

# Environmental Crisis and Mobility in Oases Societies of Morocco: The Cases of Imilchil and Merzouga

## Crisis ambiental y movilidades en sociedades oasianas de Marruecos. Los casos de Imilchil y Merzouga

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The oases of Morocco have undergone profound socio-environmental transformations in recent decades that have affected their ways of life and their economies, impacting especially the culture of nomadism and increasing the weight of other forms of mobility such as tourism and migration. To address these changes, this article adopts an ethnographic approach, employing fieldwork and using observation and interviews as its primary techniques. The towns of Imilchil (a mountain oasis in the Eastern High Atlas) and Merzouga (a desert oasis in the Ziz Valley) were selected for study based on their shared nomadic past and the increasing presence of tourism and migration. The research findings demonstrate how the combination of new and old forms of mobility and immobility forms part of attempts to adapt to changing environmental and climatic conditions, as well as part of the essential role of the state and its policies.



**Abstract**

*Los oasis de Marruecos se han visto sometidos a profundas transformaciones socioambientales en las últimas décadas que han afectado a sus modos de vida y sus economías, impactando especialmente sobre la cultura del nomadismo e incrementando el peso de otras formas de movilidad como el turismo y las migraciones. Con el fin de abordar estos cambios, el artículo adopta un enfoque etnográfico, mediante el recurso al trabajo de campo y el empleo de la observación y la entrevista como técnicas principales. Las localidades de Imilchil (oasis de montaña del Alto Atlas Oriental) y de Merzouga (oasis de desierto del Valle del Ziz) han sido seleccionadas para su estudio en base a su común pasado nómada y la presencia en aumento del turismo y las migraciones. Los resultados de la investigación muestran cómo la combinación de nuevas y antiguas*

*formas de movilidad e inmovilidad forma parte de los intentos de adaptación a condiciones ambientales y climáticas cambiantes, pero también del papel esencial del Estado y sus políticas.*

Climate change; political ecology; migration; Morocco; nomadism; tourism

*Cambio climático; ecología política; migración; Marruecos; nomadismo; turismo*



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## 1. Introduction

Human mobility studies tend to address different forms of mobility separately and hardly ever take account of their interconnections. In this article we endeavour to stress the interrelationship between different types of mobility in a field that brings together migration and tourism (the most thoroughly studied forms of mobility) as well as nomadism (more rarely studied) and immobility itself, which is also a part of mobility (Avallone, 2024; Martínez, Redin & Forero, 2024) and includes, among other forms, the sedentarization of formerly nomadic populations, the immobility of populations that are “trapped” or forced to become immobile and voluntary immobility as a form of agency.

Looked at from this standpoint, Morocco’s oases, which have undergone deep socio-environmental transformations in recent decades, are a world-class stage for studying mobility. In the past these oases were isolated areas ignored by government development policies, but now their lifestyles and economies have experienced major mutations that have had an impact on the forms of mobility and immobility that provide the structure underlying their social organization (Ait Hamza, 2009). Nomadism has traditionally been the main form of organization at many oases; continuous mobility is an ancestral means of adapting to singular and in many cases extreme environmental conditions. In recent decades, however, nomadism has been giving way to sedentarization and the rise of new economies linked to new forms of mobility, such as international migration and tourism.

Nomadism—described by Montagne (1947) and Barth (1961) as a complex, dynamic socio-ecological and political system based on regular mobility and linked to a pastoral economy—has been replaced in many places by more-restricted forms of mobility, like semi-nomadism and transhumance, where movement is more temporary and season dependent. In addition, there are now new mobilities, represented by international migration and tourism, which paradoxically (especially in the case of tourism) have also paved the way to immobility for formerly nomadic populations by furnishing them with the economic means (emigrant remittances and tourism income) to remain fixed in one place, thus enabling their sedentarization.

To demonstrate how oases societies have entered a complex process of change in connection with mobility, we have chosen the cases of the oases of Imilchil, a mountain oasis in the Eastern High Atlas, and Merzouga, a desert oasis in the Ziz Valley. We show how, until just a few decades ago, life in these small communities was run on the basis of managing limited resources in a hostile environment, but their age-old equilibriums have been upset by environ-

mental changes that are both the effect and oftentimes the cause of economic, social, political and cultural changes (Jaafary et al., 2024).

Both cases are excellent illustrations of the connection between changes of various kinds that are taking place in a context of environmental crisis and are amplified by the rising impact of anthropogenic climate change and its effects on mobility and immobility. At the same time, the combination of new and ancient forms of mobility and immobility reveal to us the complexity of human attempts to adapt to changing environmental and climate conditions and populations' limited ability to withstand those conditions.

