

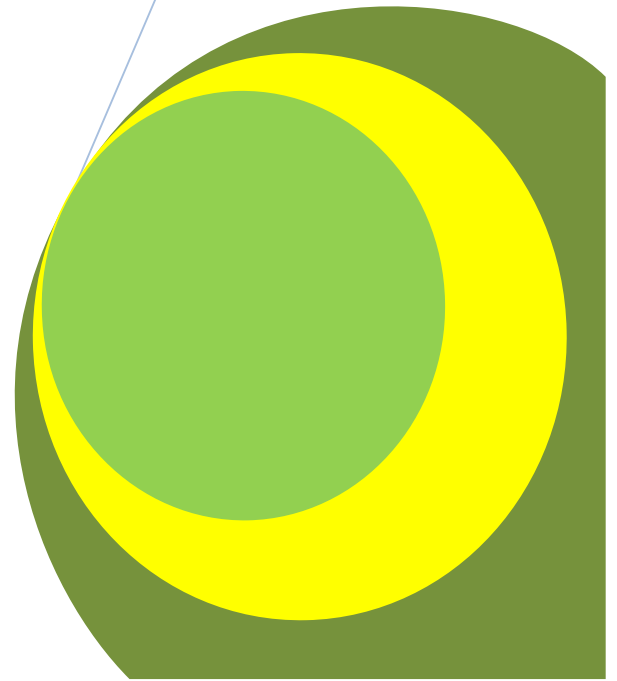
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## **Defining the Ecotourism Carrying Capacity of Langeroud City (Case Study: Khorma Forest)**

By

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*Research Article*

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## ABSTRACT

Since the early 1970s, tourism has been mentioned as a (smoke free industry) which mostly focuses on using and development of natural and cultural resources of the countries. Outdoor recreational use of the forest provides an appropriate strategy to conserve them because outdoor recreation issue in connection with the forest has been intermingled with conservation. Depending on the properties of each area, it has taken a specific status. If tourism is left uncontrolled, in addition to destruction of environment, it will threaten the identity and cultural bases of local societies. Taking this important issue will make inevitable the necessity to manage the influences of visitor's behaviour to control and adjust the adverse effect of tourism. Also, if forest lands lack a suitable pattern for tourism management, this will cause these areas to lose their characteristics on a wide range. Each area has a limited capacity to attract the tourists and related activities. These limitations are frequently formulated through integrating the carrying capacity in the frame work of sustainable development theory of tourism. Meanwhile, Khorma forest in Guilan province, Langeroud city, Otaghvar District, Oltaghvar rural district in Khorma village with 2801.5 h<sup>1</sup> area where study area is part of lands of Dehjan forestry plan, it is located in parcel 204, series 2, Rooreh rood catchments area. Dimension of study area was 1.9 h<sup>1</sup> of khorma forest selected as case study.

The aim of this study is to define the ecological capacity of the area for tourism, using GIS Arc 9.2 regions with 15387 m<sup>2</sup> (84%) identified as intensive use zone, regions with 1503 m<sup>2</sup> (8%) as conservation zone and regions with 246 m<sup>2</sup> (6%) as inappropriate zone with each area zoned according to the carrying capacity. Defining the consequences and effects of tourism activities and tourism carrying capacity in Khorma forest is performed to respond the sustainability issue in tourism practice in this forest. Required data was collected through field visits and interview of the local people, tourists and preserve guards in the area which included the use of a questionnaire consisted of 30 questions. It was distributed among and completed by 150 visitors in April and May 1392. According to International Union of Conservation of Nature and Natural Resources, using tourism carrying capacity (TCC), Tourism Carrying Capacity was evaluated in 3ways, This are Physical Carrying Capacity (PCC), Real Carrying Capacity (RCC) and Effective Carrying Capacity (ECC).

According to the results of carrying capacity formal, Physical Carrying Capacity in Khorma forest is 3712 persons/day while Real Carrying Capacity, considering limiting factors including the number of very hot days and the number of wet days, is 2001 persons/day.

Effective carrying capacity, taking the management capabilities including the number of manpower and the budget, 69 persons / day was calculated for Khorma forest. According to the results of the stuffy on the Khorma forest, effective carrying capacity is in low range due to lack of required facilities and infrastructures as well as manpower for management and providing tourism services for tourists. It is worth mentioning that effective carrying capacity can be improved through suitable planning to provide the required infrastructures, facilities and services and skilled man power.

