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# MTA Genel Müdürlüğü, 2006b. Araştırma Alanının Topoğrafik Haritası, Konya. Feasibility of Ecotourism Absorption in Desert Zones

(Case study: Tezerjan Telecabin)

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## Abstract

Ecotourism is a modern phenomenon in which the tourists' principle motive is observation and pleasure of nature and phenomena and natural-cultural landscapes. We can consider it as one of the new source of income in the line of sustainable development of our province. The main object of this research is the examination and evaluation of natural phenomena which is attractive for tourism in order to recognize ecotourism fields and opportunities. Yazd province with an area of 131,551 square kilometers (the third province from an area view point) and with a population of about 880.000 is situated in the central plateau limits. The average yearly rainfall is 107 mm, the average yearly temperature is 18 degrees centigrade and the rate of proportional humidity is between 30 and 35 degrees. Yazd, as one of the regions with dry climate, has natural, historical and cultural attractions with tourist attraction potential. The city of Taft with the different climatic conditions in comparison with other regions (the average rainfall of 250mm) and with mountains and glacier is considered as tourism axis of province. With regard to ecological capability evaluation, ecotourism potential is obtained with GIS software and with tourism ecological model (Makhdam) in the Tezerjan region. In the mentioned region, areas with centralized outdoor recreation potential of grade 1 have very limited area that arising from limitation of soil, water, ground cover, and climate of this region. In the sites 1 and 2, they have a vast outdoor recreational potential of grade 2 and suggested sites 3 and 4 have grade 1 for centralized outdoor recreation.

**Keywords:** Ecotourism, Yazd, dry areas, industrial sustainable development

## 1. Introduction

In today world, optimized utilization of potential and existing facilities of any country has become one of the major local, national and international concerns within the framework of sustained development goals. This subject has more importance in dry and semi-dry regions of world and Iran, particularly in Yazd Province of Iran due to the vulnerability of the bio and live world resources and fragility of ecosystems.

Tourism is considered as one of the largest and most variable industry of world in modern time and many countries use this dynamic industry as a main source of income, job creation and development of their substructure. Ecotourism is a responsible trip to natural environments that contributes in protecting the environment as well as sustaining local people's economy. Tourism industry is the source of 5.1 percent of national income of world [10]. More than 50 percent of job difficulties in developing countries could be solved through tourism industry. In 2004, tourism has brought 75 billion dollars income for developing countries and 21 billion dollars of it; 28 percent, is the share of ecotourism [9].

Iran is in the first five countries with highest climatic varieties in world [7]. There are more than 160 mammal species, 500 species of birds, 270 species of fish and more than 800 species of plants, giving this country an actual capability to attract ecotourism. On the other hand, Iran receives only one hundred percent of foreign tourists in the world while in a twenty years perspective, it should raise tourism income to 25 billion dollars [8]. In 2004, Iran had the last rank among other countries in world tourism organization in terms of tourists and incomes [1].

Yazd province, as a significant example of dry and semi-dry regions of the world has special characteristics in ecologic, environmental...terms; therefore, in order to achieve sustained development, any interference and actions of human groups in natural environment such as agriculture, industry, services...must be performed based on full and comprehensive knowledge on the ecologic tolerance and ability of the zone. On the other hand, due to the richness of natural phenomena in the province, such as significant desert characteristics in dry plains, Kevir and beautiful mountain foots or natural views with variety of animal and plant species, in addition to having recreational aspect, it has the opportunity to be utilized in developing local communities, remove poverty and create job along with maintaining and protecting the ecosystems of the region. Assessment of environment power means assessing possible use of man from land for agriculture, range, forestry and park management (tourism protection), engineering affairs urban development, industrial and rural improvement [4].

In Iran, development of preparations land started at State Forests and Ranges Organization in 1956. The plans were initiated in 1960 by executing forestry plan in Visar woods (south Noshahr) [3]. Eventually, the plan was executed in range administration, urban development, park management, cattle breeding, fishery management...The goal of this research is to study and assess natural phenomena that attract tourism for the purpose of identification and introduction of ecotourism grounds and opportunities in Yazd Province. The assumption is that agricultural and industrial and mining activities, with respect to the environmental and ecological conditions of the zone could not meet the present and future demands. The abundance of natural phenomena and special climatic, geology, wild life...have provided necessary potential to benefit from potential and existing chances to improve tourism. Using those potentials, by expanding and improving tourism facilities would attract ecotourism and cause economic flourish of the region. Therefore, providing telecabin in Tezerjan zone is an example of increasing potentials for attracting tourism that could peruse the goal of introducing the attractiveness of zone for executing the plan in order to improve job creation for local forces and preventing migration of rural population to cities.

