# Redesigning Small-Scaled Vernacular Lodges in Tunisia: Towards a Renewed Ecolabelling Interpretation

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## Abstract

Tunisia has always been concentrating on maximising its tourism growth while protecting its natural and cultural environments. Despite of various perceived limitations, Ecotourism has therefore become a viable dimension of tourism in many touristic areas in the country. The heritage sites in the southern part of Tunisia, are known to host a large number of Mid and Small-scaled Ecolodges. However, the redesign of these lodges appears to be a difficult task for architects, and some are undoubtedly stronger than others in their contribution to Ecotourism. The use of International Ecolabels in this regard, ensures that a tourism project is sustainable, while enhancing the ecological efficiency and competitiveness of the tourism industry in the area. The requirements for these Ecolabels must be complemented by goals designed to be suitable for the natural and cultural local aspects.

Although in principle, and mostly in practice, Ecolabels are considered as effective tools in the design and management of touristic projects, they still face some challenges. The problem in Tunisia is that most of the Ecolodges' architectural design misinterprets the environmentally and socially sustainable practices that would get them closer to the "International Recognised Ecolabel Certifications" but continue to identify themselves as such, often for marketing purposes. A comparative analysis is presented in this paper to explain the variations in the usage of several forms of Ecolabelling and accreditation systems and their effect on sustainability when implemented. It also assesses an example of Ecolodges in "Chenini" village, "Tatouine" region, south of Tunisia, and proposes strategies to turn it into more of an authentic Ecolodge in the future towards an Ecolabelling certification that is internationally recognized.

## Keywords:

Ecolabelling, Sustainable design, Ecolodge Certification, Vernacular Architecture.

## الملخص

تحرص تونس على ضمان تدفق السياح اليها بقوة في الأعوام المقبلة، في حين لا تزال تعمل على حماية مواردها الطبيعية الفريدة من نوعها. ولذلك، أصبحت السياحة البيئية نهجاً وأسلوباً يعتمد عليه العديد من المشروعات السياحية هناك. وبالرغم ان تونس تحظى بوجود نسبة كبيرة من مشروعات السياحة البيئية متوسطة وصغيرة الحجم على اراضيها، فإن تصميم تلك النوعية من المباني في تونس يميل إلى كونه خياراً صعبا بالنسبة للمعماريين، ومن المؤكد أن البعض أكثر صدقاً في التزامهم بمعايير السياحة البيئية مقارنة بغيرهم من المعماريين. ومن المعروف إن استخدام معايير السياحة البيئية الدولية في المواقع التراثية يضمن أن المشروع السياحي تام الاستدامة ويسبب أقل قدر ممكن من الضرر للبيئة الطبيعية والاجتماعية المحيطة به بالإضافة إلى تحسين الأداء البيئي والقدرة التنافسية لصناعة السياحة التونسية. وبالتالي يجب أن تتكامل هذه المعايير مع أهداف التصميم لتتناسب مع البيئة الطبيعية والثقافية المحلية.

وبالرغم ان تطبيق معايير السياحة البيئية في التصميم المعماري للمشروعات السياحية هي مبادرة مهمة من الناحية النظرية، فإنها غالبا ما تواجه بعض العقبات في الممارسة العملية. فالمشكلة في تونس هي أن معظم المشروعات السياحية البيئية غالباً ما تسيء تطبيق الممارسات السليمة بيئياً واجتماعياً في تصميمها المعماري الذي يتيح لها الحصول على الشهادات المعترف بها دولياً في هذا الإطار، ولكن يظل الاتجاه الى تسميه تلك المشروعات بهذا المسمى تجاوزا لأغراض التسويق في الأغلب. تقدم هذه الورقة البحثية دراسة مقارنة لفهم الاختلافات في استخدام أنواع مختلفة من أنظمة تحديد العلامات السياحية البيئية الدولية والإقليمية والمحلية، وتأثيرها على الاستدامة. كما تقوم بتقييم مثال لاحد مشروعات السياحة البيئية ذات القيمة التراثية الموجودة في الجزء الجنوبي من تونس، وتحديدا في قرية "شننى" بمنطقه "تطاووين"، وتقترح استراتيجية لحصول هذا النموذجs على شهادة منشآت السياحة البيئية المعترف بها دولياً.

**الكلمات الدالة:**
التصميم المستدام، العمارة التراثية، المشروعات السياحية البيئية، معايير السياحة البيئية

## I. Introduction

Mass-tourism may negatively affect all three areas of sustainable development: economic, social/cultural, and environmental through projects that are poorly designed and implemented without proper consideration of negative impact outcomes. The unrestrained development of this type of tourism can have adverse effects, such as stress on the limited infrastructure or tension among visitors and local residents. On the other hand, Ecotourism as an alternative tourism, help in the preservation of the natural and cultural heritage of the touristic area [1].

While Ecolodges ranking and standards currently vary from basic to luxury, Medium-ranged Ecolodges are not sufficiently available. Given the small size of the consumer market able to afford High-end Ecolodges and the demand for Mid-range accommodation, the international supply of Mid-priced Ecolodges is currently inadequate. Alternately, the demand for a larger supply of Mid-priced Ecolodges in Tunisian Ecotourism destinations will increase only as the middle class of tourists travel more frequently and seek comfortable accommodation in the country's wilderness areas. These Ecolodges must be approved by an impartial third party or by the state in which they are situated and acknowledged as sustainable tourism projects. Their positions in desert areas of the south are primarily induced by the historical, vernacular, and conventional building techniques that local professionals use [2].

At the same time, the reuse of heritage residential buildings as Ecolodges does, in comparison to demolition operations, offer environmental and economic benefits. Most importantly, architectural restoration supports the significant social capital that comes along with the built heritage when used in places of cultural importance [3]. Preservation and adequate use of architectural heritage will have a positive impact on the effective use of the natural and cultural environments by either of the following [4]:

1. Preserving the urban socio-economic feasibility, by convincing the people to profit from the use of heritage buildings.

2. Maintaining the energy savings aspect, by using and reusing the materials more efficiently, in order not to waste materials and to save energy.
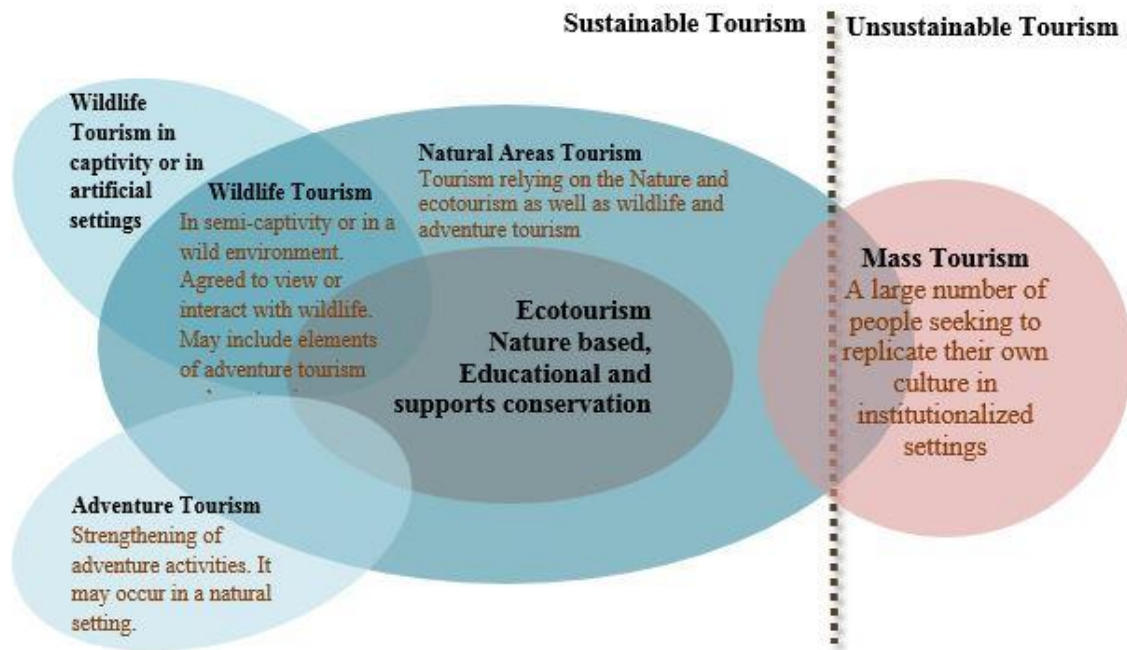
## Ii. Ecotourism And Sustainable Development