Through ethnographic fieldwork we attempt to show how climate change, the depletion of grazing land and water scarcity have forced classic nomadism to give way to semi-nomadism and (to a much lesser extent) transhumance, but mostly to internal migration, international migration and the integration of the tourist industry into household economies. Thus, we claim that nomadism as a means of adapting to the environment has lost a great deal of its original functionality and has gradually been replaced by tourism and emigration, combined with supplementary recourse to reduced livestock-raising activity and minor subsistence farming.

To address these issues, our first section explains the multiple connections between environmental crisis and forms of mobility, looked at through the lens of political ecology. The next section describes the two research settings and our methodology, which is based on an ethnographic focus. The third section explores the socio-historical and political/environmental process that has led certain populations away from nomadism and toward sedentarization. The fourth section shows how the transition from nomadism to sedentarization has transpired at the oases of Imilchil and Merzouga and points to the implications the change has had on community life. The fifth section analyses the key role of the state in changing ways of life at oases, both during the French colonial regime and after Morocco's independence, and the conflicts government action creates. The sixth section delves into the role of tourism and emigration in the various kinds of transformations the Imilchil and Merzouga oases have experienced and the political dimension of tourism and emigration. The paper concludes with the idea that the two oases' socio-political changes cannot be isolated from their environmental changes, and vice-versa; each kind of change feeds back into the other and has repercussions on mobility and immobility.

## 2. Environmental Crisis and Mobility Through the Political Ecology Focus

As the environmental crisis has deepened at the planetary scale and anthropogenic climate change has snowballed, the ecological perspective has again taken centre stage in the analysis of social problems. The centrality of what is ecological as a way of understanding social reality reminds us that whatever is natural is also pretty nearly a social fact. It helps us dethrone the myth that the environment's configuration responds only to natural changes, and it helps us realise humans' impact on nature's transformation and perceive the interests that accompany that transformation. In this sense, political ecology enables us to build a complex analytical framework with which to peer into how the environment can sway social affairs and how social processes eventually shape the environment. As Leff says, "Political ecology is the terrain where a battle takes place over the denaturalization of nature: of the 'natural' conditions of existence, of 'natural' disasters, of the ecologization of social relations." Leff stresses, "It is

not just a question of taking a constructivist stance toward nature, but a political one, where relationships among human beings and between them and nature are constructed through power relationships” (Leff, 2003, p. 5).

Environmental crises and conflicts—including climate change itself—are hard to understand fully unless we analyse their connection with power relationships and the role of public institutions. Roberts maintains that political ecology helps us grasp “how and why structural forces, such as capitalist economic processes and power relations, drive environmental change in an increasingly interconnected world” (Roberts, 2020, p. 1).

The political ecology focus not only contributes to a clearer picture of the origin of environmental problems, but also helps us trace out the connections between environmental problems and other processes, like mobility, and see that mobility is mediated by multiple factors, among which political and environmental elements play a fundamental role (Bayrak et al., 2022). The framework of political ecology, then, can be used to address mobility within a broader socio-ecological context, while at the same time perceiving more of the complexity of the link between climate change and mobility, moving away from the idea of a mechanical relationship (Avallone, 2024). The relationship between human mobility, environmental crisis and climate change can be comprehended better if we analyse the underlying socio-economic, historic and political factors and the power relationships that as a whole shape the patterns of human mobility. Mobility is not determined only by the environment; it is swayed by the political economics of whatever development scheme is being applied. Accordingly, the relationship between climate change and human mobility may also be regarded as a power relationship (Bayrak et al., 2022, p. 936).

From this perspective we can also see that both mobility and immobility are the result of specific rationales and the political acts that embody those rationales and vest them with legal standing. For instance, in the case at hand, we have colonial and post-colonization policies encouraging emigration and policies fostering sedentarization, to which we must add the borders set during the colonial era and border disputes between post-independence states.

Political ecology is a useful analytical framework for studying oases as spaces where environmental constraints are tightly interwoven with social, economic and political factors. An oasis is a first-class setting for throwing light on power relationships and environment-based conflicts, which are themselves the result of environmental transformations wrought by processes generated by human activity, manifested in the reconstruction and exploitation of the environment. In its turn, the strongly humanized environment of the oasis places constraints on the social, economic and political life of its population. In reality, the construction of an oasis is not so much a natural process as it is the result of social, economic, political and cultural processes that are still at work today.

As we shall see, oases are largely the result of power relationships that have made populations sedentary at certain locations. Colonizers have an interest in getting moving populations to stay put; it guarantees their controllability. Attempts in that direction have continued under post-independence authorities, who also see nomadism as a threat to the state’s authority. The coincidence of viewpoints reminds us that there is not always a break between colonial and post-colonial models of development (Escobar, 2011).

Using political ecology as our viewfinder forces us to discard single-cause or one-way approaches to spatial transformations. It shows us that mobility and immobility processes cannot be understood without taking account of the means by which they are produced, their

environmental constraints and especially the political factors and power relations that run through everything. As Avallone says, “[T]he political ecology of migration politicizes the discourse on migrations within the context of socio-environmental changes” (Avallone, 2024, p. 7).