2. Materials and Methods

The research method is a combination of field, research and literature review studies. After evaluation of ecology power of the limit subject of study, the systemic analysis methods. This method is based on full identification of needed resources and map development. First, the entire resources and parameters were identified, their maps were prepared and then, by analyzing data that included table processing, a map and model in GIS is used to process information layers, overlap them and in next stage, make environmental units. By using ecologic model that is developed through conformity with specifications of study zone, the units are measured in power terms for centralized and expanded recreation usage. To prepare the unit map of land figure, the map of slope layers, height layers and geographic direction layers are combined together. The placement of layers is done by using ILWIS software and the code of land shape units was extracted from the three combination formula.

$E = [j3(j1(1-1) + ja) - 1] + j13$

J3= Total number of map layers

J1= Total number of layers of height

Jii= Number f floors of height map

I= Number of floor on slope map

J13= Number of floor of map

The Range Subject of Study

Province Yazd has 131,551 square kilometers is in the center of Iran and its neighbors are Ker-  
man, Isfahan, Fars and Khorasan provinces. The zone subject of study is located between 31  
northern degree and 54 eastern degree. The maximum height 3750 meters and minimum 2066  
meters, covering an area of 9,903,500 square meters, approximately 10 square kilometres [11].  
The situation of the region in the province is shown in Figure 1.

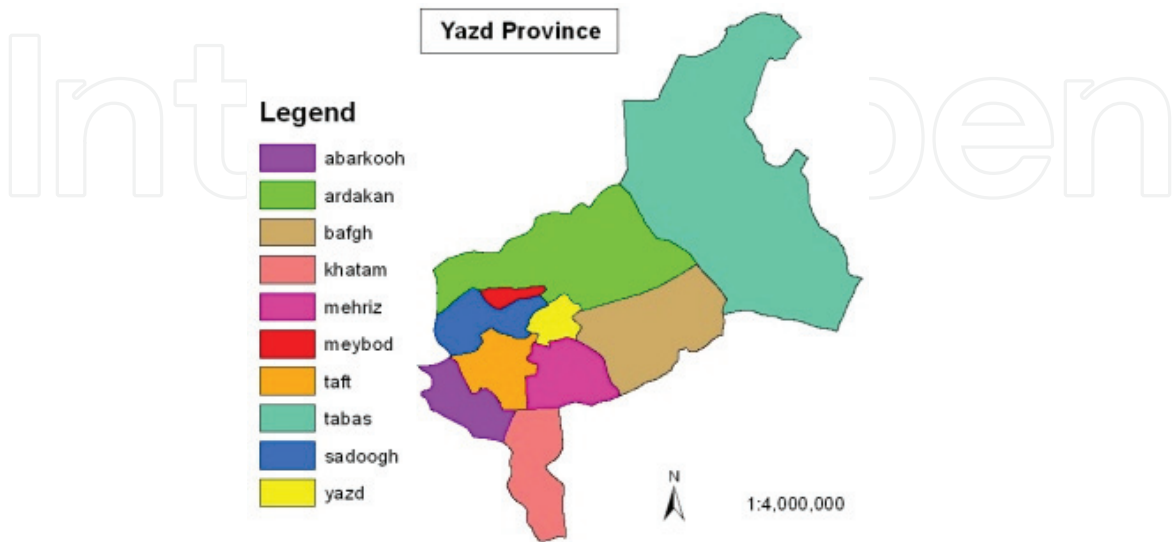


Figure 1. Political divisions of Yazd

### 3. Results

#### Natural attractions of the province

The geographic study of Yazd province shows that the existing situation of natural resources and environment of man is the product of long historical process. Yazd-Ardakan plain is one of the driest regions of the region as much that average rainfall of province is around 100 mm. There are several large and small desert pits around Yazd province, the most famous of them are Tafeh Taghestan, Abarkouh, Marvast and Daranjir [2]. Those deserts start from west part of the province that covers its east south and north and makes one of the ecotourism attractions of province. Those zones are visited by local and foreign eco-tourists.

