ABOUT A METHOD OF THE ESTIMATION OF THE RECREATIONAL AND HEALTH VALUE OF A PROTECTED AREA

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Abstract

Introduction. Recreation is very popular in protected areas where the number of visitors is increasing from year to year. They are attracted by benefits provided by natural resources in the form of favorable conditions to spend time for leisure. These benefits have a specified value which is known as a recreational one. In this paper a method is presented how to measure it. ***Material and methods.*** The method is an extension of an approach known as the travel cost method. The extension consists in taking additional assumptions into account like needs that drive people to recreate in protected areas and as a result the recreational and health value of the area is estimated more precisely. The calculation was realized on data collected by a survey based on an interview questionnaire among 60 respondents in the Kampinoski National Park in the second half of July 2014. ***Results.*** The recreational and health value estimated on the results obtained from 60 respondents amounted to 235 837 PLN and 165 194 PLN respectively. The article presents also more detailed calculations of the selected surveys. ***Conclusions.*** The factors which contribute in a decisive way into the area recreational and health value are the number of visits, the share of a health motive and the length of stay. There are also other factors of lesser contribution into the value like: the time of getting the area, the cost of its reaching and the sum respondents declared to pay for the area protection.

Key words: Kampinoski National Park, travel cost method, recreational value, health value, recreation time value

Introduction

Protected areas, by virtue of the wealth of their resources, provide a number of benefits. Probably best known and attracting widest attention are economic benefits. They are not, however, the only significant ones. There are also ecological, recreational, cultural, educational, scientific, research and aesthetic benefits to mention the most important. Growing interest they evoke, and what is more, growing danger of their loss has led to the conclusion that the way they have so far been treated should be revised. There must be another rational justification of their existence apart from merely formal regulations concerning environmental protection. Such a justification is the value of a protected areas [1, 2, 3, 4, 5, 6].

Probably the oldest, and the best known example of using this value as a decisive argument in support of protected areas was the case of the funds being allocated to support the existence of national parks in the USA. In 1946, a governmental commission was appointed, that cast doubt on the profitability of their maintenance, and as a result the project was proposed to reduce the budget of the Board of the US National Parks. The commission recognized the costs incurred for the needs of parks as much larger than the benefits received. The point was the commission had no data concerning the latter, as it was impossible to obtain them on the basis of current knowledge. The Board, looking for an aid, turned to economists, and among others to the Nobel prizewinner, H. Hotteling. Research commissioned by him showed that parks were visited by hundred thousands of people every year. His hypothesis was simple – visitors came because parks had a definite value for them. This value equals an amount of money they spend to reach a park, to support themselves during a visit and to return home. The method invented by H. Hotelling is now known as the travel cost method and it has been widely used to estimate the value of the benefits mostly from recreation, as this type of human activity has always attracted the largest number of people to national parks, and in turn, has provided the largest research material [7].

It is assumed in the travel cost method that if someone is ready to pay money to reach a protected area then the sum spend by them is a measure of a value that they attribute to the area. This sum could be spend in other ways, but if she or he is ready to incur costs to travel to the area this means that staying there is more preferred, and has a larger value than other ways to allocate money. Thus the recreational value of an protected area equals a total sum of money people pay to be found there and spend there their time. The value is calculated on the basis of a demand curve for recreation which is constructed using the data concerning people travelling to protected areas [8, 7].

Nobody knows however whether the value estimated in this way comprises all benefits provided by a protected area. The cost of travel to the area amounts to the money spend to gain benefits from making the area available and spending time there. This cost does not however express a whole range of other benefits which are many and various and present probably a larger joint value than those resulting from the sum set aside for arrival and moving over the protected area. The former are particularly visible when the costs of travelling are small or even minimal. A good example is the recreation in the Kampinoski National Park. The cost of a few or several PLN for

a Warsaw inhabitant to reach the park and spend time there cannot be a measure of its value. This value must be much larger because for people who come to the area apart from the benefit of getting there, very important are their impressions and experiences during their recreational activity. To assess this value one should apply additional assumptions complementing the travel cost method.

