vulnerable to rain shocks, which

cause high agricultural runoff. This excess level of nutrients causes an increase in algal growth, and soon dead algae accumulate in the sediment, depleting the oxygen in the lower waters. A new state has now been entered from which it is very hard to return – simply reducing phosphorus will not restore the previous state (Walker & Salt 2006: 53–57).

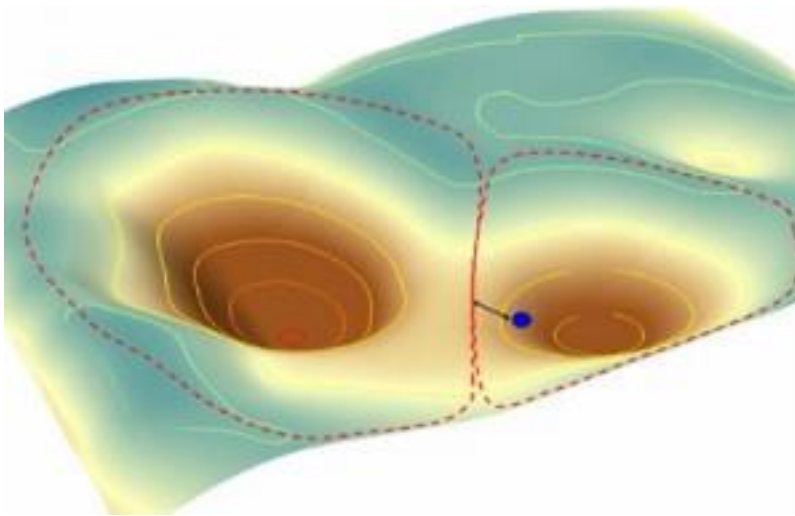


Fig 2.1.a Ball (dynamic equilibrium) in one ecological state on right-hand basin. A core conceptual illustration of resilience by resilience scholars to reveal multiple equilibria.

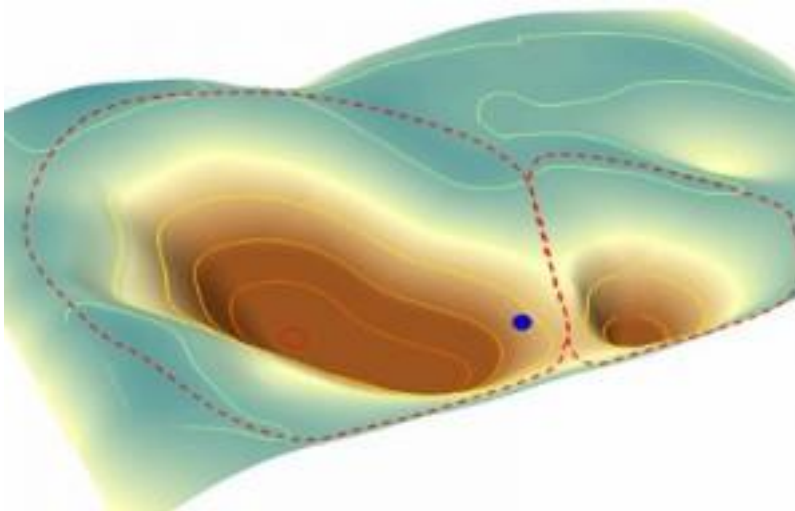


Fig 2.1.b Equilibrium shifts to alternative ecological state.

In 1986, Holling proposed the idea of the adaptive cycle to represent a general theory of states of transition, meant as a heuristic rather than a definitive model, as certain states may be skipped within the cycle. Holling was heavily influenced by the work of Joseph Schumpeter, an economist, who used the cycle to describe boom and bust cycles (Schumpeter 1950, in Walker & Salt 2006), again highlighting the emphasis on risk in both disciplines. The four phases of the cycle are growth (r), conservation (K), release (Ω), and reorganisation (α). Gunderson (1995) then extended the concept to linked socio-ecological systems, arguing that the production of novelty destabilised human forward-looking behaviour. The 'r' phase involves exploitation of resources and rapid growth. There is low regulation of the system, components are loosely connected, and the system is resilient. Examples include vegetative growth into the space left by the collapse of a large tree in a forest, or the growth of innovative businesses following deregulation. Following this, the system becomes more organised and efficient, and the competitive advantage moves from actors who can grow rapidly, to those who can thrive within high competition. Diversity reduced in favour of efficiency, and increased system connectivity leaves little room for new competitors. Examples include mature forest, and large monopolising corporations. Inflexibility in the system leaves it vulnerable to processes that release organised capital (Peterson 2000).

When a disturbance occurs that is greater than the system's ability to absorb shocks, the system flips into another state. During this transition, the system's capital and connections are thrown into disorganisation and release, the ' Ω ' phase, until the disturbance is spent. Examples that release locked up capital include fires, banking crises, and revolutions. As a result of the destructive processes during this phase, the system's boundaries and connections are loosely defined. Thus, a little

input can easily reorganise the system, creating the 'α' phase. The new structure of the system is hard to predict, for example, the budding of buried seed creating a new vegetation cover, or the new structures of Eastern Europe countries following the collapse of the Soviet Union (Peterson 2000).

Two stages of the adaptive cycle can be identified. The r to K stage is generally gradual and incremental. If the system subsequently breaks down, this can occur quite rapidly at the second stage. During the second stage, three possible outcomes can occur, *resilience*, where the system maintains its essential structure and reverts to its original identity; *adaptation*, where the system shifts into a different state maintained by different feedbacks (such as species composition in a forest), or *transformation*, characterised by a shift into a completely new regime (as in a shift from forest to grassland) (Walker et al. 2004). Management interventions can thus be optimally timed according to the phase the system is in. The system can be subsidised to pull it back from the peak of the K phase into the r phase, preventing it from entering the release phase. Or, the system can be adjusted during the reorganisation phase with little effort to maximum effect (Walker & Salt 2006: 123).

Socio-ecological systems as adaptive cycles do not exist as bounded units, according to resilience theory, but interact with other systems at different scales in time and space, above and below. For example, a farm is influenced by processes operating at larger scales such as regional droughts, or at smaller scales such as tree lifecycles. These systems apparently also have adaptive cycles, and such systems within systems have been dubbed a 'panarchy' (Holling et al. 2002). Each scale can be at a different phase of the adaptive cycle. Furthermore, larger scales set the conditions

for smaller, faster scales, which in turn act as sites of variation, and can drive change in the upper scales.

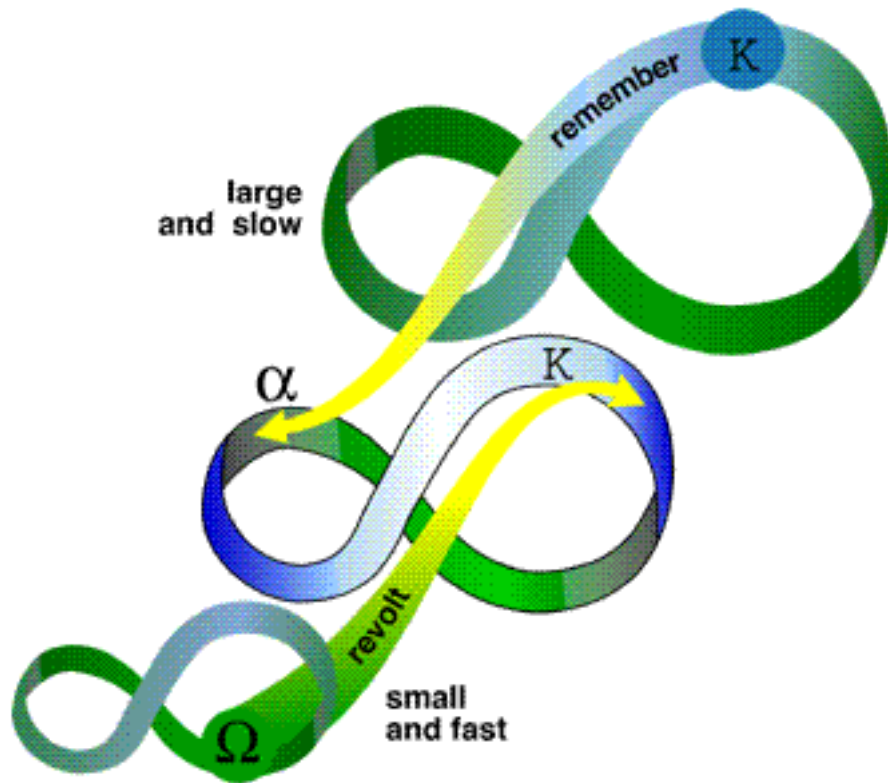


Fig 2.2 The adaptive cycle and the panarchy. Another key concept among resilience scholars. Referred to by the latter as a heuristic visualisation device, but acts as a model to connote boom-bust cycles at varying, interconnected scales.

The last decade has seen many efforts to improve the social dimension of resilience theory, with work on institutional arrangements for governing socio-ecological systems (Ostrom 1990; 2009). For instance, stable institutions are said to be preferable in times of stability for resource accumulation and wellbeing, however, institutions must have the flexibility to change during times of uncertainty (Duit et al. 2010). It may be possible to map the transformation of governance institutions in Beni Isguen on the adaptive cycle model, although conforming the model to 'reality' can be problematic. For example, the management of oasis resources was previously carried out by an older, hierarchical institution named *l'oumna* (water

guards), which has been largely replaced by new farmer associations and NGOs. Complicating this, however, is the fact that *l'oumna* still exists in parallel to the newer ones, albeit in diminished form. I discuss the implication of the compositional hybrid nature of these governance systems in chapters 6-9. Detailed ethnography showed that institutions were less prone to mapping in terms of simple 'boom and bust'.

Criticism of SES theory

Despite rejection of 1960s systems thinking, the resilience concept is still employed by anthropologists, whether uncritically (for example, Salmon 2012; Leslie & McCabe 2013; Panter-Brick 2014; Sogn 2014; Ulturgasheva et al. 2014) or critically (Rival 2009; Hornborg 2013; Hatt 2013; Fabinyi et al. 2014). Often these focus only on the social domain, though they retain the same concepts such as response diversity, system memory, adaptive strategies, and self-organisation. Sauer (2014: 9), for example, argues that "if a culture system loses its political, economic, social, or ideological autonomy, or a combination of them, the system becomes something new, even though some previous traits still exist". This definition is problematic, for on the conceptual front, it contradicts panarchy theory of the integration of multi-level systems, that is, systems which are affected by higher or lower level systems, such as the nation-state. My research further problematizes the question of autonomy and integration as related to identity. Today, no communities are unaffected by dynamics of state interference, whether through development programmes, education, taxation, law and more. In Beni Isguen, local and state legal systems have become entangled and while some judges attempt to balance statutory and customary law, individuals opportunistically

‘forum shop’ (von Benda-Beckmann 1981) between the two according to personal interest.

Some criticism notes the analogy between resilience thinking and neo-liberal economic assumptions of self-regulating markets, pointing to the more radical writings of Hayek (Walker & Cooper 2011). The same authors point to the use of resilience concepts, such as a de-emphasis on long-term planning in security discourse, to justify a constant state of security (*Ibid.*), invoking perpetual crisis, and thus for government to legitimise more stringent controls over their populations and to replace basic human rights with martial law (Calis 2011; Zebrowski 2013). Some have even suggested that the formulation of resilience reflects a postmodern turn on the problems of positivist notions of certainty, fact, and truth (Worster 1993: 166, in Nadasdy 2007).

The bulk of criticisms of resilience theory centre on issues of agency and power (see for example, Hornborg 2009; Hornborg 2013). Resilience scholars have attempted to incorporate governance issues (Adger et al. 2001; Galaz 2005; Cash et al. 2006; Lebel et al. 2006; Fabricius et al. 2007; Duit et al. 2010; Anderies et al. 2012). In all of these works, power is theorised according to the case in question, whereas for Hornborg, power is singularly dominated by economic forces, à la Marx. As Weber suggests, however, other forms of power such as ideological, military and political, may play an equal role (Mann 1986: 518–524). For example, who decides on the boundaries of the system to be fortified against disturbance, and thus what is to be excluded? As opposed to the biological sciences, boundaries in the social sciences are notoriously hard to demarcate (Scheele 2009: 150). The panarchy framework may be criticised for ‘flattening out’ social inequalities, and thus begs the question,

resilience for whom (Cote & Nightingale 2011; Davoudi et al. 2012)⁴? The question of whether resilience is good or bad is ultimately a normative, moral one (for example, if an authoritarian regime is replaced by a fragile, democratic one), such as the outcome of conflict or distribution of collective goods (Duit et al. 2010). These issues require the examination of the applicability of universal ideas of the good society to all. In societies displaying great economic disparity, the value of a resilient society will vary, from those who desire change, to those with considerable assets who wish for maintenance of the status quo. Finally, a veritable cottage industry has emerged based on critique of the resilience concept in the journal *Resilience: International Policies, Practices and Discourses*. Most contributions come from political science scholars, who comment on parallels between governance and resilience describing the latter as normative and in line with neoliberal ideologies, or masking security issues as adaptation to change (e.g. Joseph 2013; Kaufmann 2013; Bourbeau 2013), although some also argue for the potentially subversive qualities of resilience (Hornborg 2013; Chandler 2014).

Recent resilience theorists argue that the conceptual aspects of the social element of their theory has been significantly improved (Folke 2006; Duit et al. 2010). They posit that despite criticisms around structural-functionalism of earlier incarnations of complex systems theory, current dynamic systems theory with its attention to multiple causes and effects is superior to commonplace analysis in the social sciences, which are limited to a linear and probabilistic ontology. They go on to suggest that such analyses miss out emergent properties that arise from the interaction from different parts of the system (*Ibid.*). Hatt (2013) demonstrates that the resilience conceptualisation of the social is less advanced than the progressive

⁴Such criticism echoes those made by Friedman in response to Rappaport's theories of systems thinking in the late 1970s (Friedman 1979: 261), asking, "adaptive for whom?"

ecological formulation. By emphasising the cohesion of the social system as a whole as adaptive, Hatt argues that this echoes early functional sociological analyses, as opposed to the more dynamic equilibrium found through contestation and competition of ecological systems. Drawing on Gramsci, Hatt proposes a conceptualisation of the social as equally dynamic and contested, based on multiple social ‘attractors’ or norms and values. This, he argues, gives a more valid description of power and inequality in society.

Regarding agency, it has been argued that while the structural complexity of both social and ecological systems may be comparable, the feedback processes are not, as humans have a reflexive capacity, while ecological components do not. For example, societies perceiving crisis events may postpone ecological disturbance effects, in space or in time, leading to a greater disturbance further down the line, or for someone else (Davidson 2010). Reflection and subsequent action inevitably involve moral and normative leanings (Folke & Rockström 2009). Others fear that when science moves from description to prescription in the social realm beyond basic resource management, there is the risk of political management based on metrics efficiency and objective ‘facts’, rather than on democratic structures and equity, in short, a New Public Management (von Heland & Sörlin 2012). To conclude, resilience scholars admit, however, that their work isn’t meant to be a theory of everything. Thus, perhaps a more fruitful outcome may be achieved by the use of resilience assessment methods alongside other social science frameworks.

2.1.5 Adaptive management theory

In order to understand the theoretical history of adaptive management, the previous sections have reviewed the relevant literature on systems theories and

their use in anthropology. Adaptive management theory forms the central framework that is to be tested by this study.

Explaining adaptive management theory

Adaptive management has been postulated as the answer to the question of uncertainty inherent in complex systems (Holling 1978; Walters 1986: 86; Walters & Holling 1990; Lee 1993: 9; Gunderson et al. 1995; Gunderson 1999). It also recognises the plurality of potential stake-holders in socio-ecological systems, resulting in greater inclusivity than classic top-down approaches (Stringer et al. 2006). Lee (1999) claims that adaptive management contains philosophical, technical, ethical and theoretical dimensions. A definition of adaptive management includes reference to adaptive governance, adaptive capacity, and coping strategies. I chose to interrogate the adaptive management concept (by studying how farmers *actually engage with their oasis environment in practice*) due to the theory's potential to capture how people both passively respond to environmental phenomena and actively manipulate it⁵. I discuss the results in-depth in chapter nine. Here then, I focus on the literature relating to adaptive management and governance only.

Management implies governance at varying scales, in response to dynamic change and surprises of systems moving between multiple equilibria (Duit et al. 2010). The focus is on managing change, rather than trying to return to a predetermined equilibrium. Folke (2006) describes the related *adaptive capacity* as a complex interplay between maintaining and developing with change. A focus on adaptation is apparent in the third premise of socio-ecological resilience, as the capacity of the system to learn, with an emphasis on reorganisation (Carpenter et al. 2001). The

⁵ For a critical review of the use of adaptation term in the social sciences, see (Bargatzky et al. 1984).

need to focus on linked social and ecological systems comes from the assertion that most studies have focused on the adaptive processes of the social realm, treating the biophysical system as a “black box”, assuming that if the social processes are improved, ecological sustainability will automatically follow. Successful human adaptation may in fact come at the expense of the social system. Similarly, focusing only on the ecological dimension for sustainability leads to further erroneous conclusions (Folke 2006). Governance models emphasise social networks, social memory, leadership, and knowledge system integration (*Ibid.*). Although a focus on traditional knowledge and learning is important to assessing adaptive management capacity, in Beni Isguen I found other social processes such as reconciliation ability (such as between ethnic groups who worked together), as well as the ability to sensitively quell local conservative doubts while pursuing a progressive agenda were key to the successful navigation of creating and responding to social change. At times, stronger regulations were necessary for the management of oasis resources, ranging from norms enforced through social visibility and gossip, and by appeal to local authority figures. The shadow of the state upon everyday management practice, however, provided complications that limited the autonomy perhaps needed to make appropriate adaptive decisions in real-time, such as in the case of flooding. The competing interests of certain elements within the society (such as the merchant elite who sought to subvert the authority of the *‘azzāba* and *l’oumna* by appealing to state procedures) complicates and even potentially leaves obsolete the idea of social learning as a homogenous group adaptive response to stressors (again, I explore these issues in detail in chapter nine).

Adaptive management follows the simple premise that despite incomplete knowledge, managers must act. Walters (1986) originally formulated the theory as

a set of structured experimentation steps, in order to reduce uncertainty by showing what is not known, resulting in the subsequent design of policies for continued learning (see figs 2.3 and 2.4 for examples of iterative cycles of experimentation and evaluation). Adaptive management is not simply trial and error, however, but involves a process involving the “careful elucidation of goals, identification of alternative management objectives and hypotheses of causation, and procedures for the collection of data followed by evaluation and reiteration” (Allen et al. 2011: 1). Importantly, adaptive management may not be suited to all environmental conditions. The approach is best suited to conditions of high uncertainty and controllability; where controllability is low the development of alternative scenarios is suggested as a more appropriate response. Adaptive management may help in situations of low controllability such as climate change, by way of mitigation. Conversely, where there is less uncertainty, management experiments are unnecessary (*Ibid.*). Oasis systems, particularly the water component, typically show high uncertainty. Controllability is variable, however, depending on the hydraulic system in place. Water in Beni Isguen comes from multiple sources, from artisanal to deep state-owned wells, but accessibility can be severely limited by factors from prolonged drought to non-cooperation in local collectives. Thus adaptive management *is* potentially appropriate to the Beni Isguen situation.

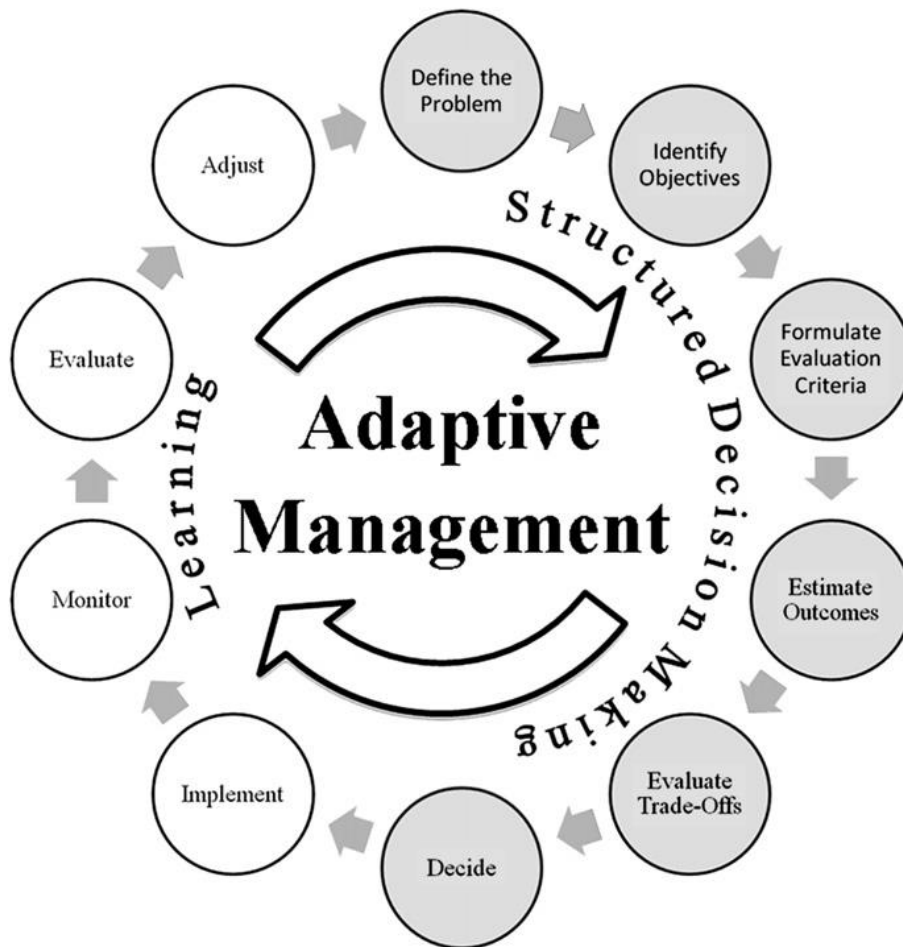


Fig. 2.3 Adaptive management, often characterized as ‘learning by doing’, is a formal iterative process of resource management that acknowledges uncertainty and achieves management objectives by increasing system knowledge through a structured feedback process. As illustrated, integral to the adaptive management process is both a decision component and an opportunity to learn. Structured decision making (gray circles), a term often confused with adaptive management, is an organized and transparent approach to the decision process for identifying and evaluating alternatives and justifying complex decisions; however, structured decision making does not necessitate the iteration and consequential higher order learning (white circles) inherent in adaptive management (from Allen et al. 2011).

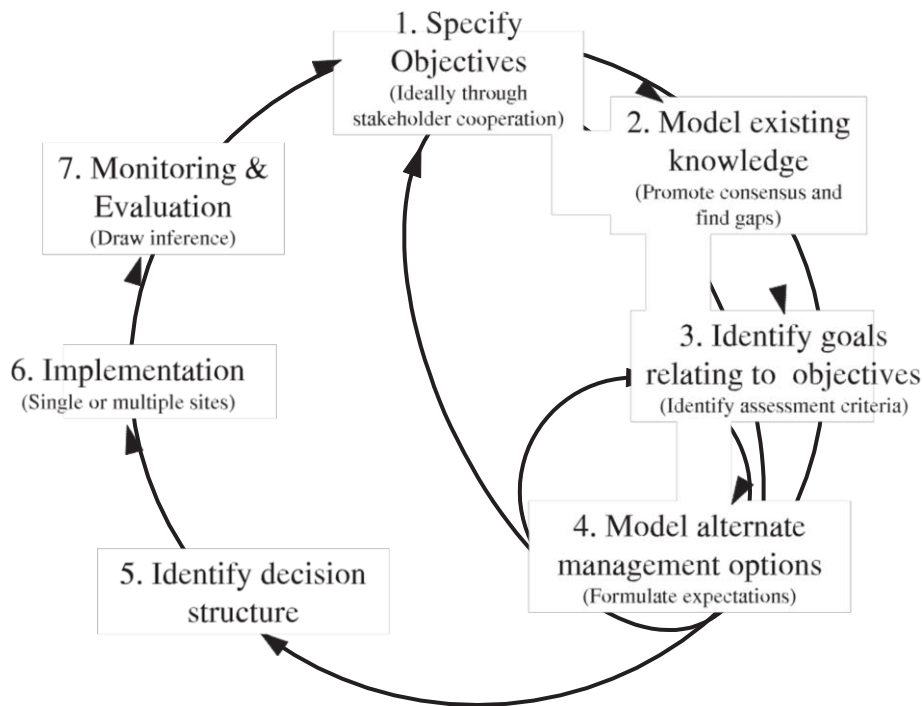


Fig. 2.4 The adaptive management process (from Schreiber et al. 2004).

Criticism of adaptive management theory

Adaptive management has been criticised for being technically proficient, yet lacking in social theory and method (Johnson 1999). Furthermore, implementation has been slow despite enthusiasm, due to unclear definitions (Allen et al. 2011; Williams & Brown 2014), management policy which favours reactive approaches to proactive ones (Schreiber et al. 2004), and a failure to understand and include the social as well as the ecological dimension of uncertainty in modelling (Tyre & Michaels 2011). Adaptive management may also be incompatible with the need for legal certainty (Allen et al. 2011; Biber 2013). Adaptive management often involves consultation with various concerned stakeholders to define management goals, and limitation of possible actions, yet the complexity generated by such collaboration has been blamed for failure (Schreiber et al. 2004). It is hard to imagine the success of a project that does not involve the complicity of affected parties, although how much ‘stake’ a stakeholder really has, and thus relative leverage, may be a

complicated political issue. Indeed, some maintain that political issues tend to be ignored by the implicit normative values of technical modelling (see for example Voß & Bornemann 2011). Finally, despite a reliance on institutions, a tension may exist between institutions' long-term goals and stability, and the need for flexible management approaches (Williams 2011).

Adaptive management may be differentiated according to active or passive approaches. Active adaptive management (as referred to in the previous paragraph) may be seen as structured or semi-structured experiments in the form of management prescriptions or policies. Passive adaptive management refers to an experiential approach characterised by flexible institutions and learning. Monitoring is central to both (Walters & Holling 1990). Rist et al. (2013) in a general review argue that this definition by Holling & Walters was misunderstood by subsequent scholarship, and that passive adaptive management actually refers to ordinary management, as all managers incorporate their reflections into subsequent planning, and that only active adaptive management is the 'true' one (I return to this issue in chapter nine). Armitage (2003), nevertheless, suggests that it is in reference to the latter that adaptive management may be linked to traditional knowledge and community-based management.

The approach is often associated with 'top down' managerial approaches (Lee 1999), or if local management is included it is often in terms of co-management with outside bodies (such as government development agencies or scientific teams), in the context of conservation and land resource management (Moller et al. 2004). Some literature does address adaptive management and capacity of local people, however, with a focus on traditional yet dynamic institutions and knowledge, and

worldviews that are able to cope with uncertainty. For example, the Iraqw'ar Da/aw are able to rely on reciprocal relationships with extended kinship and trade networks to provide food during lean times (Tengö & Hammer 2003: 135). Armitage (2003) identifies a social institution in Central Sulawesi known as *nolibu* that allows for open discussion and knowledge sharing among community members where all may voice issues, as an alternative to hierarchical meetings dominated by the village elite. Bray (2000: 20) describes how the *ejido* system (common property) of the Quintana Roo of Mexico has been adapted, and that local people have been shown “as capable of making continual adjustments to shifting ecological and social realities, as organizations that learn and that have considerable "resilience" or “robustness”. This system has been shown to be influenced by the stability of land tenure, new institutions and aggressive local marketing. Elsewhere, others assess specific adaptive practices such as crop diversification that help to resist increased pests and disease from climate change, and greater climatic uncertainty (for example Lin 2011). Similarly, Toledo et al. (2003) provide evidence of multiple land use strategies, such as swiddening, as examples of adaptive management in Mexico. It has been argued that local management is able to provide better feedback, in terms of fine-grained monitoring, than distant research scientists, who may only visit for short periods (Resilience Alliance 2010). Successful adaptive management may thus combine elements of the old and the new, joining innovation with continuity (Benessaiah 2011; Toledo et al. 2003). Finally, all these examples may or may not be included within the conceptualisation of ‘true’ adaptive management, depending on the breadth of the definition given; some such as Rist et al. (2013) are more conservative, compared to definitions given by the likes of Armitage (2003). Rather than become hung up on a definition when it came to analysing whether

farmers in Beni Isguen utilise adaptive management or not, I used a series of indicators as developed by Fabricius et al. (2007) to systematically test this.

A key criterion in most reviews of successful adaptive management at the community level are the presence or absence of experience in the form of flexible traditions and institutions, combined with the capacity for learning and innovation. Fabricius et al. (2007) provide a framework for categorising adaptive management at the community level that assesses “underlying causes of adaptations and adaptability in individuals and institutions” (2007: 2). The authors ask the questions, ‘why and how do communities adapt, what influences adaptive capacity, what are the benefits, and how can this capacity be promoted?’ They further differentiate between three types of community, as “powerless spectators” who have no power to manage, “coping actors” who act opportunistically, and “adaptive co-managers” who actively manage ecosystem services for long-term benefits. Opportunistic coping strategies are termed as actions with a short-term focus, such as controlling stocking rates, adjusting crop ratios and migration, but there is a lack of social learning among actors and institutional change for the longer term.

Adaptively managed communities in contrast, have six qualities:

1. Leadership and vision (organising toward a common goal),
2. Knowledge networks (local knowledge regarding ecological processes, history, policy; incorporation of other knowledge, new methods),
3. Institutions nested across scales (the ability to reorganise or establish new institutions, linked to other non-local institutions to increase their influence),
4. Embedded cultural management practices (e.g. supernatural sanctions for resource protection; linked land and identity),
5. Beneficial policies (e.g. clear land rights, inclusive participation in governing), and
6. Motivation (e.g. common interests, values) (Fabricius et al. 2007: 8–10).

The presence or absence of these factors was used to provide a framework to test whether Beni Isguen farmers adaptively manage their oasis resources. I return to these indicators and compare them to my ethnographic data in chapter nine.

2.2 Conclusion

In this critical review chapter, I have focused exclusively on recent systems theory as it pertains to anthropology. Of course, I also refer to a greater array of theory within and beyond the anthropological literature elsewhere in the thesis, (including but not limited to economic anthropology, legal anthropology, political anthropology, the anthropology of globalisation, postcolonial theory and Maghrebian ethnography); these fields are addressed in the subsequent chapters where relevant, relating to ethnography presented.

At the beginning of this chapter, I asked whether the ‘new ecology’ represented in reformulations of systems theory by resilience theorists presents something new or relevant to anthropology, or if in fact anthropology had moved beyond such representations. I conclude along with Hatt (2013) that while perhaps resilience does offer a new theory of equilibrium, it gives a less than satisfactory view of sociological processes, such as inequality, conflict and power. Hornborg (2013) suggests that the resilience concept does contain subversive potential but as yet this remains unrealised and instead continues to uncritically reflect and uphold the status quo. The approach clearly retains limitations such as those highlighted earlier by Moran (1990) that have not been overcome. The question is whether the framework does indeed reveal a greater complexity of socio-ecological interactions and thus increase understanding, or if while appearing to give greater clarity, actually obfuscates more than it illuminates. In this study, I utilise an alternative

approach, the event-based method, to attempt to unpick this puzzle by focusing on demonstrable phenomena rather than untestable abstractions. In the next chapter I outline my research methodology in detail as to how I practically and philosophically approached this question.

3. Methodology: Conducting ethnography in Beni Isguen

An interest in the complex intersection of social, political, economic, and environmental change has provoked a wide range of new work in recent years.... While building on the environmental history tradition, some new methodological directions are evident. Using a variety of hybrid, interdisciplinary methods.... which place special emphasis on understanding contemporary social and ecological processes in an historical context, important new perspectives that counter conventional Malthusian and balance-of-nature views have emerged.

Such approaches do not simply rely on the authority of an abstract and detached science to speak for nature, with a constructed narrative of change that follows a particular view of ecology.... Instead, a range of methods - quantitative, qualitative, textual - drawing from both the natural and social sciences inform a more integrated type of study, which investigates real processes of environmental and landscape change; *the social, political and economic processes that influence and are conditioned by environmental change; as well as the cultural symbols, interpretations, and meanings of such change.*" [Scoones 1999: 491, emphasis mine]

This chapter describes how my research question and sub-questions were operationalized. After careful review of specific research questions and data to be collected, specific methods were chosen to deliver results. The overall task was to understand human-environment relations regarding oasis management, through participating in everyday farming tasks. To reiterate, the primary research question was: do farmers in Beni Isguen practice adaptive management? I attempted to understand whether specific socio-ecological events in the commonly remembered history of oasis governance were related to (mis)management. Furthermore, I wanted to comprehend how Mozabites dealt with social change as it pertained to overall oasis governance. These social changes, which came in the form of colonialism, development, globalisation and political economic transformation may be conceived of as 'shocks' to the resilience of the oasis human-ecosystem, albeit more gradual ones. It was these subtle processes that I wished to understand, and to test whether the resilience framework could capture. Alongside classical

ethnographic methods, I used an event-based method to (re)construct multiple lines of causation into a historical ethnographic account of social-ecological change, thus drawing on and integrating multiple disciplinary approaches.

To gain a detailed understanding of these historical change processes, and to infuse this with richer detail than the more abstract, synchronic systemic illustrations, I used life histories to understand the chains of events that may have led to these changes. I expanded these findings by exploring causal contexts through archival research and reference to academic historiography. The approach I employed is partially modelled on by A.P. Vayda's proposals for a more event-based causal analysis to explain environmental change (2009: 24). As I will discuss later (chapter nine), my use of Vayda's approach varied according to the problem being investigated, raising questions about the limitations of this method/analysis. I am not uncritical of the scope of the event method, and for certain investigative understanding, other ethnographic methods such as participant observation were found to be more insightful. Partial historical analyses are contemporary with current approaches to the anthropology of time, for conventional monological means of historical presentation "can obscure as well as enlighten" (Hodges 2014: 34), indeed reflecting colonial modes of representation rather than how history is employed and reconstructed by local people according to praxis. Here I present in detail my aims and objectives, research questions, sampling, data collected with each technique, and means of analysis.

3.1. Aims and objectives

Agricultural landscapes are by definition spaces where not just ecological, but economic, socio-political and cultural factors interact (Thompson & Scoones 2009).

Understanding agricultural issues require the combination of different methods and divergent theory, often separated in different fields or disciplines. This may be by multi-disciplinary means, or by scholars of disciplines that straddle, combine or borrow from different fields, such as ecological anthropology. Complex systems theory (Holling 2001) exemplifies one such attempt to integrate human-environmental interactions, requiring a methodology that can both understand and connect myriad influences. This chapter outlines how I proposed to test for adaptive management in the M'zab (and the complex systems theory that underlies it), by ethnographic means and by an abductive causal event analysis. Concurrently, the event-based method is assessed as a means of explaining how farmers farm, through the different layers, backwards in time and outwards in space, from the material to the ideological.

My primary question was to investigate whether adaptive management is an accurate framework for describing how farmers use to manage the dynamism and unpredictability of their desert oasis ecosystem. To explore this possibility I used ethnographic methods including participant observation, oral histories, interviews, farm surveys and event analysis to understand local social historiography, economic productive practice, knowledge of ecological disturbances, cultural risk management practices, political structures and sociological regulation or conflict mitigation institutions pertaining to the management of their date palm oasis. These local strategies and contingencies were then contextualised within wider scales of influence, such as globalised political economic trends or climate systems changes, in time and space using event analysis.

Secondarily, I was interested in the roles of cultural values, institutions and identity in relation to theoretical models of adaptive management. According to the resilience formulation dynamic, unstable ecosystems require social institutions to show some degree of flexibility and learning capacity in order to navigate them, or else exhibit organisational decay and transformation into another configuration in attempting to deal with new socio-ecological realities.

The following key themes that were investigated through the research and writing were thus: adaptation, labour systems, land tenure systems, conflict resolution, management organisations (e.g. irrigation officials), political economy, and environmental change. While these can be related in a preliminary conceptual framework that diagrams how date farmers manage changing oases, the research explored these relationships in greater detail, as outlined in the following sub-questions derived from the literature review and my own fieldwork:

1. How is knowledge produced and contextualised about date palm growing and irrigation management?
2. How are ecological disturbances conceptualised?
3. What cultural practices exist to manage disturbance and risk?
4. How are social changes framed within local understanding?
5. What institutions exist for regulating social processes?
6. How does private and communal land tenure affect oasis management?
7. How are conflicts resolved?
8. Are farmers able to respond to new or extreme change?
9. To what extent do changing government development policies and scientific management methods affect management of date palm oases?

Thus the aims and objectives were to:

1. Document farmers' knowledge, beliefs, practices and values relevant to the management of date palms (question 1).
2. Document oral histories of farmers' experiences and responses to environmental change events (question 2).
3. Document local attitudes to social change in relation to local norms

- (question 3).
4. Document social institutions and practices related to oasis management, such as property norms, law codes and modes of production (questions 4-7).
 5. Analyse local understandings of adaptive capacity, ranging from traditional farming practices to newer agronomic advances (question 8).
 6. Analyse the wider political economic context (question 9).
 7. Finally, analyse presence or absence of indicators of adaptive management (as set out by Fabricius et al. 2007) (main research question).

3.2 Justification for Beni Isguen oasis as field site

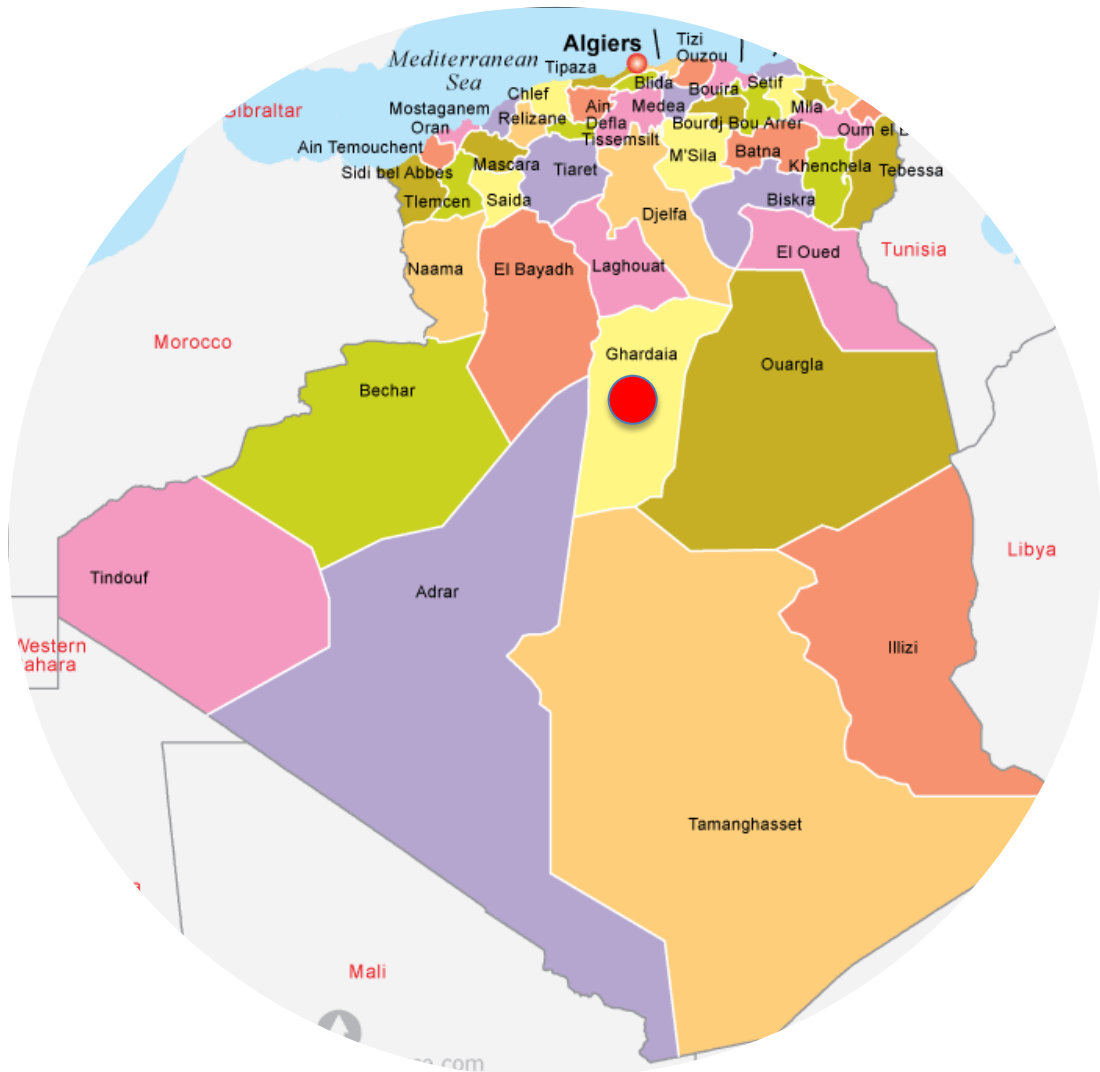


Figure 3.1 Map of Algerian administrative zones or provinces. Source: <http://transcontinentales.revues.org/1275>. (16/04/2015)



Figure. 3.2 Map of Beni Isguen oasis, M'zab valley, Ghardaïa province, Algeria.
Source: Google Earth (27/03/2015).

The Berber *qsar* or town of Beni Isguen (figs. 3.1, 3.2) in central Algeria (otherwise referred to as the M'zab valley or just the M'zab) was chosen as a field site for several key reasons. After developing my research ideas in the Moroccan Sahara in 2011, the next logical site was Algeria, for it contains the edge of the *bayoud* zone. Beni Isguen actually lies exactly on the edge of the *bayoud* range. In Morocco I studied how farmers attempted to manage the deadly date disease, *bayoud* (*Fusarium oxysporum* f.sp. *albedinis*). For the present study, in Algeria I wanted to broaden out the focus to a greater range of drivers of change to include subtle, gradual social changes, such as cultural values and market forces (such as the introduction of wage labour), and management of a Saharan oasis⁶ overall, including all the social institutions in place. This necessitated more extensive research in order to form long-term relationships and get to know the complicated social structures and

⁶ An oasis is generally a human-created ecosystem of vegetation within semi to hyper arid regions, usually desert, around a spring or other water source. Natural or non-human oases do exist, presumably when migrating birds stop at water sources, leaving seeds in their droppings, which grow into plants at the water's edge, thus forming oases. Oases until the modern period were important for economic, political and military purposes, for the control of vast trans-Saharan trade routes that reached into sub-Saharan Africa, Europe and the Levant.

practices, histories and relationship with the state and so on. After travelling extensively through the huge Algerian Sahara and meeting various farmers and officials, the location that stood out to me was the M'zab valley, for several reasons. Firstly as mentioned already, it lies on the frontier of the spreading *bayoud* disease from Morocco and western Algeria. In Beni Isguen, I learned that they had discovered how to control the disease, and I wanted to study this *in situ*. Lying at the centre of Algeria in the northern, rocky Sahara, at 1000 years old it actually is one of the younger oases, and as such has imported many of the best varieties of date palms from all around the country. Although numbering 128 varieties, it still does not have the greatest diversity of date palms (the western Touat valley has around 500). Furthermore, although the oasis is somewhat transformed from its former state, a limited form of communal management is in place, compared to other more modernised oasis communities.

Beni Isguen was preferable to other Algerian oases as it fitted the criteria I wished to investigate. For example, the modern commercial oasis of Biskra in the east consists of large, privately owned plots of land supplied by individual wells, with little left in terms of communal management. 320 km south east of Biskra lie the oases of Oued Souf⁷. There, the Algerian State has considerably damaged the delicate Saharan ecosystem through a well-intentioned development project to increase water availability (Coté 2006: 62). In the process, an aquifer was punctured thereby raising the water level, killing tens of thousands of date palms. The date palm system there was, and still partly is, known as the *ghout* system, whereby clusters of date palms are grown in the valleys of desert dunes. On first impression

⁷ Oued Souf is a site of my own paternal ancestry, making the study a kind of 'anthropology at home', due to my familiarity with Maghrebian culture. This familiarity is offset by much cultural diversity in the region, allowing for the 'othering eye'.

I wondered where the oasis was, seeing only a handful of trees at any one location, but later I realised that on achieving greater elevation, one can see these clusters stretching back in every single dune valley back by 10 km, thus creating a vast oasis network of small clusters! Here the formal social structures have largely disappeared such as the *djemaa* or *qabīla*, the tribal council of elders, although informal, tribal links and ways of life remain intact. By contrast in Beni Isguen many of these organisations are relatively intact.

As in many parts of the Sahara, work for oil companies draws many workers away from agriculture, from unskilled physical labour, to the engineering and design aspects of complex irrigation infrastructures (Zaimeche & Sutton 1998; Ross 2008). In the western regions of the Touat (Adrar province), many of the oasis systems were still managed more communally, based on the ancient *fogarra* irrigation system⁸. Many of these, however, appeared dishearteningly degraded due to ecological reasons such as drought, a situation further exacerbated by the State drawing water away to new development; also degradation of these oases was furthered by emigration of youth away to the cities or oil fields for work. By contrast the date palms of Beni Isguen were thriving. Rather than wasting my time in my quest for the ‘right’ field site, travel to different sites greatly enriched my understanding of desert agriculture in Algeria, and further travels continue to enhance it.

Beni Isguen oasis retains a communally managed flood-based irrigation system, which feeds the systems of collectively owned wells. This is now augmented by

⁸ An ancient gravity-based irrigation system in the form of underground tunnels running from a water source to the field. This system comes from ancient Persia, known as the *qanāt*.

deep state-owned wells. The older system, somewhat similar to the political organisation of river-fed irrigation systems of Morocco (Ilahiane 1996), necessitates a level of communal organisation and agreement for the whole system to work, and so understanding this was key to addressing the core questions of this study. Further, Mozabite identity - a topic of interest in understanding cultural issues that complicate the science of adaptive management – was a hotly debated topic locally. Being an ethnic island in a sea of Malikite Arabs, the Ibadite Mozabite Berbers felt their difference keenly, and actively maintained it. Being very much a religious community, values were actively discussed; they were perceived as being influenced by the multiple forces of globalisation and mass media, and not necessarily for the better.

Ecology of the M'zab

In ecological terms, the Sahara provides an ideal setting for studying dynamic systems, with highly unpredictable climate involving droughts and floods (Ward et al. 1999; Mougou et al. 2011). Beni Isguen and the M'zab valley has remained in drought conditions for the past 3-5 years⁹, and such prolonged stress enables the study of longer term responses by local actors, beyond the brief coping mechanisms used for a single seasonal drought. The Sahelian/Saharan-Atlas mountain ecotopes produce highly variable rainfall. Locals cite certain periods of the year such as autumn and spring when rain *potentially* may fall or flash floods arrive, but in reality floods and rains may occur several times a year or several years apart, with varying degrees of severity. Table 4.1 gives the major ecological disturbances in the recent

⁹ The important feature of this is that no one knows when the drought will end, thus the duration of this ecological condition is unpredictable in people's minds.

past according to living memory (compiled from information given by two farmers, one younger based on personal daily recorded, corroborated by one older farmer).

Working alongside farmers and palm specialists

Focusing on a single town (locally called a *qsar*, pl. *qsūr*, i.e. a fortified settlement common across the Maghreb) of approximately 7000 inhabitants allowed me to concentrate on the complexity of interactions at a particular locus in depth. Working mostly with the farming sector of the community allowed me to narrow down the scope of analysis and begin to understand these complex relationships. Although this study attempts to investigate complex socio-ecological ‘systems’ as units within greater units of scale, an alternate view is of the interactions between actors and things as networks (Law 2004: 200; Latour 2005). Similarly, the event-based method allows for the visualisation of multiple, causal chains. This study attempts to explore whether intangible forces and motivations can be mapped into these chains. The main actors in these oasis networks are homeowners, agriculturalists, *phoeniculteurs* (date palm specialists), local and international NGOs, hotel owners, and the mosque. Non-human actors include date palms, climate, and technology. The whole *qsar* had a stake in the oasis, however, as many people, even those who didn’t own property continued to identify with it, and many walked through on Friday holidays, boy scouts used it, people played football there and swam when there was water.

My data comes from the many conversations and observations, interviews, general discussions I gathered over the 11 months that I was there (September 2012-April 2013, and September 2013-November 2013, during that time I lived in two consecutive houses inside the oasis, and thus observed much of the daily comings

and goings. In the summer I slept on the roof like the others and so saw even more such as the workers getting up before dawn, people strolling on Fridays, scout meetings, people swimming and so on. I was present when prayers were taking place on one occasion, and I participated in wedding ceremonies several times in the oasis both outdoors and indoors. I participated in many formal and informal gatherings of farmers whether on people's land, or in the agricultural centre. I visited the inside of people's homes precisely two times in the old town of Beni Isguen, when women were present (but hidden from view), and in quite a few houses with men inside the oasis, and also small tourist hotels. In fact, in general men often experience precisely the same problem as myself, that they have no fixed meeting places, such as the visitor's living room in the front of house in ordinary Arab houses, and so often are forced to meet ad-hoc in oasis gardens or outside one of the mosques. My language capacity, which I rapidly adapted to the region, also allowed me to for effective conversations and mutual understanding.



Figure 3.3 *Phoeniciculteur* Hamza and his workers transporting dates. (08/10/13)

In order to uncover subtle social transitions such as changing values, informal rules and norms which required in-depth understanding and trust, I worked intensively with several agriculturalists over the course of a year. This entailed direct participation in farming and everyday life, oral histories and informed conversation (semi-structured interviews). Specifically, I worked most intensively with two *phoeniciculteurs* (date palm specialists, see figs. 3.3, 3.4), working at and travelling between many sites in the ‘ancient’ oasis. I also worked with landholding farmers to various degrees ranging from weeks to days. The reason for choosing to spend the bulk of my time with mobile agriculturalists rather than landholding farmers should be explained. An exclusive focus on *phoeniciculteur* livelihoods might be initially seen as limiting, in the sense of understanding management decisions, for as non-landholders they are not the primary decision-makers regarding resource

management. As specialists they do advise, however. The primary advantage of spending time with *phoeniculteurs* was *that they move*. They were constantly on the move around the oasis, as compared to farmers who would only travel early in the morning and late in the evening back and forth from their farms, unless they lived on them permanently, as a few did. This allowed me a much greater chance of witnessing a greater range of everyday happenings around the oasis than would have been the case if I remained at a fixed location.



Figure 3.4 *Phoeniculteur* Nourreddine at work. (23/02/13)

Phoeniculteurs cannot be dismissed as mere gardeners for several reasons. First, the agronomical knowledge they hold is essential to the maintenance of healthy palm groves, of planting, selection, pollination, thinning, harvesting, selection, irrigation, disease and much more. Second, most are repositories of much local

history regarding traditional practices of oasis farming, many having learnt from fathers, grandfathers and uncles. Many farmers, on the other hand having started out anew have not had the benefit of receiving agricultural knowledge from older generations¹⁰. Third, *phoeniculteurs* form part of a web of relations from the market, landowners, migrant labourers, the mosque, family and tribe, the state, local and international environmental NGOs. Understanding their position in the order of daily life helped me greatly to understand the wider social structures that impact and contextualise local management decisions, as well as the perceptions and attitudes towards such structures and observations. *Phoeniculteurs* are active in preserving their knowledge, passing it on to future generations and learning new technical knowledge, while making connections to local and international NGOs, all of which made them a fascinating subject in investigating the role of flexible learning and institutions in response to dynamic environments.

Working with farmers and phoeniculteurs meant raking paths, gathering dates, some climbing of trees (but usually I observed the harder tasks from the comfort of the ground, such as the scaling of more gigantic trees or pollinating palms), weeding, fixing irrigation canals, digging holes, pruning, planting, carrying tools and buckets of fruit and more. As stated above, working with *phoeniculteurs* meant moving between sites every couple of days or several times a day. This afforded me much movement and the ability to meet many local actors, as well as observing first-hand interactions whether economic or familial, collaborative or conflictual, or merely the everyday greeting of virtually everyone we passed on the street and the

¹⁰ Many farmers (but certainly not all), now mostly working in the new development area adjacent to the old oasis, are not the descendants of farmers but often shop owners or tradesmen who seized the opportunity offered by the government to develop virgin land. There are further reasons for rupture of intergenerational farming knowledge, to be discussed later (e.g. socialist policy, factory and oil production work).

narrow paths between walled gardens and farms. Such movement varied from the information given in the static setting of farms as it formed a kind of transect, for as we moved through the oasis' winding pathways, different things would often be pointed out: an ancient mosque, a women's Qu'ranic teaching school, an ancient irrigation channel. As my research progressed, more intimate histories were remembered and shared, such as how as a boy my friend helped his father draw well water by donkey taking the most part of a day (now by contrast performed in minutes by electric pump), or the story of how a group of slaves were killed in cold blood upon our passing a tomb.

I also worked, in a more static manner, with farmers in the old oasis, but mostly in the new development area, called Ntissa, which adjoined the old oasis (see fig 3.2). Whereas the old oasis has been almost completely colonised by homes, the new area consists of larger 2-5 hectare farm plots. This area can be differentiated by younger date palms; the oldest grown since the inception of the development in 1988, thus still affording little shade due to immature palm trees, and by the lack of a watershed, i.e. a communally-managed flood drainage irrigation system, with individual or state-owned collective wells instead.

Interviews with farmers gave me their interpretations for the physicality of what I saw in the farms and irrigation systems, for example, why olive trees were planted where they were, to give shade or as a windbreak to protect more delicate orange trees from the harsh desert winds, or why weeds were left or cleared. Interviews were in fact a necessary tool in addition to participant observation, as what I saw on farms only made sense after hearing their long-term plans, economic status or farm-management philosophy (see for example fig 5.4). Thus farmers' intentions

were made clear, thus presenting choices within a range of possibilities and constraints, such as knowledge, financial input, labour force, ecology, culture, markets, government support and so on.

Beyond clarifying immediate phenomena interviews provided histories of how problems and disasters such as severe floods and droughts (listed in table 4.1) were dealt with by means of *twiza* or communal aid. This helped enhance my understanding of disaster management processes over time. I was also able to gain an understanding of sensitive matters that I was unable to directly witness such as conflict resolution, customarily involving a scaling-up process according to the escalation of the dispute. This began by recourse to influential authority figures, the family patriarchs, and if not resolved then went to the higher levels of the council of the *‘ashīra*, to the *‘azzāba* (the mosque clerisy). This was now complicated by the appearance of new associations and an increased reliance on state law courts by those who wished to subvert traditional hierarchies, as in the case of inheritance disputes. Such disputes had a direct effect on oasis management, through the temporary ‘abandonment’ of land plots (see chapter seven), and the increasing disregard for the mosque-sanctioned irrigation officials, resulting in environmental destruction in the form of violent flash flooding (chapter eight).

As well as using immersive methods, I also visited with and interviewed other farmers and undertook farm surveys (see appendix II for an illustrative survey), but also non-farmers including those connected to the sphere of agriculture such as landowners, labourers, agronomists, government officials, and other members of Mozabite society. Indeed, it was important to understand the wider sphere of cultural relations, norms and structures, and this latter population of non-farmers

formed another essential category of interlocutors. These individuals were invaluable to me, some of whom were met casually, some forming long-standing friendships, giving me insight into the 'everyday' of Mozabite life.

Participating in group discussions

In order to understand knowledge networks and social structures I also attended meetings of local associations and NGOs, such as the meetings of farmer groups by the RADDO network which held conferences for issues such as mitigation and adaptation to climate change. Such meetings were invaluable for learning first hand which issues were most important locally and which issues were debated, giving a critical edge that could be lacking in one-on-one interviews. I was not invited to attend certain local group meetings such as the local environment protection meetings (Association for the Protection of the Environment in Beni Isguen – APEB), or the village meetings of the *'ashūra* or *ayyen* (council of notables responsible for administration of the town, which was answerable to the town council of the government), and here I had to rely on the help of friends to fill me in on proceedings. That I was not invited to such meetings is understandable, as I am not a member of Mozabite society and therefore not a decision-maker. I was invited to many of the agricultural meetings, however, and even called on for my expertise and advice at times. I offered what I could.

Some methodology textbooks and academics rightly encourage neutrality of the fieldworker, in terms of not asking leading questions, or 'contaminating' the informant with one's point of view on a matter which in turn can lead them to tailor their response accordingly. For instance, if you come out and tell them that you think a practice is bad, they may feel ashamed to then tell you the practice is good.

I, however, felt that many wouldn't allow themselves to speak freely until I had given my views, which allowed people to get a sense of who I was and what I stand for. This went beyond mere reciprocity of views to forging deeper bonds of trust, which entailed a real sense of responsibility to my new friends. Therefore in group discussions I didn't follow the protocol of keeping my ideas to myself, and I found this allowed for more intense debate, while allowed for the understanding of doubt.

3.3 Limitations of the study and ethical considerations

Based on my empirical observation of Mozabite daily routines, life consists of three main spheres: Work, the home and the mosque (see also Bourdieu 1962). Due to my (male) gender I was unable to spend much time in Mozabite homes, due to total segregation of the sexes (conventional to many Islamic interpretations of female honour and modesty but also pre-Islamic patriarchy (Afsaruddin & Ameri 1999: 121)). I was also precluded from joining in the worship in the mosque, as I am not an Ibadite, or indeed a Muslim. I even considered proclaiming the *shahada* and declaring myself an Ibadite for the sake of inclusion, but after reflection and discussion with other anthropologists, I decided that it would be unethical to do so. I was fascinated by what I imagined was being preached within the mosque in regard to the relationship with God, but also instruction pertaining to communal values, yet I contented myself to being informed by friends on such details. Religion permeates every facet of Mozabite life, through praxis and language, such as the everyday religious greetings, supplications and blessings that are uttered during every interaction or alone, to the highly structured, mandatory prayers five times a day, often starting around 4.30 am in the morning (shifting according to seasonal change). Not being able to join in such fundamental activities frustrated me, but these were not directly necessary as it was the work sphere that was the most

pertinent to my investigations, and I was able to understand broader social information both indirectly, and later directly through observation of weddings, meetings and so on.