**Key words:** Khorma forest (physical, effective, real) carrying capacity, ecotourism, tourism.

## INTRODUCTION

Touring or tourism generally is considered as recreational travelling. However, in recent years, it includes any travelling where a person exits his work place or residence. A person who performs the tourism is called tourist traveller.

Term tourist was coined when the middle class people tended to travel. This occurred when people had better standard of living.

Most tourists, more than any thing are interested in the Climate, culture or nature of their destination. Wealthy people frequently had travelled to the distant places. Of course, they had travelled accidentally rather than for any specific reason to visit the well-known Constructions and art works, learning new languages and different taste of various foods. Nowadays, organized tourism is a very important industry all over the world. This practice enjoyed regional, national and ultra national growth so that recently tourism industry has been suggested

in respect of systematic relationship and ultra sector and inter sector effects. It has created great influences on the economic boom of various countries so that it is considered in the same status as automotive and oil industry.

When tourists enter a country, they necessarily should pay some costs in that country, such as costs for food, residence, hotel and inn, recreation, transformation, touring, inflations as well the amounts paid for buying souvenir and the native goods of the country and the cost paid to enter museum or attractive places. These costs lead to economic boom of the host country through the foreign earnings to the host country. World tourists are also called invisible export. By expansion of tourism activities the ground is paved to create the employment. This is useful for countries facing increasing population and unemployment. From any 10 tourists entering to the country, a new employment opportunity is created. Tourism industry in Iran has great capacities for growth and development. Based on the report of Global Tourism organization, Iran is rated 10th in ancient and historic attractions and has rated 5th in the natural attractions globally. Iran is considered as the most secure country in the region and across the world in respect of safety for foreign tourists. In 2006 about 750/000 foreign tourists visited Iran. While in this year, 842 millions tourists travelled all over the world.

From view point of the experts, this industry has not gained the development deservedly. Among its reasons are: non preparedness of suitable economic grounds in Iran to attract the investors for construction of hotels and other secondary industries. Lack of awareness of investment opportunities existing in Iran and weak promotions, disseminations of negative news on Iran, social and religious limitations for foreign tourists and political tensions with some western countries are among other limitations for tourism industry's growth in Iran.

In contrast to Iran, some countries have succeeded to gain favourable results in tourism industry. For example just in 2007, about 15 million foreign tourists visited Dubai in united Arab Emirates in southern Persian Gulf. While Iran, with a contribution less than one fifteenth of the number of tourists of Dubai city in the same year, only accounted for 1 % of world income share form tourism industry.

### **Study problem: How much is the tourism is the Tourism Carrying Capacity of Khorma forest?**

**Aim: To** evaluate the Tourism Carrying Capacity in known forest and increasing the satisfaction and quality of tourists experience in this area.

**Objective:** Developing a strategy to initiate a tourism surveillance system.

### **Literature Review**

Davood Nahrly& Sahar Rezaey(1378) studied and presented the recreational carrying capacity. They studied the carrying capacity based on the various recreation activities as well on the type of recreational places and their relative capabilities.

Sanaz Glodooz and Majid Makhdoom (1383) studied the social psychologic carrying capacity of tourism in Takhtsoleyman as a holy place. In this study, they had defined the managerial indices effective on the evaluation of carrying capacity and developed the questionnaires according to these indices. They distributed these questionnaires among 150 persons. 140 visitors completed the questionnaires. Following the statistical analysis, socio- psychological carrying capacity determined the predicted density rate and encountering number. The number of tourists in summer was estimated 150 tourists maximally. Tabibian et al (1386) estimated the carrying capacity of Abbas Abad region- Ganjnameh in Hamedan. Firstly, they have indemnified the ecological capability and suitability of the territory for outdoor recreational development both in intensive and extensive use levels. Then they have calculated the carrying capacity of suitable areas for tourism development in the study area using the guideline developed by International Union of Conservation of Nature and Natural Resources. Results of this study indicated that carrying capacity of the areas suitable for tourism had decreased up to 98 % for both recreational classes.

Farhoody and Shoorcheh(1386) estimated the tourism carrying capacity based on the sustainable indicators changes (LAC) of the indicators and attempted to quantitatively estimate the physical real and effective capacity in the tourism region of Anahita temple in kangavar city.