The aim of the paper is to present a method enabling the evaluation of the recreational and health value of a protected area. The method is based, on the one hand, on the fundamental assumption of the travel cost method according to which this cost is a measure of the area value, and on the other hand, on the assumption that if one wants to assess the value of the protected area it is essential to refer to human needs related first of all to the recreation itself, and not merely to the travel to the place where it is performed.

The subject-matter of the paper are the inhabitants of Warsaw who go in for recreation to the Kampinoski National Park. The recreation in the park has first of all a weekend character, and therefore the research proposed to test the method have been conducted over this time. A small fragment of the park was taken into account and a sample was taken among those who visited it.

Before the method is presented it seems useful to introduce briefly the very concept of recreation and explain how its health component is interpreted. Strictly speaking, recreation does not present only one way of behavior. People going in for recreation are classified into seven different types each type being driven by different needs. For example, an activity-hedonistic type is composed of all people who choose recreation from a biological need of movement, a relaxing-cathartic type is characteristic of those for whom recreation is the way to escape from an everyday life with its troubles, duties and obligations, and serves as a remedy to relieve a psychological tension and to release stress, while a social type consists of people who try to find in recreation the opportunity to establish social contacts, to win somebody's friendship or heart. There exists also a health type. It is represented by people who go in for recreation to improve their physical and mental state, to improve and maintain their health and physical abilities as well as to watch their figures [8].

Individual types of recreation differ so much with one another that it is not reasonable to apply the same method to measure recreational and health value with reference to all the above mentioned types together. Methodologically more proper is to focus on one selected type of recreational behavior. Recent research revealed that among motives underlying recreational activity the strongest is still hedonistic one but the highest rate of increase is presented by the health type [9, 10]. It is this type of recreation that is of the interest of the article.

The method proposed consists of two stages. In the first one, the recreational value of the area is assessed, and in the second stage, its health value is estimated on the basis of a share the health motive has in recreation.

Premises underlying the method
As it has been mentioned before, another assumption is added to the assumption that the travel cost is a measure of the area recreational value. This assumption is about needs driving people to recreate in protected areas. There are two such needs:
1. every trip to a protected area comes from the present need of the consumption of the benefits provided by the area recreational resources,
2. people going in for recreation in the area reveal also the need to be sure that this consumption will be possible in the future.

Ad. (1)
In order to satisfy the need of consumption of the benefits provided by the protected area resources, an individual must first reach the area, and this results in cost. The amount of this cost, or in other way, the limit to which an individual is ready to resign from his or her own resources to get the area is interpreted as a measure of the recreational value of the protected area which the individual attributes to it. According to the literature of the subject, it is not, however, the total value of the area, and is interpreted as lower limit of this value only. At the same time the literature does not inform what is also included in the total value [2]. The assumption is made here therefore that what makes the rest of the total recreational value is the value created during the consumption of the benefits provided by the recreational resources (assets). The most important benefits are: the peace and quiet, the beauty of the scenery, clean air, the possibility to rest, the pleasure of exercise, the joy of spending time with other people, the satisfaction of achieving new experience, etc.

Ad. (2)
People care about taking advantage of the above benefits in future, and they know that the existence of these benefits depend to a considerable degree on how much money they could spend on the protection of recreational assets. These costs, that is, an amount of an individual's own resources of which he or she is ready to resign to have the opportunity to commune with the recreational resources, not only at present, but also in the future, is interpreted as a measure of the value people attribute to the protected area from the point of view of meeting the need of using it in the future.

It results from the above assumptions that the recreational value of the protected area consists of three basic components: (a) the lower limit of the protected area value, (b) the value of the protected area derived from the consumption of recreational resources, and (c) the value of the protected area arising from the need of maintaining its recreational resources in the future.

The first stage of the method that has been mentioned earlier consists in the assessment of the above three values. Their sum makes up the recreational value of the protected area.