Mozabites are a self-confessed closed-society who are happy to explain generalities and principles about their lives with outsiders, but will rarely disclose private details. Faithfulness (related to *al amena*, a local concept discussed below) to such privacy and a notion of inside and outside group membership are paramount. The installation of the Mozabite pentapolis¹¹. in such a barren, dry landscape with virtually no access to water in the eleventh century was intentionally founded on the idea of exclusion from political and ideological influences, as well as safe from the military force of nomads. This mind-set made it relatively easy to understand abstract ideology, but made it very difficult to get to the everyday substance of local conflicts and problems, the nitty-gritty of anthropological fieldwork. This was compounded by my lack of understanding of the Mozabite language of which I speak very little, although I could understand and speak perfectly the local Arabic dialect after a little time as I had grown up speaking Tunisian Arabic. Thus local friends were the 'gatekeepers' that provided essential access to Mozabite society, situations, meetings, and discussions over tea that I would have found impossible to realise otherwise. The few times I did try to introduce myself as a stranger, even though linked to people that they knew, I was treated with suspicion and names were rarely offered. Thus access was virtually always through introductions to networks from parties that could vouch for me, who knew or knew of me in some way and thus I became part of their story and trustworthy. With their strong work ethic, the fact that I was doing research on farmers and agriculture (as opposed to

¹¹ The five cities or towns of the M'zab, also known as a heptapolis if including the outlying towns of Guerrara and Berriane.

simply visiting as a tourist) was perceived as useful to the community, and people told me so, thus helping my general acceptance. The majority of people I spoke to conversed with me freely, from farmers, agronomists, NGO employees, government officials, journalists, tour guides, students, academics, merchants and on and on. (In fact the one person who avoided me, in the mode of *tebria* that I wrote about, was someone to whom I confessed that I was not a Muslim, after he had invited me to pray with him and his friends. I was asked about my religious beliefs surprisingly little.

The fact that I am Tunisian with Algerian roots appeared to give us some degree of cultural commonality (although one of my Algerian cousins nuanced this by saying that the Mozabites may have been more willing to talk to me because of my (other) status as a European outsider, who would be less suspicious than an Arab Algerian (and perhaps more prestigious)). The 'Native anthropologist' appears to be a common category within studies on the Middle East and North Africa, causing some to ask, more than slightly tongue-in-cheek, whether it is possible for a non-native to do good ethnography there (Gilsenan 1990). I am aware of the drawbacks of such a position, however, in that much may be assumed in terms of understanding on the part of the local informant, and even on the part of the anthropologist, for whom the research site is less 'other', and who thus misses certain details that the non-native might not (for wide ranging discussions on this subject, see Jackson 1987). I tried hard not to make such assumptions, and I feel that the site was sufficiently different to my upbringing which was partially in middle-class Tunisia. Further, I have trained my 'othering lens' through previous work I have done living with Andean and Amazonian communities (for two months

in 2005, and one year in 2006, respectively), which I assumed to apply through vigilant attention to the everyday details of life.

Introductions also gave them information of my status as a PhD student. I quickly learnt that especially in 'traditional' society where each knows the history of the other members of society, knowing my particular status meant that they then knew how to address me, whether as an equal, higher or lower in rank than themselves. I was made known as an anthropologist through the Tazdait association who were my primary point of contact, and this knowledge quickly spread through much of the community. Education ranks highly among Algerian values, despite the disappointment (and subsequent surrounding political upheavals in nearby countries) around subsequent lack of employment. However, as a student (rather than a professor) I was probably allowed to make a few mistakes, which were indeed necessary to the learning of subtle norms and practices.

I also noticed after some time that whom I associated with had an effect on my bearing in the society, and who would want to associate with me. For example, persons from the elite or higher classes, such as landowners, administrators, professionals and the like would be more open to me if I was in the company of other respected individuals, but treated correspondingly if I was in the company of agriculturalists or labourers, who have lower social status. Allegiance to certain individuals could make it difficult to spend time with other groups, and this depended on not only their social-economic, ethnic, gendered status or age class, but also on their reputation. Hawes (2008: 371), when living with a Berber community in Algeria also noted embarrassment by her higher status host when she spent time with lower status Black Africans.

Due to the extreme privacy values of Mozabites, I decided not to conduct a census and general household survey. However, I did collect data based on around 50 landowners, and many other members of Mozabite society. I also made a list of family names and how these relate to the tribal and village structures, from a freely available local document regarding Mozabite genealogy (see chapter four). Regarding generalisability, the M'zab valley shows many similarities to other oasis towns in the Maghreb in factors such as ecology, weather, irrigation systems, subsistence patterns, ethnic variation, relation to the market, plant disease, religion and political organisation (e.g. council of elders, new associations). The Mozabite *'azzāba* is similar to the *djem'aa* or council of elders found in many other traditional Maghrebian societies. Some details may vary such as knowledge of palm trees, particular management practices, beliefs and customs, ownership rules, particularities of irrigation management, variations of *'urf* or customary law and local interpretations of the Qu'ran, making this site all the more worthy of detailed study.

3.4 The fieldwork approach

To understand how oasis farmers deal with social and ecological change, I needed first to identify 'change to what', i.e. the initial 'soft' boundaries of the unit to be studied (the oasis), to form a working knowledge of an operational baseline of farming in Beni Isguen. This was done primarily by my participation in daily farming activities. Then, change events were identified through oral histories and direct observation during my fieldwork. I interviewed many individuals associated directly or indirectly with the oasis. I then analysed responses to change through an event-based analysis. Finally, I examined whether farmers do adaptive

management by referring to the framework described by Fabricius et al. (2007), with a focus on existing institutions and norms, and their flexibility in dealing with new situations, with reference to learning.

3.4.1 Methods used and data collected

Participant observation

The actions people engage in everyday life often differ from spoken ideals, and what people do is often different from what they say they do. Participant observation was developed to address these issues, to get at the finer details of everyday life (Bernard 2006: 136–164; Puri 2010). I undertook this method with varying degrees of participation with several agriculturalists including two *phoeniciculteurs* and several farmers. These details were subsequently methodically recorded in field notes. This facilitated a bond between myself and the farmers which over time transcended that of researcher and subject. With most, friendships were formed and we shared many details of our personal lives, dreams and aspirations, problems, attitudes, perceptions and the like. This allowed me a quality of insight into the deeper trends and forces at play in Mozabite life that greatly transcends that which a researcher studying for a few days or even a few months, would be able to record. Thus I was able to slowly understand the more gradual, subtle forces of social change in the M'zab valley. Researchers of more common short studies never have their assumptions challenged. Mozabites themselves recognise this, for example, when a researcher from Algiers came and made a joking but derisive comment about the treatment of women in Beni Isguen, a local friend of mine retorted “yes but you’ve never spent more than two days here at a time”, i.e. you have no real

experience on which to base such statements, just fleeting observations of women covered in white sheets in the street.

I noticed a reciprocal relationship in terms of depth of information shared. The more I gave of myself, in terms of personal information or work, the more information was given back to me, and the more people's lives unfolded in my understanding. Such an approach is not merely a research strategy, but essential practice for progressing an anthropological study, and quintessential for building everyday relationships. For example, intimate details, such as one's relationship with parents, nostalgic memories (especially pertinent to oral histories) were shared in this manner, or particularly at the end of the day or over dinner when winding down, rather than during the more busy morning activities.

I participated especially during the date harvest and pollination seasons, to observe and experience farmers enacting management strategies, dealing with contingencies and understanding the contexts that these practices occur in. The key benefit of the participant method is that it enables the researcher to directly observe decision-making *in process*. I maintained a focus on following people interacting with date palms, in order to not get lost in ideas of higher order phenomena such as culture, kinship, education, religion, gender, identity or modernity (Coupaye 2009). As participant observation often has a high degree of uncertainty, intuition and the following of one's gut instinct in chasing leads is essential; in times of doubt, I would remember this maxim to simply 'follow people and date palms'.

The date palm occupies several domains of interest to local people, and thus also to

researchers, in that they may be seen as cultivars in terms of productivity, nutritional, medicinal, and ecological provisioning. They are also used as insurance—a long-term bank account—as well as bestowers of symbolic sweetness to newlyweds, and a source of sexual vitality. Indeed, the date palm qualifies as a ‘cultural keystone species’ (Garibaldi 2009; de Grenade 2013); as a plant “whose existence and symbolic value are essential to the stability of a culture over time” (Cristancho & Vining 2004: 153).

Participant observation provided a baseline of everyday events for further analysis. These everyday events were then compared to oral histories regarding change and the literature. Evidence of change provided the starting point for an event analysis to determine the causes of these changes, and the importance of social, cultural, economic, political and ecological factors. These observable daily activities also led to the understanding of important ‘invisible’ phenomena, in the sense that they may not be revealed in the course of interviews or surveys, such as biological knowledge of tree and pest life-cycles, knowledge of ecology and climate, processes of learning (passive observation, active experimentation, transmission from parents or other farmers, travel to other oases, theoretical knowledge from agricultural extension agents, textbooks, online research or formal education), religious ideas related to agriculture and farming identity, land ownership, inheritance law, dispute-solving institutions and more.

Oral histories

In the course of semi-structured interviews, a selection of informants was asked about the histories of their families and communities, to construct a timeline of significant events. Questions were asked about how they and their ancestors

responded to change events and processes, going back to the limits of living memory. Once identified, particular change events were triangulated and verified among other informants and from sources such as those relating to climatological data.

These data provided an account of present management strategies and how these have been developed according to knowledge learned, and experiences over the lives of individuals and communities. As well as providing me with potential socio-ecological change events and responses, oral/life histories can be analysed to show the varying ways in which cultural values pertain to oasis management and responses to change, and how identities are constructed across the generations and the effects this has on responses to change.

The best oral histories were done in combination with participant observation as mentioned above, as more intimate memories were shared after more time had been spent together. Sometimes, it also took the right line of questioning, coming from a random topic. For example, after several months of working together, it wasn't until I asked one farmer if he followed the news that he revealed to me that he used to be heavily active in politics, campaigning for the local *al Nahda* party. Further, he was a member of *l'oumna*, an ancient institution for guarding water, a primary focus of this study (see chapter eight). He often reminded me that you can't judge a book by its cover in that a person may have many facets, unknown to many, even in a small community. This person was a full-time farmer, spent regular time at the mosque, worked as a local politician (before getting married) and trained youth at a boxing club. Most of the people he interacted with didn't know about the other aspects of his life.

I especially spent time with older farmers, and with people who had learnt from older farmers in order to understand key events in the past, and how these were dealt with. Talking to these old specialists gave me insight not only into the subtleties of certain choices and preferences for certain techniques or plant species used, but of entirely different economic systems prevalent in the oasis in the past, including their theories for the reasons behind the changes of the new system.

Semi-structured interviews

At first I allowed myself to be guided by events according to the participant observation method. Of course I had my research questions and framework in the back of my mind to help guide my attention. Over time as my understanding grew, more detailed issues and questions came to light. I often jotted down questions in the morning as a result of processing my notes the night before, based on any new information gleaned that day. These formed semi-structured topics, which became crystallised into major questions to be used in more formal interviews toward the end of the study period. In the final month of the fieldwork, I focused more on these structured interviews and I became more proficient at doing farm visits and obtaining large amounts of replicable information without the need for noting questions beforehand.

Again, this method worked best with participant observation, or simply with people who I had got to know over time, for the quality of interviews varied according to trust. As mentioned, the Mozabites are quite a closed society as they themselves admit, and so the limitations of the interview method showed themselves often, but of course it would not be practical to do participant observation with each

interviewee. I perceived the quality of information to be not only equated to trust in myself but also potentially to socio-economic status. For example, wealthier individuals who didn't know me would present a 'rosy' image of local events, of the type one might give to tourists, a kind of glossy overview. On the other hand, lower status individuals who were less happy with the status quo would complain more freely about corruption and unfair practices. The names of these individuals are changed for the sake of sensitivity. I also used informal interviews to verify the information given to me in previous meetings or activities. I would repeat back my understanding of what I thought was said in Arabic, and the respondent would confirm or further elucidate their statement. I found this a powerful way to assure the veracity of my findings.

Interviews explored such topics as date palm and general farming knowledge, transmission, social networks, livelihoods, and values, all pertaining to my research questions. Such factors built on the baseline of data from which I established responses and causes of responses to change events. These data were contrasted with individuals' ideal livelihood aspirations. Identity changes and is constructed according to socio-ecological conditions over time. This is affected by intergenerational differences which may help in understanding conflicts about values. Understanding individual intentionality is important for arriving at the motivations underlying certain decisions and courses of action. These elements are largely ignored in the treatment of adaptive management, conceptualising scientific models in purely technical terms only. Such a method involves having a prepared list of topics for discussion but in contrast to structured methods, it allows the researcher to ask follow up questions, thereby potentially identifying aspects previously unconsidered, through guided conversation (Bernard 2006: 208–236).

Farm surveys

I undertook farm surveys involving quite detailed questioning, which I formalised over time to become quite structured and comprehensive (see appendix II for an example). When farmers weren't present, as when I visited plots with *phoeniciculteurs*, I carried out surveys on tree and plant composition, date palm variety, size of plots, irrigation systems, position within the oasis and name of the owner. This gave a good sense of variation of farming methods and diversity of palm species.

Group interviews and discussions

I participated in many group activities, including many farmer meetings set up through local and international NGOs such as RADDO (Réseau Associatif de Développement Durable des Oasis), Tazdait local farmers' association, and BEDE (Biodiversity: Exchange and Diffusion of Experiences). Participants were a range of farmers, agronomists, officials and academics. I rarely led discussions, preferring instead to listen to the topics that were raised by farmers themselves, and noting the importance of these, as opposed to my own pre-formulated topics. As a researcher I was sometimes asked for my input, which I gave where appropriate. My weekly participation in a group for English practice for locals served as a useful focus group. Again, I rarely imposed my research agenda on them, although they knew what I was doing and were interested in my studies. I preferred to listen to what was on the minds of individuals at the time, and as I had time for this (as opposed to Participatory Rapid Assessments for example, e.g. Chambers 2006, in Bernard 2006: 264) and I learned a great deal this way. Conversations almost always had a moralistic tone, even though they were very jovial, at times hilarious,

usually taking place between two or more generations, and so advice was often given, solicited or not. Sometimes I would pose a question to the group, however, and they would be happy to discuss and debate it, the many voices adding greatly to my research on topics not only around oasis management, but also on Mozabite tradition and social organisation.



Figure 3.5 Beni Isguen English language group. (15/10/13)

Participatory maps and seasonal calendars

I planned to construct seasonal calendars with farmers, but decided not to as this had been done perfectly well quite recently by local ethnoscience and friend, Mr Nourreddine Ben Saadoun (2010). I did create a map with the aid of an irrigation specialist of the different named zones of the Beni Isguen oasis, along with the principal named water canals (figure 8.1). The wells are all named too, but with

around 1000 plots, and one well feeding about five plots each giving 200 wells, I didn't map all of these, there were simply too many.

Archival research

Local archives such as the Institute of Sheikh Tfiesh and the White Fathers library in Ghardaia were accessed to learn about local historical, political and religious institutions. The Sheikh Tfiesh association for the service of heritage was founded 1995 to house Ibadite cultural documentation. It holds manuscripts, and recorded oral history. I read documents, both in thesis and book form, in English and French, related to local archaeology, politics and sociology, mostly by local scholars and students (e.g. Khalifa 1985; Daddi Adoun 1991; Yahiaoui 1999; Spiga 2010).

3.5 Data management

Notes from conversations and interviews were taken down in small notebooks *in situ* which were then written up in full on a laptop computer later that evening or the next morning. Notes were processed using the Nvivo computer programme for qualitative data and coded for themes. The final coding themes that emerged were a combination of themes from my conceptual framework, and from unexpected topics whose importance was realised in the course of my fieldwork (see appendix I for full list of codes).

I also kept a field diary to record ideas, as well as more personal reflections to process the developing impressions that I had. I undertook regular free-writing of my impressions in order to give form and coherence to the wealth of information

that I was receiving. I ordered concepts into flow charts in order to help me to visualise the multiple connections between ideas.

3.6 Data analyses

Analyses of local understandings of adaptive capacity and the reported causes of farmer responses to social and environmental change were the primary sources of research findings. The former required creating a typology of local understandings of adaptive capacity from comparisons of text in Nvivo. For the latter, the abductive causal eventism method as proposed by Vayda (2013) was used to construct chains of events that establish a narrative explanation for their responses. Examining these chains of causes and effects, I could extract factors or variables that played an important role in the explanation. I then compared these to other potential causal factors, to uncover factors which may have not been revealed in immediate answers (e.g. there may be *preattentive* elements that are obvious to the specialist, but not to the layman or novice researcher (Gladwin & Murtaugh 1980)). These were identified during participant observation and formed the basis of further questions. I also analysed the extent to which changing values, institutions, knowledge, political-economic and ecological factors were important for adaptive management. These factors were considered as potential causes of adaptive management events, and eliminated on the basis of factual and counterfactual evidence or reasoning.

Abductive causal eventism

An event-based analysis was used as an analytical approach to try to understand how certain conditions or events of the Beni Isguen oasis had arisen, through careful management, or mismanagement, or due to other factors. It was also used to

analyse whether certain human actions have arisen as a response to ecological problems. In this way I was able to try to understand whether local management has been adaptive, as defined by *adaptive management* theory, in terms of: flexible institutions to deal with surprise shocks, ability to reorganise institutions if the need arose, access and approach to knowledge, direct learning ability, reflection on the course of current management plans (if such plans exist), how local values and identity assist or hinder management, links with outside organisations such as government and NGOs, local solidarity or mistrust, and so on.

Event analysis is not common in anthropological studies, many of which take a more discursive approach, and is not without its critics. Its analytical rigour comes from a focus on concrete events working backwards from effects to causes, rather than causes to effects, thereby avoiding the false logic of consequence explanations (Vayda & Walters 2011: 14). Vayda (2009: 3) gives a rather broad definition of an 'event' as "something that happens somewhere during a particular interval of time". It is an appropriate approach in ecological anthropology which involves observable physical phenomena which may have been affected by human actions, as in the case of natural resource-based livelihoods. The first iteration of this methodology was articulated by Vayda in 1983 to explain the human causes of environmental change events, which he then labelled 'progressive contextualisation'. This approach urged researchers to focus on specific human-environment interactions, and explain these by situating them within "progressively wider and denser contexts" (Vayda 1983: 265). The approach became known as event ecology in 1999 through a polemical and provocative article aimed at the shortcomings of political ecology, a recent trend in scholarship for explaining human-environment relations. Vayda and Walters (1999) lambasted political

ecology for pre-favouring political economy theory in explaining socio-ecological problems and, along with others, asking, “where is the ecology?” (see also Walker 2005). Vayda prefers an open-ended approach to causation, allowing the researcher not to close off any potential avenues prematurely in the search for causes of a problem, be they political, biological, or whatever. The approach has been further elaborated by Vayda and Walters in a series of papers (Vayda 2009; Walters & Vayda 2009; Vayda & Walters 2011; Vayda 2013; Walters 2012).

The latest iteration has been dubbed somewhat ineloquently, Abductive Causal Eventism (ACE). This methodology was adopted as a term over event ecology to reflect the inclusivity of a broader range of causes of events: social, physical, chemical and so on. It uses an abductive approach to explanation, following Peirce (1932: 495-499, in Vayda 2013), by focusing on discrete events or chains of events and working backwards in time and space to establish potential causes. Abduction involves the use of multiple working hypotheses, following the work of Chamberlin (1890, in Vayda & Walters 2011: 8), which in this case refers to the many hypothetical causes that might be tested in the process of establishing an explanation of an event. Similar to detective work, hypotheses are sought to “account for observed facts or events in contradistinction to looking for facts or events to test hypotheses” (Vayda & Walters 2011: 11). Then, factual and counterfactual questions are asked in order to keep some explanations and eliminate others. This type of method is utilised by historians and medical specialists where a degree of uncertainty exists, necessitating analysis through abductive logic. The hypotheses may originate from the investigator’s knowledge and experience, and it follows that one with more experience will generate better potential explanations. This also reveals the limitations of the approach, for its success depends on the

researcher exhausting all possibilities before going through the process of elimination, thus it goes without saying that if a possibility which has evaded the analyst is missed, the whole line of enquiry will be compromised. The experience of the researcher is strongly implied in all social science investigations, however, so this issue may not be more of a problem to this approach than any other.

The approach benefits from not depending on abstract structures as premeditated theoretical explanations, and so the researcher is not drawn into reifying systems and structures (Walters & Vayda 2009: 24), making it very suitable for analysing resilience models and formulations. Indeed, Vayda and Walters argue that the more specific a claim, the more susceptible it is to contrary evidence; so importantly, the opposite is also true, that causal claims about larger and more abstract entities become impervious to counterclaim. Thus, discovering how traditional knowledge systems affect so and so, is more likely to be inconclusive, than pursuing how specific items of knowledge affect certain actions (2011: 6).

In this thesis, abductive reasoning is used to explain responses to social and ecological changes in date palm oasis management that have been identified through participant observation of current practices and oral histories collected in interviews with farmers. To the extent that it is possible to conceive of responses as events, then it should be possible to apply event analysis, and trace the causes of those responses (Puri 2015). Of course, working backwards from purported responses helps to confirm their relationship to social ecological changes in oasis management, as well as explore the role of values, knowledge, institutions, and other factors discussed above, in these responses.

The steps involved in the event approach are as follows:

1. Identify the *what* (is to be explained) question, such as an (anthropogenically caused) environmental change event, (e.g., destruction of property by floods), but verify such an event has actually occurred before proceeding to the *why* questions. For example, desertification has been taken as a given in many environmental studies, a misreading by colonial authorities based on erroneous misconceptions, prejudice and unfamiliarity with local management methods and strategies (Vayda 2013).
2. Ask plausible *why* questions about the causes of the event, from event back to causal event, and not vice versa, and come up with multiple potential causal chains.
3. Collect data guided by the multiple working hypotheses to test potential causal chains, ask factual and counter-factual questions, to eliminating some causes and reinforce others.

Limitations and criticisms of event ecology exist. Political ecologists, for example, have defended discourse analysis, and Walters (2012) concedes that the simplification needed for the event approach may occlude such a dimension. Hebert (2011: 61) argues that the concrete events to be explained are not always so objective, in that environmental phenomena may be subjective and therefore contested, as her fieldwork in Alaska illustrated. Vayda & Walters consistently argue against systems and processes, such as those used in the socio-ecological systems (SES) theory behind adaptive management, although to be clear, Vayda isn't against the possibility of the existence of processes *per se*, where repeating sequences can be clearly demonstrated, rather he is against the need for *holisms*, as superfluous to explaining specific events.

A key point of disagreement between event and complexity theories such as SES may be the concept of emergence. Adaptive management policy is predicated on the idea that complex systems are highly unpredictable. Similarly, complexity theorists argue that *emergence cannot be reduced to the some of the parts* (although some

complexity theorists have been able to model the emergent properties of complex systems such as bat roosting behaviour patterns by demonstrating simple rules of interaction between individuals) (Rocheleau 2011). Vayda would probably argue that phenomena *can* be explained by causal chains, multiple ones if need be. It needs to be established whether emergent phenomena can be explained as events. Many phenomena such as sand dunes, bird flocks, hurricanes and consciousness are described as emergent patterns, behaviours, properties or states and thus probably fall outside the remit of an ‘event’ explainable by event analysis. Other examples of emergence (Talley 2015) include:

- Billions of neurons *interact to form* Mind, consciousness
- Dozens of birds flying *interact to form* Flocking
- Moisture, temperature, pressure *interact to form* Hurricanes, tornadoes
- Buyers, sellers, transactions *interact to form* Markets
- Lots of conversations *interact to form* Culture
- Lots of water molecules *interact to form* Liquidity
- DNA, protein, other molecules *interact to form* Life
- Mom, Dad, and the kids *interact to form* Family
- Lots of families *interact to form* a Community
- Lots of communities *interact to form* a nation-state

Vayda would surely classify such phenomena as just the sort of abstract categories he wishes to avoid, ones that cannot be broken down to particular causal chains, thus remaining impervious to falsification. This is consistent with general anthropological debunking of ideal types or fetishisation as opposed to ‘real’ life. Other phenomena such as ‘bottom-up’ social organisation, such as neighbourhood organisations, *may* be described within event terminology *and* emergence also. This begs the question, can such occurrences be explained by the sum of the parts, or are they a new condition, not contained by any of the component parts alone, but brought through the ‘magic’ of their individual and collective interactions? This thesis addresses these philosophical dilemmas, which I deal with systematically in chapter nine.

Finally, some might accuse Vayda of positivism. This would be erroneous, for while he focuses on concrete events, his approach is of multiple working hypotheses rather than deductive hypothesis testing through experiment as logical positivists have argued for. Rather, this makes Vayda's epistemological position, one of critical realism, where our view of the world can constantly be improved through greater understanding and findings; the critical realist is critical of our ability to know with certainty (Danermark 2002: 86). The event approach to history has also been criticised by Bloch (1992: 103), who favours a *longue durée* view of history, as taken up by Braudel (1958). I describe certain persistent ideas through the *longue durée* approach, but I found during this study that the event approach was more powerful in the understanding and explanation of ecological management problems and then contextualising them by working backwards and outwards to causes. I was not completely faithful to this mode of analysis and perhaps I stretched it beyond breaking point in order to cover what I wanted to understand. I give a detailed description of the limits of the event approach in chapter nine.

Resilience assessment

Finally, to compare the usefulness of an adaptive management framework, a Resilience Assessment (Resilience Alliance 2010) was carried out based on the accumulated data, and a model of the pertinent socio-ecological interactions was constructed (see appendix III). From this I was able to observe what extra dimensions regarding response to change this approach highlights; alternatively I was able then to see what wasn't covered by such modeling (see again chapter nine).

All data were analysed using the Nvivo qualitative analysis software and coded to reveal salient cultural domains, to analyse relationships qualitatively and to draw out a heuristic framework from which to organize a theoretical analysis, which was then compared to current systems theories for a comparative analysis. For example, patterns relating to separate responses regarding change and response events have been coded and analysed.

3.7 Conclusion

This chapter involved a discussion of my research questions and methodology which emerged from a review of the literature on the 'new' ecology of disequilibrium systems in the previous chapter. Next, I present the location and people with whom I used these methods, the farmers of the oasis of Beni Isguen, central Algeria, which is then followed by a critical review of ethnographic work on the M'zab region as a whole.

4. Locating the field: Beni Isguen, the M'zab and its people

This chapter situates my field site in key geographical, historical, and cultural contexts, and also provides an account of relevant ethnographic work on the region. I begin with a description of the physical landscape and climatology. From this follows an account of Mozabite history, from the early schism in Islamic history by the Kharijites which led to the formation of Ibadism, and how and why this was taken on by nomadic Zenete Amazigh (Berbers), who later called themselves the Beni M'zab (sons of the M'zab) or Mozabites. I then critically discuss the key ethnographic sources on the Mozabites, followed by a review of relevant ethnographic works from the wider region, focusing on the Sahara and the Maghreb more broadly. I argue that Bennoune's (1986) important work gives a counterpoint to the previous functionalist analyses of Mozabite adaptation to change, which posit religion as the key factor in maintaining social cohesion, despite forces of imperialism (Ottoman, French). Contrasting with the synchronic conceptions of cohesion, he provides instead a historical perspective that reveals conflictual internal dynamics of social change and class formation leading to social inequality. Yet, I argue that Bennoune does not go far enough with his theory of social change, for he does not explain why changes that began a millennium ago have only come to fruition in the past few decades. I here suggest that the Algerian revolution and independence provided the key trigger for an ideological shift which led to a political reconfiguration between the M'zab and the state based on integration rather than isolation.

4.1 Landscape of the M'zab valley, geology and hydrology

The M'zab valley lies within the rocky, northern area of the Algerian Sahara, on the edge of the Grand Erg Occidental and the Grand Erg Oriental. It lies 200 km from the Atlas Mountains in the north, and about 560 km from Algiers (located geographically between 33° and 31° 15' north latitude, 2° 30' and 5° longitude). The region forms part of the Ghardaïa province. The geology is of hard, salmon coloured limestone, in contrast to the shifting dunes classically associated with the Sahara, which in reality contains very diverse landscape formations. This geology is known locally as the *shebka*, signifying the net-like structure where valleys and ravines have been eroded over time into the hard substrate (see Figure 4.1). The valley covers 275 000 hectares, or 40 km², at 20 km long about 2 km wide; altitude is 562 m (asl). The rivers, such as the oued M'zab and oued Ntissa flow in from the al Bayadh Mountains in the west (300 km) and the Laghouat Mountains in the north (200 km) (others are oued Metlili, oued Sebseb). These rivers are dry for most of the year, yet run violently when the aforementioned mountains receive rainfall. Such rainfall and subsequent flash floods are, characteristically of the region, unpredictable (a non-equilibrium state, according ecological terminology), occurring perhaps three times in a year, or once every three years, and these at different strengths and velocity (Pavard et al. 1975).

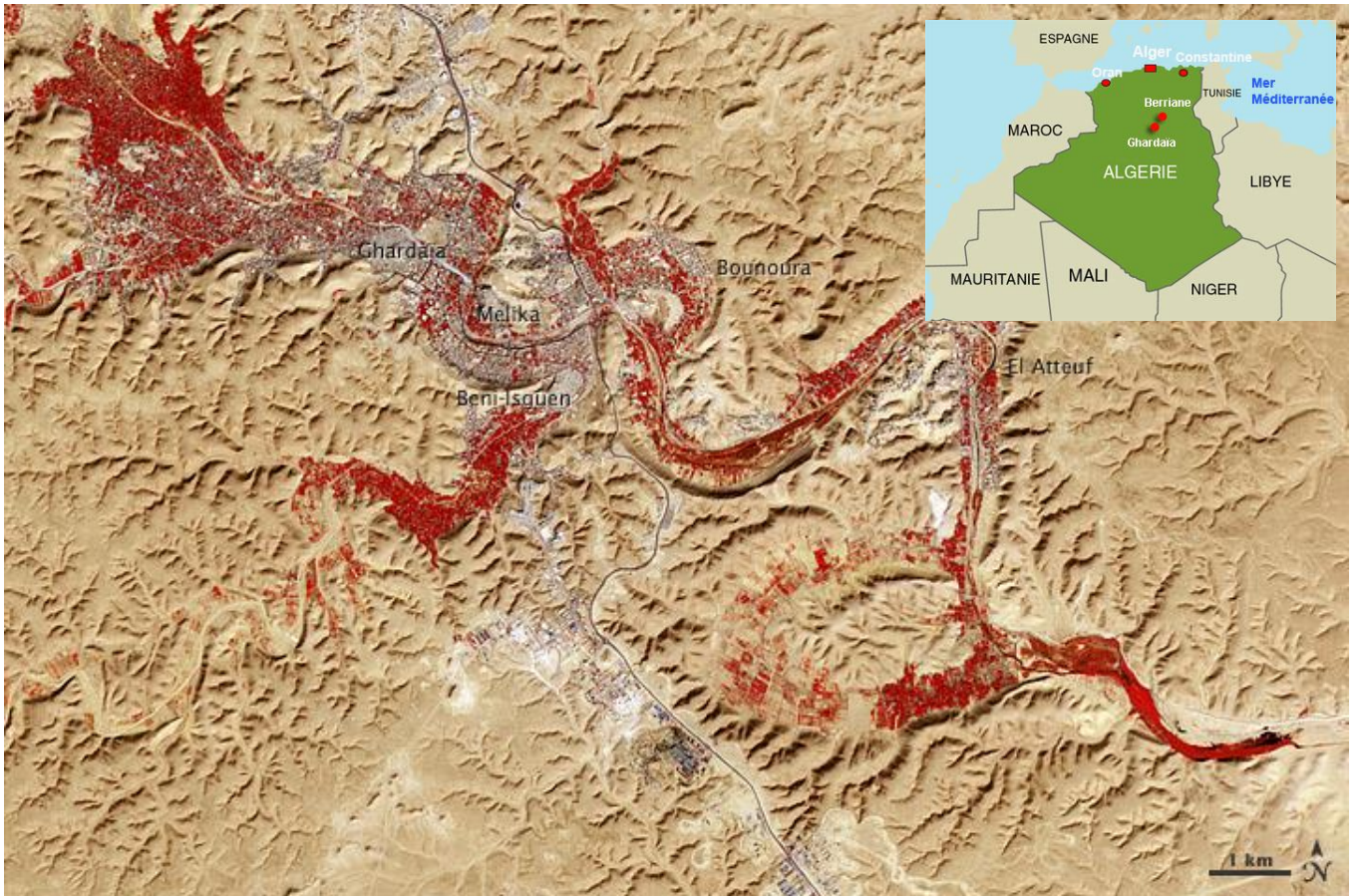


Figure 4.1 The M'zab valley, Algeria. Source: NASA
<http://earthobservatory.nasa.gov/IOTD/view.php?id=51296>

The landscape is exceedingly dry, with weather classified as “hot desert climate” (according to the [Köppen climate classification \(Koeppen 2016\)](#)) with an annual precipitation of 61.4 mm. This is statistically highest in November at 12.1 mm and lowest in July at 0.3 mm., the hottest month (NOAA, years 1964-1990). Indeed, July usually has a temperature average high of 36.9° C (record high of 49.0° C); January is typically the coldest month with an average low of 5.3° C (record low of -5.4° C). More generally, the warm season is from June-September with an average of 36° C, and the cold season is November-March with an average of 21° C. With rainfall variation above a C.V. of 33 per cent (Ellis 1994), the M'zab ecological conditions are driven by climate and may be classified as having non-equilibrium

dynamics¹² (Ellis et al. 1993). The M'zab experiences hot, dusty winds in the spring from March-May. These are largely ideal conditions for the cultivation of the date palm *Phoenix dactylifera* L., which favour hot, dry conditions for the ripening of dates, and the rains that may come in November are past the timing of the harvesting of most varieties such as *bint aqbela*. The region does lack the humidity that the popular *deglet nūr* dates prefer; these are more prevalent in eastern Algeria and Tunisia.

Despite its hyper-arid appearance, the region harbours a blessed secret to those with the knowledge and the capacity to use it: vast underground aquifers. These were surely put here by God, to offset the harshness of desert life, according to my interlocutors in Beni Isguen. The North Western Aquifer system (NWSAS) (see Figure 4.2) (also known as the Système Aquifère du Sahara Septentrional (SASS)) extends over 1 million km², across Algeria (700,000 km²), Libya (250,000 km²), and Tunisia (80,000 km²). Previously understood to be a finite source of fossil water, it is now known to recharge by 1 billion m³/year. Use levels still remain unsustainable, however, as this recharge represents only 40 per cent of current use (Gonçalvès et al. 2013). Specifically, exploitation is now 2.5 billion m³/year, as compared to 0.6 billion m³ in 1970 (Mamou et al. 2006). The NWSAS is understood to contain reserves of 60 billion m³. The M'zab dorsal sits between the two main aquifers, the occidental and oriental basins (Wallin et al. 2005). The principal aquifers are known as the Continental Intercalcaire (CI) and the Complex Terminal (CT), and shallow phreatic aquifers from the quaternary age also exist. The aquifers range from 400m to 2000 m in depth (Al-Gamal 2011).

¹² This coefficient of variation (C.V.) was calculated by myself based on historical data from the Ghardaia region, from <http://www.tutiempo.net/en/Climate/Ghardaia/605660.htm>. C.V. was calculated as a percentage using the formula: $CV = (\sigma/\bar{x}) \times 100$. Total annual precipitation was used from 1983-2013.

Table 4.1 Extreme weather events (as given by local sources).

Year	Weather Event
1930s	Drought
1952/4	Flood
1970s	Flood
1981	Earthquake
1984	Locust
1995/6	Wind (500 palms fell in Beni Isguen)
2004/5	Snow
2008	Flood (Ghardaia)

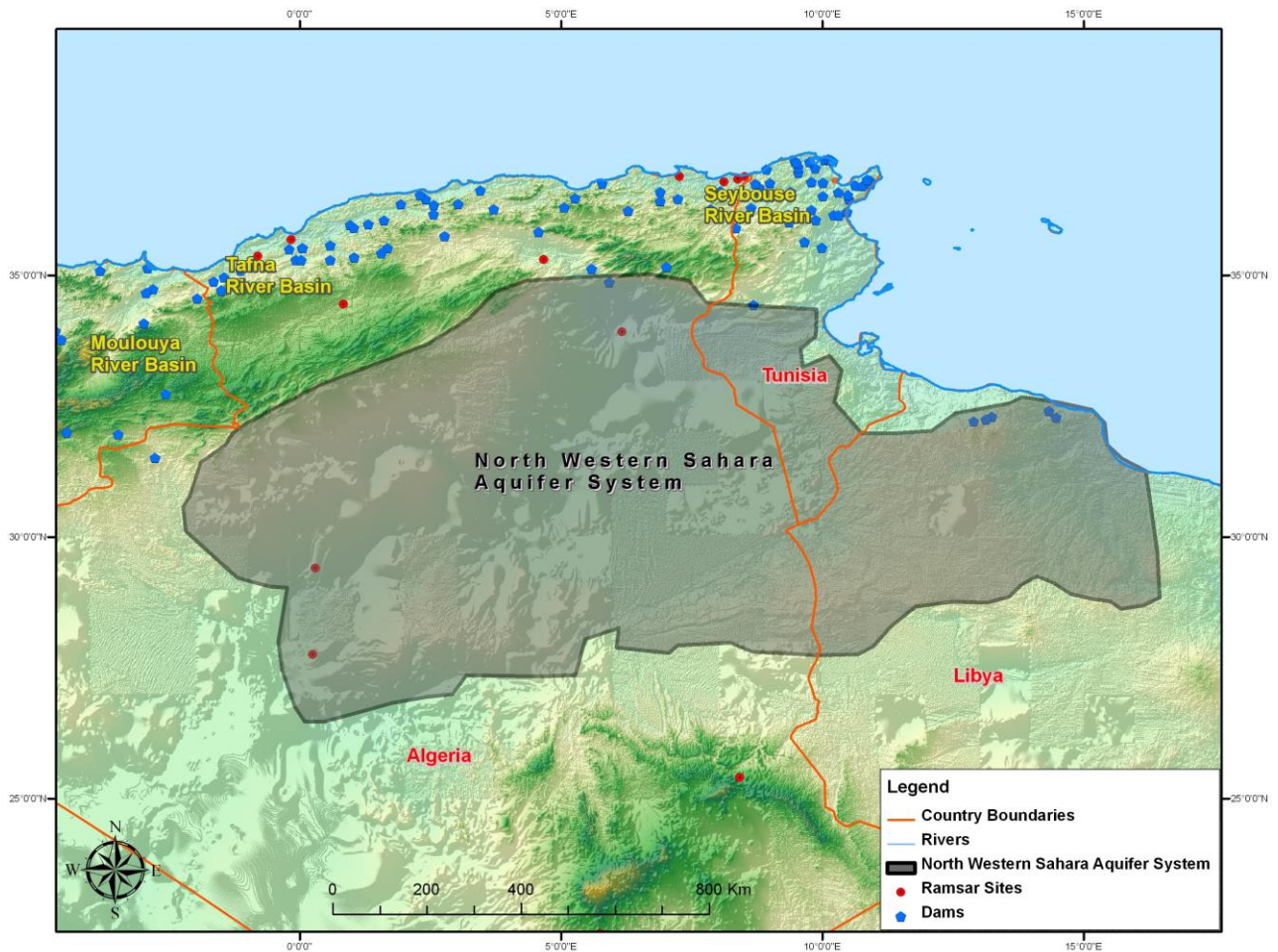


Figure 4.2 The North Western Aquifer System (NWSAS). (Source: <http://gridnairobi.unep.org/chm/waterbasins/NWSAS-19-03-08.jpg>)

4.2 Mozabite historical background: Ibadite Islam meets the Zenete Berbers

Some historical background of the Mozabites is given here, not only to describe how they came to live in the current geographical area, but also to explain the emergence of certain cultural forms that have survived the *long durée*, such as social support and isolation as forms of moral regulation of the oasis landscape and processes.

The history of the Mozabites and their movements can be traced back to a sectarian split in the early days of Islam. Mozabite religious identity, Ibadism, came from the

earlier Kharajite faction (although some Mozabites refute Kharajite ancestry¹³), which separated from the Muslim community during the time of Ali. Most sources (e.g. Masqueray 1878; Zeys 1887; Amat 1888; Alport 1954; Bourdieu 1962; Donnadiou et al. 1977; Holsinger 1980; Bennoune 1986; Bierschenk 1988; Ghazal 2013) explain the fissure by pointing to a dispute based on religious doctrine, over the battle of Siffin (Safar, 37 = July 657), between Ali, cousin and son-in-law of the prophet Mohammed, and Mu^cāwīyya of the Umiyad clan. The events that led up to this disagreement surround the well-known issue of the legitimacy of Ali as the successor to caliph Umar, as opposed to ^cUthman of the influential Quraysh family. ^cUthman was voted in due to his family's political weight, but the supporters of Ali denounced this win as a conspiracy against the family of the prophet. However, according to Willams:

[^cUthman] lived more luxuriously than his predecessors and he allowed his family and the chief companions to become owners of vast private properties in the conquered lands. At the same time he antagonised many of the companions. Discontent grew in the camp cities, where it was felt that all spoils and revenues of the conquests should be divided equally among the community. Ali was known to share this view. [1964, in Bennoune 1986: 99]

After the 11th year of ^cUthman's rule, the populace rose up against him, and eventually he was killed. A delegation of rebels approached Ali to convince him to accept candidacy of the office of Caliphate. After his election, a conservative faction made up of two companions and the prophet's widow, Aisha denounced Ali's election, even accusing him of complicity in ^cUthman's murder. A civil war among

¹³ Masqueray (1878: XI) gave the following response to this claim by a Mozabite man: "One of my Mozabite performers, as I translated *Kharidjites* as rebels, heretics, *out of the religion*, was indignant. I replied, objecting that this meaning is derived from the Arabic verb *kharadja* "going out" is that we find in all Arab historians and with their translators (e.g. Ibn Khaldun. - Baron of Slane); he replied: "There is no Mozabite that accepts this because Ali said: They hurt me because they *came out against* me. This signifies our religious ancestors separated from Ali, but not religion. We are more religious, better Muslims than the Arabs."

the rival factions ensued. When Ali and his followers moved their camp to Kufa, Mu^ʿāwīyya, the governor of Syria and cousin of ^ʿUthman, made a decisive move to crush Ali. Following several campaigns, Mu^ʿāwīyya, a skilled diplomat, suggested a truce and arbitration by means of a committee, who would make a pronouncement based on a reading of the Quʾran. Bennoune suggests that:

Ali and a large number of his supporters accepted this proposal, either because they were trying to end the deadly conflict or because the members of the *Kura* (Quʾran readers) faction had previously conducted an implacable political campaign against ^ʿUthman culminating in his murder, expected that this Quʾranic judgement would be in their favour and therefore justify their past struggle against the corruption of Beni Umaiya. [1986: 100]

One faction, the Tamin tribe, disavowed this move, claiming that the arbitration was against and above the word of God, and that judgement was for God alone. Arbitration was interpreted according to the Quʾran to be allowed only in two circumstances, when there is conflict between husband and wife, and when game is killed during the *haj* (pilgrimage) and compensation is required (Alport 1954). The Tamin faction withdrew to Harura near Kufa and elected Abd Allah Ben Wahab as their imām, calling themselves the al Haruriya. History was against Ali, however, and Kura pronounced in favour of Mu^ʿāwīyya. Consequently, the followers of Ali “went out” and were thus referred to by orthodox Muslims as Kharajites, “those who went out from the community of the faithful”. The Kharajites joined with the Haruriya under Ibn Wahab. Together they led many violent attacks upon the Umaiya, denouncing their corrupt reign and calling for a condition where “social justice, equality and fraternity could be maintained among all true followers of the Prophet without distinction of birth and standing,” (*Ibid*: 101). The Kharajites

continued to carry out revolutionary warfare using guerrilla tactics, down to the end of the Umayyad dynasty's reign. Following this, Khawarij divided into the Azarika, Sufriya and Ibadia factions. The latter was formed by Abu Bilal, Djabir ben Zayid and Abdallah Ibn Ibad (after whom the Ibadites referred to themselves).

Positioning themselves against 'artificial' arbitration is important to Mozabites today and to this study for several reasons. Firstly, Ibadite doctrine is absolute that the Qu'ran is the final word, and all actions are either right or wrong. Secondly, serious sins cannot be expiated, enforcing a strong fear of God. It is precisely this quality that people invoke today when they comment that people are acting badly against local norms, and I return to this sentiment in chapter nine. Braudel (1958) refers to this type of commonly held trope over time as the *longue durée*. Furthermore, here can be found the origins of the 'radical egalitarianism' professed by the group, which I discuss throughout the thesis in relation to observed practice.

During the reign of Marwan II (129 = 747), the followers of Ibn Ibad liberated Sanaa from the imperial army, and from there captured Mecca and Medina, although these were taken back a year later. Another insurrection was launched by the Ibadites in Oman four years later, but this was put down. Meanwhile, Ibadite missionaries spread into Hadramout, Yemen, Oman, Persia, East Africa and the Maghreb (North Africa). Pavard (1975: 6) claims that Ibadite traders from Oman spread their doctrine as far as India and China.

Although Islam spread across North Africa within only two decades of Mohammed's death, Arabs set themselves apart from the new indigenous converts, despite the doctrine of equality. Thus, the heretical Kharajism with its radical

egalitarianism, where “the only hierarchy among them was that of the intensity of their faith and the rectitude of their conduct”, (Entelis 1986: 13), was deeply attractive to the indigenous Amazigh (Berbers). Indeed, Entelis (1986: 13) asserts that North African Amazigh had a tendency toward heretical forms of the invading religions, as they took up the Donatist form of Christianity previously (and later Arianism from the Vandals in the fifth century), probably as a form of political protest. More importantly, even non-Arabs could rise and become caliphs according to Kharajism, and all Muslims could depose an unjust imām (*Ibid.*: 14). Thus, Ibadism took hold among Amazigh populations in western Tripolitania: the Zenata and the Nefouca.

Having been defeated in the Mashreq, the Ibadites proclaimed a “state of secrecy”, and many under the leadership of Ibn Rostam, a Persian, migrated to the Maghreb to establish a “kingdom of God on Earth” where Ibadite ideals of social justice, human brotherhood and political equality would prevail” (Bennoune 1986: 104). Within two years, the Ibadites took hold of Tripoli and Kairouan, in present-day Libya and Tunisia, respectively. They held Kairouan, the imperial centre of North Africa for four years, until it was recaptured by an imperial army from Egypt. From here the Ibadites withdrew, trekking about 700 miles towards central Algeria. There they settled on a former Roman camp on a pass between the Tell Atlas highlands and the lower fertile plains, which they named Tahert (761 A.D.). This theocratic state stood for 150 years, rising to become a major cosmopolitan trading centre, standing as it did between the agricultural area of the north and the pastoralist shepherders and grand nomads of the south. The two main historical sources of this period are Ibn Saghir (Calassanti-Motyliniski 1908), an orthodox Muslim, and Abu Zakaria (Masqueray 1978), an Ibadite scholar. Tahert attracted

many from as far as Iraq, Persia, Oman and Tripoli to “trade, study and learn from the successful institutional experience of the democratic-theocratic republic” (Bennoune 1986: 106). Accordingly, Tahert became one of the busiest trading centres of the Islamic world at the time (*Ibid.*)¹⁴.

This period is significant for this is when Mozabites learned to become successful traders, and during this period emerged a secular council, the *majlis ayyen*, which would vie for power with the religious ‘circle of saints’ or clerisy, the ruling *‘azzāba*. As a result of such prosperity, the Ibadite ideal of equality was thus threatened by the creation of class conflict (this theme is taken up in chapter nine). Factionalism always arose during the election of a new imām and the greatest new faction was that of the merchant class. This class invariably supported the ruling elite. This class is the most powerful in the M’zab today, whose power has now usurped that of the ruling *‘azzāba*. Importantly, it is to migratory trade that Mozabites turned to strategically when agriculture was not enough to support their households in the isolated M’zab valley. Much recent scholarship on migration argues that this phenomenon is part of household strategies largely in response to ‘modernisation’ (De Haas 2007), or previous colonialism such as to raise cash for taxes (De Haan et al. 2002). Historiography of Mozabite migration shows that regionally the practice was much older. Moreover, the practice of trade during this period alerts us to the fact that Mozabites engaged in the slave trade, and several sources confirm that

¹⁴ The economy was set up according to a redistributive economic principle: “At the moment of harvest, the Imamate appropriated an amount of surplus from every producer not only of cereals but also of sheep, cattle and camels. Upon the completion of this collection, the grains were distributed among the indigent households; then the functionaries of the Imamate proceeded to sell these sheep, cattle and goats, and camels in the market. A part of the money received from such sale was sent by the imām to the governors as their administrative budget. The remaining sum was converted into wool and oil, which was then proportionally distributed to every household. This distribution favoured the Ibadite indigent families” (Bennoune 1986: 106).

this was indeed the case (Savage 1992; Scheele 2012: 49). The descendants of some of these slaves make up part of the demographic of the M'zab today, and are recognised as part of the Mozabite community, although some differences between 'black' and 'white' Mozabites exist, as I explain later.

In 909, this Rustamid kingdom was overrun by the incoming Fatimids. From this time the Ibadites withdrew into the desert to Ouargla, about 400 miles away, where another small colony of Ibadites existed. Speculating on their collapse, they largely blamed this on the fact that they had tolerated foreigners, even admitting dissident elements into the administration and thus paving the way for the fall and annexation by the invaders. Thus in Ouargla the imām renounced his leadership and withdrew into a spiritual life, and from then on religious and secular control of the community fell on the *azzāba*. Thus the last imām proclaimed a “state of secrecy” and the Ibadites would withdraw to practice their religion in isolation, away from mixed communities. This sense of isolation and psychological or spiritual ‘dissociation’ remains important in idea and practice among Mozabites today. Many pondered out loud to me that reintegration with the Algerian nation-state, and indeed opening their doors to the world via tourism may have been the cause for many of today’s social ills.

The new city of Sedrata was also well placed for trade, however, as a major caravan route crossed it from southwest to northeast. Thus the city prospered, although not for long. The new site was dangerously exposed to the surrounding desert plains filled with armed nomads, and powerful kingdoms in the Black South. Thus the Ibadites planned their withdrawal further into inhospitable terrain. They founded a new site (built on prior Amazigh settlements) just 120 miles southwest in the arid

limestone plateau in the *shebka* (Arab. for 'net') now known as the M'zab. This area was avoided by nomads as it was devoid of resources for grazing or watering, the valleys crisscrossing the limestone ridges were utterly barren, although some ancient settlements are apparent. In 1011 A.D. the first city of the M'zab was built, al Atteuf (Tumzabt, dialect of Tamazight (Berber): *Tajmint*), followed by Bou Noura (Tum. *At-Bounour*) and Melika (Tum. *At-Mlichet*) a few decades later, followed by Beni Isguen (Tum. *At-Izjen*) and Ghardaia (Tum. *Tagherdait*). As described by Alport, within the river M'zab:

lie the five cities perched on the slopes or on higher ground in the riverbed. They are built fairly close together, so that from each it is easy to see one or two for the others... they are surrounded by stout walls and each is crowned by the Minaret of its mosque, shaped like an obelisk and lacking any kind of decoration. [Alport 1954: 34]

Conflicting sources attest that Beni Isguen was in fact built in the fourteenth century (Bafouloulou 2013: 11; Pavard et al. 1975: 12). Social conflict due to limited resources and an expanding population resulted in the creation of Guerrara (Tum. *Igraren*) and Berriane (Tum. *Iberguen*) about 45 km away, in the seventeenth century. These seven cities form the heptapole of the Mozabite federation. Metlili was founded also by Mozabites in sixteenth century, although this was overtaken by settling *Sh'amba* nomads. Population pressure meant that the local agricultural resources were insufficient to feed the population, causing male Mozabites to emigrate to outlying Algerian towns and cities in order to trade, and then sustain the desert population by sending resources back home. Population pressure within limited space contributes to violent conflict to this day, and is the driver of other changes that I deal with in later chapters. Thus came about the primary livelihood by which Mozabites are commonly known around Algeria: merchants with a reputation for honesty in their dealings (Alport 1954; Holsinger 1986). Later, with

access to European markets following French annexation, some of these grocers and butchers would form large-scale capitalist enterprises. This differs from Zuwaya merchants in Libya, for example, who John Davis (1987: 175) claims didn't become capitalists, in that they didn't form oppressive internal class relations, even if they did exploit foreign labour. I will argue that such success through wealth paradoxically has contributed to a breakdown in social relations that are necessary to the prevention of dangerous flash floods, which require cooperation between households (chapter eight). I suggest that those with great financial resources no longer 'need' each other, causing the messy entanglements of reciprocal aid to be void, although such powerful individuals can *create* need among who they choose (as opposed to the poor whose need is linked to kinsmen by bonds of reciprocity), by strategically creating favours for those they wish to influence, such as certain authority figures.

The people of the M'zab negotiated relative independence from the later Ottomans who were to take over most of North Africa, reaching present day Algeria in the early sixteenth century. After the French annexed Algeria in 1830, they at first allowed the M'zab confederation self-rule based on a treaty of 1853, provided that they pay an annual tribute. In 1882 this arrangement was nullified, and the M'zab was officially annexed into the colony, as the official capital of 'Territoire du Sud'. The Mozabite religious council which was operating in a state of secrecy since the withdrawal to Ouargla refused to recognise the authority and validity of the annexation and the newly appointed officials, however. As such, they lead the population in boycotting the French administration and its schools, hospitals, military service and taxes. Bennoune posits that:

the Mozabites tried to minimise as much as possible their dealings and relations with the colonial power and the medium of its domination; consequently a silent struggle was ushered in and prolonged to the end of French rule in Algeria. [1986: 110]

According to Ghazal (2010), French imperialism caused certain influential Mozabites such as Atfiyyash and Al-Yaqzan, influenced by the pan-Islam *Islah* movement to forget sectarian divides and reunite under the umbrella of Islam, for a unified Algeria. This question of state legitimacy is one that has been repeated again and again in Ibadite history, and I argue, one that shapes events today, especially the local capacity to self-govern and manage local resources, involving questions of scale. I suggest in this thesis that questions of autonomy and integration have been debated all through Mozabite history.

Cataldi et al. (1996) argue that it was only with the formation of independent Algeria that the autonomous self-rule of the confederation fell apart. The religious self-organisation was at odds with the new socialist government, and new flows of economic and industrial development upset traditional forms of management. Bennoune (1986), however, argues that change was in fact internally driven. With the development of a merchant class, a new lay council, known as the *ayyen*, was to challenge the authority of the religious council. Bennoune (*Ibid.*) further asserts that the new political configurations were influenced by the migrations of these merchants to the Algerian Tell, who were exposed to alternative forms of governance. What Bennoune fails to explain, however, is why the merchant class, formed centuries ago only recently displaced the *‘azzāba* from its seat of power. This thesis argues that conscious integration with the nation-state involved a decline in local power due to local recognition of state judicial authority, legitimised because of its Islamic nature. Yet, the merchant class probably pushed for

integration along more pragmatic lines in order to secure trading arrangements with national markets. Countering commonly held tropes of neoliberal modernity sweeping across the globe out of Euro-America, my investigations argue for an understanding of change that recognises more agency in local decisions and debate on integration (even if limited) with the nation-state. Of importance to this study, integration with the Algerian state meant that local systems of oasis management were eroded, whether the water guard's institution as replaced by the state-enforced local council, or of local customary law being replaced by statutory law with direct effects on land ownership and property in the oasis.

4.3 Mozabite life today

Today, there are about 500,000 Mozabites living globally (Bennoune 1986), with approximately 100,000 in the M'zab valley, Ghardaïa province, and the rest of the diaspora residing in the Algerian Tell Atlas, France and Europe. The other 200,000 residents of the M'zab valley are made up mainly of *Sh'amba* Arabs of different Islamic sects, but also a small minority of Kabyles, Touareg and other Sahelian migrants from Mali, Burkina Faso, and Niger. Other inhabitants include migrants from the north of Algeria in the Tell, and from the desert south, such as Adrar and Tamanrasset. The administrative capital Ghardaia is thus very cosmopolitan, although Mozabite and others' living quarters are mostly separate (see figure 3.1).

Language & ethnic makeup

The principal language of Mozabites is Tumzabt, a branch of the Berber (Tamazight) language, of the Afro-Asiatic family. Tumzabt as a spoken dialect is eroding, with many terms being replaced by Algerian Arabic, although efforts are being made to preserve it, for example through locally produced dictionaries (e.g.

Mefnoue & Abdessalam 2011). The Mozabites are known to be from the *Iznaten* (Zenete or Zenata) Berber ethnic group. Mozabite women invariably wear a white woollen *hā'ik* completely covering their bodies with the exception of one eye. Men wear either the white *gandoura* gown or baggy trousers with a low crotch and a shirt, as well as a white skullcap. This dress varies little (although elders complain that the youth are increasingly refusing to comply with dress norms), creating an impressive sight when Mozabites gather outside the mosque for the regular five prayers, most of which are followed without fail by individuals over 12 years old.



Figure 4.3 The *qsar* of Beni Isguen. (23/09/13)

The qsar of Beni Isguen

Within the town of Beni Isguen, my primary site of research, reside about 7,000 Mozabites (see Figure 4.3). The town sits on a hill with the watch tower of Sheikh

Belhadj, named Boulila, uppermost. Next is the central mosque, around which the core living space exists in concentric circles. Originally these were arranged with extended family groups, with the *‘azzāba* living closest to the mosque (Cataldi et al. 1996). Further out can be found the shops and market place known as Lalla Achou (figure 4.5). The *qsar* (fortified settlement) can be entered via the two principal doors, *Bab Echergui* (lit. Arab. ‘Eastern-facing door’) in the southeast, and *Bab Elgharbi* (lit. Arab. ‘western-facing door’) in the northeast. A large wall surrounds the town. One other large mosque exists near the *Bab Elgharbi* to accommodate outlying inhabitants. The walls have been expanded two times, to accommodate the growing population over time. Outside the latter mosque lies the main cemetery, made according to austere but visually attractive lines, with multiple arches made with date palm branches and white limestone.



Figure 4.4 Inside the outer wall of the Beni Isguen. (19/12/12)

In fact, the majority of the buildings in the old *qsūr* are built according to simple, traditional materials and dimensions, its soft lines and human scale creating a harmonious environment. For this reason, the M'zab valley was designated a World Heritage Site in 1982 (UNESCO 2015). The winding streets are very tall and narrow to maximise shade in the desert heat. Islamic principles of privacy are built into the architecture at all times, with entrances involving an elbow-shaped bend so as to protect the inside from sight, and entrances never facing each other. Similarly, windows are small and never exist at the ground level. There are even specially built viewing holes from the first floor from where women can observe visitors but not be observed themselves (this is common in the Islamic world). Very little in terms of furniture can be found within buildings, although niches are built into walls for storage. An ingenious window built into the roof allows light to penetrate all floors without the need for windows in the walls, while allowing air to flow in around the building (Bouchair 2004). Beni Isguen is a minor trading hub, where commodities from China and Germany alike can be found in the shops on the main road linking Beni Isguen and Ghardaia.



