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# Economic Evaluation of Khamir Hot Spring Complex Travel Cost Method

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## ABSTRACT

In this study, by using the Travel Cost Method, which is based on economical-social characteristics of tourists, cost increase and accessibility to the area, the promenading value of Bandar-E-Khamir's hot spring complex is estimated. This area, situated in Hormozgan state, has a pleasant and clean weather with hydrotherapy features in the west of Bandar-E-Khamir County. Results show that 35% of visitors were aged between 51-60, which is a result of the effectiveness and characteristic of the hot spring. And 43% chose the spring to visit that shows the area's natural environment importance.

Linear regression between the total costs of travel and the number of visitors shows a meaningful relation between them. Eventually, by identifying the relation between travel cost and visitor number, in each zone of the hot spring complex, the demand curves were drawn and by calculating the area under the curve, the touristic value of the area estimated as much as 7'432'695'000 Rials.

**KEYWORDS:** Travel Cost, Khamir Hot Spring, Economical Valuation.

## INTRODUCTION

Environmental economy intellectuals agree that economical valuation for services, non-trading benefits and environment is a crucial task to do and ignoring it, in long term, will has no results but regret (Kant, 2007) In Turner and Pier's point of view, Travel Cost Method (TCM), Hedonic Price Method (HPM), Contingent Valuation Method (CVM) and Choice Experiment approach are fitting in group of direct approach. Amongst the aforementioned methods to economical valuation of promenades, the Travel Cost Method is appropriate to valuation of promenades. The Travel Costs Method is based on tourists, their promenade behaviors and interests considering travel cost, time and natural resources.(Warden & Beal, 2000)

In 2012, Baharali economical value of case study of national park of Kaziranga in India by using valuation of travel costs concluded that the promenading value of the mentioned park is as much as 773'450 million dollar rupee in year, in 2012, Andualem evaluated the economic value of lions of Addis Abba's zoology park in Ethiopia by implementing travel costs method around 11767287 Birr per year, in another study in 2011, Mafi Gholami evaluated economic value of Poruz park, Choghakhor lagoon, Atashgah waterfall and Deymeh spring of Chahar Mahal-O-Bakhtiary, as much as 40715000, 44234600, 137239800 and 72385200 Rials, respectively. What is in our interest is the welfare not the money, when we are talking about money, our intention is not unethical economy and we don't undermine the environment's importance; But, totally in contrast, we believe that economical thinking brings up economical means which could be used in environmental purposes, the means that we've just started to use. So, we don't oppose the ethical and moral aspects of environment.

Promenade zone of Khamir hot spring (Lashteghan) by having great hydrotherapy features and separated ponds for men and women in location, great and pleasant weather around winter and spring and on the other hand locating nearby to Harra jungle of Khamir county and Persian Gulf, accepts a lot of tourists. The current study is aimed to valuate economic-social zone of hot spring of Khamir port in order to monetary evaluation of the zone and managerial approaches to improve the usage and avoid damage and sufficient understanding of managerial restrictions.

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## MATRIAL AND METHOD

Promenading Zone of Khamir hot spring, located in 7 km west of city of Khamir port, and in geographical coordinates of eastern 54°32’11” to 54°32’30” and northern 26°58’22” to 26°58’26”, which the available hot spring nearby caused many tourists to visit the area and the hot spring of Khamir has been chosen as a tourist destination and, currently, there are suits and camping and picnic facilities available for tourists.

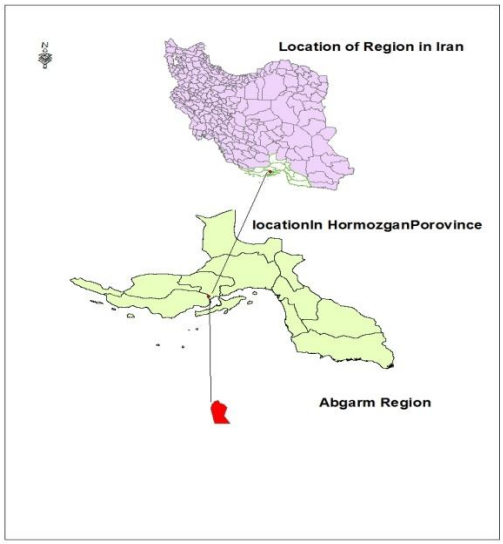



Fig 1- a view of the location and situation of Khamir port’s hot spring.

The study’s conducting method is based on gathering information and quantity and quality data, locating the geographical zone and surveying it, having the questionnaires filled by visitors, analyzing the gained data(from questionnaires) using Excel and SPSS computer software and finally concluding from the research. Questionnaires were distributed through a certain proportion of visitors (statistical population), randomly. In order to gather the initial data, 35 questionnaire were distributed through visitors of hot spring in the location. By calculating the variance of these 35 questionnaires and by using the Kukran Formulation (Pak and Fehimi Turker, 2005), the required number of needed questionnaires were conceived. Besides, considering the weather temperature, during summer and autumn questionnaires were distributed 3 times a month, and they were distributed weekly for winter and spring, resulting in 152 filled questionnaires.