Results of this study indicated that each tourism place has specific priorities different from other places. Thus it requires the related sustainable management. It was identified that the carrying capacity in this area is much lower than acceptable level.

Hosseinparvaresh, et al, (1389) identified the physical real and effective carrying capacity for Pahoo Residential Complex in Ganoo protected area. Firstly , they estimated the intensive use zone , then calculated the carrying capacity using IUCN technique. Mahmood Hasampoor , et al , (1390) studied the tourism carrying capacity in the desert areas of Shah dad and Mara jab in Aran and Bidgol city. Firstly, they identified the Effective Carrying Capacity indicators of the area and then using the quantitative technique of tourism carrying Capacity, they have calculated the number of tourists that can attend in intensive and extensive use ranges physically, really and effectively. According to the results of this study, presently, these areas in the intensive tourism are loaded more than their real carrying capacity.

Nghi, et al (2007) observed that in Quang Bin province particularly Nha-ke Bang phon national park in Vietnam, a lot of annual tourists are entering this area, due to ignorance on environmental practices, they destroy the environment at the result of unwanted activities. This has created environmental and social concerns. On this basis, researchers concluded that by estimating the carrying capacity of this area, a systematic, suitable plan will be developed to prevent the adverse effects of excessive presence of tourists. They have achieved tourism carrying capacity based on three indicators including ecologic, economic and social processes.

Results of this study indicated that people perform their greatest tourism activity as touring and walking during the day. Also it was found that averagely 71,000 persons daily visit this park which is much more than acceptable carrying capacity of the region.

Lijunzhang (2010) studied on the effect of economic indicator limit to evaluate the tourism carrying capacity for tourism purposes and activities. This study aimed to present the Carrying capacity limits based on quantitative description in tourism economic modelling. In this study, it was identified that according to the effects of tourism activities on the full time tourism carrying capacity, increased growth in the tourism demand is noted. This will decrease the temporal speed of tourism currents particularly in the crowded seasons of the year.

Marilan (2010) evaluated the carrying capacity of the area for using the sustainable land use plan. In this study, a wide range of methodological strategies to evaluate the carrying capacity was recognized, compared and studied. Also, in the study a wide range of key measures were used to compare the various factors of carrying capacity evaluation model including: uniform analysis system, dynamic response, risk taking levels, systemic limitations, applying for future planning and taking in to consideration the area boundaries. By combining and collecting these factors, wide range of connected data of the model was achieved based on practical Systems which are applicable in future.

### **The four features of ecotourism:**

Ecotourism has four features as follows:

- ❖ Depending on the nature
- ❖ Sustainable ecologically that is, free from lowest damage and adverse effects on the nature
- ❖ Training and presenting the values of visiting area, its major element should be visit
- ❖ Local and host societies should contribute in

### **Types of carrying capacity:**

#### **1. Physical carrying capacity:**

Physical carrying capacity was firstly applied for natural resources. In this technique, physical status of source was explained by taking its performance into consideration and it was defined that no physical system can tolerate excess exploitation. Frequently, this carrying capacity is used as a managerial tool in the protected areas and depends on defining a threshold beyond which environmental changes, disturbance and problems occur.

#### **2. Psychological (conceptual) carrying capacity:**

It is the lowest degree of desirability and benefit which new users of a developed region are prepared to accept before beginning the search to find an alternative place for the same use.

#### **3. Social Carrying capacity**

It will define the amount of a given effects resulting from tourists on the host societies as well as density tolerance rate by tourists.

#### **4. Economic Carrying Capacity**

It is including the capability to attract and accept the new activities without interrupting the traditional uses of native people.

#### **5. Ecological carrying capacity**

It is identified based on an evaluation of tolerable population of an ecosystem. It is also including an amount of tensions applied to the ecosystem depending on the number of persons and visiting activities which causes the ecologic value of ecosystem become unacceptable.

## 6. Environmental carrying capacity

It is estimation of total carrying capacities and represents an internal carrying capacity. In addition to the mentioned classification, another classification utilized in present study was selected based on the applied technique of evaluation of carrying capacity in the guideline of international union of conservation of nature and natural resources suggested in 1997 to calculate the carrying capacity of areas appropriate for tourism in the protected areas (Fick, 2003).

Based on this technique, carrying capacity of areas suitable for tourism is estimated in 3 levels: physical carrying capacity (PCC), real carrying capacity (RCC) and effective carrying capacity (ECC).

