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## Designing an Ecotourism Residence with a Social Sustainability Approach (Case Study: Abbasabad County)

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### Abstract

Accommodations for ecotourism are vital components of tourism services, particularly in ecotourism, as they adhere to numerous principles and criteria suited to the environmental conditions of untouched natural and rural areas. These lodgings are formulated to harmonize with the characteristics of the surrounding environment, such as shape, color, size, height, volume, and materials, thereby facilitating the development of tourism hubs. However, a significant hurdle faced by many villages is the absence of sustainable development standards for building. A critical element in establishing developmental boundaries is the design of tourist accommodations, which takes into account construction methods, materials, environmental compatibility, management practices, and energy efficiency. Mazandaran Province has embraced a positive strategy in this regard, integrating traditional architecture to foster strong links between structures and their environments. This study intends to design a sustainable ecotourism residence in Abbas Abad County that enhances rural livelihoods while preserving the essential characteristics of tourist accommodations.

**Keywords:** Native architecture, Mazandaran climate, Ecotourism, Tourism complex, Sustainable ecotourism.

## 1 | Introduction

In today's world, humans experience a sense of loss of connection with the natural environment due to the creation of artificial environments and the removal of nature from daily life. This problem is caused by human domination over nature and changes in the way settlements are built, which have lost their continuity and coherence. Native architecture, as architecture in harmony with nature, is trying to restore this continuity. This type of architecture, using natural potentials and inspired by the forms of nature, provides better conditions for human life.

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Sustainable architecture, which was proposed in the 1970s, is an approach to designing urban spaces and buildings that responds to climatic and environmental characteristics and causes minimal damage to nature. This architecture has economic, environmental and social dimensions, and paying attention to the principles of social sustainability, including creating a sense of belonging to the place, aesthetics, security and comfort, helps to increase the dynamism and spirit of life in cities. Tourism, especially tourism based on vernacular architecture, can help preserve and develop the values of this type of architecture.

The tourism industry is known today as one of the most influential industries in societies, providing tourists with an experience in harmony with nature by providing accommodations that are appropriate to the environment. Ecotourism accommodations, in addition to providing accommodation, must be designed based on the principles of local architecture and sustainable development. These accommodations are in harmony with the host environment and are in accordance with regional characteristics in terms of form, color, materials, and structure. However, in many regions, the lack of desirable standards in the construction of these accommodations has reduced their quality and harmony with the natural environment. Abbasabad County in Mazandaran, with its mountains, forests, and sea, has high potential for the development of ecotourism. This region has a rich historical and cultural background and local architecture that is appropriate to its climatic conditions. However, in recent years, uncoordinated and unplanned construction has caused the harmony of local architecture with nature to be lost. Tourism development in this region requires understanding its capabilities, considering environmental, social, and economic requirements, and careful planning to maintain a balance between the exploitation of nature and its protection.

This research aims to present a suitable design for ecotourism resorts in Abbasabad, based on the principles of sustainable ecotourism in architecture. In addition to providing rural livelihoods, this design should also have the characteristics of a tourist accommodation. Therefore, the main issue of this research is to develop criteria and criteria for designing ecotourism resorts based on sustainable architecture and ecotourism, so that while protecting nature, tourists can have an authentic and environmentally harmonious experience.

Sachs [1]: social sustainability lies in adhering to the fundamental values of equality and democracy. In fact, the effective allocation of human, political, civic, economic, and social rights for all people is considered one of its pillars.

Litting and Gribble [2]: social sustainability refers to a state in which a society can meet human needs and is formed in a way that is naturally reproducible and provides social justice, human dignity and participation over time.

Stern [3]: harmonious development in which different social and cultural groups are encouraged to participate simultaneously and harmoniously, to the extent that it improves the quality of life of all of them, is considered social sustainability.

Chumsri et al. [4]: one of the manifestations of small and family entrepreneurship is the establishment of ecotourism bases. The favorable growth of employment and entrepreneurship in different communities and the tendency of people to tourism is significant.

Watt et al. [5]: the growth of employment and entrepreneurship in different communities and the tendency of people to tourism is important. Also, the establishment of ecotourism centers in villages has contributed to their development and paved the way for the growth of sustainable tourism.

