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Conference Paper

A Contingent Valuation Approach to Community-based Watershed Management in Beyşehir Lake Basin

50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Ozdemir, Fadim Yavuz; Baycan-Levent, Tüzin (2010) : A Contingent Valuation Approach to Community-based Watershed Management in Beyşehir Lake Basin, 50th Congress of the European Regional Science Association: "Sustainable Regional Growth and Development in the Creative Knowledge Economy", 19-23 August 2010, Jönköping, Sweden, European Regional Science Association (ERSA), Louvain-la-Neuve

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**DRAFT VERSION
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**A Contingent Valuation Approach to
Community-Based Watershed Management (CBWM)
in Beyşehir Lake Basin**

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Abstract

Community-based watershed management (CBWM) has become more predominant as part of the trend towards more holistic and participatory approaches to water resources management. This paper aims to explore the knowledge and perceptions of the local people about non-point source pollution and CBWM policies in Beyşehir Lake Basin (BLB). In this context local people's; i) awareness level concerned with BLB problems, ii) attitudes toward non-point source pollution control and watershed management, iii) the socio-economic factors affecting the residents' participations to watershed management, and iv) proposal strategies to provide sustainability of the basin, and finally v) willingness to pay (WTP) for improving Beyşehir Lake's water quality is evaluated. The Contingent Valuation Method (CVM) is used to estimate economic value of improving local watershed services for BLB residents. The findings highlight the awareness level, attitude and preference differences between the people live nearby the lake and far from the lake. A better understanding of local people's knowledge and attitudes toward the watershed management is expected that will greatly help the integration of social progress and stability, economic development and natural resource management, in this way sustainability of the basin.

Keywords: Community-Based Watershed Management (CBWM), Non-Point Source Pollution, Beyşehir Lake Basin, Contingent Valuation Method (CVM)

1. Introduction

Watersheds are appropriate biophysical or socioeconomic units for management of water resources. It is stated that two important aspects make watersheds suitable spatial units for water management: First, the outlet of the watershed is not only the point towards which all water flows but also the point that accumulates the effects of land and water management activities. Secondly, a watershed is a useful scale to which both local stakeholders and policy makers can relate. This makes watersheds as ideal units to balance production and conservation over both the long and short term planning horizons, address multiple-stakeholder resource issues, and to assess the impacts of human intervention on the quantity and quality of available water [3].

There is a growing consensus that an effective way of enhancing long-term water resources management and environmental sustainability is through locally based planning at the watershed scale. Large-scale (regional) ecological systems can be most effectively regulated by small-scale (local) social organizations. Each watershed is different as it is influenced by humans and environment in a varied manner according to the local situation and culture. Therefore, matching availability of resources with the needs of humans and animals can best be carried out at a micro-level or in a community but based on ecological units in conformity with natural law [6].

It is recognized that CBWM approach is a key to prevent further ecological imbalance. Promoting integrated watershed development programs through effective participation of local people is essential in natural resource management and conservation activities. Community members may help to identify when and where problems arise, implement management techniques, or be actively involved in resource use monitoring. Both theoretical foundations and practical evidence has become available on the importance of strong community structures and active involvement of communities in resource management and conservation [3].

Also new emerging issues in the discipline of natural resources and environmental economics requires an alternative system of decision making that has no longer based purely on marketed values of natural resources but included the non marketed value in the total value component of the resources. To this end the Contingent Valuation Method (CVM) ranges the most promising and exhaustive method of estimating this non-marketed benefit. Since the non

market value of the environment or natural resources in particular has been included as the main part of the total value component in benefit cost analysis, the information based on which the decision is made would produce a comprehensive and sustainable management plan. Unlike the traditional pure benefit cost analysis, the contingent valuation has involved affected communities as a part of community based approach in the process of valuation. The result would, therefore, be comparatively politically feasible.

This paper assesses the economic value of improving local watershed services especially water quality for Beyşehir Lake Basin (Turkey) residents. It has five parts: The introduction section is followed by a brief review of the CBVM approach. Then, description of the study area follows. The characteristics of *the study site are given*. In the fourth section brief review of the CVM, survey principles and the empirical results take part in. The empirical results section compiles, analyzes and reports the results. Finally a general evaluation is made.

2. Community-Based Approach to Watershed Management

Watershed management is the integration of appropriate technologies and strategies within the natural boundaries of a watershed or drainage basin for optimum development through conservation, regeneration and judicious utilization of all resources (such as land, water, animals and human). Watershed management is a process-oriented approach that provides chance for stakeholders to balance diverse goals and uses, and to consider how their cumulative actions may affect long-term sustainability of watershed resources [6].