### 3. Contexts in Study and Analytical Methodology

The main common thread between Imilchil and Merzouga is that they are both oases strongly influenced by nomadism. The oasis—meaning an isolated space having water and vegetation in an arid environment—has conventionally been associated with the desert landscape, but it applies to arid, isolated mountain landscapes as well. Imilchil may be considered, and in fact is catalogued, like other zones of Morocco, as a high oasis surrounded by mountains practically bare of vegetation. Merzouga is a more obvious fit for the classic concept of the oasis with water and palm trees springing from the middle of a desert. In terms of landscape, both are arid, with only sparse vegetation clustering around the points where water is available.

These oases are mostly the result of a human building process that has transformed landscape and environment alike. Their urban cores were conceived during the colonial era as administrative and service hubs for areas whose population was mostly nomadic or living in tiny, scattered hamlets. The intention was to concentrate the population at these locations and equip these new towns with services that would be useful, first for colonialization purposes and then for the purposes of the new independent state, including schools. The effect was clearly to create urban development. Around the original oasis a new small city was built, which attracted inhabitants of the area and people from other regions of Morocco as well (especially civil servants in the employ of the national government), producing small-scale urban development in which streets were laid out and new homes and buildings were built in new styles instead of the local traditional style.

Imilchil is the centre of a commune of the same name in the region of the Eastern High Atlas. It belongs to the administrative province of Midelt. According to the latest census (2024), the commune has 9,154 inhabitants (the 2014 count found 8,870 inhabitants, which means the population rose by 3.2% in ten years). The region contains several communes populated by the Aït Haddidou, a Tamazight-speaking ethnic group historically characterized by their adherence to ancestral traditions and their strong sense of identity, in counterpoint to the acculturating efforts of the central state authorities. The zone occupies a steep mountain environment—Imilchil itself lies at an altitude of over 2,000 metres, although the peaks around it rise to as much as 3,500 metres—and contains small villages and hamlets dotted along various valleys, in a landscape of desertified heights covered with snow during a good portion of the year. The local economy is based primarily on animal husbandry (largely nomadic) and a small amount of subsistence farming, although more recently trade, services (particularly tourism) and both internal and international emigration have become key sources of revenue. Historically severely isolated due to its mountainous terrain, precarious communications and great distance from cities, the zone has opened up somewhat in recent years. Imilchil has now become a minor service hub (small hotels and restaurants, petrol station, grocers) and a waystation for tourists and Moroccans who travel its mountain roads to get to other regions, and it shows certain signs of urban development. This micro-urbanization process has probably also been helped along by Imilchil’s conversion into an administrative centre

holding the commune's central offices, the headquarters of the region's *caid* and *supercaid*,<sup>1</sup> the Royal Gendarmerie, a secondary school and a primary school, a hospital and postal services, plus a weekly market that draws in numerous people from neighbouring hamlets and merchants from nearby regions.

Merzouga is located in the commune of Taouz and is the commune's main hub or population centre. It acts as the commune's economic centre as well, although the administrative capital is located in the city the commune is named for, Taouz, in the province of Errachidia. The commune of Taouz currently has 9,360 inhabitants according to the 2024 census (6,792 inhabitants in 2014, so it has grown 37% in a decade). It lies in an area with few other population centres; apart from Merzouga and Taouz, only two towns, Hassi Labiad and Khamlia, have a population of significant size. Beaumont (2010) describes Merzouga as a small city of sedentarized nomads with a "mushroom city" structure, where the road strings constructions together, strongly modifying the landscape.

The vast majority of the inhabitants of Merzouga belong to the Amazigh ethnic group of the Aït Khebbach people. They are characterized by their practice of nomadism and are thought to have gradually settled around the oasis after having historically used it as a waystation to water large herds of camels and sheep. The landscape is extremely arid. Merzouga lies at the foot of the great Erg Chebbi sand dunes, which have become the region's main tourist attraction and a major economic driver. Dune tourism has spurred a messy sprawl of buildings of all kinds on the slope traversed by the Merzouga-Rissani road. Tourism is now combined with some minor livestock farming—the camels are mostly for the tourists, though there is a camel milk cooperative—and a sprinkling of subsistence farming, also numerous services aimed primarily at tourists. Although it is not the commune's capital, Merzouga has become the region's service hub and administrative centre, since it has municipal offices, a medical dispensary, the school, the post office and the Royal Gendarmerie. Most importantly, however, it is home to a large number of coffee shops, restaurants and stores selling all kinds of supplies, souvenir shops and businesses that hire out vehicles (ATVs and quads) for driving around the dunes.

