The Great Catchment of Souss-Massa Wadi (Morocco): Relationship Between Protected Areas and Ecotourism

H. Aboutayeb, M. Beraaouz, and A. Ezaidi

Abstract This study focuses on protected areas in the great catchment of Souss-Massa wadi, more specifically in the Argan Biosphere Reserve (ARB).

This region has exceptional biogeographical and sociocultural resources that could help this area to become a sustainable tourism destination.

The investigation specializes on the ecotourism side of the catchment of Souss-Massa through the analysis of its natural amenities especially the ones that are linked with biodiversity. This will position ecotourism as the basis of a development model. There are several opportunities in this region as far as biodiversity is concerned but they need to be valorized. Thus, priority ecotourism areas were identified and some recommendations were made along with strategic planning guidelines for tourism in this region. Such guidelines show the need for strict environmental protection schemes while offering good standards of living for the population and a satisfaction for the tourists.

Keywords Argan Biosphere Reserve, Biodiversity, Conservation, Ecotourism, Protected area

Contents

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Abbreviations

ARB	Argan Biosphere Reserve
BEIS	Biological and ecological interest sites
SMNP	Souss-Massa National Park
TONP	Toubkal National Park
UNESCO	United Nations Educational Scientific and Cultural Organization

1 Introduction

Nature includes both biotic and abiotic components which together form natural diversity on all geographical levels, from local, regional, and continental scales. As established by the World Heritage Convention ([1], article 2), "natural features consisting of physical and biological formations or groups of such formations which are of outstanding universal value from an aesthetic or scientific point of view," as well as "natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty" should be considered "natural heritage," and therefore need to be preserved as part of the world heritage of mankind.

Bioconservation requires inventory and evaluation procedures which play a decisive role in the implementation of any subsequent conservation. Bioconservation strategies must strengthen the complexity of the field, with regard to both scale and scientific requirements [2].

Ecotourism, when properly practiced, is the prime economic sector of sustainable development [3].

Given the incredible cultural and natural potential of the Souss-Massa region, the tourism sector and more especially ecotourism represents one of the main supports of its economy.

This contribution focuses on the biodiversity of the great catchment of the Souss-Massa wadi. It will start with the inventory and description of biological and ecological interest sites (BEIS) (biotopes), the natural parks (SMNP), the endemic or rare flora and fauna, and an overview of the heritage. It also focuses on the sustainability of ecotourism, but more specifically on the ability of the system to reach its objectives, particularly those related to the conservation of biodiversity and natural environments. Several questions arise from these objectives:

- What are the protected areas of the great catchment Souss-Massa?
- What is the place of ecotourism in these protected areas?
- What are the ecotourism territories that should be included in this framework?
- What are the educational activities, programs, and infrastructure established for the use of local populations, the tour guides, and tourists in the ecotourism framework?
- What measures should be taken in the framework of bioconservation?

The analysis of these questions is designed to produce recommendations which will be used eventually to the improvement of the management and planning of ecotourism projects.

The study of the relationship between ecotourism, local communities, and protected area is therefore crucial in order to assess the level and quality of ecotourism offered in a given area.

2 Presentation of the Study Region

The large catchment Souss-Massa is located between Agadir and Taliouine (Fig. 1) and covers an area of approximately 27,880 km^2 including 25% in lowland areas and 75% in the mountains. Up north, it includes the southern slopes of the western High Atlas, whereas in the south, the area also covers the Western Anti-Atlas foothills where the crystalline Precambrian is shown in the form of many slots. On the eastern side, the Siroua mountain range takes the form of a bulge in Precambrian crystalline coated volcanoes Plio-Quaternary strata.

The Souss-Massa basin is drained by two main wadis:

– The Souss wadi, with its tributaries (Fig. 1), constitutes the main river of the region. Coming from Mokhtar Soussi and Aoulouz dams, it leads to the Aoulouz gorges dam and through the Souss valley from the East to the West on a distance of 185 km before going to the Atlantic Ocean.
– The Massa wadi, located in the South, at 70 km from Agadir city, drains the waters of the northern side of the western Anti-Atlas foothills and constitutes the only perennial flow of fresh waters to the ocean in the south of the Souss. Its journey is cashed and forms a narrow valley on a distance of 36 km before going to the Atlantic Ocean. The Massa wadi flow rate is regularized by the dam of Youssef Ben Tachfine.

Agriculture is the main economic activity of the region. The potential irrigable land has a size of 250,000 ha. The irrigated area, located mainly in the Souss basin, extends on 134,300 ha, of which nearly 60% is irrigated using modern ways. In terms of production, the truck??? farming occupies 34% of the area. The main productions are: citrus fruits 25%, cereals 10%, and livestock 28%.