In this study, the travel cost method was implemented in order to estimate the hot spring area’s value; because, gathering information through questionnaire distribution gives the opportunity to have a personal contact with visitors, and get to know their opinions to apply them in hot springs status and to use the received information in promenade planning, to result in gathering social value and the level of inclination to pay the entrance fee by rising the fee is defined by people(Mayor, 2007). The implemented method for economic and social investigation of hot spring complex of Khamir port was the travel cost method (TCM) by the following steps:

1- Defining the set of areas around the undercover area; this areas could be defined by drawing concentric circles (constant steps) around the area.
2- Gathering information about the number of visitors and the number of visits in defined time intervals (Day, Week, Month) for each undercover zone.
3- It is the calculation of the ratio of the number of visits per 10000 people in each area. This ratio is derived by dividing the total visits to the population in each 10000 people.
4- Calculating the average travel distance and time for a two-sided travel in each area.
5- Determining the relation between distance, travel cost, and the number of visitors of promenade, based on this we can evaluate the demand function for the average of visitors.
6- Drawing the demand function, using the conceived relation for the promenade.
7- Estimating the total economic benefit of the promenade for visitors through calculating the extra consumer comparing to the area below the demand curve.(Moons, 2003)

In order to opportunity cost time in this study, considering studies done on this topic, the average opportunity cost time for people is assumed ¼ of their daily income, which is the criterion in most of researches. (Dehghanian, 2002)

To evaluate the entrance fee of hot spring complex of Khamir port is assumed to be, hypothetically, 10000,15000, 20000, 25000,00000 Rials, in order to observe visitor's reaction against the fee increase. To draw the real demand curve of Khamir port's complex, the inclination to pay the entrance fee ( hypothetical fees) are taken as random variables and the number of visitors is taken as the dependent variable, which the people's demand curve is drawn based on that. In accordance to different entrance fee taken into account in this study and the number of visitors paired with each price, promenading value of touristic zone of Khamir port's hot spring is conceived based on relation No.2 (Willis,1991)

Relation No.2 $VR=\sum N.AP$

N= the total number of visitors per year for each entrance fee

VR= economic value of promenade

AP= considered entrance fee

## Conclusion

The basic premise of the travel cost method is that the time and travel cost expenses that people incur to visit a site represent the "price" of access to the site. Thus, peoples' willingness to pay to visit the site can be estimated based on the number of trips that people make at different travel costs. This is analogous to estimating peoples' willingness to pay for a marketed good based on the quantity demanded at different prices.

The travel cost method can be used to estimate the economic benefits or costs resulting from:

- changes in access costs for a recreational site
- elimination of an existing recreational site
- addition of a new recreational site
- changes in environmental quality at a recreational site

By calculating the variance 0f 35 questionnaires distributed amongst tourists and by using Kokaran formulation(Pak and Fehimi Turker,2005) the required number of questionnaires is calculated as much as 152 which by assuming 10% probability of visitors not participating, 165 number of questionnaires were prepared.

The results from the research showed that 53% of participants were female and 47% were men, 67.7% were married and 32.3 were single. Most of questioned people (24%) were aged between 41-50, and the least number (2%) were in age group of 71+. 43% of visitors stated that they like spring to visit the most. 38% of visitors of Khamir port's hot spring were from zone No.1 within a radius of 330 kilometers around the research location, and the least amount with 3% are from zone No.7. 58% of visitors were having a job, and 42% were jobless. 9% of visitors were illiterate or less-educated and 91% had a diploma to doctorate degree. 61% of visitors said they've got to know the hot spring by the voice of mouth from their friends and the least,3%, stated mass media as the source of introduction. 47% of people were getting there by their own vehicle and the least,2%, were arrived by boat and ferry to visit the place. In consider to the stay-time, the most were there for one day with 42%, and 2% were staying there for more than 3 days. Based on the number of visits, it was the fourth time of visiting for 26% of visitors, and the least, 10%, were the first time visitors of the hot spring. The most, 47%, enjoyed their visit with their families, and the least, 10%, were alone visitors. 45% of visitors were visiting the place with 1-5 other people beside them, and the least amount was for 16+ people in one group. 32% of visitors had a salary of 600-800 thousand tomans, and the least, 5%, had a salary more the 1 million tomans. 35% of visitors were thinking the stay was average, and the least, 9%, sated it was very poor. 41% of visitors were thinking the entrance payment up to 1000 tomans is the best price, and the least, 2%, were agreeing on 3000+ tomans as entrance fee. 32% of visitors were suggesting to rebuild the ponds of hot spring and the least suggestion was about building a new hotel. 92% were satisfied by the local people's behavior and 8% weren't. Valuation of promenade value of Khamir port's hot spring touristic complex

The value of Khamir port's hot spring touristic complex, is equal to the total value of entrance fee that visitors incline to pay.