Mehta [6]: one of the most important issues and challenges in the design and construction of ecotourism resorts is the architectural principles of these resorts. According to the official definition in 2002, an ecotourism resort or eco-tourism has criteria and standards, one of which is the use of local architecture and materials, along with harmony in form, landscape and color of the environment.

## 2 | Research Method

### 2.1 | Ecotourism

The tourism industry as a green industry has a special place in the issues of sustainable environmental development, especially in villages and environmental protection. The connection of this industry with other sciences and disciplines in various service and information topics, including architecture and environmental design, is very close and in most cases inseparable.

essential and mandatory. However, in some cases, due to tourists' lack of knowledge of tourism customs and even in some cases a commercial and instrumental view of this industry, this has led to the role of tourism as a green industry being diminished and has provided grounds for the destruction and destruction of environmental attractions and the ecosystem of a region; However, preserving and reviving various cultural, historical, religious, natural, environmental, geological, sports, etc. attractions, along with developing infrastructure and creating areas for their exploitation and benefit, has always been considered and is considered a prerequisite for the growth and development of this industry; because without these attractions, tourism will lose its practical meaning and concept. Therefore, before entering into the discussion of tourism in each region and providing areas for the growth and development of infrastructure and even defining service-welfare and recreational plans, conducting ecological studies and gaining knowledge of its natural, historical and cultural environment will be essential and mandatory.

By taking this step and mapping the geographical-natural and cultural position of a region, it is possible to take steps towards sustainable development by taking advantage of the talents available in it and interacting with the people of that region in the majority of local participation plans. This issue will be very important and necessary, especially in the creation and establishment of tourism complexes. What is being paid much attention to in tourism topics today is the creation of environments that provide the necessary grounds for human coexistence with nature, and in the topics related to ecotourism and ecotourism, in the design of residential, recreational and tourism spaces, while maintaining aspects of compatibility with the climate and natural environment, by utilizing native elements and indigenous materials, and relying on the tourism talents available in the region, to build and launch tourism complexes.

With this perspective, architecture and tourism are in line with each other in the topics of sustainability, while developing infrastructure by creating small local economies in rural environments, using the cultural context of the same village for its development and providing the foundations for sustainable environmental development. These include the use of locally sourced materials, architectural textures, and defining spaces in accordance with conventional plans, the use of clean energy, the use of natural elements in defining applied energy, emphasis on the use of indigenous and local products, coexistence with the natural environment and diverse attractions available in a village to create health villages, ecotourism villages, and eco-museums [7].

### 2.2 | Types of Tourism in the Definition of Ecotourism

- I. Eco-friendly: according to the definition of ecotourism, this type of tourism has a lower impact on fragile and natural environments and focuses on providing nature-based experiences.
- II. Ethical tourism: tourism to a destination where ethical issues are the main factor. for example, social injustice, human rights, animal welfare or the environment.
- III. Ecotourism: tourism that takes place in natural areas with an emphasis on understanding and preserving natural environments.
- IV. Geotourism: tourism that preserves or enhances the geographical characteristics of a place, such as: the environment, heritage, aesthetics, culture and the well-being of its inhabitants.
- V. Nature tourism: according to the definition of ecotourism, this tourism is responsible travel to natural areas that preserves the environment and improves the well-being of local people.

- VI. Nature-based tourism: in the definition of ecotourism, this is a broad term that encompasses all tourism experiences centered on wild or natural environments. Nature-based tourism includes all forms of tourism in which relatively undisturbed natural environments form the main attraction or setting. This can include contemplative and adventurous activities that are not to be tolerated, which in turn can include ecotourism, and conservation tourism is a broad and deep extension of nature-based tourism.
- VII. Pro-poor tourism: tourism that results in increased net benefits for poor people in a destination.
- VIII. Responsible tourism: tourism that maximizes the benefits to local communities, minimizes negative social or environmental impacts, and helps local people maintain fragile cultures and habitats.
- IX. Sustainable tourism: tourism that fully considers its current and future economic, social and environmental impacts and meets the needs of visitors, industry, environment and host communities.
- X. Wildlife tourism: according to the definition of ecotourism, this tourism establishes a close relationship with wildlife and nature.

