

Salt Lake Economy and Determination of Protection Value of Salt Lake in Turkey

Dr. Aynur Demir

Department of Environmental Protection Technologies, Aksaray University, Aksaray, Turkey

e-mail: aynurdemir@aksaray.edu.tr

ABSTRACT: In this research, the recreational and protection value of the Salt Lake was determined through the Individual Travel Cost Method. For this purpose, 300 on-site questionnaires were administered to the local visitors. By applying certain criteria to these questionnaires, 280 cases were selected for the economic analysis. Travel costs, alternative recreation areas, the socio-economic variables of visitors such as education, age and income level, were taken as the independent variables in the Salt Lake demand function, while the total number of visits was selected as the dependent variable. In these economic analysis results, the individual consumer surplus was identified as \$24/years. At the same time, this value is the protection value of Salt Lake in Turkey. The results showed that to be correlated between the user features and the recreational trends, and to be interpreted their results were the most important stage of rational recreational planning.

Key words: The Salt Lake, recreational value, Travel Cost Method, economic value, natural areas. protection value

Introduction

Salt Lake have important aesthetic, cultural, economic, recreational, scientific, conservational and ecological values. They provide nesting and breeding sites especially for migrating birds. Salt Lake which was declared as a Specially Protected Area and one of the hotspots of Turkey, is rich in halophytic endemic plant species and also on the route of immigrant birds and provides suitable areas for them. This area not only has an ecological importance but also has an economical importance. It is also one of the important salt resources of Turkey. The Salt Lake, which does not exceed the half metre deep in most places, turns to a bird paradise with the winter raining. With its large water areas, the Salt Lake is an important habitat for collared pratincole (*Glareola pratincola*), shelduck (*Tadorna tadorna*) and especially for flamingos (*Phoenicopterus ruber*) (1,2,3). Since the lake environment is secluded, birds are easily fed in puddles, meadows and plantations around and they can swim in the waters, which do not freeze even in the coldest months of winter. It is possible to come across incubation colonies consisting of thousands of flamingos in the islands in the lake (Fig. 1a-b).

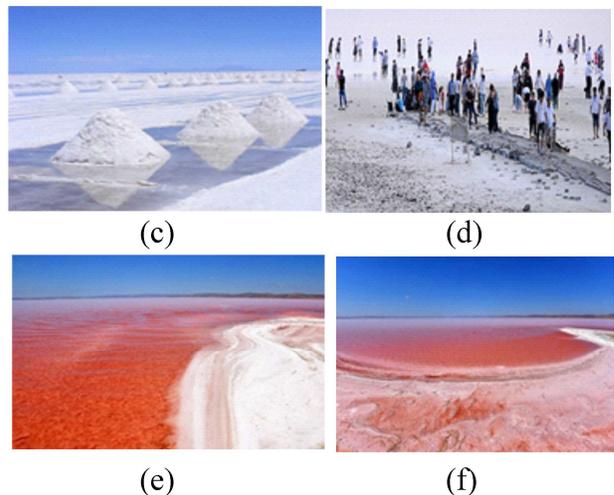


Figure 1. Some panoramas from Salt Lake in Turkey (<http://www.hurhaber.com/tuz-golu-nun-rengi-kirmizi-oldu-haberi-7770.html>) (13.10.2016)

With the evaporation of the lake's water in summer, the surface becomes covered by salt crystals and forms the ground of a vast plateau (Fig. 1c). When the sun starts to set, the colourful light beams falling on this crystallized whiteness and scattering around set a heavenly scene. Beyond this marvellous beauty, the Salt Lake is coloured with red especially in the summer due to the variety of microorganisms (Fig. 1e-f). Drawing the attention of local and foreign tourists, this redness forms a unique and spectacular view. For this reason, the Salt Lake is the heaven of photography for amateur and professional

photographers and it is significant in terms of recreation (Fig. 1d).

The recreation economy related with the demand and the supply of natural sources, which were needed for the recreational aims (4,5). Recently, some methods have been developed to determine the economic value for the recreation spaces, which have not got the monetary value. These methods may be divided into two groups as direct and indirect methods. Indirect methods followed how the economic indicators were working and they were based on the determining of represented value in account of different environmental elements, while direct methods used surveys to ask individuals' valuations for these goods in a hypothetical market (6, 7). In this way, it can be determined the rational preferences of individuals about the recreation or ecotourism spaces.

The Travel Cost Method (TCM) was the most common indirect method used to estimate the recreational and ecotourism use value of natural areas. This method was initially suggested by Harold Hotelling in the 1930s as a potential means of valuing national parks. Clawson and Knetsch developed Hotellings approach and used the name Travel Cost Method (4, 6, 8, 9). The method was applied in two different ways, namely the Individual Travel Cost Method (ITCM) and the Zonal Travel Cost Method (ZTCM) (10).