### Physical carrying capacity

It is maximum number of visitors who can attend physically in a given place and time.

### Real carrying capacity

It is maximum number of visitors of a recreational place which is calculated according to the limiting factors resulting from specific conditions of that place and influence of these factors on the physical carrying capacity.

It is worth noting that these limiting factors are considered according to the biophysical, ecological, social and managerial conditions and variables.

### Effective or permissible carrying capacity

It is considered as the maximum number of visitors of a place which exiting management has the capability to sustainable handle it. Effective carrying capacity is evaluated through the multiplication of tourism infrastructure capacity in the management capability based on the employees and budget and effect of these factors on the real carrying capacity.

### Study characteristics and geographic domain:

Langeroud city is located in 49° 54' to 50° 16' E longitude and 36° 4' to 37° 3' N Latitude this city is located at 21m above sea level. It is located on a green plain and is 10 km<sup>2</sup> from Caspian Sea. Its southern parts are covered by forest foots and its distance from the centre of province is 60 km<sup>2</sup>.

Langeroud leads to Lahijan city from north and west to Caspian Sea from east and from one side leads to Roodsar city and from south leads to Amlash.

Study area is part of lands of Dehjan forestry plan. Its location is parcel 204, series 2, Kooreh rood catchment area.

It is worth mentioning that the land has been designated in the forestry plan as a forest park. Its location from country division point of view is Guilan province, Langeroud city, Othaghvar District, Otaghvar rural district, Khorma village. Distances from effective points on its arena are province centre, Rasht, 75 km<sup>2</sup>, city centre, Langeroud, 25 km, otaghvar city, 10 km, Amlash city, 18 km, Komleh city, 19 km. It is general features are considering 1.9 h<sup>1</sup> area. Its geographic location based on UTM is: north: 125,103,4-south: 125,103,4-east: 809,412-west: 537,412.

Its four directions range is from north and east to Barkely river and paved road, from west to Barkely river and from south to the forest lands.

### Evaluating the ecologic power

The technique used in this study to analyze and summarize is derived from systemic analysis technique (Makhdum, 1385).

According to this technique, sources were identified, analyzed and summed up. For this purpose, firstly numerical topographic map of Khorma forest in 1: 25000 scale was provided by Guilan environmental organization. Then, this area was entered to the software system using the scanning and nermalizing technique. Then to define the precise borders of the study area, field work was started using GPS. Afterwards, the noted data was entered to the computer using Arc GIS 9.2 software. This way, precise border of study area was defined, and entered to the topographic map. This topographic map was utilized to draw other maps. Contour line features were used to map the slope percentage classes indicating various slops of an area. Firstly desired classes were categorized by GIS, then based on these classes (2 classes) slope percentage classes were mapped.

Maps of altitude classes and geographic directions, showing the altitude and direction of the area respectively, were drawn from topographic map. By integrating the base maps (slope, directions, altitude) in Arc GIS 9.2 software, land from unit was mapped. Soil of the area which is an important factor to plan for outdoor recreation was studied.

According to the available pedological data in the natural resources department and properties of the soil, across the plan range the soil texture is only clay Loam which is appropriate for outdoor recreation. Thus mapping of mentioned feature was not performed due to its similar role on the assembly of the layers.

To define the vegetation map, in the field operations type of trees and vegetation was identified using GPS and then vegetation map was identified using the noted data of this system and entering it to the software system. Finally, for more precise, holistic decision making on outdoor recreational use considering the soil texture and vegetation map, the area was integrated to land from map and the map of environmental units was drawn. Region with  $15387\text{m}^2$  (84%) were identified and zoned as intensive recreation, areas with  $1503\text{m}^2$  (8%) as conservation use and areas with  $1246\text{m}^2$  (6%) as inappropriate use. This way ecologic capability of area was achieved.