Tourism is the second economic sector of the region. With a capacity of 26,400 beds, the region has nearly 30% of the national accommodation capacity.

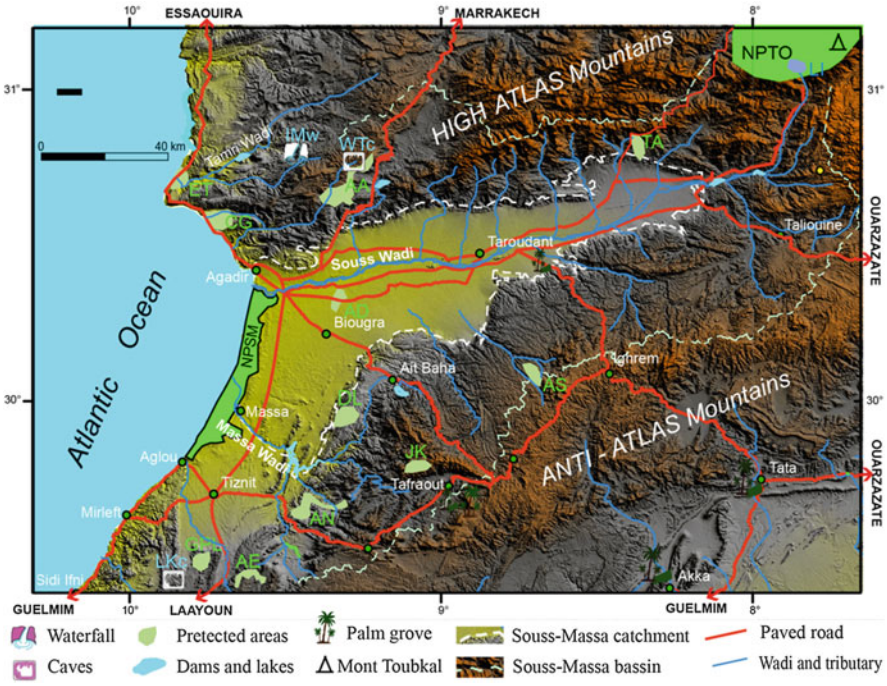

Fig. 1 Map of protected areas in the catchment of Souss-Massa wadi. *SMNP* Souss-Massa National Park, *TONP* Toubkal National Park. Biological and Ecological Interest Sites (BEIS) (CP: Cap Ghir, TM: Tamri, AD: Adnine, IL: Ifni Lake, AT: Assif N'Tifnaute, AA: Ain Asmama, TF: Tafenoulte, JL: Tbel Lkest, AN: Anzi, and AE: Ait Er-Kha). LKc: Lakhsass cave; WTc: Win Timdouine cave; IMw: Imouzzer waterfall

This region is rich in natural heritage as well as biodiversity and geodiversity, which gives it an indisputable ecotourism and geotourism vocation.

3 Regional Biodiversity

The Souss-Massa catchment is part of the Argan Biosphere Reserve (ARB). In its Atlantic part, it is located in the Souss-Massa National Park, while the eastern part includes the western boundary of Mount Toubkal National Park (TONP). The area is also well-provided with protected biological sites. The main sights are the biosphere reserve core areas that benefit from long-term protection for both biodiversity and development promotion.

3.1 The Natural Parks

3.1.1 Souss-Massa National Park

The Souss-Massa National Park (SMNP) is located at a few kilometers from Agadir on the coastline of the Chtouka-Ait Baha and Tiznit Provinces (Fig. 1). It was created in 1991 and extends over an area of 33,800 ha, from the Oued Souss mouth to Aglou in the form of a coastal strip of 65 km long and with an average of 5 km width.

The SMNP is equipped with a strategy for the organization and the rationalization of activities in order to better meet the requirements of ecotourism promotion, the local population development, and natural resources preservation. It contains a wild population of bald ibis that is unique in the world. It is also possible to observe all reintroduced species (Fig. 2) to the park: *Addax nasomaculatus*, *Oryx dammah*, *Gazella mhorr*, *Gazella dorcas*, and red necked Ostrich.

The Massa wadi mouth has the richest and most diversified wildlife of the whole park. The most remarkable species are: the wild boar, the jackal, the fox, the Genetta, the mongoose, the African wildcat, and the hare as well as reptiles, amphibians, fishes, and butterflies. It is also a site of great importance for water birds. It regularly welcomes thousands of individuals and a large number of species that overwinter to rest or reproduce.