Thoroughly designed and managed Ecotourism sites can bring a direct benefit to natural and cultural resources, particularly if they are local based [5]. As illustrated in Fig. 1, there is a difference between "Sustainable Tourism" and "Ecotourism". It also shows that there are no absolute boundaries between Sustainable and Unsustainable Tourism [6]. According to Weaver's classification of tourism types, "Sustainable Tourism" can include forms of "Mass Tourism" as well as "Ecotourism" [7]. "Mass Tourism" is regarded as the most traditional form of tourism growth, in which short-term free market principles and income maximisation are dominant [8].

In 2015, Ecotourism was defined by the "International Ecotourism Society (IES)" as: "Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people and involves interpretation and education". The IES specifies that education must be for both staff and guests. It calls on those involved in Ecotourism development or management to abide by the following principles [7]:

1. Minimize the effects of physical, social, and touristic activities' impact.
2. Create knowledge and appreciation for the environment and community.
3. Offer positive experiences to both tourists and hosts.
4. Producing immediate conservation financial benefits.
5. Generate both local and private financial advantages.
6. Provide visitors with memorable experience that contributes to the sensitivity of the environmental and social conditions of the host country.
7. Plan, construct and run facilities with low impacts.
8. Recognize and work together to strengthen the interests and spiritual values of indigenous people in the society.

Nevertheless, Sustainable Tourism has an economic, environmental, and social dimensions to play in international sustainable growth and development framework. Such a standard framework will further promote the legitimacy, comparability and extension of various initiatives while monitoring international programs related to Ecotourism, including the UNDP's Sustainable Development Goals and UNWTO's International Network of Sustainable Tourism Observatories (INSTO) Indicators [10].

**Sustainable Tourism** | **Unsustainable Tourism**

Wildlife Tourism in captivity or in artificial settings

**Wildlife Tourism**
In semi-captivity or in a wild environment. Agreed to view or interact with wildlife. May include elements of adventure tourism

**Natural Areas Tourism**
Tourism relying on the Nature and ecotourism as well as wildlife and adventure tourism

**Ecotourism**
**Nature based, Educational and supports conservation**

**Mass Tourism**
A large number of people seeking to replicate their own culture in institutionalized settings

**Adventure Tourism**
Strengthening of adventure activities. It may occur in a natural setting.

**Fig. 1. Relationship of Ecotourism with other forms of tourism**
**Source: The Author based on [6] and [7]**

## Iii. Ecolabeling In Principle And Practice

Attempts were made in the late 1980s to set up guidelines and practical procedures for assessing environmental protection policies in USA, France, and Great Britain. Back then, Ecolabels were traditionally used to certify that a company or a hotel is sustainable and causes the least amount of harm to its surrounding environment. Unfortunately, the misuse of the term "Eco" appears to have undermined the integrity of the term and the concept behind Ecolodges nowadays [11]. Therefore, a set of more detailed criteria is needed to regulate the labeling of Ecolodges. According to these criteria, Ecolodges would be granted permits and would receive a rating. The evaluation criteria that are inextricably linked with the key environmental protection measures, must be used by each certification framework to evaluate hotel compliance while their core principles should be common: eco-friendliness, sustainability, sound resource use, and minimum impact on nature. It is also important to use a local environmentally, and economically sustainable planning methodology in designing and building touristic projects, in order to minimize the impact on natural resources and consider the future socio-cultural and economic benefits. The analyzed Ecolabelling rating systems, shown in the following Table 1, used measurable environmental qualities in different ways, but the concepts they represent remain similar, and the ratings are not interchangeable. However, some companies have also been creating their own Ecolabelling tools, such as "Thomson" and "Accor" famous companies. The "Thomson Green Medal label" has been awarded to several hotels in the region that meet the given environmental standards, while "Accor's Planet 21 Program" has outlined a list of 21 commitments that clearly demonstrates its vision toward sustainability [12].

**While Ecolabels are excellent theoretical and mainly practical initiatives, their implementation and application still face certain obstacles and challenges such as:**

1.   Regional environmental criteria should have specific credits in their Ecolabelling rating to reflect the touristic project's environment as there is a shortage of one or more resources in every part of the world. For example, Hot Arid regions, including the Middle East, suffers from the lack of water resources while experiencing extreme hot weather which maximizes the need for cooling strategies. However, they have plenty of energy. On the other hand, Europe and North America are primary suffering from the lack of energy more than the scarcity of water resources, while experiencing cold weather, which needs heating design strategies. Accordingly, every region of the world's design strategy should be regulated by specific environmental credits in the international Ecolabeling rating system, with attributes defined by what priorities it has and what challenges it faces [13].

2.   Most of these Ecolabels may appear to be directed exclusively at four and five-stars hotels (the majority are foreign hotel chains in the Middle East), and these are significantly restricted in scope. As changing an operating hotel into a certified Ecolodge can be considered a relatively expensive procedure, it is cheaper for a hotel to implement these Ecolabelling requirements during the initial design process. Yet, Community-owned Ecolodges, which have developed over the last two decades, and appear to be the current trend around the world, may face a considerable challenge in this regard [12].

3.   Many regional and local Ecolabels are currently designed to emulate the most well-known design rating systems, such as LEED or BREEAM, and are not sufficiently suited to the local environmental, cultural, social, and economic background of the touristic area [14].

The market for Ecotourism certifications in developing countries is still at the beginning of its establishment and development. Ecolabelling, as a certification, is not necessarily the only goal. It can be considered as an important system of encouraging designers and owners of Ecolodges to contemplate the social, environmental, and economic performance of their property. In general, the motivation behind the use of Ecolabels and environmental accreditations in the tourism sector varies between institutions. Governmental agencies use them to promote national interests, tour operators apply them to promote marketing objectives while the tourism industry needs them to generate revenue [15].

Once the hotel management is ready to apply for a certain certification, a payment is often required, a number of documentations are completed, and the auditor or other review board member is consulted.  If all the requirements can be thoroughly examined on site then the touristic project will be granted the Ecolabel certification. The renewal of the certification should be an incentive to the hotel management to maintain the highest ecological and cultural standards [16].

