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**Article**

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# Problems of Small Recreation Areas Valuation - Forest Refugium in the Silesia Park in Chorzów

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**Abstract:** The central part of the Silesia Park in Chorzów was designed as a forest refugium. Now this area of 200 ha is under pressure. Many trees have been cut down for the safety of park visitors. The forest is of significance for people who prefer walking and relaxation far from urban noise and park events. In May 2015, a pilot valuation survey of the forest refugium was conducted using the contingent valuation method (CVM). Respondents were asked if they would be willing to pay a local tax established in consequence of a referendum. Almost half of the respondents did not support implementation of this tax in surrounding towns. The maximum annual tax amount declared by the respondents was 100 PLN, the annual average was 34 PLN and the annual median was 20 PLN. Taking into account the number of residents who totally rejected the tax proposal, the average annual amount was 17 PLN. The forest refugium in the Silesia Park is appreciated by naturalists but is not often visited by the public. This forest area is probably not sufficiently important for the residents to introduce a local tax. The aim of this article is to show restrictions of the use of the CVM method.

**Keywords:** ecosystem valuation, contingent valuation method, the Silesia Park, forest refugium, tree felling

**JEL codes:** Q51, Q57

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## 1. Introduction

The Contingent Valuation Method (CVM) is a survey-based technique of environmental valuation. It is good method for estimation of economic benefits or costs (non-use and use values) resulting from environmental changes. The use of surveys allows to estimate hypothetical changes and their impact before they have taken place (Plan Bleu, 2015: 18). Respondents are asked to declare their

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willingness to pay (WTP) for maintenance of environmental features or willingness to accept (WTA) compensation of their loss. The method was first applied in the state of Maine, USA, when Davis (1963) used surveys to estimate the benefits of recreational areas. So far, the method was used to measure the benefits of improved water and air quality, hazardous waste disposal, improved conditions for recreation as well as protection of endangered species of plants and animals (Shechter, 1996: 213).

However, the method has such restrictions as a high budget and time demands as well as a high bias risk which may lead to inaccurate WTP estimations (Plan Bleu, 2015: 18). Additionally, usefulness of the CVM method is limited to developed countries, because obtaining credible results depends on the respondents' accurate understanding of environmental issues (Winpenny, 1995). In countries without a tradition of public opinion polls, the use of a survey may entail distrust or excessive favorability of the respondents.

Questions should be as simple and as unambiguous as possible. Because they relate to a hypothetical market, there may be various errors. It is also possible to observe intentional behavior of respondents to underestimate or overestimate the final result. The first of the possible behavior patterns is "free riding", i.e. not revealing the respondents' genuine preferences, but later making use of the goods paid for by others (Panasiuk, 2002: 57-58). Reverse intentional behavior of the respondents is called strategic revaluation. If the respondents foresee consequences of the survey, the WTP amount may be overestimated to enforce the decision (Śleszyński, 2000). The aim of this article is to show restrictions of the use of the CVM method.

