

**Tourism and Migration in a Context of Extractivism
and Climate Change. Comparative Analysis of the Cases
of Merzouga (Morocco) and Lompoul (Senegal)**

**Turismo y migraciones en un contexto de extractivismo
y cambio climático. Análisis comparativo de los casos
de Merzouga (Marruecos) y Lompoul (Senegal)**

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RESUMEN

La presencia de diferentes formas de movilidad, como la migración y el turismo, así como la incidencia de las actividades extractivas y el cambio climático en dos poblaciones de Marruecos y Senegal constituyen el objeto principal de este artículo. En este se analizan las múltiples interrelaciones entre esos cuatro elementos a partir de los casos de las localidades de Merzouga y Lompoul, tomando como base el trabajo de campo realizado en ambos lugares mediante una metodología etnográfica. Los dos escenarios estudiados muestran cómo los condicionantes ambientales, y en especial el extractivismo y el cambio climático, pueden influenciar los diferentes tipos de movilidades; pero, también, cómo la movilidad (tanto el turismo como la migración) tiene importantes impactos sobre el medio, que inciden en la transformación de la vida de las comunidades locales.

Palabras clave: 1. turismo, 2. migraciones, 3. extractivismo, 4. cambio climático, 5. medio ambiente.

ABSTRACT

The presence of different forms of mobility, such as migration and tourism, as well as the impact of extractive activities and climate change in two populations in Morocco and Senegal are the main focus of this article. The multiple interrelationships between these four elements from the cases of the localities of Merzouga and Lompoul is analyzed, based on fieldwork carried out in both places using an ethnographic methodology. The two settings studied show how environmental conditions, and especially extractivism and climate change, can influence different types of mobilities; but also, how mobility (both tourism and migration) has significant impacts on the environment that affect the transformation of life in local communities.

Keywords: 1. tourism, 2. migration, 3. extractivism, 4. climate change, 5. environment.

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INTRODUCTION⁴

Both Morocco and Senegal are important destinations for international tourism, at the same time, they are the source of significant emigration.⁵ This double mobility, displacing mostly citizens of the north into the south to enjoy their leisure time, and citizens of the south into the north in search of better living conditions is a reality that has become integrated into the economies and societies of both countries, as well as in many other countries of the global south (Williams & Hall, 2000).

Tourism and migration are produced equally in contexts that also present other phenomena with notable incidence on the environment, such as extractive activities of natural resources (Chagnon et al., 2022) or rising climate change (Organisation Météorologique Mondiale [OMM], 2022).⁶ This interaction between tourism, migration, extractivism and climate change constitutes the main objective of this paper. Starting from two very localized cases, this paper seeks to demonstrate how these four phenomena act in an interconnected manner to condition the development of populations in communities in countries of the south.

In this way, and despite the geographical, social and cultural distance between the two communities studied—Merzouga in Morocco and Lompoul in Senegal—the similarities are numerous, and both cases hold notable parallels. This would suggest that these are not isolated cases of exceptional character, but instead a response to structural reasons related to unequal relationships and dependence between the countries in the global south and global north (Escobar, 2011). The persistence of these inequalities in a postcolonial context becomes illustrated in impacts associated with tourism, migration and extraction of resources, and becomes emphasized by the current incidence of another phenomenon that is equally as unequal as climate change.

As it is understood, climate change, which is generated mostly due to industrial activity in the north countries, also affects south countries, despite barely having contributed to the emissions of greenhouse gases (Roberts, 2001). The cases of Merzouga and Lompoul showcase how the effects of climate change, reinforced by extractive activity and their impacts on the environment, can amplify and/or redirect the impacts of tourism and migrations.

⁴ This investigation uses the framework from the project “*Migración, cambio climático y cooperación al desarrollo. Flujos, impactos y coherencia de políticas en los casos de Marruecos y Senegal en relación con España*” (PID2021-122559NB-I00), financed by the Science and Innovation Ministry of Spain.

⁵ According to the United Nations Department of Economic and Social Affairs (DESA) the number of Moroccan emigrants in 2024 was 3.6 million, while in Senegal’s case emigrants reached 741 400 (Migration data site, 2025). In the case of tourism, UN Tourism stated that 3 722 000 was the number of tourists received by Morocco in 2021 and 1 365 000 in Senegal in 2017 (World Trade Organization, n.d.).

⁶ In particular, different reports have shown the transformations of the weather in the latest decades in Morocco (World Bank, 2021) and Senegal (World Bank, 2011).

In order to analyze how tourism, migration, extractivism and climate change are related to one another in the two chosen cases, this article starts with a first section dedicated to highlighting some of the leading analytical frameworks that serve as theoretical support for this topic. In second place is the explanation for the methodology utilized to obtain the information that serves as basis for the writing of this article, which follows a fundamentally ethnographic approach. Third, a brief contextualization of the places in which this investigation is developed, which also serve as case studies. In fourth place, the most relevant challenges that both of the investigated areas face. In fifth place, the results of the investigative work done are analyzed in a comparative sense. Finally, a series of conclusions and reflections that were generated during the investigation process are presented.

A PROPOSAL FOR ANALYTICAL FRAMEWORK

Tourism and migration are the two main forms of international mobility, which have garnered extensive attention that reflects itself as a vast bibliography related to these concepts. However, in spite of its relevance, the intersection between tourism and migration has received considerably less attention in the academic scope, which reflects a lower and much more recent bibliographic production (Möhring, 2014; Williams & Hall, 2000).