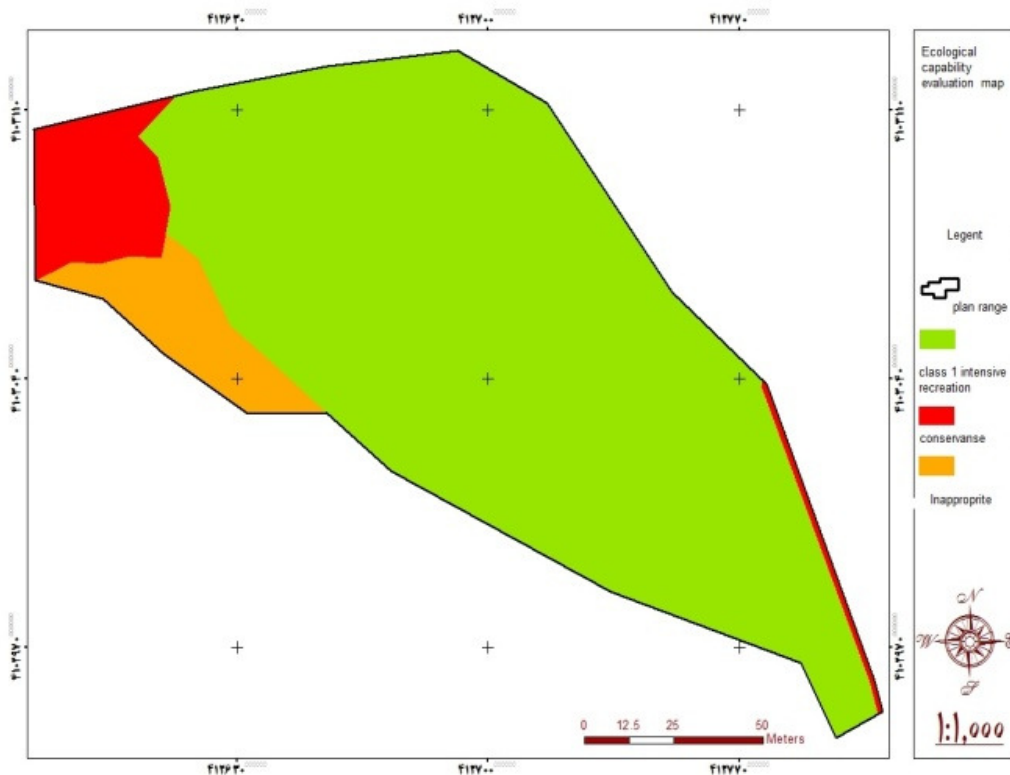


Figure 1: evaluation of ecologic capability Methodology

To evaluate the carrying capacity for tourism development in the study area, ecological capability and suitability of the area for outdoor recreational use was defined and related maps were developed. This study was performed in spring and summer (tourism season) in Khorma forest. Questionnaires were developed to collect the social and cultural information and then they were distributed among the visitors in the recreation season. to determine the effect of visitors in the area and satisfaction of visitors on the area. Finally, we have evaluated the tourism carrying capacity in the area.

#### Study on the managerial indicators to evaluate the social and psycho logic carrying capacity:

Social and psychological capacities were defined centrally relying on visitors opinions.

As the name of this type of capacity, generally it is characterized by interviewing to the visitors on their demands. That is, how many people, families, and groups leads to the relaxation places designed for them.

To define what social and psychological indicators are effective in the area, these indicators were developed as questionnaire and distributed among the tourists. A questionnaire consisting 30 questions was formulated and distributed among and completed by 150 visitors in Farvardin and Ordibehesht in 1392.

A number of questionnaires were excluded after precise study, due to deficiency. At the end 104 questionnaires were completed and used for final analysis.

After collecting and analyzing the date provided through the questionnaire, desired agreed tables were developed in EXCEL software space.

Table 1 statistic results of quantitative variables.

Variables	mean	Maximum	Mean	Standard deviation
Respondents age(year)	47	80	14	46
Respondents education number of years	10	20	0	14
Residence time in the area (hours)	4/75	9	0/5	6

Source :Questionnair findings , 1392.

### Utilizing TCC model to define the carrying capacity of khorma forest in 3 levels:

#### Physical carrying capacity, real carrying capacity, Effective or permissible carrying capacity.

In the suggested methodology by international union of conservation of nature and natural resources also 3 types of carrying capacity were considered to evaluate the carrying capacity of natural areas including : physical carrying capacity (PCC), Real carrying capacity (RCC) and Effective or permissible carrying capacity (ECC) (Tabibian, 1386). Figure (3.4) is related to the tourism carrying capacity evaluation procedure based on ICUN technique.