Community-based watershed management (CBWM) is an approach utilizes collaborative decision-making based on science and high levels of stakeholder participation. CBWM is different from the traditional natural resources management. Traditional natural resources management is a way from up to bottom, but the community-based watershed management is from bottom to up. This approach enables individuals, groups, and institutions with a stake in management outcomes (often called stakeholders) to participate in identifying and addressing local issues that affect or are affected by watershed functions. Key stakeholders of a watershed may include those people who have the authority to make land-use decisions, such as individual landowners, farmers, and local government officials, representatives from environmental and community groups etc. [2, 6].

3. The Study Area: Beyşehir Lake Basin (BLB)

Beyşehir Lake is the largest freshwater lake and drinking water reservoir in Turkey (Figure 1). The lake, located in the southwest of Konya Closed Basin, is significant both for humans, as a source of fresh water, and environmentally, due to the wetland ecosystem. Beyşehir Lake Basin (BLB) suffers from lots of environmental and socio-economic problems. Variations in water level due to inappropriate water policy and non-point source pollution in the lake have become striking environmental issues at the basin.

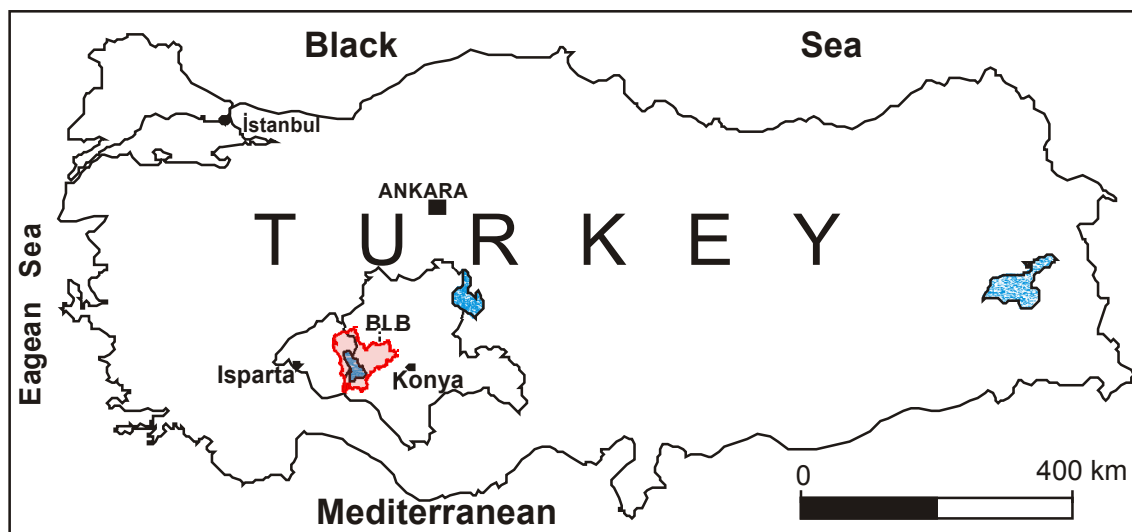


Figure 2. Location of Beyşehir Lake Basin in Turkey

Beyşehir Lake (BL) is the largest freshwater lake and drinking water reservoir in Turkey. The basin is located in the southwest of Konya Closed Basin and belongs to Konya and Isparta province borders (Figure 1). It is significant both for humans, as a source of fresh water, and environmentally, due to the wetland ecosystem [1]

Ecological importance of the basin:

Beyşehir Lake has international importance according to Ramsar Convention criteria. It has “Important Bird Area” (IBA) and “Important Plant Area” (IPA) statuses. Botanically, BL is the most important fresh water lake in Lakes District. BL’s IPA contains the third largest lake ecosystem in Turkey [5]. In addition, Beyşehir Lake acquires IBA status by its major number of wintering water birds (max. 213.824). 27.2 % of Turkish bird fauna can be observed in the basin [4, 10]. Various zones of the lake and its basin are protected as 1st, 2nd and 3rd Degreed Natural Sit statuses and declared as National Parks called BL and Kızıldağ. Also there are archeological sits in the basin. BL has drinking and potable water conservation area character.

Threats the basin faces:

BLB suffers from lots of environmental and socio-economic problems. Variations in water level due to inappropriate water policy and non-point source pollution in the lake have become striking environmental issues at the basin. BL is facing a serious pollution due to domestic wastewater, industrial wastewater and nonpoint pollutants resulting from settlements in the basin.