Figure 4.5 The central market place where the customary auction takes place in the morning, as well as conventional market stalls selling produce from the oasis farmers. (03/02/13)

According to Sheikh Tfyish, Beni Isguen was created as a merger of five villages in 1321: “Buliou on the left bank of the N’Tissa wadi; Tirisin, on the right bank of the wadi; Murqui, on the Djebel which now bears the same name, opposite Bounoura; Ajennounai, after the dam; and Tafielt, above the present town” (Pavard 1975: 12). This resulted in the consolidated *qsar* that can be seen today. Beni Isguen is known locally to be the most conservative of all the Mozabite towns, retaining many customs and practices such as dress and religious observations. Subsequently it was looked to by the others *qsūr* as a source of heritage, such as in the reformulation of Ibadite legal codes. Indeed, some claim that the M’zab as a whole serves as a repository of values for Algerian society as a whole (Hadj-Nacer 2011: 6).

The oasis



Figure 4.6 The author inside the oasis. (14/02/13)

The adjoining oasis of Beni Isguen is approximately 200 hectares, containing around 26,000 date palms, with approximately 1000 individual plots. It is divided into 16 *cartiers* (see figure 4.7). A growing number of these plots contain houses due to the spilling over of urban growth into the agricultural area, although some plots do not. Plots may increase or diminish in size according to division with inheritance over generations, or with accumulation and fusion of several plots by those who can afford it, although this is rarer. Plots are usually around half a hectare in size, and are comprised of date palms (on average about 5 varieties, mostly *bint aqbela*, *ghars*, *dela*, *temjouhert* and *deglet nour*, and often two or three less common varieties) as the general over-story for shade, grape vines which are also commonly shaped for shade, orange trees, figs, lemons are common. Ground crops are generally herbs

such as mint for brewing in tea, rosemary for cooking, and flowers such as bougainvillea and roses. A small plot with a small house can cost today upwards of €20,000. Farms tend to be 2-5 hectares in size and crops vary depending on farming strategy, preference, and how long the farmer has been working the land and how intensively. These plots are awarded through government concessions if the land has been well managed after five years. Again, date and other fruit trees are usual, and intercropping of these trees is common to prevent heat stress with the palms, and also wind stress for weaker trees such as oranges. Olive trees are becoming more common and several commercial olive presses have been initiated locally. Also common is alfalfa, grown for livestock, usually cows and goats. Farms often have ground crops, usually under polytunnels for faster growing times. These include tomatoes, chilies, courgettes, aubergine, peppers and so on. All gardens and farms contain a water basin to provide the necessary water pressure to push water through irrigation ditches, which are usually made by digging in the sand with a hoe. Most farms have personal, shallow wells, in addition to having access to government drilled, deep wells which must be paid for.

The day of a farmer or tree climber begins early, with pre-dawn prayers, and then travel to their land via bicycle, foot or car. Invariably, their migrant workers will be waiting for them at the land outside the gate, or inside if they slept on the land. during harvest time, for example, the climber will select a tree and then climb up to the crown without a harness, whispering *bismillah* (in the name of God) while the workers (including myself) would spread sheets¹⁵ to catch the falling dates. Before embarking on the first climb, the climber shouts out loudly, “oh neighbours, know that I’m going to climb the palm tree” three times, so as not to surprise any

¹⁵ Some of these sheets came from the material of the women’s white woollen *hā’ik*, an example, as related to me of one of the ways women participate indirectly in the oasis.

uncovered women in the local area, for from the top of the tree the climber can see quite far into many neighbouring plots. He then prunes any dead branches with the aid of a simple rope harness and after leaves the harness again and climbs into the crown, attempting to avoid the spines, and begins to cut the first date cluster. On dropping the cluster to the ground, he shouts *sulley ani bi*, and the workers below yell back *sula alahu alihi waslem* (praise be to God and the prophet Mohammed). The workers gather the branches and date clusters into baskets and then move on to the next tree. The basin tap is often left on for a few hours to irrigate the garden meanwhile. A mid-morning break usually consists of milk and dates, and mint tea brewed on palm leaves. The work day can continue to either the lunchtime or mid-afternoon prayers, depending on the seasonal heat, after which a bath and siesta take place. The evening is usually a more relaxed period, during which the climber may come alone to water gardens, or harvest some ground crops for the markets. The day maybe punctuated by visits with owners and friends, who discuss plans, politics, recent events and so on. They may discuss what is going wrong with a certain tree and what to do about it, or to complain about neighbours.

Agriculture declined in Beni Isguen after the abolition of slavery, as individuals mainly preferred to trade, and only a handful of farmers persisted (although agriculture carried on in other *qsūr* such as Ghardaia and Bounoura). The oasis became mainly a place of relaxation for families, as a cool retreat from busy life in the crowded town or elsewhere. (One Mozabite man informed me that the oasis garden is where Mozabites congregate in small groups, unlike Arabs who gather in cafes.) An adjoining agricultural area was developed in 1988 after the government granted free land concessions, and agriculture has seen something of a renaissance, as rich and poor alike attempted cultivation, with varying degrees of involvement

according to wealth. Even those who receive little in return in terms of produce clearly benefitted otherwise in symbolic capital, in terms of companionship and status from owning land and palms.



Figure 4.7 Map of Beni Isguen oasis and *cartiers*. These are: 1) Inghid, 2) Bouchemjen, 3) Bahmed ou Musa, 4) Ujujen, 5) Bahmed Kesi, 6) Teriyaki, 7) Tirichine, 8) Aamoud, 9) Tlet, 10) Marghoub, 11) Besel, 12) 'Absha, 13) Tikabline, 14) Tejbeselit, 15) Zaliga, 16) Ntissa. Source: Google Earth (12/02/15)

The Ronarts give a sense of agricultural life in the oasis during in the mid-twentieth century:

In centuries of hard work they created palm groves of nearly 300,000 palm trees irrigated by a dense network of channels under the monotonous grating sound of the pulley and cords, the “song of wadi Mزاب,” which, kept in ceaseless motion by donkeys and camels, take up in leather buckets the water of some 3,000 wells over 200 feet deep. These plantations requiring an enormous investment of work and energy are not to be regarded, however, from the point of view of economic returns; in fact their maintenance is made possible only by the gains of the Mozabite merchants established in the towns all over Algeria. [in Bennoune 1986: 108]



Figure 4.8 Plumbers repairing an immersion pump in an artisanal well. (29/10/13)

Today, these wells are no longer drawn by animal, but by immersion pump¹⁶ (figure 4.8), which arrived in the M'zab in 1941 with the introduction of electricity and other infrastructure by the French administration. Thus the “song of wadi Mzab” is no longer heard. Wells were the crucial *a priori* innovation in the M'zab necessary for sustained inhabitation. Some of these wells in the *oued* (North African form of Arab. *wadi*, ‘river bed’) were about 20 m deep, yet on the rocky hilltops where the dwellings were placed wells could be 45 m deep. These, my informants asserted, were done by the institution of *twiza*, communal work, over perhaps decades. Whatever the likelihood of this claim, it is also likely, yet impossible to

¹⁶ Although the grooves worn by ropes into the hard marble, made by constant pulling over decades, even centuries, can still be seen by the wells.

corroborate, that slaves were used for this exceedingly hard, brutal work, as in the creation of other Maghrebian oases (Scheele 2012: 110). We do know that Mozabites were active in the African slave trade not only as financiers (Savage 1992), but as consumers, although only among the wealthy, according to my interlocutors. The *oued* flooded only irregularly, thus the wells were essential, as Saharan agriculture requires almost constant watering especially in the summer, due to the intense heat and porosity of the sandy soils. When the *oued* did flood it provided three services: recharging the groundwater aquifers; bringing silt and thus vital nutrients for agriculture; flushing away the dangerous (to plants) salt built up in the soils from evaporation (and also killing plant diseases according to one old farmer). Each well was named, and corporately owned by the immediately surrounding landowners.

Over time, an elaborate irrigation system (described in more detail in chapter five) was raised to capitalise on the flash floods, needing only minimal interventions by the *l'oumna* or water officials (the politics of managing communal resources is investigated in chapter eight). This differs from the equally elaborate social systems needed to govern water allotment times according to need (or political clout) prevalent in other oases that have constantly running water (e.g. Price 1995; Price & Brewer 1996). When the first floodwaters were spotted by guards in the watch tower in the form of dark clouds, messages would be sent and gates in water channels closed so as to direct the first water into the aquifer. Once this was full, water would be re-channelled into the gardens. Each garden was surrounded by a wall, with an opening on one side to receive water, and another to release it, thus all gardens were connected like porous cells, or nodes on a circuit board. Large dams such as Sidi Ahbess in Beni Isguen were constructed to help channel this

water, but also to gather precious silt, to be added to scarce manure in feeding the agricultural soil. Today, a small industry still exists that transports this silt in open back trucks from the dam to gardens and farms. Also, several families in Beni Isguen oasis own goats, profitable not only for their milk, but for their manure. Some, primarily in the new agricultural concessions, also use chemical fertiliser.

Production was organised mostly by small-scale farmers working on their own small plots or on the land of wealthy landowners in a feudal-type system of sharecropping, or *khammēs*. The self-enforced isolation of the Ibadites was not to last; even with the ingenious creation of soils over time and a slow rate of population growth, the valley could not sustain the population indefinitely. This raises the question of self-sufficiency of oases. Battesti (2005) broadly classifies two types of oasis: one which is largely self-sufficient, being found on the edge of large water bodies such as the Nile, Euphrates and Tigris, or more commonly, as dependent on wider trade, whether inter- or trans-Saharan in nature. According to the classical hypothesis, these oasis settlements emerged as stopovers for the cross-desert caravans, beginning in 500 A.D., linking important water sites (Toutain et al. 1990: 8). Scheele (2012: 51) argues, however, drawing on Pascon, that virtually no oases were ever self-sufficient due to the enormous input and limited, unstable outputs of Saharan agriculture. “Oases... only exist within networks of relations” as Retaillé puts it (1986 in Scheele 2012: 51). The inputs were for the maintenance of complex irrigation systems, such as the *fogarra* with miles of underground channels that begin to silt up as soon as they have been constructed. Battesti (2005: 14) also maintains that many western and central Saharan oases can be understood only in relation to caravan traffic between the eighth and fourteenth centuries when the easier path along the Nile was blocked by Christian kingdoms during the lucrative

slave trade. Marouf (1980) however, criticises the idea that oases were merely storehouses for nomadic merchants, and I myself have witnessed relatively successful, self-sufficient oases in the Tafilalet region of Morocco, where local communities organise themselves to maintain water canals, and entire villages describe themselves as full-time farmers¹⁷.

Indeed, many sources agree that until recently the entire Mozabite community migrated from the hot crowded towns during the stifflingly hot summers, to the relative coolness of the *ghāba* (lit. Arab: forest, meaning oasis), provided by the beneficent palm trees. Today, families still sleep on the rooftops during hot seasons, and spend time in the cellars during the day, primarily the women and children as the men are invariably working in the fields or in their shops during the day, or worshipping in the mosque, coming back to eat or sleep at siesta time or night. Many now migrate north for the summer to cooler climes, or utilise modern air conditioners, while rising land prices in the oasis further preclude second home ownership.

4.4 Mozabite community

Much has been written about the external or abstract forms of Mozabite society, architecture and such, but little has been written on the substantive details of everyday life. One Mozabite confirmed to me this secrecy from outsiders, “we are

¹⁷ In the Ziz Valley, Morocco, different ethnicities and status groups either associated or differentiated from a farming identity. According to local legend, Arabs were said to have maintained the practice of date palm horticulture from its spread from Arabia. High status *Shurfa* (descendants of the prophet) Arabs had little to do with farming. Berbers preferred to do only minimal agriculture, for it was associated with low status. Haratin (former black slaves) were also associated with farming, and were previously related to nomadic Berbers through a patron-client relationship. Profession of 100% farming did not mean that they had no household members remitting wages from afar, but I noted many young people working in the oasis who were proud of their livelihood.

happy to give information on general principles, but not on more intimate details.” Indeed, even Masqueray (1878: 3) conceded the difficulty of doing ethnographic research among Mozabites, claiming that they are “the most secretive people in the world”¹⁸. Mozabite family life is a highly private affair not only from ethnographers and other outsiders but also from other Mozabites, as Mozabite men only have access to their own family networks, as the viewing of non-kin females is strictly forbidden. Indeed, Mozabite females—who arguably have more freedom than other North African women as they must manage affairs while their husbands are away trading in the Tell regions—have greater access to the insides of each other’s households through networks of friends as well as family. Women also have their own *‘azzāba* and *‘ashīra* or clan meetings, as discussed below.

Can we call Mozabites a ‘community’? Most scholars use referents such as shared language, common faith and geographical location to help define them as such (e.g. Bourdieu 1962: 44), although probably as they are spread across several towns they are referred to as a confederation. This also likely includes the fact that there are factions and schisms within the confederation itself, and perhaps refers to (not unproblematically) the idea of segmentary organisation. Mozabites themselves do self-identify as a religious community, and much religious thinking is spent on issues of sociality and codes of behaviour regarding Ibadites and non-Ibadites. In terms of political structures, however, the smallest unit is the household. This may cover several families under a patriarch. This unit may be eroding somewhat, as discussed at length in chapter seven. From this, households are organised according to *‘asha’ir* (sing. *‘ashīra*), similar to the concept of ‘clan’, from the Arabic for ten, *‘ashra*. Oussedik (2012: 97) explains that these constitute “the traditionally

¹⁸ Masqueray’s work was clearly made harder due to Mozabite resistance during the French colonial period.

dominant form of social organisation in the Mzab”, and the “building block of Mzabi society”. These are usually made up of more than ten families, represented by ten male heads, collectively named after a common ancestor. Furthermore, “every Mzabi belongs to an *‘ashīra* by birth, and remains a member of it for life, unless he leaves the town where he was born and settles in another city in the Mzab. In this case, he must be integrated into another *‘ashīra*. The *‘ashīra* is therefore a local group” (Földessy 1994: 79, in Oussedik 2012: 97). Thus individuals are connected to an *‘ashīra* by real or fictional descent. Oussedik again:

a woman belongs to the *‘ashīra* of her father for life; her children will belong to that of her husband. As a unit of social organisation, the *‘ashīra* combines forms of descent and locality to assign a place to every inhabitant of the Mzabi *cite*, with incomers absorbed through fictive kinship. [*Ibid.*]

The *‘ashīra* are responsible for assisting the common interest of the group, such as marriages, funerals, redistribution of funds and housing for the poor. Redistribution may be done through the *‘ashīra* council, or directly by wealthy families to poorer ones. This takes place in a building designated for this purpose known as *tadert an ta’chirt* (Tumzabt), about once per year. The new building belonging to the At Khaled *‘ashīra*, for example, can hold 500 individuals, and 30 families may be present at any meeting, with each man bringing his eldest son. Other *‘ashīra* or associations may be permitted to use the space at different times. The women also have their own separate *‘ashīra* meetings. Each *‘ashīra* is named and has its own section in the cemetery. Individuals are buried in the husband’s *‘ashīra* site, as inheritance is patrilineal. Conflict between *‘asha’ir* does exist, as described later. Beyond this, several *‘asha’ir* are grouped into *‘arūsh* (sing. *‘arsh*) or tribes. For example, in Beni Isguen are three *‘arūsh*, made up of varying number of *‘ashīra* as shown in fig. 4.9:

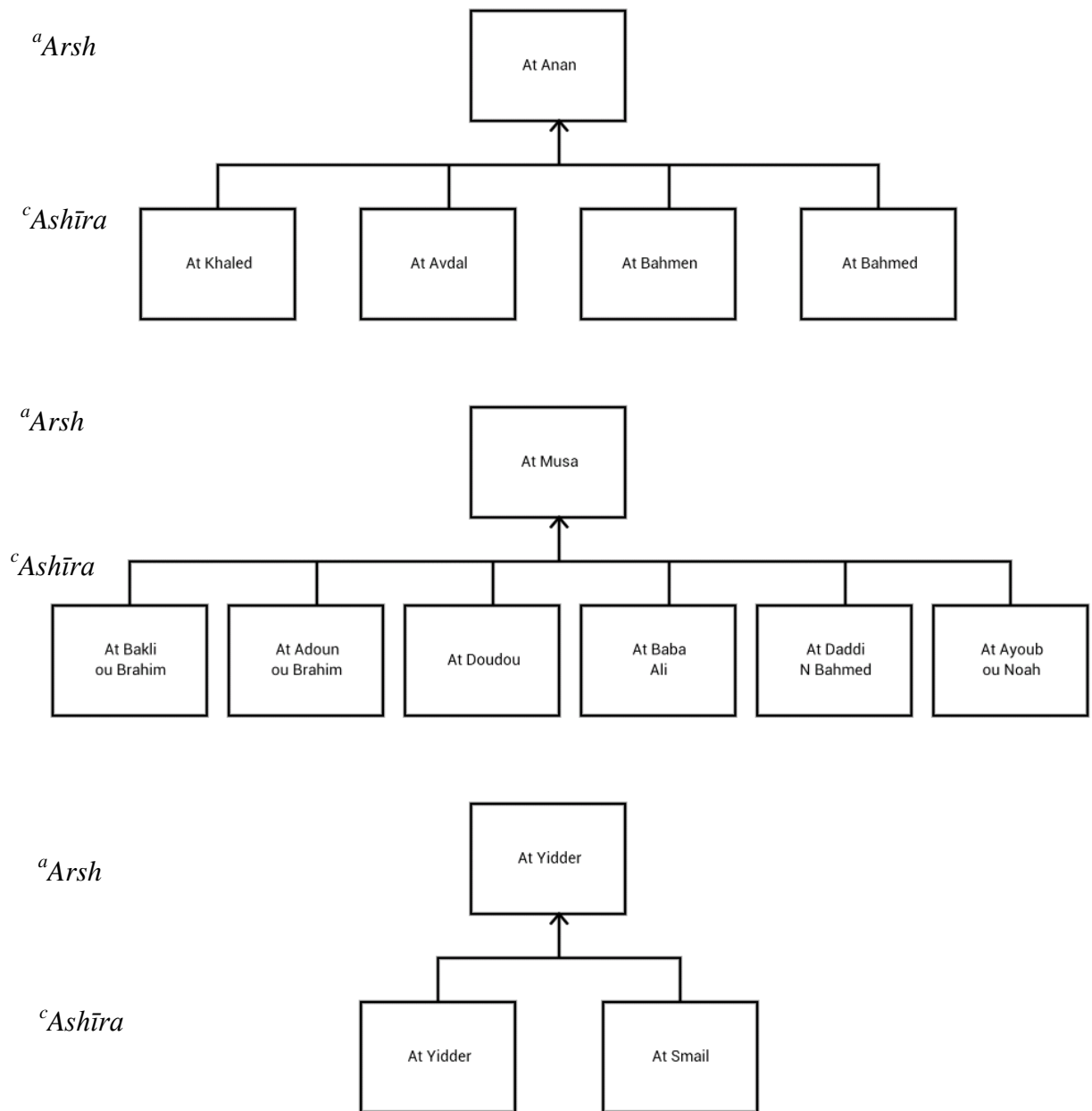


Figure 4.9 Mozabite family 'lineages' within the *ashīra* and *arsh* in Beni Isguen.

The *arsh* as vestiges of tribal units rarely meet, instead, from each *ashīra*, certain wealthy, powerful male heads make up the *majlis ayyen*, the council of notables. These deal essentially with administrative issues at the level of the town, and they

form a link in the chain of national governance between local and regional municipal councils. Above them is the *halqa ʿazzāba* (today only in moral terms), the circle of saints, the clerisy who previously held disciplinary power, who today retain moral authority over the community of believers. These are generally made up of twelve elected *tolba*, or religious scholars, including the sheikh, imām, the prayer caller, religious teacher, etc. They are said to be removed from the material world and devoted only to the holy. They are responsible for washing the dead, the final rites. Punishment for infractions used to be meted out in the form of *tebria*, temporary social ostracism or excommunication. Today this happens rarely, mostly for marriage infractions such as giving more gold in the dowry than the specified amount (50g, reduced recently to 30g on petition of poorer individuals), or for wedding celebration including illicit musical performances (supplied invariably by black Mozabites who retain this differentiating aspect of their historical practice). At rare moments, the *ʿazzāba* from each *qsar* join to form an overall council of the Mozabite clerisy, named *majlis Ammi Said*. Thus, the political organisation may be described as a theocracy, even if the power of the *ʿazzāba* is waning. I will now explain these organisations in more detail.

Political organisation

The kinship, clan and tribal units do perhaps confirm rudimentarily to a segmentary form of organisation. Briefly, anthropologists since Durkheim (1984 [1883]) and Evans-Pritchard (1940) (although Gellner (1985) pushes this genealogy back, interestingly enough to Masqueray, based on, among other Algerian ethnic groups, the Mozabites) have used this principle to describe stateless political organisation. Simply put, it describes patterns of allegiance building in

times of conflict or dispute (Eickelman 2001: 117). Roberts (2014) provides the following description of segmentation as:

The self-regulating interaction of the kinship groups of which they are composed at every level of social organisation. Each tribe is segmented into a number of clans, each clan into a number of lineages and each lineage into a number of households or tents, and at each level... order is maintained by the 'balancing and opposition' of the various segments, the theory presupposing that the segments are of roughly equal size and strength. [Roberts 2014: 16]

Segmentation differs from segmentary lineage theory, in that segmentation defines the possible forms of organisation, according to cultural values of honour and loyalty, whereas the latter, as used by Gellner (1969) refers to a more unproblematically observed balancing of political forces (see Hammoudi 1980; for refutations of segmentary lineage theory see Roberts 2002; Munson 1989; Munson Jr 1991; Munson Jr 1993). During my time in the M'zab I did hear of conflicts between factions, but I did not witness them. I experienced social gatherings, formal and informal according to lineage groupings, however, such as in working together in the oasis, or large *‘ashīra* meetings. Meetings and organisation also took place that went beyond segmentary tribal lines, however. First, it was described to me that religion created a brotherhood that went beyond kinship groupings. Further, association meetings took place, such as neighbourhood associations formed to take care of issues such as roads, drainage etc. These newer institutions bumped up against the remit of the existing traditional institutions, such as the *‘ashīra* (the subject of chapter eight, which tackles old and new political organisation). Conversely, the Other tended to provoke manifestations of group identity: the *Sh'amba* Arabs further down the street provoked notions of Mozabite identity, whereas Algeria entering the football world cup engendered feelings of affinity with all Algerians, Arab or not, and further issues such as the Israel-

Palestine conflict for example, promoted notions of kinship with all Muslims. Each of these examples involves a sense of opposition in the formation of affiliation, and so broadly agrees with ideas of segmentation beyond kin lines to those of wider identity.

Ibadite doctrine

Religious doctrine is imparted to Mozabites from an early age via the *madrasa* (religious school), during daily sermons, and even broadcast from speakers through the town after the *maghreb* or sunset period. Mozabite principles are based largely on the conservative notions of Ibadite dogma, derived from two fundamental tenets: that all actions are either right or wrong, according to the law of the Qu'ran. Only two instances may be arbitrated, namely, conflict between man and wife, and the case of killing game while on pilgrimage, where compensation must be paid. Second is a fundamental belief that all Muslims are equal (as detailed above), and that the caliphate should be elected, not dynastic (Alport 1954). The main principles are as follows:

- 1) That the law is laid down once and for all time in the Qu'ran, that therefore it is essential not only to know the Qu'ran, but to understand it; also that prayers must not merely be repeated but understood.
- 2) That there is only one way of being righteous, any other ways being sinful and leading to certain damnation.
- 3) That sin can never be expiated or forgiven; and that punishment by the law can only have secular and not spiritual or redeeming effect.
- 4) That Works are as important as Faith; that sinners are damned whether they are true believers or not; and that a man's conduct in this world determines precisely his position in the next.
- 5) And, finally, that since all Muslims are equal, luxurious living and ostentation by some is sinful; that no man can command who is not expressly elected to do so; that a man should live soberly and modestly, shunning all stimulants and intoxicants including music and dancing; and that he should practise charity and strict honesty in his personal and business dealings.

These tenets reveal that, beyond a literal interpretation of sin the Qu'ran, Work, or deeds are as important as knowledge and belief. Indeed, individuals are judged on their actions as being hard working and righteous, or lazy and thus sinful. The very idea of idleness is anathema to Mozabite values of personhood, as someone useful to God and the community, conceptualised as *al amena* (faithful, loyal). Bennoune (1986) clarifies the position of religious interpretation, however, stating that:

since the Qu'ran is the word of God created by Him, and the Sunna is the political tradition of the Prophet and his close companions, Abu Bakr and Omar, the Qu'ran and the Sunna are the basic frame of reference of the laws and rules governing al-Umma al-Islamiya; this fact requires the thorough study of the Holy book, the Hadith, and the numerous Ibadite *Itifaqat* (platforms or constitutions). [1986: 105]

Such interpretation and arbitration does exist, therefore and forms the basis of *'urf* (customary law) from which disputes are resolved. Resolution follows certain procedures through informal and formal social institutions, as I explain in chapter seven. These resolution processes are key to understanding rules centred on oasis resource use, such as land tenure law, conflict resolution and individual rights such as those forbidding a building from overlooking another. The latter case involves material and moral considerations, for overly tall buildings would rob neighbours' homes of sunlight/shade, and also the family's privacy would be compromised. Indeed, many Mozabite rules and norms have a strong moral component.

Sense of duty

I wish to convey a sense of how strongly lived life was dictated by temporal and other obligatory structures, as the emphasis on work and right action above indicates. The difference in the ways that we respectively conducted our lives was evident from the first time that I entered discussion with my friends at the English discussion group. Education had become increasingly valuable to them over the

past couple of generations, and they enquired as to my own path. I replied that I hadn't entered higher education until the age of twenty-four, upon finding my passion, as it were, in terms of vocation and personal direction regarding further schooling. Several replied that they wished they were able to take such time to choose their vocation, that education was seen more *as a duty*, than a calling. There was a pressure on them by their families, especially by their fathers, to perform well in their studies. Some later related to me that they wished that reward should be based on effort, not results.

Mozabite daily life appeared initially to me to consist of endless duties. To begin with, the majority (over 12 years old) rose before dawn for the *fajr* prayers at the mosque (the women also prayed at the mosque but at different times). After this, breakfast would be taken with the family, and then the men would depart early for work, the women presumably would cook, wash and take care of the children. Some women would shop at the market. In fact, despite the appearance of extreme subjugation (primarily due to their personal invisibility), women were visible in terms of their presence, in their all-covering white *hā'ik*, leaving one eye revealed. Furthermore, they could be seen travelling back and forth unaccompanied by men alone or in small groups. This differed from many other Saharan communities, where women are rarely seen at all. I believe that the relatively high autonomy of women in the M'zab is due to the historic absence of men, without whom the women had to run households alone.

At one p.m., some of the men would go home and prepare for the *duhur* prayer, especially if it was hot, and then eat and sleep until the mid-afternoon *‘asr* prayer. Many would go back to work for the later afternoon until the sunset, *maghreb*

prayer. Along with the pre-dawn prayer, this was possibly the most important, and one's absence at the mosque would be noted, putting one's virtue in question. This time also served a social purpose, as men would often congregate outside in the cooler weather, a flock of white robes and skullcaps, standing or on the earthen benches, until the final *isha'a* night prayer. These regular prayer times punctuated Mozabite life from the time of puberty until the grave. I reflected on what it must be like to live with such repetitive obligations, but on asking my questioning, my informants replied that they felt a real sense of peace during this communal worship. It was cited to me more than once the Qu'ranic verse stating "the greater the number of steps to the prayer congregation, the greater the virtue in the hereafter". Indeed, Mozabites were known to leave large conferences *en masse* in order to pray at the correct times, frustrating foreign organisers.

Individuals were under normative pressure to attend institutional meetings, whether attendance at the *ashīra* gatherings, or the regular neighbour association meetings, and could even be fined for non-attendance. Mozabites of the diaspora were expected to send monies home, and the children were schooled on the importance of duty and faithfulness to the family (*al amena*). Even the diaspora were expected to return for Friday holidays, and for burials, especially for notable persons such as the imāms. Indeed, I witnessed such an occasion, where approximately 3,000 Mozabites congregated *en masse* for the funeral of the grand imām in Beni Isguen. The *azzāba* even went so far as to extend the Islamic convention of burial the day after death, postponing the funeral for three days until Mozabites from Europe and beyond could attend the important event.

As well as religion, farmers had another master: the seasons. One palm specialist complained to me that they couldn't simply do a set amount of work or go on holiday when they wanted, and at harvest time I observed the palm climbers to be extremely anxious, for the window could shrink if the winds became strong, drying out the dates and making their customers angry. These two oscillating rhythms dictated the lives of farmers (for prayer times also followed natural cycles of the sun, and religious festivals are governed by moon cycles), making their lives not their own. Many preferred for God and nature to be their master rather than a boss at the factory however, boasting the independence of being self-employed.

4.5 Colonial encounters: ethnographers try to penetrate the M'zab

After the attempts of two others, Masqueray (1878; 1886; 1995) claims to be the first ethnographer allowed to study among the Mozabites. He was allowed access to local historical records, later copying it surreptitiously. He primarily focused on the document to theorise social ordering practices, and he describes conflict and resolution among opposing towns and factions. Gellner (1985) describes him as the primogenitor of pre-segmentary theorists. Roberts (2002), however, refutes this, stating that while assuming to build on earlier French ethnologists, including Hanoteau & Letourneaux, Gellner (1969: 41-42; 1985: 143; 1996: 649-51, cited in Roberts 2002) denies the importance of Berber governance institutions such as the *djem'aa*, instead proclaiming a synchronic model which does not hold up to the evidence. Furthermore, Durkheim's original footnote claims Masqueray's work to be the inspiration for his mechanical solidarity theory in his *Division of labour*, yet Durkheim does not describe precisely how the latter contributed to the former's theory (*Ibid.*). Importantly, Masqueray also described Mozabite legal norms. There is little in the way of direct observations in his writings which instead depend

largely on archival documents. These documents may still exist in the libraries of Sheikh Tfyesh and the White Fathers in Ghardaia. Masqueray is an important source for understanding previous forms of governance, even if he wasn't clear about certain aspects such as the *sfuf*, political parties (Roberts 2014: 138).

Amat (1888), a colonial French medical doctor, provides a more substantial body of work on late nineteenth century M'zab. His monograph sheds light on how information was gathered for colonial rule, from local history, economy, even highly dubious anthropometric measurements, as well as topography, botany and zoology. He describes doctrine at the time, for example, that worldly luxury was forbidden and condemned. Adultery, music, dancing, tobacco and alcohol are all banned; only a "healthy soul" is allowed to worship and pray to Allah. Women must be veiled. Importantly for this study, the 'doctrine of secrecy' or dissociation is described as follows: if one must obey the laws of the unbeliever, one must not make friends with them. "In his impenetrable heart will remain etched his belief and his disdain for the wicked of the world, its books, its laws and customs." This practice influences how Mozabites interact today with non-Mozabites, and I utilise this notion of dissociation in my theory of social and political change in the M'zab (see chapter nine).

According to Amat, following the abolition of slavery when slaves were released and told they had to look for work to live, they went back to their former masters. Rules about how slaves are to be treated are prescribed in the Qu'ran, including marriage. Slaves spent most of the time watering the oasis gardens, or labouring on earthworks or drilling wells. Amat believed that after annexation, Mozabite society would disintegrate due to the loss of free labour. Despite the colonial legacy,

Amat's work remains the most comprehensive view of Mozabite life and institutions, including details of the workings of the *'azzāba* whilst it was still at the height of its power, and informed my analysis of political change. Amat's own prediction of Mozabite social change or degradation was not fulfilled; the end of slavery did not bring about the end of oasis livelihoods, although I argue later (chapter nine) that while Beni Isguen saw a lull in agricultural activity, people were able to adapt by either changing livelihood or using the system of *twiza* for productive labour.

In 1954, Alport was the first British anthropologist to write about the M'zab (producing only a short article and not a more extensive ethnographic work). Alport informs us of the geographic origins of the three *'arsh* of Beni Isguen: one is from Sedrata; one is made up of *'asha'ir* from the Atlas; and the third, At Anan, is a later group of immigrants grouped together under the same name (see figure 4.8).

Like most scholars of the M'zab, Alport considers how this society may be able to safeguard its traditional way of life under the onslaught of "Western civilization". He states: "If it is true to say that tribal and traditional societies succumb to Western influence principally through poverty, ignorance, and inferior organization, it follows that the Beni M'zab are protected by their wealth, education, and privileged urban government" (*Ibid.*: 42-43). He finally asserts that Mozabites are used to capitalist markets and 'Western' ways, that it is their Calvinist-style outlook that prevents them from accumulating wealth in order to gain individual advantage, that their ascetic sensibilities instead guide them to employ such wealth in the wider sustenance of the community. I concur with Alport regarding the successful generation of Mozabite wealth, however, my

research suggests that although redistributive factors are still present (such as *hābūs*, a form of instituted charity), today they are in decline.

Bourdieu on the M'zab

In 1958, Pierre Bourdieu wrote *Sociology d'Algerie* (translated to English in 1962), devoting a section to the Mozabites. Bourdieu was mainly concerned, however, with how the Mozabite diaspora, who mostly remain in the North, maintain their cohesiveness and their traditional values without being acculturated by the wider Algerian society. And further, how capitalist practices can be reconciled with devout practices based on pious asceticism? Bourdieu finds the answer to the first question in the above mentioned *ittifaqāt*, religious law from which jurisprudence finds its principles. He describes how the Mozabite cities are symbolically arranged, so as to keep out profane influences, such as having the marketplace on the outside, away from the sacred centre consisting of the mosque and family homes. When individuals return from trading in the Tell, they must undergo a cleansing ritual upon returning to the valley (for an expansion on this symbolism see Benessaiah & Calis Forthcoming). He describes for the first time the flexibility of customary law, for dealing with conflict and moral issues “the basis for one of the most astonishing of social successes, and the key to this miracle of combining a completely successful adaptation to modern innovations with a total fidelity to an extremely strict tradition” (Bourdieu 1962: 44). Indeed, Bourdieu postulates that the key to their success lies in a capacity for modifying or adapting in certain ways, while knowing how to maintain their most important values, although unfortunately he provides no evidence for this statement.

Bourdieu further argues that Mozabite principles paradoxically prepared them for “the world of the competitive, capitalistic economic system” (*Ibid:* 48). Similar to Protestantism, as argued by Weber, work is a sacred activity, and idleness much frowned upon. Luxury is condemned, and persons are respected for their moral qualities, the devout Mozabite must conduct himself as a “living rule” (*Ibid:* 47). Furthermore, as Mozabite customary law contains rules not only on serious infractions but on personal consumption, Bourdieu argues that these qualities predispose Mozabites toward the accumulation of capital as an end in itself, as wealth is not to be enjoyed, and therefore must be reinvested (*Ibid:* 47-48). Moreover, traditions encouraging solidarity encourage family corporate businesses, allowing Mozabites to sell at competitive prices due to low overheads. Information networks are prominent, and newcomers are offered loans to help them start their own businesses. While Bourdieu provides insightful speculation as to the nature of how Mozabites are able to deal with change, my own research shows how 50 years on, change is occurring at an unforeseen pace. While Mozabites were previously able to separate sacred and profane tasks through manipulation of the built environment, today the *‘azzāba* has been unable to stem the global flows of information infiltrating beyond the walls into the intimate spaces of Mozabite homes through computer and television screens. Along with the integration into the postcolonial nation-state, this factor has caused Mozabites to compare themselves to the global *other*, and within the private sphere, such a lack of visibility (chapter five) is hard to control by customary means.

Recent ethnographic works

Following Goichon’s initial (1927) description of intimate family life, Amina Farrag (1971) provides further illumination into women’s lives in the M’zab. Her key work

describes the internal workings of Mozabite ordering practices, which conforms with my own analysis. She gives an alternative view of Mozabite cohesion, revealing the mechanisms of social order, particularly among women and how these are avoided. She states that women were once considered the safeguard of tradition, and therefore were banned from leaving the valley, but due to the wider integration of the M'zab into Algerian society, women were now becoming 'modernised' on the insistence of men, included in schooling and allowed to leave the valley. However, this change was not responded to equally by all women, and thus such values were no longer equally shared. Farrag goes on to describe how the *'azzābat*, the female counterpart of the male *'azzāba*, punished infractions of law by means of excommunication. After French annexation and later independence, both religious groups lost much power, retaining only moral authority. She states that even though perhaps half of Beni Isguen males are under *tebria*, the younger generations tend to ignore it.

The *'azzābat* still has a more powerful hold on the women than its counterpart does on the men. Importantly, there is a "mutual interdependence between the formal mechanism of control vested in the *'azzābat* and the informal mechanisms of control such as the power of the mother-in-law, and other controlling factors such as gossip, and public opinion" (Farrag 1971: 319). In fact, the mother-in-law appears to be the key actor in surveillance of younger women, providing information about inappropriate behaviour to the *'azzābat*. Farrag explains that this control is being circumvented due to a social differentiation in status based on wealth, despite a stress on egalitarianism and austerity. She divides status into two groups: higher status being ascribed to the wealthy such as doctors, large landowners and those with multiple shops, whereas lower status is ascribed to unskilled or semi-skilled

labourers, teachers, and those with a single shop (these groups were classified according to accounts from local individuals). The worst kind of infraction is sexual misconduct, as all rules around women are guided toward the maintenance of the household, and all women regardless of status are put into *tebria* for this. Ambiguous categories include women going to the (male) doctor, or sending girls to the school. For these, the *‘azzābat* places women in *tebria*, yet the wealthier women simply ignore it. Either the practices of wealthier women are not revealed as they, through the husband, can afford to live separately, away from the mother-in-law, or they ignore the call for *tebria* and associate with circles of other wealthy women who also ignore the call. Farrag asked women who ignored the *tebria* if they were afraid of going to hell for not repenting (done in front of the *‘azzābat* toward the end of the *tebria*, prior to reintegration into the community), they replied that “God was aware that times were changing and that they were not committing serious offences anyway” (*Ibid*: 324). Thus, of primary importance was the visibility of younger women, which was more apparent among poorer families with more of the extended family living beneath one roof, under the gaze of the mother-in-law.

Many scholars of the M’zab have continued to stress the religious factor in providing cohesion of the Mozabite confederation. Bennoune (1986) contests this, providing a convincing (Marxist inspired) alternative to this functionalist interpretation. Essentially, Bennoune contests what he calls a synchronic cultural ecology explanation, whereby Mozabite cultural institutions and practices arose as adaptations to their social and physical environment. Instead he argues for a historically contingent explanation for Mozabite social forms, based on “inter-societal conflict and struggle” (Bennoune 1986: 98). He gives a detailed historical description and analysis, citing the egalitarian basis of Ibadism, and the subsequent

formation of class differences, based on the need for, and the success of trade by Mozabites from the time of Tahert onwards. Beyond the kin and party based (*safs*) categories described above, Bennoune describes social differentiation based on original inhabitants of each city, called the *Azils*, and later immigrants, called the *Nazils*. Further, he shows how the emergence of the merchant class led to the growth in power of the lay council, countering that of the *halqa 'azzāba*. Bennoune posits that the rising power of the lay council had its origins in the new ideas absorbed by Mozabite merchants in the Tell, thus contradicting Bourdieu's assertions that the core structures could defend themselves from contaminating influences from the outside (although perhaps he would argue that this shift in power was part of the flexibility in the Mozabite disposition). Thus while most scholars ascribe a loss of power by clergy to the influence of French colonialism and later independence, Bennoune emphasises internal factors in such political change, while not denying some degree of influence of the former.

Algerian sociologist Fatma Oussedik (2012) also explores how despite the doctrine of equality, ethnic and racial difference does exist. She centres her discussion on the recently revived rite of Baba Merzoug, while providing some background detail on Mozabite involvement in the slave trade. She begins by discussing how Ibadism tempers the way in which locals deal with other social groups, creating a certain type of distance to be maintained (the doctrine of dissociation). This included the regulation of the integration of other ethnic groups into the community, such as slaves (see chapter six for a discussion on how recent sub-Saharan wage migrants have been integrated into Mozabite society – or not, as the case may be). She concurs that slaves were a necessary part of the servile labour needed to maintain labour intensive irrigation works and such in the valley.

The Baba Merzoug rite was revived in the early 2000s. Local history tells us that sometime during the nineteenth century, seven black Ibadite men requested white wives from the leader of the community. Not able to deny them openly, they took them out into a barren valley, and there they were shot. The rite is now celebrated at the men's tomb, with separate ceremonies for men and women. The event consists of singing and dancing to the rhythm of tambourine and flute, and the dancers enter a trance, under possession of the *jm̄n* (spirits; sing. *jinn*). Based on her interviews with black Mozabite women, she found that they commemorate the rite in order to celebrate their ethnic distinctiveness; as for white Mozabites music and dancing are banned (in principle, if not always in practice, as I observed). They claimed that mixed marriages were now more common. When asked if they would marry recent Sahelian migrants, they replied no, as they are not Ibadites. Thus, black Mozabites differentiate themselves from white Mozabites, but separate themselves from more recent immigrants from their place of origins, while claiming part of wider Mozabite identity.

Oussedik (2012) further discusses membership to the *‘ashīra*, to which any ethnicity may belong, briefly outlining the process of manumission and incorporation into white families, from servility to dependency, a practice common across the Maghreb. She asserts, on behalf of her interlocutor, that while the state is too large and remote to deal with local contingencies, the *‘ashīra* is the “optimal social structure, allowing for individual development and a proper balance of rights and obligations. (I consider this idea of appropriateness of scale for governance, for society as well as oasis resources in chapter eight and nine.) It has, in other words, become an idiom for “civil society” (*Ibid*: 98). She goes on to state that despite

apparent contemporary equality between black and white, mixed marriages are extremely rare, and there are no instances of blacks entering the ranks of the *‘azzāba*, the highest local authority.

So far, I have used these key texts on the M’zab to provide some historical and current context in ways which complement and contrast with my own ethnographic description and analysis. Finally, in this last section I discuss other regional ethnographies which bare relation to my work.

4.6 Saharan and Maghrebian ethnography

Unlike Morocco, since Bourdieu, anthropological scholarship on Algeria has been limited (but see Ben Hounet 2007; Bellil 1999; Goodman 2005; Goodman 2009; Keenan 2001; Keenan 2004; Keenan 2013; Moussaoui 1996; Scheele 2009; Scheele 2012). Therefore I will focus this review on North African oases, and then on key ethnographic accounts from Maghrebian anthropology which share similar themes with my own work. I then broaden the focus to the Sahara as a sociological region instead of focusing on political demarcations. Although livelihoods span political borders, these barriers do have an effect on livelihoods, although paradoxically not always a limiting one, as will be seen, with informal economic trade.

One of the few published ethnographies of a North African oasis is by Hsain Ilahiane (2004). Ilahiane explores the relationship of ethnicity and agricultural intensification in a southeastern Moroccan oasis. He puts forward the claim that ethnicity is a missing variable in earlier models of agrarian change and intensification, such as those provided by Boserup and Geertz. Instead, studies of multi-ethnic farming development must pay attention to “historically specific

developments tied to the ethnic distribution and control of resources” (Ilahiane 2004: 198). Ilahiane pays attention to the historical conditions of French colonisation, political wrangling and a harsh environment. He describes the social mobility of the underclass of black Haratine who have exploited relaxed laws regarding immigration to France, in order to profit from remittances sent back. Such funds were used to buy land, and thus status and a right to vote. Land is closely tied to the concept of *al asl*, or origin, signifying ancestry, law and identity. Land ownership was previously tied up by the local elites of Berbers and *Shurfa* (alleged descendants of the Prophet Mohammed), specifically formulated to prevent outsiders and Haratine from possessing land. Such developments were in fact created by the colonial situation, a rare case of an indigenous social group benefitting from imperialism. Thus, Ilahiane theorises that social change comes from the outside, and that without external changes local actors would have continually reproduced the same social structures. By contrast, while also focusing on class, I provide a theory of internal and external factors which interpenetrate as driving social change in the M’zab.

Other recent works on oases have also come from Morocco, such as an MSc thesis by El Jamali (2011) with a focus on understanding the factors that cause people to cooperate toward a common goal in Figuig, regarding the politics of irrigation management. She uses a commons management framework, pioneered by Ostrom among others. She discusses how environmental, social, cultural, economic and legal variables are important to the analysis. She highlights how water rights are linked to landownership, allocated to each farmer over short cycles of time, such as 15-day cycles. One of her respondents asserts that the system leaves little room for cheating, as each farmer knows his rights and as the framework is small it is

accountable and well controlled (El Jamali 2011: 45). El Jamali found that contrary to the prisoner's dilemma and tragedy of the commons scenarios, community small-scale management of commons by communities is possible, despite social inequalities. My own work shows that private property can be just as important as communally-held ownership for natural management, and that withdrawal of participation can be just as important as cheating.

Crawford (2008) provides an account of how Moroccan High Atlas Berbers, manage their natural resources in the face of socio-economic change. Central to his analysis are discussions of ideal concepts of equality in the community, compared to actual inequalities and power dynamics, which finds parallels with my own research. Following Mundy's (1995) work in Yemen, Crawford departs from classical writings on Morocco which traditionally focused on tribes, moieties and village assemblies, by arguing that the household is the most important political unit (2008: 50). He shows how household demographics are important, in that having more offspring allows patriarchs to send children away to the cities to work and benefit from their sending back remittances, allowing the patriarch to spend more time engaging in politics, if he so chooses. Crawford also reconceptualises the local relationship to the state as that of an extended segmentary lineage that leads up to the king (2008: 13).

In a recent ethnographic account of a Kabyle Berber village, Judith Scheele (2009) combines historical narrative with an ethnographic account of how Kabyle identity is shaped by intellectual trends in both France and Algeria. In her historical analysis, Scheele shows how Algeria was seen as a sociological testing ground for French academics, who debated whether good government could be

engineered or rather, had to be 'organically' grown over time, using Kabylia as an example of 'primitive' democracy. Through her dealings with the ethnographic material, Scheele skilfully demonstrates the contradictions inherent in the idea of the autonomous village, operating within a nation state. She does so by complicating notions of space and the expression of social order, presenting land rights as categorically rigid, yet practically flexible. In other words, the rules must be known in order to bend them, as a tool to defuse social conflicts, for example in land disputes, which were finally restored after confiscation by French colonialists, only to be then reappropriated by the Algerian state. Scheele highlights the ambiguities in denoting boundaries, for example while Kabyles themselves establish the 'village as 'a "moral space" (2009: 73), they maintain links with the outside world for reasons of political influence. Scheele shows that although local norms are eroded by outside values causing social change, such values are reformulated in ways that make sense locally (2009: 149). This sense of a locally contested 'modernity' is central to how I formulate how Mozabites negotiate and mediate change.

Moving the focus back to the Sahara, scholars have only recently begun to consider the region as a local network of diverse communities, rather than seeing it as a barrier to movement between political entities. Rather, researchers such as Scheele (2012) have made the case that despite the collapse of trans-Saharan caravan trade, oases continue to be hubs within pathways of moving goods, people, and knowledge, even if such movement often now operates 'beneath the radar' of the state. Rather than an impenetrable barrier, thanks to the camel and the date palm (and now the automobile and aeroplane), the Sahara is commonly viewed by its inhabitants as a 'living network', much as oceanscapes are viewed by sea-faring

communities (Hau'ofa 1993; see also Benessaiah & Calis forthcoming). Yet few studies have pursued this reformulation of spatial relationships in the Sahara and movement between its diverse regions¹⁹, though scholars have long recognised the complementarity between agriculturalists and pastoralists in the Middle East (Asad 1978; Barth 1973; Chatty 2006; Marx 1977). Saharan trade may not take place at such scales as before, but continues to thrive as an informal economy. Goods from transistor radios to narcotics and arms can be found moving along established and sometimes hidden networks (Scheele 2012: 4), as well as underground networks assisting illegal migrants, war refugees, and those deemed as international 'terrorists' (Scheele & McDougall 2012).

Historically, since the spread of Islam, Saharan movement was largely predicated on networks of Islamic scholars, whose interest was as much economic, in gold and ostrich feathers, for example, as it was religious (Lydon 2009). Islamic literacy spread far beyond Arabic ethnicity to much of Northern and Western Africa, via the kin networks upon which trade depended. Indeed, without political structures to maintain economic stability, along with sheer military might, several scholars assert that the Islamic legal framework provided the norms of economic relationships upon which trade was built (*Ibid.*). The trade in slaves was extensive; caravans might transport 3000 slaves from the *bilad Sudan* at a time, and casualties were frequent and expected (Naphegyi 1871). This trade ceased only a few generations ago, and conditions are still readily remembered by some in the M'zab whose grandfathers were slaves.

¹⁹ Existing studies are predominantly historical, such as Ahmida (2011); Austen (2010); Grégoire & Schmitz (2000); Lydon (2009); and Marfaing & Wippel (2004). Scheele's anthropological study (2012) is the sole exception.

A common misperception is that Saharan trade collapsed with the rise of industrialisation and shipping by the European powers (Holsinger 1980). While the routes of luxury items including gold and slaves shifted to industrial Europe, internal trade in everyday goods such as wheat and dates, which was far more common than the riskier trans-Saharan trade, continued. Present-day trans-Saharan concrete highways facilitate considerable movement. Movement of people, for example, is far more dynamic than simple push-and-pull factors, such as youth being attracted to the bright lights of European cities (although of course this does occur to some extent), or fleeing from famine or war. Rather, a combination of demographic reasons and cultural factors are at play, so that temporary migration is an integral component of domestic economies where wages are remitted back, and is also a rite of passage for young men who wish to accrue enough money through temporary work contracts to become marriageable and form their own households (Crawford 2008: 46; De Haas 2008). This movement is common out of the Sahel and into Algeria, Nigeria and Libya (De Haan et al. 2002). Scholars have only recently been attempting to correct common public perceptions of immigrants looking for a one-way ticket out of Africa into the West, by emphasising the cultural practice of circular migration by many Africans (De Haas 2001; 2008; 2010). This is nothing new to Mozabites, however, who have been undertaking this migratory practice of trade for centuries, thus sustaining their treasured oasis homeland.

4.7 Conclusion

Throughout this chapter, I have laid out the historical and ethnographic setting for my research. I have critically reviewed the previous literature on the region and found most to be limited either in scope or depth of analysis, especially regarding

how change has been experienced by people in the M'zab. Drawing on Braudel's focus on the *longue durée*, I have aimed to show how ideological tropes have survived to the present day, as Mozabites negotiate forces of modernity. Far from being overrun by structural change, Mozabites have continued, from the beginning, to choose their level of participation in the social and political domains of the wider population. In this they have been influenced by the doctrine of dissociation. This has involved rejection, compromise, resistance and subterfuge in relation to various caliphs, sultans, deys, kings, viceroys and so on. Earlier scholars feared the disintegration of Mozabite society, while later writers suggested reasons for their persistence despite structural pressures, citing religion, flexible legal systems, and wealth as stabilising factors. Benounne (1986) has by contrast drawn attention to social change in terms of class differentiation, while Farrag (1971) describes the details of how local power has been negated at the intimate household level.

While drawing on these latter two works, in this thesis I give a detailed explanation for how change has been facilitated through the strategic integration with the Islamic Algerian nation, and catalysed by the 'Trojan horse' of global media. As a result of global media infiltrating the homes of Mozabites, the institutional cultural guardians, the *'azzāba*, have not been able to rely on customary channels of communication and power to withstand and mediate flows of change, much as their subordinate officials *l'oumna* are no longer able to control the violent flash floods (see chapter eight). The decline in the ability to locally manage these social and ecological forces, of global information and values, and of churning tides of water, has similar causes. While appearing to be strategically useful to the community as a whole, national integration has only benefitted a portion of Mozabite society, the merchant class, who have been able to leverage the local

displacement of political and legal power to exert their own influence. Yet, today, the social glue has not decomposed entirely, and despite economic and political integration, Mozabites are allowed religious autonomy (while in the rest of Algeria, imāms are monitored by the department of religious affairs, especially after the political violence of the 1990s).

Having situated my study within these theoretical problematics, in the next chapter I present a detailed ethnographic account of agricultural activity in the oasis of Beni Isguen. I focus on key issues concerning management and governance, largely around natural resource management institutions but also informal arrangement and contingent practices. My analysis of management institutions and problems sets the scene for the three principal issues that I analyse in further chapters (6-8).

5. Agricultural praxis in Beni Isguen today

In this chapter I orientate and sharpen the focus toward general oasis management practice by small-scale farmers in Beni Isguen. The approach is largely ethnographic with the intention of giving the reader a broad overview of praxis, and highlights socio-cultural change around what I perceive to be the major political ecological themes (labour relations, land tenure laws and the politics of irrigation) to which I subject a more rigorous analysis in the following three chapters. The question I will address is whether and how Mozabites are able to manage or adapt to these gradual change processes. How and if Mozabites are able to collectively respond to political ecological change is largely an institutional matter, a tension involving a process of political negotiation between progressive and conservative elements, such as farmer associations, the elite merchant class and the mosque (chapter eight).

Socio-ecological systems theory all too often presents a functionalist view of social adaptation as collective and consensual (Hatt 2013). By contrast, I explore how conflict, whether between intergenerational or between powerful groups, can be potentially adaptive or maladaptive. In my analysis of contestation, I present how socio-economic, ethnic and other sources of friction and mistrust threaten to pull apart the collective fabric. On the other hand, a more sophisticated theory of conflict is essential to incorporating inequality into social ecological conceptualisations, and for this I draw on Gramsci (2000). Indeed, Keesing & Strathern (1998: 134) call for a new theory of socio-cultural change that “accounts

for internal dynamics and conflicts, for cultures as shared systems of cultural meaning, and for the constraints and pressures imposed by the material circumstances of people's lives". What follows is a composite drawn from focused ethnographic study, field encounters, conversations and explanations or analyses which highlight the hierarchical and rule-based (authority), intentionally cooperative (equity), or individually anarchic (anarchy)²⁰ nature of management in the oasis and the historical causality of these different elements.

After reviewing the hydraulic system and built environment I give an illustration of oasis agriculture as it is practiced by farmers. I consider economic subsistence choices in terms of the 'moral economy' as laid out by Scott (1976). To do this I describe empirical farmer practices which may be essential to dealing with the unpredictability of non-equilibrium ecological processes, but are also subject to cultural preference and to market forces. Such practices require the accumulation of ecological knowledge over time and political coordination with other individuals. This is expanded in the following section with a view on crop selection and 'tidy' farms. I consider the politics of cooperation in the subsequent section, by focusing on efforts to reduce inequality and barriers to this effort and I attempt to provide a new theory of socio-ecological change that incorporates inequality and conflict. Through the chapter I introduce the main problematics centred on labour, land and water that I analyse in chapters 6-8.

²⁰ As reflected in the title of thesis: "Authority, Anarchy or Equity?" Authority may take the form of top-down management from the mosque (*‘azzāba*). Equality means contemporary management through farming associations which for the most part, are not hierarchical. The institution of *twiza*, reciprocal aid (chapter six) can be egalitarian, or top-down, as ordered by the mosque. Yet, mutual aid has broken down due to market forces, through the introduction of wage labour to pay for new services, leading to the final category, anarchic, or individualised (non-cooperative) management.

5.1 Walled gardens and collective irrigation

Comprehension of oasis management in Beni Isguen today requires understanding the background matrix of the built environment and institutional practices as both an historical adaptive responses to ecological disequilibrium (infrequent rainfall and floods) but also due to strong socio-cultural norms which shape praxis. This reveals a view of socio-ecological interactions that is not reduced to functionalist explanations. Indeed, farming in Beni Isguen today may be seen as a historical intertwining of ecological adaptation and cultural practices. It may be possible to unravel some of these histories, as I attempt to in subsequent chapters, whereas others may be impossible to unpick, as I discuss over the next few sections, especially on crop selection and other practices.

The built environment and ‘*abandoned plots*’

The most obvious initial impression as I walked with Nejib (a local palm specialist) for the first time around the winding dusty oasis lanes on a hot October morning was the organic nature of how the built environment was laid out. The format and arrangement of plots was not subject to pre-planning except that they clustered out of necessity around artisanal wells. The plots were walled using the local *tūb*, adobe bricks from local earth, coated with white or salmon coloured limestone or gypsum, as were all the houses and the mosque and the *qsar* walls, which blended in with the salmon coloured limestone valley walls immediately surrounding. This contrasted with immaculate azure desert skies, framed by date palm silhouettes, resulting in a striking picture of ‘natural’ beauty. The walls prevented prying eyes, in comparison with the more open-plan nature of many oases I have visited or worked in previously. This, it was explained to me several times, was to protect the modesty of families, especially women from being observed, allowing them to be free to

work or relax unencumbered by the warm white woollen *hā'ik* covering (see also Hoffman (2007: 6) for a discussion of walls in another Berber context, in the sense of material and symbolic gendered boundaries).



Figure 5.1 Walking through oasis lanes with *phoeniculteur* Hamza and workers. (23/09/13)

During my movement through the oasis, I noticed many barren plots, which juxtaposed strongly with the meticulousness of the other plots, which were bursting with life. Large sections of the Beni Isguen oasis were without life and greenery, replete with rundown crumbling adobe buildings. These were described to me as *abandonné*, locked up in legal disputes. Nejib estimated that out of approximately one thousand plots, approximately 40 per cent were abandoned, 30 per cent were well kept, and the other 30 per cent had mediocre upkeep. This estimate was supported by my observations in the oasis.

Customary procedures exist within the community to deal with conflict, beginning with informal resolution at the family level, and ending with the *‘azzāba* at the village level. Now, a parallel legal body of codes exists at the state level, the *code civil*, following French introduction, with mixed results for conflict resolution at the local level and in reference to *‘urf*, customary law. These *abandonné* events, taken *en masse*, are explored using event analysis in chapter seven. The analysis draws on local knowledge of *‘urf*, *code civil* and other social changes such as at the household level, drawing on concepts and themes from legal anthropology.

The irrigation system

On further exploration through the winding pathways, most remarkable was the complex irrigations system, set up many generations ago by Mozabite engineers. The irrigation system was laboriously engineered in a hard, dry valley with no apparent access to water. The M'zab valley was originally chosen for security and seclusion for Mozabites to perform their chosen form of religious practice, undisturbed by marauders or other political and religious ideologies that might contaminate the sanctity of Mozabite life. Thus, with great labour, the first wells were dug in the agricultural low lying area, in the hard limestone rock, to around 25m depth. The wells near the homes were of even greater depth, as these were built on the high ground, on the hills, for reasons of fortification. The soil was extremely poor in the region for growing food. Eventually, large dams were built, not just to capture the infrequent flash flood waters, but also to build up the silt, used to create a topsoil layer in which to plant crops. Importantly, dams also caused the water to filter down and recharge the underground aquifers, refilling wells. This infrastructure was probably built through a combination of slave labour and

the local system of *twiza*. *Twiza* is a common practice of communal, reciprocal help centred on farming found in many Berber communities (Berque 1951; Lepkin 2004; Bergh 2009; El Jamali 2011), and indeed around the world (e.g. Godoy 1985; Sabourin & Sabourin 2007; Jana et al. 2013).