The park is home to very diverse and endemic biotopes. The procession plant is marked by a coastal steppe made of euphorbia, dune vegetation, and aquatic vegetation on the shores of the Massa wadi.

Many tourists visit this natural park for ecotourism, discovery, and leisure. These visits are spread in a balanced way in the backcountry of Agadir, while promoting the richness of the park fauna and flora. The 30 km tour shows a great amount of bioecological elements, animal reserves, home to some species of Saharan wildlife in acclimatization, and endangered bird species (the bald ibis), that can be observed between the villages of Tifnit and Sidi R'bat.

This natural park represents a management tool for the preservation of natural resources and the encouragement of ecotourism.

3.1.2 Toubkal National Park

The western part of the national park is located 175 km from Agadir city. The park extends over the central part of the High Atlas mountains, between three valleys: N'Fiss in the West, Ourika in the East, and Tifnout in the South. It is the first national park in Morocco, established in 1942. It presents a varied relief of 1,200–4,167 m of altitude (the highest summit of North Africa is mount Toubkal), plains, Ifni Lake, deep gorges, granitic landscapes, and springs.

Fig. 2 Examples of endemic mammals and birds of the protected areas in the Souss-Massa great catchment

The observable wildlife (Fig. 2) while hiking is the *Gazella cuvieri*, *Ammotragus lervia*, *the* caracal, and numerous species of bird of prey such as the royal eagle and booted eagle, the Bonelli's eagle, and the short-toed snake eagle.

In this park, flora is also diverse with stands of holm oak and thuya: Phoenicean juniper, walnut, thorny xerophytes, *Juniperus thurifera*, and endemic plant.

The cultural heritage, natural picturesque landscapes, green valleys (such as Tifnout), very rich flora and fauna, as well as a high mountain lake (Ifni Lake) give a great ecotourism potential to the TONP.

Recently, the promotion of the park was organized in a different way, as being a tourist destination for its several attractions and not only the Toubkal summit. More and more Moroccan tourists and foreigners come to the Ifni Lake and the Tifnout Valley.

Tourists awareness and information along with local guides training are essential to protect these very sensitive and fragile natural spaces.

3.2 Biological and Ecological Interest Sites

For the sake of its conservation and value, a number of biological and ecological interest sites (BEIS) were identified at the large Souss-Massa watershed. The BEIS show a strong index of high biodiversity and a remarkable ecosystem, with endemic species and/or rare or endangered ones. In the study region, there are a number of BEIS in the littoral as well as in the plains and on mountain slopes (Fig. 1).

3.2.1 The BEIS of the Coastline and Plains

On those areas the main BEIS are:

Cape Ghir It is located 40 km to the north of Agadir. The site belongs to the western High Atlas. The land is limestone from the Jurassic period, and sometimes caves. The coast is rocky, with a sandy beach.

Vegetation includes argan trees and euphorbia (*Euphorbia beaumierana* and *Euphorbia regis-jubae*). This area is unique because the argan tree reaches the seashore. Also, near the coast marine pelagic mammals including killer whales can be observed.

The site is the northern boundary, along the coast for the species *Bufo brongersmai*, an endemic toad from Morocco. The main birds are passerines (Tchagra, Gobemouche gray, and Warbler Orpheus).

It is possible to observe the passage of migratory birds on the coast.

Tamri Wadi Mouth This BEIS occupies the coastal cliffs (30–50 m). The ecosystem is made of sand dunes, on both sides of the Tamri wadi mouth. This wadi

runs throughout the year, with a terminal delta? occupying half of the downstream watercourse.

Many bald Ibis can be observed in this site as well as large flocks of gulls and Terns (Audouin's Gull). We can also observe the Falcon Peregrine and the Falcon Kestrel.

In addition, many other marine birds congregate on the beach at dawn. The Cormoran posh (subsp. *riggenbachi*), endemic to Morocco's Atlantic coast can also be observed.

Since 1990, couples of unicolor Martinet species which used to be endemic to the Canary Islands and Madeira have been implanted in this site.

In addition to five endemic species of Moroccan amphibians and reptiles, this site constitutes the northern limit of distribution of a pre-Saharan endemic species of Morocco (*Acanthodactylus busacki*).

Admine Forest This BEIS occupies 350 ha and is located in the province of Inezgane Ait Melloul, in the Admine forest. It is marked by plains where Argan trees are very anthropized. About 20 species of mammals have been identified, 50 species for the avifauna, and 25 for the herpetofauna. It constitutes one of the privileged places for relaxation of the local population in the spring. This area has a full argan protection, which should ensure a reserve and help in the replenishment of deteriorated areas.

3.2.2 The Mountain BEIS

These BEIS are present in the High Atlas and on the Anti-Atlas foothills.