In our previous study¹ we investigated the critical success factors in the Collaborative and Integrated Watershed Management of BLB. What is the most appropriate watershed management strategy that enables ecological and socio-cultural sustainability of the basin? How much important to take most advantage of the basin's Strengths and Opportunities or to reinforce most the Weaknesses and develop the best defense to the Threats? To answer these questions from the perspectives of the experts participate in BLB's decision making processes, we offered a systematic approach and analytical means with a combination of SWOT matrix and Analytic Hierarchy Process (AHP) and evaluated the most appropriate watershed management strategy for the basin. In this context a SWOT matrix is developed to make an effective situational assessment. SWOT matrix was prepared via scientific data of the workshops and conferences arranged in the basin, performed expert interviews and individual observations. In consequence the basic threats against the ecological and socio-economical sustainability of the basin were summarized in that analysis such as below:

- Migration of the population to the outside of the basin
- Climate changes
- Decline in the amount of lake water: Wasteful use of water / Decreased amount of water coming to the lake after the construction of ponds / False agricultural planting and irrigation techniques (agricultural activities that consume high amount of water, open irrigation techniques)
- Water pollution: Release of domestic/industrial waste water into the lake / Rise of health problems based on water pollution / Agricultural polluters (intensive pesticide use and chemical fertilizers)
- Overhunting (fishing or hunting)

¹ The paper titled as "Collaborative and Integrated Watershed Management (CIWM): Evaluation of Critical Success Factors in Beyşehir Lake Basin" and was presented at *BALWOIS 2010 International Conference on Water Observation and Information System for Decision Support* (25- 29 May 2010, Ohrid, Republic of Macedonia) by Fadim YAVUZ ÖZDEMİR and Tüzin BAYCAN-LEVENT (Available at: http://www.balwois.com/balwois/administration/full_paper/ffp-1378.pdf)

- Destruction of the lake ecosystem (grazing in the lake bed, swamping in coasts, decrease in the diversity of animal and plant species)
- High taxes in front of the rise of local economy
- Interventions to basin's water system from outside the basin (over water demand from Çumra Plain etc.)

Then we have developed six proposal strategies such as “Agricultural Development”, “Environment Friendly Tourism Development”, “Collaborative (Residents-Enterprises-Experts) Watershed Management”, “Decreasing the Water Consumption in Urban Area”, “Improving Water Quality- Control Invasive Pollutant” and “Improving Water Usage in Rural Areas and Agriculture”.

The results of the study showed that “Agricultural Development” is the most important strategy for the goal- to sustain socio-cultural and environmental sustainability-in the basin. “Agricultural Development” Includes strategies such as reforms in the administrative and institutional system / development of infrastructure compatible to the environment / creating branches of business that do not harm the environment and that will ensure economic development in rural areas / improving transportation/infrastructure systems / incentives such as tax cut, direct payment, cost sharing etc. / improving agricultural techniques increasing productivity / encouraging ecological agriculture / defining the agricultural product line that would ensure minimum water demand etc. [11].

However this current study tests the basin residents' i) awareness of the current problems in the basin, ii) their approaches to the projects related water quality improvement, and iii) collaboration levels via CVM. More information on the method is thoroughly given in the following chapter.

4. Contingent Valuation Approach to Beyşehir Lake Basin

4.1. Contingent Valuation Method (CVM)

The contingent valuation (CVM) is a survey-based economic technique used to estimate the non market value of all kinds of ecosystem & environmental services, environmental attributes or amenities such as values of a Grand Canyon, endangered species or recreational or scenic resources, environmental preservation or the impact of contamination, etc. These

values are generally measured based on the “Willingness to Pay” (WTP) for improved environment or the “Willingness to Accept” (WTA) compensation for damaged environment or to accept a condition of being deprived of the improved environment. The most appealing aspect of the contingent valuation method is that it allows us to estimate total value rather than components of that total value. The method has great flexibility, allowing valuation of a wider variety of non-market goods and services than is possible with any other non-market valuation technique. It can be used to estimate both use and non-use values, and it is the most widely used method for estimating non-use values. It is also the most controversial of the non-market valuation methods. CVM is now widely accepted as a real estate appraisal technique [7, 8, 9].

The CVM involves directly asking people, in a survey, how much money they would be willing to pay (or willing to accept) for specific environmental services to maintain the existence of (or be compensated for the loss of) an environmental feature, such as biodiversity. In some cases, people are asked for the amount of compensation they would be willing to accept to give up specific environmental services. It is called “contingent” valuation, because people are asked to state their WTP, *contingent* on a specific hypothetical scenario and description of the environmental service. The CVM is referred to as a “stated preference” method, because it asks people to directly state their values, rather than inferring values from actual choices, as the “revealed preference” methods do. The fact that CV is based on what people say they would do, as opposed to what people are observed to do, and is the source of its greatest strengths and its greatest weaknesses [7].

4.2. Methodology

As part of field survey a questionnaire was conducted in 44 different basin settlements in March and April of 2010. In this context a total of 457 households (approximately 1, 7 %) questionnaires were performed to determine local people’s; i) awareness level concerned with BLB problems, ii) attitudes toward non-point source pollution control and watershed management, iii) the socio-economic factors affecting the residents’ participations to watershed management, and iv) proposal strategies to provide sustainability of the basin, and finally v) willingness to pay (WTP) for improving Beyşehir Lake’s water quality (Table 1 and Figure 3). The questions were designed compatible for the CVM. The respondents were asked if they would or not pay 15 TL / household per month to estimate economic value of improving local watershed services for BLB residents.