The key concept used in the method is that of the value of recreation time (of the time set aside for recreation). It is based on the assumption that an individual who goes in for recreation, is well aware of the time being spend, and is able to evaluate it. The definition of this value is the following: the recreation time value is worth as much, as large is the minimal possible amount of money for which she or he is ready to resign from the benefits of recreation in order to earn this money. The concept of the value of recreation time has a unit dimension, and it is assumed that this is the value of one hour spend on recreation.

Applying the concept of recreation time value, it is possible to assess two of the three above mentioned values: (a) the lower limit of the value of protected area, and (b) the value of the protected area obtained from the consumption of recreational resources. The third value, that is (c) the value of the protected area arising from the need of maintaining its recreational resources in the future will be obtained using another method.

Ad. (a)
When calculating the lower limit value of the protected area which is measured in terms of the cost of overcoming the distance to it, one should take into account that this cost is of two kinds: a transport cost and a travel time cost. The former can be expressed in money, the latter cannot be however assessed in this way, and to measure it the concept of time recreation

value is applied. It is worth noting first, however, that there are two different ways an individual interprets the time spend on travel. On the one hand, the trip to the area is interpreted as a waste of time set aside for recreation, and then the cost of travel time amounts to this part of the time recreation value which is allowed for the trip. On the other hand, the trip to the area of recreation is not felt as a waste of time and is interpreted as its integral part, and then travel time cost equals zero. The lower limit value of the protected area, from the viewpoint of the travel cost to get this area, is thus the sum of the cost of travel time and the cost of transport. When necessary entrance fees and the cost of staying in the area is added.

Ad. (b)

The concept of the recreation time value is also used to measure the value of the protected area from the point of view of the benefits gained from the consumption of its recreational resources (assets). According to the definition of the concept, an individual is aware of the benefits which are lost when she or he decides to resign of recreation, that is, he or she is aware of the value of these benefits. This means, that the value of the protected area in the eyes of an individual is the same as the benefits being lost, and at the same time, is the same as the value of the time set aside for recreation. It is assumed, that every stay in the protected area produces a new portion of benefit. The benefit is thus additive in its character and increases with the number and length of stays. Its value is calculated as the product of the amount of time spent in the protected area and the value of recreation time. A year is assumed to be the time of reference.

Ad. (c)

Besides the two above values there is another one which comes into the constitution of the value of the protected area. This is the value arising from the need of preserving the recreational resources in the future. It is estimated using the willingness to pay method. Respondents are asked how much they declare to pay to maintain the current condition of the protected area resources. An amount of individual's own resources she or he is willing to dedicate to preserve these resources is a measure of the value assigned to the protected area from the viewpoint of the benefits to be gained in the future.

Material and methods

As it has been earlier mentioned the sum of the above three values equals the recreational value of the area under study. It was calculated individually for each respondent. In order to assess its health value the recreational value was multiplied by the share of the health motive in respondent's recreational activity.

A survey based on an interview questionnaire was proposed to assess the recreational and health value of the area.

The survey was conducted in the second half of July 2014 among people going in for recreation to a small fragment of the south-eastern part of the Kampinoski National Park. The group of 60 people was surveyed who were selected using a judgment (purposive) sampling technique, and more precisely, its variant known as the maximum variety sampling [11]. According to it, the selection of every successive element (respondent) was made on the basis of researcher's experience with previously sampled units. The criterion was to maximize variety. Every next respondent was selected to be as different from the preceding one as possible in terms of age, sex, and other visible features reflecting respondent's education, the degree of affluence, and social position. Sampling procedure was ending when the similarity of answers intensified so much that it became unlikely to find a subsequent respondent different enough from former ones. In case of the survey presented this began when the number of sampling units reached about 60 respondents.

The interview questionnaire was composed of five groups of questions. The first one consisted of one question only. A respondent was asked to determine a share of health motive in her or his recreational activity. The share was assessed in per cent.

