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Social cost-benefit analysis of the improving of urban recreation facilities: The case of Iskenderun-Arsuz-Payas urban area

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Abstract

Facilities for public recreation are having an increasing impact on physical and social life. The overvaluation of urban lands raises economic concerns in rapidly expanding cities. Therefore, in this study, it is aimed to reveal the social costs and benefits of the development of recreational facilities in the urban area of Iskenderun-Arsuz-Payas. Although public recreation facilities are a broad concept, these facilities are limited to active open-green spaces and cultural areas in the research, based on the current conditions and concepts in the development legislation. In the social benefit estimation, the present and future use values of recreation areas were taken as the basis, and for this purpose, a survey was conducted with 309 households. Within the scope of the survey, the monetary values spent for participation in recreational activities and the monetary values willing to pay (WTP) for the development of areas were questioned. Initial facility costs were taken into account in cost calculations. The total benefit was calculated as 1.956.310.884 TL, the total cost was 418.414.364 TL, and the social benefit-cost ratio was calculated as 1:4.67. The results show that the users will bear the cost of the benefit they will gain from an urban environment with qualified recreational areas. It is thought that the results of the study will shed light on the professional disciplines that play an active role in the planning of public open-green spaces and cultural spaces and the decision-makers in local governments.

Keywords: Net present value, Recreational planning, Social cost-benefit.

Kentsel rekreasyon olanaklarının geliştirilmesinin toplumsal maliyet-fayda analizi: İskenderun-Arsuz-Payas kentsel alanı örneği

Özet

Kamusal rekreasyon olanakları, bir kentin fiziksel ve mekansal yaşam niteliğinin önemli bir belirleyicisi olmanın yanında, sosyal yaşam niteliği üzerinde de yükseltici etkiye sahiptir. Ancak, hızlı büyüyen kentlerde kentsel toprakların aşırı değer kazanması ekonomik kaygıları ön plana çıkardığından bu olanakların tesisi geri planda kalabilmektedir. Bundan dolayı çalışmada, İskenderun-Arsuz-Payas kentsel alanında rekreasyon olanaklarının geliştirilmesinin toplumsal maliyet ve faydalarının ortaya konması amaçlanmıştır. Kamusal rekreasyon olanakları geniş içerikli bir kavram olmakla birlikte mevcut koşullar ve imar mevzuatındaki kavramlar temel alınarak bu olanaklar araştırmada, aktif açık-yeşil alanlar ve kültürel alanlarla sınırlı tutulmuştur. Sosyal fayda tahmininde rekreasyon alanlarının şimdiki ve gelecek kullanım değeri esas alınmış, bu amaçla 309 hane ile anket çalışması yürütülmüştür. Anket kapsamında rekreasyon etkinliklerine katılım için harcanan parasal değerler ve alanların geliştirilmesi için ödemeye istekli olunan parasal değerler (ÖİD) sorgulanmıştır. Maliyet hesaplamalarında ilk tesis maliyetleri dikkate alınmıştır. Toplam fayda 1.956.310.884 TL, toplam maliyet 418.414.364 TL ve sosyal fayda-maliyet oranı 1: 4.67 olarak hesaplanmıştır. Elde edilen sonuçlar kullanıcıların nitelikli rekreasyonel alanlara sahip bir kentsel çevreden sağlayacakları faydanın karşılığı olan maliyete katlanacaklarını göstermektedir. Çalışma sonuçlarının kamusal açık-yeşil alanların ve kültürel mekânların planlanmasında etkin rol üstlenen meslek disiplinleri ile yerel yönetimlerdeki karar vericilere ışık tutacağı düşünülmektedir.

Anahtar Kelimeler: Net bugünkü değer, Rekreasyonel planlama, Sosyal maliyet-fayda

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1. Introduction

Urban areas play a key role in the development and realization of the concept and scope of recreation. Williams (1995) [1] presented the relationship between urban space and recreation with three realities: First, the population is concentrated in urban areas in the vast majority of developed countries and in many developing countries. Secondly, most city dwellers spend a significant part of their free time in nature or nature-imitating units in a certain area that allow many recreational activities in the same urban environment. Thirdly, people tend to spend their free time at home or outside in indoor and outdoor spaces with up-to-date forms of recreation. For example, a significant part of free time is spent in commercial entertainment centers, bars, cafes, restaurants, shopping centers, cultural centers, and parks, which areas and spaces are generally concentrated in cities [2]. Parallel to Williams' (1995) thinking, Page (1995) [3] and Tuppen (1996) [4] emphasized that the recreational demand is mostly generated by the urban population. Beyond these views, some of today's well-known metropolises, such as London, Paris, Rome, Barcelona, Amsterdam, and New York, have become international recreation centers with their transformations in urban form [5, 6, 7].

By context, the main reasons for choosing the Iskenderun-Arsuz-Payas urban area as the research area in the study are listed as follows: There is a close relationship between the three settlements in the research area located on the east coast of Iskenderun Bay, both in terms of working life, tourism and recreation. The study area has similar characteristics and a common geography where coastal, plain, threshold, and mountainous areas meet at a short distance, and the effect of this structure plays a prominent role in the physical and socio-economic formation of this region chosen as the study area. Due to its Mediterranean climate characteristics, it is capable of allowing a wide variety of outdoor activities for an average of eight months of the year. The geographical location and ecological characteristics of the area have enabled the development of industry, agriculture, maritime transport, and the tourism sector. These features have transformed the region into a metropolitan sub-region receiving immigration, thus bringing together people from rural and urban communities from different provinces and regions. It can be accepted that this is an important factor in the diversification of recreational attitudes and demands. In addition to the region's location on the seashore or in close proximity to the sea, its proximity to the Amanos Mountains, which are rich in forest cover, creates a rich resource potential in terms of recreation.