Furthermore, studies that focus on this connection tend to adopt a predominantly eurocentric perspective, focusing on the role of northern tourists as potential migrants or entrepreneurs of the tourism sector (Carson & Carson, 2018; Işık et al., 2019), meanwhile the transforming impact of these fluctuations in southern destinations and their influence on local migratory processes have barely been explored. In this way, many of the works on tourism and migration are centered in the conversion of tourist to migrants, especially tourists from developed countries that travel to other countries with lower levels of development (Gustafson, 2002; Haug et al., 2007), as well as tourism of migrants themselves towards their countries of origin (Williams & Hall, 2000), but they barely mention how tourism can feed emigration or how emigration itself can act as a way to intensify tourism.

The connections between tourism and migration transcend unidirectional scopes, manifesting in multifaceted and complex ways. In one hand, numerous migrants of countries from the global south incorporate into the workforce of the tourism industry in destinations of the global north, at the same time participating in tourist practices in the receiving countries as well as their surroundings, additionally trips returning to their places of origin or other previously unknown regions of the same country with tourist attractions (Adams, 2020; Ali & Holden, 2006). On the other hand, migrants play a dual role as tourism promoters, spreading the characteristics of the country of destination on their place of origin and vice versa. In the same way, their ability to transfer money and specialized knowledge—either back to their native countries or other territories—can contribute to the development of different activities and tourist resources, transforming them in small and medium entrepreneurs (Kenna, 1993).

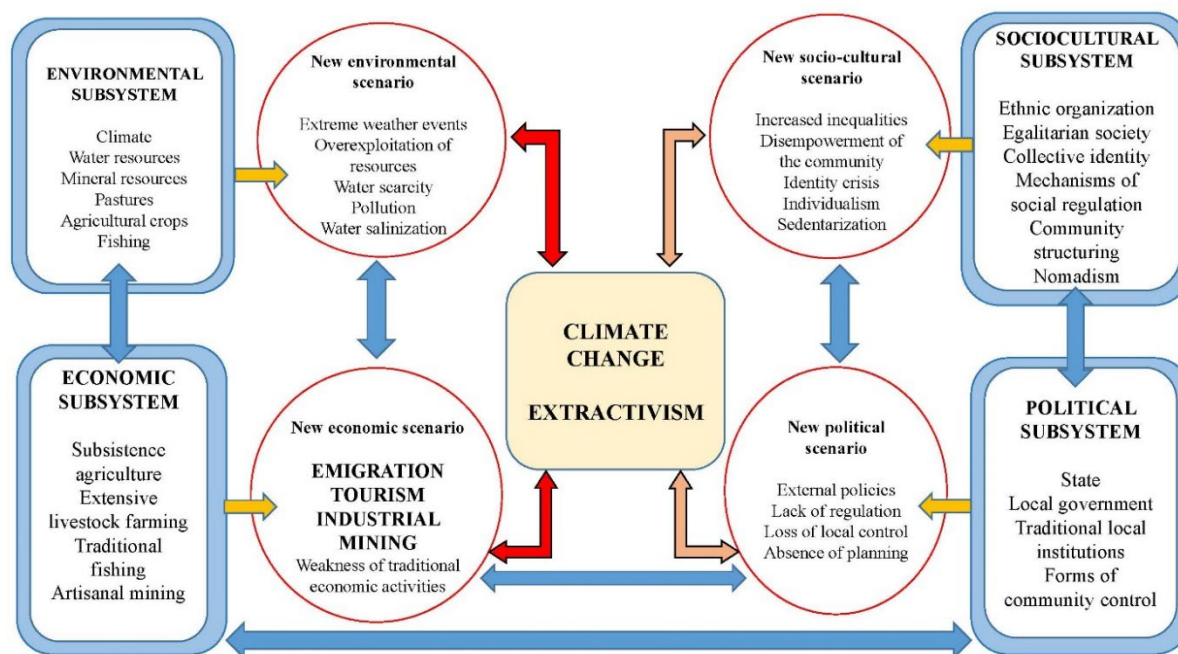
The research field of extractivism has expanded notably in recent years (Chagnon et al., 2022) and, in some cases, it has been connected to its negative impacts on tourist activity (Dunda, 2023), especially in the case of tourism projects boosted by local communities (Orozco, 2022). At the same time, there have been advancements in the consideration of the important extractive component that accompanies tourism as a consumer of local resources (Loperena, 2017), emphasis has been placed on the role of extractivism over mobility and forced displacements of certain populations (Raftopoulos, 2022) and its impact has been highlighted in the context of climate change, which can worsen its effects (Bambrick, 2018).

Lastly, studies about climate change and migrations have reached a notable presence in scientific literature (Borderon et al, 2018; Obokata et al., 2014), as well as studies about climate change and tourism (World Tourism Organization [OMT], 2007; Scott et al., 2012).

However, the comprehension about the interconnection that is produced at a local level between these two phenomena remains very limited. This is why an analytical framework is proposed in which tourism and migration occupy a key position in the reorganization of local life, at the same time as extractivism and climate change continue to rise, incrementing their environmental impacts and altering natural, economic and social equilibriums on which the life of the populations have been organized, as well as affecting tourist activity and migration. From this perspective, the interrelation between these four main variables helps highlight these complexities of movement and lack thereof that are produced in small local communities turned into complex systems, in which a web of not-always-evident bonds operate.

The system that is painted when interrelating these different elements, which is named the socioecological system (see figure 1), also includes different subsystems in which the changes made have generated transformations on the rest. The environmental subsystem shows the impacts of climate change and mining, as well as tourism and, to a lesser extent, migration, in the modifications to the environment. In the economic subsystem the abandonment of traditional economic activities and their substitution for others linked to newer industries of tourism, large scale mining or migration are made visible.