These irrigation systems were continually refined over time through trial and error, to become finely tuned to the needs of each individual plot, so that when the floodwaters arrived, the appropriate amount of water would be channelled to each area, with minimum water loss. *L'oumna*, the irrigation officials, were able to spot the flood waters coming from one of the watchtowers, which also served as a look out for marauding tribes. A network of these watchtowers was positioned so that each could see another. Thus by means of signals, perhaps using a drum or horn, or flashing a mirror, individuals could be alerted further down the oasis to prepare the hydraulic system. Now, of course, they have mobile phones. Water arriving from the mountains of al Bayadh in the east would be channelled first to fill up the aquifer. Then it would be channelled by means of gates to the gardens. Each walled garden had an opening on either side calibrated specifically to size of the plot and number of palm trees within, smaller plots with fewer trees having smaller openings to receive less water, and vice versa. Thus, the system resembled a mighty circuit board, where water like an electrical charge flowed around the entire complex, with minimal interference. All that was needed was to keep the all channels and openings clear. This was the duty of each plot owner, but was enforced by the water *l'oumna* (see Geertz 1971 for a discussion on irrigation politics in Morocco and Indonesia). Nejib informed me that the flood-based irrigation system still worked to an extent, but in many areas of the oasis the system had fallen into disrepair, due to the presence of other sources of water such

as new government installed wells, and to other sociological factors. This lack of upkeep affected others, as the system needs all or most parties to help keep channels clear. The difficulties of the politics of irrigation are explored further in chapter eight.

The built environment of the oasis appears to conform to environmental needs, such as heat reduction through an over layer of date palms and using thick earthen walls. The physical space serves local socio-cultural sensibilities also, however, such as the need for privacy. Walls separate the private domains from the public. As I discuss elsewhere, this means that social regulation through visibility is also divided, with *l'oumna* governing the outer spaces, and mothers-in-law presiding over the intimate spaces. *L'oumna* report to the secular council, whereas mothers-in-law must persuade the religious council, the *'azzāba*, as to the seriousness of misconduct. Therefore, environmental and cultural factors can be seen to be intertwined in the physical outline of the oasis.

5.2 Adaptive responses or cultural preferences?

The everyday praxis of farmers and palm specialists is also governed by these factors, combining economic (market prices, labour systems), socio-cultural, political (the politics of cooperation necessary for joint works), and ecological elements. Contrasting with the uncontrived physical configuration of the oasis, the successful nurture of living plants (and animals) under extreme conditions requires calculated strategies based on detailed knowledge of ecological processes. Choice of what to grow and when was not restricted in Beni Isguen to adaptive maximisation, however, as other sociological factors can and do play a strong role.

Crop selection: adaption or cultural preference?

Date palms are central to oasis ecosystems. To ensure good production, they require upkeep at key times during the year, including artificial fertilisation in the spring, thinning in early summer, and harvest in the autumn. The pruning of fruit trees, along with other maintenance means that *phoeniciculteurs* (palm specialists) are well provisioned with work year round. My arrival in Beni Isguen purposefully coincided with the harvest season. When not participating in the tasks of the harvest, I would survey the plot flora, noting the variety of palms, fruit trees, and ground crops. I always noted a diversity of date palms, yet although there are 82 recorded varieties in Beni Isguen (128 in Ghardaia, and around 500 in the neighbouring *Touat* region), I mostly saw palms from a choice group of 4-5 (a local favourite, *bint aqbela* known for its juiciness, *deglet nūr*, a regional favourite in Algeria and Tunisia, and usually *ghars*, *dela*, *temjouhert* and one or two others recurred). I was prompted to ask the question, was this diversity to cope with environmental problems, such as disease for example? Nejib and Hamza, the *phoeniciculteurs* I worked with, informed me that although diversity provided this function, it was not the reason people chose these varieties: specific palms were chosen primarily for taste, usually sweetness and juiciness²¹. I corroborated this in talking to garden owners, for example, the sweetness of the *bint aqbela* variety was prized above all. Following this, they were chosen for maximum productivity throughout the year, by including palms that bore their fruit early (var. *ghars*, around August) and late (var. *tardif*, December/January).

²¹ Dates are locally classified according to various categories in quite detailed ways, in terms of sweetness, soft/hard, *harr/ bārid* (hot/cold, referring to spiciness) and so on. I came to appreciate the variety of dates much in the same way as a wine connoisseur appreciates grapes. Certain *qsars* were said to have different preferences, for example, the people of Beni Isguen were said not to like the spicy red *temjouhert* dates, although the people of Ghardaia loved them.

Cultural reasons play an important role in selection. For example, you were considered a ‘nobody’ and couldn’t provide well for your family unless you had *bint aqbela* dates to give your family at harvest time. One variety of date, *tezizaout* revealed the particularity of Mozabite livelihoods in an interesting way. Generally, only men climb palm trees, and as many Mozabite men were away working as merchants in the larger cities, this palm which was known to drop its fruit (normally date clusters must be cut, not dropping unless it is windy) allowed women to put dates on the table during the long absence of the men. As Hamza explained: “there is a saying that I won’t give my daughter to you unless you have a *tezizouat* tree, as when the man is away, the woman is still able to have dates”.

Certain dates were preserved for heritage reasons also. Arguably, elite land-owning Mozabites whose wealth came from outside the land-based production could afford to throw money at projects that failed; they could replace trees by buying new ones, pay for state well water in times of drought, or simply buy produce from the market if their own harvest was insufficient. Again, it could be argued that the merchandising practice of Mozabites has been a diversifying strategy over time in response to the vagaries of the difficult Saharan environment. Dates do form an important component of families’ calorific intake however; high calcium levels (Zaid & De Wet 1999; Al-shahib & Marshall 2003) aid the growth of bones and teeth in children for example, and preserved dates can be eaten year round (Al-shahib & Marshall 2003). Further, the sharing of dates by the wealthy with the poor, an Islamic tithing practice known as *zakat*, allows for some redistribution of wealth while boosting the social standing of charity-givers.

Those more invested in full-time (or nearly full-time) farming show more diversity and ingenuity in decision-making according to risk; their entire livelihoods depend upon it. Decision-making of crop selection and farming methods takes into consideration a range of variables: economic viability, market preferences, cultural preferences, availability and ecological suitability. Farmers I spoke with often started out by growing ground crops, such as tomatoes and cucumbers in poly tunnels, in order to receive the returns of a rapid growing cycle. They then invested their profits in fruit trees, the benefits of which would not be seen for another 3-5 years, depending meanwhile on the proceeds of the ground crops to sustain them. When the fruit trees came into maturity, the profits would be more significant, especially from oranges and grapes, which have a good market price. Date palms are a longer-term investment, maturing after 5-6 years. Ecological conditions also play an important part in selection, as intense heat and dry desert winds take a heavy toll on plants, not to mention periods of prolonged drought that can dry up wells. The wisdom of intercropping is used to create a horizontal and vertical vegetative architectural structure, for example to buffer more delicate plants such as orange trees with hardier palm trees from desert winds, and also protecting against the strong sun from above, the date palm thus creating a microclimate for plants, animals and people²².

Stabilising strategies

Arguably, modern market-based practices and scientific agricultural advice have also affected crop selection, driving choice toward maximum productivity. This can be seen in crop selection geared toward maximum yield, such as olives, which come

²² In fact, many Mozabites used to own a second house in the oasis, and would spend summers there, escaping the heat and noise of the town during 45-50°C heat, showing an adaptive micro-migration, now mainly defunct due to access to air conditioning and also to rising land prices in the oasis.

from the north such as Algiers, and need to be adapted from the very different colder, mountainous climate. Older farmers appeared to make different decisions, however. For example, one older farmer who had experimented with a drip system later reverted to the older, *segua* channel-based system. He also preferred locally adapted crops. Indeed, risk-aversion may be a more primary, stabilising strategy rather than maximising output and thus wealth (which would concur with sustainability in terms of resilience thinking, but not necessarily the sustainable development discourse) in a harsh and unpredictable environment (an argument central to Scott's 1976 *Moral Economy of the Peasant*). Indeed, Scott differentiates the moral economy as based on minimising risk involving the maintenance of subsistence, rather than geared toward capitalist profit maximisation. This may involve relations of mutual aid (*Ibid*: 167). Scott further argues that when the minimum subsistence is not met through interference by the political elite, this may result in peasant uprisings and rebellion (*Ibid*: 3-4).

A principal adaptation to times of great water stress came in the form of a relaxation of the rules of collective ownership of wells. Ordinarily, one must own land in proximity to a well, approximately a 20m² radius, in order to be allowed to run an immersion pump from it and onto one's land. Some people undermine these rules by purchasing a single tree nearby and then running their pump tubing to quite far away plots. All wells were named. The number of pumps running into the *tajdid* well that belonged to the wealthy Mozabite ran at about 12 (the maximum was usually five). In times of water stress, the emergency rule was that those with plenty would give to those without. I noted at the time:

We see a well that has many pumps in it. It was the emergency well in Beni Isguen that always had water and the whole village would come to in times of drought. Even people from Ghardaia and al Atteuf would get water from there. Its water is

sweet. Before electricity, people used to take from it in rotation, 1 or 2 hours at a time. Now it is dry, maybe because of all the pumps. To take from a well you have to own land nearby, or at least a tree. But people have put in pumps from all around and now it is too late to tell them to take it out once it is established. Now Najdi's garden hasn't drunk in 2 years. He would get the pump fixed but would be worried he wouldn't be paid for doing it. The garden was once covered in grapes, and now almost all gone. He says maybe it's time to fix the pump as there may be water again but Najdi doesn't want to. Apparently the father, who was much more generous, would pay more to do a better job, but this one is the opposite. There is a large double basin above, that piped all the way to Beni Isguen, for free. Now it is empty. We come back down and he shows me the old well, takhadimt, and the new one, tajdid. He's dad says it used to be like a market place here in the past, with people pulling water, people farming, etc. now it is the opposite, desolate.

~ Field notes, 18/09/13



Figure 5.2 *Tajdid* and *Takhadimt* wells. (01/10/13)

Despite the supplement of state-drilled wells, shortages still occur. Modern intensive agricultural strategies rely on stable inputs of water and nutrients. My older informants often considered stabilising strategies to be more appropriate in the highly unpredictable conditions of the region. For example, when floods did

come, they would demolish the ground crops, as the waters could be 1.5m high and remain for over a month. Thus, farmers would have to adjust to these conditions by having economic buffers such as savings, other work, and borrowing from social support networks such as family and friends or wealthy individuals known to give *saddiqa*, literally 'friendly-assistance'.

A healthy diversity exists in farming approaches, which are arguably complementary. The old oasis is today made up largely of small garden plots involving a range of growing intensity. For those with little time to spend farming/gardening, the institution of *khammēs*, sharecropping, has diverged into one based on a money-oriented economy whereby *phoeniciculteurs* are paid to maintain date palms and other crops, as well as irrigation and fertilisation (as mentioned above). Some individuals keep goats, selling the manure at a profit to land owners, and the milk at the local shops. Others dig up the silt of the primary riverbed, *oued* (river) *Ntissa*, and sell it by the truckload, also as fertiliser, while also helping to reduce silt build-up around the primary dam, *ahbess*. Such economic adaptations thus appear to fulfil beneficial local ecological functions also.

One or two farmers have nurseries, growing local and non-local plants for distribution to the local community. Non-local plants come from the north and have to be adapted to the local arid climate over a period, depending on the plant species. This practice can have potentially non-adaptive long-term consequences, however. Dairy farming has also recently been introduced, encouraged through subsidies by the Algerian government due to a lack of national milk production, some of which has to be imported. Some argue that this has a negative effect on the local community's water supply as a whole. Cattle are highly water intensive,

requiring the supplementation of green crops that require frequent irrigation. Thus some farmers argue that dairy farming in the desert draws unsustainably from the aquifer. The aquifer is only replenished from distant rains, and Beni Isguen is regarded locally as being in a state of drought since 2011. Attempts at introducing apiculture have also been unsuccessful, as bees are extremely sensitive to environmental conditions (Robinson & Huang 1998) with colonies being brought from mountainous regions.

Not all traditional agricultural methods are necessarily adaptive; they may be maladaptive but not debilitating (lowering potential production), or neutral. Another seemingly maladaptive practice, to my mind, was the act of leaving soil bare, allowing soil erosion by wind and sun, and the compacting of soil structure. After considerable investigation and reflection, I came to theorise that rather than having a functional, ecological explanation, bare soil was due to cultural, historical and social reasons. Mozabites and other oasis dwellers value the aesthetic appearance of a 'clean' oasis garden or farm. Cleanliness of one's garden shows one's diligence and hard work, valued and essential qualities among Mozabites and other oasis peoples. Further, a clean garden/farm is often compared to a clean body, as in the proper trimming of date palm branches and cleaning of *karnaf* (stumps of branches on the trunk) is like having a haircut (Benessaiah 2011). These perceptions of cleanliness may have a historical basis. Cooking and water heating was done primarily by burning local wood before the introduction of electricity in 1941. Hamza told me that *khammēs* and before that, slaves, who didn't own their own land, needed strategies for gathering excess firewood from their masters. One way was to drop palm branches when harvesting in a certain way so that they would break and were unusable for construction purposes. They would be allowed

to take these broken ones' home. Furthermore, they cleared every last twig on the ground to be used in making tea, cooking, ritual and ordinary ablutions. In this way, gardens and farms would have had an absolutely spotless appearance. Recent generations have reproduced this aesthetic, especially as the family is usually brought to the garden on Friday holidays to spend the day relaxing.

Causal analysis of different three farms

Here I compare three different farms in terms of overall form, by analysing the main variables that have affected farmer decision-making. I begin with a less conventional approach to farming, followed by comparison with one of the most successful farms in the region, and another that was besieged by problems and was quite unproductive.

I did find some farms that were less than spotless in appearance, such as the farm of Mahmoud Ben Saleh (fig 5.3). Mahmoud farmed in a particular manner that is likely explained by his relative poverty, buttressed by a particular philosophical outlook. Mahmoud cannot afford to pay a number of full-time workers as others do, employing migrant economic labourers from Mali and the Sahel. Thus, his farm appears at first sight to be overgrown and disorganised. On closer inspection one can find order, although to fully understand it required Mahmoud's own explanations as to the 'method in the madness'. He once asked me rhetorically why he left the weeds growing around the small olive trees (less than 1m high). I suggested that they helped prevent the water from evaporating, and also to break the wind. He said yes, but also to give form to the trees, so that they grow vertically rather than horizontally. Further, he found that his donkey would eat the weeds around the olive, but not the tree itself, a very suitable arrangement. He also

has palm trees of entirely new semi-wild varieties, of average quality that he has left to grow as he has not had time to tend them, an unusual state for regular oasis plots, but adding to the local genetic diversity. He told me it took him nearly 20 years of work to see a profit on his five-hectare plot, which he supplemented by working as a mason. But he would rather be his own boss.



Figure 5.3 Messy farm?

Mahmoud started by growing ground crops, as previously mentioned, but he also received some mint roots for free from Ammi Bayoub Abess. Mint is a sure-fire income winner due to its cultural importance in sweet mint tea; a small patch can bring in about €30/month. From these profits he was able to invest in polytunnels. His strategy now is to grow olives, which are relatively rare in the region, and grapes from Algeria, France and Spain. Mahmoud's necessary innovations buttress my assertions that creativity comes not only, or not even from wealthier farmers

who can afford to make mistakes; for poorer farmers the stakes are raised much higher, therefore they pay much closer attention to ecological processes and to the results of fine adjustments, not all of them intentional. To give another example, Mahmoud did not have enough spare time or workers to tend a patch of date palms. These grew from seed, whereas to ensure quality, farmers usually plant cuttings. A portion of these untended palms developed good fruit, and are thus probably new varieties. Further, some of these new varieties may be resistant to palm diseases (like the local variety *akerbouch*, which is one of the very few which resists the deadly *bayoud* disease).

The diagram below serves to illustrate the main variables as factors influencing the decision-making process of farmers according to my analysis. These schemata serve to compare three farms in what follows, the ‘messy’ farm of Mahmoud Ben Saleh (fig. 5.4), the highly productive farm of Marwan Jabre (fig. 5.5), and the unproductive farm of Omar Ben Sheikh (fig. 5.6). I found that the important variables were: a) knowledge, both of direct experience and textual, b) financial input, c) labour force, d) culture, e.g. interest by the next generation, e) ecological factors such as drought, f) markets, g) personal investment, and h) government support.

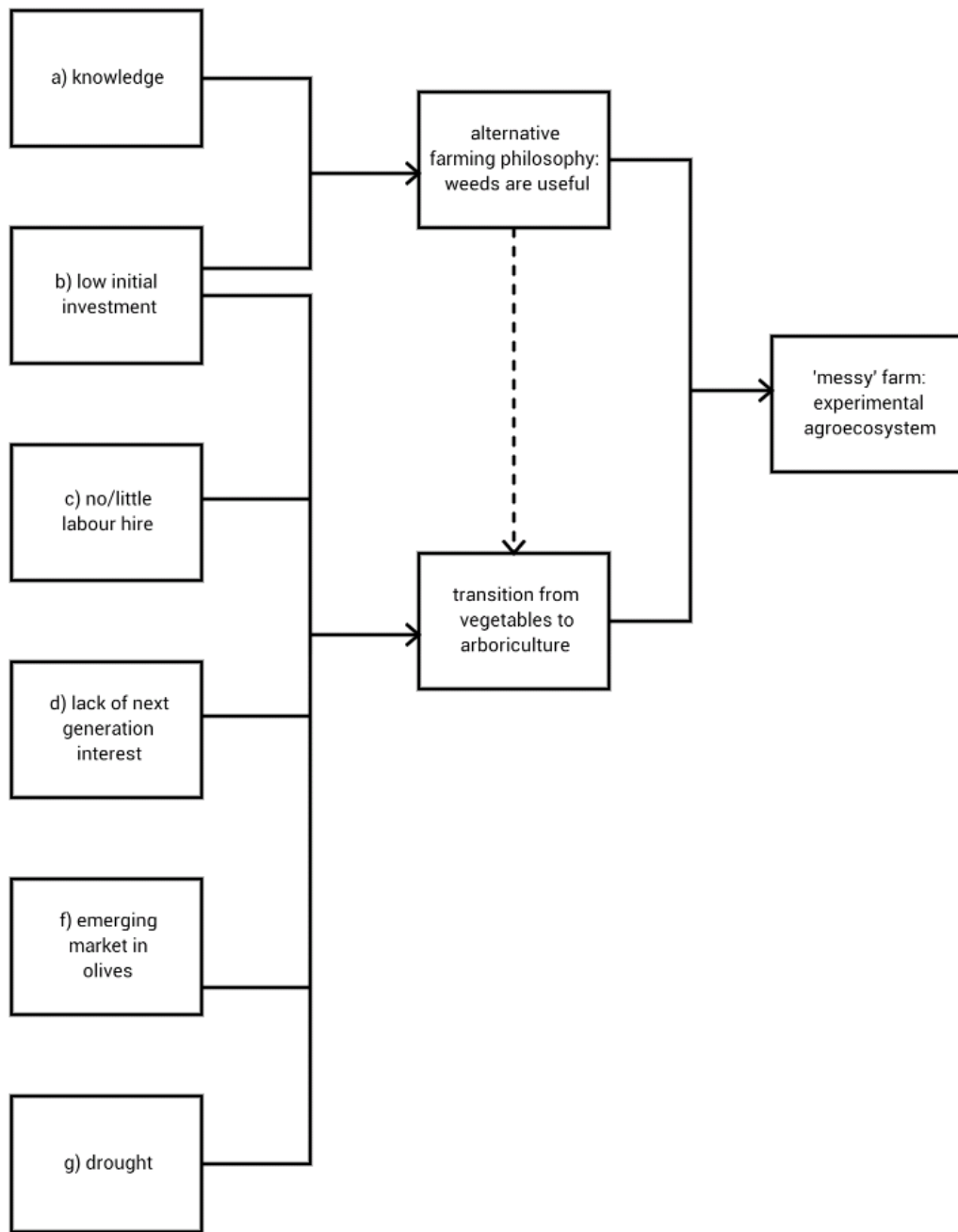


Figure 5.4 Farm A: Mahmoud’s experimental ‘messy’ agroecological farm.

Here, direct experience of the usefulness of weeds buttressed by written agricultural knowledge combined with a lack of initial input, little interest by Mahmoud’s sons, drought conditions and an emerging market in olives, provided

the context for Mahmoud to opt to convert his farm to mainly arboriculture, including fruit trees and olives. The presence of weeds and of income to finance additional labour gave the farm a 'mess' appearance, yet also provided the space and impetus for experimentation.

Mahmoud has found techniques consistent with agroecological principles: requiring minimum intervention as they resemble 'natural' ecosystems, but based on need, careful observation and experimentation rather than any special training. Compare this with the farm of Marwan Jabre, one of the most successful farmers in the valley (fig. 5.5). Marwan also started with ground crops, moved to horticulture and viticulture, and finally added a dairy. He has a team of around 10 unskilled workers, plus one foreman from Adrar, allowing Marwan to do other activities such as marketing (I was only ever able to find him on his farm on Friday mornings). His farm was immaculate, well organised, with areas for cattle fodder intercropped with date palms and peach trees, creating a microclimate and increasing production, in other areas grapes were mixed with palm trees and orange trees. Marwan's approach required a significant initial investment, thus becoming financially sustainable earlier. Yet as his farm is the main source of Marwan's income, this is the reason he has invested so much in it for it to succeed, in terms of drawing on multiple source of agricultural information from text books, internet, NGO-run courses and government support. Furthermore, Marwan's sons are all directly employed by him to run the farm, doing deliveries, caring for the livestock and so on. Marwan's training as an architect helped in his farm design, yet Mahmoud also engaged in long-term planning, the difference being that his plans took longer to manifest.

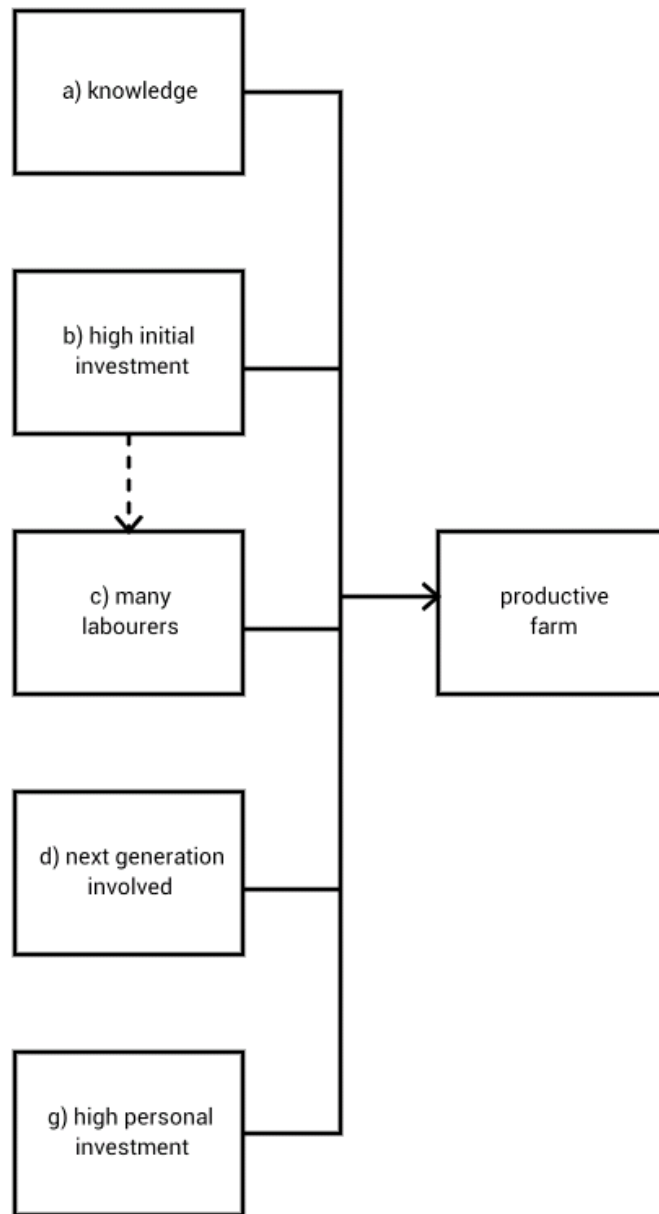


Figure. 5.5 Farm B: Marwan Jabre's highly productive farm.

Finally, compare this with Omar Ben Sheikh's unproductive farm (fig. 5.6). When I visited, he showed me all the dying trees, the ground was very bare. His land was immediately next to that of Marwan's, which ruled out blaming the soil for lack of productivity. He also had an abundant water supply, and could afford to drill a private well. The main difference was that he was a part-time farmer; he was retired

and only partially invested his time in his land. He only employed one labourer on the land. in my analysis, Omar's lack of knowledge came from a lack of impetus, for the farm was not his sole source of income, thus the stakes were not high enough for him to do everything he could to make it succeed. Marwan even told me that Omar had gone to him for advice as to correct irrigation procedures according to new methods, but Omar hadn't listened and now they had fallen out.

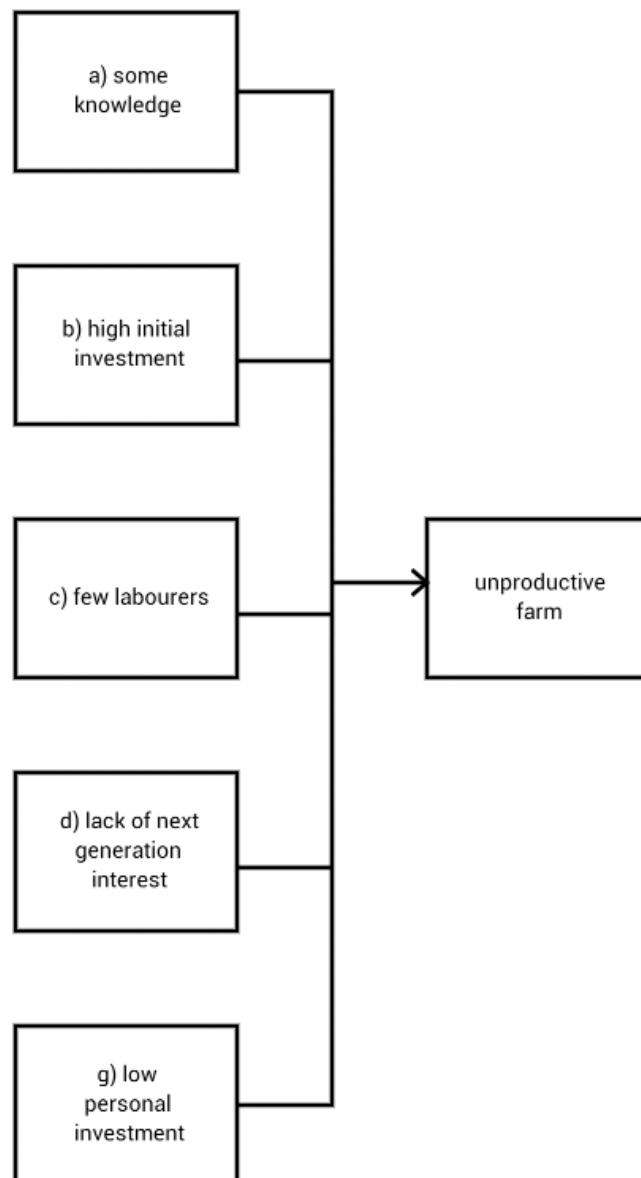


Figure. 5.6 Farm C: Omar's unproductive farm.

Farms B and C both had high initial financial input, and potential access to knowledge. Thus, this factor alone is clearly not a guarantee of success. Drought conditions were a constant, and so was access to water. Farm A was more successful relative to farm C, therefore I submit that personal investment, in that farming was the sole source of income, as perhaps the most important factor (more on this in the next section). Farm B was aided by additional initial investment (including loans which farm A was unable or unwilling to take on), a large labour force, design experience, support by his sons, and government assistance. Despite all this, it may be that Marwan's well-organised farm could be maladaptive for the community at large, drawing too heavily on the regions delicate water recharge.

Throughout this discussion I have attempted to convey a sense that agricultural practice in the M'zab is a combination of rational, adaptive measures, cultural preference, and economic pressure. Indeed, these factors have historically intertwined in a way as to make unpicking them perhaps impossible. Such a compositional dialectic of environment and socio-cultural practice confounds clear anthropological materialist/symbolic distinctions (see Marvin Harris' (e.g. 1979) and Marshall Sahlins' (e.g. 1978) fierce debate over materialist versus cultural explanations of human adaptation. Next, I discuss the sociology of farming with an exploration of political issues that the community faces in attempting to collectively manage resources.

5.3 Negotiating inequality

Social theorists in the past emphasised functional dynamics as necessary for social cohesion (e.g. Comte; Durkheim), while others have put forward theories of conflict

as appropriate to conceptualising change as more important, such as Marx (Comaroff & Roberts 1986: 75). Inequality and political difference has not been dealt with sufficiently in the literature on social ecological systems. Intergenerational friction, for example, may in fact be an important source of novelty, through the generation of new ideas, perhaps inspired by modern education. Through the jostling of different parties for power, new, more relevant, and more ethical praxis may be acquired. It is clear, however, that a degree of cooperation is necessary for the maintenance of the communal irrigation system in the M'zab. Factors such as certain shared values enhance such cooperation. Other influences, such as ethnic difference, perceptions of economic inequality and even political parties all threaten any necessary coherence. As I have tried to demonstrate elsewhere (Benessaiah 2011), the tension between conservative and progressive elements potentially serves as an adaptive balance in response to 'modern' forces, whereby change is mediated in a way that may be locally acceptable and appropriate (Watson 2006: 37). Such progressive adjustment would therefore be contingent (self-regulation) rather than definable as adaptive management, in that it involves overall change that is not directed, but collectively contested. In order to get a sense of social difference, I first give an account of class in Beni Isguen, while problematizing classical categories. I then present attempts to recreate community spirit and overcome inequality, and barriers to such attempts.

5.3.1 Class: peasant and bourgeois farmers

The socio-cultural basis of farming praxis in Beni Isguen is further complexified by the political economy of class inequality. Farmers with extra revenue streams can invest more in agricultural inputs from the outset, whereas poor farmers are forced to invest over longer time spans. Thus, farmers can be classified as part-time or

full-time farmers. Rather than ensuring success, however, I observed farmers with extra-agricultural income whose farm plots had failed. I argue, therefore, contrary to theories of 'social insurance' (e.g. Glantz 1988: 323), that farmers with no insurance are more likely to have successfully productive farms for the stakes are higher: they cannot afford to fail.

Farms and gardens weren't always hidden, and from what I could see, ground vegetation was quite minimal. In fact, I used such absence (when I could observe it) to indicate whether people were involved in activities more related to agriculture, rather than just arboriculture, which is far less intensive. The presence of ground crops suggested to me greater time spent in the oasis, as these would need regular watering perhaps every other day, depending on the season. This didn't necessarily reveal full-time farmers (I found these through networking) but different degrees of involvement with the oasis. Farms or gardens skewed towards arboriculture suggested less time spent cultivating, as trees need far less upkeep. Such areas are more likely to be gardens, and in themselves perhaps reveal an adaptation whereby livelihood activities are diversified and thus less time is available for farming.

People were highly educated in local topics such as plant pests and agricultural problems. Diverse sets of people were interacting, essentially different classes (although they may not use such terminology, such separations clearly existed, revealed in how people did or didn't interact, or intermarry, as well as notions of a rich elite and poorer manual workers) such as agriculturalists (peasants) and more bourgeois administrators and agronomists. So-called peasant farmers had highly diverse personalities, however, confusing the usual categories of peasant or bourgeois farmer, with some agriculturalists who chose to be landless, that were

educated, that were involved heavily with political affairs, that engaged in international travel to large conferences, who networked extensively, who liked to try new things while vehemently defending traditional practices and views. Also prevalent were individualists, mavericks who were not interested in organising and cooperating with groups, for various reasons (such as a jaded, eroded trust in a perceived-to-be morally degrading society). Farmers generally appeared as mavericks, who engaged an agricultural lifestyle for reasons beyond a monetary one; reasons cited tended to be independence (from having an employer dictate one's activities, see also Davis 1987: 17), and love of nature. Many enjoyed the peace and quiet away from the cities. For some youth it did provide a viable economic option with the right training and investment, while others shied away, preferring the route of education and white-collar employment. Thus, farming did seem to attract a certain 'type', and while the need for economic return is undeniable, other values are clearly involved for those who choose the farming way of life. Sabourin (2000) argues that social benefits can motivate farmers more strongly than the socio-economic productive returns, which was supported by my own observations. One farmer, Mahmoud, complained of virtually no production on his farm of 20 years, but boasted of how all his neighbours would come and eat *couscous* with him, a great honour. I found it a hub of great sociality, hilarity and warmth.

Of course, some had no choice and were forced into farming by family commitments, but many chose the freedom to work for themselves rather than 'slave away' under the *raʿīs* (boss) in the factories and industry, which has drawn away so much youth labour and talent from oases. I became interested in the difference of outlook, strategy and action between those whom I defined as *those*

who could afford to fail and those who could not. Not all could be easily classified into one or the other, but locals would point out a difference between a fully committed and a part-time farmer with reference often to the semi-mythical old-time farmers, the *ancien fellah*, as a constant quasi-real reference point. The point was that for the poor invested farmer the stakes were much higher, and he had therefore to be more strategic and robust in his knowledge, yet also more innovative (see also Scott 1998: 324).

There was often a clear difference between peasant and bourgeois farmers²³, however, in terms of manual labour. To remind the reader, Mozabite society may be seen as classed roughly between poorer manual labourers, and a bourgeois shop-owning class²⁴. Black Mozabites tend to inhabit more the former category, yet many more are now involved in more prestigious roles, such as the honourable capacity of imām, probably due to recent education and wise investment. Such a hierarchy of roles can be found continuously in local history and indeed across North Africa in the form of slavery, still extant in the memory of the people. Migrant unskilled labourers from the Sahel, especially from Mali, now fill a similar role, ironically from the same population pool in the same geographic region from which slaves were originally plucked. Interestingly, these newcomers are far less integrated than their forebears, their very lack of embeddedness in society making them more chaotic and less controllable, creating something of a headache for the

²³ These terms are not used locally, to my knowledge, although I did hear use of the term *paysan*, used jokingly. The conceptual divide between a farmer who does or doesn't get his hands dirty, (local terms, i.e. the latter being one that employs labourers and does little work himself) most definitely does exist, however, although the boundary can vary from farmer to farmer. A local metaphor, mentioned below, is in Tumzabt, *el bouze edibi telbouzt* the 'juicy date' (wealthy daughter) doesn't go with the 'dry date' (lower class farmer), however.

²⁴ A member of my English practice group in Beni Isguen insisted to me that this was because merchandising was the prophet Mohamed's profession.

order-loving Mozabites (more of this in chapter six). The fact is, however, that Mozabites rely on them as a source of cheap labour (as they did the slaves in the past, I argue), making them what I call *a necessary nuisance*, that is, an ambiguous local category (see also Sidoti et al. 2015). Lack of trust has led to open hostility and violence in some circumstances (see the fear of malaria case in chapter six), although steps have been made to remedy and formally resolve conflict in at least one case (for example in al Atteuf).

These recent immigrants served perhaps to reconstitute a third, lower category of person, that of unskilled labourer, and interactions with them were based on market relations. The question of a shift to market values and the effect on personal relationships is addressed in chapter six. I will explain how competition for workers contrasts with the historical practice of shared labour (*twiza*) in the M'zab valley.

5.3.2 Socio-political issues and problems

Barriers to equality

The successful generation of wealth by many Mozabite families has resulted in a greatly unequal society (see also Farrag 1971 for classifications). Class divisions are hard to overcome. A great divide does exist between the social classes, limiting social mobility. For instance, two of my farmer friends—one whom was black, the other from a poor family—had been refused marriage to white daughters of wealthier families. Excuses were always made, and then the suitor would find out that the daughter had been married off to someone else. Farming does not carry prestige, even if it is valued in a more distant, abstract ideal regarding local heritage.

A loss of trust in the traditional local authority institutions has also affected local solidarity. Certain figures within these institutions were perceived to be involved in underhand practices involving corruption. For example, one farmer related how *l'oumna* would often look the other way if an infraction was committed by a relative. Another farmer told me that imāms were known to own expensive houses, to participate in exploitative business practices, and to receive subsidies from wealthy individuals, who later expect favours in return. They complained of different sets of rules, one for the rich, one for the poor: the rich could essentially do what they like and get away with it, as they held the purse strings of those in power, whether the *‘azzāba*, who still maintained social and cultural control, or the *ayyen*, who held political and bureaucratic power. This sense of injustice, especially by the very organisations that were supposed to embody the very highest moral standards (ironically the word *l'oumna* comes from the root *amīn*, meaning faithful in Arabic), has served to significantly erode collective trust in these groups.

Although these local authority structures still exist, their ability to project their influence has severely waned (which even includes other institutions such as patriarchy and the *‘ashīra*). This change has been initiated by a multitude of factors, involving mistrust as stated, but also due to integration with the Algerian nation since and indeed with access to wider global flows of information with the internet and satellite, affecting the youth especially. Despite such institutional breakdown, I will try to show how Mozabites are reorganising, with the recent emergence of Algerian civil society, through multiple associations, including farmer associations. Instead of relying on the administrative institutions of central government, these associations appear to be taking on the task of reorganising local people to tackle

local problems, including oasis management. Interestingly, these tend to be more egalitarian than the older hierarchical political structures, and I explore the implications of this in chapter eight.

The problems of cooperation

Water is clearly the limiting factor in desert environments (Spooner 1989: 129), which cover over 35 per cent of the earth's land surface (Mares 1999: xxix). Living in arid areas often necessitates group cooperation, whether to share scarce resources, or to be able to do works beyond the capacity of the individual. Such needs usually require rules to guide group organisation. Oases generally consist of one of three different types of irrigation system, based on either spring water, surface water, or (under) ground water. Beni Isguen oasis hydrology utilises the third system. The second type of irrigation system also requires constant cooperation between groups, who usually allocate water use on a rotational schedule, according to proportionate size of land to be irrigated. Such systems often involve issues of fairness and conflict. Price (1995; 1996) has investigated water theft in Egypt's Fayoum oasis. He argues that water theft occurs clandestinely due to a perception of unfairness, whereby others are believed to be breaking the rules, leaving one disadvantaged, with a shortage of water for one's own crops. Ostrom (2009) has expended considerable effort in outlining factors, such as commonly held rules (or institutions), which play an important part in successful community-based management of resources. Rosen (1979) however, gives a more nuanced view of social relations, showing how negotiation is still important despite the presence of rules and norms surrounding kinship ties of obligation. Beyond individual communities, potential overexploitation of underground aquifers is a dangerous reality in the North African region as a whole (El Jamali 2011).

In Beni Isguen today, one facet of water management involves voluntary associations. To give an illustration of the type of problems these groups face, I will discuss the group named Faddān. In the new oasis of Ntissa, the decision of how to manage one's land is largely the responsibility of the individual. The presence of collective wells, however, requires participating farmers to collaborate, giving rise to political manoeuvrings involving persuasion, cajoling and other methods of negotiation (see Geertz 1971). Within groups like Faddān, a key issue involves how to ensure that individuals act in the best interests of the group at large as there is no longer recourse to traditional authority to punish offenders. Indeed, some have elected not to join collective well associations for this very reason. For example, intentionally or not, individuals often neglect to pay their water rates for using the well. This results in the water being cut off for the entire group, which will not be reinstated until the bill is paid. This scenario illustrates the difficulty within egalitarian group dynamics that cannot rely on coercive, top-down management. Instead, some sort of equilibrium must be constantly negotiated between the various parties involved to achieve a compromise. Such negotiation involves the mediation of various interests and values for the different parties concerned. For example, for some, the farm being irrigated from the well may be their sole source of income. For others, it may be more of a hobby, as discussed above for full and part-time farmers. This conflict of interests must be overcome to ensure the continued flow of water to crops that would die within days or a week without it (for a full discussion see chapter eight). Comprehending such negotiative practice may give rise to new forms of theoretical understanding of non-coercive forms of natural resource management.

Community values

In spite of such local inequalities and conflict, a strong spirit of cooperation arguably does still exist among Mozabites²⁵. I witnessed many instances of collaborative behaviour, from associative initiatives to bring in modern agricultural research, to voluntary communal work such as litter picking groups. Such activities seemed to involve a sense of pride in a distinct Mozabite identity and heritage, perhaps enhanced by the designation of the M'zab as a World heritage site in 1982. Local identity is supported through opposed differentiation with the Other - the neighbouring *Sh'amba* Arabs - and most likely enhanced by the recent deadly conflict. Furthermore, a value known as *al amena* exists which can be roughly translated as faithfulness. For example, mothers would tell stories to children at bedtime where the hero would always be the one with *al amena*. Today however, some Mozabites regret that anonymous satellite television has so easily replaced didactic instruction of locally salient values. When satellite first arrived in the 1960s, the *'azzāba* placed a *tebria* on anyone who brought in the new technology. Eventually, everyone started buying the satellite dishes. The mosque still tries to give moral guidance on the 'right' way to engage with new media, but many claim it is not enough to have any effect.

For Mozabites, religious ethics should ideally guide group relations. Omar, a student, related that the type of conflicts between neighbours that interested me in the oasis shouldn't happen if people actually adhered to religious teachings. In the mosque, preaching always involved advice on a correct relationship with God first,

²⁵ Community values based on equality translate into practice in a number of ways. Communal property such as riverbed land is managed so as to allow distribution of resources to the poor. Here, families who can't afford to own land in the oasis may plant palm trees and claim the harvest from them.

but then one's proper relationship with the community, second. Another individual complained that people now went through the motions of attending and practicing the regular prayers, but they didn't really have Islam in their hearts. Many people often complained that community members were becoming more materialistic and individualistic, surely influenced by contact with the 'West' and that community values were becoming eroded. The embodiment of egalitarianism through homogenous dress of white *gandoura* or baggy Ottoman-style trousers, and skullcaps, and identically-sized houses in Beni Isguen town is being challenged by individuals who are becoming bolder in ostentatious displays of conspicuous consumption, as some buildings in the increasingly urbanised oasis could rightly be called mansions, and cars get flashier.

The uptake of 'Western' values is not wholesale however. The disastrous 2008 flood inspired the new generation of youth, mostly university students, to rethink their community principles. Some stated that their parents had behaved wrongfully according to an individualistic orientation, which they associated with modernist, 'Western' notions of private property ("a man's home is his castle" as one of my friends put it to me, using the English idiom in the English language). The youth felt that reflecting on the actions of the older generations, they must make adjustments and revaluations in terms of their collective values. Such intergenerational processes show that social change isn't unidirectional, that with the capacity to reflect it may be more dynamic and complex. I return to intergenerational dynamics later.

5.4 Discussion: A framework of conflict and power for SES theory

It may be argued that historically, the political organisation of the majority was determined through authoritarian structures such as the elite ‘council of notables’ (the *ayyen*) and especially the theocratic clerisy, the *‘azzāba*, and to those whom power was sanctioned by them (e.g. *l’oumna*). A Gramscian analysis would suggest that the hierarchy of this political order, which maintained patriarchy and the elite over the working class, women and the youth, was upheld through a manipulation of religious ideology, thus hegemony was maintained through the consent of the ruled classes. Such a view describes how order is maintained not just by domination, such as the threat of force, but through the manufacturing of consent.

Gramsci revised Marx’s political economic analysis to include a theory of culture. Specifically, Gramsci provided a theory of cultural hegemony as central to controlling the means of production and class domination. In this way, cultural hierarchy was naturalised, and people accepted domination. To overturn the dominance of the ruling class, then, the construction of a new hegemony was needed – or portrait of the way the world looked. Hence ‘organic intellectuals’ were important – those who emerged from dominated classes and could articulate a new critical vision of cultural reality to serve as a basis for motivating the dominated to ‘revolution’ (Strinati 2004: 152–4).

The theory of hegemony can be applied at the smaller scale also, to the theocratic rule of Mozabites by the *‘azzāba*. Indeed, I argue that political change has come about through a confluence of internal and external factors. The secular elite has drawn on the power of the Algerian state to further its political influence, and in so doing has effectively pushed the *‘azzāba* to the background. This was and remains a

delicate process, however, involving the successful shaping of ideology, and as such involved acting at the right time. The crucial timing, I argue, was during the formation of the new Algerian state in the early 1960s. The new state was legitimate to Mozabite society, for unlike the previous French rulers, it was an Islamic state. Such a position was not a given within Mozabite society, and the debate, as usual, took place between progressives and conservatives. The key concern was how to achieve the optimum degree of autonomy for the M'zab, and whether this involved more or less political integration and involvement with the new state. The progressives appear to have overcome, and in drawing on state juridico-political apparatus, have effectively usurped the *'azzāba* hegemony. Imperative to the stability of the balance of power is that the *'azzāba* do retain some influence, now relegated to the moral sphere.

If we apply this framework to the collective well associations, it can be seen that the egalitarian mode of relations means that compliance is difficult to achieve. This may be because of the additional element in the network of relations: the state. In this case the relationship to the state does not involve coercive or hegemonic processes to maintain agreements, as it simply shuts off the water supply in the case of non-payment by an individual. It is not interested in continued organisation but only in payment. The more spontaneous organisation of the collective based on 'soft' agreements, i.e. not backed up by the threat of coercive force, means that maintaining the flow of water involves a network that can be broken by the weakest link. This example can be perfectly transposed onto the maintenance of the larger irrigation system for it contains identical political dynamics involving the different interests of the different social classes. Those that rely solely on a farming livelihood have a much greater interest in maintain the flow of well or irrigation

water, whereas generally for the merchant class it is not of great consequence (they can afford to purchase food, or even install an additional well). The achievement of consent among more powerful individuals is not ruled out, however, with this greater individual agency, for hegemony involves not only coercion but persuasion. It is still possible to influence non-complying individuals by appealing to their sense of (family) honour. For example, another well-respected individual may attempt to persuade them to remember their duty to cooperate with the wider community. (I discuss these local channels of conflict resolution in chapter seven.) These influential individuals may now come equally from the secular council as from the religious one, meaning that persuasion is not just religious in orientation (the *ayyen* is now incorporated into the state administration, giving them even more local legitimacy).

This framework for negotiating consent, I argue, provides a much more dynamic approach to the unstable relations of power that social ecological systems theory lacks. As Gramsci puts it, consent, involves ‘a continuous process of formation and superseding of unstable equilibria... between the interests of the fundamental group and those of the subordinate groups’ (Gramsci 1977: 182 in Nilsen 2015). I propose, therefore, that the incorporation of political theory such as Gramscian cultural hegemony is needed to address the sociological processes of conflict and inequality that are involved in natural resource management. This would then elevate the understanding of the social dimension to that already offered by the sophisticated SES conceptualisation of non-equilibrium ecological processes.

5.5 Conclusion

I began this chapter by showing that local structures and processes, whether the built environment or social institutions, are not just adaptive responses to the environment, but involve other historical factors such as cultural preferences and market pressures. For example, the need for ‘social visibility’ necessary for natural resource management contrasted with cultural norms of privacy. Within individual oasis plots, the presence of crop diversity may be more influenced by cultural factors, which coincidentally serve an adaptive function.

Thereafter, I described the political sociology of oasis management, with an analysis of class differences, followed by discussion of the mediation of equality in idea and practice. I finished with a suggestion for a new formulation of SES theory that includes the Gramscian conception of hegemony. Thus, I have gone some way to portraying the productive transformation of oasis resources as involving both material and social relations. Next, I go further into an analysis of issues of class and ethnicity involved in contemporary labour relations.

6. Misunderstanding migrants: Coping with unstable labour relations

One of the main problems is labour. You train one guy, often from Adrar or Mali, who wait [for work] in Ghardaia. Then someone else offers them more money once you have trained them and you are left at square one. Or if you know workers who live nearby who rent houses you can go straight there. Malians don't have agricultural knowledge and you have to spend time showing them what to do. There are no local workers from Beni Isguen.

~ Bayoub Abbess, 24/12/12

6.0 Preamble: From Gift Economy to Market Economy?

The configuration of contemporary labour relations and how they have changed over time is one of three major events that have shaped how farming is undertaken today in Beni Isguen oasis. I discuss how recent trends related to a shift toward market-based practices have affected social ties previously styled upon reciprocal, mutualised “gift” relations (Mauss 2011 [1954]; Gregory 1982) and subsequent changes regarding competition and atomisation, affecting the local conception of *al amena* (loyalty or faithfulness). Classical theorising of an inevitable shift from *gemeinschaft* to *gesellschaft* (Weber 1978: 41 [1920]) does not fit the Mozabites of Beni Isguen, however, who rely on old and new institutions to mitigate such change, while at the same time embracing a certain type of merchant economy. Strathern's *Gender of the Gift* (1988) (drawing from Chris Gregory's (1982) framework), presents an overly dichotomised distinction between gift economies in Melanesia and market economies in the West (Biersack 1991). Along with other recent works (Pascon 1986: 20), I aim here to show that the transition is more complex, and multiple forms of economic relationship remain (Hornborg 2001:

148). Indeed, to some degree a 'moral economy' (Scott 1976) has returned, due to reflection on what happens to local notions of personhood and mutual aid which can be lost in narrower market relations.

Although this chapter is about labour relations and wider economic systems, the event to be explained is not, therefore, the (abstract) penetration of market forces into the M'zab valley (these already existed due to the merchandising activities of Mozabite traders), but *the demand for economic remuneration for labour services rendered in the oasis, in the form of cash currency, rather than remuneration by (delayed) reciprocal labour*. This action further entails a rejection of persons through bonded entanglement, as relations are instead commoditised. I attempt to explain the etiology of these changes by examining the development of modern infrastructure by the Algerian state following independence in the 1960s, as part of a broader national economic development programme. This is not to claim that such development was not locally desired, yet Mozabites have since reflected on the negative repercussions of the resulting higher living costs, which, as I attempt to portray, has in turn caused the economic rationalisation of (certain) social relations.

My starting point, however, is the problem of unreliability or instability of labour, as premised along the lines of competitive jostling between farmers for experienced workers, as decried by the old farmer Ammi Bayoub in the above quote. The reason that I explore labour instability, is due to its contrast with stated local institutions of *al amena* (loyalty to the group), *twiza* (mutual aid), and the hard work ethic more generally (discussed below), as well as the fact that it was described as a serious problem by farmers. I suggest this situation has resulted from the effects of the political subordination of the Mozabite community during the colonial and

postcolonial eras (despite resistance by Mozabites to the colonisers), and from a subsequent drive toward national economic development. I show that state policy *intentionally* drew labour away from agriculture to industry, as part of a modernising development drive, although what *form* of modernity it was to be remains the source of national debate (McDougall 2006: 3).

I begin with the present, therefore, by outlining the contemporary labour relations in the valley as I observed them. A contemporary problem is that migrant workers do not tend to stay. This pattern contrasts with the reliability of *twiza* labour (reciprocal work). Such instability is partly due to the nature of temporary migration, but also due to other factors which I describe. Such transience creates further problems for Mozabite notions of order and control, as well as revealing ideological views towards black Africans. I then explore the proximate drivers regarding labour scarcity, including the development of industry and universities. I go on to describe previous historical labour arrangements (in consecutive sections on *twiza* and *khammēs*) and the events that lead to the transformation of the current configuration, primarily the national economic development programme. This is followed by a discussion on Algeria's experiments with socialism and state-led capitalism and their relationship to the political interpretation of Islam. I then discuss how the M'zab valley is only partially integrated into the market economy, with local farmers on the one hand unable to export their goods beyond the immediate region due to structural reasons (the Algerian 'rentier' economy); and on the other hand, an attempt to revive traditional gift economy practices at the local level. I finish with a critical review of Bourdieu's examination of the economic peasant, followed by a discussion of local attitudes to work and the environment. I begin, therefore, by presenting an ethnographic view of current labour relations.

6.1. Migrant wage labour: a necessary nuisance

My wife (also an anthropologist, who was visiting for Christmas) had been asking Ammi Bayoub what the main problems of farming in the oasis were. He gruffly responded, “there is no work without problems/troubles (*mushākil*)”. He went on to explain, however, that labour was a big problem. Further, you would spend time training a worker, and then another farmer would come along and poach him. Such workers mostly came from a new labour pool in the region, made up mainly of Malian migrants, although there were some from Niger, Burkina Faso in the Sahel and some from coastal West Africa including Liberia and Cote D’Ivoire. They were invariably young and carried their rich, colourful music blasting tinnily from their mobile phones everywhere they went. Mozabites referred to them *en masse* as “les Malians” (as do I here at times for ease of reference, and to echo the local usage).

Migrants as a necessary nuisance

The Malians appeared to be a necessary nuisance to the Mozabites, with their perceived brash youthfulness, lack of awareness of local customs and sensibilities, and limited command of local languages (usually a weak form of French was used; the majority had not been educated beyond primary school). Yet the Malians performed the key services of unskilled agricultural labour such as digging irrigation trenches and weeding, construction of the increasing number of living spaces now dominating the oasis, and as caretakers to the various second houses and agricultural spaces in the old oasis and the Ntissa areas beyond.

People often complained to me about the migrants, saying they didn’t trust them; they would rather hire a worker from Algeria. Migrants would often be employed

to look after oasis properties while owners were absent. With the war going on in neighbouring Mali (in early 2013), however, whose border was not far, tensions escalated locally. Migrants were attracted to the higher wages paid by the wealthier Mozabites, and the M'zab valley lies on the route between the border crossing at Tamanrasset and the capital Algiers in the north. As a 'white' foreigner, some people were afraid for my safety and I kept a low profile. On one occasion, one of my benefactors, Ahmed, came to visit where I was staying and he heard a group of migrants next door. He became agitated and called the owner of the building. When the owner arrived, Ahmed complained to the owner, "I don't know these people and I don't trust them. I prefer to hire Algerians whose *asl* (Arab: lit. 'roots', meaning 'origins') I know. They could bring weapons there and store them and nobody would know".

Although they have been coming since the late 1980s, for the Mozabites, the migrants still represent an unruly force, a potential threat as they are not subject to the local order. This contrasts with populations who arrived from the same regions up until only three or four generations ago as part of the trade in slaves, who now self-identify as Mozabites. These individuals were completely under the control of their masters, unlike the new wave of 'Africans' coming now by their own volition. Mozabites of West African origin did not associate with the newcomers. They had their own unique Mozabite identity, which they differentiated partially from the 'white' Mozabites by certain practices. I asked one whose grandfather was a slave and knew many of the stories. He had no interest in knowing more about his deep past – the only connection he had to earlier roots was his name.

The valley was once fully Mozabite, but with the settlement of the previously nomadic *Sh^aamba* Arabs (over the past century) and subsequent migrants from around the country, the original inhabitants have become a minority. Further, the migrants were said to bring diseases from “Africa” as they referred to the sub-Saharan region²⁶. I attended a major conference attended by farmers from around Saharan Algeria. All the major problems regarding oasis farming were discussed, with one workshop for ecological issues, and another for social ones (I attended both). That migrant labour was an embarrassment locally was clear, due to the complete absence of any reference to this group. In fact, Mozabite politicians had been campaigning to have the migrants removed from the old oasis, now an extension of the residential area of the town due to increasing urbanisation, due to the allegation of some recent thefts. Malian thieves had apparently broken the sacrosanct inner chambers of some family homes in the oasis and stolen something of value. The powerful politicians didn’t want them completely removed from the area, however (as one of my friends cannily pointed out), as Malians were needed to look after the extensive lands of wealthy Mozabites (in the Ntissa farming area). Thus they wanted to keep them at arm’s length, removed from the locality, but still within the margins of the occupied territory in the valley.

Some wanted them expelled completely. While we gathered low-grade dates into sacks for animal feed one day, Hamza confided:

Once someone called me at the time of gathering dates. I said we could meet that evening. They came and told me, “You mustn’t hire Malians anymore”. Why? The *ayyen* (bureaucratic council) had decided this year that they are trouble. I said, “Ok, but who’s going to work in their place? You? The man

²⁶ In fact, some unfortunate attacks on some migrants had occurred recently in al Atteuf. Before I left, however, I was informed by a local Christian missionary that a sort of reconciliation had taken place between Malian and Mozabite leaders, to make amends for such behaviour.

said, “Ok, but don’t give them somewhere to live.” At the time I agreed. But how am I going to stop thieves from robbing my house without a guard? Who will work in their place?

~ Hamza, 12/10/13

A tradition of Malian migratory practice

Many migrants actually had a history of emigrational work and returned to the valley time and time again. Migrants from arid Mali and Niger tend to differ from other forested West African countries such as Guinea, whose educated migrants tend to scoff at agricultural work, and tended to be lazy when they *did* undertake it, according to farmers. This latter group were ‘stop-off’ migrants, hoping to make it to Europe for a better life, compared to the Malians who actually had a tradition, regarded as something of an initiation rite, of cyclical, temporary migration (de Haan et al. 2004). They would work for a couple of years, make enough to set up and buy land or a shop and find a wife and start a family. After the long period of slavery populations from Mali, Niger and Burkina Faso tended to migrate from the dry Sahel to the lush British cacao plantations of the West coast, such as Ghana (Konseiga 2005). Here, the local population were known to be jealous of the Sahelians as they had a reputation for working hard (the theory being that the Sahelian soil took so much more labour to be productive, and even then it was not productive enough, hence the necessary emigration). Following the various civil wars of West Africa such as in Liberia and the Ivory Coast, the Sahelian migrants re-routed themselves back along the old slave routes to Algeria (Johan Miltenburg, Père Blanc missionary, pers. comm: 20/09/13).

I was informed by Hamza who employed ‘Maliens’ regularly that they started to appear in the M’zab just before the 1990s, congregating around *la Post*. At first they used to gather scrap aluminium and ship it back to Mali. Then they realised

they could get more by working for people. “There was a time when they weren’t here and work was hard. But *al-hamdu lillāh* (praise God), they are useful.”

Contrasting with Mozabite perception of disorderliness, inter-Malian relationships were in fact highly structured, with a headman for each group of the different West African countries, who maintained order, guiding washing activities on the Friday holiday, and providing general favours based on his connections, with people as far away as Algiers, Tamanrasset and Mali. This headman was elected and could call on favours, based on his honour, his ability, and his worldly knowledge to fix things (Johan Miltenburg, Père Blanc missionary, personal communication, 08/03/13).

The instability of market-based relations

Some migrants, such as Mohamed, expressed interest in learning tree-climbing skills, presumably in order to increase wage levels and employability. Hamza related to me Mohamed’s desire. Yet for Hamza there was an issue of trust, he had trained people in the past and they had then simply disappeared. Hamza wasn’t always so cynical of the relationship with his workers. In the past, he had a worker from Mali named Ali. He spoke with great fondness of Ali, whom everyone knew. “Ali returned every year, and would think ahead, and pre-empt your needs,” he reminisced. “These workers nowadays, they just do the basic minimum; they do their hours and then leave, even if the task isn’t finished! You ask them to stay and they say no!” We went on to discuss how wage-based relationships devalued social relations based on stronger ties of kinship and reciprocal gift-based economies. With the Malians, he implied, there is no social capital.