Our study of these two zones is largely ethnographic. The fieldwork in Imilchil was done at various times in 2002, followed by repeated stays in 2009, 2010 and 2018 as part of some dissertation work. The last stay there was in July 2024, to collect more-recent field materials for a comparison with other oasis zones. The fieldwork done in Merzouga was more limited, confined to one fortnight spent there in January 2024 for the comparison just mentioned, and later rounded out by ongoing contact with various local informants over WhatsApp and e-mail up to the date when this article was written (May 2025).<sup>2</sup> During the fieldwork, participant and non-participant observation and formal and informal interviews were the main means of access to information. Travel through the various population centres and areas of particular environmental importance (grazing zones, family farms, mountain lake and river environments in Imilchil; dune area, palm grove, wells, mining areas in Merzouga) accounted for a great deal of the time devoted to research and enabled a view to be gained of the envi-

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1 The *caid* and *supercaid* are the representatives of state authority in the zone.

2 The trips in 2024 were part of a research project entitled "Migration, climate change and development cooperation. Flows, impacts and policy coherence in the cases of Morocco and Senegal in connection with Spain" (PID2021-122559NB-I00), funded by the Spanish Ministry of Science and Innovation.

ronmental problems at the sites and the local population's relationship with its environment. Informal interviews in the form of conversations included an indeterminate number of local inhabitants in different contexts (in their daily activities as herders, farmers, merchants, tour guides, officials, etc.). The formal interviews were semi-structured; over 50 such interviews were conducted in Imilchil, and around 10 in Merzouga. The most important were interviews with local development agents at official institutions and non-governmental development associations and organisations. The vast majority of the interviews and informal conversations took place in French, the exceptions being in the case of a number of tour guides who spoke Spanish and local Tamazight-speaking people, where local translators were used.

#### 4. From Nomadism to Sedentarization and Other Forms of Mobility

Nomadism, which ethnographic studies regard as a form of social, economic and political organisation based on mobility in order to adapt to certain environmental conditions (Barth, 1961), has shrunk drastically throughout the world (Bradley, 2012). Livestock-raising cultures based on herd mobility as a strategy of anthropic adaptation to the constraints of the physical environment and seasonal climate have dwindled significantly or else have shifted to more-limited forms of movement like transhumance, which is considered a form of seasonal nomadism (Antón, 2000, p. 23).

In the case of Morocco, the nomadic population has experienced a rapid, progressive decline (Hennani, 2021). According to census data from the Haut Commissariat au Plan, in 2004 there were a total of 68,540 nomads, which by 2014 had shrunk to 25,274 (63% fewer). The decimated nomadic population in 2014 accounted for seven out of every 10,000 inhabitants of Morocco and was clustered in four provinces, Tinghir (21.5%), Midelt (20.3%), Assa-Zag (13.8%) and Errachidia (13.8%).

According to the bibliography we consulted (Bechchari, 2014; Ait Hamza, 2012) and the information we gathered during our fieldwork, the sedentarization of the nomadic population of Morocco seems to have taken place in stages. The first stage took place before 1956 (the date of Morocco's independence) and was driven by colonization policy. It began in 1933 with the entry in force of the "Charte de la transhumance," which did not pursue absolute sedentarization but instead called for nomadism to give way to transhumance, such that well-to-do families of leading local citizens were allowed to continue to keep a good share of their livestock. The second stage, post-independence, was the result of the Moroccan state's own settlement policies implemented in the 1970s. These policies took pains to tie sedentarization to new jobs provided by the state administration and to shift a portion of the population to a salaried way of life. The third stage was linked to the great droughts of the 1980s, which decimated herds; in this stage sedentarization was predicated upon a reduction of grazing land and a downsizing of herds, coinciding with the start of rural tourism and a career switch for many herders who became guides or opened small tourist businesses. The fourth and last stage came about as a consequence of the exacerbation of climate change, the environmental crisis and the impoverishment of the way of life of the last nomads. In this, the most-recent stage, the sedentarization of the last nomad families took place under conditions of great precariousness and environmental vulnerability.

In addition to its environmental components, the process of sedentarizing nomadic populations has an important political backdrop that reveals the power relationships and political conflicts underlying environmental problems (Robbins, 2012). In 1933 the French colonial administration rolled out the *Charte de la transhumance*, paving the way to making pro-sedentarization policy official (Skounti, 2012). And the policy lives on today, with measures by the Moroccan state such as the *Loi n° 113-13 du 27 avril 2016 relative à la transhumance pastorale, à l'aménagement et à la gestion des espaces pastoraux et sylvopastoraux*, a law that made official authorization necessary for transhumance and has been regarded as an additional threat to the pastoral lifestyle (Hamzaoui, Faysse & Sraïri, 2024). Other political measures too, like the creation of herders' cooperatives, the digging of wells at certain points and the controlled distribution of feed and fodder by the state, have also done their part to encourage sedentarization (Ait Hamza, 2012).