Figure 1. Representation of the Socioecological System



Source: Own elaboration.

The sociocultural subsystem highlights the weakening of the community's identity in favor of higher individualism linked to newer economic activities, which have favored certain types of mobility and limited others, like nomadism; while the political subsystem makes the tensions that are lived between the capability of decision and control of the population itself as well as state politics and foreign interests evident.

On the epistemological level, an approach close to the paradigm of the complexity is adopted (Morin, 2004), understanding these social phenomena to be tightly interconnected and that they must be analyzed this way, paying close attention to its multiple connections and the context in which they are produced. This positioning is reinforced by the emphasis of environmental issues through the social lens and, inversely, according to the ecosocial scope (Krieger, 2001). Both cases discussed allow to identify multiple and complex links, in a framework that acquires a systematic characteristic (von Bertalanffy, 1976/2018), where a web of connected components operate and interact via non-linear relationships (Ritter, 2019).

METHODOLOGY

The work presented here is produced on the framework of a broader investigation project focused on studying the links between migration, climate change and cooperation for the development of Morocco and Senegal, as was described in the introduction. The project, developed between 2022 and 2025, contemplates as main axes the analysis of public politics, consultations with experts on the matter and fieldwork in various areas of both countries.

Specifically, the study of the two communities that compose this article are preceded by the fieldwork in different locations in Morocco and Senegal, which has allowed the construction of a broader perspective that feeds the analysis of the specific cases of Merzouga and Lompoul.

The fieldwork of these two locations took place in January 2024 in Merzouga and in the month of June 2024 in Lompoul. The ethnographic approximation was started as an exploratory measure with the objective of observing the transformations that took place because of the mobility induced by climate change, but it was quickly extended to tourism and extractivism as phenomena with strong incidence on the changes in course. Without a structured hypothesis to begin with—a particular condition of ethnographic investigation (Hammersley & Atkinson, 1994)—a good portion of the fieldwork centered around observation of the social, economic and environmental characteristics of the two areas through contact with the population and the environment, to progressively shift focus towards the big catalysts of change: tourism, migration, extractivism and climate change.

In this manner, the first observations were aided, first, with informal conversations with the local population and, progressively, with formal interviews with local members with a relevant weight inside of the community. This progressive process allowed the broadening of the lens of investigation and to incorporate a series of variables initially unforeseen.

Fieldwork in the Merzouga region started with an initial observation tour through different localities (Hassi Labiad, oasis, the administrative center of Merzouga, the Erg Chebbi dune, the mines of Mfsis, Hamlia, water extraction wells and the nomad population camp, among others) with representatives of local development associations, local tourist agents, farmers, merchants, family members of migrants and a health professional.

In the case of Lompoul a similar strategy was utilized, the initial observations led to in depth interviews with local population, local authorities and workers of the mining company that exploits the immense zirconium deposit. From the interviews that took place (a total of twenty), testimonies of the workers of the Société Grande Côte Opération (GCO)⁷ were collected, as well as from owners, workers of the touristic camps, art merchants of Lompoul, off-road vehicle drivers that transport the curious, visitors and tourists from neighboring towns in the desert, as well as residents of the Lompoul Peulh, Garage Guethie and Thiokmat villages.

In the qualitative investigation there is essential emphasis to the locals, their life experiences and perceptions. Thus, throughout this article there is special protagonism given to their voices and many fragments from the interviews and conversations are reproduced, attempting to ensure the anonymity of the informants.

⁷ GCO is the subsidiary of French group Eramet which extracts zirconium and ilmenite. 90 percent of its control falls on Eramet, and the State's participation is reduced to ten percent.

CONTEXTUALIZATION OF THE MERZOUGA (MOROCCO) AND LOMPOUL (SENEGAL) REGIONS

Merzouga is located in the desert of the Drâa-Tafilalet region, to the southeast of Morocco, inside the Errachidia province and under the jurisdiction of the Et-Taous commune, in proximity to the algerian border. Its saharan climate is characterized by extreme temperatures that exceed 50°C, coupled with its barrenness, evidenced by yearly precipitations inferior to 200 mm (Escriche, 2011). During the last few years, the analysis of climate data has indicated an important transformation of the weather of the region (Sebbar et al., 2017), as well as Morocco as a whole (Driouech et al., 2021), with an increment of the median temperature and higher irregularity in pluviometry and episodes of torrential rain with catastrophic effects (Hammoudy et al., 2024).

The Et-Taous commune, which belongs to the Merzouga locality, had, according to the 2024 census, 9 360 inhabitants (of which, around 1 500 reside in the population nucleus of Merzouga). In this region, whose population belongs for the most part to the Berber ethnic group of the Aït Khebbach, the desert coexists with the oasis that are home to extensive palm groves and are the space for the development of small crops that allow the production of vegetables and cereals (Habran, 2019; Mseffer, 2021). These oases are fragile ecosystems, which have been getting gradually smaller due to climate change, water scarcity and the abandonment of agriculture (Houzir, 2017; Mseffer, 2021).

Merzouga, located at the foot of the Erg Chebbi dune complex—which extends to about 140 km² and a maximum height of 150 m—, holds in its subsoil a very vulnerable aquifer system (Ferrández et al., 2019); with time, this has forced the population to build an infrastructure system that revolves around the collection of water, as well as to manage its use and distribution (Escriche, 2011; Mseffer, 2021).