Nejib, a palm specialist, also described his frustration with the wage system, yet his sentiments exposed ambivalence toward cash payments. He angrily related how as a paid worker people felt they could talk to him in a certain way, revealing a hierarchy inherent within commoditised relations. Essentially he felt disposable, contrasting with the deep bonds of responsibility that still existed within other social relationships, such as the qualities of voluntary service to the community at large which are still highly valued. On the other hand, he expressed his preference for cash, while previously workers were paid in kind usually with produce at the end of harvest (I describe the *khammēs* or sharecropping arrangement below). This new preference is directly correlated with the multiplication of new possibilities and responsibilities upon which one can or must spend said cash. I describe next how the range of possibilities has expanded as the cost of living has risen and along with it, expectations, and I outline the forces behind these economic changes.

To summarise, there was a problem of skilled labour in the valley. Many argued that this was the major problem affecting the entire Saharan Maghreb, after water shortages. Some migrants did have agricultural experience, but it was apparently inapplicable to local conditions. For those that did have know-how, there was fierce competition between farmers by means of undercutting, i.e. offering higher wages to labourers who had been trained by others, and this was causing animosity and mistrust among farmers who previously used to cooperate as a matter of necessity (as I explain below). Conversely, there were some, like Mohamed Jebra, who insisted that the workers didn't need to know anything, as long as someone in charge had adequate knowledge. He himself had hired a foreman to manage the workers. I observed that this involved a lot of micro-management, however, simulating a paternal relationship and reinforcing dependence. Perhaps this served

Mohamed's interests better and he cultivated it on purpose; I do not know. Yet when it came to the harvesting of dates, he complained of the lack of experienced climbers. The fact that farming had only started in the Ntissa area 25 years previously, and the old farmers were dying out, meant that there was a rupture in most cases of traditional farming knowledge. This was exacerbated by socialist experiments by post-independence governments in the 1960s. New intensive farming methods were being picked up, yet some of these are, arguably less sustainable in the fragile Saharan environment of the M'zab. Thus skilled individuals, trained in the old ways, were a rare 'commodity'.

6.2. Possible explanations for labour instability

Here I analyse the cause(s) for instability in work relations in the M'zab. Clearly, Mozabites required cheap labour, and on the other hand, Sahelian migrants were looking for work. Why were Mozabite employers so dissatisfied with them? To depict this systematically, I work through various possible explanations and eliminate those which do not stand up to the ethnographic evidence. Based on Vayda's suggestion (pers. comm.), as there are multiple causes I have weighted them according to the importance to my informants as based on their narratives. As this is a relatively subjective score I have not ranked them against each other, although I give full justification through reasoned inference.

Table 6.1 Possible explanations and their weighting for labour instability.

Potential causal event	Valid?	Weighting (0 not important – 5 important)
a) Temporary nature of work migration (supply)	Yes	2
b) Seasonal nature of work (demand)	Yes	3
c) Lack of trust between workers and employers	Yes	4
d) Better pay	Yes	4
e) Lack of fixed agreements, contracts or legal recognition for workers	Yes	4
f) Competitive undercutting by other farmers (poaching)	No	1
g) Hourly wage labour system	Yes	5

a) *Temporary nature of work migration (supply)*

The Sahelian migrants had their own expectations regarding the informal working contract with their Mozabite employers, such as ‘loyalty’ and length of employment (see figure 6.1 for an illustration of how multiple factors interact). When asked, migrants told me that they came to make money, to save in order to buy land, start a business and save for a dowry to get married. They were essentially young males looking to set themselves up in order to prepare for family life back home. Such temporary migration is a traditional cultural practice in the Sahel. From the Mozabite point of view, the fact that today’s workers are coming for one time only and not seasonally results in a lack of emotional investment, in terms of creating lasting bonds of affinity, and in terms of training.

b) *Seasonal nature of work (demand)*

The temporal nature of work in the oasis is not only due to workers expectations, but also to the way that farming is adjusted to the seasons. There are high and low seasons that correspond to intensive labour tasks, and times when there is less to do. Much help is needed during the harvest. December, however, involves a lull when there is less to do. I spoke to farmers who related the difficulty of keeping workers employed full-time and finding tasks for them to do during quiet periods. They felt a responsibility to workers, but could not afford to keep large teams, and thus perhaps reduced workers groups to smaller numbers. Thus demand, as well as supply factors have an effect on the expectations of work migrants.

c) *Lack of trust between workers and employers*

The preceding section (6.1) described the lack of trust by Mozabites of the 'Malians'. This was partially because they were mostly unknown, and didn't fit into the highly normative order of Mozabite life based on conservative ideas of correct behaviour, involving as well derogatory views toward 'Africans'. This was compounded by the position of 'dissociation' toward non-Ibadites, described elsewhere (chapter four). Some sympathy for these workers was apparent among some Mozabites due to the on-going war in Mali at the time, yet this sentiment appeared uncommon. Distrust of the 'Malians' tellingly contrasted with attitudes to settled black individuals from the same region, brought generations ago with the slave trade, who were known and trusted. Oussedik (2012) argues that this is because they were Ibadites, but I propose that it is mostly because they were familiar, and knew the 'proper' ways to behave (not that this group wasn't also discriminated against, but they were accepted as part of the local order of things). Finally, the 'Malians' were not included in the local notion of *al amena*, as they are not recognised as belonging to the in-group to whom loyalty is owed, or upon

whom the notion of group loyalty is impressed. Conversely, because the Malians were looked down upon and mistreated by many Mozabites, they retained animosity towards their employers. I witnessed one farmer yelling at one of his Malian employees, on hearing he had been sleeping on the job whilst unsupervised. The problem was, he employed several Malians, and had no way of knowing for sure which had committed the misdeed. A sense of animosity therefore, goes both ways, feeding the unstable state of working relationships between the two groups, for such ill-feeling encourages Malians to shop around for better working conditions.

d) *Better pay*

I witnessed quite a high turnover of employees working for farmers and palm experts. As well as being motivated by optimising working conditions in terms of respectful working relationships as discussed above, Malians were clearly shopping around for the best deal in monetary terms. Thus, another factor of Malian organisation was the presence of networks of communication, where individuals shared experiences of bosses and wage rates. This factor also meant that Malians would move around frequently, also destabilising reliability.

e) *Lack of fixed agreements, contracts or legal recognition for workers*

Even though migrants were supposed to be officially permitted by the state, there was a sense of nervousness and ambiguity among many about their status. Furthermore, there was little in terms of agreements between workers and employers, let alone fixed contracts. The minimal understanding was that employers would turn up in the early morning outside the town gate and choose a worker or two from the group who had been waiting there since pre-dawn. If the

employer appreciated the work done, he would tell him where to meet him the next day, if not he would return to the same pool the next day to choose someone else. This situation suited the employers.

f) *Competitive undercutting by other farmers (poaching)*

Several farmers, including Ammi Bayoub, pointed to this factor of undercutting as a major problem. Although labour was available, workers had to be trained. The problem here was that there was no guarantee that they would be loyal to the farmer who had spent weeks or months doing the training. Thus, the sense was that others were identifying trained workers and offering them more money, which the original employees were often unable to match (especially Bayoub). This belief belied the agency of workers (factor d), however, and the fact that based on their communications they could choose employers through recommendations of others (another less random way for employers to find workers). Therefore I give this a low ranking in relation to the shopping around of workers.

h) *Hourly wage labour system*

The wage labour system itself, compounded by lack of fixed agreements encourages competition, and shopping around for the best work situation, in turn causing instability of work bonds and loyalty. Further, the hourly wage system - as opposed to one based directly on productivity - leads to lack of incentive for individuals to work hard, perhaps then leading to the perception by employers that work migrants are lazy. It might be suggested that employers prefer not to give a greater share of profits, and thus keep them at a controllable, minimum hourly wage.

All of these factors play a role, from the expectations of workers to that of employers, the uncomfortableness of Mozabites with unknown 'Africans' and subsequent discrimination all play a part (see figure 6.1). The financial aspect is perhaps the strongest factor, entailing a fragile contract involving the receipt of a wage at the end of a week's work, which points to the nature of market principles and values in guiding labour relations. This reveals how the competitive instability contrasts with the need of farmers for reliable for an entire season work. This is compounded by the informal nature of the contract, where no legal certainty is provided for either party, perhaps also revealing the relative newness of farmers to the market system of labour. The supply and demand aspects of employer and employee also play a role, based on seasonal needs and motivations, respectively. The short-term nature of these relationships, compounded by the loftiness displayed by some Mozabites contributes to mutual feelings of distrust. I argue that competitive undercutting by other farmers is less of a factor, for it does not account for the agency and organised networking by Malians, and so I disagree with Ammi Bayoub's explanation for worker unreliability.

Such transient relations contrast strongly with the long-term, highly bonded, obligatory relations formed through *twiza*, or mutual aid, a notion which is still valued in the valley. I suggest that the Sahelian migrants filled a vacuum in the valley of cheap labour that was once supplied by slaves. Next, I will try to assess what caused this vacuum, prior to the arrival of the migrants.

6.3 Economic context affecting declining agricultural labour in the M'zab

Sahelian labour fulfilled a need for agricultural workers in the oases of the M'zab. Here, I offer an historical ethnographic analysis of the causes of labour relations, and the political context that caused significant changes. This labour void was caused by several factors. First and foremost, the industrialisation of Algeria in the 1960s, and with it the creation of factories, drew the majority of unskilled labourers away from the rural areas. Indeed, Bennoune (1986) describes how the urban population swelled from 3.6 million to 6.8 million between 1964 and 1971. My friend Hamza was perhaps a rare individual who, after spending several years working in factories, as encouraged by his father, came back to the oasis to work as a *phoeniciculteur*, as he preferred to work for himself, thus re-establishing an ancestral lineage of agriculturalists who worked as *khammēs* previously to Hamza, and before that as slaves. Hamza has adapted the traditional role of *khammēs*, however, by branching into more commercial relations, such as trading dates and fruit trees, and by employing teams of skilled and unskilled workers from Mali and Adrar.

Further, the development of the oil industry, headed by state-owned Sonatrach, is *the* major draw as a source of jobs at different skill levels. Djabbir told me that it is possible to earn €10,000 per month, “so then why would I want to shin up and down palm trees²⁷?” I pictured that for Algerians, securing an oil job is similar to winning the lottery; one could then easily buy a house, marry, and have children. This contrasted sharply with actual economic conditions in the country of

²⁷ Thus earning 10 times more than a date palm expert, who can earn around €30/day.

extremely high unemployment, causing many to seek employment transporting contraband for the black market²⁸.

Mozabites were becoming more educated²⁹, with more gaining higher education degrees since the opening of the Ghardaia University in the 2000s. The first doctor graduated in Beni Isguen in 1967. Now, Nejib informed me, fathers do not want their sons to climb palms anymore due to the perceived risk³⁰. A tree climbing school does exist in Beni Isguen, and I met a young climber named Youssef who had graduated and now worked sometimes as a professional *phoeniciculteur*. Youssef was also doing a master's degree in engineering, however, which would take him out of the oasis as soon as he could get oil work. On learning of this school I went to speak with Ahmed Cherifi, who ran it. I had unfortunately missed the season, so I could not witness the activities, but Ahmed explained to me how the school was run. Previous graduates would teach the new cohort of about 10 boys the essentials of palm tree climbing. On inquiring how many went on to professional palm tree climbing, however, Ahmed informed me that the vast majority did not, that the real value of the activity was in the confidence and endurance it inspired in the youth. It promoted broad life skills, thus revealing his pupil Youssef to be rare example of a youth who actually climbed trees for a living, although that future was far from certain.

²⁸ Indeed, unemployment or underemployment has been the root cause of many protests, partly held by the *union des chomeurs* (unemployed), hundreds in the year of 2013 alone, yet invisible alongside the movements of the surrounding 'Arab Spring' in neighbouring countries due to a lack of unification, free hand-outs from the State, and general fear of return to the 'bloody decade' of the 1990s.

²⁹ Education was previously frowned upon by the *'azzāba* due to its potential to subvert normative, religious thought and practice.

³⁰ Falling is indeed a risk and a major cause of injury, due to loose segments on the dry trunk. A French NGO named BEDE has been working alongside Tazdait to secure assistance from the climbing company, Petzel to aid in designing special harnesses for *phoeniciculteurs*. I witnessed some testing *in-situ* of pre-production models.

Phoeniciculteurs were becoming a rare breed, and it was necessary to bring skilled climbers up from Adrar, although many of these were also drawn away to oil jobs. The Tazdait association was formed partly to safeguard *phoeniciculteur* knowledge and livelihoods. I did hear a story, however, that gave more hope for the future of these specialists. Nejib told me that once a youth had approached him, who told him that although he had never directly spoken with him, the youth had taken the confidence from Nejib through silent observation over time, and gradually taught himself to climb. This made Nejib very happy, for it was indeed his wish that his actions should inspire the next generation.

The urbanisation of agricultural land is a common problem across the Sahara. This phenomenon drives land prices up and farmers out. Many complained to me that this was a serious threat to Algerian oases, after problems of water scarcity and transient labour, and that although there are laws in place to prevent such activities, such encroachment is rarely policed. The opening up of adjacent land in Oued Ntissa and across Algeria is a state development initiative to encourage agriculture and rural livelihoods and has caused more families to take up agriculture again. Now, the old oasis consists of mostly small horticultural plots with houses, maintained by *phoeniciculteurs* (local and from Adrar) along with paid migrant labour, and a handful of farms. Adjacent to this is Ntissa, with smallholdings of two to five hectares, developed gradually by those without resources and more rapidly by those able to invest saving or loans, and pay small teams of Malian workers.

With better pay and arguably better conditions, industry has enticed unskilled labour from the oases generally across the Maghreb, and university education leading to the emerging professional sector has attracted the intelligentsia, while the hydrocarbon sector has attracted both. This created a need for labour in the valley which the Sahelian migrants have necessarily filled. As well as a slave-based economy prior to abolition in 1848 (although slavery continued for some time, for despite slave revolts the French didn't wish to disturb relations with wealthy clients (Brower 2013: 173)), production took place according to a mixed system involving both feudalism and mutual aid. I discuss the system of mutual work first, and then describe the semi-feudal sharecropping system after.

6.4. Economic transformations

Prior to the industrial drive of the 1960s which drew labour away from the M'zab oases, work was based on a particular cashless economic form known as *twiza*. I describe now how the need for cash led to the transformation of this former productive economic system, and the structural reasons for this change. *Twiza* describes the relations between farming peers. In the following section, I then explain the system of *khammēs*, which links landless peasants (or landowning peasants who wish to cultivate additional land) to landowners. Thus the two together describe institutions of labour and property, involving 'horizontal', egalitarian relations (*twiza*) and 'vertical', hierarchical relations (*khammēs*). These taken together outline an overall picture of oasis production prior to Algerian independence.

6.4.1. *Twiza*: the ‘gift economy’?

Returning to our conversation with Ammi Bayoub (quoted at the beginning), we continued to ask him about other farmers in the area. He became silent and reflective. According to Bayoub, farmers - of which there were only four or five now in the old oasis - had now virtually turned against each other in a competitive struggle for a scarce resource: skilled labour. Yet it wasn't always this way. Farmers used to help each other, as Bayoub outlined, for example, to deal with drought:

The last big drought was in the 1940s, it lasted 11 years. They dealt with it by twiza, by moving water back and forth by donkey. Twiza consisted of working together, two days here, two days there. There were about 20 or so farmers in the oasis in the past [working in this way]
~ Bayoub Abbess, 28/02/12.

Twiza was also used to deal with flash floods. On asking him about how many floods he could remember, he told me:

By God I wouldn't lie to you", [i.e. I don't remember, not sure]. A huge one came in 1954 that destroyed a lot of property. A lot of people helped each other back then, by twiza, to repair the houses, clean the cellars etc.
~ Bayoub Abbess, 19/11/13

On inquiring further about *twiza* people would tell me that there were two forms, ‘obligatory’ *twiza* that was ordered by the mosque, for the communal restoration of public works such as a damaged irrigation canal, and ‘voluntary’ *twiza*. The following definition of *twiza* by French colonial ethnographer Georges Colin (1994) captures this dualistic sense. *Twiza*, as Colin argues, involves:

- 1) The provision of unremunerated collective work.
- 2) Unpaid, mandatory labor, generally voluntary, agreed to by a group... for another group as return for a favor, especially for agricultural work; plowing, harvesting, threshing, the harvest of olives, also for building a house... in exchange for offering the participants a substantial meal... for

the profit of the community for repairing a mosque, maintaining footpaths, irrigation canals, etc.

3) A *corvée* placed on citizens by a *qaid* ... he has at his disposal in each village belonging to the tribe he oversees, a field or large plot of land belonging to the state; it is a mark of bondage as unpopular as it is onerous... [Sinaceur 1994: 208]

Lepkin (2004) argues that this contradictory sense of *twiza* lies in a tension between a solidary past and colonial coercion. The actual, forgotten history of obligatory *twiza* lies in the orders of the colonial French government for *corvée* labour from a humiliated Algerian population. Based on local texts, the underlying rationale for *twiza* relates to maintaining group solidarity and creating a just order. This was complicated as the French attempted to usurp local categories of equality, in the professed interest of righting past wrongs, especially the divide between landless blacks and landed whites. Yet, for certain categories of outsider, solidarity meant resistance against the despised outsiders (Lepkin 2004: 29-30). Using Pascon, Lepkin shows how the mutual aid of *twiza* was originally distinguished from *kulfa*, which was imposed by the *qaid* or the *makhzen* (colonially charged local authorities). Due to a “slippage” of meaning, the two terms became conflated. Then drawing on Le Tourneau (1978 [1949]), Lepkin relates how the *makhzen* in Fez periodically imposed *corvée* labour upon the population for irrigation and general upkeep of the city, calling this *twiza* (2004: 32-33). Of course, ‘voluntary’ *twiza*, is not exactly freely given either, but forms a kind of informal contract of reciprocity (*sensu* Mauss 1954).

Reciprocal systems of aid based on use-value have probably existed the world over, prior to the global capitalist system that now prevails (e.g. Sabourin 2000). This is not to say that the newer system is experienced in the same way everywhere, indeed local conditions as revealed by ethnographic sources reveal unfamiliar

hybridised forms that are locally modified (e.g. Narotzky 1997: 196). *Twiza* is common across North Africa among Berbers as a system of reciprocal agricultural labour. These arrangements are generally understood as a form of mutual ‘entanglement’ where mutual need creates mutual assistance, thus generating debts. Over time, keeping tally of so many debts may become impossible, and thus neighbours may feel at ease in calling on one another for help. On the other hand, Crawford (2009: 106) describes how long-term labour debts may be remembered and reciprocation is expected over generations.

On the loss of *twiza*:

We go back and sit on cushions and chat about the past. He talks of how twiza happened when planting or turning the earth. I ask why it changed. He said because of cash, people started demanding that after independence, in order to pay for commodities, such as electricity. It wasn't just about putting bread on the table.

~ Field notes on Bayoub Abbess, 09/04/13

Bayoub described his unease with the changes in modern day social relations, stating “now you are afraid of some people, you have to choose your friends carefully for trustworthiness”. I was curious to understand how and why *twiza* broke down. Nejib explained the situation to me somewhat, also deploring such change:

Nejib visits. Inside, I question him about twiza and tebria. He says twiza happens no longer, after the French ‘broke’ [sic] the social structure or at least the traditional rules, and replaced them with the civil law. Now, people say they will just pay someone. But we talk of what is lost, the camaraderie, such as cannot be bought.

~ Field notes, 01/02/13

Nejib decried the loss of a more complete, human relationship that existed until it was narrowed into a uniquely economic category. This economic exchange no

longer involved the reproduction of social relations based on values of solidarity, but became a transaction where the relationship devolved into one of consumer and producer/service provider where the bond was fragile, and thus easily displaced. Thus, service providers became essentially 'disposable' by those who were thus minded, while of course others still honoured older, long-term relationships. Cash economics simply meant that those who wished to could break those bonds, seeking improvement in quality, greater efficiency (less time-consuming feasting was necessary, for example) or the best deal. Nejib informed me that often landowners, using the language of the hierarchy of the consumer, spoke to him rudely, and so in return he would break economic and social relations with them. He told me that what motivated him more was when the children came out and started asking when the dates would be available once again. Of course, he also needed to put food on the table, but this example clearly shows the tension that exists when benefits are rationalised into discrete, calculable economic units, and what this does to social relations that are based on trust.

Indeed, the very act of reciprocity in North Africa, the 'interested gift', must not be returned instantly, as to do so would mean that the receiver wants no further relationship with the giver. Furthermore, Bourdieu argues that the "spirit of calculation" is diametrically opposed to the value of honour and generosity, giving the example of the workman who was told never to return after he demanded an extra 200 francs for not receiving the usual symbolic meal at the end of the day (Bourdieu 1979: 20). Thus the counter-gift must be given in such a way and after such a time, that the calculation remains 'hidden', although each really is noted, and those who do not repay are remembered, and perhaps mocked. Indeed, describing an individual as 'someone who calculates' is a great insult, insinuating that the

person in question only gives after first evaluating what he or she will receive in return for the gesture.

Essentially, the catalysing shift seems to have come when modern infrastructure entered the valley, making the Mozabites dependent on these payable services which had been privatised by the state. Cash existed in the town for it was the currency of merchants, but agricultural labourers had small need for it before this period. The biggest change was the technical ability to pump water from the existing wells. Previously, farmers used to spend the entire day, or at least six hours straight going back and forth hauling the water by beast power, and in the hot season this had to be done every other day. Hamza remembered well doing the work for his father when he was young:

I spent a lot of time watering the garden here with the hmar, donkey. We fed the donkey well, but it would be panting. When Baba was by himself he used to fill up the basin, then drain it into his wheat field. People had wheat fields to feed their families, some would be used for a special kind of tam [couscous] for the wedding ceremonies, and the rest would go to the animals. We didn't sell it. He would let it dry and then cut it and take it in bundles to where all the farmers kept their wheat. Baba used to grow wheat in Merghoub with Ammi Bayoub. They stopped when it became easier to buy in the shops.

~ Hamza, 12/10/13

A labour-saving device such as the immersion pump was warmly welcomed to reduce the burden of such a laborious process on the farmer's time. This was made possible by the introduction of electricity into the oasis, in the early 1960s. Yet many people also complained about the prohibitive cost of electricity bills. The government also began to drill deep wells down to the phreatic, fossil aquifer, starting at about 120m depth, beyond the shallower, rechargeable albian aquifer, at 18-30m depth. This was undertaken as a development project to assist with the recurrent and severe Saharan droughts in the 1960s. Yet farmers complain about

the price of these services also (see previous chapter for how this affected collective well associations). These, along with the rising costs of other infrastructural services made a life without cash impossible. So, in return for work, as Ammi Bayoub stated, people started demanding wages for labour. Based on information from Nejib, I hypothesize that during obligatory *twiza* labour, it became more commonplace to provide a cash substitute. Cash would have been more common among the bourgeois merchant class than the labouring *khammēs*. The merchants could afford to start paying for labour. Yet then *khammēs* workers also began demanding cash instead of a share of the harvest.

To summarise, the rising cost of life led to labourers demanding cash instead of the reciprocation of labour. Before delving into the wider economic changes taking place nationally, I must explain the changing economic relationship between landowners and labourers in the M'zab.

6.4.2. *Khammēs*: sharecropping arrangements

The khammēs system

I discuss here the productive labour system in the M'zab prior to Algerian independence, where sharecroppers worked the land of wealthier individuals in return for a share of the harvest. Roberson (1987: 1) defines sharecropping arrangements as occurring between “two or more parties [who] agree to combine their privately held resources in a productive enterprise, and to share output in prearranged proportions”. The institution of *khammasāt* in the Arab world has a long history. It is based on the idea that labour consists of one-fifth (*khammēs* means five in Arabic) of the five necessary inputs into agriculture (Knauss 1977), the other four being land, manure, water and seed, and often also clothing and

shelter. Different sharecropping arrangements existed according to how many of the inputs the labourer or landowner held, and perhaps other considerations such as power relations. According to my interlocutors, the landscape and work arrangements of the central oasis 50 years ago looked very different – and it was largely worked by *khammēs* in a patronage arrangement with bourgeois landowners. The majority of the old oasis was arable land, before market forces meant that flour was cheaper to buy in the store. Date palms existed but were more sparsely distributed than today, belonging to individual families, and people would come with large jars of water especially to water them. Clusters of date palms covered only 15-20 per cent of the oasis, on the land where houses were historically owned. In fact it probably looked much like the new Ntissa area looks now, and thus palms apparently did not provide the usual microclimate that is normal to oases worldwide (although a few here and there were surely welcomed as a spot to rest from the sun and brew refreshments).

As noted, different complex arrangements existed. According to Bayoub, in Beni Isguen only a fifth of the harvest went to the owner, who put in only land, the *khammēs* providing the other inputs. He explained that this ratio could shift to one-sixth or alternatively to one-half depending on the final negotiation, and the amount of inputs from the landowner, who may also add electricity. Alternatively, the land may be divided into *Faddān* (parcels), bordered by a *segua* (stream). Four *Faddān* might have been cultivated by the *khammēs*, and one by the landowner, who could grow in it what he liked. Alternatively, the landowner might ask the *khammēs* to grow the produce and bring it to the owner's house. *Khammēs* also helped each other, through the institution of *twiza*. Therefore, there was little need for cash, instead mutual help and sharing existed as described earlier. Bayoub also described

the custom of *saddiqa*, (Arab. *Saddiq* meaning ‘friend’), a kind of sharing whereby you would never leave somewhere without being given some fruit or other produce, but “now it’s each to his own” (Bayoub Abess, 11/11/13).

Drawbacks of the khammēs contract

The *khammēs* relationship was based on a type of unwritten contract which could be exploited. Nowadays, it was explained to me, with weaker (monetary) social contracts, if you don’t like how you are treated, you can go elsewhere, whereas the social and contractual bonds of *khammēs* and slavery would not allow this. In this light, a positive attribute is given to the wage labour relationship. Previously, patronage arrangements were favoured by many nomadic Amazigh (Berber) groups, who looked down on settled agricultural populations. In Morocco, the powerful Ait Atta Berber lineage had black, *Haratine* client labourers (Hart 1981: 4; Ilahiane 1996). I observed when I visited that area that even when settled, most Berber individuals perceived agriculture as a lowly affair, participating only minimally during the pollination of palms and harvesting of the dates, and plots were bare of all other vegetation. *Haratine khammēs* were treated barely better than animals, even serving as targets for the testing of new rifles (Ilahiane 1996). In the M’zab, a real social divide is still evident, although social mobility has been achieved largely through education and access to white and blue-collar jobs. The Moroccan *Haratine* themselves achieved long-fought-for rights through investing remittances from work abroad to realise land rights and political expression, at a time when neighbouring Berbers were emigrating in one direction only. The mushrooming of industry siphoned most of the *khammēs* workers away from the land to the factories, while many of the remaining have managed to secure small-holding plots through the government land grant scheme of 1988 (while working

at other day jobs such as plastering, for example). The other category of farmer today is the bourgeois farmer who pays migrant Sahelian labourers for their manual labour.

Historically, slaves would have occupied the lowest strata of Mozabite society, below the *khammēs*. Yet, such ownership was a prerogative of the wealthy, and only an estimated 15 per cent or so owned slaves. It has been argued that the master-slave distinction, as owner and property, was less clear cut in North Africa than in other societies, and that slaves were more integrated into the family household (El Hamel 2002). Even now, I observed that some of my black friends maintained their previous owners' surname, and that patron-client relationships continued, albeit in somewhat altered form. For instance, one of my friends, to remain unnamed for reasons of privacy, still maintained several lands owned by his white namesakes, as his male lineage had done for some time, although now he is paid to do so.

Sharecropping arrangements, along with usury, were not looked upon favourably by the prophet Mohamed, who urged instead that the wealthy should give freely to the poor (Shafiai 2011). My interlocutor Hamza told me that according to local interpretation, it would indeed be the worker who would receive the blessings, which would be spoken as follows: "*Allah y'irham Hamza, al asāfir was al malikā'*" (Bless Hamza, the birds and the angels). Thus, it is generally felt that the one who produces through sweat and toil receives God's benediction rather than the one who owns the land. This discussion aims to present a picture of labour and economic relations in the M'zab valley prior to Algerian independence.

To be clear, however, the *twiza* and *khammēs* relationships have not entirely disappeared, but continue to exist alongside contemporary market relations that Mozabites and Malians engage in. Some landowners continue to pay palm experts in dates, as Hamza grumbled about one miserly client, as he put it. Furthermore, *twiza* notions of voluntary communal work continue, whereby an individual will make a call for aid to rebuild a wall, for example, or a suggestion is made by the mosque for voluntary litter picking. I encountered a *twiza* association one day working together to remove rocks and stones to prepare a piece of land for planting. They had assembled for the very reason of preserving the *twiza* concept as a form of local heritage. The overall makeup of economic relationships therefore is made up of these mixed systems. Such hybrids, I will argue are central to understanding how Mozabites mediate change in its different forms, thus making external forms locally relevant. In the discussion, I deepen this argument by presenting how local value systems may contain notions incongruent to those of market principles, resulting in resistance to the latter. Before that, however, I discuss the primary forces that have driven overall (if not wholesale) changes toward market-based labour relations.

6.5. Algerian postcolonial economic development

Here I introduce the wider historical context surrounding economic changes. I have argued that Algerian economic development in the 1960s, after the revolutionary war with France, was a driver of changing economic relations in the M'zab valley. This was not, however, the precursor to the penetration of market capitalism into a rural Saharan area, which is a more complicated affair. Now, I discuss this series of events in more detail.

In 1962, after the bloody eight year war with colonial France, and following a period of political wrangling among the revolutionaries (mostly between Ben Bella and general Boumediene), a socialist revolution was declared, inspired mostly by Arab Nationalism in Nasser's Egypt, to include agrarian reform (Ageron 1991: 132). This economic and political orientation was largely in reaction to France and her allies as a hegemonic, imperialist force, thus creating an ideological alliance with the Soviet Republics, China and Cuba. This non-alignment, anti-United States and anti-'Western' rhetoric never affected *pragmatic* economic relations with the US, however (Ruedy 2005: 221; Entelis 1986: 1–2), and Algeria rejected outright Marxism, communism and Soviet-style central planning (Adamson 2005). The fledgling Algerian state was reeling from the destruction of its native economic structures by colonisation in the nineteenth century, further economic destruction in the eight-year revolution leading to independence, with the final shock created by the fleeing of technical, professional and managerial expertise (Ruedy 2005: 195). With the consolidation of the National Liberation Front (FLN) and elimination of other parties, including the communist party, the political scene became a one-party system. Further power struggles continued between Ben Bella and Boumediene, until after a coup after which the latter finally began a state capitalist programme of national development in 1967 (although it didn't completely distance itself from socialist ideology until the reforms of 1976), which placed heavy emphasis on the hydrocarbon sector, to the neglect of the agricultural and other sectors (Ruedy 2005: 196).

The socialist development plan of 1963 included the so-called *autogestion* of the agricultural sector, with the creation of peasant cooperatives to manage land abandoned by the colonials, although other great estates were taken over by the

military and nationalised (Ageron 1991: 133). This socialist system experienced great difficulties, however, due to lack of administrative and technical personnel, and the sector made heavy losses. The shift to state capitalism may be explained due to the victory of its proponents, the petit bourgeois within the bureaucracy, who held the ground between the advocates of the worker-managed approach of Ben Bella, and the free-market position of the emerging middle class. Analysis of this victory asserts the obstruction of the bureaucracy of the working class, alongside the need of the elite to exercise economic control (Ruedy 2005: 216). The local effects of socialism on farmers in terms of work are discussed briefly later. Of importance here, however, is that this led to the industrialisation and development of infrastructure in Algeria, including the rural areas such as the M'zab. Following the discovery of oil in the Sahara in 1956 (Ruedy 2005: 183), the hydrocarbon sector is now responsible for 95 per cent of Algerian exports. Alongside the industrialisation drive, education was emphasised, and in the late 1970s and early 1980s, the state spent 30 per cent of the state budget and 11 per cent of GDP on education (Ruedy 2005: 226). As previously stated, these events created a draw away from agriculture to the industrial and professional sectors.

6.6. Constraints on development by the rentier Algerian economy

Despite more recent policy aimed at boosting the agricultural sector, there are many barriers to small rural farmers actually accessing national markets. This included failed development plans based on the idea that rapidly expanding industrialisation would go on to feed the agricultural sector.

Many spoke to me of southern Algeria as a 'cash cow' that was milked by the North, with little benefits to the Saharan locals – meaning of course primarily oil

profit. Although most of the nation's mineral and hydrocarbon wealth is found in the South, only 10 per cent of its population lives there. Moreover, the Atlas mountain chain means that there is more connectivity between the trans-Saharan localities (the Sahara, Sahel and the coastal belt of Guinea to Nigeria), than the North and South regions of Algeria (Entelis 1986: 3). Oil work was largely seen by locals as an ultimate goal, an opportunity to fulfil one's lifelong duty to provide for one's family, and thereby achieve great social standing. As might be expected, there were others that viewed such developments as a theft from the land, as one oil worker was admonished by his elderly father³¹.

The move toward industrialisation as the driver of Algeria's economic development was based on the (mostly untested) theories of the French advisor to Algerian industry, de Bernis in 1963 and 1966 (Henry 2004). He suggested that the agricultural sector was insufficient to support a decent standard of living, and thus the rural population should find employment in industry. Furthermore, he argued, the agricultural revolution historically always followed the industrial revolution, and not the other way around. Thus the hydrocarbon sector would provide the materials for fertiliser and machinery for agriculture, as well as a market place. This industrialisation-first program was in line with the postcolonial political orientation of economic (and thus political) independence from the globally predominant capitalist system, by not exporting agricultural produce and raw materials. The first four-year industrialisation program (1970-73) devoted 45 per cent of total capital investment to heavy industrialisation, 40 per cent to social and economic infrastructure, and only 15 per cent to agriculture. The ailing agricultural

³¹ A 1974 survey by the World Bank showed that 30,000 Sonatrach workers received an aggregated salary of 600 million Algerian Dinars (DA), while 250,000 workers in the self-management agricultural sector earned 450 million DA (Entelis 1986: 139).

sector has ensured that Algeria is now heavily dependent on foreign exports, though it has resulted in the creation of land (Entelis 1986: 111-30). Regarding the failure of accelerated industrialisation, Abderrezak (2001) explains that:

the various sectors of the economy did not evolve as the coherent entity that de Bernis' economic model predicted. In particular, heavily invested and export-oriented sectors such as hydrocarbons have not contributed enough to the development of other sectors of the economy. The links between hydrocarbons and other sectors have evolved into a relation of dependence based on subsidy rather than viable economic integration. The deliberate efforts to accelerate the industrialisation process through subsidies from hydrocarbons to key sectors may have resulted in the creation and exacerbation of sectoral imbalances. [Abderrezak 2001: 14]

Algeria is among the prominent group of oil rich nations in North Africa and the Middle East (after Libya, Iraq, UAE, Kuwait, Iran and Saudi Arabia in production). In 1965, the state-owned gas and oil corporation, *Sonatrach*, was created, followed by various other state-owned industrial companies, in iron and steel, textiles, and banking, to name a few. The Algerian power structure has been explained as a complex tripartite relationship between party, military and intelligence services, and oil wealth (Entelis 2011), and with corruption on top of this, some have described *Sonatrach* as the politician's private purse³². Today, the state has acquired over \$100 billion of foreign reserves from exports, for a population of 34 million (Lowi 2009: xii). Oil exports went from 12 per cent of exports in 1960 to 60 per cent in 1965, and then 97 per cent in 2010 (Butcher 2014). With this excess, Bouteflika's government has been able to buy off much discontent with cash hand-outs, fending off social pressures that have troubled the region such as the 'Arab Spring' (Volpi 2013). Yet Algeria remains an authoritarian regime, and the country

³² "Corruption is pervasive in Algeria constituting the most serious barrier to fundamental economic reform. Algeria scored 2.9 out of 10, ranking 105th out of 159 countries in Transparency International's 2010 Corruption Perceptions Index, putting it just behind Egypt, Mexico, and Zambia, and placing it among the five most corrupt countries in the Middle East and North Africa (MENA)" (Entelis 2011: 663).

experiences little trickle down in terms of investment. According to some authors, this is largely due to considerable cronyism and nepotism at the top, with retired generals and family members of current regime officials monopolising most of the domestic firms and access to markets (Achy 2013; Lowi 2009: 35). Such contempt by the elite for ordinary individuals is known as *hogra* by Algerians (Entelis 2011)³³.

Thus despite development programmes aimed at rural development, certain elements of the state constitute an insurmountable limitation to such economic improvement, forcing populations to rely on locally self-sufficient means of production. The military oligarchs who control the oil wealth also control the agricultural export markets, causing the entry of Mozabite farmers into this market to be nigh on impossible (see also Logan & Moseley 2002 for parallels in Zimbabwe under apparent development). Ferguson (1990: 255) contends that in Lesotho the state claims its very legitimacy and expansion of power based on the poverty alleviation discourse. In Southeast Asia, Scott (2009: 64–66) vividly describes how the control of poor manpower has been central to the dominance of the state. In Algeria, the proponents of the revolution who, 50 years on are still in power have little need for small-scale farmers or for creating conditions that would enhance social mobility. They continue to draw on oil revenue to keep unruly elements of the population quiet when social discontent emerges. Yet, the revolutionaries have

³³ This sense of discontent, combined with a drop in global oil prices and thus the ability of the state to subsidise basic food commodities resulted in the riots of 1988. These events led to the preliminary opening of the Algerian political system, the first in the Arab world, before the recent 'Arab Spring'. However, the military intervened in 1992, preventing the Islamist party, the Islamic Salvation Front (FIS) from taking power, leading to the 'bloody decade' (Entelis 2011) with 200,000 dead and 6000 disappearances (Kristianasen 2006). Current president Bouteflika exonerated the military from any wrongdoing, ostensibly to broker a military hold on power, although many families are still campaigning for resolution and justice over missing relatives (Kristianasen 2006).

become less relevant to the generations that were born later. Micro-social movements in the M'zab, based on limited associational freedom are attempting to solve such economic problems by looking for alternative markets (such as Fair Trade), but even then they complain that there is not enough time to effectuate such plans.

This situation of purported development on the one hand and forces which counter such development might appear paradoxical, unless we adopt a Foucauldian perspective of the state, however. Such a view reveals instead of a Weberian monolithic, coherent entity, rather the dissipated, fragmented structure of competing forces (Gupta & Sharma 2006: 291). The Algerian state is successful at portraying itself as unitary and integrated, however, through manipulation of discourse and regulation of the media, often entailing silence as to the workings of the state. Such silence fuels rumours and speculation, on the other hand, about internal conflict within *le pouvoir* (the state) between the executive and secretive intelligence agency.

6.7. Discussion

I have aimed to unpick the major historical drivers leading to the current system of labour relations while attempting not to oversimplify historical contingencies and subtleties. These have largely involved political economic forces of change, whereby government development has raised the local cost of living, thereby inducing a market-based system of labour relations. As I have shown, however, contemporary work relationships remain mixed, and older relations of production continue alongside the more recent capitalist system. As documented elsewhere, for example, farmers may grow cash crops to raise funds for certain needs (such as

taxes), while relying on shared work systems for family production (Keesing & Strathern 1998: 219).

In the discussion that follows, I will give further arguments, for and against, as to the 'predisposition' of Mozabites to the market based system. To do this I draw on Bourdieu (1978), by presenting two conflicting representations by the latter regarding the locally conceived Mozabite work ethic. I then argue that some Mozabites appear to hold a syncretic, quasi-animistic view of nature that goes beyond the orthodox Islamic ontology. I contend that this view complicates a capitalist worldview, in which nature is dead raw matter, ready to be exploited. I give examples that show a contrasting viewpoint, which may at least cause hesitation for some, for 'transforming' such 'dead matter' may thus entail an act of violence. By presenting these alternative viewpoints, I will reinforce my claim that localised economic change is not a simple replacement of a 'traditional' peasant system by the global capitalist system, but something culturally mediated and locally useful.

6.7.1 Local Islam & the Mozabite work ethic

In chapter four, I discussed how for Mozabites, Ibadite interpretation of Islam emphasises the importance of work as an expression of faith, for faith alone is not sufficient. I then portrayed in chapter five how empirically, Mozabite everyday life can be seen to be divided among three principle activities: the mosque, work and the family. Indeed, the family-owned plot within the oasis provides a backdrop for all three of these activities, at different times. Primarily, it is a site of work, yet on religious holidays such as Fridays, it may become a space inhabited by women and children, who eat and play together, in quite large social gatherings. Small Qu'ranic

reading groups or prayers may take place on the land, especially for the *maghreb* (sunset) prayer.

Some authors have argued in the past that Mozabites have a protestant-like work ethic, based on a puritanical ideology (Alport 1954; Bourdieu 1962)³⁴. This was in many ways reinforced by my experience in the M'zab. One day, while walking with my friend Smail, I complained of having a flu and needing to take some time off. Smail informed me that by contrast, a Mozabite would be encouraged never to take time off. He went on to emphasise the work ethic, urging that you never see an unemployed Mozabite, in contrast to the Arabs, for whom unemployment is officially about 25 per cent, unofficially even higher. "Mozabites will do anything" Smail explained, "even sweeping the street". The greatest scandal described to me was the idea of the rich son, who lies about doing nothing. Such decadent behaviour would certainly lead to the moral disintegration of society, was the implication. Others would complain that young Mozabites no longer wished to do physical labour, however, not out of laziness but more from the associated low status, as already discussed. This facilitated somewhat the acceptance of the Malians to undertake such menial labour. The emergence of a professional class was facilitating social mobility, yet gnawing away at local ethics of egalitarianism.

Writing about the Mozabites, Bourdieu (1962) claimed that their values and social practices fundamentally predispose them toward the capitalist system. Essentially, he argued that the custom of relying on family for labour, combined with Mozabite piety, meant that they were disposed to acquire considerable capital (1962: 46). However, this contrasts with Bourdieu's argument made elsewhere (1978) about

³⁴ Although Bourdieu proposes that Jews' religious relationship to work might be a more apt comparison.

Berber peasants. In *Disenchantment of the world* (Bourdieu 1979: 26–7), Bourdieu presented the case that for Kabyle peasants work for its own sake was more important than effort based on the rational calculation of reward. This, he argued, did not dispose them toward the capitalist system whereby labour is converted into capital. My ethnography corroborates this value of work for its own sake among Mozabites, as I presented briefly above. Does this apparent contradiction mean, therefore, that Mozabites are or are not predisposed to the market economic system? The facts are that some Mozabites have indeed successfully invested their capital in ways that has expanded their businesses, such as the purchase of textile factories in France, making certain of them very wealthy. The purported work ethic does indeed mean that Mozabites are very industrious in a range of activities from business to repairing bicycles and it is true that unemployment is extremely low. On the other hand, some complain that youth are becoming lazy, relying on their parents' wealth rather than generating their own. This may reveal more about the ethic itself, but it seems possible that youth values are shifting with the influence of modern media, portraying images of individuals relaxing, enjoying an easy life. Thus, the evidence given here complicates conceptions that authors such as Bourdieu have suggested of a Mozabite 'predisposition' toward the 'capitalist system'.

6.7.2 Human-environment ontologies

Further constraints to the wholesale adoption of capitalism, I argue, involve local conceptions of nature. Bierchank (1988) shows that in two centres of Ibadism, Oman and the M'zab, Ibadite doctrine is locally constructed. Indeed, rather than a pure version of Ibadite Islam, local views of nature often entail a quasi-animistic syncretism.

An ideal Islamic worldview, as an extension of the Judeo-Christian traditions, makes it clear that the earth was made for the use of humanity. My experience with some Mozabites revealed a different relationship to nature, however. I will use several examples to make this case. Sliman, for example, revered the date palm (*Tazdait* in Tumzabt) as having a *rūh*, soul like humans. The date palm soul had majestic qualities, including durability and fidelity, qualities which should be exemplary for humans. He recounted to me an alternative version of creation where “God made Adam and the palm out of clay and then breathed life into them, the *rūh*”. He recounted a legend of how the date stone is marked by the stamp of the prophet’s ring, and thereby protects any food left out overnight from hungry creatures. He further passionately related the story of how one day he witnessed a date palm garden being thoughtlessly torn up using heavy machinery to be converted into a hotel. He described the anguish for him of seeing the mighty trees destroyed without a care. The punch line to the story was when someone came along and mindlessly wished the entrepreneur *Allah ya’onkom* (God help you)!

I noticed a similar phenomenon among rural farmers in Morocco. Some farmers would use the same symbolic humoral healing system³⁵ on date palm diseases, placing the palm within the same domain as the human body. Reference would often be made to cleaning the palm as if it were a social body, such as ‘giving a haircut’ or ‘going to the *hammam*’. Back in Beni Isguen, I noticed practices where certain farming objects were treated as if they were persons also. After digging a trench one day, I stood the all-important farmer’s *fella*, a kind of digging hoe,

³⁵ The Hippocratic humoral system was taken up by the Prophet Mohamed consisted of the four elements being: fire (hot), earth (dry), water (moist), and air (cold), which leads to the four humours: (yellow bile - hot/dry; black bile - cold/dry; phlegm – cold/moist; blood – hot/moist.

upright for the sake of ease of retrieval. Hamza told me never to leave the *fella* upright but to lay it down to give it a rest, as it has been working all day. Another example involved the berating of a young Mozabite oil worker by his grandfather, who entreated the young man this work was morally wrong, and that the oil should be left in the body of the earth.

The first example reveals a difference of Mozabite viewpoints toward nature. Yet arguably, a view of the land as animated by soul is morally more problematic as a source of exploitation, as opposed to the capitalist perspective in which resources can be extracted as dead matter, along the path to material accumulation. Fortunately for Mozabites, the Islamic ontology separates soul as belonging to the higher realms of humans and divine beings such as angels, while the earth and its creatures remain fair game for the taking. Yet, ambiguities still work within the imaginations of mixed Mozabite lineages where the *jnoun* (spirits, good or bad) still linger in out of the way places. Places inhabited by *jnoun* that have to be placated would not appear to be immediately suitable for exploitation. Generally, a belief in the *jnoun* is locally associated with a lack of education, however, revealing a potential change in beliefs.

In this discussion I have advanced the idea that certain local ways of viewing and being in the world may not be entirely commensurable with the neoliberal project. I argued that the Mozabite sense of work does not necessarily predispose them toward capitalism. Then I tried to convey that alternative local views of nature exist, which may influence and limit the rational exploitation of date palms and the earth. Through this I have illustrated how the local economy is a hybrid one (just

like local religious interpretation), composed of different systems based on different sets of values systems and serving different cultural ends.

6.8. Conclusion

To summarise, I began by setting out the problem in Beni Isguen of labour based on conversations with farmers, Malians, and empirical observation. According to farmers, labour relations have become less reliable in the M'zab, and this was described as the second biggest problem after water shortages in the oasis. Farmers often contrasted this situation with previous labour relations based on the more predictable, *twiza* institution. Some farmers cited competitive undercutting as the reason behind this instability of working relationships. Through my investigation, I concluded that such a view marginalises the agency of Malian workers. Indeed, the view of many Mozabites of Malians as a chaotic category did not bear up to my experience; in fact they were quite organised, and through established networks were able to share information regarding sites with favourable working conditions. Other factors play a role, such as seasonality of work and lack of clear, reliable working terms of contracts.

I then analysed the reasons behind this economic shift, citing state development programmes as driving up the cost of living, causing workers to demand cash. I advanced the hypothesis that when wealthy merchants offered cash instead of their sons in response to the call for group *twiza* by the mosque, this could have set up the preconditions for contemporary economic relations. I further described how development drew labour and expertise away from the oasis, resulting in a vacuum which the Malians came to fill. I then portrayed, however, that the entry of the capitalist set of working relations did not entail a complete replacement of already

existing labour systems. I argued that 'traditional' systems continue to exist alongside wage labour relationships, with each having different functions. I then sought to buttress this assertion with a discussion on Mozabite notions of work and on local hybridised ontological views of nature, which I contend provide resistance to exploitative views of the land.

I term this current scenario 'anarchic organisation' in reference to Sahlins' (2008) conceptualisation, as opposed to equitable or top-down relations, in that the interaction of farmers in this case is based on a principle of 'each to his own'. Of course, relations are also mixed, for competitive relations between farmers contrast with the hierarchical relations between worker and employee. *Twiza* involved equitable relations between farmers, whereas *khammēs* relationships were definitively hierarchical. In the market-based system, people could now pay for services rather than go through the messy ties of reciprocal obligations. It could be claimed that the wealthy no longer need to ask for help, for they are able to pay for someone to fix their material problems. Indeed, during conversations some suggested to me that *need* is the glue that binds the community. However, by framing relationships in terms of consumption, as documented by others (Carrier 1992; Baudrillard 1998: 65), feelings of alienation have been seen to creep in. Values based on self-interest which locals associate with the West are seen to correlate with alienation, a shift which is less than satisfactory for many for whom personhood is constituted through the community itself. Reflection on these matters has caused some to act rather than sink into apathy. As I will show in chapter eight, many have utilised the opening of Algerian civil society to form associations based on group activities for anything from sports, employment,

disability, *twiza*, to heritage preservation. Many Mozabite youth appear to be admirably active in such activity, displaying great pride rooted in local identity.

Various theorists have attempted to explain the conditions and limitations to the ability to embrace the market system by various societies. Weber (2002 [1920]: 160) argued, of course, that a protestant-style ethic was the basis for a rational, market driven economy, yet he failed to explain why societies outside the West with such characteristics, such as the Mozabites, did not develop a form of capitalism. Mozabites have since embraced market ideology, and recent wealth creation has driven social inequity even farther apart than ever before. It would be consistent with Weberian theory, however, to say that Mozabite merchant activities developed also due to the difficult socio-economic conditions of a small community trying to maintain itself on an insufficiently adequate agricultural resource base in the desert. Turner (1974), however, in true orientalist style, postulates that the ethic of hard work was imported into Islamic communities from the West who perceived the success of capitalism. I would argue, the hard work ethic of the Mozabites was a result of austere lifestyle perhaps as a strategy aimed at the survival of the group combined with a specific interpretation of Ibadite doctrine.

Bourdieu himself argued that in Algeria the shift from gift economy to a market economy was caused by the French legitimation of private land ownership over communally-owned tribal lands, resulting in “social vivisection” or atomisation (1961: 84, in Fowler 1997: 15). Bourdieu’s generalised formulation was applicable to nomadic tribal groups, for whom commons land was more important, than for sedentary populations. Whilst the concentration of private land tenure is important,

(which I deal with in depth in chapter seven), I explain the shift from gift to market economy according to a more detailed chain of events. Furthermore, I argue that the primary driver (in chronological order) of this situation was the removal of political independence by the French colonial rulers in 1882³⁶, creating entry into the previously closed political system of the Mozabites. The secondary driver, following independence in 1962, was the national economic development programme initiated by the Algerian state and National party, the FLN. This resulted in the introduction of modern infrastructure during the 1960s, causing subsequent economic dependence on state-owned energy companies. This, I argue, explains the creation of the contemporary system of labour relations.

The use of wage labour means less predictability for farmers, and thus *less ability to make rational calculations regarding farming activities*. The economic climate then mirrors the ecological one, in terms of predictability. The valley exists in a non-equilibrium state (Ahern 2011), with great unpredictability around the timing of floods and rain which recharge the groundwater that the wells depend on, creating a sense of great precariousness to farming livelihoods. Labour relations based on mutual aid are in fact more flexible, as the timing of farming activities is not fixed and the favour may be returned at any time (see also Robertson 1987: 1). Short-term or temporary wage labour also provides the same flexibility for uncertain ecological conditions. However, this situation does not encourage long-term relationships with skilled workers, who need a full time wage, and thus a gap in their working calendar causes them to find work elsewhere, thus rendering this relationship more fragile in the case of the Beni Isguen oasis ecosystem.

³⁶ In 1853 the Mzab had been made a protectorate by Marshall Randon, and left in relative autonomy (Jomier 2012).

This highlights an important question for this study: how can institutions be flexible to deal with uncertain, changing ecological conditions? Reciprocal labour is one solution, wage labour another, but the latter creates more work for the farmer in temporary work situations with unskilled labourers, and more uncertainty regarding the long-term with skilled labourers. Thus wage labour in the M'zab can be consistent with variable ecological conditions, but only in the temporary form, and this causes a problem for farmers as it encourages unskilled labour relations rather than skilled ones. This maintains the burden of experienced knowledge solely on the farmer, creating a hierarchical, paternal system where labourers remain dependent like children, unable to rise to roles of responsibility, and also maintaining their position on the lowest rung of the social ladder. Keeping labourers on a minimum wage also serves to maintain the hierarchical situation by preventing accumulation of capital by said group, and thus social mobility to positions of local prominence.

Ammi Bayoub lamented the scarcity of labour. But what he resented even more than the impersonal nature of wage labour relations and the loss of camaraderie of communal work, was the unreliability of such economic relations as compared to the strong ties of inextricably intertwined social relations of communal labour with its feasting, the security felt in being able to ask a favour of others, of social capital, a sense of trust, of social care; essentially, that one can rely on one's neighbours in times of need. Now that each pays for his needs to be serviced, Bayoub seemed too often to feel alone, not knowing when workers or friends were going to show up and give colour to the day. In the next chapter, I discuss what happens when the social contract regarding care is delegated to the state.

7. Local justice: Anomie & the postcolonial state

Undivided ownership can only continue so long as no one thinks of drawing up a systematic balance-sheet of the individual shares in production and consumption. And indeed, the generalisation of money exchanges and of the spirit of calculation has everywhere coincided with an increasing number of breakups of joint ownership; ... Money encourages calculation of the respective shares of each household in the group economy. In short, joint ownership prevents calculation, and conversely, the prevention of calculation as the condition of the permanence of undivided property and of the community (family or clan) that is based on it. [Bourdieu 1977: 17]

We need religion to keep the moral order. Without it there would be chaos.
~Field notes, bank manager, 14/03/13, Ghardaia

7.0 Introduction

The above quotes address changes to the normative order and how to restore it. Bourdieu, speaking of a shift from communal to private ownership of property, blames neoliberal values as encouraging a “spirit of calculation” and a focus on individual monetary shares (Bourdieu 1977: 17). Conversely, he claims that joint ownership prevents such calculation. The bank manager I interviewed in Ghardaia, on the other hand, asserted that ultimately it is religion that is needed to keep the social order. He was reflecting on the recent events of revolution in nearby Tunisia, while also recalling the horrific violence of Algeria’s ‘black decade’. In this chapter I examine changes related to inheritance and property in Beni Isguen oasis, and explore issues pertaining to social regulation more broadly.

The classic debates between Gluckman and Bohannan in the mid-twentieth century (see Nader 2002: 25), of whether a Western concept of law (e.g. Roman law) should be imposed on other societies in attempting to understand local conceptions of order, appear to have been perpetuated with the more recent polemics regarding

'legal pluralism'. Anthropologists using the legal pluralism approach (e.g. von Benda-Beckmann 2002; 2006) take a broader approach to the definition of law to encapsulate social norms, judicial processes and governance (Pirie 2013: 219). Pirie (2013: 42), however, argues that to stretch the definition of law too far is to lose any sense of analytical clarity, and herself urges for a differentiation between law as legal code and conflict resolution or mediation. Pirie (2013: 45–6) further contends that law should be distinguished from social norms by referring to the “creation and use of explicit rules and categories, and a type of associated reasoning³⁷.”

Drawing on Moore's (1973) formulation of “semi-autonomous social fields”, Griffiths' (1986) conception of multiple legal systems attempted to decentre the notion of the state as the sole source of regulation. In response, Roberts (2005: 11), posits a centrist view of law, directly linking its emergence to the state as coming from kingship, involving a process through which “when those in power cease making decisions on an ad hoc basis and begin pronouncing the same judgements in similar situations.” Furthermore, he claims that law is:

a particular mode of decision-making, that of command, followed by the discursive formulation of an ideological justification for the leader's authority, the articulation of normative propositions, the attempt to achieve compliance with such rules, and the provision of adjudicative agencies. [Pirie 2013: 43]

Despite this powerful assertion, Pirie (2013: 44) reminds us that anthropologists have found that law is possible in societies without government in terms of “codes

³⁷ As Pirie (2013: 221) suggests, “at its most basic, a law code might present a vision of (moral) order and regularity, associated with a sense of community and belonging, and defining what it is to be a (good) member [of society]”. However, beyond being confined to rules alone, legalism incorporates judicial reasoning. These two forms “employ general categories into which people, events, and objects can be placed, and whose application implies duties or rights, along with limits or restrictions on those rights, as well as defining relations between them” (*Ibid*: 222).

and rules that have an intellectual life independent of any project of government,” pointing to the examples of Hindu and Islamic law. Furthermore, Scheele (2008) urges that a move away from labelling customary practice as law should not blind us to local conceptions and propensities toward law making.

Aside from these contentions, thematic interests in legal anthropology moved on in the 1980s to “questions of power, and the entwinements of power, social knowledge, discourse, and identity” (Greenhouse 2012: 432). More recently, legal anthropologists have looked at the “break between the interests and values of legal institutions and the communities they serve” (*Ibid.*). Indeed, order-making may be seen in one sense as maintaining the status quo of those in power. Nader (2002: 28–9) critiques legal discourse on harmony making in such terms, as used throughout colonial history, underpinned by Christian ideals. Alternatively, as I argue, order may be conceived as a more delicate balance of power, where contestation takes place through “a continuous process of formation and superseding of unstable equilibria (on the juridical plane) between the interests of the fundamental group and those of the subordinate groups - equilibria in which the interests of the dominant group prevail” (Gramsci 2000: 206). To suggest such a view is not to naively claim that subordinated groups can easily overthrow oppressive groups, but it does go toward an understanding of the forms of resistance to power subordinates can use (Nilsen 2015). Indeed, as Fuller (1994: 10) suggests, “it is clear not only that 'legal' orders are not all equally legal, but also that legal pluralism is at least partially a relation of dominance, and possible resistance.”

The Algerian judicial sphere is constituted of a plurality of systems including the French civil law, Islamic shari‘a and customary law (Christelow 2014: 6). This

chapter investigates, therefore, how the presence of multiple systems of law influences the decision-making process of disputants in Beni Isguen. For example, some Mozabites tend to view the French civil law as adopted by the Algerian state with suspicion as a colonial imposition, preferring instead local processes. Indeed, other locals, however, take a more strategic view and employ different laws for different purposes. Rather than becoming entangled in definition of law, I argue a focus on social regulatory practice may be more useful, by arguing for continuity between formal and informal ordering. Furthermore, I expand on von Benda-Beckmann's concept of 'forum shopping' with a reformulation of classical social contract theory.