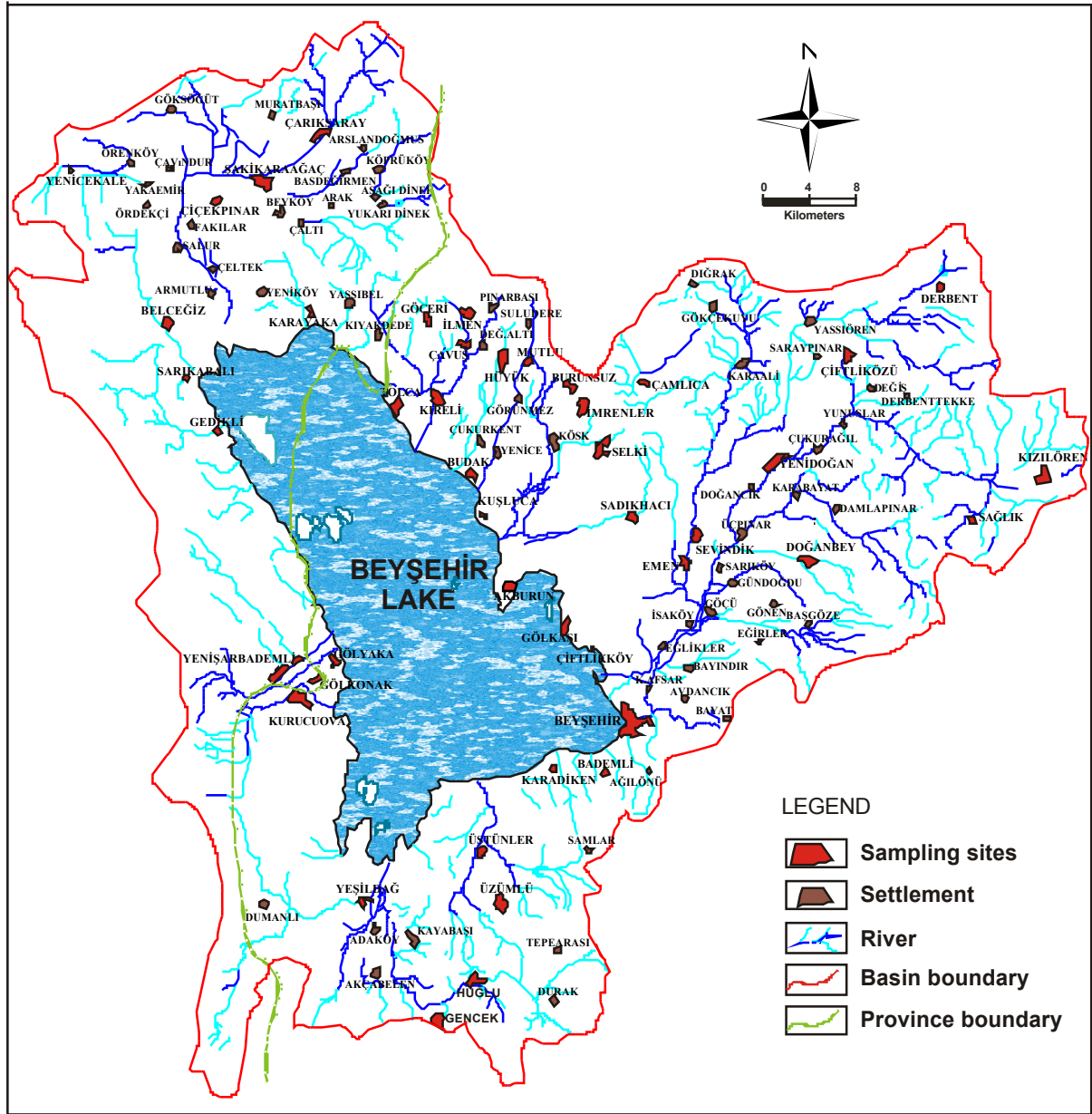


Figure 2. Study area, sampling sites

Tablo 1 Sampling sites and the sampling sizes

Settlement:	Quest.	%	Settlement:	Quest.	%	Settlement:	Quest.	%	Settlement:	Quest.	%
Akburun	6	1,3	Çiftliközü	4	0,9	Hüyük	12	2,6	Sağlık	4	0,9
Bademli	4	0,9	Derbent	13	2,8	İlmen	4	0,9	Sarıkabalı	4	0,9
Belceğiz	5	1,1	Doğanbey	13	2,8	İmrenler	5	1,1	Selki	6	1,3
Beyşehir	131	28,7	Emen	5	1,1	Karadiken	4	0,9	Sevindik	3	0,9
Budak	6	1,3	Gedikli	4	0,9	Karayaka	3	0,7	Ş.karaağaç	48	10,5
Burunsuz	5	1,1	Gencek	5	1,1	Kireli	9	2	Tolca	5	1,1
Çamlica	6	1,3	Göçeri	5	1,1	Kızılören	5	1,1	Üstünler	7	1,5
Çarıksaraylar	10	2,2	Gölkaşı	5	1,1	Kurucuova	6	1,3	Üzümlü	20	4,4
Çavuş	4	0,9	Gölkonak	5	1,1	Kuşluca	6	1,3	Yenidoğan	6	1,3
Çiçekpınar	7	1,5	Gölyaka	3	0,7	Mutlu	4	0,9	Y.bademli	12	2,6
Çiftlikköy	3	0,7	Huğlu	13	2,8	Sadıkacı	12	2,6	Yeşildağ	10	2,2
TOTAL:										457	100

4.3. Empirical Results

The data obtained was entered and analyzed using statistical techniques appropriate for the type of the question. Table 2 shows the socio-economical characteristics of the respondents.

Table 2. Descriptive Statistics of socio-economic variables

Variable	Category	Percentage / average	Variable	Category	Percentage / average
Sex:	Male	98,5 %	Average family size:	Person	3,8 %
Marriage status:	Married	90,6 %	Origin:	Native	98,2 %
Age:	Years	47,6	Monthly Income: (TL / household)	Less than 500	15,1 %
Occupation:	Skilled labor (private sector)	2,0 %		501 – 750	37,4 %
	Employer	2,2 %		751 – 1000	29,3 %
	Craftsman	15,5 %		1001 – 1500	10,9 %
	Worker	15,8 %		1501 +	6,8 %
	Farmer	20,1 %		No response	0,4 %
	Fisherman	2,6 %	Education:	Illiterate	2,4 %
	Retired	30,6 %		Non university	88,6 %
	Student	0,7 %		University	9,0 %
	Administrator (public/ private sector)	1,3 %	Environmental group membership:	Yes	2,6 %
	Officer (public/ private sector)	8,1 %	Attending meetings about BLB' s problems:	Yes	7,0 %
Jobless	1,1 %	Request to participate in the efforts to resolve BLB' s issues:	Yes	91,9 %	

* 1TL (Turkish Liras) = 0, 5 Euro (aprox)

Source: Authors' own elaboration