Traditionally, the inhabitants have lived off agropastoral activities, and cattle raising has been based, to a large extent, in the practice of nomadism. In earlier times, this tribal group would continuously travel, searching for grassy areas and water (Hennani, 2021). However, the authorities of the country have promoted the sedentary lifestyle of the population from the colonization era to present day (Dekkari, 2013; Gagnol & Landel, 2016; Gélard, 2008).

This politically induced process would be reinforced in the last couple of decades because of the impact of the environmental crisis and climate change. In such a way that, currently, nomadism has almost disappeared, and the last remaining families that still practice it suffer from severe situations of poverty. As consequence, the nomadism crisis has pushed many families to emigrate to the cities as well as to foreign countries (Hennani, 2021; Mseffer, 2021), while other older nomadic families remain in the region, but have abandoned cattle raising in favor of tourism (Dekkari, 2013), just as it happens to other nomadic groups in other countries (Aryal et al., 2018).

On the other hand, the Lompoul region is a semiarid space (with rains that barely surpass 400 mm) that is situated on the Atlantic coast, halfway between the Dakar and Saint-Louis cities, and about 50 km to the west of the Kébémér locality, in the Thiès region. During the last couple of years, this zone has been affected by the effects of climate change just like the Senegal conglomerate, with special incidence of stronger winds, rising temperatures, more irregular rainfall and coastal erosion phenomena as a consequence of rising ocean levels (Diallo et al., 2022; Faye et al., 2024).

With the exception of the strip of she-oaks that runs along the coast, vegetation is scarce; it is composed of wild trees, as well as a reforestation that started at the end of the French colonization and renovated in various occasions by the Senegal State with the objective of setting the dunes.

The desert known as “desert of Lompoul” is formed by white and yellow dunes that extend parallel to the coast, with a height of around 30 and 40 m. Its current aspect is the consequence of natural alterations to the ecological equilibriums over time (Ndiaye, 1995), but also due to recent anthropogenic activity, such as the extraction of zirconium and ilmenite, with important perturbances to the ecosystem.⁸

Lompoul Village’s population was on the rise, according to census data in 2023, to 231 people, but the Diokoul Diawrigne commune to which it belongs had a total of 21 288 inhabitants. Most of the people that live in Lompoul belong to the peul ethnicity, traditionally cattle raisers, but here they also dedicate themselves to fishing and tourism. Equally, there is important intensive agricultural activity that has become threatened by the rising climate variability and salinization of the water (Faye et al., 2022). Agriculture is done mostly by the populations of the peul, wolof, and serere ethnicities, the members of this last ethnicity also perform work in transportation with horse-drawn carts that transport the fish from the beach to the refrigerated trucks or on carts that are pushed by hand.

Similar to the Merzouga desert, the reduced Lompoul desert—with an extension of about 18 km²—has become a tourist destination that fundamentally attracts foreign clientele in search of exoticism and adventure.

However, in both cases the “desert” is nothing but a social construct that feeds the tourist image the visitor awaits; because, in reality, and in strict terms, none of the dune formations fits the scientific description of a desert correctly, instead these are sand sediments transported by the wind (which are known as *ergs*). In this process of the construction of a desert, the environment has been adapted with the introduction of constructions that fit the tourists’ preconceived notions or the import of dromedaries to reinforce its exotic image. Both spaces share the presence of mineral extracting activities (especially in the case of Lompoul), as well as important emigrations to the cities and foreign countries (mostly in

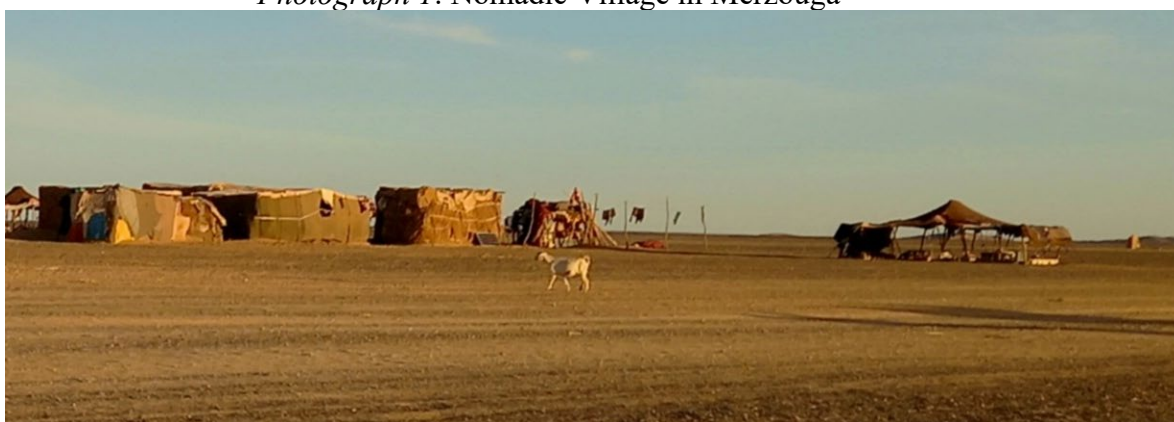
⁸ Faye et al. (2024) counts 19 mining enterprises that operate in the region of Thiès.

Merzouga), while populations from other regions and foreigners arrive to participate in the tourism economy and the exploitation of zirconium and ilmenite.

MERZOUGA, BETWEEN THE NOMADISM CRISIS, TOURISM, AND MIGRATION

Merzouga's society became organized towards the beginning of the 1980s around nomadism and cattle raising (see photograph 1). This lifestyle has gone through a profound crisis in the last decades linked to environmental changes and the drought that has hit the region continuously, similarly to other oasis zones of Morocco (Aït Hamza, 2012).