This chapter together with the next thus outline a range of political organisation from 'control' (tight regulation) to 'agreement' (loose regulation) (along with the drawbacks and benefits of each), by focusing on regulatory frameworks (this chapter), and regulatory institutions (next chapter) and their transformations. While there is some overlap, this chapter focuses primarily on private ownership, whereas the next chapter concentrates on issues of communal property.

7.1 'Abandoned' oasis lands

To gain a view of how individuals are affected by and also utilise multiple legal systems at the everyday level, I focus on inheritance disputes regarding land tenure in the Beni Isguen oasis. My starting point was the empirical observation of seemingly abandoned plots. Land issues, along with water and labour and changes in how these resources have been and continue to be managed, are key to understanding local governance within the wider rubric of sociological change.

It was plainly clear after only a short time of working with farmers in Beni Isguen oasis that many plots appeared to lie fallow. These weren't fallow in the traditional sense, however, as the land appeared to be completely barren, the soil was bare, trees (if any) were dying, and so on. They contrasted with adjacent plots that were extremely lush and verdant, bursting with the life of palms, fruit trees and brightly coloured flowers. The local proverb that "the difference between the desert and the oasis is man" became strikingly clear to me in how a lack of maintenance resulted in the rapid conversion of these human-made fruit forests into desert. In the course of my daily movements through the oasis I saw a lot of this degraded land, sometimes with a note written in red spray paint on a door, declaring its status "*abandonné*" (in French and Arabic). Nejib, a palm tree climber, estimated that perhaps 40 per cent of the oasis lay in this state. I verified this through direct observation, and by means of satellite photography.



Figure 7.1 Beni Isguen oasis. Note bare 'abandoned' plots in the foreground. (22/12/12)

I puzzled for some time over this dilemma: why were the plots ‘abandoned’? Was it simply another case of farming as a disintegrating antiquated lifestyle? How did this square with the fact that farmers were complaining of a lack of arable land, due to the urban encroachment of town buildings in the oasis? With land obviously being the first requirement of any farming project, not to mention that land lying unused resulted in a temporal rupture in the maintenance of farming knowledge across generations, I set out to try to solve this puzzle.

7.2 Possible explanations for ‘abandoned’ plots

As the above proverb implies, dryland agriculture requires constant maintenance, and land that is left static quickly reverts to a desert state (or if not an ‘equilibrium’ state, then at least a much less productive state, due to irrigation and date palm pollinating requirements). This stasis further conflicted with a Mozabite onus on the importance of work as a manifestation of faith. Based on my conversations with Mozabite farmers and other agricultural practitioners, my experience in other oases and the literature, I generated several potential explanations (following Vayda 2013) to try to discover the causes for this state of affairs (fig. 7.2 and table 7.1). I outline these below followed by an analysis based on the existing evidence.

Table 7.1 Possible explanations for abandoned agricultural plots.

Potential causal event	Valid?	Weighting (0 not important – 5 important)
a) Emigration	No	0
b) No profit for farmers	No	0
c) Rising cost of land	Yes	2
d) Holidays away from the oasis	Yes	3
e) Inheritance disputes	Yes	5
f) Devalorisation of farming	Yes	3

a) *Emigration*

As noted in the previous chapter, one of the primary reasons given generally for the degradation of oases across the Sahara is emigration of youth to the metropolises. This is a commonly held perception, as an influential article by Nee (1989) demonstrates. What is misunderstood here is the fact that very often, migrants are part of family units who strategically send some of their sons and daughters to work and send back most of their monthly wages, the patriarch may make a monthly trip to the metropole to collect the earnings and leave just enough for rent and food (Crawford 2013). As mentioned elsewhere, Mozabites have in fact been undertaking this strategy for perhaps a millennium, for the oases were probably never self-sufficient. Therefore, emigration was taking place prior to the more recent general event of the “abandonment” of oasis plots. I will explain the timing of this event in a coming point.

More local emigration is certainly taking place, drawing workers away from the agricultural sector to the factories and hydrocarbon sector (as also discussed in chapter 6). However, this missing demographic is being replaced by migrant workers from elsewhere (Adrar, the Sahel). Regionally, climatic factors such as flood or drought are also said to drive emigration. This is a very real and important

problem, yet to my knowledge drought and floods are relatively cyclic, and have never decisively driven people away from farming in the M'zab.

b) *No profit for famers*

A lack of profit could drive farmers to seek other employment, whether due to climatic conditions, or to low market prices. Indeed, market cronyism is prevalent at the national level, preventing farmers from entering the larger national and international markets. Lambin et al. (2001) in seeking to explain global land use changes, blamed changing economic conditions, mediated by institutional factors” (*Ibid*: 266). Another recent review of agricultural land abandonment drivers by Benayas et al. (2007) agrees with this view. In the M'zab, however, farmers continue to sell their produce locally or nearby, and there is little evidence that this has been a decisive factor for any particular landholder. From my experience, profit maximisation is not the highest priority among Beni Isguen farmers (see chapter five), who seem content with modest returns, instead valorising other social benefits from farming such as independence, status associated with owning land, health and recreation benefits.

c) *Rising cost of land*

Land prices are inflating in Beni Isguen oasis. This is primarily due to increased demand related to population increase, and also to the fact that young families no longer wish to live in their parents' households, as discussed below in point (f). Urban areas are spilling into rural 'green' zones, a factor common to Saharan towns (which also contradicts the outmigration hypothesis). Indeed, Holden & Otsuka theorise (2014) that across sub-Saharan Africa, rising land prices are directly linked to population pressure. In the M'zab, support systems do exist, enabling individuals

to acquire interest-free loans from wealthy patrons. Alternatively, many have applied for and received land concessions given by the state (such as the Ntissa area in Beni Isguen – see Aghrout & Bougherira (2004: 108) for more details on Algerian state development)³⁸. (It is feasible that farmers may sell their land in the oasis for a profit and apply for concessionary land, although a farmer I spoke to largely preferred old oasis land as the soils were already improved and because of the watershed system to channel the flood waters, whereas the new concession land relied solely on new pumps, drilled at a large cost.) Due to the availability of new concessionary land therefore, I propose that this factor is not a significant causal factor in the abandonment of plots.

d) *Travel/technology*

Although not directly related to farming, in the past during the summer (with temperatures soaring to 45-50^o C) the entire Mozabite population migrated to the oasis to benefit from the microclimate provided by palms, and the peace and quiet away from the bustle of the city. Increasingly, Mozabites are now travelling to the cooler mountainous and coastal Tell regions (North of Algeria), or abroad during the summer months to escape the desert heat, while others remain thanks to the recent availability of affordable air conditioning. This is largely enjoyed by families who have become wealthier. This wealth was generated during the post-revolution period when France opened its borders, temporarily, to allow Algerians to immigrate. Many Mozabites travelled there and successfully ran factories and shops in wealthy districts. Much of this wealth has in fact been reinvested in oasis land, which can be seen in the form of large plots with enormous houses, created by procuring and combining several smaller plots. Thus, this factor is ambiguous as

³⁸ Land that was perceived by the state to be barren and unused public land was actually claimed as rangeland by nomadic herders.

reinvestment does occur (see also Ilahiane 2004: 181). On the other hand, many smaller plots are left due to inheritance complications, with families preferring to travel rather than solve complicated disputes.

e) *Inheritance disputes*

In the opening quote of this chapter, Bourdieu (1979) argues that demand for equal shares in inheritance was driven by a new “spirit of calculation” that emerged with the shift to a market economy. However, as merchants, Mozabites have long been involved in cash transactions (long before French colonial rule), contradicting this view. By what process then, did joint ownership in the M’zab become replaced by private ownership? Inheritance rules of private property are clear according to Islamic law, with sons receiving equal shares, and females (mothers or daughters) receive a half of these shares. In the M’zab, that which is not covered in the Qu’ran is dealt with according to customary law, *urf*. The national law code (civil law), introduced by the French (based by contrast on a separation of Church and State in the resolution of such matters), provides an alternative, potentially conflicting set of rules and procedures. Individuals wanting their share of inherited property have been appealing to this alternative system, in order to subvert the local rules. As such, much land is locked up in unsettled disputes, and this issue, discussed in greater detail below, forms the core explanation for ‘abandoned’ land. Thus I point toward access to colonial laws to explain this shift, rather than colonial markets as Bourdieu did.

f) *Devalorisation of farming*

From my conversations with Mozabite youths, it is clear that farming is not perceived as a prestigious activity, and probably never was. That said, there is a

certain romantic nostalgia for the oasis among many individuals, whether it be drinking tea with peers under the fruit trees, reading the Qu’ran; youth initiatives to learn tree climbing; horse racing by the large *ahbess* dam churning up clouds of dust; wedding celebrations with ‘illicit’ music and musket fire; scout groups singing songs while sauntering through the windy lanes; white clad women in groups walking or riding in groups on the back of pickup trucks to family events in the cool evenings; or returning to retire and finally be buried with their ancestors, Mozabites retain a strong connection to their ochre coloured oasis home. The availability of land concessions and government training is attractive to many, who with their strong work ethic, are deciding to try their hand at agriculture, whether or not they have a background in farming. On the other hand, access to global media has given Mozabite youth access to images from beyond their desert valley, enticing many with alternative lifestyles centred on consumption, in direct contrast to the asceticism of Ibadism. In light of modern lifestyles, some youth feel embarrassed about Mozabite norms and habits, feeling themselves to be “backwards”, as one youth told me. Yet, still others continue to be proud of their culture, finding concrete ways of preserving and maintaining their unique life-ways with their many benefits.

I have argued that hypotheses a, b & c, (emigration, no profit for farmers, and rising cost of land) have had little relevance as causes of plot abandonment. Explanation (d), holidays away from the oasis has had multiple effects, with increased wealth driving both a shift away from the valley for some, while others reinvest in larger oasis properties (in turn, transforming the old oasis into an extension of the town, pushing agriculture out to the new concession zone – revisited in chapter 9). Globalisation is driving some to question their values, through media or education,

and driving some away from the oasis, while others continue to remain attached to the valley for multiple reasons, far beyond the function of providing livelihoods. The central reason for locked-up, disused land is unequivocally inheritance disputes. Yet the drivers behind this are complex (see figure 7.2), and I will attempt to unravel them now.

7.3 Explaining ‘abandoned’ plots

Some scholars (e.g. Lambin et al. 2001) through the synthesis of global findings have attempted to explain and generalise land abandonment, claiming that economic opportunities are the most important driver. My analysis of land use processes in the M’zab provides an alternative viewpoint, instead bringing to the forefront the complications that arise from navigating multiple legal systems. In this section I provide a brief sketch of the role of local authority in managing land, and how the legitimacy of this authority has begun to be challenged.

7.3.1 Inheritance disputes

A significant amount of Beni Isguen oasis land that appeared to be abandoned was in fact locked in inheritance disputes. I was unable to do a comprehensive survey as I did not have access to land records or legal dispute records, due to the extreme sense of privacy regarding Mozabites internal affairs in relation to outsiders. This was further compounded by the fact that disputes involving women and their inheritance were even more sensitive. However, I was able to carry out an ethnographic assessment of the wider social context regarding disputes and their resolution, how this context had changed, and how this in turn had affected the dispute process (a context that I wouldn’t have been able to uncover through interviews or surveys alone). I now give an outline, beginning abductively with

what I observed (the disputed plots), followed by historical context to show the causal factors that have influenced the present state.

I often observed the disused plots from early on in my fieldwork, prompting my curiosity. I soon asked my companion, in this case the palm expert Nejib, could the mosque, or another local authority not intercede and redistribute the land to those who needed it? He replied that they could not, as the land was tied up in the law courts:

Before, the surviving family head managed the land so that it remained undivided. Now everybody wants his or her share. Although they are Muslims, they deny Qu'ranic law, people aren't God fearing anymore.
~Nejib, 24/11/12

This statement revealed a key institution of patriarchy (as well as religion) that had prevented inheritance disputes and the fragmentation (see chapter five, also Rae 2002: 11) of family plots over time with the classic problem of succession. Family plots tend to diminish over time, for with any more than a single offspring per generation, property must be divided among them (3-5 offspring per family was common in the M'zab). This problem was solved in the past through the management of the collective family property by the male family head through his authoritarian presence. I address below the consequences to family management of land that have resulted when this authority was gradually challenged by new ideas around inheritance. Before I discuss this further, it is pertinent to further detail local ordering practices.

Historical forms of local social control

Here I outline historical regulatory practices so as to provide a contrast with social norms today, and thus develop a view as to how such processes have changed.

Mozabites surely feared punishment in the next life more than in this one, yet perhaps even stronger a coercive force was the normative aspect of social life: one feared the loss of one's family honour and social standing. Thus in such a face-to-face society, an individual's actions always necessitate a consideration of more than just the consequences for them alone, and although people were known as diverse characters and to act alone, immoral acts could have huge repercussions for the family honour. Therefore, prevention as well as punishment began at home. Beyond this at the wider social level, unsanctioned behaviour could be formally punished through *tebria* (excommunication) by the *‘azzāba* , who effectively ruled as a theocracy. *Tebria* simultaneously shamed the individual and reinforced the moral norms of society, as the rule-breaker had to confess and ask for repentance at each Friday prayer in front of the entire community. Historically, a range of punishments existed. In a discussion on Mozabite *qanūn* (laws) in the late nineteenth century, Masqueray described the power of *‘azzāba*:

masters of conscience through confession, alone able to repress crimes through banishment, presidents of all meetings, custodians of all contracts, severe guardians of morality and old customs. [Masqueray, my translation from the French, 1878: 215]

The *‘azzāba* were seen as wise and fair judges, and even the Arabs wished to be judged by them³⁹. Punishment given by the *‘azzāba* could take the form of banishment, compensation, public penance, prison, or baton blows (Masqueray 1878: 225). Below the *‘azzāba* was the *majlis ayyen*, council of notables, who had legislative and judicial power (similar to the *djem‘aa*, or council of elders found in

³⁹ For example, “A Mozabite charged a Chambâa of stealing camels used to extract water. The latter denied and stated that the animal had been purchased in Laghouat and had never been put to such use. What did the judge declare? He ordered the camel to be harnessed to a winch on a well and after this was undertaken, he said that the animal was indeed stolen from the complainant” (Amat 1888: 159-60).

other Maghrebian towns and villages), although the executive power lay with the former. Bourdieu explains that judgements were made based on:

the law of the Qu'ran and according to the *ittifaqāt*, the written compilation of Mozabite customs. These *ittifaqāt*, which can be modified at any time to settle current problems, but which are always interpreted by reference to religious jurisprudence, govern political life as well as private morals and provide for archaic but very formidable punishments—bastinado, fines, banishment and excommunication, the latter being the supremely dreaded punishment which excludes the guilty person from the religious and social community and entails the loss of all his rights. [1962: 43]

Furthermore, beyond the usual crimes of theft, adultery, violence and murder, the breaking of cultural taboos was also punishable, such as use of alcohol, tobacco and coffee, of breaking marriage customs such as the amount of allowable dowry, playing music and dancing, and so on (*Ibid*: 47; for detailed categories of offenses and punishments, see Amat 1888: 47-50). The *‘azzāba* had a further powerful weapon: the withdrawal of religious services. This would mean no prayers would be held, and no bodies washed upon death ready for burial. Over time, the *ayyen* has gradually gained power and independence from the oversight of the *‘azzāba* (Bourdieu 1962: 43; Bennoune 1986), now integrated into the regional framework of the national government, although the *‘azzāba* still retains considerable moral influence. Today the use of *tebria* as punishment is virtually non-existent, yet the moral weight of normative behaviour is strong, and as such a sort of informal *tebria* exists, where immoral people are simply avoided.

This reveals the presence of local legal codes and punishments. Yet these formalised practices were combined with informal norms. For example, punishment was pre-empted and reinforced by *social visibility*, as I discussed in chapter five, whether in general, by *l'oumna*, or by mothers-in-law. Furthermore, while use of

tebria has waned (for reasons I explain below), avoidance of anti-social individuals continues. Thus, I argue not for such practices to be included within definitions of law as such, yet they do constitute legitimate study for legal anthropologists.

Islamic land tenure law

In solving issues related to property, local political institutions are guided by the interpretation of Islamic law. Yet local people may challenge such rulings. During one occasion, Hamza explained to me how Islamic *sharī'a* may be contested in everyday situations:

The entire Islamic world shares inheritance laws of all private belongings, mulk (private property). For example, if you have a shop, it will be sold and divided into equal parts, or half if for a woman. Or, if it runs well and makes a good profit, one of them may run it, and give a share of the proceeds to the others. But often people contest the divisions, claiming that one is worth more than the other. This causes them to be stuck in legislation, even on to the next generation. This is not good; they should be divided straight away. Or a father may leave a will, but should not give a favoured son more.

~Hamza, 15/09/13

Jurisprudence then, must attempt to apply the *sharī'a* to everyday realities. Furthermore, the Qu'ran determines proper usage and succession of land according to certain categories. First, it is necessary to give a definition of Islamic land tenure here (from Forni 2003):

Land tenure can be defined as the group of rights of individuals, households or communities with respect to land. Water also can be accessed under different types of rights. Tenure includes not only property rights, but also use rights of a permanent or seasonal nature. A tenure system may include rights sanctioned both by law and by custom. That is, alongside the formal legal systems, following defined administrative procedures, there also exist customary rules accepted by the majority of users. [Forni, 2003]

Furthermore, land ownership regimes are generally classified into four categories:

1) private land, *mulk*, in which one has full rights of ownership, alienation and

usufruct; 2) state land, *mīrī*, where the state provides usufruct usage, codified during the Ottoman period (land code of 1858) to counter the power of large landholders; 3) public land, *hābūs* (or *waqf* in South-West Asia) which is inalienable, usually for charitable use; and 4) “dead’ land, *marwāt*, often used for communal grazing, and a political “grey area” (Rae 2002: 7-9). Furthermore, land and water tenure are presently governed by a legal plurality combining Islamic law, customary law or *‘urf*, and national statutory law. I describe how these ‘laws’ are combined below.

Beni Isguen oasis consists of a mixture of *mulk*, communal, and *hābūs* lands (owned by the mosque). Most of the land is now private property, yet the riverbeds are communally owned, and those who cannot afford to own land may plant date palms here, which are then privately owned. This is in accordance with local Islamic interpretation, that water not held in artificially made constructions is public property⁴⁰.

Finally, from Hamza’s statement we return to the notion of joint management and conversely, an important source of dispute, namely, that one share may be (perceived to be) worth more than the others. For example, although a plot of land may be divided equally according to land surface, one of the divisions might contain

⁴⁰ It is quite difficult to accurately reconstruct a picture of historical land tenure in the oasis. Two different Mozabite sources related to me that none of the land was owned, and only individual palms were, in accordance with *‘urf*. This is hard to square with the much repeated statement that virtually all Mozabites owned a second property in the oasis to spend the hot summers. From old farmers, I have been able to reconstruct a visual description of the oasis, where about 70 per cent was farmed on sharecropping basis, on plots about 2 hectares in size. The rest, in the area known as Ujujen, consisted of residential land. The oasis now consists of virtually all private houses and gardens with very few half hectare plots, and the majority of farming occurs in the new concessionary land Ntissa, which is state-owned but can become private property after five years of proper management.

a property, making it more desirable. This situation is clearly difficult to resolve, and one solution was to sell the whole property and divide the proceeds. I argue below that such disputes depend on notions of shifting or multiple centres of authority. Before this, I must describe in more detail the local customary laws on which dispute settlement is based, *‘urf*, and how this intersected with Islamic law.

7.3.2 Customary law: *‘urf*

Local disputes were historically resolved according to *‘urf* (similar to *‘āda* in Central Asia), or customary law, consisting of encoded verbal rules or agreements⁴¹. Nejjib explained *‘urf* and its relation to Islamic law by means of a story:

One day the Prophet Mohammed saw a man pollinating a palm tree and said “why are you doing that? You should leave it alone to pollinate naturally by the wind”. The man did as he was told, and at harvest season the production of dates was very low. When the Prophet learned of this he exclaimed “indeed, there are some things which I do not know, and different regions have their own specificities with their own ways and laws not covered in the Holy Qu’ran. For this there is ‘urf”.

~ Nejjib, 07/02/12

This example reveals the interaction between pre-Islamic local custom, and *sharī‘a*. Moreover, Sartori & Shahar (2012) have the following to say regarding the relationship of *‘urf* to Islamic law:

The sharp distinction between Islamic law and *‘urf* / *‘āda*, taken for granted by Western students of Islamic law for decades, has been challenged in recent years by scholars who emphasised the fuzzy boundaries between *sharī‘a* and custom. In particular, anthropologists studying the socio-legal sphere in Muslim societies have contended that Muslim laymen hardly make a distinction between *sharī‘a* and custom in their everyday lives. It appears that jurists, too, have been tolerant towards custom and have viewed it as

⁴¹ Some opponents of legal pluralism have argued that customary law is largely a colonial invention (e.g. Ranger et al. 1997). While in many ways this statement contains much truth, especially in the codification of custom in written form, it is also demonstrable that *‘urf* has pre-colonial origins (Scheele 2008).

perfectly Islamic, as long as it does not violate Qur'anic prescriptions.
[2012: 648]

However, Islamic jurists:

have perceived these as two distinct normative orders, and it is precisely this distinctiveness that enabled them to interrogate the relations between Islamic law and custom and discuss the circumstances under which law-abiding Muslims are allowed to act in accordance with local customs. Apparently, the fuzzy boundaries between *sharī'a* and *'urf* in daily life made it all the more necessary for jurists to distinguish between them at the doctrinal and discursive levels. [2012: 649]

Access to limited resources, not to mention densely occupied living spaces and intense heat, may give rise to frequent quarrels⁴². I once witnessed a disagreement over the building on a footpath by a particular party. This party claimed that it was public property and thus free to use, while his neighbour claimed that the path, adjacent to his land was in fact his property. This dispute was probably resolved quite simply by consultation with a Mozabite expert on property use, as private and public usage had clear precedents. Regarding resolution of more ambiguous problems, I was informed that this usually began by an informal process. Arbitration of conflict was first attempted by appealing to family members. If this first point of call failed, then an appeal would be made to the *'ashīra*, council of families, to pressure parties to resolve their problems in an equitable way. If this didn't work, then the problem would be escalated to members of the mosque, whose elevated social standing usually gave them the necessary gravity in the eye of the beholder to sort the problem out. Here, the *'azzāba* had a more formal approach, involving the following steps:

1. Look for the rule in the Qu'ran. If not then,
2. Look for it in the Hadith, sayings of the prophet. If not there, then,

⁴² Historically disputes took place between individuals, clans (or *safs*) or even whole towns, as I described elsewhere (chapter four, on segmentary theory).

3. Look for similar examples in the Qu’ran and try to weigh up the pros and cons for the people. If not there, then,
4. Look to ‘urf, customary law. If not,
5. Look to civil law.

Interestingly, Nejib exclaimed that now actions 4 & 5 are the wrong way round, people look to civil law first, then to customary law. He went on to use the metaphor of a house, remarking that “you can’t build a house from the top. You have to start with the foundations, the local layers. The customary and civil law should be complementary, yet, they are inverted.” This points us to the fact that the state law is now a further complicating factor in power relations between regulatory systems. Furthermore, Nejib argued that local institutions are better geared toward local problems, and they can find tailor-made solutions, whereas the state tends to offer one-size-fits-all policies.

Issues commonly covered by ‘urf involve the sanctity of the family, such as building regulations. For example, if a bakery is opened next to a family residence and it makes a disturbance (as bakeries commonly begin work early in the morning), then the family has the right to demand that the bakery has to move. I was curious as to how decisions were reached, and how new applications of ‘urf were made, and it became clear that consultation was a key part.

The Qu’ran has allowed for customary law to be applied to deal with particulars of a situation, it says “apply the legality and the right custom”. People try a new law for ten years or so, and consult people as to its efficacy and worth. Custom is the accumulation of experience over time. Another example is shafa’a: if you sell a house, you must ask your neighbours, otherwise they can cut in on the contract [right of pre-emption]. This is for conserving community. Yet another example of ‘urf is where in the past all neighbours around a well would give up a piece of land around it including the space for the animal to pull the line. Now neighbours ‘steal’ that land as they have electricity [for pumps]. But it is collective land. The Algerian law doesn’t know about these things, so there is conflict. There is a French hangover of rules from that time. They have updated their rules, however, here we have not. Such rules are adapted to French and European customs and geography,

not ours. Another example is the customary law that stipulates that houses cannot be built higher than others, for access to sunlight, but now people go to the hokuma [local government] and they say you can build as high as you like. People can say nothing. Also, they may put windows, but this is haram. L'oumna [the water guards] in the past would have said, "close it". If the perpetrators didn't listen to these words, then the issue would be taken to the 'ashīra, at that time people were very afraid of this authority. If they needed to go higher up, they would go to the mosque. People respected these institutions then, before there was solidarity. France broke everything. People say, "a bad agreement is better than going to the tribunal."
~Nejib, 24/11/13

There is much here worthy of discussion, but importantly it was stated that the various customary authorities, from family members to councils, are said today not to hold the same power of awe over individuals, who instead often decide to try their chances at the law courts or settle for "bad agreements". Thus local authority is waning. New more inclusive forms of governance are being experimented with, as I explain in chapter eight, leaving the problem of how to deal with serious conflict without the force of locally recognised sanctions.

Discussing the issue with Nebil, he claimed that one reason that people were going to the law courts rather than deal with it internally, was due to the length of the traditional process:

Going to the family would take a week, going to the 'ashīra would take another week. ...there cannot be two powers in town. If you have two brothers, you listen to the older one.
~ Nebil, 18/11/13

This statement interestingly discusses the relationship between local and state legal institutions in terms of kinship, using the metaphor of older and younger brothers. We further discussed what role the state law courts played:

You may go to the family for example, if you hadn't been paid for doing a job. If you went to the justice for such a petty manner, they would say to you "why didn't you go to the family first? What arrangements did you make?" A person with a bad

character may manipulate the 'urf as it is flexible, but they cannot get away from the power of the law.

~Nebil, 18/11/13

From these examples, it is clear that the influence of local institutions has been waning for some time, as local people put it, because people are “not God fearing”, or “because the French took the power away”. However, for certain issues, like divorce, people still prefer to consult the traditional institutions. Furthermore, my interlocutors declared that they try to keep women away from the courts, preferring to deal with such disputes locally (although I observed that this wasn't always the case). Perhaps the most important influence is that of the introduction of French civil law, in providing an alternative venue to be exploited by those who could, in order to demand individual shares of inheritance. But before entering an examination of the more recent legal system and its effects, it is essential to discuss how land was jointly managed in the past, and how and why this has changed with the new inheritance practices.

7.3.3 Atomisation of the extended family

On a cool winter's day, Bessem and Nejib visit us for dinner. Once again, I enquire how the problem of inheritance has been managed so as not to continually diminish the palm gardens. Bessem replies that in the past families operated like Christian families, with one son managing the garden, one professor, one doctor, two practicing commerce in the north, and one imām or lawyer. The merchants would invest some money in the palm grove, and everyone would get their share of dates or the sale of dates. But sometimes, and more regularly now, one would complain of not having an equal income and would demand their share. Then the family would either buy their part, or sell part of the palm grove, dividing it to a smaller size, or even sell the whole plot and divide it.

~Field notes, 25/12/12

From this and other conversations as described above, I began to understand that historically resources such as land tended to be managed in common, presided over

by the family patriarch (see Crawford 2008: 15, for a comparison in the Moroccan context). Families, as in medieval Europe it was pointed out to me, were like microcosms of society, in that sons would actively choose different careers, e.g. one priest, one lawyer, one teacher, one soldier, one farmer, so that each could draw on the benefits of the various social and political fields for the overall prosperity of the family. Thus the proceeds of each would be roughly equally shared out among members, such as the seasonal harvest of the land⁴³. This situation no longer seems to be prevalent.

Recently, however, a certain atomisation has been taking place in Mozabite society, dissolving this microcosm. On discussing the issue of inheritance with an elderly farmer:

Sons used to bring their wives into the household of their father, until they have children, at which point they would move out, rent or buy a house of their own. With inheritance, if they agree, they divide the land between them. If they don't agree, they sell the land. Daughters are often the source of disagreements, as their spouses often demand cash.

~Bayoub Abbas, 19/11/13

As noted by Farrag (1971), this drive to small, atomised families most probably is related to the ability of wealthy individuals to break away, setting up independent households, rather than being forced to wait for the patriarch to die, in order to inherit and finally gain authority. As Bayoub noted, however, this could be exacerbated by affinal relations, such as the spouse, wishing to make a claim. Furthermore, certain factors, analysed below, have caused family members to cease to acquiesce to the ascendancy of the elder male, especially after the death of the father, and seek their share of the communal resources in monetary value.

⁴³ Bessem pointed out that he was influenced by the local radical Mozabite thinker, Abderrahmane Hadj-Nacer (2011), in coming to this understanding regarding extended household management.

Regarding the allocation of property following a death, paradoxically, despite the doctrine of Ibadite (and indeed wider Amazigh) equality, it may be due to new notions of *individual* equality that have caused a downfall in previous management methods of family oasis plots. Historically, equality was generally sought *between* household heads, while a hierarchy of age and gender ruled *within* the households (Crawford 2008: 12). Currently, while hierarchy between generations still exists, it appears that equality is sought between siblings. Thus, the eldest sibling is no longer the most important, and is no longer able to take on the mantle of ‘patriarch’ of the family household.

It is my contention that by breaking off and starting their own households, young wealthy families are circumventing *social visibility* (as discussed in chapter five), creating barriers by means of walls to this mechanism of social control in the M’zab. Walls are more prevalent in Mozabite oases than others I have encountered in North Africa, and they are erected and maintained according to local norms regarding the privacy of the family. Thus, such norms of privacy could be seen to be offsetting norms of control through visibility and the *social gaze*. Further, it is the wealthy that are most able to afford such walls. Therefore again, it is the wealthier classes that are eschewing traditional normative practices.

Bourdieu argued that in Algeria, atomisation was driven by the promotion of private property by French laws (1961: 84, in Fowler 1997: 15), which agrees with my assertion of the rise in importance of individual rights. Of course, family managed farms were already privately owned, but Bourdieu seems to be arguing that with privatisation came a ‘modern’, individualist ethic, perhaps alongside this

emphasis on individual rights. It is this disruptive, often violent, social upheaval that I now examine in more detail.

7.3.4 Civil law and colonialism in Algeria

Before, the mosque protected the oasis, ensured the law, 'urf, dictated when certain things were done in the oasis, such as cutting the branches. In Morocco it is different, there they have the king, who protects their interests. Here, there is conflict with the state, they don't act in the peoples' interests. Now the mosque here is only for praying, and it is the population and the government together. It was the French who took away the power of L'oumna and the mosque.

~ Salah Ba Ali, farmer, 19/09/13

On the African continent, customary law was mainly created in reaction to colonial rule (Ranger 1997: 456, also in Hobsbawm, *The Invention of Tradition*)⁴⁴. However, in the Islamic world, Islamic law existed prior to colonial civil or common law, which coexisted with pre-existing local customary laws. This resulted in a plurality of laws, as although the colonial rulers needed to apply European Roman laws such as criminal and commercial laws in order to facilitate market expansion, they had to leave certain elements intact such as family law or personal-status law, in order to ensure social stability (Sartori & Shahar 2012). Indeed, key to maintaining a delicate control meant allowing Muslim communities to continue to practice the Islamic faith undisturbed, and a central tenet of this is Islamic law, *sharī'a* (Christelow 2014: 4). Clearly, customary laws were subservient to colonial authority (Nasr 2001: 43). Moreover, indigenous systems of law were not merely incorporated into statutory law, but were adjusted, with unsatisfactory ones being criminalised as dangerous or primitive (Sartori & Shahar 2012). An important factor of legal pluralism under colonial rule is that colonial powers were able to

⁴⁴ As Ranger (1997: 456) unequivocally puts it: "what were called customary law, customary land rights, customary political structure and so on, were in fact *all* invented by colonial codification."

apply different law codes of different pre-existing ethnic divisions, in order to maintain a divide-and-rule policy (*Ibid.*).

Interestingly, pluralistic hegemonic regimes, rather than being solely sites of power and subordination, have been used for counter-hegemonic purposes by indigenous populations (Nader 2002: 36), or manipulated opportunistically as a way out of customary modes of practise, such as with traditional inheritance rights (for example, civil law gave women equal property rights (Rae 2002: 9)). Indeed, a multiplicity of legal regimes has afforded a kind of ‘forum shopping’ by litigants based on opportunistic self-interest, as I found in the M’zab (von Benda-Beckmann 1981). Furthermore, not only did colonial law affect Islamic and customary laws, the mother countries in turn were transformed by the encounter (Comaroff 2001).

Colonial subjugation varied from direct to indirect rule. Algerians experienced a particularly brutal form of direct colonial rule (Fanon 1959; 1963), where the French centralised and bureaucratised a formerly highly variable judicial order by introducing a court of appeal which oversaw the previously independent *qadi* law (Islamic jurisprudence) system⁴⁵ (Christelow 2014: 9). The first phase of colonial rule entailed removing all vestiges of Ottoman political structures and, reflecting Ottoman rule, they regarded the Algerians as never having had an indigenous state. The sultan or *bey* was left to remain as a symbol of national sovereignty, as in Morocco and Tunisia. Next, they eradicated all tribal structures, and reassigned their fragmented remains to territorial units or *communes* under direct French administration. The commune leader or *qaid* was selected by the French, often

⁴⁵ In the 1880s the French attempted to eliminate the Muslim courts entirely. This led to the first popular protest movement in Algeria after 60 years of colonial rule, and eventually the French withdrew this policy (Christelow 2014: 9).

from outside the area, and thus usually despised by the local population for subservience to the colonials and for their domineering habits (*Ibid.*: 12).

The M'zab was left alone by the colonial administration for the first 50 years; apparently the new administration admired the Mozabites disciplined self-organising abilities. Finally, in 1882, the French annexed the M'zab as punishment for aiding and sheltering members of a resistance movement led by Abd al-Qadir, and also tripled their taxes⁴⁶ (Amat 1888: 238). From the Mozabite point of view, they were caught between a rock and a hard place, fearing both the advancing colonials and the dynamic Abd al-Qadir. For a long time they hedged and debated as to which side appeared to be gaining the upper hand (Bennoune 1986). However, following annexation, as Bennoune puts it:

...the council of the clerks, which governed the Mozabites since the declaration of the state of secrecy in Ouargla, and which was operating clandestinely, never recognized either the legal validity of annexation or the French authority represented locally by the appointed officers. The clerks in accord with the committee of the *halqāt* (circles) organized the total boycott and avoidance of the French administration and the means of its presence: schools, hospitals, military service and even tax evasion. In a word, the Mozabites tried to minimize as much as possible their dealings and relations with the colonial power and the medium of its domination. [1986: 110]

Thus, the Mozabites largely continued to attend to their own affairs, preferring to solve their problems and conflict internally, according to their own methods of justice, resolution or punishment. However, a new precedent was set, and an

⁴⁶Amat (1888: 26) relates the French proclamation: "Inhabitants of Mzab, when you have made your submission to France, we promised you that our powerful protection will cover you in your travels and during your stay in our cities, we have kept our promise... you will keep your municipal *djem'aa* as a useful measure and your Abadites sheikhs will do your justice. We affirm the authority of your leaders and we will respect the decisions of your sheikhs when they act with fairness and justice. But we will also reach out and strike those who fail in their duty, or vis-à-vis the administration and the defendant, or vis-à-vis the Government of the French Republic." (my translation from the French)

alternative seat of justice was available for those who didn't agree with the judgements of the Mozabite authorities, or who wished to subvert traditional arrangements regarding land tenure, inheritance, and authority (the household patriarch, the *‘ashīra*, the *‘azzāba*).

Such a shift in the centres of authority and identity has been alluded to by Scheele (2009: 107-11) in her work on the Kabyles of Northern Algeria. I contend that at a certain point, Mozabite individuals, most probably from the wealthier section of society, who were already subverting the practice of *tebria* by forming their own bourgeois circles, turned to another centre of authority, that of the nation-state. This was probably more attractive than accepting the authority of the colonials, as the new state had a self-proclaimed Islamic identity. Support for this view was provided by several individuals in the M'zab when discussing changes regarding local power. For example, Nejib informed me that:

In the past before the French when a crisis happened, the community found solutions to problems and then put them into writing. The French removed power from the mosque to make decisions and placed an outsider muqqadam who didn't understand people or local history. He can't find a solution to the problems. The mosque used to be able to solve disputes by reference to Islamic law, solving disputes quickly so that the land doesn't lose value, unlike now. Now power is centralised as civil law.

~ Nejib, 23/11/12

Further, in discussing the matter with Bechir, a student of city planning:

I ask about power and how the French at first allowed local autonomy, but then took it away. Bechir says that from the local point of view, they didn't really manage to interfere. But now power is given to central government, because they are an Islamic institution, but they respect local specificities. General regulations sometimes don't fit with local regulations. They often allow exceptions, however, e.g. "we are free to deal with the mosque about 90 per cent. In other mosques in Algeria, the imām is chosen from the ministry of Religion, this is important, as religion is the most important thing in Mozabite society". Also, there are no policemen. This change in power dynamics took place gradually since independence.

~Field notes, 21/09/13

Nejib argued that civil law cannot decide a local situation of which it knows nothing, by relating how two neighbours disagreed over something and went to court, and the judge told them that the law could tell them nothing that their own common sense or local conventions couldn't. Further to this, Salah Ba Ali added that judges indeed often enquired of plaintiffs whether they had exhausted the local processes first. This shows that conflict between customary and statutory laws is not always necessarily the case.

The brutal French colonial rule was experienced more violently in Algeria than anywhere else, and the disruptive effects were far reaching. We can see these effects continue into the postcolonial period, for as the fledging state attempted to oppose the dominant imperial powers in its formation, including attempts at socialism, the colonial structures, especially the legal system, resisted and endured. This probably took some time to filter down to the M'zab in its remote enclave in the desert, protected by the parochial *'azzāba*. Yet, (some) Mozabites decided to strategically engage with the new Islamic Algerian state because it was seen as morally and ideologically aligned with local interests. This arguably opened up the possibility of choosing an alternative pathway for litigating disputes. This shows that colonialism wasn't simply experienced as a loss of local agency; rather, it provided alternatives for those who wished and were able to exploit them. In contrast to indirect rule, French imperialism in Algeria sought an assimilationist policy (Christelow 2014: 11). Cultural change came slowly to the M'zab, despite the fears of some (e.g. Amat 1888: 228). Arguably, it is only recently that large-scale changes have been felt, primarily due to the introduction of global mass media, and despite

futile resistance by the *‘azzāba*. I now discuss this final component of change regarding notions of inheritance.

7.3.5 Globalisation & changing values

While formal modes of local governance have been denigrated by the presence of the state, informal means of normative order have also been slowly eroded by conflict with the new ideas that arrive by global mass media. Recently, youth have been experimenting with alternative forms of identity in the less socially accountable realms of social media (as one local friend complained to me). Again, this social arena is largely outside of the customary physical space which succumbs to social visibility. These new, unregulated spaces allow young people to experiment and engage with new ideas and values, and some of these values are locally perceived as a threat to the moral fabric of the community. In engaging with the outside as never before, the previous sacrosanct inner sanctum of the local community, once upheld by the family and mosque appears to have been violated from within, a kind of Trojan horse, as young Mozabites sit in front of their computers within the walls of the old towns engaging with an unprecedented, unregulated flow of information, ideas and images. Individuals are now debating the role of conformity (with social norms) in limiting the creative process, for example, referring to economically successful ‘Western’ role models, such as Steve Jobs.

In discussing the effects of globalisation, I asked Omar about what he meant when he said that “the culture is getting lost”. He replied:

In the past we were isolated. With the event of globalisation, the young people question their ways and culture, and perhaps see themselves as “retarded, ignorant”.

Plus now there are many people around with different ways. Religion is being lost, and this is tied up very strongly with their culture or identity. People don't listen to the ʿazzāba as much anymore. [I ask him for an example of culture or religion getting lost, he replies:] for example, neighbours wouldn't make problems over land, this wouldn't have happened in the past (by God fearing people), now they go to the courts.

~Omar Blidi, 25/11/12

Omar went on to speak of conserving traditions, afraid of a monoculture in the future due to globalised mass media on the internet and TV. He referred to Japan as a notable model, that some things need to remain closed at times, some things open; not all things open all the time. He regarded community to be the natural human state, and associated the rise of individualism with industrialism. Another friend had this to say:

people may have seemed a bit harsh in the past, closed off to people who are open-minded today, e.g. being open to foreigners, but maybe we are letting bad things in. this is my view. Like now people on Facebook are calling themselves 'emo' or crazy person. This didn't happen three years ago, it is the bad effects of globalisation.

~Omar Ben Enis, 08/10/13

The people I spoke to in the M'zab were clearly afraid of some of the effects of globalisation, yet some were obviously embracing such change. I found it heartening at least, that such change was the subject of debate, by the young and old alike, and thus they were contesting such change, determined, largely to accept it only on their own terms.

Benmoussa (2013) argues that globalisation has indeed affected Algerian values regarding land. He states that the French drive to privatise communally managed land did not affect all of Algeria equally, and the less-profitable southern rangelands were not affected as those in the North. In the South, tribes continued to have right of use of rangelands (although these technically belonged to the

state); it was not until the end of the 1980s after the self-declared socialist period in Algeria and the privatisation of the economy, that this began to change. Benmoussa describes how communal land is now being privatised and sold off by means of a legal loophole, where portions of land may be given to poorer individuals for temporary use, a tradition named *haq al-afou* (lit. Arab: right to tranquillity). This transition is recognised by national statutory law, and then the land may be sold off to a third-party from outside the tribe. The author further argues that although this technicality in the law provides the mechanism for privatisation of communal lands, globalisation has provided the impetus for change through changing local values to support self-interest over that of the community, in agreement with my own arguments.

To summarise all of the above, I suggest that the breakdown of extended households toward a more atomised family unit has been strongly influenced by ‘Western’ images, of notions of individual freedom and independence, without the overbearing obligations to the family and wider society. Such notions of choice and obligation were being openly discussed in the M’zab (such as at my English language club). I further theorise that an increase in the wealth of some, especially since France opened her borders for a period, leading to expansion of Mozabite business, but also due to education since independence and the creation of a professional class. This same newfound independence and freedom of choice for the individual (over the community) has resulted in more individuals making inheritance claims rather than allowing for property to be managed in common by the family head. This in turn has been facilitated by the introduction of French statutory law. Thus we have structural changes facilitating change from outside the

valley, combined with changes in values and motivations of individuals, which have resulted in the present problem of disputed, fragmented and abandoned land.

7.4 A tale of two systems: a polyvocal discussion on the problems of legal pluralism

The ʿazzāba help to bring equilibrium among the people, and to respect the rule of law.... If there is a conflict, the courts often - if they can't find a solution - refer the case back to 'urf, customary law, using jurisprudence.
~ Salah Ba Ali, 11/04/13

In order to present the wider debate on how the above issues are framed at the local level, I present here an excerpt from a discussion on the topic between Ba Noah (a local geologist and son of a prominent imām), Mustapha (a petrochemical engineer and president of the *amal* association for youth employment) and myself:

Mustapha: *What is your sense of local governance issues?*

Nejm: *I think the problem is that there are two laws, national and local, and that they conflict. In Morocco they still agree to follow local rules and participate in local sanctions.*

Ba Noah: *Yes, having the state law is the problem.*

Mustapha: *One response would be to adapt state law to local sensibilities, the second would be to create awareness of local problems through the associations.*

Nejm: *Yes, there are the carrot and the stick approaches. The difficulty would be to have local lawyers engage with politicians, perhaps representatives of the region to convince the state to allow the region to come up with their own agendas and to follow local rules, that in America and other places they allow tribal law, although not without its problems, is essentially a devolution.*

Ba Noah: *The problem is not with convincing the state, but with convincing people locally to come up with a common goal, or strategy. In the past everyone had their part to play in society, now everyone is just living [independently]. The spirit of law and order comes from need. If people opened up a new land, they would need to rely on each other once more through working together [twiza]. We need new horizons.*

Nejm: *In the West, people have tried to make intentional communities and failed at the organisation level, e.g. endless decision-making due to democratic ideals causing stagnation of action.*

Ba Noah: *Yes but we have centuries of tradition of organisation that we can draw on.*

Mustapha: *Many structures are good such as the mosque, the ʿashīra etc., but now there is lack of trust such as by young people, because they don't agree with rules that were made to serve previous times and which are now out of context.*

Ba Noah: *You can give incentives to non-cooperative persons, such as the wealthy, what do they need, maybe give them money or some other kind of help.*

Nejm: *But the rich think they need nothing so there's nothing you can give them.*

Mustapha: *These people are very rare.*

Nejm: *At the moment, L'oumna individuals don't have the power to make fines so they must go to the ayyen, who will then talk to the individuals.*

Mustapha: *It is important to have the non-cooperative person talk to another corresponding 'right' person for willingness to acquiesce to the demands.*

Nejm: *perhaps the reputation of the family is a resource of the rich that can be affected, so shaming them would be a manner of insuring cooperation. Also, in some countries they have tribal law which is respected, although not without problems.*

Ba Noah: *The people need a common strategy.*

Mustapha: *So we are back to associations! The ʿashīra, schools even.*

Ba Noah: *In the past the organisation in the valley worked, with representatives at different levels.*

Mustapha: *Following national political parties has caused some local divisions, making it even harder to share a common vision.*

~ Field notes, Mustapha & Ba Noah, 27/10/13

While the conversation addressed many issues, the major themes can be summarised as: a preference for local solutions; that community solidarity is based on mutual need and mutual vision; that compliance could be further achieved through persuasion by respected individuals; but that community was threatened by traditional authority becoming irrelevant, and further by political divisions.

This preference for local solutions contrasted with my suggestions which involved devolution of state power and potentially a form of state-sanctioned 'tribal law'. This attitude came up repeatedly, and while it revealed the unwillingness to oppose the authoritarian regime, it also highlighted the willingness to deal with issues at the local level. Similarly, when it came to meetings regarding oasis problems, people explicitly focused on what could be engaged with, rather than listing abstract global issues over which nobody had any control. Such pragmatism and motivation in formation of social organisations is the focus of the next chapter.

7.5 Discussion

In considering bodies of 'law', from local customary and Islamic, to colonial and postcolonial, which is the most important in terms of controlling, regulating or motivating behaviour? Usually, with the creation of the nation-state, dispute settlement between parties is delegated from the local to the national, in the form of law courts. This appears to follow a trend whereby the notion of individual *rights* ends up usurping the moral prerogative of *social care* for one's fellow household members and neighbours. As such, this points away from ineffectual critiques of legal pluralism, toward a more insightful wider analysis of different ideological systems, as Fuller (1994), drawing on Geertz (1983) would have us do.

Put another way, as I have documented above, the rise of the state and a new legal framework, with its corresponding 'social contract' (i.e. taxation in return for supposed government protection of private property through state legal apparatus), have supplanted social allegiance to one's family and neighbours. This situation is especially prevalent in large 'faceless' societies where social inequalities exacerbate fear, making it less likely that strangers will intervene on another's misfortune (Nader 2002: 55). The 'state' and the 'nation' must be unpacked somewhat, however: although this is not the place here to go into detail, it must be reasserted that the 'nation' is not simply an abstract political construct, but a social one. The state is reinforced by people through everyday practices, and by the 'state' through banal nationalist rituals (Sharma & Gupta 2006). In this way, people participate in reconstituting the state in the everyday, even when they claim to resist its influence.

Indeed, in the M'zab, it is evident that the wealthy class are foremost in breaking away from traditional ordering practises, such as religion, *tebria*, the patriarch, gossip and such, by drawing on technologies of the state. This accords with arguments made in the previous chapter, in that they can afford to deal with problems through the use of money, rather than having to go through drawn-out negotiations with peers, as dictated by reciprocal work. In this case, rather than go through the customary channels (family, *ashīra*, *azzāba*), those who can afford them employ lawyers. As it turns out, this has protracted disputes rather than expediting them, but receiving individual shares has become more important than joint management of land and resources. Indeed, perhaps in the creation of barriers to visibility by the wealthy, Mozabite society is moving away from a face-to-face society and thus formal litigation processes are becoming necessary. However, as many people agreed (as with Nejib's above analogy of the house), national law courts have little understanding of local norms and practices, whereas local authorities may be able to give a more nuanced ruling. It is clear that local power plays into people's decision-making around present day disputes; with some perceiving the national law courts as being more neutral in their decision-making, as having less personal interest; yet entirely the opposite may be reckoned also, as state interests in the M'zab are seen as clearly less than neutral.

My argument is this: such a move by certain local people toward a state-centred social contract based on taxation - again, based on the idea of individual consumer - thus replaces a local social contract comprised by messy, complex obligations. This latter is not predicated on the exchange of money and the threat of force, but on the circulation of obligation, and a withdrawal of cooperation if obligations are not met (see Roberts 1979: 30). This conceptualisation of contract theory, I contend, goes

beyond mere 'forum shopping' as searching for strategic advantage (Benda-Beckmann 1982). Finally, in response to critics of legal pluralism, I urge that an analysis of multiple regulatory systems need not entail a dilution of the notion of law, but instead allows for a critical perspective of power relations between individual and state actors.

7.6 Conclusion

This thesis asks how Mozabites respond to and create social and ecological change. The problems associated with inheritance claims to land resources are clearly socio-ecological problems, emerging from the long-term hangovers of colonialism and more recently globalisation. It would appear that while some Mozabites have adapted to these changing conditions, this has not benefitted the community as a whole. To specify, they have not been able to modify current institutions or create new ones to deal with the new challenges involved with dealing with multiple systems of law and the power dynamics involved which have denigrated customary practice. It is not clear whether such jostling for advantage will result in a kind of group adaptation as theorised in chapter five, for it is clear that the new political elite (the merchant class) is the only beneficiary of the current circumstances, as they alone can afford to pay high legal costs. Thus, a new equilibrium may have been achieved, but one that supports a new hegemonic status quo. As the conversations with Mustapha and Ba Noah above show, however, people are not remaining idle in the face of these challenges, but looking for new (and old) solutions.

In summary, differences in the perceived quality of different land parcels appeared to be a key factor in some of these inheritance conflicts. In the M'zab, formal laws,

whether written or verbal, often contain an explicit moral dimension. Islamic interpretations are used to argue for the representation of an ideal Muslim community, largely as imagined and reconstructed by the *‘azzāba* during sermons, repeated in Qu’ranic schools to pupils and in the home or at work by mothers and fathers to their children. For being able to repeat a certain difficult passage in the Holy Book, a father may reward his son with a date palm, a venerable gift. I have shown that oral customary law, scriptural Islamic law and state statutory law may be in conflict (as when used to ‘forum shop’ by individuals), yet can be ‘harmonious’ also (as when referred to by ‘enlightened’ judges).

In the analysis in this chapter, I have had to extend the event-based approach to fit the problem by necessarily abstracting to deal with multiple events, or a trend of events. This is largely acceptable under event analysis theory (Vayda 2013). My lack of access to households and legal documents has constrained the analysis of specific conflict cases, however, and some of the above theory is conjectural, although still using the method of elimination of possible explanations through logical examination. Further research time in the region would be needed to access these documents.

To conclude, because of the social changes outlined above, Mozabite society appears to be becoming more fragmented. This would not be a problem in a post-modern consumer-oriented neoliberal society, where any issue can (apparently) be resolved through money, if one has enough of it. Yet, when people truly need each other in order to survive, this is not enough. As I show in the next chapter, management of natural resources which require participation of the whole community necessitates the need for a social consciousness beyond individual

consumerism, and following a recent natural disaster, many have been questioning such notions as 'individualism' and 'community', and their outcomes regarding competing visions of a locally desirable society.

8. Voluntary politics: Associational life in the M'zab

A Muslim should not start to make prayers on the dry oued because it may be full by the time he stops.

~Bessam, 18/10/12

This chapter continues themes raised in the previous one, in that it examines governance, but this time of common resources rather than private property, primarily irrigation water (but also agricultural knowledge, labour, and date pollen, among others). There is some crossover in property classifications, however, and fields can be dynamic, as in times of crisis. For example, water running through artificial constructions in Beni Isguen, for example, (such as wells) is classified as private (in accordance with Islamic law), although this designation can be relaxed during crisis times such as drought. On the other hand, river water is common property, and so is canal water, as canals are communally constructed. In contrast to private property, where one can more or less do what one likes until it is passed on, communal water management is very much a political affair, as the actions of one affect others.

The literature on natural resource management for sustainability and resilience abounds with reference to co-governance (Ackerman 2004; Folke et al. 2005; Duit et al. 2010). This usually refers to joint management between small communities and the state. For example, Trimble & Berkes (2015: 2) optimistically refer to such initiatives as “institutional design that considers the sharing of costs and benefits.” The focus is on collective learning and power sharing, indeed the ‘empowerment’ of communities. Despite a focus on multiple stakeholders, resilience and co-

governance literature lacks a theory of the state (Ratner et al. 2012). The different sub-disciplines of political anthropology (which previously focused on stateless societies) and political ecology are today, by contrast, largely centred on investigating how the state is implicated in the everyday, drawing for example on Foucauldian notions of discourse and technologies of governmentality (e.g. Sharma & Gupta 2006), feminism and neo-Marxist theory (Neumann 2014: 46–9). Indeed, Sharma & Gupta (2006) criticise state discourse on power sharing, however, which they describe as “neoliberal “unloading” of public services onto empowered and “responsibilized” individuals and communities. Many studies in political anthropology have centred on corruption, in the forms of factionalism, patron client relations, and bossism, for example (Nuijten 2003: 2). Some attempts at fusing resilience and political ecology theory have resulted in progress in addressing this deficiency in the former (e.g. Hornborg 2013).

I discuss here the politics of water management, and a general shift from hierarchical forms to organisation based on voluntary associations in the M'zab, and the theoretical implications of both. In terms of the former, much has been written connecting the development of irrigation to advanced societies and ‘civilisation’ (Witfogel 1957). While such theories have been largely discredited (Lewellan 2003: 60), anthropologists have continued to advance political theory on irrigation and society, such as the link between politics and scale, whereby larger groupings require specialised authorities to regulate water users (Geertz 1972; Lansing 1987; Price 1995; Mabry 1996). My research corroborated such links, with interesting implications for notions of self-regulation (chapter nine; see also Harvey 2012: 69). In the Maghreb, some have documented the direct replacement of ‘traditional’ authorities by voluntary associations (Scheele 2008) or hybridisation

between them (Bergh 2009). The case of the M'zab is different, for older authorities continue to coexist with the newer ones. De Tocqueville originally envisaged that such civil society groups would serve as a benign, mediating link between state and society. Many later theorists have problematized such relations (Gramsci 2006; Comaroff & Comaroff 1999), with some claiming that the state uses civic organisations as an excuse to withdraw welfare services (Liverani 2009: 7). Yet others claim that civil society, even if limited, offers a path to resistance (e.g. Butcher 2014). My research corroborated this. Attempting to get around this impasse, I redefine civic organisations in Beni Isguen as micro-social movements. Even the definition of social movements is not without its drawbacks (e.g. Gledhill 2000: 184), yet I justify my usage of the term to distinguish how local progressive groups, such as farmer associations, are dealing with change, in contrast to 'traditional' organisations that are more concerned with and geared toward maintaining the status quo. This brings us squarely back to the central question of this thesis, of how Mozabites are navigating sociological change in relation to oasis resources. I have dealt with labour and land in the previous chapters, now I turn to communal management of water.

8.0 Communal irrigation problems in the M'zab

Unlike other commonly managed resources, which may be subject to collapse from overuse if poorly managed or unregulated (Hardin 1968; McCay & Acheson 1987: 18; Ostrom 1990), the problem in Beni Isguen and the M'zab in general, is that people are using communal water *less*, not more. Following government development in the 1960s, some individuals have used pumps to draw well water, rather than relying solely on the communal floodwaters. This has caused parts of the irrigation system to fall into disrepair, affecting everyone, as each section must

be maintained to retain flow to all. This maintenance was historically overseen and regulated by the *l'oumna* water officials who had power to fine, as sanctioned by the mosque. Some new wells are individually owned, while others are owned by the state, which involve collectives of water users. The organisation of this latter group has not been without problems due to lack of enforcement for non-compliance.

Well-intentioned development plans have combined with other more insidious state interventions, originating with the colonial state to subjugate populations. I argued in the previous chapter that local Mozabite litigation procedures have been displaced to the national state legal system, which was not simply a result of top-down interference, but a result of local agency by particular parties. However, despite local contestations, the fact cannot be avoided that the manoeuvrings of the French helped remove a key component of power from the local authorities (*'azzāba*): the power to punish. Previously, the ancient institution of water guards, *l'oumna*, were given authority to punish individuals for infractions according to their expertise, such as relating to the irrigation canals, buildings that affected public byways, and so on. The French arguably stripped the *'azzāba* and by association *l'oumna* of their capacity to punish crimes, though a degree of normative control still exists. An alternative explanation is that Mozabites refused to accept local authority with the presence of a 'higher' authority, the state. Both explanations are legitimate and add to a more complex understanding.

Here, I investigate how these local institutions have been eroding and why, and with typical Mozabite 'resilience', how new organisational formations have emerged to take their place. I ask whether these new formations are able to do the same job without coercive capacities. Firstly, however, I present a recent

catastrophic flood event which, I argue, forced people to reflect on the state of local management institutions. Then I return to the present and discuss the two current management structures for water and other resources, one old, one new. One could be forgiven for viewing new associations as in the ascendant, and ‘traditional’ authorities as in decline, but as I explain, things are not necessarily as they appear at first sight. I then return to the flood as I work backwards in time through the causes for the present state of affairs, and I discuss how local people themselves are questioning current social trajectories and transformations regarding especially social relations and value sets, and reimagining how traditional structures could be reworked for future benefit.

8.1 The 2008 flood event

In 2008, a devastating flood ripped through the *oued* (river) M’zab, tearing down earthen buildings and causing the loss of life. Although floods are erratic, even chaotic, they are still expected within a certain timeframe (Park 1992), so what made this one particularly devastating? Was it the scale of the flood, which brought an unprecedented quantity and velocity of powerful, churning effluence? Or was it that the inhabitants of the valley were somehow unprepared? Was it an act of God as punishment for some social indiscretion (as one Mozabite put it, “we see events as an act of providence”)? It is understandable that the paradoxical force which refills the underground aquifers, brings nourishing mountain silt, and washes away the salt accumulations, yet can also take away life, is attributable to God (see also Ilahiane 1996). Indeed, it was related to me that just a day before the flood arrived, a significant conflict arose between ethnic factions in the valley. It happened that a disagreement occurred between the Mozabite and the Arab imāms as to their prediction for the final day of Ramadan, the month of fasting. A scuffle broke out,

and blows were dealt. The subsequent flood was widely perceived as a direct punishment for such impious behaviour.