Furthermore, the same principles of colonization that promoted sedentarization were also responsible for mobilizing a good portion of the population—including nomads themselves—in migratory flows to seek work in big cities, other French colonies (such as Algeria) and expanding cities within Morocco. The policy was designed to uproot people, especially rural people, and it was upheld by the Moroccan state after independence. New forms of mobility have since been added, such as international tourism, which has been warmly fostered by government policies and mechanisms to facilitate emigration as a path to creating remittances.

## 5. Two Oases' Societies in Crisis

The oases societies<sup>3</sup> of Morocco are facing major challenges that threaten their survival (Msefer, 2021). Houzir talks about a process of advanced degradation, with problems having to do with water scarcity and overuse, a decline in agricultural productivity, pressure on the limited local resources of a growing population and heavy dependence on the money sent home by emigrants (Houzir, 2017, p. 6). Oases, which are home to around 5.3% of Morocco's population according to Houzir's data, are facing the degradation of their plant cover, soil erosion resulting from overgrazing and the major threat of desertification. All these environmental problems are related with socio-anthropological problems like former traditional institutions' loss of power, the emigration of young people and the weakening of social bonds, as a consequence of the influence of values and models imported from cities and from abroad (Houzir, 2017, p. 6). This diagnosis applies to the two case studies at issue here as well.

Researchers consider the community of Imilchil a semi-nomadic pastoral society that adapted to the conditions of the Atlas range centuries ago. Michèle Kasriel (1989) documents that the Aït Haddidou came from the Assif Melloul Valley in the 17<sup>th</sup> century through the agency of Sultan Moulay Ismail, to undermine the power of the Aït Atta group. After their arrival they built various towns, the most important being Agoudal, where their prominent families lived. Nevertheless, with French rule of the region as of 1933, central importance was transferred from Agoudal to Imilchil, which became the administrative hub and the centre of political power.

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<sup>3</sup> The concept of oases societies refers to the particular social and political system exhibited by populations organized in isolated contexts with limited resources in an oftentimes hostile environment. The concept has been used in a number of papers, including the case study by Ait Hamza, Faskaoui and Fermin (2009) in the case of Morocco.

The ethnic group of the Aït Haddidou have of old been combining nomadism and medium-distance transhumance during certain times of the year with livestock herding on the outskirts of population centres. Kasriel explains that until 1980 transhumance involved entire families, but when school attendance was made compulsory, women and children ceased to participate and it was the men who carried on with the task of leading their herds to neighbouring regions. Thus began the gradual tapering off of transhumance and the rise of herding in one's own territory only, which put increased pressure on vegetation and set off a powerful process of mountain desertification that has had a heavy environmental impact (Kasriel, 1989, p. 42). Hamzaoui has estimated that in 2022 there were around 170 transhumant herders in the Aït Haddidou group, and that the number of transhumant households plummeted from 70% in 1990 to 15% in 2022, a 78% decline in just over thirty years (Hamzaoui et al., 2024, p. 7).

Other authors, like Bechchari (2014), also stress the significance of the breakdown of the pastoral ecosystem, which took place in roughly the 1940s, when the large number of animals outgrew the available grazing land and livestock herders began resorting to supplementary feeds like wheat and barley. Bechchari also notes how, during the 1990s, the number of sheep continued to rise although nomadism had declined considerably, thus augmenting the degradation of grazing land. Furthermore, with sedentarization and greater grazing difficulties, families started raising new stable-based animals like cows and fruit trees such as apple trees, while keeping small vegetable gardens to round out the family diet.

The environmental and social crisis affecting oases has a particular impact on women. It is they who are more strongly linked to the provision of natural resources, and it is they who more often remain where they are, since they are bound by greater cultural restrictions on mobility (Bossenbroek et al., 2024), although in recent years incipient female emigration has been observed, together with a greater presence of women in salaried work linked to the tourism economy (Berlangua & El Khamisi, 2024). Because of short water supplies and reduced vegetation, women have to travel longer distances for provisions, spending more hours on tasks like drawing water from wells and hunting for firewood for cooking or heating. While under nomadism it was the men who took care of the livestock (flocks of sheep or herds of goats or camels), with sedentarization and the introduction of new household animals (like cows, chickens or rabbits), it is the women who now care for the family's animals, making for a heavier domestic workload. Also, the women who cultivate family vegetable patches have to work harder and harder for less and less produce because of water scarcity, soil impoverishment and climate uncertainties.

The case of the oasis of Merzouga is a strong parallel with that of Imilchil, but it does have certain features of its own. Originally the ethnic group of the Aït Khebbach practiced nomadism with huge herds of camels, ranging over an extensive territory where the Aït Khebbach had a symbiotic relationship with small groups of sedentary populations to whom they offered protection and with whom they traded animals for food and other products (Gélard, 2004, p. 17). The Aït Khebbach still regard their nomadic nature as a constituent part of their identity, looking on sedentary populations as "weak," and until the early 20<sup>th</sup> century they kept the oases populations under their political and martial dominion (Gélard, 2007, p. 161).