### **2.3 | Positive Effects of Ecotourism**

Ecotourism brings cultures and communities closer together: one of the principles emphasized in ecotourism is education and creating cultural awareness with the people of a region. In ecotourism, tourists become closely acquainted with the culture and way of life of the people of the region and participate in their daily activities; in this connection created between hosts and tourists, the people of the region also become acquainted with the culture of the people of other regions and countries, and these two groups gradually develop a kind of interest in each other. By creating this familiarity and culture of friendship, tourists become sensitive to the host region and give more importance to its conditions.

Ecotourism helps preserve natural resources and heritage: it is well known that "in ecotourism, only your footprints remain in nature and you take nothing back from your trip to nature except memories". This type of view on ecotourism, along with its emphasis on preserving natural resources, education, and minimizing damage to nature during travel, reveals the importance of respecting nature and prevents harming it.

In addition, ecotourism, by creating opportunities for economic progress and development, can be considered an alternative to other sources of income for the people of the region and prevent locals from turning to other ways of earning income, such as selling agricultural land and exploiting natural resources indiscriminately.

### **2.4 | Negative Effects of Ecotourism**

Although the construction of ecotourism resorts in Iran dates back more than a decade, new challenges are now emerging in this area with the increasing development of these resorts. In their latest report, experts from the Tourism Commission of the Iranian Chamber of Commerce, while talking to the owners of ecotourism resorts and experts and activists in the field of tourism, have identified the most important factors affecting the activities of eco-tourism resorts. Five categories of factors affecting the activities of eco-tourism resorts and the mutual harms of activities in this field have been examined. Accordingly, laws and regulations, economic factors, socio-cultural factors, local environment factors, and human resources have been introduced as the five main axes of the activities of eco-tourism resorts.

### **2.5 | Study of the Indigenous Characteristics of Mazandaran in Different Geographical Regions**

In this section, the architectural characteristics of Mazandaran are presented in two parts. First, the characteristics of Mazandaran architecture that are in harmony with the climate or overcome harsh environmental conditions are presented. Then, the physical solutions and tricks that have been used to facilitate climatic conditions are explained.

Mountainous region with a cold mountainous climate: stone buildings are common in the mountains of Mazandaran, (although on the slopes close to the forest due to the abundance of wood, houses are built of wood). Stone, which is abundant in the region, is used to build various and main parts of the building. The foundations are made entirely of stone and mud mortar, and the stone walls are made in two ways:

- I. In the walls of the building, they are made of flat stones with mud mortar.
- II. In the walls of the courtyard, they are made of flat stones without mortar (dry masonry) [8].

The roof is flat and covered with soil and mud [9].

### 3 | The Caspian Plain with a Temperate Climate

Due to the relatively sufficient availability of wood and mud suitable for the construction of houses, "wooden layered" houses were more common, in which the walls were made of layered wood and the floor and ceiling were made of wood, and wood was also placed as a coil at intervals from the layered wall for coiling to increase the strength of the structure [8].

The roof was sloping, and covered with "Gali" (a plant that grows in pools and ponds) and "Kolo" or "Kola" (rice stalks), "Lat" (small planks), "Ceramic" and "Shirvani" [9].



Fig. 1. Traditional rural architecture in Abbasabad County supporting sustainable ecotourism [10].

### 4 | Forest Highlands with a Cold Caspian Climate

Due to the presence of dense forests and suitable trees in this region, almost 100% of the houses, including the walls, roof, floor and sloping roof covering, are made of wood, and wooden houses are common in these areas. For the construction of the walls, mostly natural tree trunks are used [8].

The roof is sloping, and covered with "lat", "sefal" and rarely "gali" and "shirvani" [9].

In places where livelihood is based on rice cultivation, the "kalash" covering is more common, and in places where villages are located in the heart of the forest, the "lat" covering. The "lat" covering came from forest villages to the plains, and the "kalash" covering became popular with the change in livelihood in forest villages.

#### 4.1 | Urban Fabric

In areas near the seashore or with high rainfall, the presence of humidity is one of the major problems. Humid air is heavier than dry air and is located below dry air. Therefore, if urban spaces are enclosed and air and wind do not flow in them, all of these spaces will be filled with humid air throughout the city, making breathing and activities very tiring.