The flood arrived on the day of Eid at 7.30 am, after dawn prayers. Beni Isguen wasn't affected as much as the other *qsūr* of the pentapolis, as it sits off the main course of oued M'zab, in a separate valley. Khadir Khota, a farmer and agronomist, took me on a tour of al Atteuf, the oldest *qsar*, and furthest along the *oued* M'zab.

He related the events to me:

I was lucky to hear about the flood early, as I keep bees upstream in Berriane [about 30 km away], and a friend called me to tell me. Thank God the flood split in two [in Berriane] before going on to Ghardaia and another direction, otherwise the flood would have been even worse. Before 2008, the last major flood was July 2004, a reasonably big one. It usually comes in May-June, or autumn, roughly every 1½ years. The last was September 1st 2011. In al Atteuf, the impermeable limestone rock at the end holds the water, giving it nowhere to go, and only slowly sinks into the phreatic aquifer.

~Khadir Khota, 13/11/13

This holding of water by the limestone floor means that the water wells up, softening the locally sourced mud adobe walls, causing them to crumble if the water has nowhere to drain. This is the primary means by which buildings were destroyed. The flood finally subsided at about 10.30 am, leaving chaos in its wake: destroyed houses, detritus everywhere, including rubbish, flooded cellars, and tragically, 78 human mortalities. Aid came from different corners, as groups such as the boy scouts and the Red Crescent emerged seemingly from nowhere to help people remove water from their cellars and clean the roads. Food packages were sent from other districts of the country to be distributed by the *‘asha’ir* (pl. for *‘ashīra*) and mosques to whoever needed it. A committee for each quarter of each town was formed, and the president of each reported to the *ayyen* what was needed. Although Beni Isguen was not in the direct flood path and so was less affected,

damage was still accrued by some buildings. These were rebuilt over the duration of three months on every Friday by the people of the area through ‘involuntary’ *twiza*, as ordered by the mosque.

Local people complain that the state has not done enough, only acting in retrospect, and that even these actions have not been enough. One response by the state, for example, was to create a system of zones according to flood risk, enacted nationwide. The red zone is for land lying alongside riverine floodplains, and for here building permits are no longer allocated. In the intermediate zone permits are given with conditions, and above in the highest zones, such as the mountains, permits are given ‘freely’. Khadir commented that during the colonial era restrictions were more stringently enforced and it was only after independence that the expansion of building began in the more risky lower lying areas.

I understood that Mozabites had dealt with violent floods in the past, so what had changed in the interim? Continuing our tour of al Atteuf, Khadir pointed out where the line still showed on buildings at around 2 m still stained on local shops and houses (fig. 8.1). He then showed me the 1.5 m high concrete walls the state had since erected along the *oued*, and pointed out where the buildings had been destroyed (fig. 8.2).



Figure 8.1 The remaining watermark at 2m in al Atteuf *qsar*. (03/11/13)



Figure 8.2 New state-built concrete walls on the edge of the river. (03/11/13)

The 2008 flood is important as it still represents a significant point of reference in the local imagination. I was not there to witness it, thus I could not observe directly the ways in which it was dealt, yet I was able to observe the after ripples, not just physical but social. There was actually less focus on divine causes and improper behaviour, than on the social ramifications. The question: ‘what were we doing wrong for this disaster to happen on such a scale?’ seemed to be the main issue, again, revealing the local focus on pragmatic action.

This event and its consequences prompts questions about local notions of risk and predictability. It seems likely that extreme variation in river behaviour within a known range would be expected by local people, and for these shocks there would be a contingent set of response actions already prepared. Yet unexpected variation, or surprises, may require something more, a certain flexibility of existing institutions, involving the capacity to learn and adapt to such unknown variations (see for example Davidson-Hunt 2006). I deal with this more thoroughly in the next chapter when I return to my original research questions about complex adaptive systems and adaptive management.

A key question raised is why the 2008 flood caused so much damage. In framing the event as a mismanagement episode I am following local peoples’ lead by asking which human factors were lacking that could potentially have averted the disaster. If floods, although erratic, have been a commonplace event for centuries, what went wrong? Should people rely on the government to protect them against such disaster, or could it be dealt with more effectively at the local level? Table 8.1 lists the possible causes, drawn from my conversations and interview with local farmers,

NGOs and government officials, as well as my own direct observations of irrigation problems.

Table 8.1 List of possible causal factors leading to the mismanagement of the 2008 flood.

Multiple working hypotheses for the 2008 flood damage	Cause Yes/No
1. Flood more powerful than usual	Maybe
2. People built houses by river	Yes
3. Lack of suitable building regulations	No
4. Lack of flood defences, e.g. river walls, diversion canals	Unknown
5. Lack of advance warning system	No
6. Irrigation vents not opened	Yes
7. Divine punishment for inappropriate behaviour	Untestable

This cataclysmic and catalytic event revealed a gaping hole (or even closed holes where they should have been open) in local management capacity to deal with flash floods. People organised well *after* the event, but were not adequately prepared *prior* to it. This sets the scene for a discussion of the management institutions that exist today in Beni Isguen oasis. These consist of new voluntary farmer associations, local and international NGOs, and *l'oumna* water guards. The state, in the form of the municipal council is also discussed as to its role in managing Mozabite oasis resources. I analyse the problems that these different groups face within today's social and political context. I go on to discuss the emergence of new groups due to the rise of civil society in Algeria, and explore the causes and ramifications of this. Next, I describe prior management structures, and ask, are they really in decline? I finish with a discussion on what I call 'co-ordination without coercion', that is, the difficulty of creating social organisation without the capacity for sanctions (force, fines), which opens a debate on authoritarian (hierarchical), egalitarian (emergent,

equal), and anarchic (individualist) political modes of organisation (Sahlins 2008; see also Jessop 2003).

8.2 Rise of new farmer associations; the decline and return of *I'oumna* water guards

This section brings us back to the present, to try to explain the ethnographic *quotidien* of the multiple ways in which oasis resources, both human and natural in the M'zab are currently managed. The multiplicity of institutions, both complimentary and conflicting in different ways, reflect, I believe, the shifting structures that have traditionally managed the oases, and new ones which have emerged through necessity under the pressures of various processes of social change. I now discuss the local political present, and then go on to argue how local factors have interacted with historical, colonial and postcolonial state forces.

8.2.1 Voluntary associations

There are a bewildering number of associations in the M'zab, with a group for just about anything you could think of: neighbourhood associations, scout associations, sport associations, associations for the disabled, employment associations, farmer associations, and on and on. With over 73,000 groups, civil society associations have exploded in Algeria in recent times (Liverani 2008: xxviii). I was told that sporting (football) associations were the first to emerge in the 1970s. This group later became *amal said* (uplifting hope) and included other activities such as judo and karate. Other groups soon mushroomed to deal with countless social issues.

8.2.1.1 Role of associations

As this thesis focuses on agriculture, here I will focus on two farmer associations, named Tazdait (Tum: ‘date palm’), and Faddān (Arab: ‘land parcel’), based in the old oasis and new farming zone, Ntissa, respectively. I will also comment, however, on other farmer associations from within the M’zab and outside, whom I met through conferences and through on-farm visits, to provide additional context and comparison. Other, non-farmer associations are also discussed in the context of new types of social organisation, which now exist alongside traditional formations, potentially causing friction where their areas of jurisdiction overlap.

My primary contact in the M’zab was in fact with the Tazdait association, a member of which I met first at an academic conference in Montpellier. Tazdait is supported by a French NGO which assists farmers, named ‘Biodiversity and Exchange of Experience’ (BEDE). Tazdait was spawned from a five-year participatory management programme in the Maghreb, by the ‘International Plant Genetic Resources Institute’ (IPGRI, now Bioversity International), funded by UNDP-GEF, founded in 1999. Farmers and *phoeniculteurs* who participated decided to continue the initiative locally, and thus formed Tazdait. The primary role of Tazdait was to protect and valorise *phoeniculteur* livelihoods and knowledge, and to protect date palms against the deadly disease, *bayoud*. Thus from the start, the role of scientific knowledge and discourse was significant. This is partially, at least, to do with the fact that members of Tazdait who are not *phoeniculteurs*, are scientifically trained agronomists (indeed, there are perhaps more agronomists in Beni Isguen than farmers and *phoeniculteurs*, presumably due to the higher social status conferred).

Significantly, part of the remit of Tazdait was to unite *phoeniciculteurs* and provide a forum for mutual support and exchange. Arguably, the success of Tazdait is because it has always created locally achievable goals, aimed at the local scale. For example, they have published an important book on local *phoeniciculteur* knowledge (Ben Saadoun & Boulahouat 2010). Also, through the support of BEDE, they secured the assistance of Petzel, a climber harness making company, who agreed to work with Tazdait to design innovative harnesses, specifically geared towards developing safety measures for *phoeniciculteurs*, for whom falls constitute a real livelihood risk. Future projects include developing further security for *phoeniciculteurs*, such as insurance, but also research and investment into animal traction, creating a blacksmith's shop, and entering the Fair Trade movement for local produce.

Positions such as president, secretary, treasurer and so on are chosen through voting, in theory, democratically. I was present during one of these sessions, which took place in an *‘ashīra* house. The yearly finances were reported to the group members, after which a local research project was presented (on local medicinal plants), and finally the elections were held. The affair was quite informal: a name would be suggested and the majority of members would vote yes or no. In practice, it was stated that there was a dearth of young people, and older members were worried about the renewal of the association, therefore, young people were encouraged and cajoled into positions, such as vice treasurer and so on. Individuals seemed unclear as to the extent of the responsibilities being assumed, and thus required some persuasion.

Tazdait received funding through BEDE and they were audited regularly by a development professional in order to ensure proper use of funds. I was also present during one of these meetings. The development professional informed me that Tazdait was successful compared to other farming associations in Algeria (he had just come from the Kabyle region) because they were proactive in searching for funding; they networked with other regional or international groups and exchanged ideas; they have diverse membership comprising individuals with different skills, such as researchers; and there is interaction with youth in the form of students.

Tazdait interacts with other farming groups across Algeria and the Maghreb, under the umbrella organisation, Réseau Associatif de Développement Durable des Oasis (RADDO). The RADDO headquarters are located in the Association for the Protection of the Environment at Beni Isguen (APEB). This NGO is externally funded, and effectively works to provide a network between different farmer groups across the Maghreb, working primarily on oasis issues. It is led by Salah Ba Ali, who also happened to sit on the *majlis ayyen*, therefore providing a bridge between the new and the older local organisational structures. Some of the problems they are currently working on include adaptation to climate change, promotion of 'responsible' tourism, integrated management of water resources, and the economic development of oases. I participated in several of these meetings, and farmers would discuss local problems with the intention of producing practical solutions. I often heard the criticism, however, that for all the managerial talk and use of graphs, very little else actually materialised. One farmer contrasted RADDO and APEB, in that the problems they tackled were too generalised, and the people discussing them were remote, whereas smaller groups such as Tazdait were able to solve small but

realisable problems, and thus realised results, as mentioned earlier. Another interesting critique was that ‘real’ farmers could little afford the time away to attend such conference, with some as far afield as the luxury resort island of Jerba (see issues related to full-time and part-time farmers in chapter five). On the plus side, RADDO owned a conference centre in Ntissa named *Akraz* (Tum: ‘farmer’), which also served as a training centre in practical farming methods, such as drip irrigation, compost and organic agriculture. I was informed these courses were useful.



Figure 8.3 RADDO meeting of farmer associations from across southern Algeria. (26/12/12)

The Faddān association of farmers in the new concession region of Ntissa, adjacent to the old oasis, was also originally set up to disseminate scientific information. This degenerated, according to (another) Salah Ba Ali who set it up, into serving a

practical function, that of coordinating users of the 450m deep collective well that was the outcome of a state development project. State drilled wells have had beneficial effects, but not all outcomes have been positive. For one, many complain that the electricity from the communal pump is too expensive (3DZD/m³). Payment of the bill is a collective responsibility, and therefore if one doesn't pay, the electricity is shut off with the result that none of the farmers have access to water until it is paid. It may be the case that certain farmers struggle to raise the monthly funds, but it is more likely that because some individuals are not full-time farmers, and thus have less to lose if they do not water their fields on time, they are less likely or slower to pay up. I was informed that indeed this was the case. Some farmers do have individual wells to supplement the state well, but these are costly to drill and not as deep as the latter. In Ntissa, there is no water catchment like the ancient irrigation system in the oasis, therefore farmers are more reliant on the cooperative management of the deep well. When well water is cut off, farmers are forced to prioritise the crops they must water, leaving others to wilt and die.

Cooperation among farmers may be strained in other ways, as when individuals perform an action that affects the collective without first consulting the others. There are no formal coercion mechanisms due to the voluntary nature of associations, therefore arguments and feuds may go on for some time, with serious matters requiring litigation through the intervention of the municipal council. Regarding making payments on time, there is little pressure that individuals can put on one another, and meetings are not frequent, at about twice per year. Some individuals prefer simply to go it alone and avoid the headache involved in having to negotiate with others. One farmer, Omar, built his own well by hand, digging for over three years. Admittedly, his was a unique case, for more often those who can

afford it pay a drilling company to dig a private well. This can be critical to the survival of crops and livelihoods. For example, another farmer, Khadir (whom I mentioned at the beginning), is part of a well collective in al Atteuf. It dried up in 2012, so Khadir, with resources from his agricultural shop in Ghardaia, paid for another well to be drilled on his land, 40m deep. I observed that his farm (of mainly dates and oranges) was very productive (see fig 8.4), whereas in comparison his neighbour's land, who didn't own a private well, was dry and deficient (fig. 8.5).



Figure 8.4 Khadir Khota's well-watered plot. (03/11/13)



Figure 8.5 Khadir's neighbour's dry plot. (03/11/13)

Other associations, such the *djem'aat al hei*, the neighbourhood associations, deal with problems such as adequate running water, electricity and upkeep of roads. Problems are made known to a *cartier* president, who then informs the city council. Some overlap, and therefore conflict exists, however, with other local institutions who have traditionally managed such problems. *L'oumna*, discussed below, used to deal with issues such as building regulations as well as irrigation, and the *ashīra* is still involved with infrastructural governance. As Bechir, a local town-planning student informed me, the neighbourhood association:

Is different from the ashīra, because in the latter, everyone is part of a family group. The former group is comprised of different relations, of classmates and neighbours, non-blood relations. It is a relatively new thing, and it speaks to an Islamic sense of community. There is also the Protection for the Non-material Patrimony in the Mزاب valley (OPVM). All men are expected to participate, one night a week, it is a part of social duty and benefits. What is unique about APEB is that it is part run by

the state and part local. That is, there is the agreement from the state, but it is run in a locally accepted, familiar way. Normally it takes time to trust something new, but here it is trusted because it is done in a locally accepted way, a friendly way. It is not done in a top-down manner, but with rules given by relatives, and therefore more acceptable to people.

~Bechir 29/09/13

Bechir here explains why and how the associations are acceptable to local ways of doing things: they involve relatives who outline the rules rather than unknown officials; that is, they run along patterns of local organisation familiar to people. Indeed, the state bureaucracy is not visible within the hallowed walls of the *qsar*, there are no police inside, and the *gendarmerie* is only found outside the walls. 'New' associations meet in old meeting halls within the *qsar*. Further, the neighbourhood association is in agreement with local interpretations of religion, which asserts the importance of alliance across kinship lines, to unite the Islamic society as a whole. However, some confusion can arise between old and new institutions, as Nejib confided to me:

there is no coordination, especially about who has responsibility over infrastructure issues. Thus there may be conflict between °ashīra and neighbourhood associations, conflict between °asha'ir, and conflict between rich and poor neighbourhoods, vis a vis respective projects. In the past, when the °ashīra ordered someone to do something they used to do it. Now there are over 50 associations in Beni Isguen, there is no coordination, it is anarchy. They need the experience of running them over time, a new system.

~Nejib, 26/11/13

Nejib highlighted a key distinction in his statement between the new and old institutions, that of authority. Previously, in hierarchical fashion, the traditional groups were able to give orders, or punish for orders that were not followed, as local authority, based on religion, gender, age or wealth, was respected. In the family, age, which involved replacement over time was key, whereas relations between the genders was and still is immutable (although of course elder women

exercised power over the younger). Between families, the authority of the *‘ashīra* was observed, being made up of family heads, although the wealthy held most influence. Finally, the *‘azzāba* held absolute authority over all matters. *L’oumna*, who was in charge of water, building, date palms and other communal matters, were in fact a kind of police force, who derived their power to fine from the mosque.

8.2.1.2 Political issues of associations

It should now be clear that the main problem of contemporary oasis institutions was a lack of coercive influence. As I explained in the previous chapter, the presence of a higher authority, the French judicial system, provided an alternative venue for people to ‘forum shop’ and circumvent local forms of control. This did not happen so much during the colonial period, however, as local Mozabites largely boycotted French institutions. It was not until after independence, that the Mozabites decided to engage with the new Algerian state, given legitimacy due to its Islamic status. This has left rather ‘weak’ institutions, in terms of retaining the power to organise locally without needing the intervention of the state, when dealing with ‘rule-breakers’ or anti-social individuals (Ostrom’s (1990) fifth necessary component for community-based management). Thus, such democratic structures work fine while all are interested in cooperating, yet difficulties arise when individuals do not cooperate. This is due to the voluntary nature of civic associations themselves. I was advised that in the M’zab problematic individuals were actually few, and that it was possible to put some pressure on them through, for example the *ayyen* or the *‘azzāba*, whose moral authority was still overtly respected. Being a relatively small-scale population, these face-to-face measures still have some effect, which would not be the same in large cities.

To give another example, another limited resource not under private control is date palm pollen. All date palms need to be hand pollinated, creating a strong demand, and therefore competition for pollen and pollinators, at present generally based on a first-come-first-served basis. The associations did once attempt to create rules of use, but being based on benign mutual consent only, the regulation was soon broken. Nejib had discussed with me the idea of creating a plantation of male palms in the communal *oued* area, thus reducing competition by making the resource abundant. This initiative could actually work, but unfortunately the abundance solution is not applicable in other circumstances, such as for water.

As I will describe in the proceeding section, the state reluctantly permitted the development of civil society in Algeria, with one crucial condition: that associations were not to use their clout to meddle in state policy, in other words, to form unions or political parties. Most of the associations were cautious, although those I spoke to in fact remarked that they did apply pressure, through their leaders, on the local council when it came to improving roads and public services. One association president, Mohamed Brik from nearby Laghouat, related the following example:

The Ministry for Public Works built the new bridge over the river. They sealed it off, however, with large cans. The people on the other side had to drive down over the river. There was sewage running into the river. One day, I saw a kid hanging out of a car window, almost falling into the dirty water. I decided to write to the council with a petition of 25 landowners who lived on the other side of the river, and copied in other officials [on the email]. The official was away that day in Algiers, but his secretary called him and they decided in a rush to open the bridge the next day. When this worked, people asked me to intervene on other things, like being hassled by the gendarmes, but I refused, there must be a limit!

~Mohamed Brik, 02/04/13

This story shows the importance of leadership in organising and pressuring the state. The state has attempted to extend its influence through other administrative means (Sharma & Gupta 2006), such as changing the regulations to make it harder

for certain groups that cause trouble, such as making accounting rules more complex, or other through similar means. In September of 2013 before I left, they changed the rules again, requiring detailed accounts going back the previous three years, and other regulations. This was around the time of the surrounding Arab ‘uprisings’, and so while causing complications in some areas the state made concessions in others, such as subsidising interest-free loans for small investors in agricultural land as well as training.

I argue that the emergence of civil society in the M’zab is due to two mutually reinforcing processes of change: the decline of local customary management structures, and the concomitant opening of a once-repressed civil society by the Algerian state. It is the latter that I deal with first.

8.3 The rise of civil society in Algeria and the state

Diamond (1994, in Butcher 2014) defines civil society as “the realm of organized social life that is voluntary, self-generating, (largely) self-supporting, autonomous from the state, and bound by a legal order or set of shared rules”. Benthall (2000: 1) defines it more broadly as “all the associational forms in society other than the state and the market”. The term is commonly attributed to de Tocqueville based on the associationalism of 19th century America. This involves a position, as Liverani (2008: 4) puts it, which is “independent of the state, ...[and] occupies the space between the latter and the individual”. Liverani further describes epistemological and normative aspects of the term. Epistemological notions involve the interpretation of the contestation between society and the state, involving a balance of power and actions intended to protect the former from the latter. Normative

aspects invoke the democratic ideals of political freedom and empowerment in the face of state repression (*Ibid.*).

The Comaroffs (1999: 3) posit that despite a post-1989 revolution in politics, common ideas of *civil society* uncritically advance traditional notions of community and social organisation, interestingly at a time when unfettered, pro-market post-social ideas are being propounded. The very ambiguous, non-analytical nature of civil society discourse has provided its attraction to represent various differing ideals of pre-modern communitarianism and pre-national ideals, such as in India (*Ibid.*: 6-7). The authors argue that the term ('civil'), proffers 'Western' ideas of civilisation as opposed to a barbarous 'state of nature' of ungoverned populations, which is clearly problematic for non-'Western' societies in the postcolonial era (*Ibid.*: 7). Yet, most authors agree that historically, civil society emerged as a public domain from which to counter the hegemony of the monarchy, or the state (Keane 1988: 65).

Although civil society was encouraged by the French from around 1908 and was developed on their model, it only began to burgeon in the 1980s, after a decree on the freedom of association in 1987. This followed a period of repression of associative life by the new single-party government, the FLN. They banned Islamic groups, women's rights groups, and Amazigh associations, which were all seen by the FLN as a threat to its hold on power, and also to its totalitarian representation of Algerian life. This is indeed ironic, as the FLN itself was the fruit of two previous political movements, the PPA and *Etoile Nord Africaine*, which themselves relied heavily on associative connections to draw together the emerging intelligentsia and the popular masses (Liverani 2008: 15). The main reason for the new concession by

the state appears to be a strategic one of (minimal) appeasement, following the food riots that were spawned by a lack of state subsidies on basic foodstuffs, after the drop in global oil prices in 1985 (Butcher 2014). This fluctuation revealed the weakness of the state economy, despite being based on an abundance of oil (although not on the scale of Qatar, for example), has not been diversified, nor seen any trickle down to local economies. The economy was also heavily centralised, still rooted in a socialist model, making local economies particularly vulnerable to price fluctuations.

Liverani (2008: 7) has argued, contrary to de Tocqueville's classic formulation of civil society as a pre-requisite to democratic government, that state strategy was to permit a limited form of civil society to perform the tasks of administering the social services of which the state was perceived to be failing to provide. Thus, when social services continued to break down, civil society could be blamed as the scapegoat. Leca (foreword to Liverani 2008) contests Liverani's depiction of the Algerian government as a 'weak state', explaining that while Algerians generally may not have faith in the government per se, aka the FLN, they do believe in the state as a national representation. In my personal experience, at the time of the ongoing uprisings in Tunisia and Egypt, people expressed to me that while they distrusted the opaque authoritarian rule of *le pouvoir* (French. lit: 'the power'), they were more fearful still of violent political change, still remembering the awful violence of the 1990s, and in some cases the war of independence itself. People preferred stability and security to political freedom (even though many small, largely unreported protests were erupting nationwide, mainly related to employment and housing).

Meanwhile, Butcher (2014) gives a more optimistic view, arguing that in general even though nation-states heavily reliant on oil are less likely to democratise, in the case of Algeria, despite restrictions, civil society has flourished. For example, powerful business associations and the Algerian Human Rights League (LADDAH) have in fact challenged government policy. In 2011, these groups joined forces to form the National Coordination for Change and Democracy (CNDC). Following a protest march, the government agreed to lift the two-decade long state of emergency. She concludes:

While the government may have initially allowed associations with the intent of appearing to “liberalize” while at the same time manipulating these associations for their own gains, this process has actually provided an opening for some civic associations to organize and oppose the government. This process of liberalization, regardless of how empty it may have seemed at first, might be considered an “opening of the floodgates”, that now cannot be closed. Thus, the recent “Arab Spring” and the protests in Algeria can be seen as directly facilitated by the government’s prior liberalization and opening of the system to civic associations. [Butcher 2014: 13]

The state has since brought in further restrictions concerning civic associations, including a condition that ‘goals of the association must not be contrary to “national values”’ (*Ibid*: 13), and groups can now be disbanded without the intervention of a judge.

While Butcher, like many others, does not question ‘democracy’ as a normative concept (for a critical review of the term see for example Schmitter & Karl 1991), and her analysis may be regarded as overly sanguine, it seems clear that despite restrictions, civil society is exploding in Algeria. The timing of this emergence in the M’zab is concurrent with the relaxing of state laws around civic society at the end of the 1980s. Yet, this rise of associative life in the M’zab is not just a top-down process, where democratically minded individuals are simply waiting for the laws to

change to allow them to coalesce. The region already had its own set of customary organisational structures, and I would suggest that these traditional structures were in the process of breaking down at the time of the new laws, thus leaving a governance 'void'. It is these traditional institutions that I now describe, as well as the conditions of their decline, as well as their contemporary return, albeit in a mutated form.

8.4 Customary governance: *L'oumna*

Early on in my stay I heard rumours about a semi-mythical, ancient organisation of specialists known as *l'oumna* who had guarded the hydraulic system for a very long time. Yet, I could find out very little about this masonic-like group. Even the farmers I spoke to didn't know of any of them. What I did hear was framed in the negative: yes, they used to protect the waterways from debris or illicit building activities, but they were corrupt, for they would turn a blind eye to illegal activity if you were a relative. Even some of the 'azzāba who oversaw and sanctified *l'oumna's* authority were seen to be corrupt. People (who will remain anonymous) informed me that the wealthy were essentially exempt from punishment. Beyond their elevated status, it was understood that often 'azzāba legitimacy was based on financing from the elite. Thus in return for favours, the 'azzāba turned a blind eye to infractions. This led to the commonly perceived notion that there was 'one rule for the rich, another rule for the poor'. One palm specialist told me:

L'oumna used to enforce all the rules of the oasis, not just water, involving the clearing of lanes, building regulations, and so on. For example, fallen trees must be cleared from pathways. Buildings must not be over 5m tall. Now their power is gone since after independence, the dangerous Hizib al wahad, one-God one-party [FLN]. So now things don't get done, people tend to build where they like. Also people don't listen to them because they have two faces: if the rich give them money, they look the other way.

L'oumna's power was negated by the French, who gave authority instead to a centrally appointed, usually non-local *qaid*. However, as Nejib clarified, local organisations continued to govern, and it was not until the revolution and independence that power was really taken away. After many months of working with farmers and palm experts, I finally realised that someone I had been working with all along, Hamza, was in fact a member of *l'oumna*. He was able to inform me of the contemporary situation regarding this ancient organisation.

8.4.1 Role of *l'oumna*

The term *l'oumna* comes from the root '*amīn*', Arabic for 'faithful' or 'reliable', and is therefore related to the term '*al amena*', discussed elsewhere, and has local significance referring to loyalty. Thus, for M'zab '*l'oumna*' means 'our faithful'. The various subdivisions of *l'oumna* officials were in charge of different tasks; here I will discuss the water guards. The most important task was to guide the flash floods in the proper direction when they arrived, by means of switches and gates. First, the floodwaters would be directed along the primary canal via the primary gate, which is named *tazouni wamen*. The water is first directed toward the *tagherbit* (western door), for which Hamza was responsible, then to *bougoufa*, at which point the correct gate is sealed so that clean water is directed down into the wells, preventing the accumulation of debris, which is deposited on the sides of the canal. Thus, the aquifer is allowed to recharge first. After this, the water is directed towards the gardens, so that they may benefit. The waters hydrate the soil and plants, rinse away excess salt and add nutrients from the silt.



Figure 8.6 An irrigation canal. (23/04/13)

All this coordination involves communication between officials, who historically gave signals from watchtowers, each one positioned within the oasis so that it has a view to the one before and after on the horizon. Beni Isguen oasis is divided up into

fifteen *cartiers*, or sections, with 3 watchtowers, and 2-4 officials in charge of each section. The names of the sections are given in figure 4.7.

Officials, who are usually local to the area, are chosen for their expertise in the field (see Geertz 1971 for a comparative discussion of water officials in Morocco and Indonesia). During non-flood periods, the task of *l'oumna* is to monitor their delegated area. Officials are, therefore, usually farmers who already frequent the area on a daily basis and can also provide such monitoring. They look out for individuals who illegally block the canals, for whatever reason, but usually for building purposes or dumping waste. Previously, *l'oumna* had the authority to fine individuals who broke the rules. Today, they only have recourse to report the individuals to the *ayyen* council, who use their recognised status to put pressure on individuals by talking to them, but they have no ability to penalise.

8.4.2 Two case studies

I observed one such example of this when a local hotel owner, attempting to provide better access to the front of his business, consulted with only one such elderly, retired *l'oumna* official. This involved building a small concrete bridge over a canal that ran past the house I was living in. The official informed the hotelier that his proposition was sound *in theory*, and so the latter forged ahead without any further concern for due process. One day I heard shouting outside my house. I later found the bridge knocked down and all building work abandoned. The hotelier had paid the price for not consulting his neighbours, who had knocked the bridge down, perhaps feeling that his prestige as a wealthy man of influence would win him powerful support in favour of his project. In this case, however, he was

unsuccessful. It appeared that the bridge would not have affected the flow of water; the real issue was the lack of consultation with the appropriate parties.

In 2007, I was informed, a conflict broke out between the people of Bouchemjen and Bahmed ou Musa (see fig. 4.7). When the *oued* flooded, the water that normally flowed from west to east along the canal through Inghid, past Bouchemjen and on to Bahmed ou Musa became blocked (allegedly unintentionally), and the water started to pool near a house, so an individual affected made another blockage at Bouchemjen to prevent this from exacerbating further. There was a conflict so the council came and made a *segua* for the water in the canal to drain to the main *oued* Ntissa. For unknown reasons they didn't yet remove his dam. This instance shows a lack of contingent planning, that is, what actions to take in an emergency. Supposedly, if *l'oumna* had been present and on call at the height of the problem, they could have been consulted. As the council were now seen as the appropriate authorities, they were certainly not present, and could only take action *after* the event.

These examples highlight that consultation is an essential part of decision-making in the M'zab, which agrees with customary law, *'urf* (chapter seven), in that neighbours, especially the sanctity of the family, is paramount in the case of development activity. Thus, despite the hierarchical nature of *l'oumna*, who derived its authority from the *'azzāba* (and now tellingly from the *ayyen*), consultation is the norm in attempting to mediate problems before they escalate into conflict. Adad (2008), who researched the development of housing in the area for low-income families, described this "spirit of organisation" as being consistent with Ibadite doctrine. He further claims that "the M'zab is a world where community

consultation has become law” (Adad 2008: 67), although he overemphasises tendencies towards ‘harmony’ and cohesion in the area.

8.4.3 The return of *l’oumna*

Following the revelation that my friend Hamza was in fact a water official and that they were still present in the oasis, albeit in a reduced role, I thought I was witnessing an ancient institution in decline. However, based on further enquiry, it appeared that in fact, they had declined already and what I was seeing constituted a reappearance, following a re-evaluation of the need to police at the local level. This monitoring can be viewed as part of the social *visibility* that I discussed in chapter five. Perhaps several events led to this reappraisal of the need for this policing in the oasis, but it is evident that after the 2008 flood, people became serious about it.

Following the 2008 flood, it appears that a movement arose to bring back *l’oumna*. Discussions took place in Ghardaia on how to persuade people to open their water vents once again in a coordinated manner, to prevent this disaster from happening again. *L’oumna* should, in theory, be able to prevent people from building in risky areas also. The same discussion took place in Inghid, to police illegal building and encroachment on agricultural land. The need to police the oasis was discussed in agricultural conferences that I attended. In Beni Isguen, as evidenced by Hamza, a return was concretely taking place. As I understand it, there was a direct causal link between the flood and fragmented attempts to reinstate this organisation. Opinion was divided, however. Some clearly saw the need to implement local strategies involving local people who knew the particularities of the area. They distrusted state interventions because they saw that the state implemented policies from far away and lacked a fine-grained understanding of local issues and ecology.

Others, however, simply stated that *l'oumna* have no sanctified authority, and therefore no influence. Others still were wary of them for other reasons, such as perceptions of cronyism toward friends and relatives, as described earlier. This viewpoint contradicts the previous point that involving local actors is not the answer due to ties of kinship and other reciprocal obligations, which are said to affect fair judgement. Indeed, unless there is trust in the organisation, as the notion of *amān* implies, cooperation will prove difficult.

8.5 Discussion

I have tried to show that management of common resources in the M'zab, or more succinctly, coordination of people in how they relate to natural resources, currently includes two types of organisation: 1) *l'oumna*, which has returned following a general decline in traditional governance structures; and 2) voluntary associations, which have risen to fill the management gap left by the erosion of the older structures. I have chosen to term associations as micro-social movements to reflect that they may be more apt at dealing with change than conventional political structures in the Beni Isguen, which may be more concerned with upholding the status quo. Indeed, Kerri (1976) presents a similar conception for voluntary associations. I depart from Kerri's position, however, which is that such movements entail adaptive mechanisms to social change. For while they may indeed be responsive, I argue that adaptation may not be the primary reason for the existence of these groups, and such representation is overly functionalist and reductionistic. Similarly, I recognise that the social movement designation is not unproblematic, for as Gledhill (2000: 184) demonstrates, some social movements may represent the status quo also, such as the pro-lifers in the United States who murder abortion

doctors. Yet, I retain this designation for conceptual rather than theoretical reasons, in order to contrast with customary local organisations.

I suggested that civil society was only able to emerge to fill this gap after the “opening of the floodgates” as Butcher (2014) put it, albeit with restrictions on political activity. I showed the causes for this strategic move, entailing a defensive manoeuvre by the government which was instigated by the precipitous drop in global oil prices. I also described, following the 2008 flood, how the debate on the need for a locally based irrigation official to prevent the recurrence of such disasters led to the return of the *l'oumna* (see fig. 8.7). Both of these management organisations lack ‘teeth’, however. This is not a problem while people agree; yet when conflict breaks out, as it inevitably does, the need for intervention is currently solved by appealing to the municipal council, or for more grievous matters, to the *gendarmerie*. Yet these officials are seen as outsiders to Mozabite society, and more practically, lack understanding of local sensibilities and fine knowledge of local ecology.

Despite the need for coordinated behaviour to manage the hydraulic system, a conflict arose due to notions of private property. ‘On *my* land, I am the lord of all I survey’ was the ethos that was conveyed to me about certain people. As the town had spilled over into the oasis and many people now lived there permanently, they had no wish for their gardens and potentially their homes to be flooded. Furthermore, in private property behind the ubiquitous walls that shielded family life, there is the question of *visibility* that I raised earlier (chapter five). Visibility leads to control due to the fact that certain social behaviours are modified by the degree to which others will react (Roberts 1979: 38). However, if one’s actions are

not visible to society, this normative enforcement is not present, and one is guided by conscience alone. If an individual feels they are not likely to get caught breaking the rules, he may have less incentive to follow them. This is not to say that society functions solely to restrain basic human desires, however, as people tend to continually follow rules due to the weight of 'tradition', as "a particular way of doing things [which] has been followed again and again, and with repetition has acquired a 'rightness' over time" (Roberts 1979: 37).

The harmony model of social order has been strongly contested in legal and political anthropology going back to the 1960s, with scholars positing that conflict is not pathological but the norm (Comaroff & Roberts 1986: 5), the acceptable degree of which is different in different societies (Nader 2002: 34), and that trouble itself is the basis of much social organisation (Roberts 1979: 34). In his classic (if rare) comparative study, Geertz (1972) noted that Moroccan Berbers were inclined toward individualist antagonism in disputes, with Islamic law being the primary factor in resolution, as opposed to group-oriented Balinese who solved problems through consensus. Though normally against such essentialising, Geertz does claim the Moroccan example to be common to all of Morocco, even though such claims of a pan-Berber culture have now been definitively discredited (e.g. Crawford 2001: 405). Mozabite oppositional social formations apparently inspired Masqueray to theorise the rudiments of a later segmentary theory, according to Durkheim, upon which the latter developed his theory of mechanical society (1984: 57–87). My fieldwork observations contradict all of this. It is true that society is ordered into the extended family, *‘ashīra*, *‘arsh*, and *qsar*, other crosscutting obligations negate such simple 'building block' explanation of social order, such as religious ties, and neighbourhood associations. Entire towns are no longer in conflict, although

unfortunate battles between Mozabites and *Sh'amba* Arabs have erupted recently. What has been claimed to be a 'modern' trend of individualism is not how the majority conduct their affairs. This may change in the future, as the wealthy class, such as hotel owners, attempt to circumvent such consultation with relevant local parties – as one local put it “to have their own set of rules”; the rise of associations shows a clear, continued trend of growing support for collaborative effort over individualistic action.

Despite the decline of the power of *l'oumna* and the *'azzāba*, I would argue that 'carrot and stick' forms of coercion do still exist. Although the use of *tebria* has declined dramatically, the withdrawal of social support, a sort of informal ostracism, continues. For example, a known thief was pointed out to me. Such people are tolerated but have low social standing and are mostly avoided. Thus, shame, despite being problematized by several authors (Herzfeld 1980; Akpinar 2003) remains a powerful ordering force in this relatively small-scale society. Enforcement now lies in the hands of the state, through the local *gendarmerie* and law courts. The problem, as stated to me several times, and related by the following metaphor, is that in relying on the state first, one is attempting to build one's house from the top downwards rather from the foundations, and so dealing with problems from the bottom-up, through family, *'ashīra* and so on, is seen as the *natural* way to proceed. Further, the state is seen as remote and lacking in detailed knowledge of local issues, and thus is likely to deliver inappropriate solutions.

Wittfogel (1957: 66) posited that larger irrigation systems require centralised government to coordinate them, and these historically grew into despotic elites. Other studies have shown that complex states have risen without extensive

irrigation systems (Lewellen 2003: 60; see also Leach 1959 for an earlier critique). Using a comparative method, Mabry (1996: 6) showed that although small-scale irrigation systems are much more common (especially to the Middle East, Asia, Africa and Latin America), a correlation does exist between larger irrigation systems and centralised management. For example, Uphoff (1986: 81) discovered that areas of 40 ha or less tended to be governed by groups or irrigators themselves, whereas areas between 40 and 400 ha were managed by a central official. Studies of irrigation systems based on surface water, such as in Morocco (Ilahiane 1996), Egypt (Price & Brewer 1996) and elsewhere, show the presence of locally appointed water officials, usually individuals known for their honesty. Building on Geertz, Lansing (1987; 1993) has argued that Bali's complex irrigation system, over hundreds of hectares in area, is optimally managed by local water temples, arising to regulate both water flow and minimize pests (grasshoppers). Vayda (2009) has refuted Lansing's model, however, stating that Lansing ignored alternative explanations for the origins of this coordination, and that pests only became a problem recently during the Green Revolution due to pesticides which killed their predators. Instead, coordination could have come about as a reaction to force by populations up or downstream (Vayda 2009: 40-41). Whatever the case may be in Bali, coordination of the irrigation system in the M'zab clearly required the presence of a dedicated and sanctified group to channel the floodwaters and to fine individuals who blocked the flow of water. As personal pumps came into fashion, people perceived that they didn't need to rely on the floodwaters anymore. Sadly, this was only to substitute the advantages of the flood and to forget its destructive qualities. When the massive 2008 flood arrived, blocked water pooled and destroyed property, and life. Thus the need for coordination was reassessed.

L'oumna have returned, but their presence is contested, and their authority ambiguous, without the religious sanction they once had to punish when needed.

I suggested to several people that the solution to the need for coercion might be to achieve central recognition of local authority to punish, such as returning the ability to give fines to the *‘azzāba* or *l'oumna*. Such legal recognition of local police is evident in the form of recognition of tribal law, as with indigenous peoples in the United States and Australia (Griffiths 2011). Alternatively, oasis populations in neighbouring Morocco continue to fine despite the presence of national statutory law, based on local agreements. People tended to disagree with me, however, stating that the mosque should be confined to religious matters, and that social cooperation should be based on incentives rather than punishment. Some stated that the mosque, in fact, often persuaded people to follow the rules. This would seem to imply a shift from hierarchical modes of governance to more egalitarian ones based on consultation and consent. Such a view would ignore, however, that many people still seek recourse from the state when it comes to conflict, thus maintaining top-down forms of organisation and control.

The relationship with the state is certainly ambiguous. Despite local recognition of the Algerian nation-state, this move was largely strategic, and many Mozabites prefer to remain autonomous in many matters, such as freedom of religion, or in solving minor disputes, although this does not prevent certain individuals turning to the state when it suits them. Relations with the state have become increasingly strained, as during the most recent iteration of violent riots between Mozabites and Arabs. I witnessed how riot police stood by while hooded Arab youth threw rocks at Mozabite people and property. The state was forced to take action only after

Mozabites published videos of the events online, which were picked up by the global media, and a peaceful Mozabite protest in the capital.

Many Mozabite youth appear to be engaging these very notions, of the meaning of society, questions of identity, and how to maintain both tangible and intangible heritage. Explicitly learning from the mistakes of the previous generation (although reluctant to reveal their elders in a negative light), youth such as Bechir discuss the ‘social contract’ at the local level, in terms of obligations and duties in return for the many social benefits offered by Mozabite society. These youth are proud of local identity, and attempt to achieve cooperative consent by the use of incentives, such as appealing to the economic, religious or ecological interests of people:

The idea is to work on people’s ideologies, and to enlarge the movement exponentially. In order to achieve concrete change, we need to analyse what people really want. By speaking the language of people’s core interests, we can convince them. For example, if people are just interested in religion, you can say they will be punished by Holy God. But global media makes and shapes people’s thinking now. If they are materialistic, you can show them the material benefit. After the 2008 flood, people were touched materially. You talk in the language they understand. Another example is that people blocked off their garden drains because they didn’t like the flood coming into the house. A study was made, showing that old field, unblocked, had more nutrients than new fields that are blocked off, that didn’t get the nutrients from the flood water. This gives another way to convince them.

~ Bechir, 21/09/13

Bechir optimistically remarked that “the youth are always discussing the future and the right way to proceed. Even if they make mistakes it is good, they are engaging.” This evidence of intergenerational contestation of values, knowledge and identity corroborates my assertions that a Gramscian framework gives us a more accurate theoretical view of the local dynamic equilibrium of Mozabite socio-politics, than that of consensus-based resilience theory. It is important to note that such political jostling is not necessarily primarily adaptive in function, although social change

may have ecologically adaptive outcomes. For instance, the delicate power struggle between the secular (the *ayyen*) and religious (the *‘azzāba*) councils potentially contributed to a maladaptive situation, whereby the communal irrigation system collapsed due to, what I argue to be individualistic, neoliberal principles which de-emphasise messy, reciprocal ties of obligation in favour of paying for such services instead (i.e. government-supplied water). Meanwhile, intergenerational contestation has questioned the social and ecological consequences of such values, resulting in a re-emphasis of certain communitarian ethics, alongside other, ‘modern’ forms (such as scientific information about nutrients). This shows how the newer hegemony is being challenged at the local level by the (re)formulation of ideologies by various groups. Some might frame this as a contestation between ‘traditional’ and ‘modern’ sets of values, whereas Gramsci viewed this rather as power relations between oppressor and oppressed, in terms of class and capital (Crehan 2002: 6–7). It thus could be suggested that the merchant class (represented by the *ayyen*) formed links with the wider political economic relations of the nation-state in order to overthrow the local political order. Yet, as I have argued, this involved the contentious use of ideological manoeuvring, making such linking to national body politic possible only with the legitimacy of the Islamic Algerian state. Thus, in Gramscian terms, in order to shift the dominant ideology (this is not to portray ‘ideology’ as homogenously held, but rather as a common theme), the Mozabite students are attempting to challenge it by assembling an alternative social ideal that is rooted in everyday needs, thus appealing to how people are directly implicated by cooperation whether through economic, religious or ecological means.

This implies, as I demonstrated in the previous chapter, a revision of the relations of the ‘social contract’, in terms of rights and duties, back from the individual to the nation-state to the individual and the immediate community⁴⁷. In a polemical review, Brown & Purcell (2005) attempt to warn against the current trend in political ecology of over-emphasising the local over the national in terms of the appropriate scale for effective governance. Such a view is reminiscent of older criticisms of the ‘noble savage’ (Ellen 1986; Redford 1991), and more recent debates surrounding community-based conservation (Agrawal & Gibson 2001; Campbell & Vainio-Mattila 2003; Otto et al. 2013). Brown & Purcell (2005), however, confine their argument to theoretical considerations of how scale is socially constructed rather than on the direct link between scale and governing bodies in terms of regulation. By contrast, I, along with others (Mabry 1996: 6) using the example of irrigation, propose that larger groups appear to need external bodies to assist with regulation. This also challenges ideas of self-regulation in resilience theory, and also commons management as advanced by Ostrom (2009), in that it emphasises the role for hierarchy and authority for the direction and coordination of resource users (see also Park 1992).

From this, it may be theorised that leadership is key to group organisation of larger bodies. The key issue that arises from this observation thus centres on the question of political legitimacy. Who gives the leader their authority? How does this process work and how is it solidified? Foucault’s (1991) notion of governmentality expresses how a ‘vertical’, unitary notion of political legitimacy is internalised and

⁴⁷ The social contract theory of Hobbes, Locke, Rousseau and Kant has seen something of a resurgence with Rawl’s works (1971, in Boucher & Kelly 1994: 1). Graeber (2011: 71–6) argues that classic social contract theory only makes sense if one assumes that markets historically emerged separately from the state, yet falls apart if governments are seen as the “guardians” of an individual’s debt to society, which, he contends, translates to taxation, and smaller debts to monetary fines.

maintained through horizontal aggregated relations extending throughout the bureaucracy and the populace. From the view of those who wish to challenge authority, how does the dominant class thus maintain its hegemony, and why can't political structures be more fluid (i.e. when those in power cease to represent the needs of the public, how to remove them)? Voluntary associations appear to represent a more representative, egalitarian politics, yet as I have shown, the removal of authority from leaders, i.e. the ability to punish, can result in political stagnation, as in disputes over inheritance, and inability to coordinate water users. Yet such a deadlock may be overcome through the careful manoeuvring with the state policy and instruments. Indeed, farmer associations have been able to prevent illegal activities by cautiously ignoring the state's provision to not engage in political activity, as evidenced by the following example from nearby Laghouat:

There was a man whose job it was to police building, who worked in the town hall, he prevented illegal walls, and so on. He was killed during the violence of the 1990s, and it is not known if he was killed by Islamists or someone he had fined taking revenge. Now there are environmental police at the town hall but they do nothing. For example, a man started building an illegal enterprise, a concrete silo on local farming land, they thought he was building a chicken coup. I started writing letters, and the gendarmes came and asked him for his permit, of which he had none. They moved him on, but the trouble was that in the time they took to respond, he had already laid the foundations. We are the watchers, however, and I am not afraid to put my name on a document. The area is legally restricted to agricultural activities, thus there is a need for local monitoring, for even if there are not communally managed resources, 'private' activities may affect others in an adverse way. So activities in the area must be compatible, otherwise I will campaign against them.

~Mohammed Brik, 02/04/13

To conclude, rather than a linear progression from traditional, hierarchical forms of governance to modern, democratic ones, the present composition reveals the continued existence of several, mixed forms of political behaviour: authoritarian (still to some degree the family, the *ashūra*, the *azzāba* and the state), individualistic market-driven, competitive behaviour (the labour market, mercantile selling of

goods, consumption of goods and services), and consensus-based egalitarian decision-making (associations). The existence of these mixed modes of governance could be seen as evidence for a society in transition, as newer forms gradually replace the old. The same could be argued of the mixed forms of economy and law in the previous chapters. Instead of the eclipse of the 'traditional' by a monolithic modernity, however, along with Pascon (1986: 20), I would argue that this hybrid composition in fact constitutes *a locally negotiated form of modernity* itself.

8.6 Conclusion

Debates regarding the 'nature' of humanity and the corresponding role of government have abounded in the social sciences, and despite the arguments in the 1970s between formalism and substantivism, some schools, such as sociobiologists and evolutionary psychologists, follow in the footsteps of Hobbes and Smith and continue to argue for an intrinsically selfish human nature, and thus the need to regulate it via government (e.g. Chagnon 1988). Others, following Aristotle and Durkheim, posit that humanity is essentially social. Sahlins (2008: 104-12) goes beyond this, arguing that the possibility of selfish and cooperative behaviour exists as a potential in all of us, and it is the form of socialisation and upbringing that encourages one or the other. These notions of human nature influence political thinking about the 'right' way to govern society, from dictatorial modes, socialist forms, to market-based individualistic systems, through to anti-authoritarian and anarchic modes of government. Alternatively, anarchists have argued that the very existence of the state undermines humanity's inherent capability to self-organise (e.g. Kropotkin 2002: 288).

What does this mean for the M'zab? The previous would suggest that what is important is the value systems transmitted by those involved in raising and educating Mozabite youth. It has been shown that notions of *al amena* (faithfulness or loyalty), once portrayed in stories, are being replaced by television in the home. The mosque does continue to preach the values of sociality, of right behaviour in relation to one's neighbour. Yet, education takes many forms, and with exposure to other forms of thought via national education or the internet, local normative ways of being are increasingly put into question. Often, as I experienced, this takes the form of open debate, by listening to differing ideas of other Muslims, for example, and talking amongst themselves about what they have heard. However, ideologies are not always explicit, and therefore, arguably non-social, individualist notions (which run counter to cooperative modes) may slip in under the guise of economic norms around business and financial thinking, or with ideas of creativity and competition. I have utilised Gramsci's notion of hegemony as a way to understand such ideological contestations. I have clarified that such political jostling may or may not have adaptive qualities. In the M'zab, however, such debate has resulted in reflection on how to better manage critical oasis resources such as water. The new generation has realised that the current form of technological adaptation to their environment and watershed systems dictates that they must at least coordinate in order to safely channel water around the system, both to prevent harm and damage, and to receive the benefits of the flood. They have been discussing how to reconfigure local ideological relations and value systems in relation to this need. This is not a neo-functional analysis whereby social institutions and values exist primarily to support the whole; this alternative theoretical view reflects rather, that local people have realised that a degree of sociality involving coordination and cooperation is unavoidable for the successful management of communal resources.

9. Meta-analysis: Historical events or systems models in understanding change?

In the preceding three chapters I have investigated in turn, certain specific problems pertaining to the management and governance of Beni Isguen oasis. This chapter presents a final, meta-analysis in order to search for inconsistencies and further insights. The study has raised certain key analytical questions, which I explore here. I found that the key event regarding the governance of the oasis in the M'zab concerned the timing and ideological legitimacy of the integration with the Algerian state, which also involved pragmatic considerations. Based on a resilience assessment that I carried out, I concluded that the M'zab oases can be classified as non-equilibrium systems, meaning that they exist in states of dynamic equilibrium in response to changing climatic conditions, but are also socially dynamic, in response to processes of the wider political economy. I return to my research question, and I find that certain Mozabite institutions and practices bear resemblances to adaptive management. I further compare my ethnographic data to the indicators of adaptive management given by Fabricius et al. (2007). Adaptive management and resilience, as explanatory frameworks, were shown to contain inconsistencies, however, in that the former is ultimately framed as a learning tool, whereas certain phenomena may have no definite centre of stability and remain unpredictable (Park 1992). Most importantly, resilience theory has been shown to be limited in its social analysis and representation. Building on Hatt (2013), I have suggested an alternative framework which draws on the Gramscian notion of dynamic equilibria of power, thus offering a comparable social analysis to the

ecological conceptualisation in resilience theory. In relation to this, I discuss issues of the notion of self-regulation in the literature, arguing that the composition of hybrid systems of governance, law and economy, contradict simplistic representations of a balance of power theorised to hold self-organising systems together.

This chapter is thus divided into three sections. The first is a brief historical revision, involving themes of identity, power and economy as organising factors. The second part consists of a comparative analysis of the event and resilience approaches. The third section addresses the central research question of whether Mozabites practice adaptive management, and goes on to explore theoretical implications regarding the politics of self-organisation. The three main themes thus far presented have centred on social change in relation to the management of natural resources. Importantly, I have aimed to understand the context regarding how such changes have come about within wider processes of global change, and how these have been experienced at the local level. All this could be framed uncritically in terms of a narrative of the forces of ‘Western’ modernity and globalisation, including liberalism and neoliberalism through the colonial and postcolonial eras, sweeping across the globe, and finally catching up to the secluded desert refuge of the Mozabites. This simplistic overview is problematic in several ways. Most importantly, ‘modernity’ is not a monolithic homogeneous global entity, but is experienced and contested differently in different regions (Harvey 1996: 27; Mills 1997). The anthropology of globalisation has shown how local people repeatedly adapt new elements to fit with local cosmologies and practices (e.g. Watson 2006: 37). Therefore, here I describe how the people of the M’zab have

negotiated change over the centuries, especially with reference to their oases' natural resources.

9.1 Mozabite history revisited

9.1.1 Historical reconstruction of oasis livelihoods

This section reconstructs the major significant change events affecting Beni Isguen oasis and its inhabitants in combination. Since the battle of Siffin in 657 CE (see chapter 4), those who would become the Ibadites distinguished themselves from the rest of the Islamic community through a code of *dissociation*, and refusal to recognise the Caliph as legitimate due to his impious, self-seeking behaviour, thus creating a code of behaviour that would last through the *longue durée*. Following the collapse of the cosmopolitan Tahert in 909, the Ibadites, guided by their *sheikh*, sought isolation from diverse influences for religious and political reasons, blaming such diversity as the main cause of the downfall, and thus reinforcing the notion of dissociation. After the subsequent fall of Sedrata, they moved to the present location of the M'zab valley. Palm tree agriculture was developed over time, but the population grew beyond the capacity of the area to support itself. Mozabites began to migrate across Algeria in order to trade. At the same time, they participated heavily in the North African slave trade, financing *Sh'amba* and Touareg caravans⁴⁸. This meant that they had to again interact with the outside world, and thus dissociation became a more internal spiritual or psychological distancing from non-Ibadites.

⁴⁸ It is uncertain whether oasis land was utilised on a communal or private tenure basis, as both of these systems exist at present, although customary law points to the private ownership only of trees, rather than land.

Regarding the internal oasis economy, in recent centuries most of the oasis land appears to have been owned by wealthy families, who used slaves or rented land to *khammēs*. Scheele (2012: 55) has convincingly argued that the massive earthwork projects for the initiation and maintenance of irrigation canals and buildings required a large, low-cost work force. The removal of this capacity with emancipation (by French colonial law in 1848), as Amat (1888: 228) projected, would have a major effect on oasis economies across the Maghreb. I contend that this would have resulted in a lull of productivity, after which landowners sought more financially rewarding activities, and were wealthy enough to reinvest in other economic activities. Poor farmers struggled on, relying on family members (mostly sons) to help in difficult menial tasks, such as walking beasts of burden back and forth, in the endless irrigation activity necessitated by the fierce desert sun.

In the 1960s following independence, the economic system of *twiza* was essentially phased out with the rising cost of living, created by government infrastructural development in the region. This, along with the creation of industrial jobs drew labour away from the oasis. As agricultural activity decreased, more oasis land became used for housing to support the expanding population. As more individuals sought atomised households, rather than patriarchal ones, more and more land claims resulted in the stagnation of many plots due to contested ownership. This situation was facilitated by the plurality of legal systems available, as more wealthy individuals sought to take advantage of a French created and Algerian maintained judicial system. Thus farming production decreased significantly. This shift involved a relaxation in the position of dissociation maintained by Mozabites with the outside world, allowing this use of state institutions.

It wasn't until the civil wars in Western Africa of the 1980s that Sahelian migrant labourers were forced to reroute their movements back (since the slave trade) to Algeria, thus bringing in a new source of cheap labour. At the same time, government land concessions in nearby Ntissa resulted in a resurgence of oasis farming. During the 1990s 'black decade' of violence everything remained reasonably quiet, with any innovative activity suppressed. In the 2000s, however, farmers began to self-organise to take control of the maintenance and protection of the oasis resources and livelihoods. This was due to two major social shifts, the decline of local authority, and the instigation of article 20 of the Universal Declaration of Human Rights by the government, entailing freedom of association (Pillay 2012). Both of these involved state power, for following independence, Mozabites ostensibly decided to drop the practice of dissociation, and recognise the authority of the new state, due to its proffered Islamic status. As I argue below, this involved pragmatic and political considerations, for a shift in the balance of power favoured the economic elite whose secular power, ensconced within the secular council (the *ayyen*) relegated the long held authority of the *‘azzāba* to that of solely moral influence. Meanwhile, the rise of civic groups has led to a parallel form of political organisation challenging this new powerful elite. Farming associations so far have been able to use their resources to access global knowledge sources, funding and other forms of support, and even at times to make demands of central government. Yet, as ultimate power lies in the hands of the state, through the instruments of the gendarmes and the judicial system, the issue of how to get people to conform to the rules, has in my view, become a central issue.

The rekindling of civil society in Algeria, however, has created the opportunity for significant creativity in this domain. All of this is fertile ground for theoretical

investigations of innovative (and historical) forms of economic and political organisation, including bottom up, inclusive governance such as anarchism (see for example Graeber 2004), recent trends in commons management (as in Ecuador, e.g. Bauwens & Kostakis 2014; and Greece, e.g. Karyotis & Kioupiolis 2015), and advances in democratic, self-regulatory complex systems. I return to these themes and their problems later. The reframing of associations as ‘micro’ social movements, as I have done, may be more useful for viewing their capacity to deal with recent change, and help avoid the pitfalls commonly linked with emancipatory notions of civil society. But first, it is necessary to analyse how these change events have been historically intertwined, and what this has meant for life in Mozabite society. Further, I discuss how my research findings challenge other explanations of change found in the literature on the M’zab.

9.1.2 How do the three major themes of social change combine and what does this reveal?

A different view of change in the M’zab

To reiterate, Bennoune (1986) importantly theorised that political change in the M’zab has been driven by class, specifically, with the rise of an elite merchant class that challenged the authority of the *‘azzāba*. This conceptualisation replaced earlier ahistorical functional analyses (Alport 1953; Bourdieu 1962). Yet the problem with Bennoune’s analysis is this: if the merchant class began emerging in the tenth century (at the time of the commercial city of Tiaret), as he posits, why has it taken a millennia to overthrow the clerical class? My central argument regarding all of the major social shifts in the M’zab is related to the timing of *when and why Mozabites decided to participate in the nation-state*. Denial of legitimacy of rule ever

since the perceived tyranny of the early sultans, and later the colonial rulers can be linked to the Mozabite principle of dissociation. With the Ottomans and for a period of time the French, the Mozabites enjoyed relative autonomy. When the French annexed the M'zab, the Mozabites silently boycotted French institutions and rule. It was not until the creation of an independent, Islamic Algeria that the Mozabites decided to participate in the state.