In this research, the Salt Lake's use value for ecotourism was determined through the Individual Travel Cost Method. In estimating the economic value of the natural area of the Salt Lake, the main aim was to determine the benefit value that provided by its rational use as recreational space. This value determination which was supplied to take account of present and future benefits of environmental elements and thus, this determination will be a directive way to take political decisions about the rational use of protected areas like the Salt Lake. The main aim of this research was to emphasise the importance of utilising from information about the active and potential user eatures and demands, and about the using of natural areas for recreation and protection value. At the same time, this research will contribute to the economic value determination studies of the using of natural sources for recreational purposes and the social benefit and cost comparisons in the analysis of local development projects to be reflected to the national income accounts of natural sources. Turkey has rather limited research on the recreational use and the economic value of the Salt

Lake. This research will resolve an important deficiency in this area.

Materials and Methods

The Individual TCM was used to determine to the economic value for the recreation. TCM was one of the special methods based on the consumer surplus to determine the economic value of the services of natural sources, which have not got any market. In the TCM, which was made of the recreation demand analysis, a number of visits to the space were related with the travel cost, the travel time and the other demographic and local variables (4,11,12). In other words, in a certain period, the numbers of visitation to the recreation space was expressed as a function of socio-economic variables, which determine the travel cost of individuals and the visit of individuals. The TCM demand function was shown as a production function of the relationship between the space demand and expenditures in the space (Equation 1) (4, 5). The Salt Lake demand function, which was formed using the half logarithmic function model, is shown at Equation (1). According to this:

$$V_{it} = f(TC_{it}, D_i, A_i, E_i, HI_i) \quad (1)$$

In this equation, V_{it} = The annual visiting number for each person to the Salt Lake, TC_{it} = The travel cost for each person to the Salt Lake, D_i = Alternative region, for Ihlara Valley 0-1 dummy variable, A_i = Age, E_i = Education, HI_i = Household income.

The consumer surplus has expressed the difference between the accepted price to buy the goods or services by a consumer and the paid balance price in the market (4, 9). In the calculation of consumer surplus, annual visiting number was taken as the dependent variable, while data about visitors and travel features were selected as the independent variables. The travel expenses were taken as the travel cost per person, which was obtained from the total travel cost variable, which was divided by the number of individuals in the group. The total travel cost includes the transportation costs, the opportunity cost of time, etc.¹ The bus prices of cities around the Salt Lake were accepted as a reference for visitors who came by bus and average round-trip cost was calculated as \$20. In this research, in the calculation of time opportunity cost, it was accepted that Casario's suggestion, which was based 1/3 of hourly wages rates 12 and to accumulate to the consumer surplus, was used Equation (2) (1):

$$CSSL = q / -^2SL \quad (2)$$

In the equation: CS = Consumer surplus, q = Average of the total annual number of visits, a = Curve of the demand function (cost coefficient).

The survey form was the source of obtained data from the field and the research was prepared according to region's features and similar studies, which were examined. In the survey form, which was used for the implementation of TCM, the questions were about visitor's expenses in the Salt Lake and their socio-economic features. This survey was applied for all local visitors in the dates between 25th June and 10th July 2013. The survey was applied in weekends and weekdays for only the volunteer visitors. Foreign tourists did not take part in the survey, because they have come to the Salt Lake via tours, which make it more difficult to accumulate their individual travel cost. However, in this field study, no official data about the exact number of the Salt Lake visitors was available (local or not). Therefore, a sample could not be established.

The target audience of the questionnaires performed in the process of the survey study were the visitors of Salt Lake who were over the age of 18. In total 300 surveys were applied to the local visitors via face to face interview in the field, 280 surveys were evaluated for the economic analysis to allow the implementation of TCM. The survey data was brought to the numeric form using the SPSS 15.0 for Windows programme and thus, it was created into a database. In the next level, data were analysed.

Results and Discussion

A total of 280 surveys was evaluated on the Salt Lake in the statistical analysis. According to the data obtained from analysis, 45% of the visitors were male and 55% were female (Table 1). The results showed that women were more interested in types of social activities. When visitors were analysed according to age groups, the majority of visitors, 70.3%, were between the ages of 26-45. The 36-45 age groups of visitors were 35.7% and the 26-35 age groups of visitors 34.6%. It was seen that 59.1% of the Salt Lake visitors were graduated and post graduated from university, and 28.6% were from high school (Table 1). This situation showed that there was a positive relationship between education level and the using of the Salt Lake for recreational aims.

(Footnotes)¹

. In the calculation of travel cost, car running costs were estimated at £0.35 (\$0.5) per mile, which figure takes account of the cost of petrol plus costs such as depreciation, road tax, insurance and service costs (13).

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Table 1. Travel Cost Method according to survey results demographic distribution.