**Table 1. Examples of Important International, Regional and National Ecolabels**
**Source: The Author based on [17]-[25]**

| | Name of the Ecolabel | Establishment and Description | Standard Criteria and Benchmark Indicators | Importance and Partnerships |
|---|---|---|---|---|
| **International Examples** | **EarthCheck** (previously known as EC3 Global)<br><br>EARTHCHECK<br><br>https://earthcheck.org/ | • An international environmental and benchmarking program that focuses specifically on tourism.<br>• It was established in 1987 by the "Australian Government.<br>• Sustainable Tourism Co-operative Research Center" and accredited by the "Global Sustainable Tourism Council (GSTC)".<br>• Its headquarters are in Queensland, Australia.<br>• It aims at enabling managers to solve resource problems by introducing manageable procedures and benchmarking. | Its criteria and benchmarking include the following:<br>1. Emissions of Greenhouse gas<br>2. Quality of energy<br>3. Management and conservation<br>4. Freshwater and stormwater resources management<br>5. Ecosystem conservation and management<br>6. Social and cultural management<br>7. Planning and administration<br>8. Regulation of air quality and noise<br>9. Management of wastewater<br>10. Control of solid waste<br>11. Environmentally harmful substance | • It is centred on "Agenda 21 Sustainable Development Principles "of the "United Nations' Rio de Janeiro Earth Summit" in 1992, as well as on the final report at the "Johannesburg Summit of World Sustainable Development" in 2002.<br>• Its standard consists of 6 steps in 2 distinct phases which must be met by a "Destination Authority" in order to become Benchmarked and Certified: the "Bronze Benchmarked" and the "Silver Certified" |

| | Name of the Ecolabel | Establishment and Description | Standard Criteria and Benchmarking Indicators | Importance and Partnerships |
|---|---|---|---|---|
| | **Green Key**<br><br>https://www.fee.global/green-key-1 | • An international Ecolabel awarded to accommodation and other hospitality facilities dedicated to sustainable practices.<br>• It was founded in 1994 in England and Wales by the "Foundation for Environmental Education FEE".<br>• Green Key operates globally in the FEE headquarters in Copenhagen, while in most countries the "National Operators" introduce the programme on the national level. | • Its toolbox is divided into 13 topics including "Information" and "Templates" such as: Environmental Management, Staff Involvement, Guest Information, Energy, Food and Beverage, and Laundry and Cleaning.<br>• Water footprint is calculated using the "Hotel Water Measurement Initiative" developed by the "International Tourism Partnership", while Carbon Footprint is calculated using the "Hotel Carbon Measurement Initiative" developed by the "International Tourism Partnership" and the "World Tourism Council". | • Awarded to over 3,200 hotels and other establishments in 65 countries. These establishments comply with strict criteria, which are independently verified through regular on-site audits.<br>• The "Foundation for Environmental Education FEE" is a partner of UNESCO, ISESCO and the Charter of the Earth. The label is recognized and supported by the "World Tourism Organization WTO" and the "United Nations Environment Program UNEP". |
| **International Examples** | **Green Globe**<br><br>https://greenglobe.com/green-globe-certification/ | • It is a structured assessment of the sustainability efficiency of travel and tourism companies and their partners.<br>• It Operates under the license of "Green Globe Ltd UK" since 1999.<br>• It is applied in 83 countries around the | • This scheme presents 44 criteria that includes more than 380 indicators. The standards vary by region, type of certification, and also consider local influences.<br>• Its standard criteria and indicators include: Sustainability, Social, Economic Management, Cultural Heritage, and Environmental Issues. | • Its standards are recognised by the "Global Sustainable Tourism Council GSTC" and have an affiliate membership in the "United Nations Tourism Organization UNWTO".<br>• The Accreditation is divided into membership levels: Certified Member (confirmed annually |

| | | | |
|---|---|---|---|
| | world and provides certification, training, and education services.<br>• Its head office is located in Los Angeles.<br>• It is aligned with other established international sustainability certification programs. | • Its standard is reviewed and updated twice a year.<br>• Certified Members must also complete independent and mandatory on-site and desktop audits in alternate years.<br>• It maintains a global network of independent auditors who provide third party inspection and validation. | when more than 50% of the relevant criteria are met), Gold Member (certified for 5 consecutive years when the Member meets all the required criteria), Platinum Member (certified for 10 consecutive years when member meets all requisite criteria). |
| **Regional Examples** | **The European Union EU Ecolabel**<br><br>http://ec.europa.eu/ecat/hotels-campsites/en | • It is an official indication of the environmental standard of services and products in the EU, both accredited by an independent body and valid in several European Union Member States.<br>• One of the first Ecolabels which was established in 1992 to be recognized across Europe and around the world.<br>• Its implementation is determined by "Regulation of the European Parliament", while its management is carried out by the "European Union Commission" and the competent national authorities. | • Operators must comply with strict environmental performance and health standards criteria. They are divided into 7 hotspots as follows:<br>1. Lack of commitment to the environment.<br>2. Unnecessary carbon emissions and energy use.<br>3. Inefficient water use.<br>4. Reduction of pesticides and chemical substances.<br>5. Excessive solid waste and poorly managed disposal of waste.<br>6. Reducing transport emissions of carbon.<br>7. Excessive waste of food.<br>• The compliance by an independent organization (third Party) is confirmed by the European Ecolabel standard. | • There is a great potential that long-term synergies can be developed between various EU Ecolabel products and other ISO type I products for furniture, bedding, floor coverings, detergent products, cosmetics for rinsing, paper, and textile products as well as cleaning services.<br>• Tourist accommodations wishing to be certified must comply with 22 mandatory criteria and must receive at least 20 points under the optional criteria. |

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| | Name of the Ecolabel | Establishment and Description | Standard Criteria and Benchmarking Indicators | Importance and Partnerships |
|---|---|---|---|---|
| Regional Examples | **Green Star Custom Certification**<br><br>green star<br>Rating System<br>★★★★★★<br>GREEN BUILDING COUNCIL<br><br>https://gbcsa.org.za/certify/green-star-sa/ | • Established in partnership with emerging "Green Building Councils" across Africa by the "Green Building Council of South Africa GBCSA" to provide objective measurement of Green Buildings in Africa. GBCSA is part of the "World Green Building Council", which is one among about 75 members. Its headquarter office is in the Cape Town.<br>• The Ecolabel was published for public comment through a pilot form in 2008. | • This label is made up of 9 categories: Management, Indoor Environment Quality (IEQ), Electricity, Transport, Water, Materials, Land Use and Ecology, Pollution and Innovation, and finally, the Socio-Economic category.<br>• Its "Scoring Card" applies weighting criteria that are unique to each tool to achieve the final ranking.<br>• "Green Star Accredited Professionals" are third-party professionals whose fees are explicitly negotiated with project developers and not set by the GBCSA. | • It concentrates on new constructions and large refurbishments, with very slight emphasis on ongoing building operations and management. The main focus is on design and construction.<br>• Every country produces and submits a "Local Context Report", with the changes defined for review by GBCSA (South Africa).<br>• Touristic projects can be certifiable to a maximum of 1–6 stars' certification and the rating is valid for a period of 3 years. |
| Major National Examples | **Green Tourism Business Scheme**<br><br>Green Tourism<br><br>https://www.green-tourism.com/pages/home | • Also known as the "National Sustainable Tourism Certification for the United Kingdom and Ireland" which was established in 1997 with more than 2,400 members and endorsed by local national tourism agencies.<br>• Its membership network consists of a wide range of accommodation and | • Touristic projects opting to join "Green Tourism" are assessed by a qualified grading advisor against a rigorous set of 145 criteria, covering a range of areas, including Energy, Water Efficiency, Waste Management, Purchasing, Travel, Biodiversity and more.<br>• The scheme represents a third-party verification for large enterprises | • As Corporate Social Responsibility (CSR) is growing in importance in the United Kingdom, the involvement of Green Tourism through the use of Ecolabelling is a must to enhance these CSR credentials.<br>• A Bronze, Silver or Gold Award, based on the performance levels, will be awarded to touristic projects that meet the required standard. They are |