#### Defining the physical (PCC):

Physical carrying capacity is the maximum number of visitors which can attend physically in a day in Khorma forest. This type of capacity for Khorma forest is evaluated as follows:

$$PCC = A \times V/a \times R.f$$

The major date used to evaluate the physical carrying capacity and how to achieve each one is as follows:

#### Area suitable for tourism (A):

Location of the study area Khorma forest in this study are 19247 m<sup>2</sup> or 1/9<sup>hr</sup> that area suitable for tourism(A) for intensive recreation two are 16499 m<sup>2</sup> or 1/6<sup>hr</sup>.

#### Appropriate space for displacement of tourists (V/a):

This is considered as a space the visitors need to be able to move without encountering other persons. This data is collected through questionnaire. This horizontal space required for each visitor in Khorma forest is considered as 10 m<sup>2</sup>.

#### RF man time required for each visit during a year:

It is calculated through dividing the amount time usable in day for visitors on the mean time of a visit.

#### Duration of usability of Khorma forest:

The number of visits hours per day on Khorma forest, taking the lack of appropriate residential facilities in the area, is not more than 9 hours. Results of questionnaire affirms that in this study presence of tourist in the area is 9 hours, and according to the field survey by the author, and based on the questionnaire and interviewing with the tourists, local people and the authorities, most tourists visiting Khorma forest do not remain more than one day in the region and Khorma forest has limited number of tourists.

#### Visit duration:

Thus, according to the fact that duration of Khorma forest visit was 9 hours and average time required by tourists for touring and visiting various attractions of the region and resting is about 4 hours which represents the maximum number of hours to visit the are by tourists. This will decrease the tourist carrying capacity in Khorma forest.

Physical carrying capacity according to the formula is as follows:

Person per day

$$pcc = 16499 \times \frac{1}{10} \times \frac{9}{4} = 3712$$

Person per year

$$pcc = 3712 \times 365 = 1354880$$

#### Defining the real carrying capacity:

It is maximum number of tourists visiting Khorma forest. It is evaluated according to the limiting factors resulting from specific conditions of the place and influence of these factors on the physical carrying capacity. It is worth noting that these limiting factors are achieved taking the climatic conditions of Khorma forest such as the number of frost days per year, the number of rainy days and the number of very hot days in Khorma forest through the following relationships:

$Rcc = Pcc - cf_1 - cf_2 - \dots - cf_n$ , where of is a limiting factor stating in percent.

$Rcc = Pcc \times \frac{100 - cf_1}{100} - \frac{100 - cf_2}{100} - \frac{100 - cf_n}{100}$  Each limiting factor is calculated through the following formula:

$$CF = \frac{M_1}{M_t} \times 100$$

M1: Limited order of magnitude (size) of a variable,

Mt: total magnitude (size) of a variable,

Table 2 Total number of forest days

Year/month	April	May	Jun	July	August	September	October	November	December	January	February	March	Annual
1391	0	0	0	0	0	0	0	0	2	4	10	1	17

Table 3 Total number of rainy days

Year/month	April	May	Jun	July	August	September	October	November	December	January	February	March	Annual
1391	14	9	4	2	2	5	18	20	21	7	12	6	121

Table 4. Total number of hot days

Year/month	April	May	Jun	July	August	September	October	November	December	January	February	March	Annual
1391	2	5	8	11	14	9	0	0	0	0	0	0	49

#### Limiting factor: the number of rainy days:

From 365 days of the year, in average about 196 days in Khorma forest are rainy when tourism activities are actually impossible for ecotourism (Dericed from Guilan Meterology organization)

$$CF = \frac{121}{365} \times 100 = 33/15$$



### Limiting factor: the number of frost days and snow covered lands

Among 365 days of year, in average about 17 days in the Khorma forest are frost days and the land is covered with the snow.

(Derived from Guilan metrology organization)

$$CF = \frac{17}{365} \times 100 = 4/65$$

### Limiting factor: the number of very hot days:

Of 365 days in a year, in average about 49 days have very hot sun( extracted from Guilan meteorology organization)

$$FC = \frac{49}{365} \times 100 = 13/42$$

According to the set of achieved CFS, real carrying capacity of Khomam forest was estimated as follows :  
Person per year

$$RCC = 3712 \times \frac{100 - 33/15}{100} \times \frac{100 - 4/65}{100} \times \frac{100 - 13/42}{100} = 2001$$

Person per day

$$RCC = 2001 \times 365 = 730365$$

As expected, taking the limiting factors and its influence on the physical carrying capacity, real carrying capacity will be under estimated compared to the value calculated in the physical carrying capacity.