Recreational landscape planning studies have increasingly included an economic perspective in recent years. It mainly uses net present value (NPV) to measure or model the economic aspects of natural and cultural landscapes and their management. Studies covering a wide range of topics provide context for our analyses. These include the estimation of economic value within the context of recreational planning in national parks [8, 9], the estimation of the value of revitalization and preservation of urban parks used for recreation and sport [10, 11], the estimation of the value of improving the quality of various attributes in beaches [12] and other coastal recreational areas [13, 14], and economic analysis to support marine spatial planning [14, 15].

In order to measure the hypothetical changes in recreational activities or the quality of a specific site, resource economists have generally used the net present value (NPV) [10, 13, 14, 16], which is a

method used to designate the current value of all future cash flows generated by a project, comprising the initial capital investment [17]. In this context, individuals meet their demands for any good or service by purchasing or consuming it. Thus, the actual demand arises. Benefits come from meeting demand. The benefit provided covers a very wide range according to the goods and services consumed, and although it is difficult to determine its contribution to welfare, money is the most effective measuring stick here. When all other conditions are considered normal, the money that individuals risk spending to use or consume any good or service is the return for the benefit of that good or service. In a more concrete expression, if individuals are willing to pay a certain amount of money for the existence of any recreational area or place in their city or neighborhood, it can be accepted that they expect to benefit from this area or place at least as much as the money they pay. In such a case, individuals will demand the recreation opportunity because it will benefit them, and they will pay money for this benefit. This demand is an actual demand and the intensity of use of that facility will increase in relation to the aggregate demand (demand of the community) and the amount of money afforded to be paid. However, activating the recreational facilities—that is, reaching the quantity and scope that can meet the user demand—will impose a cost on the people of the city. In normal circumstances, in order to decide to develop recreational facilities, the cost (investment cost) of doing so shouldn't be higher than the benefits that come from using them, or the total amount of money that people are willing to pay for the development of these resources [18, 19, 20, 21, 30].

The main purpose of this study is to estimate the net present values (NPV) of the social benefits and costs that will arise from the fulfillment of the recreational demands of the people of Iskenderun-Arsuz-Payas. As it is known, users use or consume any goods and services that have a market for a certain price, and this price is the measure of the benefit obtained from use or consumption under normal conditions. The user is willing to pay the price formed in the market because he/she provides a benefit from that good or service. However, public spaces such as parks, sports and playgrounds are not represented in the normal market and are therefore considered zero-priced goods. However, these areas and spaces directly participate in production activities with the mental and physical development of individuals, as well as the stabilizing effect on the physical structure of the city and the regulatory effect on the urban ecosystem. For this reason, although public recreation areas do not have a market value, in other words, an exchange value, their use value, that is, their contribution to the welfare of society, is very high. Theoretically, there is a persistent gap or gap between the economic value of a good and total welfare. This difference arises in the way that the user-consumer gets more than they pay. In other words, individuals provide a return (rent) from use or consumption. This return, which is directly reflected in the total welfare of individuals and defined as consumer surplus in economic terminology, is shaped by the willingness to pay (WTP) of individuals for a good or service that benefits them [18, 19, 20, 21]. When the subject is looked at in terms of public recreation areas, there are two ways to see how willing people are to pay:

- Individuals reflect their willingness to pay for these spaces and spaces that contribute to their total well-being by taking a certain amount of expenditure into their behavior. For example, parents can afford to spend on the road and in the field to use a playground with their children. because they will benefit in return for their use. This benefit is often much greater than the amount spent, and so there is a willingness to pay. Such a determination is an indirect determination of individuals' willingness to pay.

- Individuals directly disclose their willingness to pay for the use of any public space. This is often revealed through questioning individuals. The survey application is the most important tool of inquiry. Using the right survey method and carefully chosen questions, you can get consistent and objective answers about how much people are willing to pay to improve or develop public recreation areas or give them new facilities.

Here, a significant constraint appears. The development of public recreation areas will require significant expenditure, which will impose a social cost on the users, namely the local people. Theoretically, in order to decide to realize an investment, the benefit of that investment should be greater than the cost. There are many valid and easily accessible instruments (such as unit price analysis, discount rates, etc.) in calculating the investment cost. However, user-based studies are required to provide an accurate estimate of benefits, particularly when it comes to public goods.

2. Materials and method

2.1. Materials

The Iskenderun-Arsuz-Payas urban area, which is the main material of the research area, is located on coastal, plain, and partially threshold lands running north to south parallel to the eastern shore of Iskenderun Bay. The three settlement areas of the province of Hatay are the sea coast and beaches that are continuous along the western borders; the Amanos mountains and the threshold lands that are rich in vegetation along the eastern borders; the agricultural areas that serve as the threshold between them; and especially the orchards, which divide the topographic structure generally in the east-west direction. Due to the rivers and the natural and near-natural habitats around them, they have an important potential for recreational activities as well as the main sectors that attract the population, such as agriculture, settlement, industry, and tourism. Iskenderun district is located at the intersection of 36° 34' 54" north latitude and 36° 09' 54" east longitude. It is bounded by the Amanos Mountains to the east and the Mediterranean Sea to the west. For this reason, the district center has developed in the north-south direction on the coastal and plain between the mountains and the sea, and partly on the threshold lands. Iskenderun, which is established in 45 neighborhoods on an area of 247 km^2 [22], has a population of 250.976 [23]. The Arsuz district is located at the intersection of 36° 24' 41" north latitude and 35° 52' 60" east longitude. Located 30 km south of Iskenderun, the district is surrounded by the Mediterranean on the north and fertile plain land on the other three sides. The urban settlement area is divided into two by the Arsuz Stream. The population of the district, which is established in 38 neighborhoods in an area of 462 km^2 [22], is 99.480 [23]. In the study, the area formed by these three adjacent districts was expressed as the Iskenderun-Arsuz-Payas Urban Area. The Payas district is located at the intersection of 36° 44' 56" north latitude and 36° 12' 02" east longitude. It is surrounded by the Amanos mountains in the east, agricultural lands in the north, the Iskenderun port in the south, and the Mediterranean Sea in the west. Settled on the plain, the district is an industrial and commercial city with a surface area of 157 km^2 [22], established in 12 neighborhoods, with a population of 43.495 [23]. The geographical location map of the study area is given in Figure 1.