The Western High Atlas constitutes a privileged place for the practice of ecotourism activities. The BEIS of the Atlas are:

Ifni Lake It's a natural lake with a depth of 65 m and a size of 35 ha. Its location at the bottom of a "valley" gives it its value and beauty. It's surrounded by arid mountains, and very steep slopes. The cirque glacier which is the origin of this lake is a hundred meters high.

The green color that sometimes appears on the lake's surface is linked to the abundance of an alga (*Cyanophyceae*).

The lake is poor in fauna: a species of culturing??, a species of Copopoda and form quite special of *Salmo trutta macrostigma* (probably an ecotype). No water birds can be found on the lake.

Tifnoute wadi It is the main tributary of the Souss wadi, although in offseason a very low quantity of its waters arrives to the Souss wadi. It takes its origins in the southern flank of the Jbel Toubkal where two large tributaries feed: assif N'Izli from a resurgence in the south of the lake of Ifni and Assif N'Wakten, the valley of the Tifnoute is about thirty kilometers further downstream.

The flora is relatively varied with a dozen of biogeographically interesting species: *Dactylorhiza elata*, *Juncus fontanesii*, *Juncus pygmaeus*, *Lolium perenne*, *Medicago sativa*, *Paspalum paspaloides*, *Persicaria lapathifolia*, *Persicaria salicifolia*, *Ranunculus trichophyllus*, *Sphenopus divaricatus*, and *Trifolium michelianum*.

The invertebrate fauna is also varied. The fish population is composed mainly of barbels and introduced trout, but it is necessary to point out the presence of Cincle plongeur, and the Bergeronnette creeks.

Ain Asmama This SBEI is situated in the commune of Tiqqi, in the province of Agadir on a surface area of 23.5 ha [4]. It is located on bottom of the great cliff of the valley of the Argana. Biodiversity is very important. The main tree species of the area are the argan, the green oak, western red cedar juniper, the pistachio, and the acacia. There are many rare plants and the rate of endemism is high enough. It also consists of 25 species of mammals, 70 species of birds, and 20 species of reptiles. It's a limestone plateau of Jurassic age, based on clays sandstone of Permian and Triassic appearing below the cliffs overlooking the valley of the Argana. Its waterfalls are similar to the ones at Imouzzer Ida Outanane and Tamaroute, its surroundings beautiful landscapes, as well as the big dam of Abdelmoumen, constitute a highly attractive site for the tourists.

Tafingoult It is located in the South of the High Atlas, in the province of Taroudant. The site represents a reserve of 400 ha. The vegetation is composed of the Arganeraie, tetraclinaie, and oak woodland green. Thirteen species of mammals among which are: Shrew Murette, *Atlantoxerus getulus*, Hystrix, Genetta, ichneumon mongoose, gloved cat, lynx caracal, and Cuvier's Gazella. There are also 50 species of birds and 20 species of reptiles.

In the north slope of the western Anti-Atlas, the main SBEI are:

Jbel Lkest This SBEI is located in the province of Tiznit and covers an area of 1,300 ha. It represents a siliceous mountain of the Anti-Atlas foothills and is known for its pink granitic rocks. The altitude in the SBEI varies from 1,600 to 2,258 m. Vegetation includes argan trees, western red cedar, green oaks, pistachios of the Atlas, carob trees, and acacias gummiferes. In regards to wildlife, there are a dozen species of mammals classed as rare or threatened with extinction including more than 27 herds of gazelles, wild boar, a rich and varied herpetofauna, and 8 endemic species. It is also an area recognized internationally for its richness in butterflies. Fifty-five species of birds nest here. The mountain of Jbel Lkest has an international reputation among the followers of nature tourism and hiking.

Anzi It is located in the province of Tiznit on an area of 475 ha. It is formed by the plates of the western Anti-Atlas. The vegetation (Fig. 2) consists of argan trees, carob trees, holm oaks, Draco trees, and Sage Thrasher. In addition, some 60 species of birds nest in the sector. There are also a few hyenas and Gazella of Cuvier.

Ait Er-Kha It is located in the rural commune of Ait Er-Rkha on an area of 4,000 ha. The ecosystem here is well preserved. The plant species are composed mainly of argan trees and cedar. The fauna consist of gazelles, wild boar, and reptiles.

3.3 The Argan Biosphere Reserve

This reserve includes all protected areas described above. It was created in 1998 and is designed around an endemic tree species of Morocco that is the *Argania spinosa* [5, 6].