### Defining the effective carrying capacity

This type of capacity is known as the maximum visitors of a place the available management has the ability to handle them sustainable.

To study the effective carrying capacity we will use the management capabilities in the region.

These capabilities are divided to two parts:

$$ECC = RCC \times \frac{100 - FM}{100}$$

### Man power capacity

To study the man power capacity, the number of employees working in khorma forest to conserve and protect it is calculated:

$$FM = \frac{lmc - Amc}{lmc} \times 100$$

lmc= The number of ideal man power for tourism sustainable management.

Amc= The number of existing man power.

Forestry project of series 3 in Khorma forest located in the custody domain of Guilanian natural resources department which was sent to the supreme council through the letter with number 277.3 in 1387.5.17 by honourable assistant director of this organization in the affairs of northern forests, was studied by the members and introduced in the session of 87.9.3 with the features of 2801.5 total area of the project. It's executive program was passed after some reforms on the plan text. Presently 5 reserve guard are working in the region but the ideal number of reserve guard is given in the following table: Man power designated for this park is a follows

Table 5. power designated for this park

Status	Education grade		Work duration
Park Manager	Forest(or landscape) expert	1	All the year round
Guard	Diploma-under diploma	2	All the year round
Simple workman	Diploma-under diploma	6	6 month of the year
Total		9 person	

$$FM = \frac{9 - 2}{9} \times 100 = 77$$

### Expenditure budget capacity

In studying the expenditure budget rate of the area, according to the interview performed to the experts of Otaghvar forestry department, at present by taking the environment guard salary, this expenditure is estimated as 96,000,000 rials per year. According to the current and investment costs, it was estimated as 600,200,000 rials.

**Personnel costs:** Annual personnel cost was estimated for 9 staff of the park considering the new year gift money and rewards totally as 377,200,000 rials. Its worth mentioning that management, permanent guard man and other personnel are employed as daily paid. Monthly wages of employees are as follows:

Park manager: 4.500.000 rials  
 Guard man: 4.000.000 rials  
 Workman: 3.500.000 rials  
 Consumption costs per year  
 Electricity: 4.000.000 rials  
 Fuel, etc: 25.000.000 rials  
 Total estimates will be as 65.000.000 rials

### Table of investment costs:

Guard construction area is 36 m<sup>2</sup> with 2.500.000 unit cost and 5.000.000 total cost. The cost for equipping the guard construction for a unit is 20.000.000 with 20.000.000 total cost.

### Effective carrying capacity:

Person/ day

$$FM = \frac{60200000 - 96000000}{60200000} \times 100 = 84/8$$

Person/ year

$$ECC = 2001 \times \frac{100 - 77}{100} \times \frac{100 - 84/8}{100} = 69ECC = 69 \times 365 = 25185$$

At the end, taking the management capabilities in Khorma forest, the effective carrying capacity , i.e the number of people Khorma forest management has the ability to providing service for, was understanding compared the real carrying capacity.

### Results of comparing the physical, real and effective carrying capacity in Khorma forest

Table 6 comparing( the physical, real and effective carrying capacity)

	Physical Carrying Capacity (Person/day)	Real Carrying Capacity (Person/day)	Effective Carrying Capacity (Person/day)
Outdoor recreation range	3712	2001	69