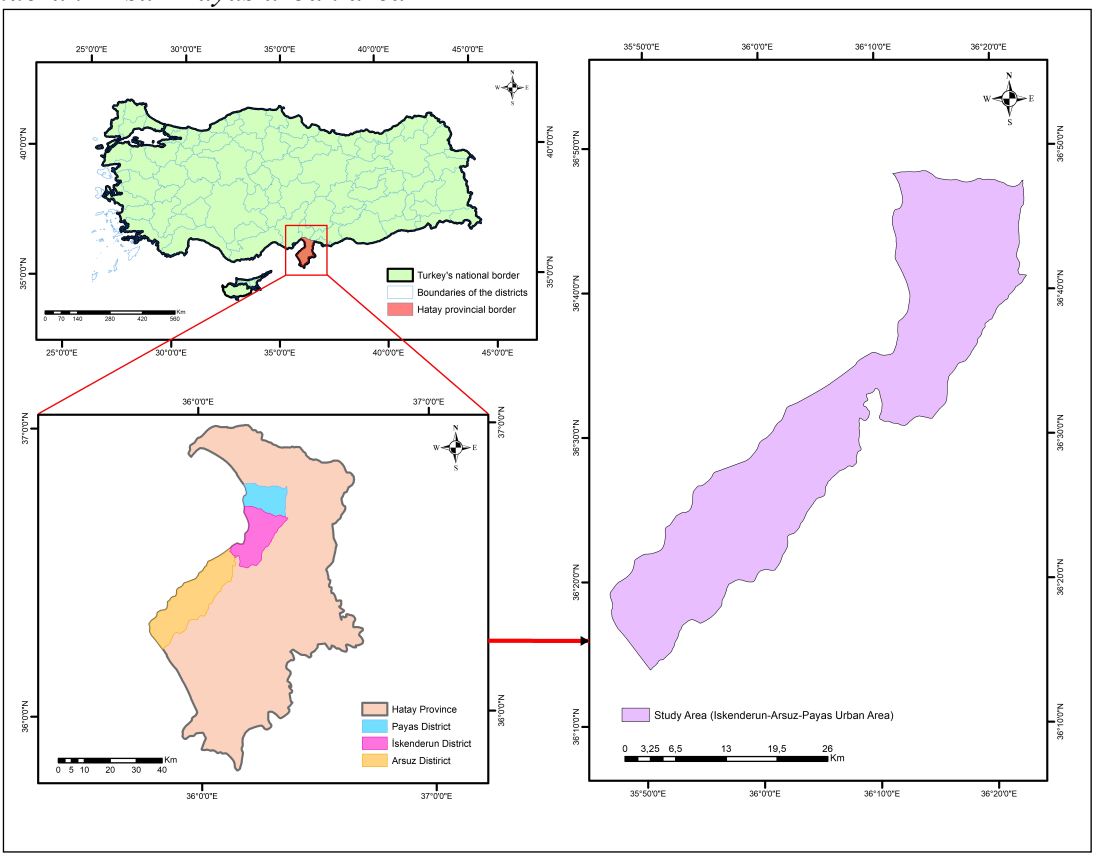

Figure 1. Location map of the study area (Original, 2022).

2.2. Method

In order for an investment project to be implemented according to social benefit and cost evaluations, the condition specified in equation (1) below is sought [18, 24]. This equation was used to figure out the net present values (NPV) of public recreation facilities in the study.

$$NBD = \sum_{t=0}^{T} (B_t - C_t) / (1+r)^t > 0 \quad [1] \qquad (1)$$

In equality:

T = Time when benefits and costs occur (project life in years),

r = discount rate, Bt = utility per unit time in t, and

t = unit time (year), Ct = t, which defines the cost per unit time.

Since our country's development plans cover a 20-year period, the benefits and costs of public recreation areas that include active open-green spaces and cultural areas have been calculated for the next 20 years.

In this study, the long-term change rate of the gross domestic product, which was stated to be used under similar conditions by many researchers [25, 26, 27, 28], was accepted as the discount rate. The equation A/B=(1+r).n is used to calculate the discount rate (r). In this equation, A=last year's GDP, B=first year's GDP, r=discount rate, and n=annual period between years A and B [27].

In determining the social benefit of environmental goods and services, the total economic value (TEV) of the relevant environmental good or service is decisive. The concept of TED consists of three main components, as seen in equation (2).

$$\text{TEV} = \text{Value of Present Use} + \underbrace{\text{Option Value} + \text{Existence Value}}_{\text{(Future Use Value + Non-Use Value)}} \text{ [29]} \qquad (2)$$

As seen in Equation 2.2, the current use value is the benefit the user or consumer derives from using or consuming any good or service today. Option value includes future use value and non-use value. Non-use value and existence value components gain importance in terms of the sustainability of natural values in general. Public recreation facilities in cities are cultural assets that serve present and future human uses rather than being natural. The features of their presence may change according to the conditions of the day [30]. Because of this, the study found that it made sense for the total economic value to be equal to the sum of the current use value and the future use value of the recreation facilities.