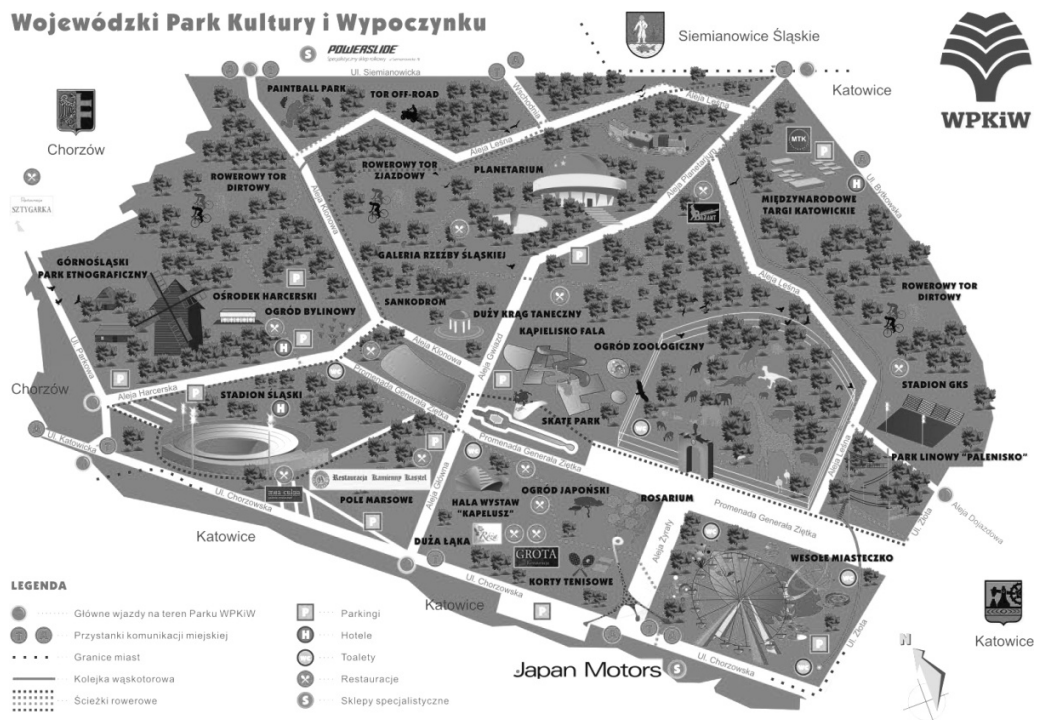
## **2. The Silesia Park**

The Silesia Park (*Park Śląski*) in Chorzów is a vast green oasis for inhabitants of the northern part of the Upper Silesian metropolitan area which is the biggest urban agglomeration in Poland. It is located within the borders of the cities of Katowice, Chorzów and Siemianowice Śląskie, in an area of 620 hectares. The park was established in 1951 on post-industrial grounds (mining slag heaps, mining wastes, bootleg mines, cave-ins, marshes and garbage dumps) as the Voivodeship Park of Culture and Recreation (*Wojewódzki Park Kultury i Wypoczynku*) for the whole Katowice province (Silesia Park, 2011). It performs multiple functions and includes an amusement park (*Śląskie Wesole Miasteczko*), zoological and rose gardens, planetarium, regional open-air museum,

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two stadiums, concert and fair grounds, swimming-pool complex, tennis courts, shooting range, ropes course, scout centre (all mainly in southern part) as well as ponds, 100 hectares of tended greens and parklands and also 250 ha of forested areas, see fig. 1.

**Figure 1. Facilities of the Silesia Park (former Voivodeship Park of Culture and Recreation) in Chorzów**



Source: crewtrip.pl

The central part of the Silesia Park (around the planetarium) was designed as a forest refugium and it has not been significantly modified in the last 20 years. Now, this 200 ha park area is under pressure. Since the year 2010 many trees were cut down. As justified by the park authorities this was done for the benefit of the park visitors' safety and new tree fellings are currently planned. However, the forest area is highly valuable for people who enjoy long walks and rest far from urban noise and park events. Additionally, trees and shrubs are a friendly refugium for wild animals, i.e. birds (including 5 species of woodpecker), mammals (e.g. weasel, roe deer, foxes and occasionally wild boar) as well as amphibians and reptiles (*Rozprawa z drzewami*, 2012).

### **3. Profile of the park visitors and opinions on tree felling**

In 2013, in reaction to the first tree felling, scientists of the University of Silesia in Katowice carried out a survey on the attitudes of 438 respondents on tree felling (University of Silesia, 2013). The questionnaire results show that 46% of the respondents visit the Silesia Park several times a year, 15% - once a month, 13% - once a week and 14% - several times a week. The remaining respondents visit the park only once a year or it was their first visit. Majority of the visitors always walk in the park, often visit the zoological garden, planetarium and stadiums and participate in organized events but rarely make use of the catering facilities. Some of the visitors also ride bikes, skate or run. The forest refugium is a favorite part of the park, where 56% of the respondents very frequently come for a rest and 30% of them sometimes relax. 60% of the visitors responded that they definitely felt safe walking in the forest despite the presence of old and partially decayed trees and 25% responded that they felt to some extent safe.

In May 2015 a pilot valuation survey of the forest refugium was carried out by Panasiuk (2015) using the CVM method. This study was proposed by a community of naturalists from the University of Silesia worried tree felling in the park. Students of the Faculty of Biology and Environmental Protection of this university collected 75 questionnaires in one working day. Respondents were polled in different parts of the park. They were asked about the frequency of their visits, forms of rest and recreation in the park and their willingness to pay a local tax for forest conservation.

Women constituted 64% of all the respondents. The youngest visitors, those not over 24 years of age, accounted for 36% of the respondents. Together with a group of visitors aged from 25 to 34 years they constituted 49% of all the respondents. This is consistent with the results of the University of Silesia survey carried out in 2013. Only the 65+ age group (10% of the respondents) was overrepresented. In consequence, the age structure of the respondents was as follows: 39% were students or pupils, 33% were employed, 23% were pensioners and 5% were unemployed. Most often the respondents declared a monthly income in the range of 1250-1750 PLN per person. No one declared membership in an environmental organization.