Photograph 1. Nomadic Village in Merzouga



Source: María Jesús Berlanga Adell, Merzouga, Morocco (2024a).

The result was extreme impoverishment of the few nomadic groups that remain and further complications of their already difficult life conditions:

The life they had [the nomads] was very easy. They had their animals, dromedaries... They were very humble [...]. The kids had old shirts and no pants on [...]. They all slept on the floor, all together, one right beside the other. (E1, personal communication, January, 2024)

In the 80s they began abandoning the nomad lifestyle. They abandoned it because the nomad lifestyle became very difficult. (E2, personal communication, January, 2024)

The nomad lifestyles that survive have also been questioned by a society that becomes more and more sedentary, frequently underrating it and considering it backwards, such as one of the informants narrates: "They used a derogatory word to refer to them [the nomads]. They look at them wrong. For them they were a little..., as if they're dumb, like they don't know" (E1, personal communication, January 2024).

Despite everything, nowadays it is still possible to find nomadic families that resist abandoning their traditional lifestyle, but they now depend of the help of tourists that feel attraction to a lifestyle model they tend to mythologize (photograph 2):

Photograph 2. Nomadic Tent Dedicated to Serving Tourists



Source: María Jesús Berlanga Adell, Merzouga, Morocco (2024b).

The nomads that are there [...] the Bajta family is their name [...]. This family is one of the ones that's still hanging on [...]. They're very poor now. And thanks to tourism otherwise they wouldn't resist. That family is one of the big nomadic families. It was the one that owned the most dromedaries [...]. Now they're really poor, poor nomads. (E3, personal communication, January 2024)

Before tourism, the nomadic population also became sedentary when linked, in some cases, to mining, introduced by French colonizers (Gagnol and Landel, 2016), who remained in Morocco until 1956: "When the French were in Morocco there were lead mines. The activity in Merzouga started with the mines. And little by little, with tourism" (E1, personal communication, January 2024).

This activity began making use of some of the local inhabitants, both men and women. They worked in the lead mines, but also in search of fossils, in dangerous conditions and high-risk situations for their life and health:

My granddad and his generation were all nomads. And then the generation of our parents came, who are now 80 years old, and half of them dedicated themselves to nomadism and the other half remained in the oases or worked in the lead mines. (E2, personal communication, January 2024)

My family used to work in the mines. So did the women: my mom, my aunt, my grandmother... Because this zone is famous for its fossils. (E4, personal communication, January 2024)

The environmental and human health consequences of lead mining in Merzouga have not been analyzed yet, but Lozano and Arango (2024) and Castrillo et al. (2024) explain how this type of mining increases the levels of lead in the ground and the water, leading to neurological, cardiovascular, reproductive and kidney damages, among others, and increasing the levels of cancer among the population as well, even in small concentrations.

Lead, which is highly toxic, contaminates the earth and the water, resources that agriculture and cattle raising depend on, generating an exposure risk to human beings through the food chain. Currently, mining activity has a residual characteristic, despite there being those who still extract lead from abandoned mines, with insecure conditions, or search for fossils and minerals that are sold to tourists.

Once mining had its crisis, after the abandoning of the exploitations at the hand of the French, and now that nomadism stopped accomplishing its economic and social function, emigration on a large scale, first to the cities and then to foreign countries, became the leading resource for the local population, only substituted progressively by tourism. It is an emigration that had started in the colonial era, but that became especially relevant in the context of the droughts that took place in the 1980s (Bossenbroek et al., 2024):

I think that people emigrate due to the same reason. You can't live here if there's no water. (E5, personal communication, January 2024)

After the drought of the 80s [...], there's a lot of people that have left the desert [...] and has settled in the city, where they work [...]. And they have remained there so far. A lot of people have left the palm groves. You see how it's all dried up, they even leave the dates on the palm [...] They've made another life in the city. (E2, personal communication, January 2024)

Currently, emigration is one of the economic pillars of Merzouga, as well as in other oasis areas (Van Praag, 2021). This emigration, limited before to only men, and that is associated to higher vulnerability in local women (women are still subject to heavier mobility restrictions and have less alternative resources at their disposal in comparison to men), has seen changes in the last couple of years, starting a temporary feminine migration mode through which the women of the region emigrate to Spain to work during the strawberry season, after being selected by the National Agency for the Promotion of Employment and Skills (Anapec).

The bank transfers sent by men and women become economic aid for the family members that have remained in the region, and many of the families invest the money of migration into new small local businesses, often related with the tourism industry:

The families invest the money mostly in tourism, or in little corner stores... Or they buy a car to work as taxi drivers... Or they buy a bicycle so they can work [...] But not in cattle, because there's no grass. Sometimes they buy dromedaries, but they're for tourism. (E1, personal communication, January 2024)

This same tourism sector, in which a large portion of the emigration earnings are invested into, has become the great economic engine of the region even over emigration itself, although the last couple of years show signs of exhaustion. Tourism, which also had a presence during colonization, did not start having a large-scale international dimension until

the 1980s, experiencing its biggest growth starting from the year 2000 (Gagnol & Landel, 2016).