Beyond ideological rationale, joining the nation-state had pragmatic goals, based on security and freedom of commerce. Yet, I argue, it was primarily the wealthy merchant class that took advantage of this new orientation, to participate in national administrative structures, in order to abrogate local control, whether moral, normative or punitive. By appealing to a higher authority, yet based on local notions of hierarchy (the state is the 'older brother' and therefore has greater authority), local sanctions such as fines could be ignored, and alternative systems of property and inheritance invoked. *Tebria* could be avoided simply by forming groups that could ignore the sanction, as such cooperative measures only work if all agree to participate in them.

Other factors such as competing ideologies about how to live that could have driven the change already existed prior to independence, as Mozabites had participated in the wider economy for centuries, and been exposed to other ways of thinking and being. This factor therefore was not new, although ideological shifts have certainly accelerated since the 1960s through much increased education and exposure to mass media, as well as increased foreign travel. Alongside newer, liberal ideas of private property and individual rights, increased wealth can be seen as a driving factor in overthrowing local control, through subverting social visibility by means of acquiring separate housing and living in nuclear families away from the eye of

the mother-in-law and the authority of the patriarch. A proportion of Mozabites have always been very wealthy, acting as regional money-lenders, owning water shares in other Saharan localities, financing the slave trade and long-range transport systems into the present, even owning shares in cotton as far afield as England (Scheele 2012: 131-132). Overall, wealth does appear to have increased recently, however, with opportunities such as access to foreign and domestic markets and jobs.

Other factors such as demographic changes may certainly have played a role. Face-to-face social control through visibility (see chapter five) is only practical below a certain population threshold. Some have argued that civil laws are necessary beyond a certain population size where grievances are usually between anonymous parties who have no common social obligations (Nader 2002: 34; Roberts 1979: 25). In the past, Mozabites settled this problem through group fission, creating new settlements further upriver, hence the resulting seven cities of the M'zab. I was informed that the fortified walls surrounding the *qsūr* were not only to keep undesirables out, but prevented further population expansion. Moreover, the geological form of the river valleys prevented further expansion. On top of this, immigration from other regions of Algeria to the valley has largely exacerbated population increase, further complicating local cultural administration capabilities, not to mention generally challenging normative behaviour at the day-to-day level.

Therefore, potential factors of social change were already present before independence, such as financial power (Alport 1954, Farrag 1971), dominant political forces (Amat 1888: 228), alternative ideological values around rights and property (Bourdieu 1962), and class division (Bennoune 1986). Therefore, I postulate that overtly, the tipping point was ideological (religious) alignment, in

that the new nation-state was seen as in alignment with Ibadite notions of legitimate authority. Yet, the underlying reason for change was more than likely pragmatic opportunism for the wealthy elite to take advantage of state administrative protection to bolster trade and protect private property and power. This legitimacy – the abstention of dissociation and thus beginning of participation – provided the elite with the legitimacy to effectively overthrow *‘azzāba* control, or at least minimize it, while paying it lip service, and to further their own personal aspirations.

Shifting centres of authority and identity

All of this, perhaps, could be framed in terms of shifting centres. Scheele (2009: 107) has discussed this to some degree, yet I explore these ideas in more depth. Many cultures throughout history have perceived their place in the universe as an origin point, locally referred to as the ‘navel of the world’ among other terms. Yet when the central point of reference shifts, say, during national formation and a people are told really they live on the periphery, especially when living in the desert, a cognitive shift can occur, similar to that of Galileo’s heliocentric universe. For a millennium, Mozabites have returned to the M’zab after their forays into the Tell and beyond to retire and eventually be buried amongst their ancestors. For many, this is still the case. Yet for others, I argue, the seduction of the developed capital (Algiers, Paris, New York) is irresistible. For these individuals, attracted by other values that directly challenge their own, the M’zab valley has become a backwater. For most, however, there may be multiple points of reference. For example, the M’zab may remain a spiritual homeland, visited at times, while Marseille remains the central pole of business and everyday life, Mecca remains a broader centre on the religious plane from which Islam radiated and to which they

position their prayers on a daily basis; paradise remains a mythological centre, a reference point upon which all devout and moral life is directed. These multiple reference points are probably representative for many in the present globalised world, as being constituted of deterritorialised notions of identity (Appadurai 1996: 37–39). Thus local pride may be constitutive of various role models, be they the Prophet himself, or the late creator of Apple, Steve Jobs.

A concurrent shift to that of centres is that of changes to the social contract (Skyrms 2014). In the M'zab, there has been a strong sense of a *local* social contract, in the terms of a strong local sense of obligations or duties, in return for social benefits, and this is being reconsidered. Many Mozabites do benefit from a sense of social welfare, of free (or nearly free) locally produced services. There is also a sense that such social welfare can be withdrawn, providing an incentive to be a participating community member, as the other side of the coin is social isolation (an informal *tebria*). Conversely, many today also rely on the state to provide services (through the municipal council). A difference can be seen in comparing Mozabites with the *Sh'amba* Arabs. Regarding rubbish collection for example, whereas the *Sh'amba* will leave mess to be gathered by the authorities, the Mozabites usually self-organise (often coordinated by the mosque) and deal with it themselves, although today participation is allegedly only carried out by around half of able-bodied males. This example is one of many which reveal a shift of social responsibility from the local to the state, and arguably a move from a thinking ethical involvement in social interactions, to an unthinking legalist mode of interaction, which places the law, and thus the state, as the ultimate moral arbiter. Put another way, a responsibility of care for one's neighbour is removed and thus

absolved due the presence of state structures which can remotely perform the same function, albeit in an impersonal manner.

This means that a shift to a social contract with the state implies, rather than participating in a shared local moral economy, instead the payment of taxes is sufficient to maintain the (alternative) contract. This is arguably the direction that bourgeois thinking has gone in the M'zab, from a productive sense of reciprocal communal work and effort, to a sense that consumption can solve everything, and verily drive society itself, mirroring wider global social and economic trends (Harvey 2010: 327). Interestingly, this inverts the notion of the contract as developed by Hobbes. For Hobbes and others (e.g. Rousseau, Locke), the selfish nature of humans necessitates the strong authority of monarchy, and later the state. In this case, however, individuals are co-opting the authority of the larger powers, in order to escape the smaller, local one.

Hatt (2013) developed the notion of social attractors as 'stabilisers' of identity, to mirror the ecological attractors which act as a gravitational centre and thus relative stability (see chapter two). These social attractors serve as norms and values within society which may serve to pull in different directions, thus illustrating conflict and power in social relations. Hatt gives the examples of "nature", "conservation" and "property" as attractors in a Canadian village, whereby different groups rallied around different values depending on whether power boats were acceptable (property) or not (nature & conservation). I depart from Hatt's conceptualisation, however, for I argue that focusing solely on attraction, and thus agency, deflects from how power operates in terms of political structures to prevent rural Algerians

from challenging the state. By contrast I have attempted to portray how both structure and agency interact.

Conceptualising social change

Some Mozabites perceive all these changes as indicative of a slow decline of core common values, whereas others see it as a timely transition into ‘modern’ life, and that as Muslims they can improve their lives by questioning previously unchallenged beliefs without losing their most important values and practices. Likewise, some fear assimilation into a homogenous global consumer culture, whereas others actively contest and debate the future direction of development, highlighting rather cyclical forms of change rather than linear ones, as generations learn from the previous one’s mistakes. This is the question that vexed Bourdieu (1962) in his reflections on how Mozabites managed to adjust to changing social conditions, such as French colonial hegemonic notions of private property, while shielding central core notions. I present, I believe, a clearer vision of diverging social dynamics of those that embrace ‘modernity’ and those who do not. Potentially all societies contain progressive and conservative camps, and what may be essential is not that either wins (resulting in either radical but undirected change, or a static state of paralysis) but that a tension is maintained from which comes a sense of dialectical change consistent with a constantly shifting social and ecological climate. Indeed, the ‘tradition’ versus ‘modernity’ debate may be better framed and understood as a struggle between oppressor and oppressed, as Gramsci would have it. This view of the contestations between unequal groups has informed my analysis.

Such reflection is essential to the question of how this dynamic, flood-based Saharan region is managed. Further, this assessment of the multifaceted social realities in the M'zab, containing what I have tried to portray of the messy social dynamics that colour real-world situations of natural resource management, allows us to revisit the central question upon which this thesis has been organised. Yet before this I review the different approaches utilised in this thesis.

9.2 A comparison of the event and resilience approaches to oasis management

The historical account given above was constructed using an event-based analysis loosely related to Vayda's (2015) approach (abbreviated here to ACE: abductive causal eventism). I chose to utilise this approach in order to test the systems theory that underpins adaptive management, in order to seek to understand causal relationships across time and space. My use of the event approach involved more macro scales than Vayda's more micro-focused chains of events (although see pages 160-7 for a comparative analysis of individual farms), to incorporate important factors to Mozabite life, such as French colonialism and State development projects. These forces can still be viewed as events, if seen as the point of contact, and the resulting cascading effects. Here I will briefly compare the event and systems frameworks.

Of theoretical concern to resilience theory is the notion of 'emergence'. This is said to come from the interaction of multiple factors, resulting in 'more than the sum of the parts' (such as consciousness). Resilience theorists claim that 'emergence' cannot be explained by being boiled down to the individual parts, therefore, for emergence takes place through the unpredictable interaction of the components. It

is this unpredictability and potential reflexivity that causes a system to be adaptive (such as artificial intelligence). Thus, systems theorists focus on attempting to manage such complexity by adaptive management, through structured experimentation, aimed at learning by doing. ACE, by contrast, deals primarily with explanatory power, and thus looks historically and contextually for answers through a process of elimination, and thus akin to detective work seeks to identify specific causes which can then be managed. The evidence given here suggests that it is possible to unpick causal factors by looking to multiple threads linked by concrete and intangible events, as I have illustrated throughout chapters 6-8. Alternatively, I also claim that elements such as adaptive pressure and cultural choice may historically intertwine in ways that is very difficult to disentangle. The key difference is the availability of data regarding historical events from which to perform an analysis. The event approach has been criticised for not being able to pay attention to discourse (as acknowledged by Walters 2012), but it is conceivable that one may equally perform an 'archaeology' of language used to get at such an analysis.

The point of departure for resilience theory is the 'state' of a socio-ecological system (whereas for ACE, it is a concrete event - while ACE does not deny the (provable) existence of states or structures, it does not presuppose them either). The resilience assessment (see appendix III) gave a view of the oasis as a series of economic states, emphasising labour as the key variable that governed the maintenance of a particular economic system, or change to another. From here one may investigate which phenomena influenced this variable (for example an important element of change between economic states was French colonial rule through the abolition of slavery, the primary source of labour). The modelling of

states highlighted the interaction of other components, such as water, labour, knowledge and land access. Some of this was hypothetical, however, and the ACE approach was more robust at examining real problems.

ACE can give a more specific historical sequence of how contemporary events have unfolded and been shaped. The ACE approach was most useful for specific problems that were identified to me by local people. From there I was able to identify causal chains, by eliminating alternatives. By working on three different issues and then backwards and outwards in time and space, I was able to illustrate the greater context surrounding the more specific issues, and to see their interrelationships. For example, I was able to note the legal context and, more specifically, how some Mozabites chose to opportunistically draw on statutory law in order to get around local control institutions. I was further able to trace how the atomisation of family households along with population pressure has increased the number of land disputes. Resilience analysis did not identify this, due to a focus on structural factors rather than the agency of local actors. Further, the ACE approach produced a much more detailed vision of the causes of labour instability.

Realistically, I had to stretch the methodological boundaries of the ACE approach to include each management problem. Moving from single events to trends of events wasn't really a problem, as with land conflict: land abandonment was clearly a common phenomenon affected generally by a singular causal factor, that of legal forum shopping (which itself, I argue is due to complex reasons). Similarly, local emergence of the cash economy generally was due to the creation of infrastructure by state development projects, causing a need for cash among farmers who had to pay for electricity for the first time, to operate their wells. Both labour instability

(chapter six) and the political landscape (chapter eight) could be characterised as states, although I added to the robustness of the latter analysis by beginning with a single event, the 2008 flood, and tracing its effect on other institutions. Similarly, the causal analysis of real-life cases of workers moving around between different employers, asking about their intentions, as well as analysing the experience of the farmers in these circumstances, contributed to a much more robust understanding of labour problems. Overall, I experienced ACE to be the more powerful approach for understanding of *what* people are trying to manage in the oasis and *how* they are approaching it, based on the contextualisation of specific problems, rather than the more abstract view based on hypothetical interactions as suggested by resilience thinking.

9.3 Adaptive management in Beni Isguen oasis?

9.3.1 Revisiting the research question

Now, I am able to finally return to the central thesis question: Do Mozabites use adaptive management (AM) to manage their oases? How do they adapt to social and ecological change *and* create such changes? If not *adaptive* management, then how do they manage? Which leads to the subsequent logical possibility: that institutions must show social learning and flexibility in response to such change, or will undergo transformation. This belies the sense that such organisations expect a given range of variability ('shock absorption'), whereas unknown change may push them beyond the limits of adaptability into decline and potentially transformation into a new form.

It will be remembered that adaptive management theory was developed in the 1970s to deal with the frustration of the uncertainty inherent in the management involving complex non-linear systems that resisted long-range predictability. It is often summarised as 'policy as experiment'. Furthermore, AM emphasises qualitative over quantitative understanding of systems in order to visualise complex interactions, although indicators may be used as minimal measurement (see below). Definitions of AM vary. Rist et al.'s (2013) conservative definition of AM confines it to a systematic procedure of structured experiments aimed at increasing knowledge of unpredictable systems. This usage appears to assert the role of professional managers as primary users of AM. More expansive definitions tailored toward community-based co-management of natural resources (e.g. Armitage 2003) emphasise the participative dimension of AM that involves consultation with multiple 'stakeholders' in achieving understanding of the dynamism of socio-ecological systems.

Beginning with Rist et al.'s (2012) definition, we may consider two elements of agriculture in Beni Isguen, the first potentially generalisable to farmers everywhere, the second specific to the M'zab (but relatable to other Berber communities in modified form): farmer experimentation, and customary law, '*wrf*'. Regarding the first, experimentation, it may be argued that farmers everywhere engage in experimentation. Alternative views exist as to whether wealthier or poorer farmers practice such experimentation, based on perceptions of risk and the stakes involved (see Benessaiah 2011). Mahmoud, for example, was forced by poverty to undertake certain experiments through trial and error, such as letting weeds grow, for he couldn't afford the help to pick them. He found that letting weeds grow in certain areas protected tree saplings from the hot desert winds,

while providing fodder for his donkey, who fortuitously preferred to eat the weeds than the young trees. Such happenstance experiments clearly enhance knowledge of specific instances, but it would be hard to compare such isolated events with the systematic structured experimentation of AM which aimed at system-wide understanding. The boundary here between farmer experimentation and the systematic experiments of AM is not entirely clear, however.

Urf (customary law), however, provides an interesting corollary to AM in certain key areas. Firstly, I have argued that *urf* involves consultation with the relevant parties to arrive at semi-formal agreements. Secondly, according to my informants, new agreements involving *urf* are tried for a period of time before they become solidified into custom. Thus *urf* involves key elements that are analogous to AM, namely policy as experiment, and consultation with stakeholders. The latter is interesting, for while an emphasis on consultation implies self-organising egalitarian notions of political organisation, agreements are enforced by hierarchies, whether *l'oumna* (as sanctioned by the *azzāba* or now the *ayyen*), or by the municipal council, to whom people turn when agreements are broken or adequate consultation has not taken place. Furthermore, critics of AM point to its consultative aspect as a pragmatic downfall. I would argue, however, that rather than constituting a limitation, the consultative dimension must rather incorporate an understanding of contestation and power, through which agreement is achieved as an unstable compromise. Indeed, I have pointed to how this may be conceptualised throughout this thesis (especially chapters five & eight).

The notion of *urf* as being similar to AM, however, necessitates that this institution is in active use. The contemporary presence of legal pluralism negates

the primacy of customary law as praxis. The practice by elite groups of 'forum shopping' for ways of subverting local ordering norms by appealing to state law thus relegates the effectiveness of *'urf'* as adaptive management. Judiciary jurisprudence is also a factor in this equation, for judges may or may not choose to pay attention to customary law in their rulings. The patchy nature of *'urf'* agreements between small groups also differentiates it from AM, which postulates consensus regarding management actions by entire groups. Finally, adaptive management has been adopted as a framework by the RADDO NGO, perhaps due to their contact with my own research. How this may be implemented remains to be seen. The problem with this is that according to local people, discourse by this organisation never translates to action, thus policy will never even make it to the experimentation stage, depending on their interpretation of AM. Most importantly, as I have argued, management of the Beni Isguen oasis is made up of a patchwork of different organised and individualistic management efforts, and thus cannot be represented as a fully comprehensive, integrated image. Thus, in answer to the central question, institutions and practices in Beni Isguen bear some resemblance to adaptive management, albeit with certain key qualifications.

In order to corroborate the foregone conclusions, I compare my ethnographic findings with Fabricius et al.'s (2007) six key indicators of adaptive management:

1. Leadership and vision (organising toward a common goal),
2. Knowledge networks (local knowledge regarding ecological processes, history, policy; incorporation of other knowledge, new methods),
3. Institutions nested across scales (the ability to reorganise or establish new institutions, linked to other non-local institutions to increase their influence),
4. Embedded cultural management practices (e.g. supernatural sanctions for resource protection; linked land and identity),

5. Beneficial policies (e.g. clear land rights, inclusive participation in governing), and
6. Motivation (e.g. common interests, values)

1. *Leadership and vision*

Leadership is key to association success. Farmers generally do not have a lot of time, and thus leaders help to guide organisational activities. The issue then is how much influence does the leader have? In my experience, however, the answer is very little. Unfortunately I had no direct experience of the Faddān association meetings, but I did meet members who related that there was no means of coercing farmers who didn't pay their bills, and this affected water supply to all. This problem highlights the egalitarian ethos within the political organisation of associations. I never witnessed any coercion. Leaders seemed to lead more through inspiration, a bit of persuasion, and by means of administration. This raises two separate issues. In order to inspire, leaders need to have time on their hands. The most successful associations (in terms of simply carrying out projects) were those whose leaders had time. For example, Mohamed Brik of Arghoub Association was retired and relatively well off. This meant he could spend time researching and going to conferences, and then disseminating the information to the other members of the group. He told me there was no way he could have done all this if he was still employed. One farmer joked to me that the authoritarian method would have been useful in coordinating fellow farmers during a visit to an international conference in Italy.

Difference of vision, regarding different groups who focus on the same problems, is also an issue. For example, local infrastructure is dealt with by the *‘ashūra*, by the *djem‘aat al hei* (neighbourhood groups), and by the local council. Farmer

associations are able to put some pressure on the council, by making demands through their leaders. Although this highlights again the role of leaders, it does reveal some confusion about responsibility for certain issues. The hierarchical mode of the *‘ashīra*, themselves lead by an elite of the wealthiest individuals, is slowly being challenged by more inclusive methods of governing.

The idea of vision and organising toward a common goal may be contested, for some diversity of vision may be more useful in terms of multiple conversations regarding decision-making. Unity of vision may imply a totalitarian normativity, as I argued in reference to hegemony. Arguably, a wider number of viewpoints are being listened to than before in the M’zab; the *‘azzāba*, the rich, and the patriarchs no longer dominate discourse as strongly as before, although the voices of women outside of their gender are still relatively silent. This diversity contributes to innovation in terms of agricultural practice and social organisation. On the other hand, of course, utter disunity of vision is also unhelpful, as in the case of the M’zab, coordination is needed for the maintenance of irrigation systems, and other forms of mutual assistance. I conclude that leadership is crucial to organisation in the M’zab.

2. Knowledge networks

Knowledge networks are clearly prevalent in Beni Isguen, and local people are highly connected with international organisations involved in issues of environment and livelihoods. Locally based RADDO facilitates networks that encourage the transmission of scientific knowledge across the Maghreb, as well as local knowledge between oasis communities. These networks enabled me as a researcher to communicate with other oasis farmers. This highlights, however, the issue of scale. Mozabite physical, architectural structures are famous for their

'human-scaled' dimensions. Further, as I have noted elsewhere several times, local people stated that local institutions are far more appropriate for dealing with local problems and ecologies, in reference to development, judicial verdicts, and political decision-making. The associations and NGOs active within the M'zab come in many shapes and sizes. When it comes to managing an oasis, organisations should be neither too large nor too small. Further, oases vary enormously in size. Larger-scaled organisations are able to connect groups across space, but tend to lose the fine-scaled resolution regarding local knowledge of the area and have been shown to be lacking in terms of practical outcomes. Organisations that are too small would not be representative of the entire oasis population and may create discordance about proper governance. Conceivably, smaller groups could combine with larger groups, of course. Essentially, larger-scaled organisations may assist with generating ideas about general oasis components (soil, economy and so forth), yet decision-making and the realisability of goals is more feasible at the local level. Further, governance in terms of ensuring that individuals follow local rules is arguably much more achievable at the local level, something I will return to later.

Ideas about the proper role for local and scientific knowledge are varied in the M'zab. Some highlighted the importance of the traditional knowledge of older farmers, while others stated that modern knowledge will simply replace the old. Local knowledge involves details such as precisely what time of day to cut a date branch (in the morning it is most supple), and how to prune a date bunch so as to ensure the health of the tree while encouraging optimal growth of dates (maximising yields can cause the branch to break and harm the tree).

Similarly, disagreements occurred over modern and traditional irrigation methods. These could have reflected modern ideas regarding intensive production as opposed to stabilising strategies, however. For example, traditional *segui*a irrigation reaches a wider stretch of land and may be less efficient in terms of water conservation, but it encourages deeper and wider root growth of plants, making them more structurally stable in the face of bad weather, and able to draw on deeper nutrients. Others claimed that they could reproduce the *segui*a benefits with a drip system. Yet again, some argued that ‘tradition’ and ‘modernity’ each had separate, complementary roles to play, with science providing the means, and tradition providing the policy, or direction.

3. Institutions nested across scales

Fabricius et al. posit that adaptive management is enhanced when governance is linked across scales, e.g. involving individual, community, municipality and central government (*Ibid:* 9). This focus is similar to the previous criterion, except that the authors here neglect the role of power and conflict between local communities and the state. Citing Dietz et al. (2003), they note: “an advantage to institutional diversity is that it promotes alignment of rules and policies at different scales” (*Ibid:* 9). A central finding from Beni Isguen is that incorporating the local into the state legal system has resulted in a disempowerment of local governance institutions and their capacity to manage their natural resources, benefitting only a proportion of Mozabite society. Fabricius et al. do recognise, however, that “powerful stakeholders might use information and resources from cross-scale interactions to undermine trust and reinforce their own authority” (*Ibid:* 9).

The authors claim that “institutional networks can also strengthen the power of communities to avert external policy and economic threats from local to global”, citing that such networking can support communities to counter large multinational corporations, such as mining companies. Yet, while acknowledging that government inefficiency can harm cross-scaled governance, they suggest that “bridging organizations, which bridge the divide between communities and other levels of government, are often vital in ensuring that governance capacity is developed or maintained”. This view suggests that harmony can exist between levels of governance from local to central. I offer a contrasting view, that governance occurs largely in spite of the state in the M’zab. Centralised government has in fact decreased the local ability to manage their resources, as the state owns a monopoly on the use of force and sanctions and is recognised as such.

Rather, international networking has helped the Mozabite community to bypass the restrictions of the state, by gaining support from internal organisations. Support has come in different forms. For example, the ‘Biodiversity Exchange and Dissemination of Experience’ (BEDE) NGO in Montpellier connected Mozabite farmers (through the Tazdait association) with the Petzel climbing-harness company, who have provided innovative designs for safety harnesses for palm climbers. Support also comes in terms of access to scientific knowledge, and funding. Central government also tends to prefer to deal with groups, even while banning the political activity of such associations (see chapter eight). However, individuals also make networks and bring wider knowledge to the area through education, and I met several individuals who had undertaken master’s degrees in France and applied the knowledge locally in the oasis.

Therefore, although this point by Fabricius et al. is partially nuanced, it does not go far enough in clarifying the potential problems of linking with institutions that are (mostly) not beneficial to them. Anthropological studies have shown that today no populations remain isolated from ‘modern’ development (Wolf 1982). What is most important, I argue, in terms of successful governance of local resources is local empowerment, and how larger scaled institutions support or detract from this. Yet, as a fine-grained study such as this reveals, local communities are certainly not homogenous, making governance a site of contestation (Fabinyi et al. 2014).

4. Embedded cultural management practices

Here Fabricius et al. discuss how supernatural sanctions, taboos, and social institutions may be seen as part of adaptive management. My study has focused on culturally-embedded management systems and thus agrees with this point. For example, local practices exist such as the sharing of water during times of drought. Legally speaking, *mulk*, or private property regarding water must be relaxed so that those without water in their wells can receive water from those who have. Further, until recently, the *l'oumna* water guards received their authority to fine for infractions directly from the mosque. The mosque still retains a degree of moral authority, thus an individual may ask the mosque to put out a call for *twiza*, such as to restore a broken wall. Order is still largely maintained through local hierarchical institutions such as the family, the *‘ashīra* and the *‘azzāba*, but as I have already argued, this authority is waning in the eyes of younger generations, who look to the ‘higher’ authority of the state instead. Beyond this, however, normative pressures remain very strong in the M’zab valley, especially in Beni Isguen which is still considered to be very conservative, even by local standards.

5. *Beneficial policies* (e.g. clear land rights, inclusive participation in governing)

The authors are quite general in defining beneficial policies as those which may assist in the successful management of local natural resources. The Algerian state has provided land concessions, loans and training to farmers, along with limited subsidies in areas such as dairy production. Yet beside access to tenured land (most of which is located in very unproductive areas), most farmers that I spoke to stated that government policy did not go far enough. Many agricultural development plans have proved to be unsuccessful, and even detrimental to local areas, for example, in Oued Souf, attempts to enhance aquifer storage resulted in the flooding and killing of thousands of date palms. Locally, development has caused the cost of living to rise substantially, transforming local livelihoods previously predicated on a gift economy (see chapter six). Some farmers confided to me that many government policies related to freedom of associations are extremely problematic, involving bureaucracy which not only restrained political activity, but prevented beneficial local development, causing individuals to give up associative participation entirely.

6. *Motivation*

Here, the authors discuss the importance of common vision and interest of stakeholders in natural resource management. I agree that this is a key factor. I have described how *need* raises the stakes, in terms of individual will to survive environmental and social disorder (chapter five). Stated more clearly, farmers who do not have a safety net, in terms of another job, additional financial resources and so on, tended to be more innovative in finding solutions to problems, in that they could not 'afford' to fail. This challenges, to some degree, theory regarding 'social protection' regarding the role of different forms of insurance in the context of risk

management (e.g. Sabates-Wheeler & Devereux 2007). Others who had alternative revenue streams could afford for their crops to fail and indeed I witnessed this. *Need* further defined the level of interest among diverse groups, which included bourgeois and peasant farmers, homeowners, hotel owners, and labourers. Further, beyond trust, need was described to me as a key factor in the cooperation of different interest groups, and the lack of this factor explained the breakdown in social relations, for as certain individuals have become more wealthy, their perceived reliance on others has decreased (as discussed in chapter 6). This discussion of innovation and need does not rule out other forms of social insurance. For example, many poorer families benefit from interest-free loans in order to start businesses or buy homes (although many that I met also preferred to build up capital alone, asserting their independence from the favours involved in such transactions), and one palm expert I knew was aided for two years after falling from a tree. Yet, these instances are very different from direct, personal access to alternative revenue, for loans involve all sorts of social ties of obligation and honour.

This finding that wealth has contributed to a breakdown in social relations, could suggest the opposite, that poverty causes people to help each other, inferring that wealth production increases individual resilience at the cost of group resilience. This is clearly not a hard and fast rule, however, as poverty has in some cases severely reduced cooperation during hard times, such as in South Africa (Cundill et al. 2005).

In summary, based on my fieldwork data, my assessment reveals that three of the six indicators given by Fabricius et al. are present: leadership, knowledge networks,

and embedded cultural management practices (see table 9.1). The others are partial or lacking. The factors that are lacking involve problems of relations with the state (3 & 5), and unequal dependency on the oasis as a primary source of livelihood (6). Such a naïve focus on questions of scale is common in the resilience literature, and could benefit from better incorporation of political economic theory. Finally, the Fabricius et al. emphasise long-term strategies, whereas Mozabite adaptation might be more faithfully classified as tactical, due to chaotic occurrence of floods. In other words, adaptive management styled experiments would not result in increased understanding of this climatic system due to lack of predictable patterns (see appendix III for an analysis of Beni Isguen oasis as a complex adaptive system). I conclude that this comparison largely agrees with my previous statements, that certain institutions and practices in Beni Isguen are comparable to adaptive management, with some notable qualifications. Following this assessment, it is thus important to clarify how in practice Mozabites actually do manage this complex, dynamic and unpredictable 'system'.

Table 9.1 Presence or absence of indicators of adaptive management in the M'zab community, based on Fabricius et al. (2007).

Indicator	Presence or absence?	Comments
1. Leadership and vision	Yes	Observations of leaders as key to organising associational activities
2. Knowledge networks	Yes	A problem is that locally adapted knowledge may be subsumed by non-specific scientific agricultural knowledge
3. Institutions nested across scales	No	Central power is an obstacle to local management capacity
4. Embedded cultural management practices	Yes	Culturally embedded institutions are present
5. Beneficial policies	No	Similar to 3, beneficial policies are seriously lacking
6. Motivation	Some	Motivation is mixed, depending on whether farmers or landowners have alternative revenue streams

9.3.1 How do Mozabites manage their oasis?

If adaptive management is not sufficient to conceptualise how Mozabites manage oasis resources, many of which have unpredictable dynamic qualities, then how can we better assess and convey the way they do manage? This study has shown that management is constituted by a combination of different organisations, including civil society, farmers, NGOs, the state and the mosque, involving varying power relations. Some aspects are carried out according to market-based practice along individualist lines; some are group oriented (especially regarding knowledge provided by NGOs and government research facilities). Behavioural norms are guided by historical precedence, religious ideology and ecological constraints. The mosque purportedly retains moral, if not juridical influence. The state provides limited assistance (such as wells) while arguably hindering economic development, and ultimately underpins law and order through the threat of force (punishment).

But how do they manage risk? The main ecological problems are drought and floods, potentially exacerbated by climate change in the future. State wells (into deep aquifers) have provided an alternative water source to help buffer against drought when the artisanal aquifer runs low. Yet, collective well associations are fraught with problems, as I have discussed. Extra wealth does provide a buffer, but for long-term stability wealth needs to be reinvested in agricultural resources (such as extra wells or drip irrigation), guided by suitably appropriate knowledge. Some redistribution of wealth does occur, through other resources, e.g. free drinking water for all via the mosque from privately drilled water sources. Loans can provide temporary support following short-term loss of livelihood, such as an accident (e.g., falling from palm trees), or floods (which swamp crops for 1-2 months). Floods are not well managed at present, probably as no large inundations have hit the area for over a decade (in Beni Isguen). The state has retrospectively taken action to reinforce river walls and create risk zones, and the community at large has been rethinking the role of *l'oumna* after the 2008 disaster. *L'oumna's* ability to govern flood management is weakened by its incapacity to fine, however. Yet, other means beyond punishment are being discussed locally, such as education concerning the benefits of flood irrigation, the creation of incentives and more.

This study has especially looked at social changes linked to ecology, and how this is dealt with. Roberts (pers. comm.) has suggested that the traditional *djem'aa* (like the *‘azzāba*) was sufficient in dealing with routine governance, but when it comes to radical social change and empowerment, associative movements are more appropriate, and it appears that civil society is indeed in the process of experimenting with new forms of more inclusive government. I showed how what I

refer to as micro-social movements have been developing alongside more customary organisations. I proposed that these movements have emerged to replace the loss of the diminishing traditional governing structures, but also to deal with new problems, such as how to enter international labour markets, learn new languages, or how to integrate new agricultural knowledge. Some friction between the new and older organisations does occur, regarding who has primacy for dealing with issues. While the older structures remain in decidedly hierarchical form, the new movements are inclusive, and with the decline of authority, people appear to be attracted to this egalitarian form. Thus, rather than collapsing into a form of anomie, local people are decidedly re-organising, for which Mozabites are famous, along different lines. As they experiment with these new forms of governance, based on voluntarism and agreement, certain issues emerge, such as how to deal with dissent and conflict. Rather than appealing to the state to legitimate the use of force to punish offenders (except in inheritance and serious cases or course), ideas are being formulated for how to non-violently persuade non-conformists, through didactic education, direct persuasion by respected individuals, and social exclusion and removal of social benefits (the local 'social contract', an informal version of the institution of *tebria*).

9.4 Discussion: Self-regulating systems?

All of this leads to a discussion of the so-called self-regulating capacity of 'systems', which are central to ideas of resilience. First I frame the discussion before returning to how the concept compares in the M'zab. Where does the 'regulation' aspect of self-regulating systems come from? Self-regulating systems have their corollary in processual political theory of the 1970s (see Comaroff & Roberts 1986: 11) as opposed to rule centred discourse apparent in legal anthropology (e.g. Moore 2000:

178). Paralleling these two approaches, Durkheim considered moral rules to exist outside of the person, whereas for Foucault, morality is rather “the manner in which one ought to form oneself as an ethical subject acting in reference to the prescriptive elements that make up the code” (1990 [1984]: 25–26, in Fassin 2014: 7). Furthermore, the balanced-opposition of segmentary theory of Evans-Prichard and Gellner falls into the self-regulation camp, and so does Bourdieu’s theory of practice which rejects deterministic rule-based behaviour in favour of improvisational interaction guided by codes of honour (e.g. Bourdieu 1977: 11). By contrast, based on his fieldwork in Kabylia, Roberts (Roberts 2014: 20) rejects acephalous process descriptions of Maghrebian society, whose authors have not understood, he asserts, the importance of the *djem’aa* (similar to the ‘*azzāba*) in Berber (and also Arab) government. Scheele (Scheele 2014) also argues that Bourdieu ignores the presence of law as an aspect that defines identity and norms in Kabylia. I found leadership to be central to organisational ability, although this raises questions of legitimacy, as I explore below.

Much recent literature in the social sciences has focused on notion of self-regulating (or self-organising) systems as a new form of governance, with many examples based on modern social movements such as *Occupy* (Chesters 2003; Urry 2005; Chesters & Welsh 2006; Juris & Razsa 2012). Some of these contributions, however, are limited by their singular focus on theory, and lack of practical examples (e.g. Sawyer 2005). Jessop (2003) claims self-organising systems to constitute a new form of governance, contrasting it to top-down and market-based forms, yet his technical discussion also lacks any case studies. Purkis (2001), by contrast, provides an ethnographic description of issues of power experienced by the anarchist movement *Earth First!* Following Bakunin, Purkis suggests that

group members while attempting to avoid authoritarian structures, lacked a necessary distinction between *authoritative* and *authoritarian*. He goes on to comment, paraphrasing Coover et al. (1978: 47), “this is not unusual in radical groups and there is a need to concentrate on ‘leadership’ as a composite of learnable skills, a set of functions rather than as a personal trait or the exercising of power per se” (Purkis 2001: 170).

Anarchists are interesting in their view on power, and Purkis’ among others describe the incredibly long discussions that are then necessary to achieve consensus through debate and compromise. Indeed, Purkis further shows that power cannot be ignored by such groups, for certain people tend to dominate over others, for reasons such as charisma, experience or access to social and material resources. Such groups may be aware of and thus attempt to prevent such accumulation of power through certain means. Indeed, anthropologists have described how acephalous societies, rather than reflecting a lower ‘evolutionary’ position, have rather developed ways to check power (Gledhill 2000: 13), such as through chiding or group fission.

Returning to resilience theory, it has been suggested that Holling’s development of the self-regulating adaptive cycle was inspired by Von Hayek’s free-market economics (Walker & Cooper 2011). Jessop (2003), however, provides an interesting distinction between the blind emergence of equilibrium through market competition, and the reflexive organisation of individuals. This reflexivity distinguishes the difference between ‘emergence’ of organisation of ecological and social systems. It also thus highlights the socio-political dimension of negotiation and regulation. I have further argued that scale must be considered as to whether

organisations require separate, authorised groups to regulate them. This was on the evidence of water users based on irrigation management, backed up by other instances in the literature (e.g. Geertz 1972; Lansing 1989; Mabry 1996). I contend that while smaller groups may be able to spontaneously self-regulate, larger groups require intervention.

In line with the view of shifting authoritarian to more inclusive governance as presented in this thesis (see introduction), a distinction between leaders and authority must be suggested. Who gives leaders their authority? In the case of *l'oumna*, it was the mosque, followed by the *ayyen*, yet arguably it was the population also. This should be clear from the accounts given by those who described them as corrupt (as opposed to 'faithful', as to which the word *amīn* – the root of *l'oumna* - refers), and thus began to ignore their authority. In voluntary associations then, similar qualities such as reliability, charisma, knowledge and morality may be seen in their leaders. Thus the ability of these leaders to govern is based on principles of attraction rather than coercion. Potentially, it is also due to their small size, where all are known to each other and therefore more accountable. I have discussed scale and *social visibility* elsewhere (chapter five). On a normative note, I am not prescribing small communities as ideal units of governance, for locals have described to me the suffocating dimension of accountability, with some indeed preferring the freedom invisibility inherent to cities. As I have argued, rather than the small scale, it is the networks that small groups have forged with other organisations, nationally and internationally, that has assisted with local governance, in terms of increasing knowledge, or in terms of resisting political hegemony. As I have also shown, these types of linkages can be drawbacks for the entire community, depending on the group using them. For instance, I showed how

the secular elite affiliated itself with the state in order to bypass local authority, with negative consequences for the oasis ('abandoned' land). On the other hand, micro-movements have contested the hegemony of the state through the creation of networks with international organisations.

Resilience theory assumes that the self-organisation potential of all social systems operates in an egalitarian context. This is arguably due to a limited, functional view of management in small communities as being consensus based (e.g. Ostrom 1990; Berkes 2005). By highlighting issues of power, inequality and scale, I have problematized this view. Yet, instead of dismissing resilience theory wholesale, I have proposed an alternative social theory that is more compatible to its sophisticated ecological theory, thus providing the opportunity to further develop resilience theory as a whole.

9.5 Conclusion

In the first part of this chapter I drew together the three central strands of this thesis – labour, land and power – into a brief historical meta-analysis organised around the themes of identity, economy and politics in Beni Isguen oasis. I then clarified my position in reference to other theorists who have written about the M'zab, especially regarding change, arguing that the most important catalysing event was based on timing of the ideological and pragmatic realignment of the M'zab with the independent Algerian nation-state. I theorised how the elite class manipulated the central ideological positionality of Mozabite *dissociation* in order to subvert local control. By using an historical analysis I differ from functionalist, synchronic perspectives of Mozabite negotiation with socio-political and ecological change.

The second section involved a comparative analysis of the event and systems approaches. I discussed resilience theory as defined by the notion of emergence as the complex, unpredictable interaction between social and ecological elements. Alternatively, event analysis claims that historical causal factors can be unpicked by a focus on concrete events, through a process of elimination. While it may be impossible to unravel certain histories due to a lack of available data, I showed through this study that it is possible to identify causes and form contextual histories of management issues.

In the third section I returned to the main thesis question: Do farmers in Beni Isguen use adaptive management? I argued that certain key principles, practices and institutions bear strong similarity to definitions of adaptive management, but with key qualifications. I discussed that rather than being a limitation, the consultative element of the adaptive management procedure should embrace a broader view of how to achieve consensus through a more nuanced view of contestation and power. Practically speaking, different social norms of group communication and listening for different communities, and practitioners must be sensitive to local sensibilities. Following this I contrasted my ethnographic data to the six indicators of adaptive management given by Fabricius et al. (2007). This corroborated my view that an appreciation of political economy is lacking in resilience theory. I continued with a discussion of how management actually takes place in Beni Isguen through a patchwork manner with hybrid economic and political forms, by which I mean that there is no consensual management overview, despite some attempts to do so.

I finished with a discussion of self-regulating systems, to which the title of this thesis relates: authority, anarchy and equity (following Sahlins 2008). After presenting certain theoretical problems in the literature such as relating to social movements, I presented an analysis of the organising role of authority, with a discussion of where the power of leaders and authority comes from. Analyses of the sources of political power tend to point to its dispersed, disaggregated nature, highlighting the cracks and fissures at which resistance can be aimed. Nilsen (2015) argues that such horizontal Foucauldian conceptions deny the actual degree of power that the elite hold, which prevents subordinated groups from rising up and effecting political change, otherwise it would happen all the time. In this thesis I described how Mozabite farmer associations have been able to exploit certain cracks, such as the opening of civil society to create a degree of political pressure on the Algerian state, with some positive results. Furthermore, they have strategically enhanced their position by networking with international NGOs. In general, Mozabites have been looking at ways to achieve minimal community solidarity through creative, non-coercive methods. These means of organisation speak to questions that other alternative social movements across the globe are asking, regarding the role of authority. It would be naïve to attempt to address contemporary organisation in politics without discussing how power should be navigated, and I hope that the discussion given here may add to that conversation.

10. Conclusions: Politics of the palm

Life within the arid M'zab valley oases has entailed a supreme concerted effort to produce and maintain the abundant verdure watered by sparkling flows of pumped water, framed by aesthetically pleasing soft lines of hand sculpted walls and doorways, all of which engender a sense of quiet and reflection, especially within the cooler spaces under the palms and earthen roofs. This contrasts with the bustle of the towns, especially at market time, and even more so with the barren rocky landscape outside the valley. Desert aesthetics appear to be characterised by frugality, based on the minimum of physical objects needed for life, whether in the home or outdoors. Such austerity appears to suit the lifestyle chosen by Mozabites, who in some ways resemble a monastic order. Yet for those born into this society, increasing exposure to the alternatives presented through the global media, education and travel throws their own lives into sharp relief, and through this contrast the 'rightness' of the chosen Mozabite lifeway is now questioned. The higher truth of Islam is not in doubt here, but the 'correct' way of being a Muslim is increasingly open to interpretation.

During my time in Beni Isguen, I experienced and engaged in conversation and debate on proper forms of conduct within local social relations, usually didactically in response to perceived misconduct of unacceptable behaviour. This reflection might be directed, for example, at guiding the youth toward more moderate, socially acceptable dispositions (such as in response to the 'unruly' behaviour observed during the success of Algerian squad in the 2014 football world cup), at

perceived corruption by local officials, or at individualistic behaviour that marginalises the interests of the wider community. Such behaviours were often explained as due to external influences arising from the West which encouraged moral perversion. Some Mozabites blamed all ills on the opening up of their community to wider society, while conversely others encouraged the active engagement with outside values to achieve a more morally consistent form of Islamic identity based on intelligent reflection rather than blind faith.

These types of questions encourage a different view of ‘authenticity.’ Identity here is based on change and inner reflection rather than on ‘tradition’ (see also Theodossopoulos 2013). Such reflexivity may be said to entail a sort of indigenous anthropology (Sahlins 2015), whereby local order and praxis is compared to that of other societies around the world. Historically, social order was maintained through largely authoritarian modes of control, with hierarchies of power based on theocracy, gerontocracy, patriarchy, plutocracy and ethnic identity. These were exercised through the institutions of the mosque over the populace, elder males over their families, and the wealthy over the poorer classes and white over black Mozabites and non-Ibadites. This contrasted with an ethic that historically promoted radical egalitarianism (see chapter four), although arguably the only real equity was found among male household heads (Dominguez & Benessaiah 2015). While a reading of contemporary local politics limited to the local scale might suggest a decline and transition from authoritarian to more democratic structures, a wider sociological analysis offers a view whereby local hierarchies of power are being replaced by national ones. Such a relationship, based on modern bureaucracy and social distance, as compared to the intimacy of ‘village’ politics, arguably gives more impetus for local resistance. This has been especially evident in local attitudes

of mistrust toward the state in recent riots, during which the police were seen as prejudiced against the Mozabites, favouring local Arabs. Conversely, when new institutions are expressed in a familiar manner they are locally accepted (as I showed in chapter eight), as with voluntary associations, through which political expression is channelled along forms acceptable and manageable by the state (Gledhill 2000: 18).

I have argued, however, that voluntary associations, which I frame as micro social movements, may be viewed as local sites whereby power is contested. By using Gramsci's notion of hegemony I have aimed to reassess how Mozabite farmer and student movements have been challenging contemporary local power structures not just through ideological contestation (as Gramscian analysis is often limited in anthropology – see Crehan 2002: 172), but through the praxis of regional and international networking and alliance building with NGOs to provide support through means of knowledge and financial resources. Thus social movements such as farmer associations are an important source of governance in terms of generating necessary social change rather than suppressing it.

10.1 Conflict and legal pluralism in the M'zab

The overall purpose of this thesis was to analyse if and how local people have been able to engage and manage social change in relation to the management of natural resources. In the M'zab, life is tightly bound to ecological processes, thus requiring the participation of society in the upkeep of oasis and town, as opposed to modern cities in which responsibility is usually delegated to the state through local councils in return for tax payment. I have explored the differences between local and national social contracts (chapter seven), by plotting alternative strategies whereby

certain groups (the merchant class embodied by the *ayyen*) in the M'zab have utilized state resources and power in order to bypass local authority. Thus I described how the presence of multiple but unequal systems of 'law' enabled forum shopping by individuals to search for the most advantageous outcome. Such wrangling was typical of inheritance disputes over land succession in the oasis. The subjection of Algerians to civil law by the colonial French completely overhauled and further complexified the historical judicial integration of Islamic and customary laws. I explained that despite a general mistrust of state law as a colonial imposition, some were utilising the judicial system to maximise personal gain. This recent practice has been enhanced by an atomisation of the extended household, and perhaps the newly autonomous sons and daughters-in-law have had a hand in influencing the demand for individual shares. I described that in the past land was managed by the family patriarch, who held the family and its resources together by means of his authority. I further described how locals are blaming such *anomie* on processes of globalisation that have eroded local standards based on duty and service to the community. Based on this discussion I suggested a new formulation of the 'social contract' thus expanding Von Benda-Beckmann's (1981) concept of 'forum-shopping'. Furthermore, following Fuller (1994), I pointed to a more useful analysis of legal pluralism as involving competing (and unequal) ideological systems.

10.2 Social movements and voluntary politics

Moving on from this discussion of private property and associated norms and values, I continued with a corresponding analysis of the management of communal/private property, especially water. Access to flowing water is central to the maintenance of life in the desert. Oases typically access water by means of

springs, rivers or wells to underground aquifers, the latter being the form utilised in the M'zab. Underground aquifers are replenished by unpredictable flash floods which in themselves can be violent, requiring proper management in order to diminish their force through social and technical measures. A group named *l'oumna* customarily organised the irrigation canals, fining people who blocked the flow of water. State development has involved the drilling of deep wells in order to supplement artisanal wells, aiming to safeguard against recurrent drought. This resulted in a different social formation around communal wells. I argued in chapter eight that the latter organisations differ significantly from the former in that they are based on voluntary as opposed to hierarchical principles. Such a move to egalitarian structures reflects the change in local political preferences, yet these formations have often entailed stagnation when communal agreements are broken. I went on to suggest that some form of minimally authorised leadership appears necessary to guide such groups through such disputes and for general decision-making. Referring to the literature on irrigation, I argued that while small groups may be able to self-organise, larger groups appear to require regulation by separate officials. Uphoff's (1986: 81) comparative study confirms this. Scale, therefore, is clearly a key consideration to political organisation.

Yet, experiments are also occurring in non-coercive governance. Some local students have been looking at other ways to achieve group consent and the cooperation necessary for communal irrigation management. It appeared that the recent 2008 flood was an important factor in galvanising such consent through understanding that despite the illusion of insurance created by wealth, Mozabites are not immune from the destructive force of the floods. Through appeals to different interests, whether religious, financial or ecological, students and others

are attempting to reassert more broadly, community values against the current ideological hegemony centred on individual property and rights.

10.3 Migrants and the moral economy

Local debate on 'proper' social relationships and the meaning of community could also be seen regarding labour relations. The relationship of Mozabites to the quite recent social category of labour migrants from the Sahel also revealed local prejudices. Despite the religious policy of *dissociation*, Mozabites were increasingly forced to interact with other social groups who have arrived in the M'zab for various reasons. Labour migrants, mostly young Malians, were minimally tolerated for they were needed to perform menial labour that Mozabites increasingly preferred not to do. I proposed that the Malians' arrival in the early 1980s filled a gap left since the abolition of slavery in 1848. (The latter took many decades to be realised in practice, partly due to the French reluctance to interfere with certain economically beneficial relationships.) The lull in agriculture occurred in Beni Isguen during which time agriculture was largely family run, based on a moral economy of mutual aid (*twiza*) combined with sharecropping arrangements on land owned by wealthy merchants. I described how postcolonial state development, as mentioned above, caused living costs to rise, largely putting an end to *twiza* relationships. This, I argued, caused a shift in local relationships within the M'zab, as people increasingly paid for services for which in the past they relied on reciprocal aid. These market-based relationships further encouraged a hierarchy among peers that was not experienced with *twiza* exchanges. Thus the market economy did cause a certain experience of *anomie*. I argued, however, that local experience of market relations does not equate to the conventional impression of global market domination, rather economic practices continue to be mixed,

depending on local purposes, whether to raise cash or to engage in family oriented practice. Furthermore, I discussed local conceptual barriers to the wholesale adoption of market-based practice and ideology.

10.4 Addressing power, agency and inequality in systems theory and beyond

Systems theory purports to be superior to other forms of analysis in conceptualising complex human-environment interactions (Duit et al. 2010). A common criticism of resilience theory is that, by turn, it is lacking in social theory (Hornborg 2013; Hatt 2013; Fabinyi et al. 2014). My assessment is that this is indeed the case, due to a framing of social adaptation as being contingent on consensus. Throughout this thesis I have referred to social conflict, inequality and contestation as a more accurate framing of how power relations are actually negotiated in everyday life. Arriving at this social analysis was made possible through the use of event analysis, which enabled me to look at historical conditions within which people make decisions relating to oasis management. In chapter five, I suggested a way for resilience and adaptive management to incorporate power and conflict, inspired by Gramsci's hegemony. In that chapter, I further problematized the primacy of adaptation in explaining social institutions and strategies in the oasis, by showing that cultural preferences play a strong role, as well as other factors such as the market.

I began the thesis by discussing whether the social and ecological realms may be theorised as a totality, or if due to fundamental differences they should be considered apart. Actor Network Theory (ANT) based studies (e.g. Latour 2005) including recent anthropological approaches to infrastructure attempt to visualise

the linkages between material and immaterial phenomena (Larkin 2013). However, along with Kipnis (2015) I am reluctant to attribute human-style agency on non-humans, preferring instead to describe degrees of agency that material phenomena may impress on humans in terms of constraints. Here, I have attempted to portray how material and immaterial factors affect each other by following lines of palms and people, and by exploring the contextual worlds within which they are folded. The representation of societies as involving contested, dynamic equilibrational relations centred on both shared and competing ideologies is more analogous to how ecological communities are theorised in terms of social ecological systems (SES). A key difference that I initially raised concerned the reflexive capacity of societies, yet theorisation based on hegemony does not appear to require this factor as essential. Even a slight shift from conflict to ethical reflexivity, however, to constitute a view of humans as reflective self-fashioning agents, could disturb this flattened distribution of agency (see also Laidlaw 2014: 107). The relationship between structural constraint and ethical reflection on decision-making regarding natural resource management will be the subject of further inquiry.

Appendix I: NVivo codes

- Biophysical
 - Built environment
 - Date palm
 - Ecological change
 - Climate change
 - Disease-pest
 - Drought
 - Floods
 - Irrigation system
 - Ntissa (new concession area)
- Economy
 - Labour
 - The market
- Everyday
 - Attitudes
 - Discourse
 - Local histories
 - Religion
 - Sayings
 - Social change
 - Solidarity and inequality
 - Values
- Governance
 - Associations
 - Individual decisions
 - International NGOs
 - The State
 - Development
 - French colonial rule
 - Local management
 - *Urf*
 - *Ashūra*
 - *Ayyen*
 - *Azzāba*
 - The family
 - *L'oumna*
- Knowledge, practices & adaptive strategies
 - Adaptive strategies
 - Modern farming
 - Phoeniculteurs
 - Traditional farming
 - Transmission women's roles
- Land tenure
 - Communal ownership
 - Inheritance issues
 - Private ownership

Appendix II: Example of questions asked on a typical farm survey

- What are the main problems?
- Is salinization a problem?
- Where are your seeds from?
- Do you have labour problems?
- What crises have you experienced? How did you deal with them?
- Have you experienced plant diseases?
- How do you deal with flood?
- Where do you sell crops?
- Do you get decent price for your produce? Does it fluctuate?
- Do you use new methods? (e.g. drip irrigation, compost, chemical fertilizer/pesticides, hybrid seeds)
- Do you experiment?
- Which activities are governed by the seasons?
- Is the farm profitable?
- What are the inputs?
- How much is water/electricity?
- Which crops do you grow and why?
- What is your experience of government development?
- How long have you been farming here?
- Do you employ tree climbers?
- How did you get into farming?
- Do you have farming ancestors?
- Where does your knowledge come from?
- Are your children interested?

Appendix III: Summary of resilience assessment

I utilised the Resilience Assessment developed by the Resilience Alliance (Alliance, R. 2010) in order to view the oasis through the framework of a socio-ecological system, which would allow me to assess it as a complex adaptive system. This involved identifying and narrowing down the key components or variables involved in the structure of the oasis as a functioning system. Then I was led to assess which variables were less stable, and the thresholds of such variables (core variables were land access, water availability, labour availability and appropriate knowledge). I then noted the main drivers which affected these variables (these included climate, global market prices, mass media, migration, the state, and colonialism). Then, I described the alternative states that the oasis could exist in, which were essentially either as a functioning agroecosystem, or as an unmanaged arid landscape, with labour and water as the key variables. From this I differentiated five economic forms of exploitation, which were: slave-based agricultural oasis, gift and feudal economy agricultural oasis, urban garden oasis, non-agricultural land, and a capitalist oasis (see table III.1). These have changed according to historical processes roughly along a line, although in reality some of the systems (except of course slavery), continue to coexist, which confounds the idea of separate states given by resilience theory (more on this later).

Table III.1. Alternative oasis states.

No.	State	Crops cultivated
1	Slave-based agricultural oasis: communal land tenure and family managed land , worked by slaves (labour economy) and specialists (knowledge). Water hauled by slaves and camels from artisan wells. No cash, slave economy.	Mainly arable (barley, wheat), mixed date palms and other fruit trees (approx. 15 per cent) and some vegetables.
2	Gift and feudal economy agricultural oasis: privately owned land by merchants, farmed by <i>khammēs</i> (with knowledge) by means of <i>twiza</i> (labour economy). Water hauled by sons of <i>khammēs</i> . No cash, gift economy/feudal economy.	Same as above.
3	Urban garden oasis: Merchants move onto the land , worked by labour migrants and palm specialists (knowledge), water pumped electrically from collective and state-owned wells. Cash drives the economy, consumerist-led. Labour is paid for.	Mainly date palms and other fruit trees.
4	Arid, non-irrigated (water) land used by nomadic pastoralists (knowledge and economy) on a communal management agreement (land) (generally unrecognised by the state).	Wild crops used for pastoral grazing.
5	Newly developed capitalist oasis (alongside the urban one): Privately owned medium sized plots (land), worked by working class or bourgeois farmers trained in modern techniques (knowledge), worked by labour migrants (labour economy), water is pumped from privately-owned wells or collectively accessed state-owned wells.	Date palms, fruit trees and vegetables, some alfalfa for livestock; livestock.

The key driver behind the shift from each state to another was then described. According to the modelling, the decline of agricultural production based on slavery was due to the abolition of slavery by the French rulers. The next, second state involved a number of *khammēs* continuing to farm the land using *twiza* as the primary economic method of labour organisation (alongside sharecropping), until market prices drove down the desirability of growing certain crops, such as wheat and barley. Government development of infrastructure drove up the cost of living and thus people stopped engaging in *twiza* and instead demanded cash. The dual development of education and oil work drew away potential skilled and unskilled labour alike. As the local population increased and more young families were willing and able to buy separate houses, more housing developments occurred within the oasis. The same trend has seen the fragmentation of land over generations due to the demand for individual inheritance, rather than allowing communally owned management by the extended family's patriarch. This drove up the price of land causing farmers to sell their land. The low status of farmers also exacerbated the decline of farming in the area. It has been stated that fathers are now afraid to let their sons climb the tall date palms. Farming has only seen a return in Beni Isguen with the opening of the new concessionary land in Ntissa for free by the state beginning in 1988. Training and loans are now also provided. The arrival of unskilled labour migrants in the 1980s from Mali and elsewhere brought back the possibility of cheap labour.

One of the most revealing aspects of the assessment was looking at how various components interacted, for example, drought could affect farm profitability and the ability to pay labourers, which could cause them to migrate elsewhere. Shifting market prices could have the same effect. Another interesting exercise was mapping each problem (oasis economy, land tenure, political organisation) onto the adaptive cycle model (see chapter 2). Certain systems were resistant to such mapping as they followed unpredictable trajectories, such as climate. Others such as political systems were interesting, because according to the model, the point at which the system exists along the cycle can be key to the timing of management interventions (ref). Both farming associations and *l'oumna* are currently insufficient in management capacity when it comes to the ability to punish rule-breakers. Yet, according to the model both institutions are still early on in terms of organisational growth, thus they are not yet rigid or established in their practice and form, and therefore the possibility of improvement exists. This might be contrasted with the more rigid nature of the mosque. In fact, the reason for the breakdown of traditional structures, according to Resilience thinking, lies in their very rigidity. The persistence of these structures may contradict this view, although as I have argued, the decline over the past five decades is due to the fact that the M'zab fortified *qsūr* have now opened up to outside influences, in terms of state power, tourism and mass media, which has had structural and ideological effects on local personhood and control.

Perhaps the most revealing outcome of the assessment was the focus on exclusivity of 'states'. While a focus on varying forms of economic system was interesting, in terms of identifying the key components and agents of change, exclusivity was a telling difference between models and lived reality. For today, in each problematic that I have investigated, multiple forms of each domain exist in the M'zab. In the economic realm, monetary, gift (*twiza*), feudal (*khammēs* or sharecropping), redistribution and barter all coexist. In terms of land, private, communal, state-owned and mosque land are all present. In political systems authoritarian, anarchic

and democratic forms all are potentially vying for position. These forms may or may not be mutually exclusive, and some are more dominant than others. Yet, such diversity and hybridity is likely the form that modern life will increasingly take, at all levels, acknowledged or not.

To summarise, the Resilience Assessment highlighted that certain key phenomena in the oasis are indeed dynamic, which require ingenuity, flexibility, strategy, knowledge and coordination to deal with. Namely, water, land access, labour and knowledge are all variable components. Farm income is a variable which is contingent on the first four factors, as well as markets. Elements that affect these variables include climate, land tenure law, labour markets, access to suitable knowledge (local and scientific), and market prices. The assessment focused more on social institutions and learning in regards to how humans deal with shocks and disturbances.

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