With 830,000 ha and approximately 20 million trees, the Arganeraie constitutes the last bulwark face to the advancement of the Sahara desert. It constitutes an ecosystem singular by its dimensions ecogeographic and socioeconomic [7]. It occupies the Atlantic coastline from the north of Essaouira to the south of Tiznit, on a continental depth reaching hundred kilometers, and on altitudes up to 1,500 m [8]. The largest stands of argan forest cover the southern slopes of the High Atlas Mountains and northern reaches of the Anti-Atlas foothills, that is to say a large part of the basin of Souss-Massa.

The ARB covers both the plains and plateaux (Souss, Massa, and Tiznit) and surrounding mountains (western High Atlas to the north and western Anti-Atlas foothills in the south), at altitudes up to a maximum of 2,000 m.

The creation of the ARB is justified by the fact that the forest of argan provides multiple uses for the population (argan oil, ecotourism, and products of terroir) likely to contribute effectively to the socioeconomic development of the region of the South West of Morocco.

The mammals that may be encountered in this reserve are:

- The species well represented are *Ammotragus lervia*, *Gazella cuvieri*, and *Gazella dorcas*.
- The species moderately represented are genus *Lepus capensis*, *Hystrix cristata*, *Canis aureus*, *Vulpes rueppellii*, *Felis silvestris*, *Genetta genetta*, *Herpestes ichneumon*, and *Lutra lutra*.
- The species minimally represented are *Leptailurus serval*, *Mustela vulgaris*, *Acinonyx jubatus*, *Felis margarita*, *Caracal caracal*, *Ictonyx libyca*, *Mellivora capensis*, and *Gazella dama*.

The flora is very diverse and rich in endemic and rare species [9–12]. In the coastal part grows [7] crassulescents elements and often leafless (*Euphorbia officinarum* ssp. *echinus*, *Euphorbia obtusifolia* ssp. *regis-jubae*, *Euphorbia beaumierana*, *Warionia saharae*, *Senecio anteuphorbium*, *Caralluma burchardii* var. *maura*, *Caralluma commutata*, *Aeonium arboreum*, etc.) and endemic plants (*Asparagus pastorianus*, *Helianthemum canariense*, *Bupleurum canescens*, *Artemisia canariensis*, *Sonchus pinnatifidus*, *Thymus broussonetii* var. *hannoni*, etc.)

Many endemic characterize the region as: *Periploca M. laevigata* subsp. *angustifolia*, *Genista ferox* subsp. *Sutherlandia microphylla*, *Bupleurum dumosum*, *Hesperolaburnum platycarpum*, *Lavandula maroccana*, *Satureja macrosiphon*, *Sideritis cossoniana*, *Thymus leptobotrys*, *Chamaecytisus albidus*, *Satureja arganietorum*, etc.

The species of tropical strain among the most rare of the North African flora are: *Chloris gayana*, *Kalanchoe faustii*, *Commelina rupicola*, *Leptochloa ginae*, *Enteropogon rupestris*, *Heteropogon contortus*, and *Dichanthium ischaemum*.

Very locally, it is found that the argan cohabited with populations of lone rider (*Dracaena draco* subsp. *ajgal*) at the level of the Jbel Emzi (at the Anzi SBEI).

Very locally, we find that the argan tree cohabits with populations of dragon tree (*Dracaena draco* ssp. *ajgal*) at the Jebel Emzi in the Anzi SIBE [13].

The argan tree *Euphorbia echinus* is the best represented Training (borders Kerdous plateaus, massive Lakhsass, and Ifni). It is in the mountain of Ifni that training is the most original with the presence of *Euphorbia* [14].

The vegetation types also contains many elements halophiles (saline soils), often endemic (*Suaeda ifniensis*, *Salsola longifolia*, *Traganum moquinii*, *Asparagus pastorianus*, *Artemisia reptans*, etc.) and the cliffs are rare species (*Hibiscus micranthus*, for example).

The vegetation types of cedar (*Tetraclinis articulata*) and *Euphorbia echinus* are presented in Idaou Tanae and Bou Izakarn.

Some plants in this pre-Saharan region are toxic including the Thistle glue (*Atractylis gummijëra*), the Harmel (*Peganum harmala*), the apple of Sodom (*Calotropis procera*), the desert melon (*Citrullus colocynthis*), etc.

The slopes of the Souss-Massa basin are characterized by several spontaneous aromatic and medicinal plants [15] such as rosemary (*Rosmarinus officinalis*), sagebrush (*Artemisia tridentata*), thyme (*Thymus vulgaris*), wild chamomile, carob (*Jacaranda procera*), oregano (*Origanum vulgare*), mastic (*Pistacia lentiscus*), lavender (*Lavandula dentata*), myrtle (*Myrica cerifera*), etc. (Fig. 3).