The local people basically derive benefit from the lake such as drinking water supply (42.2%), economic activities such as fishing and cutting rush (28.4 %), the landscape and recreation (21.9 %). The rates at the tourism activities and the bird or wildlife watching and viewing are very low (max. 2 %).

We requested the residents to evaluate the Beyşehir Lake's water quality compared to the old. The majority of the basin residents consider that the lake's water quality is worse (47 %). However, it is being considered that water quality is "better" at the level of 28.2 % and 18.4 % of the people stated that water quality is same. Then 3.7 % of the participants expressed that they have no idea.

Almost all of the respondents (97.8 %) state that “everybody has responsibility to protect Beyşehir Lake's water quality and the quantity”. Despite the fact that their environmental

awareness is at the high level, it is observed that they participate in any organization (local / national) only at the level of 2,6 %. In addition, only 7 % of the respondents participated in the meetings related BGH problems in the last two years.

In the later questions, people were asked how much they are willing to pay for the projects aiming to improve the BL's water quality. Firstly the respondents are given the choice of the willingness to pay 15 TL/ household per month. As the first, 151 persons (33 %) said "yes" and 306 persons (67 %) said "no" to the bid of 15 TL. In the second round 71 persons accepted to pay more than 15 TL. 18 respondents did not accepted to pay 15 TL, stated that they can't afford that amount but they are willing to pay 1 TL (17 persons) and 4 TL (1 person). Finally willingness to pay proportion is 37 % (169 persons) (Table 3). The reasons for not willing to pay are listed at the Table 4.

Table 3. Frequency distribution of respondents by bid amount they would vote in favor

WTP amount (TL per month)	0	1	4	15	20	25	30	40	45	50	100
Frequency (%)	63,0 [288]	3,7 [17]	0,2 [1]	23,4 [107]	5,0 [23]	1,3 [6]	0,7 [3]	0,2 [1]	0,2 [1]	1,5 [7]	0,7 [3]