During the 1980s, however, a major process of sedentarization took place in the vicinity of Merzouga due to drought and dwindling grazing land. As nomadic groups settled, they entered into agreements for ownership of land on which to build homes, not without conflicts with the local populations already there, who claimed ownership of the oasis (Gélard, 2007,

pp. 169-170). Gagnol (2016) dates the origin of Merzouga as a population centre to around 1930 and attributes the city's creation to sedentarization under colonial policies and the start of lead mining by the French. When the French colonialists introduced mining, salaried jobs appeared in Merzouga to compete with nomadism and herding, and a new town of labourers grew on the outskirts of the oasis. The development of mining also had a considerable environmental impact that persists today, with effects on the landscape, aquifer pollution and health problems in local population members who worked in the mines or were exposed to the harmful effects of lead mining.

The title of the article by Gélard (2008), “De la tente à la terre, de la terre au ciment,” is a nice summation of the processes experienced by the nomad populations and the stages they passed through until they settled definitively in Merzouga. Leaving tent life and large animal herding first; setting up in small adobe cabins with some of their animals next; building permanent cement-block homes and abandoning animal husbandry most recently. And yet, other kinds of realities have also existed for members of the sedentarized nomadic population in recent years, forced on them by climate crisis and extreme poverty. Some have gone straight from the tent to the plastic that is often draped over battered tents or cobbled together with other kinds of waste, like different plastics, wood scraps and sheet metal, to build shanties. Nomads sedentarized under precarious conditions like this are called “Kurds” by the local population, and although they too belong to the Aït Khebbach group, “their spatial removal and ignorance of local rules earns them foreign status” (Gélard, 2007, p. 170). Even so, reference to their nomadic past remains very present among the population, and that past is in a way idealized: many inhabitants refer to the nomadic life's freedom or contact with nature, despite the harshness of the conditions they lived under until very recently.

## 6. Political and Environmental Conflicts, Against the Backdrop of the Role Played by the State

The role of the state, both in the colonial era and after independence, has had mighty repercussions on the political dispossession of oases communities, with effects on the environment and mobility alike. One of the key aspects of state intervention is its redefinition of local political limits and redrawing of borders. For example, when the border was established between Morocco and Algeria, it set a definitive boundary for nomadism and split up families and nomadic groups on both sides of the line. Gélard tells how Algeria's independence in the early 1960s and its disputes with the Moroccan state initiated a border transformation that eventually deprived the populations of the Erg Chebbi zone (Merzouga) of their nomadic territories, creating numerous everyday conflicts that live on today (Gélard, 2007, pp. 168-169).

By imposing new forms of administrative organisation and redrawing local maps, the state tends to alter the socio-spatial organization of local communities historically constructed on the basis of ethnic equilibriums and access to natural resources. In the case of Imilchil, conflicts with national authorities have happened again and again. In 1974 Imilchil was actually the epicentre of an armed uprising that attempted to do away with the regime of Hassan II, as told by Mehdi Bennouna (2002) in his book *Héros sans gloire. Échec d'une révolution (1963-1973)*. In this respect, the very fact that the region's capital was moved from Agoudal to Imilchil constituted an attempt to weaken local political power, as well as to introduce new administrative structures that have since dispossessed traditional institutions like the *jemmaa* (community assembly) of its power to take decisions and mediate in local matters like

the management of natural resources (water or grazing land). In fact, the main conflicts at mountain oases revolve around overuse of collective grazing land and violations of ancestral rules on its use (regulated by the institution of the *agdal*<sup>4</sup>) and confrontations with nomadic herders arriving from other regions of the country to compete for increasingly scarce grazing land (Boubrik, 2022). The case of the Merzouga oasis also reveals how the presence of the state clashes with traditional systems for the political management of collective affairs by the local community, which has been stripped of its ability to deal with abusive water use, breaches of irrigation schedules and illegal well drilling.

Environmental conflicts involving the state also appear in other areas, like forestry policy. The state has run reforestation campaigns in the Imilchil area, unsuccessfully because the campaigns are met with mistrust by the local inhabitants, who see such policies as threatening to dispossess them of communal land and restrict grazing (some local informants tell stories of people going out at night to rip up the trees planted by the state during the day).<sup>5</sup> Similarly, the creation of the 49,000-hectare Haut Atlas Oriental National Park in the vicinity of Imilchil has been a source of conflicts between the state and the local community, which defends its ancestral ways of managing and using natural resources.<sup>6</sup>

In Merzouga conflicts have accompanied the introduction of the nationwide Maroc Vert programme, which calls for thousands of palm trees to be planted to combat desertification and climate change. The plan has sometimes come up against resistance from local populations, however, who see in it a loss of their control over land use.<sup>7</sup> Under the political ecology focus, all these examples may be considered ways of politicizing ecosystems (Leff, 2003).