In the first question the respondents were asked when they visit the Silesia Park. Interviewed on a working day, 37% of the respondents declared that they visit the Silesia Park several times a week, 9% - once a week, 17% - once or twice a month and 28% less than once a month. The biggest group of respondents (41%) declared that they have never visited the forest

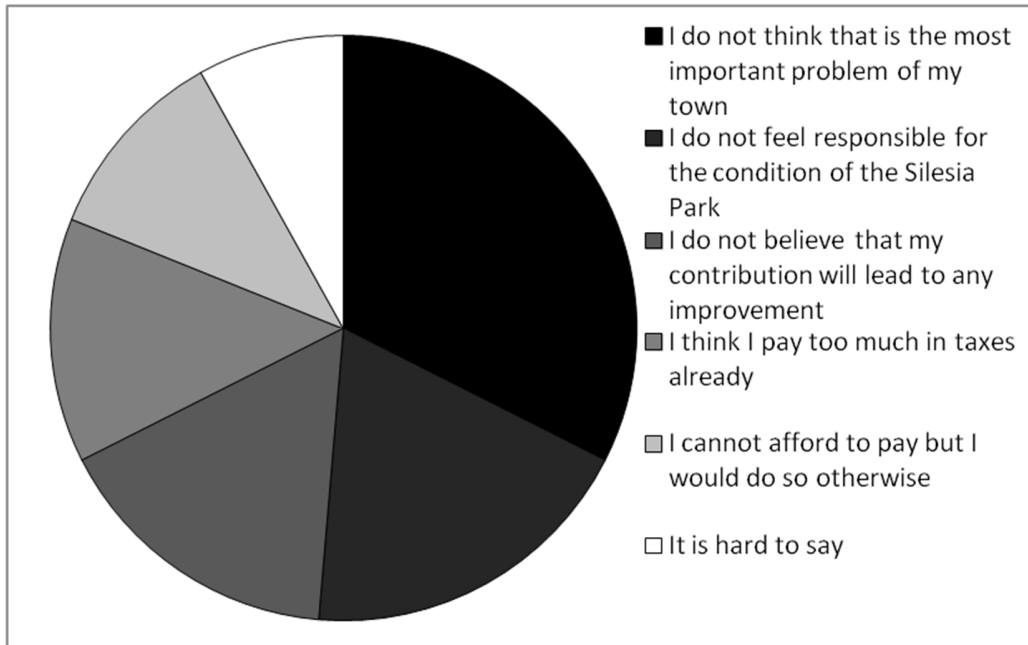
refugium. 33% of the respondents rarely visit this part of park. Only 20% of the respondents often walk in the forested area and 5% always visit the forest refugium during their stay in the park. In effect, merely 35% of the respondents personally faced the problem of tree felling in the Silesia Park.

In the next stage, pollsters presented opinions of the park managers on tree felling. Authorities of the Silesia Park argued that strollers often walk through inaccessible areas and tree limbs may fall on them. Besides, wild boars took a liking to the forest part of park and their presence is a threat to humans. Therefore, if there will be fewer trees, there is a chance that wild boars will leave the park. Fewer trees is also an impediment for thieves. Generally, park authorities claim that the forest character of the park does not serve visitor security. Half of the respondents agreed with this opinion. 9% said definitely yes and 41% said rather yes. The structure of respondents who thought the opposite was similar.

#### **4. Willingness to pay for maintenance of the forest refugium**

Questions on the willingness to pay for maintenance of the forest refugium in the Silesia Park were the main part of the 2015 survey. The local tax put forward in the referendum was proposed in order to gather additional funds for maintenance of trees as well as for reduction of pressure from expansion of the amusement park and introduction of other loud recreation. Respondents were also asked whether they support the introduction of a tax imposed on inhabitants of surrounding towns. Type of n-bounded dichotomous choice question CVM was used with the proposed bid level of willingness to pay to accept or refuse (Georgiou, 1996). Questions for code cards were used from the Markowska (1995) CVM survey for clean Baltic Sea valuation. Almost half of the respondents did not support this local tax, 12% definitely not supported and 37% rather not. Fig. 2 shows reasons for refusing to pay a local tax.