Source: Authors' own elaboration

Table 4. Distribution of survey willingness to pay responses

Response:	Percent of respondents (%)
Willing to pay some amount	37 [169]
Unwilling to pay any amount	63 [288]
I can't afford to pay this amount (15 TL/ month)	3,9 [18]
Basin residents have more important issues than reducing water pollution in the basin *	3,9 [18]
I don't care to decrease the existing water pollution at Beyşehir Lake *	3,9 [18]
It is unfair to expect me to pay for decreasing the existing water pollution at Beyşehir Lake *	51,2 [234]
The enterprises should be responsible for the problem, it is not the BLB residents' responsibility *	23,2 [106]
Industry should be responsible for the problem, not the people *	1,1 [5]
I have no information to decide for this payment	2,2 [10]
Need to know others' opinions about the service fee	1,5 [7]
I am opposed to paying for this purpose*	1,5 [7]
Other reasons	5,5 [25]
TOTAL	[457]

* Classified as a protest response

**Due to the residents voted maximum 3 options, the totals do not equal to one hundred percent.

Estimating mean WTP/WTA:

From these data a mean WTP value is calculated. Then this mean WTP amount multiplied with the number of households (9.677) provide the contingent valuation for the BL's water quality improvement projects. After this stage we derive the estimated contingent value of the BL's services related water quality as 2, 09 million TL (Table 5). It must be emphasized that the contingent valuation of 2, 09 million TL for the BL is not the total value of the lakes water system. People in BLB are willing to spend this amount to maintain and preserve the lake's water quality.

Table 5. Willing to pay ratio of households in Beyşehir Lake Basin

Household monthly mean WTP (TL)*	Household annual mean WTP (TL)	Number of households	Number of households which have WTP	Annual aggregate WTP (millions)
18	216	26.153	9.677	2,09

Source: Authors' own elaboration

* "yes" responses to the question of WTP has been evaluated to calculate mean WTP.

The study hypothesized that the socio-economical characteristics of the respondents and the distance between the hang out and the lake have an effect on the amount of contribution they are willing to restore the water quality. To measure this relationship, the variable contribution was cross-tabulated with these variables and the chi square values were calculated.

The results show that variables such as gender, year, marriage status, education level, family size, land ownership don't have statistically significant influence on WTP. Likewise, the status of whether or not being indigenous of the region is not effective in the payment.

As well as the "WTP" is directly related to the occupational group ($\chi^2 = 1,686$, $df=100$, $p - 0 \leq 0,05$). The civil servants (57 %), private sector (55 %) and fishermen (50 %) are the occupational groups with the highest WTP. The farmers have no direct (such as fishing) but indirect economical benefit from the basin stated that they can participate to the payment in the 35 % level.

There is a statistical relationship between the income groups and WTP and WTP amount ($\chi^2 = 87,881$, $df=50$, $p - 0,01 \leq 0,05$). The WTP has declined in the face of the income growth. Residents have income at the rate of 500-1000 TL /household per month have maximum WTP amount. Moreover, WTP amount has increased depending on the income increase and

those who have household income more than 1001 TL per month accept to pay 40 TL or more.

Mean WTP amount is directly related to the last water bill ($\chi^2 = 62,127$, $df=40$, $p = 0,014 \leq 0,05$). When the water bill increases the WTP amount is reduces.

There is no statistically relation between the WTP / WTP amount and the participation to any environmental organization. But the WTP and WTP amount depends on the situation of being attended to the meetings organized in last two years and related with BLB problems. Te respondents attended to the those meetings have the WTP proportion as 65 % ($\chi^2 = 14,593$, $df=3$, $p = 0,052 \leq 0,05$). Besides, respondents did not attend to those meetings have higher WTP amount on the contrary ($\chi^2 = 47,984$, $df=30$, $p = 0,02 \leq 0,05$).

There is also a statistically relation between the WTP and the request to participate in the efforts to resolve BLB's issue ($\chi^2 = 15,209$, $df=4$, $p = 0,054 \leq 0,05$). Half of the respondents willing to participate in those efforts want to pay for BL's water quality. And among the respondents' do not willing to participate in those efforts, only 30 % of them are WTP.

There is no statistically difference between the WTP / WTP amount and the position of the settlement such as being at the lake shore or upper basin. However, the WTP and the WTP amount shows a different distribution in the settlements over the basin ($\chi^2 = 5,696$, $df=430$, $p = 0 \leq 0,05$). Because of the different population sizes, settlements' sensitivity levels to the basin's problems and the monetary contribution percentages to the solutions were calculated for each settlement within itself (Table 6). Residents living in Bademli, Çiftliközü, Gedikli, Karayaka and Kurucuova settlements do not have willingness to pay any amount in the basin.