As used by many researchers in their studies [27, 30, 31], users' willingness to pay value (WTP) is taken as the basis for calculating the social benefit to be obtained from the development of public recreation facilities. The monetary values that are spent for the use of cultural areas (cultural center, library) and active open-green spaces (children's parks, neighborhood parks, sports and playgrounds) facilities, which are examined within the scope of public recreation facilities and that the individual is willing to pay from their household income for one year in order to develop them, are done with the help of questionnaires. On-site questionnaire application with standard forms was preferred for being safer and faster through face-to-face interviews [27, 28, 32, 33, 34, 35, 36, 37]. The sample was formed by a random selection of individuals representing the household from the general population. The sample size was determined based on the minimum number of 400 subjects that Arkin and Colton predicted for a population of over 100,000 according to a 5% margin of error [38]. The household size of Hatay in 2007 was 4.5 people [39]. Based on this, it was accepted that each person participating in the survey represented 4.5 people in the household, and a total of 1755 (390 x 4.5) people were interviewed by interviewing 390 households. Thus, the number of subjects exceeding at least 400 for a population of over 100,000 has been exceeded. The surveys were conducted in Iskenderun in July, August, and September 2008; in Payas in February and March 2008; and in Arsuz in March and April 2008.

Responses on willingness to pay were used to estimate the net present value (NPV) of the societal benefit of public recreation areas from current and future uses. The collected data were analyzed using the SPSS statistical program and the Microsoft Excel program.

The benefit to be obtained from the use of public recreation facilities for 20 years will decrease in the coming years due to population growth. The decreased benefit amount in the study was expressed by the amount of recreational area per capita. For this purpose, a 20-year population projection was made for each district, and the number of recreational areas per capita was determined, and the rate of diminishing utility (RDU) for each year was determined by dividing these amounts by the initial year. The Total Economic Value of the development of recreational facilities, in other words, the Total Annual Benefit (B_{total}) resulting from the development, was estimated using equation (3).

$$B_{total} = WTP_{average} \text{ x The number of households}_{year} \text{ x RDU} \quad [29] \qquad (3)$$

The development of public recreation facilities will have a significant cost. When it is accepted that the cost will be passed on to the individuals (households) who benefit from these facilities in various ways (tax, fee, entrance or usage fee, etc.), improvement and facility costs can also be considered as social costs.

In the study, the initial facility costs of active open-green spaces (children's parks, neighborhood parks, sports and playgrounds) and cultural areas (cultural center, library) were taken into account in calculating the social costs of developing public recreation facilities. In calculations;

• TMMOB-PMO's "2009 Landscape Architecture Project/Planning Unit (m^2) Approximate Implementation Costs According to Service Classes (YUM m^2/TL)-Structural and Plant Landscape Architecture Services Provision" [40], and

• Lists of "Approximate Unit Costs of Buildings in 2008 to be Used in Calculation of Architecture and Engineering Service Fees" [41] have been taken into account.

3. Results and discussion

In the research, the project life (T) of active open-green spaces and cultural areas was accepted as 20 years. The long-term rate of change in gross domestic product (GDP) is taken as the discount rate. GDP calculated by the production method (at constant prices) was 70,203 Million TL in 1998 and 101.046 Million TL in 2007 [42]. There is a 10 (n) year variation between the two data. By substituting these values in the equation A/B=(1+r).n given in the method section, 101.046 / 70.203 = (1+r)10, the discount rate (r) was found to be 0.0371 (3.71%).

In the research, in determining the social benefits of the development of public recreation facilities, first the arithmetic averages of the individual benefits (individual willingness to pay values) were calculated, and the social benefit value was obtained by multiplying the values with the number of households and the rate of diminishing utility (RDU).

In order to determine the utility value (willingness to pay value), as used by many researchers [24, 27, 34, 43, 44, 45, 46] in their studies, the smallest economic unit, the number of households, was taken as the basis. In this model, there were three parts to the social benefit of creating public recreation facilities:

- The number of households that will benefit from the development of public recreation facilities,

- The arithmetic average of the amount of money individuals spend on the benefit they provide and are willing to pay for the benefit they will provide in the future from their monthly household income over a one-year period,
- The rate of diminishing utility (RDU), which determines the reduction in benefits as a result of population growth.

As the value of "Number of Houses" in the benefit (B) formula in Equation 2.3, the number of households (A) that have an annual payment in proportion to the urban population is used. In the calculation of A, obtained from the survey data, based on the number of households (B), the number of urban households (C), and the number of households surveyed (D), In the calculation of the number of urban households, the value of 4.5, which is the average household size in 2007, representing Hatay, was taken as a basis. The number of households with an annual payment proportioned to the urban population in 2007 was calculated with the equation A = (B*C)/D. Values are given in Table 1.