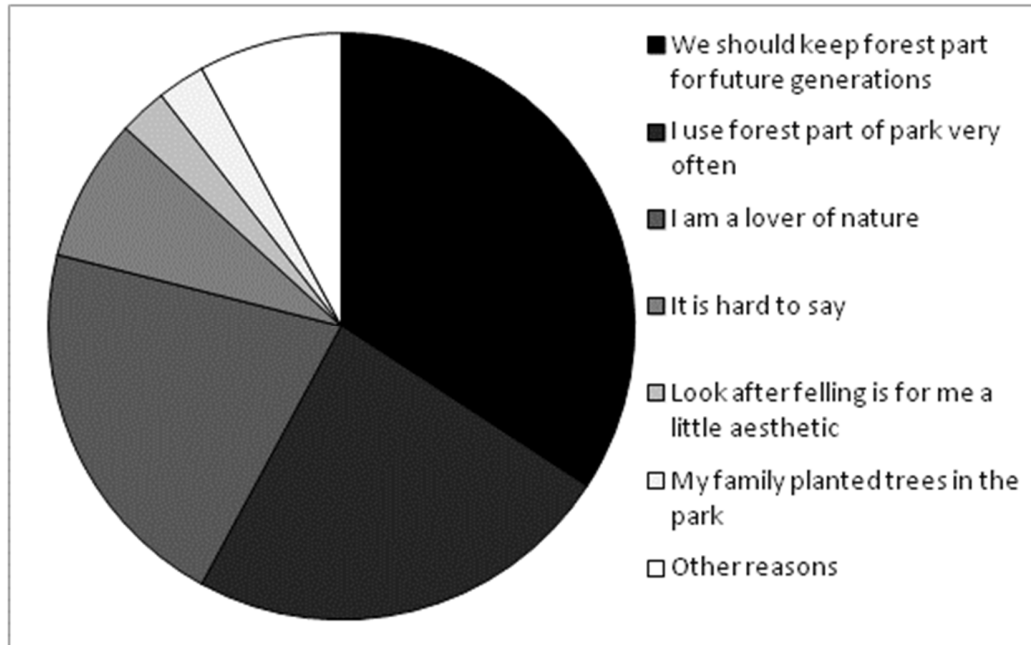
**Figure 2. Reasons for refusing to pay tax for maintenance of the forest refugium in the Silesia Park**



Source: Author's own elaboration

Group of the “zero bidders” (Markowska and Żylicz, 1999: 308-309) includes those who think that there are other, more important, goals to be financed (16% of all 75 respondents) as well as those who cannot afford to pay it (5%). In turn, the “protest bidders” claimed that payment of the local tax was not their responsibility (28%). 4% of the respondents said that they had no opinion. Second half of the respondents supported the idea of a local tax (9% said definitely yes and 42% said rather yes). Fig. 3 shows reasons for paying the tax. The biggest group, 17% of all the 75 respondents, claimed that they should preserve the forest refugium for future generations. The remaining respondents made use of the forest refugium very often (12%) or were nature lovers (11%).

**Figure 3. Reasons for supporting payment of a tax for maintenance of the forest refugium in the Silesia Park**



Source: Author's own elaboration

The maximum annual tax amount declared by the respondents was 100 PLN, the average annual value of WTP was 34 PLN and the annual median value was 20 PLN. In the largest youth group the average value was the same. The highest average was declared by 25-34 year olds (45 PLN), the lowest by seniors, mainly pensioners (21 PLN). Looking at the gender structure, women declared a higher average value (38 PLN) than men (22 PLN). Frequency of the forest refugium visits did not affect the results. There was a numerous group of zero and protest bidders. Taking these results into account, the average annual value of the WTP amounted only to 17 PLN.

### 5. CVM studies in Poland

The WTP value for maintenance of the forest refugium in the Silesia Park is relatively low in comparison with other studies conducted in Poland with the use of the CVM method. Willingness to pay for the clean Baltic Sea was priced at 169 PLN (73 USD) annually for positive bidders or 129 PLN (56 USD), including zero bidders but excluding protest bidders (Markowska and Żylicz, 1999: 310). Effective annual protection of the Biebrza marsh amounted to 100 PLN (Ciszewska, 1997), limiting traffic in the center of Kraków at 100 PLN annually (Berbeka and Peszko, 1997)



and clean water in Polish rivers and taps amounted annually to 80 PLN (Markowska, 2004). Zero and protest bidders are a significant problem of valuation. In the Polish survey concerning clean Baltic Sea, 60% of the respondents supported the idea of the 'Baltic tax'. In a similar Lithuanian survey only 44% respondents positively answered the question concerning support for the Baltic tax (Markowska and Żylicz, 1999: 308-309).