With time, tourism has become not only an element of economic transformation, but sociocultural as well. However, tourist activity has come to replace the nomadic lifestyle without the need to abandon certain elements completely (displacement through the region accompanied by tourists or the use of *haimas*⁹ and dromedaries), but in different conditions to which previous generations lived through:

There are no nomads anymore. Because now their lives are easier here with tourism. It's easier to have clothes with tourism [...]. And they have medicine for their children. With tourism everything is easier for them, easier than to remain nomads. (E2, personal communication, January 2024)

Tourism has allowed the improvement of families' economies and to provide new infrastructures and services to the population, but it has also had significant environmental impacts after the constructions of an undetermined number of hotels, cafés and even camps inside of the dune system:

The main change in Merzouga is the increase in shelters [...] The first time I went, I stayed in a shelter called *Café du Sud*. And there were only six shelters around the dunes [...] Now there's around two hundred. (E1, personal communication, January 2024)

The proliferation of tourist accommodations has resulted in strong urbanization of natural spaces, especially around the dunes (Beaumont, 2010; Dekkari, 2013), with an important effect on the environment. Furthermore, the tourist activity brings with it other environmental impacts, such as large water consumption, which worsens the effects of the drought in the region. In fact, the tourists do not only generate a far superior consumption of water to that of the local population, but have also proliferated in the pools inside hotels: "Now the tourists that show up [...] don't concern themselves with the environment" (E5, personal communication, January 2024); "The tourism has been savage, it consumes a lot of water" (E1, personal communication, January 2024); "The problem is that people come to take sand showers and waste a lot of water" (E4, personal communication, January 2024) (photograph 3).

⁹ A type of Mauritanian style camping tent, woven with camel wool, that resists sand storms.

Photograph 3. Water Usage in the Merzouga Oasis



Source: María Jesús Berlanga Adell, Merzouga, Morocco (2024c).

Aside from a decrease in the water table as a consequence from the overexploitation of the aquifer (García et al., 2008), the management of waste (especially plastics) or sewage are some of the main environmental problems generated by tourism itself. Also worth mentioning is the noise pollution caused by the circulation of 4×4 vehicles or *quads* between the dunes, which emit dust and smoke that have negative health effects, as well as their effect on dune morphology itself (Cholez, 2010).

LOMPOUL, BETWEEN THE WAGER OF TOURISM AND A PREDATORY EXTRACTIVISM

The Lompoul region was a marginalized zone of Senegal until the extraction of zirconium began at the hands of foreign companies and the sudden appearance of a local tourism industry. With an economy based only on agriculture for the last couple of decades—especially horticulture—, cattle raising and fishing—with a small fishing port in Lompoul upon sea at its disposal—, the area has seen the appearance since the 1980s of a growing tourism sector.

In forty years, and differently from other arid and semi-arid areas of Sahel that are now victims of armed conflict, this part of Senegal has become a safe zone that tourists from around the world explore. Visitors stay in *haimas* that have running water, electricity, restrooms and beds. The installations are comprised of various camps often established at the foot of dunes or in sand valleys (photograph 4).

Photograph 4. Tourist Camp Between the Lompoul Dunes



Source: Papa Sow, Lompoul, Senegal (2024a).

Since 2003, thanks to the initiative of a handful of double nationality migrant investors, this “desert” has experimented incessant mobility of foreign tourists, especially European, who seek “exceptional” solitary places to spend their vacations. The promoters of this tourism are often foreigners, returning migrants or local businessmen that promote ecotourism with a certain personal commitment, and advocate for the revaluation of the desertification to give new life to these spaces that are considered hostile and forgotten in national development plans. This way, the desert camps in Lompoul have acquired importance as they provide work for the local population, helping fight against poverty and acting as well as a way to adapt against the challenging weather.

Tourist activity in Lompoul began around the end of the 1980s, when small tourist camps in the dune area became visible:

The first time I saw camps in the valleys of sand dunes was towards the end of the 80s, I was little and I was with my father as we grazed our animals at the foot of the dunes. One of the first camps was called “camp of the dunes” and was installed by a French person that came from Saint-Louis. This camp lasted a lot of years before it was dismantled by the Eramet Grand Côte (GCO) company which, alongside the Senegal State, expropriated the place due to mining exploitation. (E6, personal communication, June 2024)

According to testimonies, “camp of the dunes” was followed by a series of other camps that existed up until 2013, when most of them began being dismantled due to mining activity.

One of the last camps that remains between the dunes is the Lompoul Ecolodge. This camp was also founded by a French-Senegalese person from Mbour (city in Senegal with tourist attraction) that also employs local labor from Lompoul natives as well as northern cities (Kebemer, Louga, Saint-Louis).

Testimonies say that most of the investors already had activity in the tourism sector and that they are of foreign origin or former Senegalese migrants that returned to the country and focused on tourism (photograph 5):

Photograph 5. Tourists Riding Dromedaries in the Dunes



Source: Papa Sow, Lompoul, Senegal (2024b).

I think the people that created the camps here already worked in tourism or lived outside of Senegal... Some were guides or had hotels or cooperated with European tourism operators. I don't think they started these activities just because..., they wanted solitary spots and a little far from the noise from the big cities like Mbour, Dakar, and Saint-Louis. (E7, personal communication, June 2024)

However, in parallel to the development of tourist activity, the Senegal State, alongside a French company, have begun exploiting a scarce resource, zirconium sand or zirconium silicate (a heavily disputed rare earth currently). This strategic mineral is utilized in jewelry as a substitute to diamonds, but it is also utilized mainly in nuclear energy, fabrication of glass, ceramics, varnish, tiles and sanitary equipment, dental prosthesis and the automobile industry (brake pads). The exploitation of zirconium has an important impact over the

physical environment, with changes to the biophysical characteristics, mobility and socioeconomic activities, especially tourism, agriculture and cattle farming (photograph 6).

Photograph 6. Extractive Activity in Lompoul



Source: Papa Sow, Lompoul, Senegal (2024c).