The state has also intervened in other sectors, often accompanied by a discourse in favour of developing apparently “underdeveloped” areas. For example, until the 1980s both Imilchil and Merzouga were isolated, hard-to-reach places where the state had only a small presence. Opening roads for motor vehicles has wrought a fundamental change in terms of the population’s mobility and the arrival of visitors, bringing these oases into better contact with the outside world. The state has promoted the construction of roadways: first dirt roads, which gradually grew in number and were then paved in the 2000s (both the road between Rissani and Merzouga and the road between Aghbala and Imilchil were paved in 2002). By drawing these locations out of their isolation, roads have facilitated emigration and transformed practices like nomadism itself. They enable herders to use large vehicles (lorries and pickup trucks) to carry their livestock to other grazing areas without having to move the entire household, but they also provide a way for police and military forces to arrive quickly at times of political unrest. Furthermore, this growing state intervention has also been accompa-

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4 The *agdal* is the institution that regulates the use of grazing land by setting restrictions and scheduling when grazing is allowed.

5 Conflicts over forestry policies have become widespread in many countries of the Global South. See the case of Vietnam discussed in the article by Bayrak, Nam Tu and Burgers (2013).

6 The issue of the park’s effects on the use of grazing land and other resources is addressed by David Goeury (2014) in his paper “Le parc national contre la démocratie? Du conflit local à la revendication nationale, le cas du Parc National du Haut Atlas Oriental.” Goeury criticizes the fact that the park was created without participation by the local population.

7 Traditionally it has been the local inhabitants of Merzouga who have planted palm trees as a means of claiming ownership of unclaimed land. The state’s action therefore creates a great deal of mistrust.

nied by a fostering of local development organisations involved in implementing state-funded projects. These organisations rival with and question the legitimacy of traditional community institutions and create new forms of political and economic standards and dependence in the local population (Ramou et al., 2022, p. 88).

The factors that have most decidedly transformed daily life and accelerated sedentarization are probably mandatory schooling, which was introduced by the state after independence, and the arrival of electricity. Although mandatory schooling was introduced in 1963, official state schools did not replace Quran schools in places like Imilchil and Merzouga until the 1980s. Electrification came late, too, reaching Imilchil in 2003 and Merzouga in 1998. Mandatory schooling led to the construction of fixed homes and urban development, while the arrival of electricity afforded access to indoor lighting, television, mobile telephones and the Internet, considerably transforming the daily lives of former nomads and accelerating their individualization and acculturation.

## 7. Tourism and Migration as Policy Fields

The mobilities associated with tourism and migration can also be seen within the context of the politicization of environmental problems (Robbins, 2012), with the generation of new interests that redirect the use and exploitation of local resources, thus altering the environment, particularly if we bear in mind that both tourism and migration cannot be considered spontaneous phenomena but are instead linked to specific policies.

The first two hotels in Imilchil and Merzouga (both of which are now gone) were built in the 1970s under a state initiative to make both places tourism destinations, as part of a strategy to create a central administration presence in the territory. Similarly, emigration can also be associated originally with French colonial aspirations followed by the interests of the post-independence Moroccan state, to provide a source of soldiers<sup>8</sup> or labourers for public works in other areas of the country and to help reduce social discontent and control seats of political opposition.

However, the state's initial impetus to promote tourism—as part of a project that endeavoured not only to provide an alternative to nomadism and animal husbandry as a livelihood, but also to water down the strong local sense of identity through tourism—was not backed up by a long-term policy. Consequently, the tourist industry developed under practically no control, increasing the conflicts over resources (land and water use) and the competition between local tourist business owners. For example, the development of tourism in Merzouga has left deep economic impacts due to the wild growth of housing (Dekkari, 2013, p. 40). Mass tourism has also increased the pressure on Merzouga's limited aquifer-based water resources (Rodríguez et al., 2008), while much of the wastewater from hotels and camps is dumped, untreated and uncontrolled, to filter into and pollute the underground water (not to mention solid waste, which is burned or heaped in dumps). Socially and culturally, tourism has become a powerful factor of acculturation and has caused a devaluation of local economic activities

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<sup>8</sup> Many nomads were enlisted in the army to serve in the Sahara, where their knowledge and ability to adapt to the terrain under extreme conditions were useful.

such as livestock raising and handicraft production, which are seen as much less profitable than tourism (Escriche, 2011).

Other authors also focus on the environmental degradation associated with tourism (which has far surpassed the territory's load-bearing capacity), the threat that environmental problems pose to the tourism business itself (Hiri, 2024, p. 92) and the fact that climate change, which causes torrential rainfall with catastrophic effects, has become a constant in mountain and desert alike (Tangermann & Traoré, 2016). For example, Imilchil has seen river flooding due to the destruction of farmland, while Merzouga has had to contend with torrential rain, the worst of which was in 2006, although severe rainfall of varying strength has been recurrent in recent years. In Merzouga torrential rain has silted up plots of oasis farmland, destroyed homes and hotels and taken lives, both among the local population and among tourists, an ongoing threat that is amplified by the fact that many of the city's hotels were built on flood plains.