For this reason, maximum use should be made of airflow to prevent excessive humidity from settling in urban spaces [11]. Therefore, buildings in these areas are built separately, with courtyards and wide open spaces, and the fence around these spaces is often shorter than a human height.

The reason for this is to use airflow to pass through the buildings and carry the humid and stagnant air outside the premises and living spaces. Taking advantage of the beautiful and lush nature of the region is another reason for combining the residential environment with nature. The general characteristics of the urban and rural texture in this region are as follows [11]:

- I. Open and extensive urban and rural texture.
- II. Relatively wide urban spaces.
- III. Areas with short walls.
- IV. Relatively wide alleys.
- V. Buildings separated from each other, in connected urban centers.

## 4.2 | Dominant Form and Orientation of the Building

In these areas, free and even cruciform forms can be used. However, the building form must be elongated along the east-west axis to provide the required blind area [12]. The main light front of most rooms and verandas is south.

The main courtyard of the building is also located on the south side. In general, the plans are wide and open and their physical form is mostly geometric, long and narrow shapes. In order to maximize the use of wind to create ventilation inside the rooms, the orientation of the buildings is determined according to the direction of the sea breezes. In places where strong winds blow, the windward side of the buildings is completely closed [13].

## 4.3 | The Four-Season Nature of the Building

Like the four-season houses in hot and dry regions, where the residents move from north to south according to the different seasons of the year, seasonal movement also takes place in the houses of this region. Thus: In the cold season, the most important activities take place in the rooms on the first floor. However, in the warm season, these activities are carried out in the veranda, especially the veranda on the second floor (the attic) and the room on the second floor (the attic room) [11].

## 4.4 | Relationship with the Earth

The blending of architecture with the earth and nature in Mazandaran is accompanied by both obedience to it and its utilization [14]. Due to the humidity of the air and the shallow depth of groundwater, they try to build the ground floor of the building as high as possible above the natural level of the ground so that the floor of the building is away from the moisture and humidity of the ground and can benefit from the wind flow, which is faster at higher altitudes [11].

A few points are necessary to mention regarding the relationship between the earth and the architectural structure in Mazandaran. First: It is not correct to build a basement in these humid areas. Second: Since the depth of groundwater in these areas is very shallow and the soil is moist and has little resistance, it is quite logical to use a wide foundation to bear the load on this loose ground. Third, by creating a distance between the building and the ground surface, the possibility of any moisture spreading to the floor of the building is prevented.

This distance from the floor to the ground level in buildings near the sea is about two meters and in buildings located at the foot of the mountain is about 50 centimeters or less. Due to being in the shade and exposed to the wind, this space is a place to keep poultry (cage), dry wood and store equipment, and is sometimes used as a barn. In fact, the type of use of this space depends on the humidity level in different regions. As stated, "Mazandaran province can be divided into three general areas in terms of natural characteristics: mountainous areas with a cold climate, forested highlands (foothills) and plain areas. In the mountainous area, stone and wood are the main construction materials, in the forest area, wood is the main construction material, and in

the coastal and plain areas, wood and mud are the main construction materials [14]". Considering the aforementioned areas and the materials and materials available in them, the construction methods will be as follows:



Fig. 2. Vernacular architecture in Abbasabad County, blending tradition with ecological sustainability [15].

## 5 | Findings

### 5.1 | Research Community

Regarding the research topic, the research community can be considered as two groups. The first group is people who set up tourist accommodations in villages. People who try to provide hospitality and accommodation services at an acceptable level as a family and are trying to introduce their native culture in the best possible way. The second group is travelers and tourists who enthusiastically visit these ecotourism complexes and choose these centers as their tourism destination. They are interested in understanding the culture of different nationalities and the customs and traditions of different regions of Iran.

### 5.2 | Abbas Abad County

Abbas Abad County is one of the counties of Mazandaran Province in northern Iran, which is connected to Tonekabon County to the west, Chalus County to the east, the Caspian Sea to the north, and the Alborz Mountains and Kelardasht County to the south. The center of this county is Abbas Abad. The people of this county speak Mazandarani. This county includes the central districts (East Langarod and West Langarod), Salmanshahr (West Kelar Abad), and Kelar Abad (East Kelar and West Kelar).