In terms of hills and high lands, Yazd province is very variable. The heights of different spots vary from 850 meters from sea in Tabas to 4070 meters in Shir Kouh Mountains. This range of height leads to emergence of mountain foots and plains in Shirkouh range, among which, one might note Manshad, Dehbala, Tazarjan, Sanich...green valley [5].

There are several springs in the region, the most important of them are Gharbal Biz spring in 40 Klm of Yazd, Tamehr Spring in 6 kilometers south of Taft city. Touran Post boiling lime spring is one of the unique springs in Iran where hot water boils out of land along with gypsum minerals. In the lapse of time, the boiled water has created laminated salina hills.

Existence of many caves in the province, some of them containing remains of cavemen are among natural attractions. There are thirty caves in the province, including three groups of epic, historical and geological caves that are visited by many tourists each year. Province Yazd with its considerable area and special desert capabilities has high environmental value. Despite undesirable climatic conditions and limited resources of water, it is the wild life habitation of wild animals such as ewe, panther, deer, bustard and partridge, they could play role in tourists attraction.

#### 3.1. Climate

The climate subject of study, according to Amperage division has dry and cold climate. A considerable part of rainfall is snow fall. Average annual rainfall is 205 mm and mean average annual temperature is 11.4 centigrade degree. The temperature and rainfall maps are as follows.

#### 3.2. Hydrology and water resources

The hydrology and water resources of subject of study are located in Yazd-Ardakan hydrological unit. The water resources of the region consist of springs, subterranean canals and wells and due to the existence of Snow Mountains in the surface and underground water resources in spring, the amount of water shed is very high. Tezerjan underground water beds are of mountain beds. Among significant specifications of those beds one may point out the low thickness of alluvium, large grain alluvium deposits, high penetration and relatively low reserve of the bed. The floor rocks in all regions are Shirkouh granite and the direction of underground water flows are along topography slope

3.3. Slope and aspect

To prepare the drawings of land shape, height layers, slope and direction maps are needed. To prepare the map of height layers, the numerical models of height was classified as per table one. To assess the area between height lines, Planimeter and Ilwis software was used and the relevant curves were drawn in Excel software environment. With respect to mountain morphology of the mountain, the maps of height layers have been prepared in three floors.