Participants were evaluated according to their profession groups: 31.5% of participants were self-employed, 18.2% worked for the state, 18.2% had an annual income between \$5,001-10,000, 26% had \$10,001-15,000 and 15.1% had \$15,001-20,000 (Table 1). This showed that 40% of participants had the average annual income \$10,000-20,000. In the TCM studies, the most important independent

variable that determined the consumer surplus was the travel cost. In this research, it is taken as the travel cost, the fuel and time opportunity cost for visitors who came to the lake by their car and the bus price and time opportunity cost for the visitors who came to the lake by bus. According to this, the total travel cost was accumulated as \$140/each person for coming by their car and was calculated as \$75/each person for coming by bus. In this situation, the individual total travel cost was changing between \$75 and \$140.



Fig. 2. Ihlara Walley, Aksaray in Turkey (<http://asucem.aksaray.edu.tr/>) (13.10.2016)

It was recommended Ihlara Walley (fig. 2.) to the visitors in the same field as alternative recreation space and Ihlara Walley was taken as the independent variables. It is determined that 89.3% of the participants had information about Ihlara Walley (Table 1). This showed that Ihlara Walley, where has been in the same fields, was an important recreation and tourism space for visitors.

In the Individual TCM, the number of individual visits during one year was taken as the dependent variables. A single annual visit to The Salt Lake was the most common rate at 51.7%, visiting twice per year was 28.8% and three visits or more 19.5%. The average visiting rate was 2.45 in one year. Of the Salt Lake visitors 7.8% lived in Aksaray, 92.2% were living in nearby cities such as Ankara, Konya and Nevşehir and they explained that they visited the the Salt Lake for recreation (Table 1).

Results about the demand function: The function was used “the half logarithmic function” in the accumulation of consumer surplus and in the creation of demand model of the Salt Lake protection area. The half logarithmic function, which was selected for simple recreation analysis, was very important in the 0.01 level (Table 2).

Table 2. Variance Analysis

Models	Sum of Squares	df value	Mean Square	F value	Significance
Regression	5.379	5	1.076	3.605**	0.004
Residue	81.781	274	0.298		
Total	87.161	279			

**Significant at 1% alpha lev

The results, which were obtained through model variables, were compatible with theoretical expectations in the travel cost implementation. The settlement place distance variable received a negative value (-) ², which showed that there was an opposite relationship between the settlement place distance and the number visiting within one year. In other words, when the settlement distance was increased, the number of visiting decreased. Age, education and income level were independent variables, which affected the number visiting positively. However, “alternative region” variables took a negative value (-). This means, to have an alternative recreation space affected the number of annual travel negatively (Table 3).

Table 3. Coefficients

Models Variables	Coefficient of Regression (β)	Std. Error	t-statistic	p-value
Constant (a)	0.444	0.223	1.987	0.048
Travel costs	-0.0000051	0.011	-1.976	0.049
Age	0.006	0.036	1.657	0.099
Education	0.006	0.031	2.082	0.038
Household income	0.03	0.030	1.285	0.012
Alternative sites	-0.108	0.081	-1.323	0.187

In the research and in the used model, it was seen that the socio-economic independent variables such as the travel cost, age, education and income level explained that 62% of visitors to the Salt Lake Protection Area for recreation and protection value of Salt Lake (Table 4).

Table 4 Model Summary

Models	R value	R ² value	Adjusted R ² value	Standard error of the Estimate
1	0.248	0.62	0.45	0.546326

Equation (2) was used in the accumulation of individual consumer surplus. According to this, the average visit of 280 visitors, who joined the analysis, was 2.45 to the Salt Lake Protection area for recreational purposes. Accordingly, the individual consumer surplus was accumulated at \$24. At the same time, this value is the protection value of Salt Lake. There was not any official record about the number of annual visitor of the Salt Lake. However, if it was assumed that about 20,000-30,000 local visitors visited to the Salt Lake annually, then it would be accumulated that the total minimum consumer surplus was \$5,000,000/year. The value of consumer surplus showed the use value of the

Salt Lake Protection Area. In other words, only local visitors were providing \$5 million social benefit from the Salt Lake Protection Area.

Conclusions

The demand for the Salt Lake recreation space has changed depending on expectations like the expectation of visiting, the attractiveness, the quality in the recreation space, the tastes and preferences, the substitution recreation spaces, protection value and socio-economic variables such as the incurred costs, income, education, age. In this context, some recommendations were presented. For example, around the Salt Lake it can be constituted information boards and the cruise port/towers without causing annoyance to the birds and without destroy their natural habitat in their incubation period. Also, visual and auditory information systems of the Lake views can be prepared for visitors to see the different seasons and different times of day. The natural views of the Salt Lake, which the Salt Lake ruddiness, Salt Lake images similar to human silhouette, flamingos, etc. can be presented to the visitors through geographical information system. All these things can be attractive for foreign and local tourists. In this sense, to correlation between the user features and the recreational trends and to evaluate the obtained results should be accepted as the most important stage of the rational recreational planning. Besides, it was the fact that plans and projects were done which takes into account the visitor expectations as a guiding character.

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