Table 1. Number of households charged an annual payment proportioned to population

	Number of households with annual payment according to surveys (B*): *Numbers of households reporting spending money for participation + reporting WTP for improvement + reporting WTP for initial establishment			**Number of households charged with an annual payment proportioned to population (A):**		
				Payas	**Iskenderun**	**Arsuz**
				Population$_{2007}$	32.587	177.294	2.256
				Number of households$_{2007}$ **(C)**	7.242	39.399	501
				Number of Households Surveyed $_{2008}$ **(D)**	90	280	20
				The Household Size of Hatay in 2007 is 4.5			
				A= (BxC) / D			
A) Recreational activities in open-green spaces	**Payas**	**Iskenderun**	**Arsuz**	**Payas**	**Iskenderun**	**Arsuz**
1. Playing Basketball / Volleyball	4	14	1	322	1970	25
2. Playing handball	0	0	0	0	0	0
3. Playing Tennis	6	15	1	483	2111	25
4. Playing table tennis	0	3	0	0	422	0
5. Playing Mini Golf	0	2	0	0	281	0
6. Playing golf	0	0	0	0	0	0
7. Doing defensive sports	4	0	0	322	0	0
8. Playing football on a grass field	16	26	5	1287	3658	125
9. Playing football on the football field	2	65	2	161	9146	50
10. Playing strategy games (Paintball, floor chess, etc.)	0	0	0	0	0	0
11. Jogging	0	0	1	0	0	25
12. Fitness	16	17	5	1287	2392	125
13. Aerobics, stepping	12	29	6	966	4081	150
14. Athletics	0	0	0	0	0	0
15. Archery	0	0	0	0	0	0
16. Riding a Horse	0	0	0	0	0	0
17. Racing on the track	0	0	0	0	0	0
18. Motor racing	0	0	0	0	0	0
19. Cycling	16	46	5	1287	6473	125

20. Skateboarding, Skating, Scooting	0	0	0	0	0	0
21. Do artificial wall climbs	2	0	0	161	0	0
22. Watching a sports match in the sports field	0	0	0	0	0	0
27. Visiting zoos	0	0	0	0	0	0
28. Visiting botanical gardens	0	0	0	0	0	0
29. Going to the amusement park	6	55	1	483	7739	25
30. Traveling on foot or by car for scenic viewing	12	106	6	966	14915	150
31. Outdoor hobby activities (growing plants in the garden/terrace, nature photography, etc.)	30	54	4	2414	7598	100
32. Hiking / strolling	62	372	20	4989	52344	501
33. Sitting on benches to rest / newspaper, etc. to read	10	34	8	805	4784	200
34. Free activities (flying kites, playing frisby, flying model airplanes, etc.)	22	87	4	1770	12242	100
35. Running in the parks / doing cultural and physical movements	28	90	14	2253	12664	351
36. Activities to entertain children	34	86	1	2736	12101	25
37. Walking the pet	0	6	0	0	844	0
38. Have a picnic	78	252	10	6276	35459	251
39. Swimming in an outdoor pool	8	16	0	644	2251	0
40. Swimming in an indoor pool	6	3	0	483	422	0
41. Beach activities such as swimming in the sea, sunbathing, etc.	40	119	28	3219	16745	701
42. Playing water polo	0	0	0	0	0	0
43. Windsurfing	0	0	0	0	0	0
44. Using a sailboat	4	4	0	322	563	0
45. Rowing	0	0	0	0	0	0
46. Water skiing	0	1	0	0	141	0
47. Using a pedalo	0	6	2	0	844	50
48. Riding a jet ski	6	2	2	483	281	50
49. Sailing						
50. Going to water parks (Experiencing water slides, swimming pools, artificial wave pools, etc. in parks where water-related entertainment can be done)	6	82	7	483	11538	175
51. Angling	4	14	4	322	1970	100
B) Social-cultural activities in cultural areas						
23. Participating in outdoor festivals	0	62	1	0	8724	25
24. Visiting Fairs	0	18	0	0	2533	0
25. Visiting open space exhibitions	18	56	4	1448	7880	100
26. Attending an open-air cinema/theatre/concert	52	165	13	4184	23217	326

In the study, the amount of money that individuals spend on the benefit they provide and are willing to pay for one year from their monthly household income for the benefit they will provide in the future is determined as follows:

The amount of money spent by individuals for participation in recreational activities represents *the current use value*, and the amount of money they are willing to pay for the improvement of existing facilities and the establishment of those who do not have them represents *the future use value* (option = value of being an option). Individuals were asked to indicate the amount of money they spent from their monthly household income on a single participation in the events and the amount of money they were willing to pay each month (WTP: Willingness to Pay Value) for a year for the improvement and facility. Although participation in events takes place throughout the year or in certain parts of the year, depending on the event, since the tendency to consider the whole year in such studies is effective, the participation time in this study was determined as 12 months. Using the values reported by the individuals participating in the survey, the following were calculated: a) the average amount of money spent on a single event participation; b) monthly WTP for event improvement and establishment; and c) the number of monthly event participations. The average amount of money spent per month was obtained by multiplying the amount of money spent on a single participation in the events by the number of monthly participations. The total amount of money loaded to pay in a year is formulated as the average amount of money spent per month x 12 + monthly WTP for improvement x 12 + monthly WTP for facility x 12. The values of the total amount of money loaded to pay in a given year are multiplied by the number of households that have incurred the payment, and the amount of money loaded to pay in a given year has been calculated in proportion to the number of households. In this context, monetary values obtained for Payas, Iskenderun, and Arsuz are given in Tables 2.

Table 2. Total amount of money undertaken to pay in a year (2009) for the benefit of current and future use of recreation facilities (WTP-Willingness to pay values) in Iskenderun-Arsuz-Payas urban area (TL*).