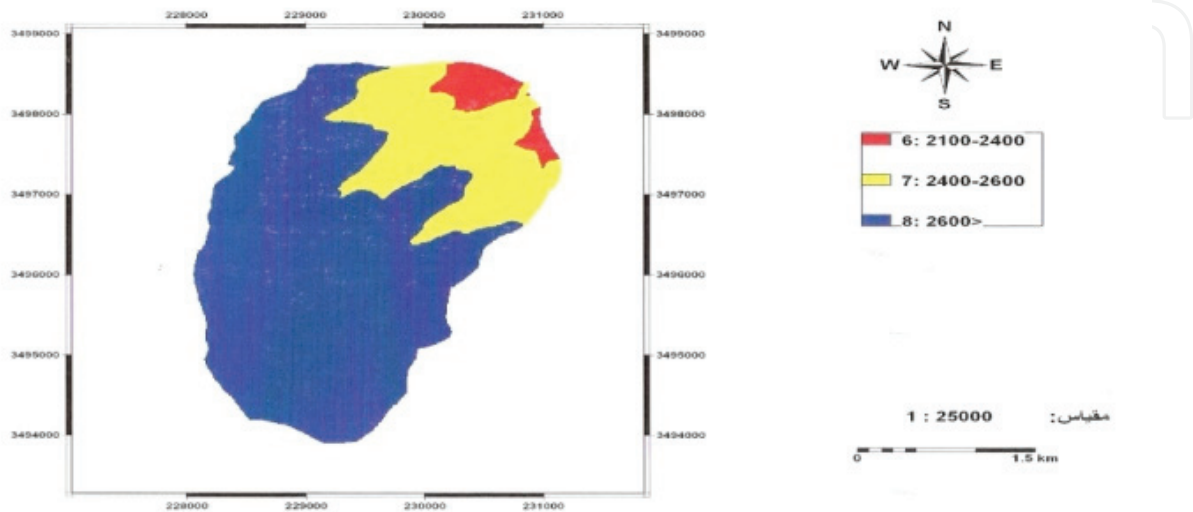
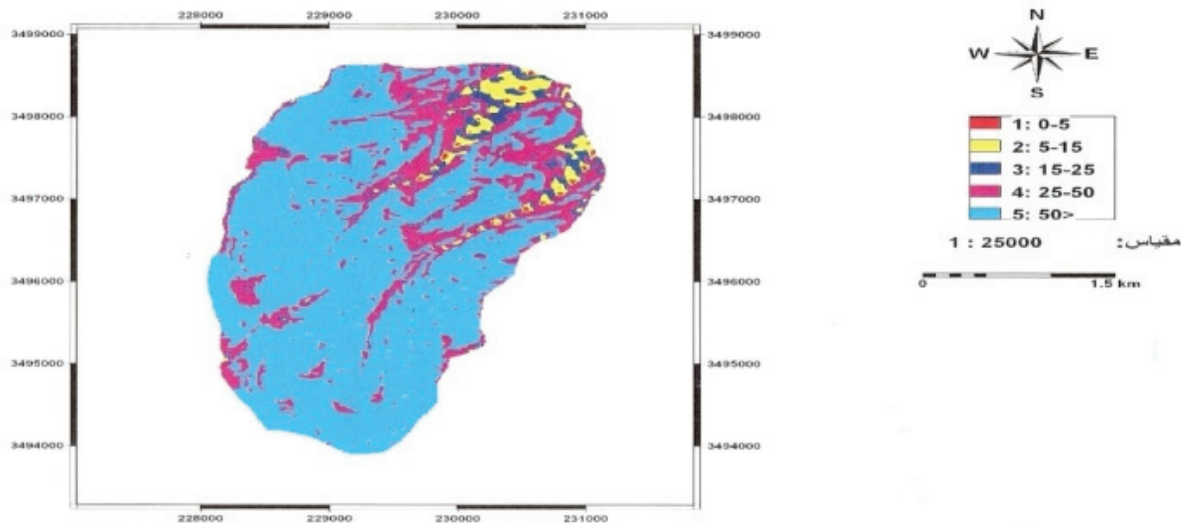
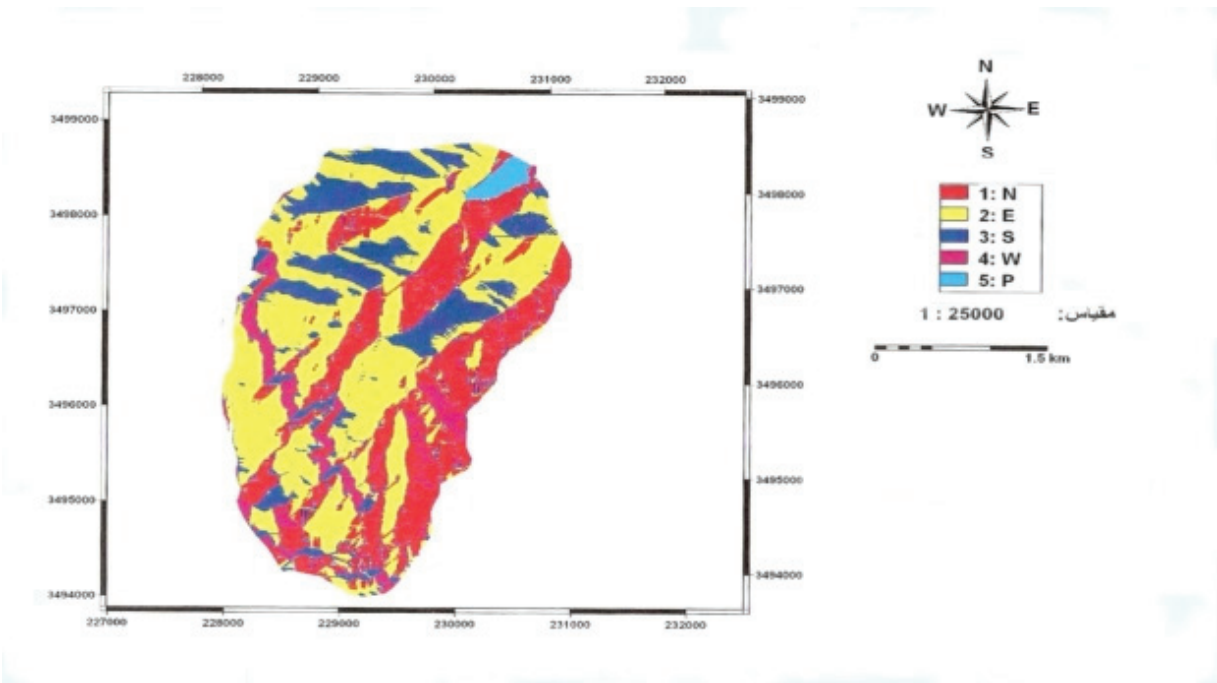