Lower WTP was achieved in valuation of the Ślęza Landscape Park. In addition to the travel cost method study, respondents were asked about their willingness to pay for access to the environment at an unchanged level by donating to a foundation specifically set up to protect this area. The average annual WTP was 37.30 PLN. Willingness to pay to achieve a high level of naturalness in the commercial part of the Białowieża Forest was priced at 38 PLN (9.2 EUR) annually and in the second-growth forest at 48 PLN (11.7 EUR) annually. These parts of the Białowieża Forest are not as unique as areas on the borders of the Białowieża National Park (Bartczak, 2013: 11). WTP for reduced Polish forest littering was priced at 27 PLN annually for single visited forests and 36 PLN annually for all the forests in an administrative region (Bartczak and Żylicz, 2014: 143). The study by Zandersen et al. (2012: 47-59) reviews forest valuation studies in Europe but it mainly focuses on western and northern European forests.

The forest refugium in the Silesia Park is an even smaller recreation area than those mentioned above. It may be the main reason for a much lower WTP value in relation to nationwide ecological problems and a lower WTP than that for bigger forest complexes or landscape parks.

## **6. Conclusion**

The willingness to pay for maintenance of the forest refugium in the Silesia Park in Chorzów is relatively lower, amounting to 17 PLN annually, including zero and protest bidders. This may be explained by the fact that the forest refugium is appreciated by naturalists but not frequently visited by the local public. Locally, the condition of the forest refugium is probably a less important community issue and the results of a referendum on a local tax carried out in three neighboring towns would probably be a disappointment and implementation of the concept of financial support for maintenance of the forest refugium is difficult to achieve. In consequence, it is not possible to introduce such an issue in a CVM study.

Alternatively, the travel cost method (TCM) study could generate real income paid by visitors, but the amount would probably be inadequate because most of the visitors to the forest refugium come from nearby communities and come on foot or by public transport with monthly commuter passes. In turn, the park forest refugium is not an alternative for weekend trips to the Silesian Beskids mountains located several tens of kilometers to the south of the Katowice agglomeration. The example of valuation of the 200 ha forest refugium shows limitations of the use of the contingent valuation method, other than a high budget, time demand as well as bias risks.

It is recommended to choose for CVM research such ecological problems, which are more widely known by the local community. In terms of size, the area under investigation should be closer to a national or landscape park than a natural reserve or ecological site.

Valuation of the forest refugium in the Silesia Park was made within the framework of student workshops conducted by the University Environmental Studies: Ordered Specialty “Environmental Protection” (*UStuŚ - Uniwersyteckie Studia Środowiskowe*), in the Faculty of Biology and Environmental Protection of the University of Silesia in Katowice. The Author thanks the EU European Social Fund for financing the workshops.

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*Problemy wyceny małych obszarów rekreacyjnych - ostoja leśna w Parku Śląskim w Chorzowie*

*Streszczenie*

Centralna część Parku Śląskiego w Chorzowie została zaprojektowana jako leśna ostoja. Obecnie ten 200-hektarowy obszar jest poddawany presji. Wiele drzew zostało wyciętych dla bezpieczeństwa odwiedzających, ale las stanowi dużą wartość dla osób preferujących spacer i odpoczynek z dala od zgiełku miejskiego oraz parkowych imprez. W maju 2015 r. przeprowadzono wstępną wycenę ostoi leśnej metodą wyceny warunkowej (CVM). Ankietowanych pytano o chęć zapłaty podatku lokalnego wprowadzonego w drodze referendum. Prawie połowa ankietowanych nie poparła wprowadzenia takiego podatku nałożonego na mieszkańców okolicznych miast. Maksymalna zadeklarowana kwota podatku wyniosła 100 zł rocznie, średnia - 34 zł, a mediana 20 zł rocznie. Po uwzględnieniu osób odrzucających podatek, średnia kwota wyniosła 17 zł rocznie. Ostoja leśna w Parku Śląskim jest doceniana przez przyrodników, ale nie jest powszechnie odwiedzana przez ludność. Ten zalesiony obszar jest prawdopodobnie za mało ważny dla wprowadzenia podatku lokalnego. Celem artykułu jest pokazanie ograniczeń zastosowania metody CVM.

**Słowa kluczowe:** wycena ekosystemów, metoda wyceny warunkowej, Park Śląski, ostoja leśna, wycinka drzew

**Kody JEL:** Q51, Q57

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