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| | | | reclassified every 2 years. |
|---|---|---|---|
| **Green Star** Australia greenstar https://www.architectureanddesign.com.au/news/bpn/green-star-rating-tool-for-public-buildings | • It was developed by the "Green Building Council of Australia GBCA" in 2003. <br> • More than 1900 projects in Australia have achieved the "Green Star" ratings. <br> • The scheme is applied to a wide range of building types, both new buildings and existing buildings. | • It classifies projects in the following categories: Livability, Economic Prosperity, Environment, Design, Governance, and Innovation. <br> • A maximum of 100 points can be achieved for each credit. <br> • The system can be applied to the phases of construction, refurbishment and operation. | • It is expressed as a number of stars: 1-3 Stars corresponding respectively to the Minimum Practice, the Average Practice and the Good Practice while 4 Stars correspond to the Best Practice Score, 5 Stars correspond to the Australian Excellence Level and 6 Stars to the World Leadership Grade. |

## Iv. Touristic Green Community and Ecolabeling in Tunisia

In view of the increasing negative environmental impacts of the uncontrolled development of the tourism sector in Tunisia, the implementation of a sustainable tourism approach was a priority for local tourism authorities. One of the potential strategies to achieve sustainability in this sector was the application of voluntary sustainability standards [26]. The "Tunisian International Centre for Environmental Technologies (CITET)" has recently developed the "Tunisian Ecolabel" as a nationwide initiative to improve products and services for tourism, textiles, food, and cleaning materials. The "Tunisian Ecolabel" is a national Ecolabel of type1, which was established in 1997, is mainly designed to promote access to European and foreign markets for Tunisian goods and services and to identify technical and environmentally sustainable standards for certifying tourist accommodation services [27].

The CITET is known to be a public institution under the supervision of the "Tunisian Ministry of Local Affairs and the Environment". Established in 1996, in response to the international recommendations of the RIO Summit (1992) on capacity building in developing countries and support for the transfer of environmentally sound technologies, CITET is committed to developing Tunisian skills to ensure environmentally sound and well-adapted technology transfer to the local, regional, and international contexts. It is a voluntary certification implemented by an independent third-party organization to comply with a set of technical and environmental criteria throughout the product's life cycle [28].

In 2015, CITET developed a five-year strategic study on the evolution of the "Tunisian Ecolabel", with a view to being recognized by the "Global Ecolabelling Network". Unfortunately, several actors are participating in the Ecolabelling process of touristic areas in Tunisia. The key players in this process are Hotels Companies, the Ministry of the Environment and the Ministry of Tourism, all with varying degrees of involvement as seen in Figure 2. The

problem of Ecolabelling tourism in Tunisia is mainly due to the lack of all these stakeholders, which is the key prerequisite for effective decision making [30].



Policy supervisor and financial supporter

**Fig. 2. Role of the different stakeholders in developing Tunisian touristic communities**
**Source: The Author based on [29]**

It is important to know that the criteria used for the certification of the "Tunisian Ecolabel" are mostly based on the "European Union Ecolabel". The main criteria to be met by accommodation services to obtain the "EU Ecolabel" are saving energy and water, reducing waste, using more renewable energy, improving the local environment, and making employees and customers more aware of the environment. In order to be certified by the "Tunisian Ecolabel", the applicant must meet 40 mandatory criteria and at least 30% of the optional criteria within a period of 7 months [30]. In addition to the national Tunisian Ecolabelling, Tunisia also follows some international Ecolabelling certifications. These are "Green Globe" and "Green Key" certifications [31]. Each of these certifications has its objectives, standards, procedures and rating structure or levels as previously explained in Table 1.

While the local requirements for defining Ecolodges in Tunisia remain unclear, many local entrepreneurs have begun to follow an environmentally friendly, small-scale tourism practises throughout the country by establishing vernacular lodges using renewable energy resources, growing organic food, and using local materials to create their lodges. These examples of small-scaled lodges serve a predominantly European market by offering a strong combination of cultural experience in a low-impact setting. However, these lodges in Tunisia are not certified as 'Green Hotels'.

## V. Small-Scaled Lodges In Touristic Destinations In The South Of Tunisia

Since the Tunisian certification does not target smaller lodges, there is a strong national need to establish a label of excellence for small Ecolodges with a maximum of 20 to 25 units. This segment of Ecolodges has not been paid attention to, in particular, that they are very vulnerable to any drop in the tourism market. The "Tataouine" region, in the southern part of Tunisia, is one of the most ideal regions for small-scaled lodges. It has a rich and remarkable historical sedimentation due to its geographical location in a crossroads of several civilizations. The "Chenini" village, located in the south-west of "Tataouine", is the main village in the region. It is a "Zenet" village known for its "Amazigh" architecture of the "Ksours" (plural of the "Ksar" in Arabic, meaning castle), which is considered an important heritage to preserve [32].

In view of the importance of the architectural and cultural heritage that characterizes the village of Chenini, the Tunisian "National Heritage Institute" has set up a pilot project to highlight the village as a sample of the "Ksours" of South Tunisia. The mission of this project is to preserve the heritage elements (tangible and intangible) of the village in order to exploit them in the context of the promotion of cultural tourism and to generate a potential for local sustainable development. The restoration of the "Ksours" was envisaged for their renovation and their reopening to the visit of tourists [33], which encouraged the recent opening of small-scaled touristic lodges.

## V.I Description and Urban Analogy of The "Chenini Village" Touristic Area

Having completed their settlement in ancient "Chenini", situated on one of the foothills of the mountain facing the "Farch," the "Zenets" built the "Qsar-Citadel" towards the end of the 12th century. It is most likely, from this time onwards, that the present village began to appear lower down, facing the "Dahar," a plateau which has a stretch that can be cultivated as well as a few meadows [32]. The "Qsar of Chenini" hangs over rows of houses consisting of several storerooms (Ghorfas) stacked one on top of the other and reached by narrow alleys, the paths of which embrace the shape of the land. Now deserted, this fortress, which doubled as a collective attic, fell into ruin. Further down, the new village consists essentially of houses, a mosque, an oil mill, alleys and courtyards (as shown in Figure 3).
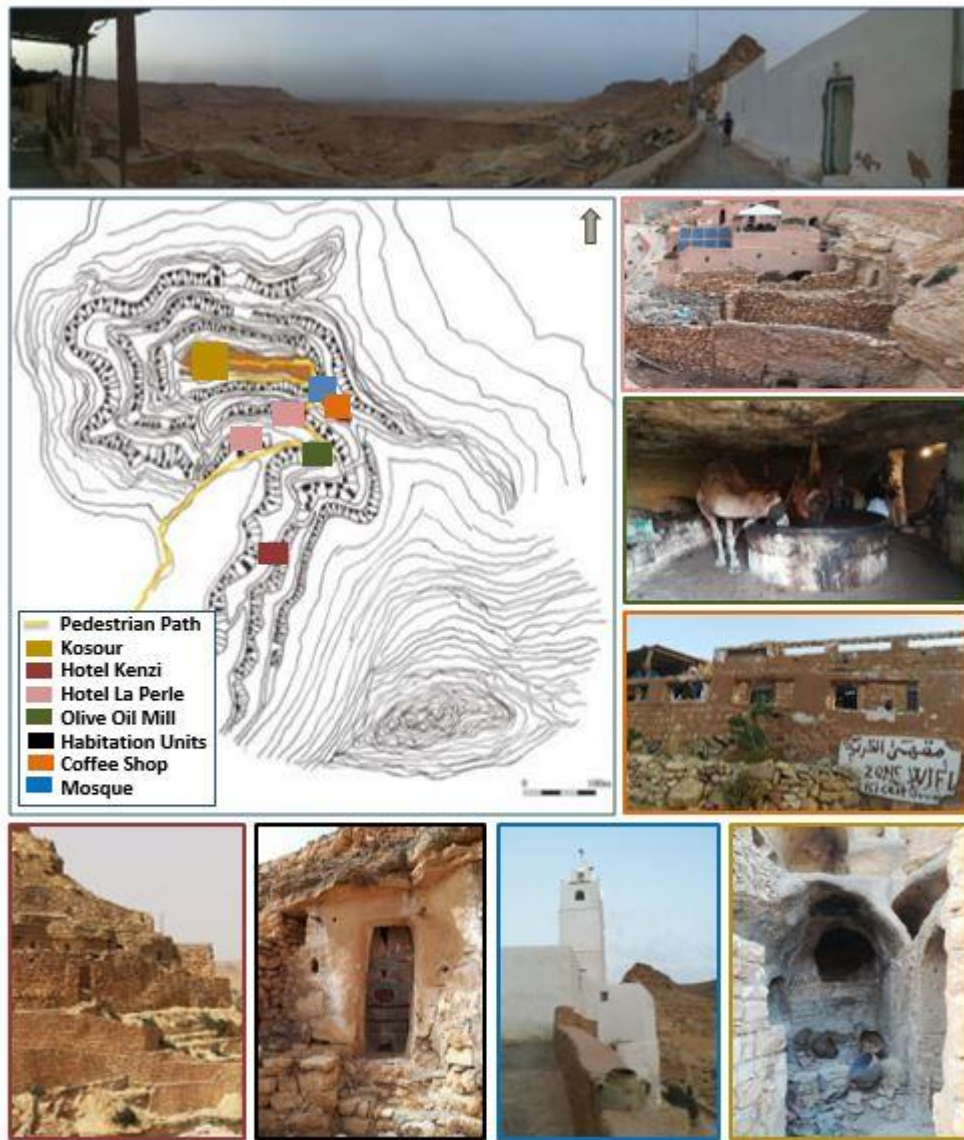
**Fig. 3. Chenini Village spatial configuration**
**Source: Based on [32] - photos taken by the Author**