Table 6. BLB settlements' monetary contribution percentages

Settlement:	%	Settlement:	%	Settlement:	%	Settlement:	%
Akburun	83,3	Çiftliközü	0	Hüyük	50	Sağlık	50
Bademli	0	Derbent	15,3	İlmen	75	Sarıkabalı	50
Belceğiz	20	Doğanbey	30,7	İmrenler	80	Selki	50
Beyşehir	45	Emen	40	Karadiken	25	Sevindik	33,3
Budak	16,6	Gedikli	0	Karayaka	0	Şarkıkaraağaç	16,6
Burunsuz	60	Gencek	60	Kireli	22,2	Tolca	40
Çamlıca	16,6	Göçeri	20	Kızılören	20	Üstünler	57,1
Çarıksaraylar	40	Gölkaşı	60	Kurucuova	0	Üzümlü	45
Çavuş	25	Gölkonak	20	Kuşluca	50	Yenidoğan	33,3
Çiçekpınar	42,8	Gölyaka	100	Mutlu	75	Yenişarbademli	8,3
Çiflikköy	33,3	Huğlu	30,7	Sadıkhacı	66,6	Yeşildağ	20

The spatial distribution of mean WTP amount is shown in the Figure 3. Gölyaka (100 %), Akburun (83, 3 %), İmrenler (80, 0 %), İlmen and Mutlu (75,0 %) are the settlements which have maximum WTP. Maximum WTP (TL/ household) is varying between 1-18 TL. The Mean WTP amount is the highest at Akburun, Burunsuz, Çavuş, Hüyük, İlmen, İmrenler, Çiftlikköy and Gölyaka (13-18 TL/ household per month).