According to the census of the Statistical Center of Iran, the population of Abbas Abad County in 1395 was 52,832 people. The historical name of the Abbas Abad region is Langa. The name Langa first appeared in the history of Mazandaran in 277 AH (about 1,100 years ago) as one of the settlements of western Tabarestan. Langa has always been mentioned as a settlement in the provinces of Royan in the times before the Alavid rule. In the past, the Royan region extended from the cities of Noor, Nowshahr, Chalus, Tonekabon, and sometimes its western border extended to Rudsar. Also, the two dialects of Tabari Kajuri and Tabari Kalar-Staghi are a subset of the ancient Royan dialect, which is spoken from Noor to Tonekabon. The Tabari Royan dialect was also the language of the rulers of Espahbod Royan.

### 5.3 | Climatic Analysis

According to the direction of the site, the prevailing winds will be from the main entrance of the site and the entrance to the site. In such a way that the north-south winds are the favorable summer winds and the west-east winds are the unfavorable winter prevailing winds. There is a natural and suitable view and landscape in the north (sea) and south (tree-covered mountains) of the site. The direction of the sun's radiation is as shown in the figure below.

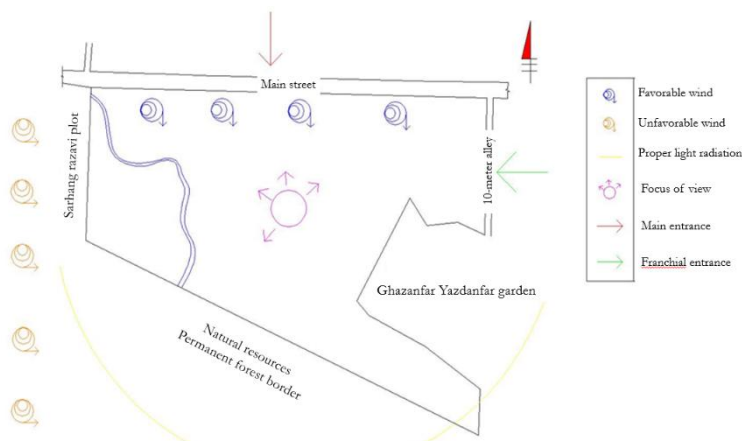


Fig. 3. Climatic analysis of the site.

### 5.4 | Views and Landscape

The site has a suitable natural base and naturally the quality of the land and its landscape will also be desirable. The unique location of the site, the site's leaning against the southern walls of the mountain covered with tall trees, having a higher elevation than the sea and of course enjoying a beautiful view of the sea, the presence of a beautiful spring upstream and the stream flowing into the ground have caused this site to not only enjoy attractive and enjoyable natural landscapes but also to have suitable and significant natural elements. *Table 1* shows the views and landscape from the site to the outside, and *Table 2* shows the significant natural elements of the site that will have a great impact on the attractiveness of the project.

Table 1. Site view.






| Existing View                                                                       |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |
| Northern view of the site                                                           | Southern view of the site                                                            |
|  |  |
| Western view of the site                                                            | Eastern view of the site                                                             |

Table 2. Natural hazards present on the site.

|                                                                                    |                     |
|------------------------------------------------------------------------------------|---------------------|
|   | The Spring Above    |
|   | Trees on the Site   |
|  | Rice Fields on Site |

## 5.5 | Physical Plan

The International Ecotourism Society (TIES) has provided a comprehensive definition for ecotourism: Ecotourism is responsible travel to natural areas in which the environment is preserved and the well-being of local people is emphasized. With the growth of the tourism industry, the demand for nature tourism, especially ecotourism and related branches such as rural tourism, agrotourism, etc., has increased. The World Tourism Organization estimates the growth in demand for 10-30 percent, while the annual growth in demand for tourism is 4 percent.

Ecotourism, from the perspective of the World Tourism Organization, has the following four characteristics:

- I. It is dependent on nature.
- II. It is ecologically sustainable.
- III. Education and interpretation of the site's values are its most important part.
- IV. Local and host communities participate in it.

Iran can be considered one of the world's leading countries in terms of natural capabilities. Biodiversity, diversity of ecosystems, climate diversity and the existence of four complete seasons, and in general, unparalleled natural attractions along with the authentic Iranian-Islamic culture indicate the high potential for the development of ecotourism and ecotourism in Iran.