## V.II Description of the Traditional Residential Units/Houses in the Area

The houses of "Chenini", arranged in rows, which are troglodytic and lateral in type. Each house contains one or more rooms that have been excavated from the soft alluvial layer of the mountain face. The rooms are entered through palm wood doors and look out onto a paved, open-plan courtyard, which includes a kitchen, latrines and a stable (as illustrated in Figure 4). Some houses have a loft, which is covered by a vault, above their entrance, to replace the "Ghorfas of the Qsar", which fell into disrepair. The village has a granary citadel called "Taxal/Ghouraf", built of stones, clay, plaster, and lime, which was intended to store wheat, barley, and other crops. There are several reasons for the design of elevated attics in the village: it helps keep food from getting wet and, at the same time, granaries are littered with food-containing jars and openings that allow air current to flow and moisture to decrease. The walls are decorated with historic symbols which have allowed Amazigh families to indicate the distribution of the harvest [34].
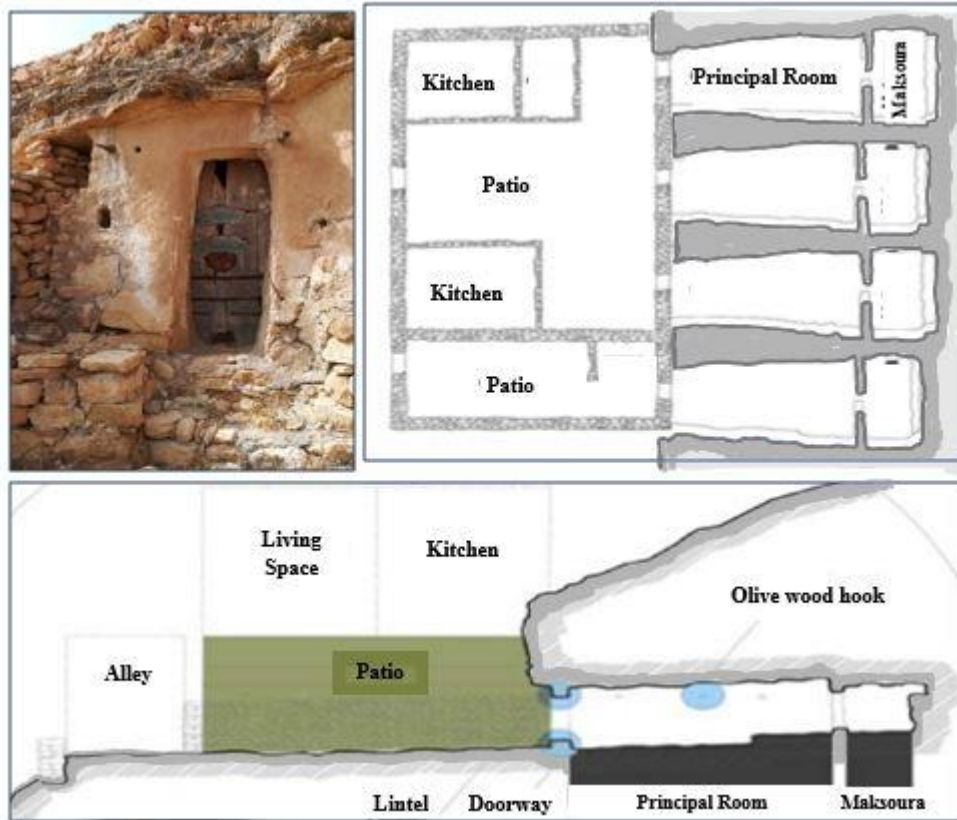
**Fig. 4: The vernacular design of troglodytic houses of Chenini village**
**Source: based on [32] – Photo of the entrance of the house taken by the Author**

The design of Mountain Houses is generally determined by local geology. Thus, the volume of the house is consistent with the limestone layers trapped in two shale marls which form the floor and ceiling. All aspects of the buildings are therefore designed to maintain basic convenience: thick walls of earth absorb warmth and keep the interior cool while the temperature drops, then radiate the heat during the night.

**V.III Continuing the Legacy: Vernacular Design of New Residential Units in the Area**
Recently, cave dwelling has returned to being one of the residential design options in the Chenini area. The families in Tataouine now dug their homes and set up wooden doors of ancient local trees. They still believe that this type of housing has been designed to protect against harsh climates and reduce the need for energy consumption by keeping the heat in winter and the freshness in summer. Their vernacular heritage is a model of good practice in terms of sustainable resource use and adaptation to the Hot Arid climate of the region. The new modern settlements in Chenini are also shaped by social and cultural values alongside the geoclimatic data of their surroundings. These factors could easily constitute a reference model for contemporary design to meet the needs of the users of these spaces [34].

However, building a contemporary structure using a traditional construction method is not an easy task to accomplish. The scarcity of available local competent traditional workers and expert craftsmen presents a major challenge to the construction of these new dwellings. The different and modern lifestyle of the new potential residents of these new units is another additional challenge. For example, the new design must be adapted to include an internal