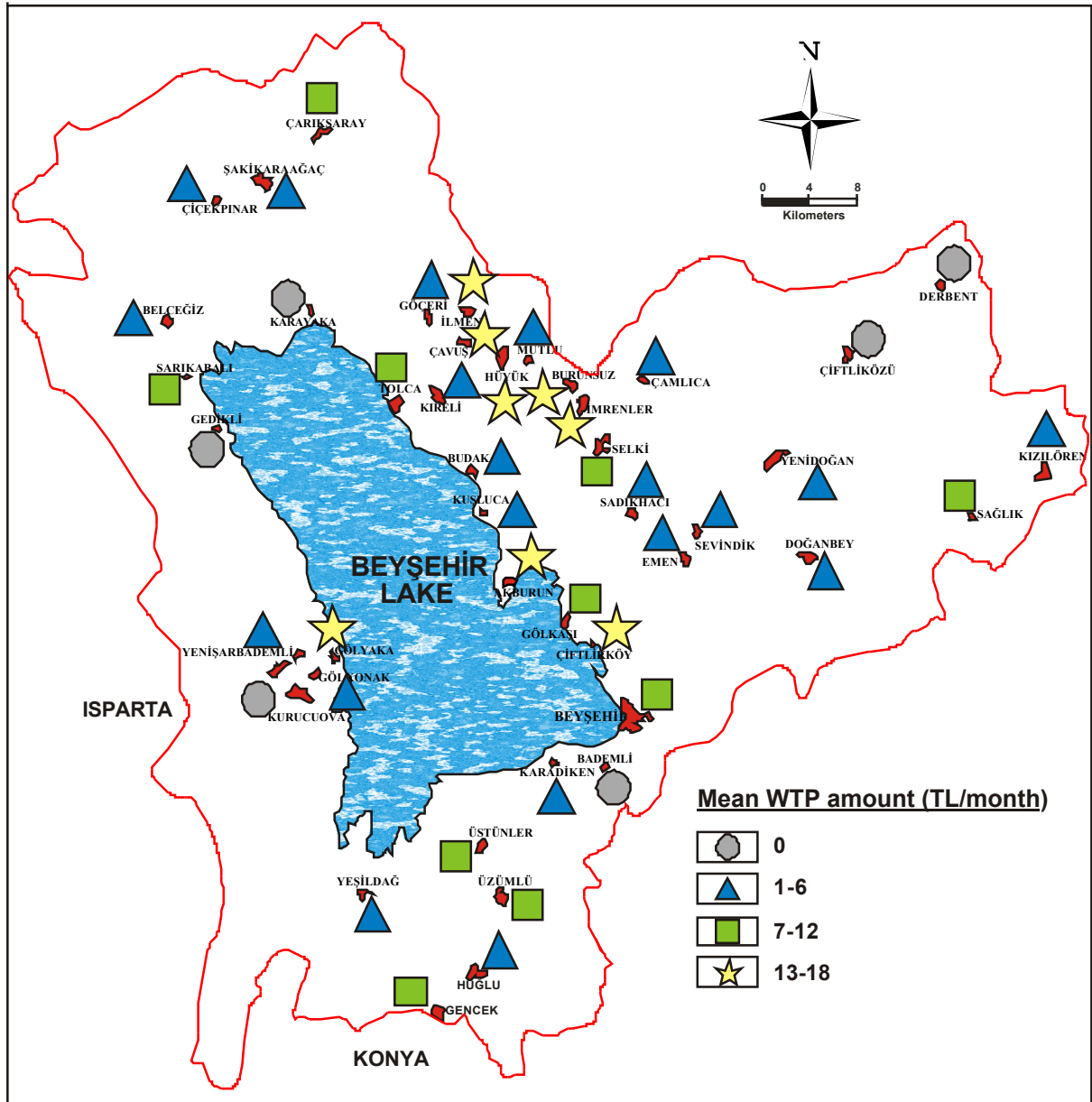


Figure 3. Distribution of Max WTP over the BLB

Source: Authors' own elaboration

Residents willing to pay 15 TL or more than 15 TL (151 household) were asked “for which purposes should the WTP amount be used?” The majority of the residents (68 %) want to pay for enabling future generations to use the basin’s existing natural resources (Figure 4). From the point of basin residents, the best way to collect WTP amount is collecting separately with a new name (56 %) (Figure 5). Otherwise WTP may be collected via income tax (9 %), water bill (22 %), litter tax (5 %), electricity bill (4 %), and the property taxes (1 %) and in another way (3 %). The amount of water use (79 %) is accepted as the most appropriate way to determine WTP for per capita (Figure 6). Almost half of the households rejected to pay any amount stated that they are not able and not willing to pay for BLB’s ecological improvements (41 %) (Figure 7).



Figure 4.

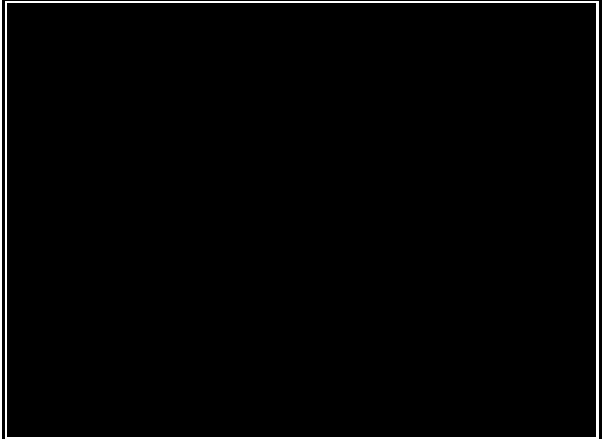


Figure 5.

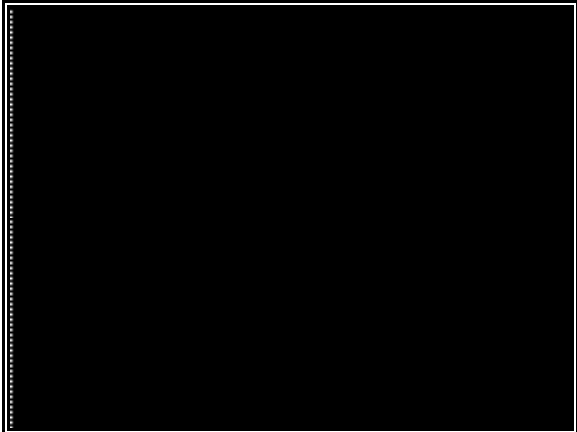


Figure 6.



Figure 7.

5. General Evaluation

It is well known that there is a water pollution problem in the area. This study confirmed size of this situation from the point of basin residents' perspectives via using CVM. This paper estimated the value of improving BL's water quality in BLB to be approximately 2, 09 million TL per year and illustrated that there is a substantial non-market willingness to pay for restoring BL's water quality.

The empirical study demonstrated that despite the fact that the basin residents' environmental awareness is at the high levels, the percentage of the WTP is considerably low.

This is consistent with recent findings that individual's attitudes and experience drive their WTP and/ or WTP amount for the water quality improvement as much as socio-economic, physical and ecological characteristics. The results show that WTP does not depend on the variables such as gender, year, marriage status, education level, family size, land ownership, whether or not being indigenous of the region. But there are real differences in the amount of contributions by income, occupation and the quantity of last water bill. Persons who have high income are willing to contribute a higher amount. Also when the water bill increases the WTP amount is reduces. However there is no statistically difference between the WTP / WTP amount and the position of the settlement (such as being at the lake shore or upper basin), the WTP and the WTP amount shows a different distribution in the settlements over the basin. The factors such as request to participate in the efforts to resolve BLB's issue, income or occupation leads some of the settlements to pay maximum WTP.

The majority of the residents want to pay for enabling future generations to use the basin's existing natural resources. Almost half of the households rejecting to pay any amount, stated that they are not able and not willing to pay for BLB's ecological improvements. From the point of basin residents, the best way to collect WTP amount is collecting separately with a new. The amount of water use is thought to be as the most appropriate way to determine WTP for per capita.

Results such as those presented in this study can be considered starting points on which to base a longer term process of participatory resource management. In order to get public support for solving the basin's problems, decision makers should include Beyşehir Lake water quality improvement projects.

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