## 5.6 | The Concept of Ecotourism Accommodations

- *Cause the least damage to the surrounding environment, both natural and cultural.*
- *Have the least possible impact on the surrounding natural environment during construction.*
- *Be appropriate and in harmony with the physical and cultural texture of the region and be built with respect to the shape, appearance, color and local architecture.*
- *Use sustainable methods to obtain and reduce water consumption.*
- *Have an efficient waste and wastewater disposal system.*
- *Use alternative energy sources as much as possible, while respecting the principles of sustainability.*
- *Work to cooperate with local associations.*
- *Organize educational programs about the natural and cultural environments of the region for employees and tourists.*
- *Contribute to the sustainable development of the region by participating in research programs.*

Based on the above interpretations, eco-friendly hotels are hotels that are built in natural environments, observing the highest possible level of environmental standards and in a manner compatible with the local architecture and natural landscape of the region. While interacting with the local community as much as possible, they provide the opportunity for nature lovers to stay and stay in natural environments with acceptable and defined quality. Obviously, considering the principles governing the sustainable development of ecotourism, ecotourism hotels will be built on a smaller scale than hotels of the same rank. During their construction and ranking, while paying attention to the principles of hotel management, special attention to the principles governing the sustainable development of ecotourism seems necessary.

## 5.7 | General Requirements and Conditions of Eco-Friendly Accommodations

- I. All eco-friendly hotels, while observing technical and engineering principles that guarantee the safety of the building's residents, are constructed using local materials and maximum local knowledge, and in complete harmony with the natural and cultural environment around them. During the operation and development of such hotels, the above principles will always be carefully observed.
- II. The interior and exterior design of all eco-friendly hotels must be carried out with the approach of maximum utilization of traditional and local furniture and equipment, and while ensuring the well-being of tourists, efforts should be made to give them the opportunity to get to know and understand the culture of the region while staying in eco-friendly hotels.
- III. Specific plans should be implemented in all eco-friendly hotels regarding waste management and recycling and optimal use of wastewater. The existence of eco-friendly hotels should not lead to environmental pollution of their surroundings under any circumstances.
- IV. All faucets in eco-friendly hotels should be selected from types that reduce water consumption. All lamps should be selected as energy-efficient, and the lighting of eco-tourism hotels should be such that, while providing the lighting needed by tourists, it creates minimal light pollution in the area.
- V. The heating and cooling system of eco-tourism hotels should, while providing the well-being of travelers, have minimal negative impact on the environment of the area. For this purpose, efforts should be made to observe the principles and forms of local architecture, benefit from local architectural principles and current technical knowledge, and witness the lowest level of heat leakage in the building of eco-tourism hotels.
- VI. It is mandatory to observe the principles of hygiene and cleanliness of all spaces of eco-tourism hotels (including the kitchen, tourist accommodation, bathrooms, etc.) in accordance with existing standards and regulations. Also, all employees of eco-tourism hotels must have a health card.
- VII. It is mandatory for all employees of eco-tourism hotels to wear local clothes while observing health and safety principles.

- VIII. All eco-friendly hotels are required to provide tourists with local food and drinks, using local table settings and observing hygiene principles, while respecting the taste of tourists.
- IX. All eco-friendly hotels must provide tourists with the necessary information about the surrounding natural and cultural environment in various ways (including brochures, signboards, photos, exhibitions, etc.). The presence of local guides and the provision of opportunities to visit the natural landscape and cultural context around such hotels by guides approved by the Cultural Heritage, Handicrafts and Tourism Organization are mandatory in all eco-friendly hotels.
- X. Given that eco-tourism hotels are located in natural environments and generally far from relief centers, it is essential that all eco-tourism hotels, while identifying the risks and incidents related to their activities and submitting them to the licensing authority in a report that will be reviewed every two years, take the necessary measures regarding the management of incidents within the geographical area of their activities (including interaction with local relief organizations, provision of relief equipment as needed and in accordance with the aforementioned report, etc.). It should be noted that all employees of eco-tourism hotels who are in contact with tourists are required to be familiar with the principles of first aid and relief.
- XI. Compliance with the laws and regulations of the Islamic Republic of Iran and tourists' awareness and adherence to the norms of the host society are required in all eco-tourism hotels. For this purpose, it is essential that the management of eco-tourism hotels, while explaining the regulations to tourists in a proper and respectful manner, establish the necessary interaction with them and local authorities in this regard.