The second group of questions was aimed at assessing the value of the recreation time ITSELF. Respondent was offered to take part in a joint calculation of this value together with the interviewer. The questions did not include the request to provide the information about his or her earnings. Respondent was asked only to count (from memory) the monthly free decision fund and divide the result by the number of working days to obtain a daily wage, or, continuing further the counting, divide a daily wage by the number of working hours to get an hourly wage (a pocket calculator was given to assist the respondent). The hourly or daily rate was then compared with the amount of time set aside for recreation making it possible to describe the minimum limit of earnings at which respondent was willing to resign from a particular amount of time for recreation. It was assumed that this minimum amount of money for which the respondent was ready to give up recreation was a measure of the value of recreation time.

The objective of the third group of questions was to describe what was the respondent's attitude to the time spent on the trip to the area. This was an important information in order to assess the cost of travel time. There were two options as to the attitude. The first one was when the respondent treated travel time as an inseparable part of his or her recreation adventure, and then the travel time cost equaled zero. The second option was when the respondent treated travelling time as being separated from the whole recreation event, and then the cost of travel time amounted to this part of the recreation time value which was wasted for travelling.

The fourth group of questions was aimed at assessing the area value from the point of view of the benefits provided by its recreational resources. As it has been mentioned earlier in the text, this value was measured in terms of the value of recreation time, and equaled the amount of time spend for recreation in the area (usually during a year) multiplied by the recreation time value.

The fifth group of questions concerned the problem of how to value the area from the point of view of the need to preserve its resources in the future. It was estimated using a willingness-to-pay concept. According to the park authorities the cost of its maintenance amounted to 35 mln PLN in 2013, and the number of visitors arriving that time equaled about 750 000. This gave 50 PLN of annual cost per one visitor. Respondents were asked whether they are ready to pay a sum of 50.00 PLN during the period of 5 years to retain a current state of the area. There were three options: to declare willingness to pay: (1) the above sum, (2) a lesser sum, and (3) a higher sum, defining each time its amount.

Results

The recreational and health value of the fragment of the Kampinoski National Park where respondents were surveyed, was measured for one year time interval. Three components entered into the composition of the recreational value:
- the annual cost of travel which was composed of the cost of travel (transport) to the area and the cost of travel time,
- the annual value of the time spend on recreation in the area,

- the declared annual amount of money for the area protection, plus one component more:
- the share of the health motive in recreation, that enabled to assess the health value of the area.

The first three components were calculated using the following equations:
(1) the annual travel cost = the number of visits in the area during a year × the average cost of transport to the area,
(2) the annual cost of travel time = the value of 1 hour of the time spend on recreation × the average time of travelling to the area × the number of visits to the area during a year,
(3) the annual value of time spend on recreation in the area = the value of 1 hour of the time spend on recreation × the number of visits to the area during a year × the average time of one visit in the area,
(4) the annual declared amount of money for the area protection = a declared entrance fee × the number of visits to the area during a year.

In table 1, data to calculate the above equations is presented with reference to a selected respondent.

Table 1. Data to calculate the recreational and health value of the protected area obtained from a selected respondent

The recreation time value (PLN)	50.00
The number of visits to the park within one year time interval	54
The average time of travelling to the park there and back (hours)	0.5
Is the time of travelling to the park a wasted time (to what degree in %)?	Yes (100%)
The average cost of transport to the park in PLN (there and back)	0.00
The average length of one stay in the park (hours)	1.0
Declared amount per month for the park protection	50.00
The annual recreational value of the protected area(PLN)	**4 100.00**
The share of the health motive in recreation (%)	100
The annual health value of the protected area (PLN)	**4 100.00**

Source: authors' own elaboration based on the results of the survey.