Source: study findings; 1392

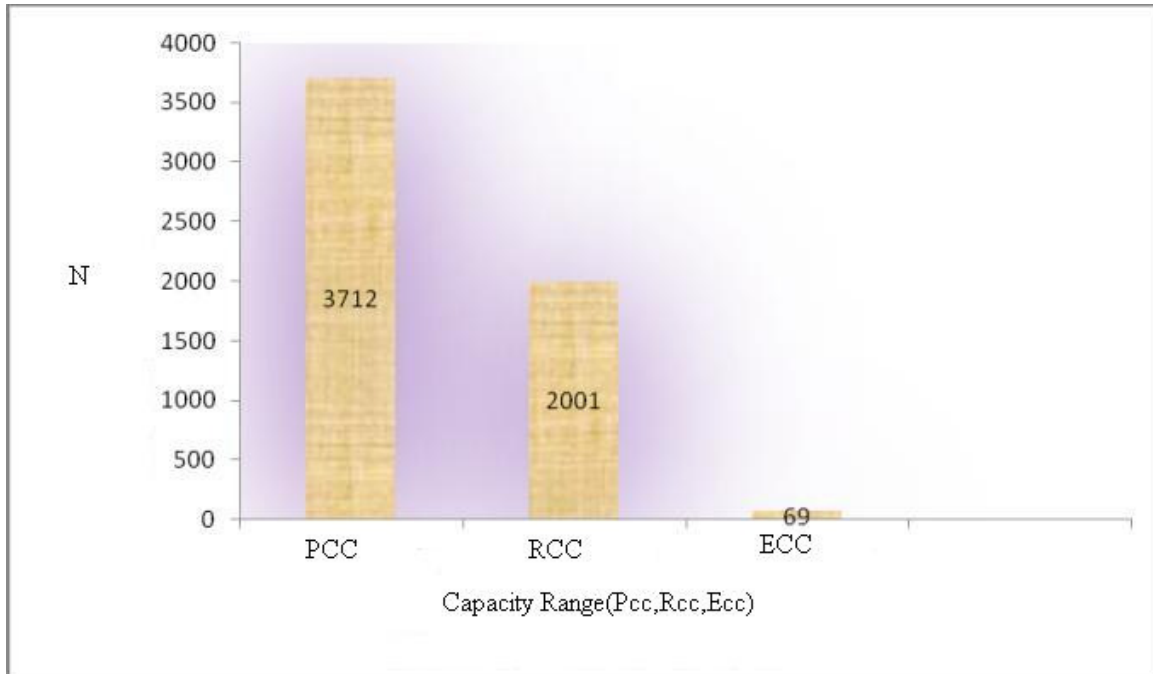


Figure 2. comparing ( physical , real, effective carrying capacity in Khorma forest).

## RESULTS

In present study, the objective was to measure and improve the tourism carrying capacity in Khorma forest for tourism sustainable tourism. In this regard, data analysis was performed using the model suggested by IUCN in physical, real and effective dimensions to measure the carrying capacity and the quality of tourism experience. According to the estimation of carrying capacities, firstly for estimating the physical carrying capacity, the appropriate area for tourism was considered as 1.6 h<sup>1</sup> of Khorma with class two intensive use capability. Then, the tourist dislocation optimum space was considered as 10 m<sup>2</sup> of Khorma forest for each person. Also in this report the number of visits or duration of usability of Khorma forest per day is 9 hours tourist presence in the area. According to the field visits of the tourists, duration of visit or mean time required by tourists to tour and visit was considered about 4 hours. Thus physical carrying capacity of Khorma forest was estimated 3712 persons/ day. Then to estimate the real carrying capacity, the limiting factors, including the number of rainy days, the number of forest days, the number of very hot days/ year were multiplied in physical carrying capacity. According to the formula, real carrying capacity was achieved as 2001 persons / day. Finally, the effective carrying capacity of Khorma forest was estimated through the management capabilities including man power capacity and expenditure budget capacity and by multiplying it in the real carrying capacity, effective carrying capacity with 69 persons/ day was achieved. Finally, taking the management capabilities in Khorma forest, effective carrying capacity i.e the number of persons management of Khorma forest has the ability to provide service for, was underestimated compared to the real carrying capacity. Also the visual observation performed in the area and according to the study on available facilities, it can be noted that lack of adequate safety around the river, the risk of rock fall in the foot, lack of suitable communication network in the area for easy access of tourists to the forest lands, high rate of crimes and offense, failure to control adequately by security authorities such as disciplinary force during various times of day and night and shortage of toilets all of which decrease the usability hours of this area. Caused that Khorma forest has a lower rate physical, real and effective carrying capacities. During the interview of the tourists of this forest, the quality of tourists experience was very low. So that most of them were not interested to travel to this area again, due to lack of facilities.

In the study area, due to lack of required service facilities and infrastructures as well as suitable man power for management and providing tourism services for tourists, effective carrying capacity is in a low level. It is worth mentioning that by a suitable planning to provide the required infrastructures and facilities as well as skilled man power, effective carrying capacity can be increased.

By studying the results, it can be found that environmental quality of mentioned area play an important role on the carrying capacity of the area.

On the other hand, the quality of tourism experience in Khorma forest is decreasing and only it is unique natural landscapes of forest lands, temperature climate, the countryside with beautiful landscapes with calm

atmosphere attract the tourists to this tourism area and appropriate tourists facilities failed to play a role on this regard.

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