4 Ecotourism and Biodiversity Conservation

4.1 Ecotourism Concepts

Since the creation of alternative forms of tourism, among which ecotourism, it became obvious that mass tourism has been perceived in a negative way. One of the main reasons is that it generates a significant number of negative impacts especially at the level of natural protected areas. Therefore, ecotourism was created largely because of the growing dissatisfaction toward mass tourism, the proliferation of ideas concerning the conservation of biodiversity, and the increasing demand of tourists wanting to visit protected areas [16].

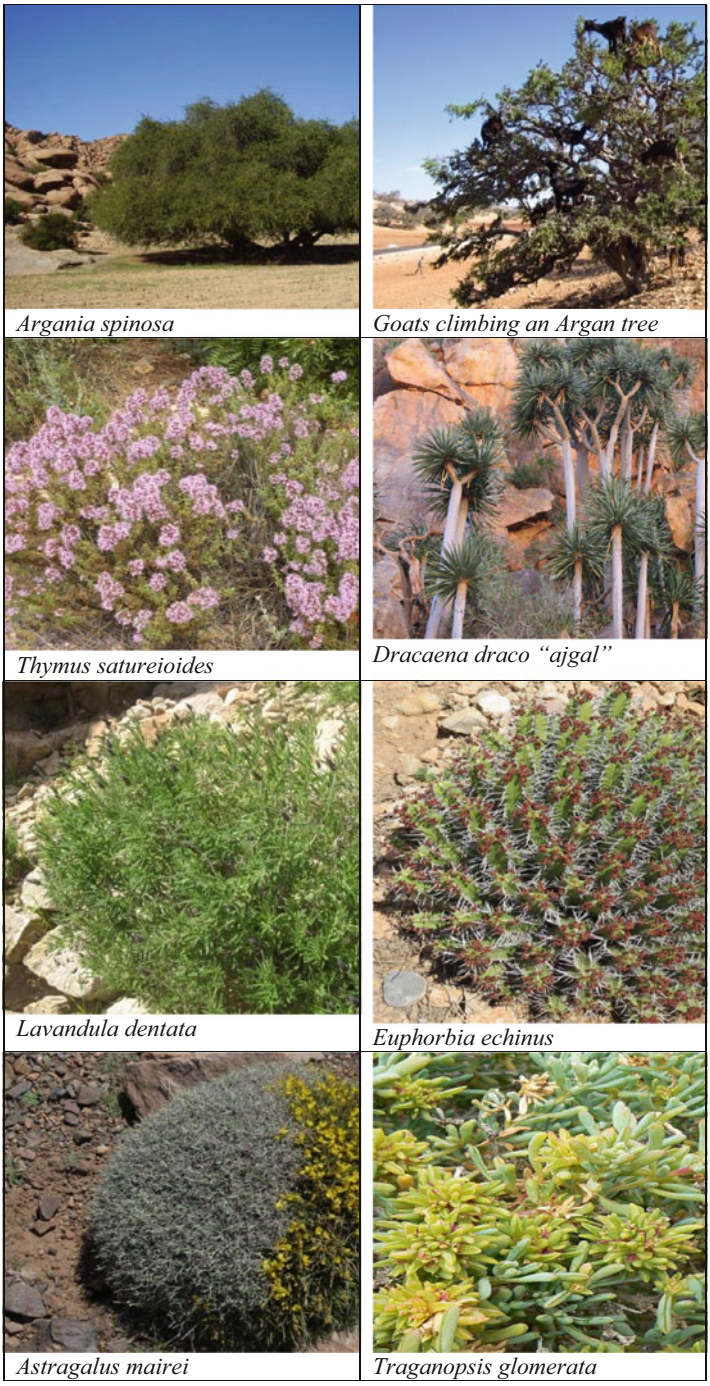

Fig. 3 Examples of flora of the Souss-Massa great catchment marked by a large variety of species

Ecotourism is often associated with the designations of "responsible" or "sustainable" tourism and linked with "conservation" and "low impact." Tourism industry frequently links it with nature tourism or adventure [17]. However, with the prefix "eco" standing for ecology there is a special connection between ecotourism and natural unaltered environments [18]. Currently, there is a consensus to say that ecotourism is part of a broader category, represented by nature tourism [19].

There is still no standard definition of ecotourism to which reference can be made [18].

According to Blamey [16], ecotourism activities should therefore be conducted in natural environment, should contribute to cultural and environmental education toward tourists and local communities, support the conservation of the environment, improve the well-being of local communities through economic benefits in a sustainable development perspective, and should operate on a small scale in order to strengthen the empowerment and participation of local communities.