Using data from table 1, the calculation of the annual recreational and health value attributed by a respondent to the area proceeds as follows:
(1) the annual travel cost = 54 visits × 0.00 PLN = 0 PLN,
(2) the annual cost of travel time = 50.00 PLN × 54 visits × 0.5 h = 1350 PLN,
(3) the annual value of time spend on recreation in the area = 50.00 PLN × 54 visits × 1.0 h = 2700 PLN,
(4) the annual declared amount of money for the area protection = 50.00 PLN.

The obtained sum of 4 100.00 PLN presents both the annual recreational value and the health value of the area.

In table 2, the annual recreational and health values are presented attributed by some selected respondents to the area under study.

The recreational value of the area under study, estimated on the basis of the survey of 60 respondents amounted to 235 837 PLN, and the health value to 165 194 PLN, presenting 70% of the former.

Table 2. The annual recreational and health value of the protected area using data from selected respondents

Respon-dent's number	The value of recrea-tion time (PLN/ hour)	The number of visits per annum	The rec-reational value of the protected area (PLN)	The share of health motive (%)	The rec-reational and health value of the protected area (PLN)
2	30	54	3290	100	3 290.00
6	100	1	280	100	280.00
12	50	54	4100	100	4 100.00
22	50	30	3750	5	187.50
32	40	12	1067	80	853.60
43	30	2	130	50	65.00
49	50	15	2370	80	1 896.00
52	100	30	12120	50	6 060.00
55	300	30	6605	50	3 303.00

Source: authors' own elaboration based on the results of the survey.

Conclusions

The idea underlying the paper has been to present both the method to estimate the recreational and health value of the area under study, and the results of this estimation.

The method was applied with reference to a population presenting an active, and as a result of a continuous inflow and outflow of people to the area, spatially fluctuating set which made it impossible to ensure a random character to the procedure of respondents' selection. In the end, the sample obtained could not be considered as representative, and this in turn, meant that the results could not be generalized onto the whole population of tourists visiting the protected area under study. The only way to approximate its value in their eyes is, on the one hand, to repeat the method in as many places within the area as possible, and on the other hand, to apply the method cyclically in equal time brackets following in succession.

A decisive contribution into the area recreational and health value had no so much the recreation time value as other two factors shown in table 2: the number of visits and the share of a health motive. The values of recreation time presented relatively small differences (from 20 PLN to 150 PLN in average what resulted from a fairly uniform distribution of respondents' incomes) whereas the frequency of visits fluctuated from 1 to 80, and the share of the health motive, from 2% to 100%. How the number of visits affected the area value is seen for example of respondents having numbers 6 and 52. In their case the recreational values amounted to 280 and 12 210 PLN respectively. As to the influence of the health motive share a good example is presented by respondents with numbers 12 and 22 where the difference between recreational values they attributed to the area was small while the recreational and health values amounted to 4 100 PLN and 187.5 PLN respectively.

The third vital factor influencing the recreational and health value of the area (not taken into account in the table) was the length of stay in it. As the example two respondents may serve with the numbers 52 and 55. The former valued the recreation time at 100 PLN, the latter at 300 PLN. As the number of visits

was the same in both cases (30) a decisive influence on the area recreational and health value had the length of staying. The first respondent stayed 4 hours, and the second one, 45 minutes that is 5 times shorter. It was enough to smooth out the difference in the recreation time values (100 PLN and 300 PLN), and as a result to get 2 times larger the area recreational and health value in the eyes of the first respondent.

Remaining factors, that is the time of getting the area, the cost of its reaching and the sum respondents declared to pay for the area protection had lesser influence on its recreational and health value mainly on account of small fluctuations of their sizes.

An approximate distribution of respondents' incomes was obtained when the recreation time value was calculating. Only few respondents had access to large money. Majority of them had lesser incomes, what together with small differences among them, found its reflection in a relatively small contribution of the individual's recreation time value into his or her overall recreational and health value attributed to the area. An intuitive conviction found its confirmation that the larger were incomes of respondents the less time they spend on recreation and the more they valued it what found its reflection not only in the assessment of the recreational benefits provided by the area but also in the amount of money they declared for its protection.

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