The other big environmental problem associated with tourism is water scarcity. This is a problem in both mountain and desert oases. In Imilchil the main water source is the snow that accumulates in the mountains in winter and melts into the Assif Melloul or filters into aquifers. In recent years snowfall has been much lighter and more irregular, making it necessary to pipe water in from greater distances and drill deeper wells. In Merzouga the problem is much more serious, because water availability is much more limited, as it depends exclusively on rainfall and aquifer replenishment. At both locations water consumption has risen significantly as a consequence of the population's sedentarization and the lifestyle changes that come with access to drinking water and electricity at home; for instance, some families have washing machines. Most of all, however, water consumption has increased in association with tourism. As tourist accommodations and all kinds of tourist businesses and infrastructure have spread (including swimming pools at most of the desert oasis hotels), the demand for water has spiked. Water is used to scrub facilities, wash tourists' sheets and towels, clean the vehicles tourists ride in or, in the case of the desert, provide therapeutic sand baths (Gagnol, 2016).

Like tourism, the other major form of mobility, emigration, has become stronger and stronger, evolving from temporary emigration to cities to long-term emigration abroad. Skounti (2012) refers to the early emigration of the 1970s as "labour transhumance," since it combined seasons of heavy emigration in spring and summer with a retreat home in autumn and winter, thus enabling people to keep up supplementary local business activities and avoid uprooting. Later, in the 1990s, this kind of mobility faded and was replaced by long-term international emigration, where herding and other ways of earning a livelihood were abandoned, supplanted by remittances and family economies that depended increasingly on funds from abroad (Skounti, 2012, p. 230).

And like tourism, emigration also has its own environmental costs. Firstly, in many cases emigrating means abandoning crops and, in the case of Merzouga, allowing the palm grove to deteriorate. At the same time, emigrants can afford to install pumps to draw water for irrigation—for example, Susan Steinmann (1993, p. 123) tells how at the Todgha oasis it was migrant families who installed the first water pump—driving deeper wells and enabling the introduction of thirstier crops. At the same time, emigrant money has also been used to finance a good number of the tourist accommodations and other tourist businesses that have had such a heavy environmental impact. Furthermore, most families have at least one member who has emigrated to Europe and contributes considerably to household income through

remittances. Such income makes new alternatives possible, like buying additional fodder for livestock or investing in livestock as savings assets (Freier, Finckh & Schneider, 2014).

## 8. Conclusions

Today's context of high-speed climate change highlights the significance of human action in the environmental crisis and brings to light issues of environmental justice and responsibility in the degradation of the environmental conditions needed for a decent life. The cases studied in this article are illustrative of how certain groups (in this case minority ethnic groups) are dispossessed of control over their systems and livelihoods, rendering them even more vulnerable. The penetration of the market economy—and with it wage-based relationships and ways of doing things—plus colonial and post-colonial policies are key factors in the eco-social transformation of these small communities. At the same time, the intensification of the effects of anthropic climate change—rising temperatures, season creep and increasing extreme climate phenomena—endangers the life of fragile ecosystems like oases and hastens the abandonment of nomadism, which has traditionally operated as a way of adapting to environmental constraints. So, the increasingly palpable influence of climate change has had ambivalent effects; and, while it has forced part of the population into immobility through sedentarization under precarious conditions (we might speak of “trapped populations,” to use the term coined by Zickgraf [2021]), it has also pressured another part of the population into emigration because they cannot eke a sufficient living out of the tourist economy.

The cases of the oases of Imilchil and Merzouga are clear examples of the breakdown of systems that have hitherto survived over time thanks to their ability to adapt, which has been increasingly challenged by restrictions that have only become greater with the impact of growing climate change itself. Both cases also bring to light the role of tourism and migration as strategies for adapting to environmental and climate change. The doubts thus raised are numerous: tourism and migration have acted as major economic drivers, but at a high environmental cost that also makes local communities more vulnerable. In all these realms, both the French colonial regime and the post-independent Moroccan state have had a telling influence by favouring certain forms of mobility and immobility at different times, upsetting the balance of local power and undermining the legitimacy of traditional institutions. Sedentarization as encouraged by different policies not only has had major environmental impact, upping the pressure on limited local resources, but also has changed the power relationships between local populations and the state as national authorities have imposed their own rationales and administration systems. In conclusion, the cases of Imilchil and Merzouga show how mobility and immobility processes cannot be extricated from their deep involvement with environmental and political changes, and both cases illustrate the need to tackle mobility and immobility processes from the standpoint of political ecology.

Lastly, while these are highly localized, unique cases, the results of the study can serve as a basis on which to extend the field of comparison to include other oases societies and small rural communities affected by environmental transformations, migration and tourism, thus helping to broaden the range of studies on environmental crisis and mobility with a political ecology focus.

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