It has been shown that ecotourism preserves threatened biodiversity and enhances local economies in remote regions [20].

In the ARB, ecotourism should promote the creation of new jobs in rural areas and assist the development of rural infrastructure, which will contribute to the economic development of these regions and reduce the rural exodus [21, 22].

Often, the local populations do not receive much benefits from tourism because of the leakages as the profit remains in the tourists' countries of origin or in the hands of national urban entrepreneurs. In the great Souss-Massa watershed, tourism benefits are distributed unevenly and are concentrated in the two crowded, Agadir and Taroudant.

4.2 Biodiversity Conservation

Biodiversity and ecosystem services are both important management and conservation targets.

On the Earth, the percentage of the land area under some form of legal protection has risen sharply from <4% in 1985 to nearly 15.4% by 2014 [23].

While protected areas can protect vegetation and minimize land-use pressures after establishment [24], coverage is still inadequate because many endemic and threatened species are found entirely outside the global protected-area network [25]. Furthermore, many protected areas – especially in the tropics – are failing to fully protect their biodiversity [26].

The biological heritage of the catchment area of Souss-Massa is remarkable because of its great diversity, including many rare and endemic species. This important reserve of biodiversity can be used for ecotourism while preserving it.

The establishment of regulated spaces (natural reserves, national parks, and BEIS) faces economic land exploitation in an ever increasing way. The establishment of protected areas (flora and fauna) allows the conservation of certain

threatened animal species, provides the foundation for the development of ecotourism, and also contributes to lower rural flight??.

The concept of protected areas is useful in case of rapid loss of wildlife habitat, but it does nothing to resolve the social and economic dimensions of fundamental threats to biodiversity [27]. One of the challenges encountered by conservation specialists is the implantation of strategies to protect the natural environments in the regions dominated by poverty and characterized by a strong biological richness [28].

Ecotourism can have negative consequences for the areas too, and in particular on the environment and the socioeconomic situation. The arrival of tourists without any structure or management can play a part in the degradation of the environment and ecosystems [29].

Landfill sites are found in the vicinity of agglomerations, and especially in the edges of the roads leading to the protected areas. Tourism is also with waste management even if the population itself contributes to increase the quantity of waste and plastic bags. To reduce or even eliminate the waste in these protected areas, the systematic collection of waste and the development of landfills and regulatory infrastructure for waste incineration by rural towns must be organized. In addition, it is necessary to organize awareness campaigns for local people, with guides and tourists for managing more eco-friendly waste.

One of the most positive aspects of ecotourism may be that it is considered, even by the local and indigenous communities, as a potential strategy for biodiversity and natural environment conservation [30].

Ecotourism contributes to strengthen the conservation of a protected area by generating revenues. The income is then reinvested in the strengthening of the conservation strategy of the region [17]. These economic benefits have also aim to prevent the tensions which have often taken place in the past and which have had the effect of disrupting the experience of tourists, and the perception of tourism by local communities. However, the improvement of the well-being of communities is closely linked with the quality of the ecotourism experience offered to tourists.

The teaching materials on the protected areas should be implemented in the Souss-Massa great catchment such as guides, brochures, interpretation boards, exhibitions, museums, websites, and digital guides.

4.3 The Ecotourism Territories

In order to ensure an ecotourism development integrated in the studied region, it is necessary to put in place a regional action plan that integrates all the stakeholders on a multisectoral logic. This approach will encourage local parties to act in consultation and in solidarity in order to enhance the whole of local tourism resources. This vision of integration is even more at the desired level of ecotourism.