## 5.8 | How to Classify Eco-Lodges

The minimum number of accommodation units in one- and two-star eco-lodges will be 4 units, three-star 6 units, and four- and five-star 8 units. Also, the maximum number of guests per accommodation unit is usually considered to be 4 people.

### 5.8.1 | Explanation

An eco-lodge hotel can include two or more accommodation complexes, provided that firstly, these complexes have a single management and secondly, there is a physical connection and easy access (on foot) between the complexes in question.

It is possible to build two or more eco-lodges with different levels and objectives of activity in an environment with a single management, provided that the activity of none of them has a negative impact on the performance of the other units.

### 5.8.2 | One-star eco-lodges

Their minimum number of accommodation units is calculated as 4 units.

For every two accommodation units, they must have a bathroom and toilet set, and a total of at least two active bathroom and toilet sets, one for women and the other for men.

They must have an independent place to receive passengers.

The possibility of passengers accessing the Internet network provides the basis for one-star eco-tourism hotels to be upgraded to a premium star.

### 5.8.3 | Two-star ecotourism accommodations

The minimum number of accommodation units is calculated as 4 units.

For every two accommodation units, they must have a bathroom and toilet set and a total of at least two active bathroom and toilet sets, one for women and the other for men.

They must have an independent place to receive passengers.

In all two-star ecotourism hotels, it must be possible to serve food and receive passengers in the accommodation units under their control.

They must have a space to display and sell local handicrafts and products.

The visible impact on the protection of the natural environment of the region or the access of tourists to the Internet network will provide the basis for upgrading two-star ecotourism hotels to two-star premium.

#### **5.8.4 | Three-star eco-friendly accommodations**

The minimum number of accommodation units in three-star eco-friendly hotels is 6 units, and in addition to having at least two bathrooms and toilets (separate for women and men), at least half of the accommodation units in three-star eco-friendly hotels will have independent bathrooms and toilets.

They must have an independent place to receive passengers.

All three-star eco-friendly hotels must have the possibility of serving food and receiving passengers in the accommodation units under their control.

They must have a space to display and sell local handicrafts and products.

If the required infrastructure is available, tourists must have access to the Internet in three-star eco-friendly hotels.

Creating an effective role in protecting the natural environment and biodiversity of the region and providing related services to tourists or using new energies will provide the basis for upgrading three-star eco-friendly hotels to three-star premium.

#### **5.8.5 | Four-star eco-friendly accommodations:**

The minimum number of accommodation units in four-star eco-friendly hotels is 8 units, all of which must have independent bathrooms and toilets.

They must have independent places for eating and serving passengers (teahouse) 24/7.

All four-star eco-friendly hotels must have the possibility of serving food and serving passengers in the accommodation units under their control.

They will have spaces for displaying and selling local handicrafts and products, and the handicrafts and local products will be offered to tourists with the highest possible quality.

If the required infrastructure exists, tourists must have access to the Internet in all accommodation units of four-star eco-tourism hotels.

The use of new energies is mandatory in four-star eco-tourism hotels.

All four-star eco-tourism hotels must play an effective role in protecting the cultural and natural environments and biodiversity of the region and present the results of their actions to tourists in the form of tourism products.

The existence of biodiversity restoration plans or the provision of thirty percent of the energy required by the complex will provide the basis for upgrading four-star eco-tourism hotels to four-star premium.

#### **5.8.6 | Five-star eco-friendly accommodations**

The minimum number of accommodation units in five-star eco-friendly hotels is 8 units, all of which must have independent bathrooms and toilets, and the services in them must be provided with the highest possible quality while observing environmental considerations.

They must have independent places for eating and entertaining passengers (teahouse).

In all five-star eco-friendly hotels, it must be possible to serve food and entertain passengers in the accommodation units under their control with the highest possible quality.

They must have spaces for displaying and selling local handicrafts and products, and local handicrafts and products must be offered to tourists with the highest possible quality.