Type of Recreational Activities			**The amount of money undertaken to pay in a year proportioned to the number of households for the benefit from the present and future use of recreational facilities (TL*) (WTP-Willingness to Pay Values)**		
A) Recreational activities in open-green spaces			**Payas**	**Iskenderun**	**Arsuz**
Sport activities	*Participating in team sports activities in the sports field	1. Playing Basketball / Volleyball	5.793,60	352.058,21	214,71
		2. Playing handball	0.00	0.00	0.00
		3. Playing Tennis	11.426,27	1.267.436,38	200,40
		4. Playing table tennis	0.00	20.262,34	0.00
		5. Playing Mini Golf	0.00	18.573,81	0.00
		6. Playing golf	0.00	0.00	0.00
		7. Doing defensive sports	6.069,49	0.00	0.00
		8. Playing football on a grass field	45.718,20	164.967,52	2.039,79
		9. Playing football on the football field	6.035,00	1.097.268,00	2.329,65
		10. Playing strategy games *(Paintball, floor chess, etc.)*	0.00	0.00	0.00
	*Participating in individual sports	11. jogging	0,00	0.00	2.254,50
		12. Doing cultural physical movements	40.254,79	277.720,74	5.949,38
		13. Aerobics, stepping	23.335,33	10.169.025,92	4.689,36

activities in the sports field	14. Athletics	0.00	0.00	0.00
	15. Archery	0.00	0.00	0.00
	16. Riding a Horse	0.00	0.00	0.00
	17. Racing on the track	0.00	0.00	0.00
	18. Motor racing on the track	0.00	0.00	0.00
	19. Cycling	40.018,76	574.791,72	8.817,60
	20. Skateboarding, Skating, Scooting	0.00	0.00	0.00
	21. Do artificial wall climbs	1.931,20	0.00	0.00
	22. Watching a sports match in the sports field	8.754,77	1.023.376,48	160,32
Free Leisure Activities	27. Visiting zoos	0.00	0.00	0.00
	28. Visiting botanical gardens	0.00	0.00	0.00
	29. Going to the amusement park	10.138,80	673.187,40	37,58
	30. Traveling on foot or by car for scenic viewing	138.742,53	7.155.874,63	36.204,38
	31. Outdoor hobby activities *(growing plants in the garden/terrace, nature photography, etc.)*	91.354,96	735.156,54	3.000,27
	32. Hiking / strolling	1.264.717,12	20.869.205,92	33.205,20
	33. Sitting on benches to rest / newspaper, etc. to read	33.617,19	6.760.024,14	35.381,99
	34. Free activities *(flying kites, playing frisby, flying model airplanes, etc.)*	42.594,98	478.618,88	1.282,56
	35. Running in the parks / doing cultural and physical movements	79.622,66	17.852.560,28	21.680,78
	36. Activities to entertain children	1.084.223,13	12.671.019,72	429,43
	37. Walking the pet	0.00	56.096,67	0,00
	38. Have a picnic	667.603,27	6.779.706,69	14.615,81
Water-based recreational activities	39. Swimming in an outdoor pool	25.749,33	122.294,50	0.00
	40. Swimming in an indoor pool	18.105,00	53.821,85	0.00
	41. Beach activities such as swimming in the sea, sunbathing, etc.	230.876,82	7.161.008,25	48.870,01
	42. Playing water polo	0.00	0.00	0.00
	43. Windsurfing	0.00	0.00	0.00
	44. Using a sailboat	6.759,20	1.551.265,27	0.00
	45. Rowing	0.00	0.00	0.00
	46. Water skiing	0.00	2.532,79	0.00
	47. Using a pedalo	0.00	95.669,78	933,20
	48. Riding a jet ski	1.448,40	9.286,91	2.645,28
	49. Sailing	0.00	0.00	0.000
	50. Going to water parks *(Experiencing water slides, swimming pools, artificial wave pools, etc. in parks where water-related entertainment can be done)*	3.231,54	6.922.967,14	1.087,17
	51. Angling	5.255,78	274.131,72	2.164,32
	Total monetary value	**3.893.378,11**	**105.189.910,18**	**228.193,67**
B) Social-cultural activities in cultural areas				
	23. Participating in outdoor festivals	0.00	1.171.685,85	20,04
	24. Visiting Fairs	0.00	0.00	0.00
	25. Visiting open space exhibitions	53.518,38	311.607,46	36.569,94
	26. Attending an open-air cinema/theatre/concert	72.339,42	1.220.324,96	9.417,80
	Total monetary value	**125.857,80**	**2.703.618,27**	**46.007,77**

* Average dollar rate for 2009 is 1 USD=1,55 TL [47].

The Total Economic Value (TEV) of the development of recreational facilities, in other words, the Total Annual Benefit ($B_{total\ annual}$) resulting from the development, will decrease at a certain rate each year depending on the annual population growth. Because as the population increases, the amount of public recreation area per capita will decrease. For this reason, the reduction in the amount of recreation area per capita (benefit reduction) resulting from population growth should be reflected in the benefit value of the development of recreational facilities. In order to achieve this, the rate of diminishing utility (RDU) to be gained by the development of public recreation facilities for 20 years were calculated separately for each year in the study. RDU over the years has been reached by dividing the amount of public recreation area per capita calculated for each successive year by the amount of public recreation area to be created in the first year. This calculation required Payas, Iskenderun, and Arsuz urban population data from 2009. Therefore, based on the 2007 census data, a population projection was made first for 2009 and then for 20 years, which was determined as the life of the project. According to the 2007 census of the three settlements, the populations were 32.587 in Payas, 177.294 in Iskenderun, and 2256 in Arsuz [39]. Using the 2007 population data, a population projection was made for the Iskenderun-Arsuz-Payas urban area for the years 2009-2029 (20 years). While making the projection, the natural increase relation based on TUIK was used [48]. The natural increase relation is mathematically defined in equation (4) given below:

$$P_n=P_o \times e^{r.n} \quad [48] \tag{4}$$

In equality;

Pn : The second of two successive counts e : 2.7182818 (constant number)
Po : The first of two consecutive counts n : The number of time units between two counts
r : It defines the population growth rate in the unit of time between two censuses.