Mining has made the local population and tourism entrepreneurs fearful of irreversible environmental changes, such as a destruction of natural landscapes and an acceleration of desertification, as well as a massive and uncontrolled use of water resources:

The GCO has made the Senegal State and local populations believe that dune systems that have been destroyed, which have been around for millions of years, will be biologically “reconstituted.” The population also opposes the mechanical cleaning of the dunes with sieves that destroy the local geomorphology and the different ecosystems of the natural landscapes. (E6, personal communication, June 2024)

Other important population displacements have also been observed due to the extraction of zirconium (around two thousand “relocations” organized under the supervision of the Senegal State), as well as a drastic reduction in traditional economic activities. Extractive activity and tourist activity have also caused local, national and international migration to this area of the country. Migration to Lompoul can be considered a reversible flow, characterized as individual choice based on personal commitments that are often linked to

activities that already take place in other places (such as tourism). These mobile, flexible and low intensity flows can be linked to job searches, the development of artisan objects for sale or the reconversion into new jobs or professions, and are composed of hotel workers, art and general merchants, tourist guides, entrepreneurs and 4×4 vehicle drivers that transport tourists to the “desert.”

Despite a large part of the population being born in the region, many confirm they abandoned their respective towns to work in Lompoul’s tourism. Fishing, agriculture, but also their mining industry. Some of them even come from the big cities like Saint-Louis, Kebemer, Louga, Mbour, or Dakar. Others come from foreign countries or have lived many years outside of Senegal after emigrating to Italy, Spain, France or the United States.

Since the 2000s we’ve had more people born elsewhere than Lompoul natives. Everyone knew each other here... I’m talking about all the families... especially the fulani [peul] that founded this town around the year 1800 according to our ancestors. Now we have wólofs, soninké, sérères and even our other fulani relatives from Guinea... First the immigrants came because of highway projects with the State, then, with the installation of camps, they now work in the tourist industry. Now we have geological engineers and lab technicians that work with GCO... In the fishing industry the lébous that come from Kayar or Guet-Ndar in Saint-Louis. Then there’s the migrants that return and the foreigners of other nationalities that have invested in tourism and horticulture. The serer and fulani that come from the center and southeast of the country are the horticulture laborers. (E8, personal communication, July 2024)

Migrants face progressive social disengagement of sorts from their original surroundings, especially those that work in the tourism sector, and the practice of a new utilitarian commitment that makes use of the opportunities the “desert” of Lompoul provides. The new job market conditions in this part of the country have contributed largely to local, national and international mobility. This fluctuating migration runs the risk of fragmenting and not continuing long-term, as these new migration flows obey the current employment opportunities and the random characteristics of the desert concept, acting as a strategy for situational adaptation (Scheffran et al., 2012).

MERZOUGA AND LOMPOUL THROUGH THE LENS OF COMPARISON

The Merzouga and Lompoul cases present numerous parallelisms. Both zones face important transformations to their traditional life systems, conditions by social, economic, cultural and environmental changes. Because of these new challenges, the alternatives that have gained strength in these last years, such as tourism, migration or extractive activities, become an added challenge with effects that threatened established structure and elevated impacts over the environment.

Merzouga and Lompoul have been, until recently, marginalized areas for the State and business interests. Far from big urban centers and their decisions, their geographic isolations have become amplified largely due to their political isolation. Inhabited by minority ethnic groups that maintain a conflictive relationship or complete lack of recognition by the State, the regions that they occupy have been traditionally perceived as spaces that are “difficult to develop.” However, both Merzouga and Lompoul have recently become convenient economic spaces for economic investment of national capital and, especially, foreign capital. Their arid zone characteristics, that had gifted them the condition of “useless regions,” has transformed, with the discoveries of these areas made by tourism and extractive companies, in its greatest resource.

In the case of tourism, the presence of dunes has brought forth an industry that has had to build the image of a desert to service tourism flow. The “invention” of that desert has been accompanied, both in Merzouga and Lompoul, by the import of all sorts of elements that attempt to emulate the image of a classic desert: tent camps between the dunes, clothing belonging to desert populations like the tuaregs or the dromedaries brought from other places. For example, in Merzouga, dromedaries that were used as a means of transport in the context of nomadism have become a tourist attraction, at the same time a commerce has spawned surrounding these animals to nurture other zones of the country, that also use them for the sake of tourism.

In the case of Lompoul, the dromedary is an exogenous animal that has been recently imported from Mauritania to meet tourist demand. This has resulted in a considerable reconfiguration of the local landscape in service of tourism.

Tourism arrived in Merzouga before it did in Lompoul and its impacts, both in economy as well as the environment, have reached a larger scope. Merzouga’s economy depends heavily on national and international tourism, which became evident during the COVID-19 pandemic and the mobility restrictions (after the pandemic, many tourism businesses did not reopen or did so partially, and the owners consider the search for alternatives that are less dependent of such an uncertain market).

The investments from foreign tourism entrepreneurs are more common in Merzouga, where the size and characteristics of tourist infrastructures (large hotels with all kinds of services) require considerable capital. As such, the tourism model of Lompoul, developed in a smaller scale, could be apparently more sustainable in economic and environmental terms, as well as more inclusive of local lifestyles, but it is also more vulnerable to external factors, such as the interests of foreign mining companies. However, in both Merzouga and Lompoul, the impact of tourism in the environment is very apparent, such as degradation and erosion of dune systems because of construction or the circulation of all kinds of vehicles, the dumping of sewage and waste with barely any control, as well as the construction of illegal water wells.