If the required infrastructure is available, tourists must be able to access the Internet in all accommodation units of five-star eco-friendly hotels.

The use of new energies in five-star eco-tourism hotels is mandatory, and such hotels must provide at least thirty percent of their energy needs through renewable sources.

All five-star eco-tourism hotels must play an effective role in protecting the cultural and natural environments and biodiversity of the region and present the results of their actions in the form of tourism products (especially during the implementation of biodiversity protection plans such as dedicated enclosures, etc.) to tourists in the best possible way. It is mandatory to use all the tourism capacities of the region, deploy professional nature guides, and plan and implement nature tours of the highest possible quality alongside five-star eco-tourism hotels.

## 5.9 | Standardization, Monitoring of the Activities and Training of Employees of Eco-Tourism Accommodations

Provincial eco-tourism experts, in interaction with standardization and monitoring experts and tourism deputies of the General Departments of Cultural Heritage, Handicrafts and Tourism in all provinces of the country, will be responsible for standardizing and monitoring the performance of eco-tourism hotels. For this purpose, it is necessary to establish the necessary interaction and communication between the General Directorate of the National Committee for Nature Tourism and the General Directorate of Tourism Centers and Services at the headquarters level and within the framework of the Tourism Deputy of the Cultural Heritage, Handicrafts and Tourism Organization.

The General Directorate of the National Committee for Nature Tourism will determine the training topics for the employees of ecotourism hotels and provide the basis for their training as soon as possible and in interaction with the General Directorate of Education of the Tourism Deputy of the Cultural Heritage, Handicrafts and Tourism Organization.

## 6 | Conclusion

According to what was mentioned in all chapters of this research and the review of the results obtained and also the drawing of various alternatives, it was decided to consider the most responsive design to the main question of this research and to carry out a selected and appropriate design for the ecotourism complex in line with social sustainability in the region and in accordance with the local architectural patterns of the region. Sustainable tourism meets the needs of current tourists and host communities and at the same time develops and expands opportunities for the future and uses resources in a way that meets economic, social and aesthetic needs while preserving cultural values, ecological processes and biodiversity.

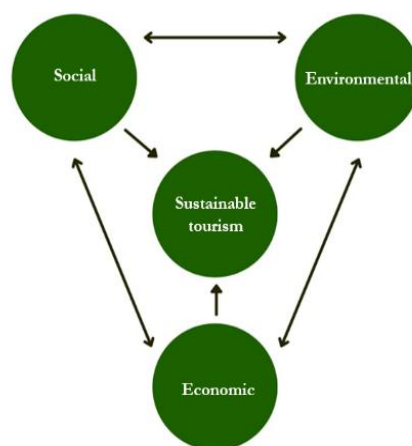


Fig. 4. Dimensions of sustainable tourism and the interrelationship between them.

Based on the research conducted and the materials presented in previous chapters, a comprehensive definition of ecotourism accommodations has been reached, and the constituent elements and key characteristics considered in an ecotourism complex have been presented.



Fig. 5. Vital goals of ecotourism resorts.

This study investigated the mechanical behavior of reinforced concrete containing rock wool fibers under cold and frost conditions. The results show that the incorporation of rock wool fibers improves both compressive and tensile strength, with the optimum performance achieved at a fiber content of 0.4%, while higher fiber contents lead to a reduction in concrete efficiency. The main outcomes of the experimental investigations are presented in the following points:

- I. Sustainable development of the destination and local community.
- II. Creating local businesses.
- III. Building trust for tourists.

Recognizing the components of local architecture in the use of decorations and proportions in the design of the Abbas Abad ecotourism resort influenced by the local architecture of the region. In order to achieve this goal, the local architecture of Mazandaran was examined and evaluated in detail and completely in the previous chapters, and all the architectural and structural characteristics of the local architecture of the region were described.

## Authors' Contributions

The author solely conducted the research and prepared the manuscript and has approved its final version.

## Data Availability

The data that support the findings of this study can be obtained from the corresponding author upon reasonable

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This research received no external funding.

## Conflict of Interest

The author declares that in this paper, there is no conflict of interests.

## Consent for Publication

Consent for publication has been obtained from the author.

## Ethics Approval and Consent to Participate

No studies involving human participants or animals were performed in this research.

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