Before the calculations, the rate of increase (r) was determined for each settlement by using the last two census results with known exact results. The equation r = 1/n x ln (Pn/Po) was used to determine the "r" value, and r = 0.003375 for Payas and r = 0.013496 for Iskenderun. Then, the projection for each settlement was applied to the known starting year, and the value of the following years was found. When Arsuz's 2000 and 2007 census results are compared, it is seen that the population tends not to change or even to decrease. In the study, the Arsuz population was thought to stay the same because of this, so no projections were made.

While calculating the rates of diminishing utility (RDU) of active open-green spaces within the scope of public recreation facilities due to population, the value of 10 m^2 per capita stipulated in Annex-1 of the Regulation on the Principles of Planning, enacted within the scope of the Construction Law No. 3194, is taken as a basis [49]. On the other hand, in Arsuz, since the population is considered constant, the RDU over the years has not been calculated. However, based on the size of 10 m^2/per capita, the total size of open-green space required to be established for the fixed population (total project area) has been determined. While calculating the decreasing population-related benefit rates for cultural sites, 1 m^2/per capita (for Payas) for a population of 15.000–45.000 for cultural facility areas and 2.5 m^2/per capita (for Iskenderun) for a population of 100.000 and above are taken as the basis [49]. In Arsuz, the population is assumed to be constant and the RDU for cultural venues is not calculated over the years, but the total size of cultural venues (total project area) required to be established for a fixed population

has been determined based on 0.5 m^2/per person size for a population of 0–15.000. Within the scope of Boyacıgil's (2010) doctoral thesis [50], the changes in the amount of open-green space and cultural area per capita per year in three districts for 20 years and the calculated RDUs accordingly are given in detail. The original study [50] includes calculations in a number of tables, and the resulting RDUs were used to calculate social benefit.

In the study, the monetary values proportioned to the number of households willing to pay in a year in return for the benefit obtained from the current and future use of public recreation facilities and the data on the RDU by years constitute the components of the social benefit estimations. Equation (5) was used to figure out the 20-year social benefit for active open-green spaces and cultural areas in three settlements:

$B_{\text{total year}}$ = Total amount of money loaded to pay in a year proportioned to the number of household $_{2009}$ x RDU_{year} (5)

The costs of active open-green spaces are calculated on the basis of the "Provision for Structural and Plantal Landscape Architecture Services" within the scope of "Unit Approximate Application Costs (AAC) According to Landscape Architecture Project/Planning Service Classes (m^2/TL)" of TMMOB (Union of Chambers of Turkish Engineers and Architects**) -** Chamber of Landscape Architects for 2009.

In the study, the children's parks, neighborhood parks, sports and playgrounds, which are examined within the scope of active open-green spaces, are in the second service class and the approximate unit cost is 39 AAC m^2/TL [40]. For libraries and cultural buildings examined within the scope of cultural areas, the price of 682 m^2/TL in the "Communiqué on the Approximate Unit Costs of Buildings in 2008 to be Used in the Calculation of Architecture and Engineering Service Fees", published in the Official Gazette dated 26.03.2008 and numbered 26828, is based on [41]. The initial establishment costs calculated according to the above-mentioned unit prices are given in Table 3 for three settlements, active open-green spaces and cultural areas.

Table 3. Calculated initial construction costs for 2009 of active green spaces and cultural venues in Iskenderun-Arsuz-Payas-Urban area (TL*)

	Active Open-Green Spaces				
City	Urban Population in 2009	**Standard Size Required Per Person (m^2)	Total Project Area (m^2)	Unit Price (TL)	**Initial Establishment Costs (TL)**
Payas	32.808		328.077		**12.795.003**
Iskenderun	182.145	10	1.821.447	39	**71.037.603**
Arsuz	2256		22.560		**879.840**
	Cultural Areas				
Payas	32.808	1	32.808	682	**22.375.056**
Iskenderun	182.145	2.5	455.363		**310.557.566**

Arsuz	2256	0.5	1128	**769.296**

* Average dollar rate for 2009 is 1 USD=1,55 TL [47].
** The size of the proposed area (m^2) per person is based on the area size values found in Annex-1 [49] of the Regulation on the Principles of Planning.

When the social benefits and social costs take their place in the NPV equation with a 20-year project life that covers the years 2009-2029 and a 3.71% discount, the net social benefits of the development of public recreation facilities are based on the Regulation on the Principles of Planning in three settlements, based on "Activities in Open-Green Spaces" and "Activities in Cultural Areas". It was evaluated in two main groups as activities.

The findings were compiled in Table 4 in order to perceive three settlements and two recreational facilities as a whole and to allow comparison between them. The table includes benefits, costs, and net present values (NPV) for the districts and for the total urban area.

Table 4. Net present value of development of recreation facilities in Iskenderun-Arsuz-Payas urban area (TL*)

	Total Benefit		**Total Cost**		**Cost: Benefit Ratio**		**Net Present Value (NPV) by Opportunity Clusters**		**Integrated Net Present Value (NBD)**
City	Active open-green spaces	Cultural areas	Active open-green spaces	Cultural areas	Active open-green spaces	Cultural areas	Active open-green spaces	Cultural areas	
Payas	75.171.063	2.430.101	12.795.003	22.375.056	1: 5.88	1:0.11	39.834.663	-20.673.667	**19.160.997**
Iskenderun	1.831.365.800	47.069.719	71.037.603	310.557.566	1: 25.28	1:0.15	1.226.716.637	-277.202.722	**949.513.915**
Arsuz	228.193	46.007	879.840	879.840	1: 0.26	1:0.06	2.302.561	-127.678	**2.174.882**
Total	**1.906.765.057**	**49.545.827**	**84.712.446**	**333.701.918**	**1: 22.51**	**1:0.15**	**1.268.853.861**	**-298.004.067**	**970.849.794**
The overall total	**1.956.310.884**		**418.414.364**		**1: 4.67**				

* Average dollar rate for 2009 is 1 USD=1,55 TL [47].