When talking about the interrelation between tourism and migration, this results much more evident in the case of Merzouga. There, a large part of the tourist infrastructures received financing thanks to the profits of emigration, often as the result of marriage of migrants with foreigners that have once acted as their investors. In Lompoul, these kinds of dynamics are not as common, or are more recent; and, despite tourism being able to feed migration through love-fueled adventures, this phenomenon has not reached the scope that it has in Merzouga.

In Merzouga, contact with tourism has become the driving force of mobility, at the same time allowing many other inhabitants to remain there with the resources that migration brings. This paradoxical relationship between tourism and migration has given Merzouga a stable symbiotic system. In this context, migration would allow for a boost in tourism through the contacts of emigrants in foreign countries and their ability to direct tourism to Merzouga, informally or as small tourism entrepreneurs in the countries where they reside. As such, the relationship between tourism and migration became set, making its substitution for other short-term alternatives difficult as a way of life.

At the same time, both in Merzouga and Lompoul, international emigration is combined with national migration that takes place in both areas in order to work temporarily in tourist businesses or mining (mining especially in Lompoul's case), which introduces a more complex factor in mobility dynamics.

The link between tourism and migration is also evidenced in emigration particularly of young adults in the environment of families dedicated to this activity, both in Merzouga and Lompoul. At the same time, the role acquired by these young adults and their families affects the power dynamics in their communities. In a way that families benefited by tourism and migration not only increase their acquisition power and, occasionally, even political power, but emigrants—especially young adults—acquire a new status because of their experience, skills and contacts accumulated outside.

Regarding extractive activities, these are found in two places, although their modality and scale differ. In Merzouga, mining started during the colonization and saw its decline shortly after the independence up until their closure, which is why their environmental impact has been a lot lower. However, the extraction of minerals has never stopped, even if it is carried out informally, including the extraction of fossils for tourist commerce, but through artisan methods that limit its impact over the environment. On the other hand, in Lompoul, extractive activity has become an authentic ecocide that has transformed the territory and threatens tourism itself as well as fishing carried out by small local entrepreneurs. The industrial extraction of zirconium, that forces the removal of tons of sand and uses millions of liters of water, has an incalculable impact over the environment and the population itself, that has even been displaced to facilitate the extension of the extractive area.

Both Merzouga and Lompoul have been submitted to the effects of climate change in the last handful of years, being especially perceivable in the first case, with extreme temperatures that continue to rise and flash floods that have caused severe material damages and have caused deaths within the local population as well as tourists.

In Merzouga, catastrophic flood events alternate now with long drought periods, which is why the use of subterranean aquifers has become essential, forcing an organized water management system that, occasionally, is not respected by tourism businesses. The presence of the Erg Chebbi dune system has allowed for the accumulation of water in the subsoil, which also keeps it from evaporating, but it also has a concentrating effect on the population and all kinds of surrounding services that contribute to the overexploitation of water resources.

Lompoul benefits from calmer weather due to its closeness with the ocean and the presence of humidity that allows for horticultural crops. Water availability here is higher than in Merzouga, but the extractive activities of zirconium and ilmenite have affected it progressively, as they employ a disproportionate amount of water to separate the mineral from the sand.

CONCLUSION

The relation between tourism, migration, extractivism and climate change have barely been studied, or have been studied partially, without integrating or connecting the different elements and their impacts. The Merzouga and Lompoul cases constitute a field that leans towards the analysis of its interrelations between the four phenomena, and can result exemplifying for the approach of other cases in other regions of the world.

The implications and interrelations of tourism, migrations, extractivism and climate change are multiple and not always evident, keeping in many cases a paradoxical¹⁰ characteristic or, even, apparently contradictory.

The links between tourism and migration deserve a chapter of their own, and constitute a central axis in the operated transformations of both of the studied communities. However, those transformations would not be comprehensible without accounting for other types of changes, such as the transition from nomadism to sedentarism—especially in Merzouga's case—or the substitution of traditionally agricultural, cattle raising and fishing activities in favor of industrial activities such as mining—particularly in Lompoul's case—.

The other axis, no less important, is the link between extractivism and climate change. Here, the links are numerous as well, and go from the negative incidence that extractivism can have over tourism, the incidence that climate change can have as an inductor, directly or

¹⁰ Paradoxical, on the Eramet web page reads that the purpose of the business is to “become a reference for the responsible transformation of the Earth's mineral resources for ‘living well’ together.” (Eramet, n.d., first paragraph) and alludes to the sustainability of its activities.

indirectly, in migrations. Furthermore, extractivism on a large scale can amplify the effects of climate change, contributing to the degradation of the environment and overexploitation, not only of mineral resources, but water as well, also leading to its contamination for human, agricultural and cattle usage.

Merzouga and Lompoul show equally how complexity reaches the interior of seemingly virtuous circles, like the one established by tourism and migrations, in such a way that the development of logical differences surrounding these can become the source of tension and conflict. For example, tourism can contribute to the revaluation of cultural heritage as a local attraction (architecture based in traditional models and techniques or clothing that can establish ethnical differences); on the other hand, migration tends to promote a modernizing effect that devalues that same heritage (new types of urbanized constructions or the adoption of western clothing).

It is worth asking what the role of the State is when it comes to ensuring a development model that is sustainable and egalitarian, and the responsibility of their presences or absences in guaranteeing the well-being of vulnerable and high-risk populations; but also ask about the responsibility of the global north in exploiting natural and human resources in the global south, be it through the mining industry, tourism industry or migration industry, as well as the limited capabilities of the local communities to resist or generate viable alternatives, especially in a climate crisis context.

Translation: Paul Enrique Esquivel García

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