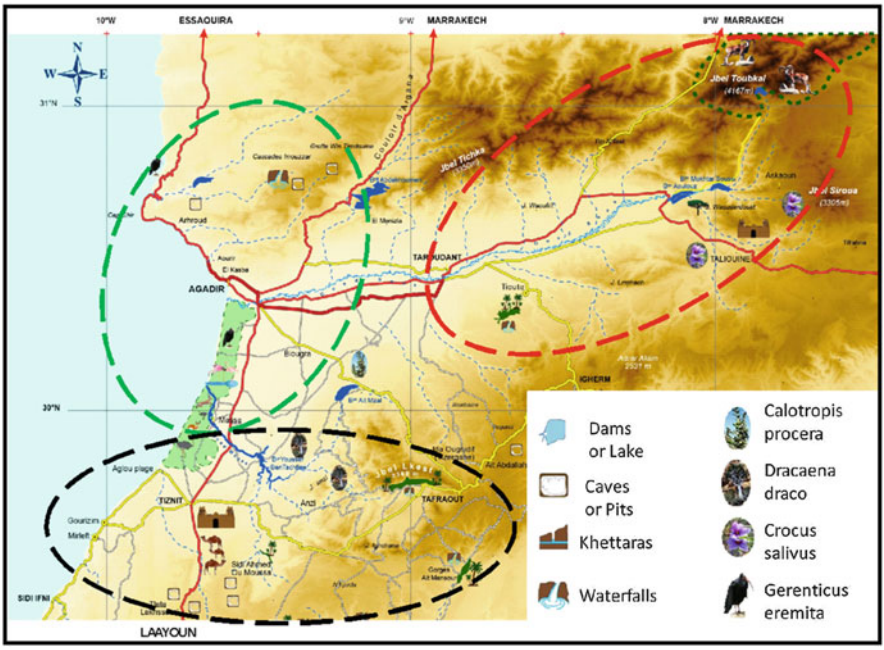

Fig. 4 The three major ecoterritories that were selected in the studied area according to their richness in terms of biodiversity and as a function of their sociocultural heritage. The *Red ellipse* shows the ecoterritory of Taroudant region, the *black ellipse* marks the ecoterritory of Tiznit region, and the *green ellipse* indicates the ecoterritory of Agadir region

It will involve the whole key areas as well as socioeconomic and cultural activities [31].

In this perspective, three major territories with ecotourism priority were selected according to their richness in terms of biodiversity and as a function of their intangible sociocultural heritage. The presence of a real dynamic of local actors is also a determining factor in the choice of the territory. These priority ecotourism areas are the following (Fig. 4):

- Taroudant region: Tafingoult BEIS, TONP, Tifnout and Talkjount valleys, Khettaras, dams, sources, and Ifni Lake;
- Tiznit region: Jbel Lkest BEIS and dispositions at Anzi, springs, caves, almond trees and dragonia, granitic chaos;
- Agadir region: Cape Ghir BEIS, Massa Natural Park, win Timdouine cave, Imouzzer waterfalls, aromatic and medicinal plants.

For these reasons, ecotourism plays its full role of conservation in these economically poor areas. It must provide the population with significant revenues to support the local and regional economies, and restrict other forms of nonresponsible use of wild territories.

In order to promote rural tourism, the Department has also adopted the concept of "Country of Tourism" or "PAT." This concept identifies a specific territory to make it become a tourism destination thanks to a comprehensive approach based on the tourist's experience. He/she will discover the rural areas of the country by meeting the population and observing their way of life directly in contrast to normal channels.

This concept brings together regions sharing certain characteristics under one designation to offer them as a tourist destination on its own. In the studied areas, there are Ida Outanane, Chtouka Ait Baha, Taroudant, and Tiznit that were chosen for this concept.

5 Conclusion

The main objective of this contribution was to examine, through the relations between local communities, tourism, and protected areas, more specifically the relationship between protected areas and ecotourism in the catchment of the Souss-Massa wadi.

The native people seem to agree with the creation of protected areas and their conservation. However, the revenues generated by ecotourism toward the natives are not significant.

The impacts of tourism on the environment including on biodiversity are nowadays an unquestionable reality in the protected areas of the Souss-Massa great watershed. This impact may be physical (change in the soil, trails, plastic and other waste, water pollution, etc.) or biological (change in the vegetation, risk of invasive plant species development, flora and wildlife disturbance).

These protected natural areas become even more attractive and therefore subject to even more anthropogenic pressures. In fact, there is a growing demand of preserved mountainous areas, wild landscapes, and observation of diversified wildlife. In addition, the attractivity is emphasized by the easy access to these areas by false guides or even professional guides that have not followed any training about such specific areas.

The protection of nature is fundamental to the success of the tourism sector, as well as for the scientific knowledge of certain ecosystems.

Several shortcomings and deficiencies in terms of communication and signage (educational pathways, explanatory signs, topoguides, brochures, exhibitions, museums, internet sites, etc.) are observed in the protected areas. It is used therefore to improve the information of such sites management, make sure of their understanding by the general public and the promotion of collaboration between the mountain professionals (guides, tourist offices, and hosts) and academics.

In addition, the limited budgets of the protected areas slow down this expansion, thus contributing to the deterioration of the local environment and decreasing the quality of the natural experience offered to tourists.

The main recommendations are:

- To achieve media and teaching activities for tourists and general public in protected areas;
- To install protected areas signs, interpretation boards, and appropriate marking of pathways.
- To implement environmental awareness and educational activities on a regular basis among the native people and the tour guides.
- To establish a reform in the income distribution structure, aimed at encouraging neighboring communities to maintain the protected areas.

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