bathroom and kitchen. Nevertheless, the use of electricity from the national grid is also essential. Figure 5 shows a comparison between traditional and new forms of cave dwelling in Chenini village, while Figure 6 shows an example of its construction processes and activities.
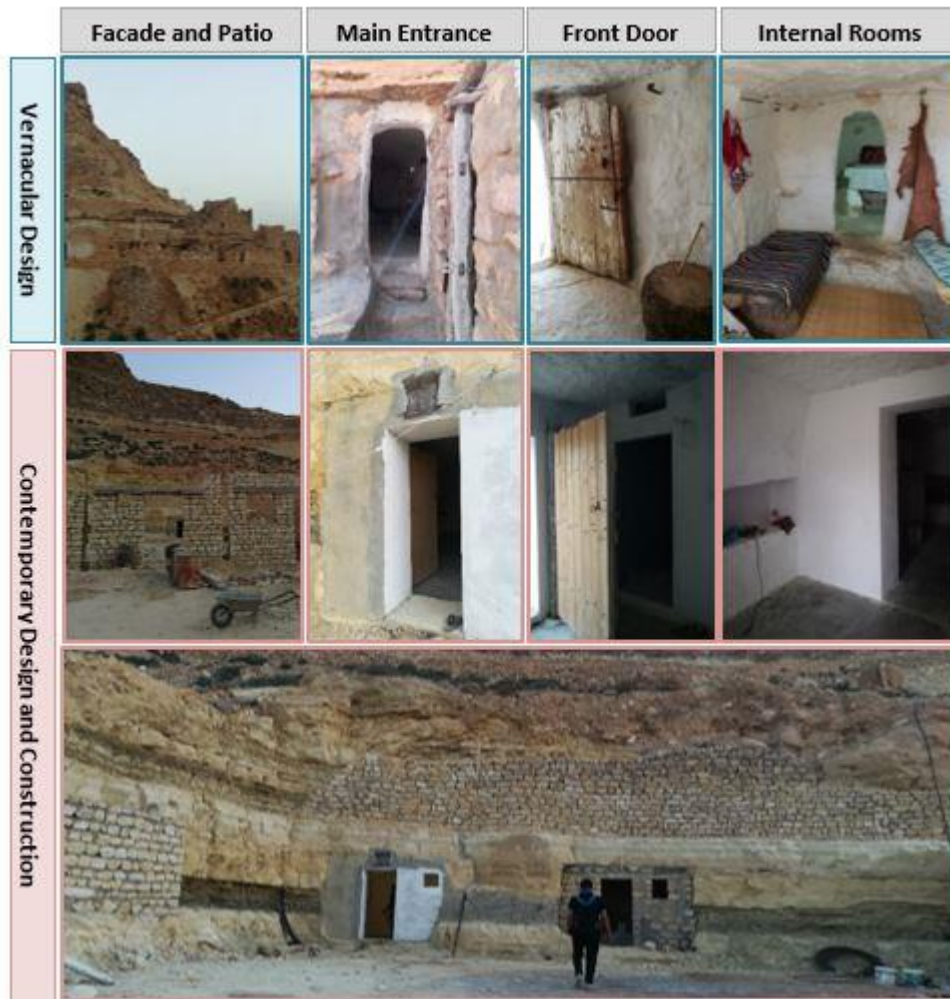


**Fig. 5. A comparison between the vernacular and the contemporary design of cave dwelling in Chenini Village**
**Photos taken by the Author**



**Fig. 6. The building process of new dwelling in Chenini area. Photos taken by the Author.**
**A)     Building the outer wall of the front Patio and underground utilities.**
**B)     Digging the Principal Room/cave in the mountain.**
**C)     Carving the inner room/Maksoura after the Principal Room.**

**V.IV Heritage/Cultural Events Organised in Chenini Area to Promote Ecotourism**

According to the "United Nations Statistical Commission" on the contribution of tourism to its Sustainable Development Goals (SDGs), key statistical data and indicators on the social impacts of tourism at national and/or sub-national levels include Heritage/Culture, Education, the Community, Visitor Perception, and Tourism Governance [35]. It is a well known fact that the "Ksour" and their necropolises are respected for the positive socio-cultural image they develop for the south-eastern part of Tunisia's Berber population. Within this framework, the engaged Tunisian government agencies tend not only to focus on the "Ksourian" architecture or the history of these constructions, but rather on a more direct understanding of the phenomenon: the ingenuity and cultural richness of the place. In view of the importance of the architectural and cultural heritage that characterizes the village of Chenini, the Tunisian "National Heritage Institute" (INP) has set up a pilot project to show the village of Chenini as a sample of the "Ksour" of southern Tunisia. The objective of the plan is to lay down a regulation specific to the village of Chenini, Tataouine, in order to ensure its conservation and recovery while considering the establishment of a center for the presentation and interpretation of the village [34]. Several local associations and NGOs in Chenini are already working to promote Cultural Tourism in the area, such as the "Association of Economic Development and Tourism Promotion of South Tunisia". The role of the local community and these NGOs together with the government's efforts, in order to promote national heritage and cultural importance within the Ecotourism sector, has been relatively effective.

In 2018, in order to explore the inhabited memories of the "Ksour", an artistic exhibition organized by several Tunisian artists and entitled "What is the silence of the ruins?" on contemporary art through paintings, presented a sound project based on the image of an amphora found in the ruins of a "Ksar" in the area. This sound system consisted of the recordings of the breathing and the words of certain inhabitants of the regions near the "Ksour" as well as the recording of the wind blowing on the sand, making the transition between the various testimonies [36]. Photos of the event can be seen in Figure 7.

Another cultural event organized in the region was the opening of the "Mountain Olive Festival" in December 2019 in the nearby "Douirat" area. An exhibition dedicated to the traditional industries and a seminar were organized to introduce mountain olives of the olive branch of the "Acurit Zeitoun" (the largest olive branch in the world) in the Ecotourism context. The event also included a heritage evening featuring a traditional fashion show [37]. Similarly, the international "Saharan Ksour Festival" is organized every year in Tataouine to attract international and Tunisian tourists.

**Fig. 7. Organised cultural and heritage events in the historical Ksours of Tataouine [36]**

Photos on the right side illustrate an overview of a traditional art exhibition in the area while photos on the left side illustrate the Roundtable entitled «A desert heritage of tomorrow, how to achieve it? » at the Nassamo-Samo Gallery in Chenini in 2018

## V.V Chenini's Small-Scaled Lodges' Initiative

If Mega-Tourism projects are planned with walled-in complexes, this category of projects cannot be expected to be appropriate for the Ecotourism of Mountain Architecture. In the present context, it is more reasonable to ask for local individual businesses to specialise in delivering environmentally friendly accommodation which is expected to benefit the local community. In general, successful accommodations in the Ecotourism industry are usually priced at a mid-range price. These lodges are often relatively small, and owners need government support and a small amount of capital to start up. They usually turn to NGOs or the Ecotourism industry itself to provide financial assistance. Training programs are necessary in this case to give local residents the opportunity to run their own businesses [38].

The development of such small-scaled lodges in the southern part of Tunisia encourages local people to engage in other tourism-related activities, such as the olive oil industry and the weaving of wool into traditional carpets. At the same time, local Bedouin women are given the opportunity to gain employment by selling local products, a prospect that was previously unheard of in a male-dominated society.

The village of Chenini has two examples of small-scaled lodges: "Kenza Residence", founded in 2007, and "La Perle de Desert" which was founded in 2020. The first lodge, Kenza Residence, was chosen to be fully studied as an example of a sustainable development and a social and solidarity-based small-scale tourism project in the area because of its sincerity as an individual local initiative while the second one is run by Locksmiths Travel Agency, UK [39].

## VI. KENZA RESIDENCE (DAR KENZA) AS AN EXAMPLE OF SMALL-SCALED TUNISIAN LODGES

The Ecolodge is a small touristic project formed by a set of caves assembled in suites that can accommodate between 30 and 40 tourists. It promotes the sobriety, purity and originality of the traditional cave family living in the crest villages of the Tataouine region. The "Kenza Residence" is considered to be a place of meditation and contemplation that allows its guests to enjoy the beauty of this picturesque site while sharing with the last cave dwellers their way of life and the delights of lodging in caves which are cleverly furnished and equipped with all the amenities and comforts that a tourist would need.

### VI.I Establishment and Objectives

The property was founded on the initiative of its owner, the local entrepreneur Nedra Boulila, who wanted to develop an integrated tourism project in the area. Her primary aim was to provide the young people in the village, as well as women, with a stable source of income via tourism activities. She also wanted to promote the hotel as an integrated scientific, cultural, and touristic project, with a particular focus on research related to natural and cultural spaces of the "Ksours" in the Sahara of Southern Tunisia [40].