Figure 2. The height classes

Slope and aspect classification

Preparing slope classification is significant due to the importance of this parameter in using the land. The number of layers of slope of basin subject of study was determined with respect to the goal and type of plan usage. The geographic direction is effective on amount of receiving light and amount of light affects on the evaporation, perspiration and photosynthesis. Therefore, it is considered as an ecologic factor that could affect on frequency of plant society.





**Figure 3.** Classes for aspect and The slope of area

**3.4. Geology**

The geology and soil science show that in terms of texture of geology layers, the range of variety is not high. In large part of the area, Shirkouh granite is noticeable. In some parts, sand stone and cretaceous limes are located on Shirkouh granite. In addition, soil science studies show that there is no fertile and cultivable soil and the region is more consist of Rocky Mountains without soil. Most soils have light texture with pebbles.

**3.5. Vegetation**

Variety and compactness of natural vegetation is much limited in the area subject of study. Despite relatively good rainfalls, mountainous region and sharp slopes, particularly granite stone texture, the plants coverage development has been limited. The dominant vegetation of the region is mountain wormseed in +2400 meters height and plain wormseeds in less than 2400 meters height. In addition, there are different types of goat's thorn in the region. The vegetation coverage is less than 10%.

**4. Discussion and Conclusion**

**4.1. Evaluation of environmental power for tourism application**

In order to prepare a unit map of land, the maps of slope layers, height and geographic direction were mixed. The overlap is performed by using Ilwis software and the code and units of shape of land were given to the polygons through the three-combine formula, the results are in accordance with following table. The land units were prepared by GIS software. The unit map of shape of land and soil science map, slope, vegetation and plants coverage were overlapped

and ultimately, the map of environmental units were specified. Ultimately, the overlap steps, preparing environmental unit maps and specifications of each unit were compared with the ecologic models for that scope and its power for vast recreation and centralized applications were determined.

As shown in table number 1, in the scope subject of study, the range with centralized recreation power with first class desirability has limited area. This factor is due to the limitations of soil, water, vegetation and climate. The complex of those factors has lowered the ability of the zone for centralized recreation and risks its success. With respect to the principle of multi-use, the application of expanded recreation and centralized recreation usage are compatible. Thus, to implement this plan in the zone, it is sufficient to perform local zoning for selecting proposed sites of the origin and destination stations. With respect to the base map, decisions and studies, the suggested sites have been specified for centralized recreation. Sites 1 and 2 have expanded recreation power with quality degree 2 and have closest distance to the access roads. Therefore, it could be discussed as a suggested site for origin stations. Sites 3 and 4 have the advantage of centralized recreation with quality degree 2 and closeness to Tezerjan snow peak as well as beautiful view.

| Type                         | Area          | Limits the number in each class |
|------------------------------|---------------|---------------------------------|
| Intensive recreation class 1 | 3.918/462     | 5                               |
| Intensive recreation class 2 | 1.147.370/881 | 187                             |
| Extensive recreation class 1 | 4.034.100/933 | 850                             |
| Extensive recreation class 2 | 3.885.293/13  | 333                             |