Table 1- evaluation of population and travel cost in regard of each zone (prices in thousand Rials)

| Midle number visitor | Number visitor Retative to tenthousand | ecotourists No | Population (Ind) | Region |
|---|---|---|---|---|
| 5.96 | 14309 | 58 | 2.4 | **1** |
| 0.98 | 8388 | 34 | 8.5 | **2** |
| 0.47 | 6168 | 25 | 13 | **3** |
| 0.39 | 3454 | 14 | 8.7 | **4** |
| 0.14 | 2714 | 11 | 19 | **5** |
| 0.12 | 1480 | 6 | 11.7 | **6** |
| 0.1 | 987 | 4 | 9.7 | **7** |
| 0 | 0 | 0 | 1.8 | **8** |
| | 37500 | 152 | | **total** |

In table 1, the real amount of visitors in each zone is shown, which the most visitors were for zone 1 with 5.96 person in each 10000 people.

Table 2- calculating the cumulative percent of visitors

| Zone | Precent collective | Number | precent | Middle expence |
|---|---|---|---|---|
| 1 | 390 | 58 | 38.158 | 38.158 |
| 2 | 840 | 34 | 22.368 | 60.526 |
| 3 | 1500 | 25 | 16.447 | 76.974 |
| 4 | 2300 | 14 | 9.2105 | 86.184 |
| 5 | 3300 | 11 | 7.2368 | 93.124 |
| 6 | 3700 | 6 | 3.9474 | 97.368 |
| 7 | 3950 | 4 | 2.6316 | 100 |
| 8 | 0 | 0 | 0 | 0 |
| Total | | 152 | 100 | |

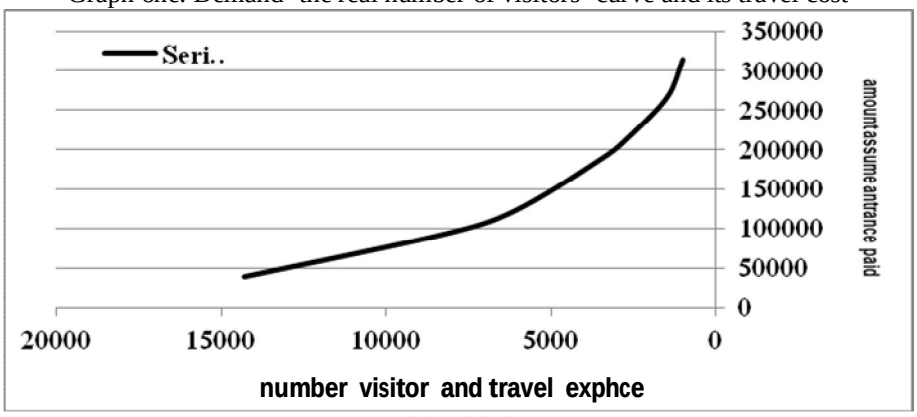
Considering the different entrance fees in this study and the number of visitors paired with each entrance fee, which is calculated and evaluated in table 3, the promenade value of the hot spring touristic complex is 7432695000 Rials per year, obviously, it will rise by the increase in number of visitors.

By taking a year equal to 365 days, the daily promenade value could be calculated too: VRD= 20363548 Rials

Table 3- calculation of promenade value of hot spring of Khamir port prices (Rials)

| promenade value of hot spring | The amount paid admission | Number of tourists |
|---|---|---|
| 187500000 | 5000 | 37500 |
| 372060000 | 10000 | 37206 |
| 556470000 | 15000 | 37098 |
| 739780000 | 20000 | 36989 |
| 922025000 | 25000 | 36881 |
| 1103160000 | 30000 | 36772 |
| 3551700000 | 100000 | 35517 |
| 7432695000 | | |

Graph one. Demand- the real number of visitors' curve and its travel cost




## DISCUSSION

The results of the survey might show that the economic benefits of preserving the site by not allowing mining are greater than the benefits received from allowing mining. If this were the case, the mining lease might not be issued, unless other factors override these results. Alternatively, the results might indicate that some mining scenarios are acceptable, in terms of economic costs and benefits. The results could then be used to rank different options, and to help select the most preferred option.

The travel cost method is relatively uncontroversial, because it is modeled on standard economic techniques for measuring value, and it uses information on actual behavior rather than verbal responses to hypothetical scenarios. It is based on the simple and well-founded assumption that travel costs reflect recreational value. It is often relatively inexpensive to apply.

The area of Khamir port's hot spring, having a virgin and beautiful nature, is a suitable destination for eco-tourists and economic value of this area in order to maximize the services to eco-tourists seems essential. The results

of this research shows that age, education level, salary and job of visitors doesn't have a considerable effect on their visit of the hot spring area. Most of visitors were coming to this complex with their families in age groups of 51-64 aiming to hydrotherapy and spending some free time. Around 26% of interviewed people were visiting the place for more the 4 times which this number of visit is more than the eco-tourist capacity of the area. The most people were introduced to area by their friends and the least were getting informed via media, which should be addressed by proper measures and actions from responsible organizations. In relation to the determined entrance fee for visitors of Kahmir port's hot spring, by increasing the entrance fee the number of visitors would plumb. A meaningful regression relation ($r^2$ =0.85) is conceived between the total expense as a random variable and the number of total variable as a dependent variable, and shows a negative linear relation between these two variables, consequently, by increasing the fee, the number of visitors will decline.

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