**Fig. 8. Kenza Residence's location in Chenini, its rooms (Ghorfas) and internal details/furniture**
**Photos taken by the Author**

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## VI.II Rating and Available Services

The Kenza Residence is considered to be a 4-Stars accommodation, with 9 caves, widely arranged in various configurations, and 8 bathrooms. A reception area, an outdoor terrasse, a kitchen and a restaurant have been added to the lodge. Unfortunately, the lodge is not certified by the "Tunisian Ecolabel".

The number of people per room ranges from 9 people in a room (1 double bed, 5 single beds, 2 sofa beds) to a triple room (1 double bed, 1 single bed) [41]. The average accommodation rate (as calculated at the end of 2020) is 17 U.S. Dollars per person in one night. Breakfast is also available upon request [42]. The lodge offers several amenities such as: WIFI coverage, heating/air conditioning (according to the cave), indoor swimming pool (seasonal) next to the rooftop pool, and a gift/souvenir shop.

## VI.III Adopted Sustainability Strategies

Since its opening, the lodge has been challenged to become energy self-sufficient. It has placed solar energy cells on the roof, but still combines them with the use of conventional electricity from the government grid. Kenza also integrated various kinds of sustainability strategies in its operation and management, including a composting unit, solid waste, and wastewater treatment, while training and educating local staff to use these technologies [41].

## VI.IV Offered Cultural Activities and Experiences

In order to discover the culture of the local population and give its visitors the opportunity to know the history and enjoy the natural features of the region, the lodge has added the aspect of Cultural Tourism to its activities' program as follows [43, 44]:
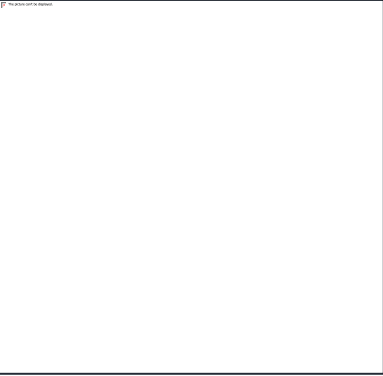
A)   The Kenza Residence offers its guests the chance to taste traditional Berber Cuisine in its Restaurant as part of the discovery of the region's heritage.

B)   Since the lodge is located 500 m from the "Seven Sleepers Mosque" and only One km from the "El Ogla Oasis", it also offers bike tours from Chenini to different "Ksours" and monuments surrounding the village in the Tataouine region. Visitors can also walk to the villages of "Douiret" or "Guermassa" with the aid of local guides.

C)   The lodge's management encourages its guests to take part in the usual activities of the Chenini village residents (pastoral activities, collecting olives, etc.) as well as olive oil production in the nearby mill and traditional wool wooden tapestries.

D)   Organizing "Traditional Music-Calligraphy evenings" with the aim of creating a successful combination between the music of a local music band and the calligraphy of another local artist. It should be noted that international tourist movements in the Southern Sahara region of Tunisia usually originate from the east coast and, in particular, from the island of "Jerba," due to the presence of an international airport in the island since 1970. These are usually guided tours to see the oases, the desert, and the Berber villages. Nevertheless, several travel agencies in Tunisia are also offering domestic tourism excursions to the south of Tunisia by bus for a weekend or three days, especially during the winter and spring school holidays or during cultural events such as the "Saharan Ksour festival" in Tataouine [43]. Consequently, Kenza Residence adapts its offered cultural programs to the type of visitor and the relative tourism sector (domestic or international).

While Kenza Residence is seen as a successful example of Small-scaled Lodges in the region and, at the same time, delivering socio-economic benefits to local residents, its architectural design and management ignore some important Ecotourism characteristics which could bring it closer to an international Ecolabelling certificate, as shown in the following Figure 9.

***Table 2. Kenza's Potential Negative Impact on the Village's Visual and Cultural Identity***
*Photos taken by the researcher and [40]*

| | | **Negative Design Features and Installations** | **Potential Rectifying Solutions** |
|---|---|---|---|
| **The Impact on the Village's Visual Identity** |  | Although the main idea of the lodge's design was based on the Berber caves' architecture and the replication of their authentic lifestyle, the public spaces of the lodge were externally built using different modern building materials and landscape design features. | • The design of large public areas of the lodge such as the Reception area and the Restaurant could have been divided into several secondary areas and integrated in large caves without the need for any external additions.<br>• The use of local palm trees trunks and olive trees branches could represent a more authentic alternatives to the use of typical modern canopies as already applied in the Patio of neighboring caves. |
| |  | The installation of Solar Panels on the lodge's roof beside the sun terrace has negatively affected the rural visual image of the village since the lodge is in the center of it. | Other alternative renewable energy resources could be used without the need to aesthetically affect the vernacular view such as the use of Biogas. The presence of the olive oil mill residues as well as the composting unit in the residence may be an asset to the proposed energy alternative. |

| | | |
|---|---|---|
| **The Impact on the Cultural Identity and Visitors Experience** |  | Although the presence of a swimming pool in a touristic project in a Hot Arid climate is necessary to achieve the needed number of "Stars", the integration of an indoor swimming Pool has negatively affected the cultural identity of the lodge. | • Different form of a swimming pool in a more natural setting mimicking an underground well for example can be designed.<br>• Another related recreational activity can be substituted instead of the presence of a typical swimming pool.<br>• The use of a more natural finishing material around the pool instead of the convental ceramic tiles would be more appropriate. |
| |  | The use of a typical modern dinning setting of a western restaurant instead of the original Bedouin/Berber eating setting does not add to the cultural experience of the visitor. The same applies on using Air-conditioning in public and private spaces. | • Local eating setting (on the ground or on low rise traditional tables) could be used instead of the actual modern one with the same traditional tableware used by the Berber.<br>• Part of the kitchen can be opened on the restaurant to allow the visitors to witness the preparation of the traditional Berber cuisine. |

"Kenza Residence" can be completely booked throughout the High Season with no advertising beyond its Internet Website and a simple road billboard at the entrance of Chenini village. Recently, the management of "Kenza Residence" invited their visitors to help the Lodge by describing their experience in Southern Tunisia and put it in touch with Ecotourism experts, or networks [41].

## VII. DISCUSSIONS AND ANALYSIS

Kenza Residence, as a typical vernacular architecture example of the Berber mountain settlements in South Tunisia, has been adapted to the principles of simplicity and minimal environmental impact. The Ecolodge uses sustainable design principles and minimises the use of non-renewable materials while using local natural building materials and techniques. However, it relies on the local governmental electricity grid, alongside its solar power, and other modern design features, as explained in Table 2. Other similar regional examples of certified Small-scaled Eco lodges have overcome this challenge by operating the lodge without the use of electricity, such as "Edrar Amlal," Siwa Oasis, Egypt, in order to maintain the authentic

cultural experience of its guests. Nevertheless, Kenza has fulfilled several of the Ecolodge characteristics described below:

1. It offers local community participation and development while offering opportunities for environmental education and interpretation of nature as well as socio-cultural understanding.

2. The lodge implements solid waste management and wastewater management and recycling techniques as well as water conservation and energy conservation measures and makes use of solar renewable resources.

3. Cultural appreciation and interpretation of nature are maintained through the actual accommodation in the lodge as well as through Ecotourism recreational activities and cultural visits to nearby Bedouin settlements.