Table 1. Tvansnjy range of model produced using

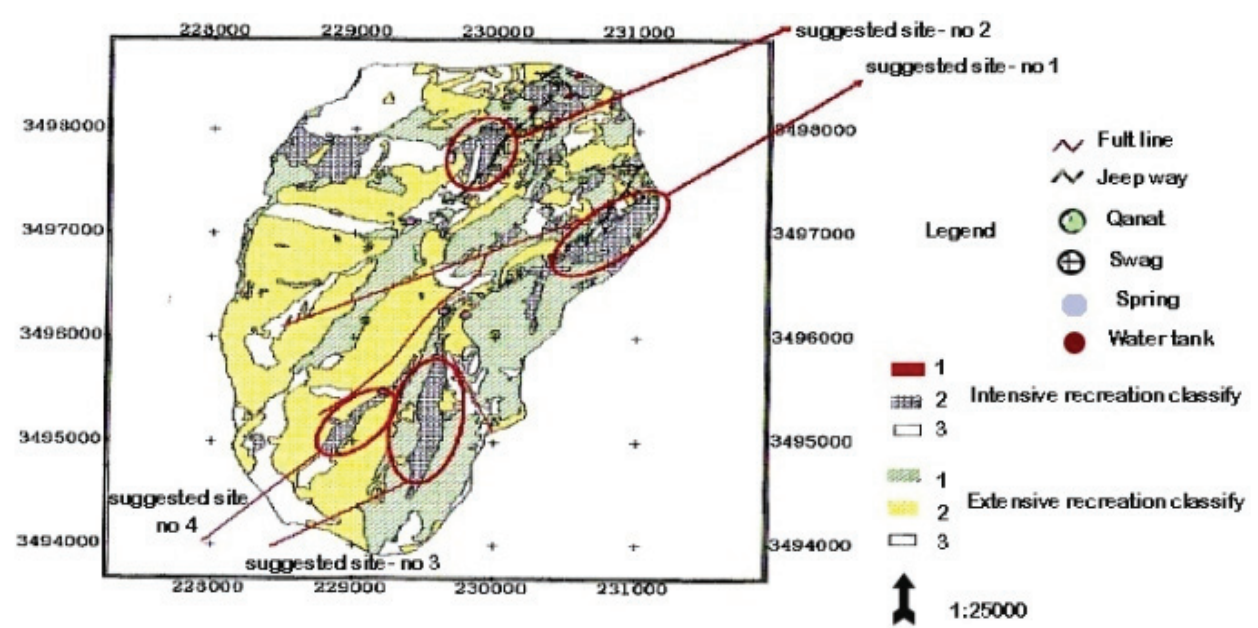


Figure 4. Map based decision making

## 5. References

- [1] Hosseini, H, 2004. Pact of Environmental Development of Yazd Province, Environment Protection dept. of Yazd Province. p. 67
- [2] Ghoabadian, A, 1982. Natural Figure of Yazd Province in connection with Desert Issues, first Ed. Mashhad .p. 41-54.
- [3] Gharenejad, H, 1996. Tourism Economy and Policymaking, Mani Publications. p. 23.
- [4] Makhdoum, M, 1999. Foundations of Land Preparation, Tehran University Press. p. 241-242.
- [5] Mehrshahi, D, 1989. A View on Geo-morphology of Yazd province, Journal of Geographic Researches, Research Foundations of Razavi Shrine, Vols. 15 .p. 54
- [6] Nasirzadeh, H, 2002. Tourism and Ecotourism Studies and their Impacts on Environmental and Development, Publications of Yazd Governor General Office.
- [7] Parsaian, A. Arabi, M, 1998. Tourism in Comprehensive Perspective, Publication of Cultural Researches
- [8] Rezaei, M, 2003. Ecotourism, Journal of Travel, 12<sup>th</sup> Year, No. 2.
- [9] Saghaei, M, 2007. Feasibility of Ecotourism Development in Iran, Regional Tourism and Sustained Development Congress
- [10] Sheybani, V, 2005. Tourism in Iran, Tehran, Research Center of Islamic Legislative Assembly. p. 191-193.
- [11] Zare, A, 2004. Comprehensive Plan of Economic, Social and Cultural Development of Yazd Province, Yazd Governor General Publication. p. 161-164.