Investigations made in the context of the findings obtained reveal three basic results:

1) The cost-benefit ratios calculated for active open-green spaces are 1: 25.28 for Iskenderun, 1: 5.88 for Payas, and 1: 0.26 for Arsuz. The reason why the highest benefit occurs in Iskenderun, which is approximately 25 times the cost, is that Iskenderun has a much higher population than the other two settlements, and consequently it tends to be densely built. Since dense construction requires more urban land use, urban land allocation can be realized against open-green spaces. Since this situation increases the need of the people of the city for open-green spaces, it can be considered natural that such a cost-benefit ratio occurs. Payas, which is in the second place, includes both rural and urban features. Natural or near-natural areas in the immediate vicinity can provide an advantage in meeting open-green space requirements. However, the organized industrial zone located in the area is a center of attraction for people from the rural areas of Payas as it offers employment facilities. Although not as much as Iskenderun, especially in recent years, the construction originating from the organized industrial zone has been gaining intensity. This situation increases the need for accessible open-green spaces in a short time for the local people who spend a significant part of the day working. The 1: 5.88 cost-benefit ratio

found in the study can be accepted as an indicator of the need to increase. The fact that the benefit is close to the cost in Arsuz can be explained by the fact that this area is a more rural and natural summer resort with a lower settled population. Residents of the town can easily get to and use the areas nearby where the quality of the landscape is getting better for their needs of recreational open-green spaces.

2) The cost-benefit ratios calculated for cultural sites are 1:0.15 for Iskenderun, 1:0.06 for Arsuz and 1:0.11 for Payas. In other words, the social costs calculated for all three settlements are higher than the social benefits. The reason for this is the high structural first facility costs of the library and cultural center, which are considered within the scope of cultural areas. However, the benefit to society and the sustainability of the environment are of primary importance in societal cost-benefit estimations. Considering that the initial facility costs are 0 TL over time and the benefits provided are spread over many years, it can be concluded that this cost, which seems high, is an incurable cost. In addition, when the non-use benefits of cultural facilities (such as the establishment of social relations and the establishment of social solidarity, the development of urban and urban identity, and culture) are added to the social benefits, which are not discussed in this study, the cost-benefit ratio will change in favor of the benefit.

3) When the benefit and cost estimates are analyzed across the Iskenderun-Arsuz-Payas urban area, the benefit from the current and future use of active open-green spaces is 22.51 times the cost. The cost-benefit ratio calculated for cultural venues is 1:0.15. That is, the cost is higher than the benefit. While the average dollar rate was 1.55 TL in 2009, the calculated NPV values are as follows: The NPV for active open-green spaces is 1.268.853.861 TL, and for cultural venues is -298.004.067 TL. The negative value of NPV for cultural venues is a result of high structural costs, as mentioned earlier. However, when the recreational facilities at the scale of the urban area are evaluated in general, the total benefit is calculated as 1.956.310.884 TL, the initial facility cost is 418.524.908 TL, and the NPV is 983.629.964 TL. As a result, the benefit was found to be approximately 4 times the cost, and the NPV>0 condition was met by taking the NPV plus value.

4. Conclusion

The results of this manuscript's NPV approach can be validated in urban recreation areas throughout the world. Also, the methodology used in this study can be applied to other similar urban areas with open green spaces and cultural areas that need to be improved to enhance the quality of life for the people who live there. For future studies that use the NPV, we suggest that interviewees give real, verifiable monetary values and pick a value based on the WTP, just like in similar studies. [8, 10, 13, 27, 30, 31].

Urban plans and programs must seek and find answers to the question of what the means of sustainability are and how they will be produced. One of these tools is the social benefits and costs of planning decisions to create a sustainable city. According to many researchers who are experts in this subject [18-21, 51-53], the social benefits of investments that directly contribute to the sustainability of natural and cultural resources and to improving the quality of life of people are much greater than their costs. Despite emphasizing that costs can be overlooked to a certain extent because of their high cost, the Iskenderun, Arsuz and Payas studies made an effort to estimate social benefits and costs, taking into account the principle of efficient and sustainable use of scarce resources. Although the use value is taken

as the basis in the estimation of social benefits and the existence value is ignored, the fact that the social benefit-cost ratio is 1: 4.67 confirms the predictions of the researchers above.

In light of these determinations, it is necessary to develop contemporary standards related to urban planning by adapting them to the ecological, socio-economic, and cultural characteristics of the study area and applying them as decision criteria to increase the quality of urban life. Within the scope of these standards, it is undeniable that active open green spaces and cultural areas, which are important parts of urban recreation, are given priority. Because these areas and spaces are of vital importance due to their functions in the physical and mental health development of urban people, the establishment and maintenance of social relations in the context of various actions and activities, the establishment of social solidarity, and the development of urban and urban identity and culture. The results of the research show that this importance has turned into a strong demand from the local people, and that the people are willing to pay a price that isn't required to meet this demand. This means that those in charge of making decisions and putting them into action will need to take steps to do their jobs in this area.

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