As has already been pointed out, Tunisia follows several international Ecotourism Standards/Ecolabels alongside its national one, such as the "Green Globe", the "Green Key" and the "European Union Ecolabel". Since the Tunisian Ecolabel, developed by CITET as a local rating system, needs a great deal of development in order to enhance its role for Tourism Sustainability in Tunisia, the "Green Globe 21" was chosen by the Author as the potential International Ecolabel to be applied by Kenza Residence. The scheme was selected due to the following criteria [45]:

1. The "World Travel and Tourism Council (WTTC)" launched the "Green Globe" in England in 1994. Since that date, the scheme has evolved from a process-based framework to a more performance-based one.

2. Its standards vary by region and consider local influences. There are already a number of successful tourism projects that already follow the "Green Globe 21" in Africa. They exist in Tunisia (3 projects in the cities of Tunis, Djerba and Soucess), Egypt, Kenya, Ghana, Madagascar, Morocco, Mauritius, Senegal, and Seychelles.

3. The scheme provides a complete framework for tourism operations to benchmark their environmental and social performance and to continuously improve their performance. It presents more than 380 indicators while also addressing corporate policies, the regulatory framework, performance, and stakeholder consultation.

The system has 4 standards suitable for Ecotourism establishments and companies [46]. They cover different main criteria as outlined in the Table 3. It should be noted that each standard is characterised by a specific total amount of points and is distinguished by a precise number of available credits. The following table summarises the potential and limitations of the design and management of the Kenza Residence to achieve the "Green Global 21" Ecolabel in accordance with the main criteria of the scheme's standards.

**Table 3: Main areas of focus within Green Globe's four certification standards.**
**Source: The Author based on [46]**

| Green Globe 21 Standards | Main Criteria within the standard | Kenza Indices | Observations and Remarks |
|---|---|---|---|
| **Design and Construction** | 1. Sustainable Design and Construction Policy | | Being an example of a vernacular replanned site, which is operated in an environmentally sound manner, does not reduce the importance of a needed sustainable design regulatory framework, assessment, and management. |
| | 2. Regulatory Framework | | |
| | 3. Sustainable Design Assessment | | |
| | 4. Sustainable Design Process Management | | |
| | 5. Sustainable Construction Process Management | | |
| | 6. Community and Stakeholder Consultation and Performance Reporting | | |
| **Ecotourism Standard** | 1. Ecotourism policy, performance, and regulatory framework | | The respect of the environmental and socio-cultural contexts emphasizes the Ecotourism potentials of the lodge, while avoiding the introduction of new buildings and modern installations and entertainment facilities (such as the indoor modern swimming pool and the obvious roof Solar Energy Cells) around the caves is recommended. |
| | 2. Natural area focus | | |
| | 3. Interpretation and education | | |
| | 4. Ecologically compatible infrastructure | | |
| | 5. Ecologically sustainable practice | | |
| | 6. Contributing to conservation | | |
| | 7. Ecotourism benefiting local communities | | |
| | 8. Cultural respect and sensitivity | | |
| | 9. Customer satisfaction | | |
| | 10. Responsible marketing | | |
| | 11. Ecotourism product minimal impact | | |
| **Communities Standard** | 1. Community Authority | | Kenza's owner and operators may not have sufficient time, resources, or expertise to professionally plan, manage and assess the environmental and social sustainability performance which may be costly and laborious comparing to the scale of the lodge and its location. |
| | 2. Regulatory Framework | | |
| | 3. Environmental and Social Sustainability Policy | | |
| | 4. Environmental and Social Sustainability Planning Systems | | |
| | 5. Environmental and Social Sustainability Benchmarking | | |
| | 6. Community Stakeholder Consultation and Performance Reporting | | |
| **Company Stand** | 1. Environmental and Social Sustainability Policy | | |

| | | |
|---|---|---|
| 2. Legislative Framework Environmental and Social Sustainability Performance | | |
| 3. Environmental Management System | | |
| 4. Consultation and Communication | | |

| | | | |
|---|---|---|---|
| | Existing positive impact due to the Vernacular Architecture. | | Need to establish Policies, Framework, Benchmarking and Planning systems. |
| | Challenging positive impact which needs managerial and design interventions. | | Need for Reporting, Consultation and Communication. |

Since the Ecolodge is a small-scale, individually owned, and managed lodge, it is clear that the lodge does not have any planned or written Environmental and Social Sustainability Policies or a legislative framework for its performance and management system. Unfortunately, being internationally accredited as an Ecolodge is not limited to the sustainable design of building facilities and energy resources, while at the same time respecting the cultural and social context. A detailed collection of documentation and written plans and monitoring processes must be submitted to the accreditation scheme in the related process. It is vital to incorporate hotel management, tourism management, food and drink services, and additional services in order to build an internationally accredited lodge while not neglecting other subsystems such as infrastructure and vernacular architecture.

## VIII. CONCLUSIONS AND RECOMMENDATIONS
The paper explores an alternative sustainable tourism development project in the village of Chenini, in the south of Tunisia, which is an environmentally and culturally sensitive and economically viable region. It studies and analyses the possibility of the reuse of the Vernacular Architecture of Chenini's Berber Mountain Settlements through the examination of the development of the "Kenza Residence," as an example of a potentially certified small-scaled lodge, through the adaptive reuse of abandoned Berber mountain caves and its restoration and transformation into a locally owned and managed Ecolodge. In its theoretical part, the paper explains in general the definition of an Ecolodge and an Ecolabelling system in order to prove that it is highly important to use a rated scheme (either international, regional, or local) through following certain management principles and design guidelines. First, a comparative analysis is carried out between different international, regional, and local Ecolabelling schemes in order to describe the principles and best strategies of a successful rating system that can be appropriate for the local studied region. Several conclusions and recommendations can be redacted and classified as follows:

### VIII.I Applying Ecolabelling on the Tunisian National Level
By comparing the studied Ecolabelling schemes, it is possible to conclude that while there is a significant commonality among the various Ecolabelling systems discussed in this paper, major differences in their design (in terms of the objectives, methodology and structure of environmental and local needs) are addressed. It is therefore important, in the absence of a clear

national Ecolabel, to choose an acceptable International Ecolabelling Scheme relevant to the unique needs of the regional and local climate and cultural context.

The key challenge with the "Tunisian Ecolabel" is that the various involved stakeholders are not sufficiently coordinated and that there is no practical timetable for the accreditation process. Nevertheless, the Tunisian tourism sector is becoming increasingly variant regarding the scale of the touristic projects and establishments, which requires special attention from the government to Mid and Small-scaled lodges that are individually owned and managed in historical areas.

### VIII.II Tunisian Small-scaled Lodges' Opportunities and Limitations

The success of Ecotourism in the mountains of southern Tunisia, particularly in the "Ksour" and Cave sites, requires considerable efforts from all stakeholders. This should make new decision-makers aware of the need to change Tunisia's tourist orientation towards alternative forms within the framework of sustainable development, particularly in fragile environments such as "Tatouine" region, where the population is poor and development projects are rare. The low diversity of Ecotourism projects, long dominated by large-scale hotels and tourism projects, undermines the ability of the local community to benefit from Ecotourism. On the other hand, if these touristic destinations contain more micro-enterprises or Mid to Small-scaled lodges, it is more likely that a larger percentage of locals will benefit from their presence. Many of these vernacular lodges can actually be considered as a win-win situation to both locals and the government: by offering a planned reuse opportunity of caves and residential units in these historical regions, while at the same time allowing the Tunisian tourism sector to score marketing points, with potential consumers interested in this scale of lodges, without having to reach the extremes of a certified Ecolodge. The Government may also contribute by temporarily reducing national taxes and/or other charges with the aim of maximising the individual returning to local owners. Efforts to support community-based entrepreneurship must therefore be based on local cultural needs.

### AKNOWLEDGEMENT

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