

## **Management of City Parks of the Capital City Warsaw and Its Function as Example of Public Good**

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**ABSTRACT :** *In this article, the group of authors based on the theory of public goods, present urban parks from perspective of public good. For the purposes of this article, surveys were carried out among residents of City of Warsaw. The survey was designed to examine the role and function of the city parks in Warsaw in the opinion of their users. The article describes the theory and role of public goods and the ways of their financing, with particular emphasis on urban parks as an example of this public good. The study analyzed available data on Warsaw green areas. The research is based on the analysis of questionnaire surveys. It describes the role, functions, assessment of the level of maintenance, equipment and satisfaction with city parks according to the opinions of their users. Analyzes have shown that urban parks are most valued by residents areas of greenery, thus being the most expensive type of green areas in the city considering the maintenance costs. The main reasons for diversifying the costs of maintaining city parks are driven by functionality and equipping. Moreover, the relationship between the level of maintenance of parks and the level of meeting the residents' expectations is presented. The article includes conclusions and proposals for future research.*

**KEYWORDS** - *city parks, costs of maintenance, green areas, local government, public goods*

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### **I INTRODUCTION**

Public spaces such as green areas, and in particular urban parks are increasingly appreciated components of the city landscape. The ability to approach the design of public space, its proper management gives the opportunity to merge urban spaces by combining individual areas. Through these activities, you can also influence the quality and lifestyle of its residents. It is worth mentioning that the described space plays an important role in the functioning of the city and creates a frame and background for buildings, shapes the aesthetic character of the city and influences how it is perceived (Wantuch - Matla, 2010). Green areas are understood as a kind of a distinctive whole in the city landscape, which has the character of a complex object (Szumański, 2007). The park is one of the elements of green areas, areas developed primarily with the help of vegetation, for recreation (Niemirski, 2007), it also has an area of more than two hectares, which distinguishes it from other smaller green areas. Warsaw is the only capital in Europe and one of the two in the world borders with a national park, it has many green areas including park assumptions, which after the political changes of the 90's thanks to systematically transferred financial resources are constantly changing their face, thus contributing to the development of the city.

There are 12 nature reserves in the capital, of which seven are available for tourist traffic, sightseeing on designated roads and trails (Wojtatowicz, 2005). Probably that is why Warsaw is referred to as the "green city" outside Poland. The area of parks, green areas, and street greenery covers 4240 hectares, which is more than 8% of the city's area, however urban greenery also includes legally protected areas, including reserves and landscape parks that cover 12216 hectares (Kozłowska, 2014), ie 24 % of the city's area. Warsaw due to the total large area of green spaces - 32% of the city's area, next to the Scandinavian cities, Vienna and Berlin is one of the greenest European cities. Public goods is an issue that has been described by some authors as goods that are characterized by the inability to exclude them from consumption and at the same time are not competitive in consumption.

The first condition means that the good supplier cannot legally prevent the use of good by others. The second condition means that consumption of good by one person does not deprive other people of the possibility to consume the same good, and therefore without any consequences good can be consumed by several people at the same time (Holcombe, 1997). Public goods are those goods that are available and intended for all and are financed by the state budget, local government budgets and other public funds (Hart, 2011). In this approach, public goods create a collective consumption of society, which is financed from public funds. Public infrastructure is considered to be a public good to a large extent, including urban parks, which due to the significant competitiveness resulting from the limited natural resources, may not be considered public goods under all conditions (Borek, 2007). Green areas, including Warsaw's city parks, form the natural system of the city and

create the specific character and climate of many of its fragments, shaping the purity of air in the capital. Trees are a barrier against pollution, such as car exhaust, which is the main source of pollution in Warsaw. It should be remembered that the biggest environmental threat in the world is air pollution with so-called suspended dust, trees create an effective barrier against it. Considering the above claims, city parks in Warsaw are part of public goods and as such will be described further in this article.

An important need of a city citizen is contact with nature, and it is possible thanks to the green spaces. This characterizes a modern inhabitant, although it is similar to the needs of citizens of the nineteenth century city (Wolski, 2006). Parks and urban green areas can be considered a kind of index of civilization development and living standards (Zachariasz, 2006). Same is confirmed by opinions giving access to areas open to parity with access to basic services considered to be essential for a good quality of life and sustainable development at the local level. Green areas are also places where residents often rest and find an oasis for peace, feeling a specific microclimate in contrast to the polluted urban climate. Parks are a natural barrier to annoying urban noise and fulfill an important environmental function which should be the protection of rainwater. It is these features that distinguish urban greenery from other places in a crowded city.

Greenery beyond its advantages also affects the city and its residents financially. One hand, it is a share in the budget also determines the value of real estate and individual locations (Nov, 2004). For financing green areas in 2016, funds in the amount of over EUR 18 million have been spent in Warsaw. This amount consists of maintenance and conservation of greenery, street greenery, parks and forests as well as studies related to greenery. It can be considered as significant amount, but assuming that it accounts for less than 1% of current expenditure of the entire city budget, and considering the previous years, it is certainly too low to take. This amounts consist of maintenance and conservation of greenery, street greenery, parks and forests as well as studies related to greenery. It can be considered a large amount, but assuming that it accounts for less than 1% of current expenditures of the entire city budget and considering the previous years, it is certainly too low considering the important role of urban greenery for society. City parks, which are the research objects of the following work, are part of urban greenery and are a public, organized within the city space, managed by vegetation. Urban green areas have recreational, ecological and health functions, affect the mitigation or elimination of the nuisance of life in cities, shaping urban layouts, introduce spatial order and give the cities a specific and individual character.

The result of this article is the presentation based on the theory of public goods of city parks from the perspective of public good. In studies carried out among residents, the author examined the role, functions and condition of city parks in Warsaw in the opinion of their users.

## **II PARK AS A PUBLIC GOOD**

"The theory of public goods is one of the elements of a broader theory of public choice, which includes, inter alia, the economic theory of democracy, the theory of interest groups, the theory of common goods and the analysis of mechanisms for rent" (Maciejczak, 2009). The aforementioned theories function in the mainstream of the new institutional economy, which is a successful synthesis of neoclassical economics and institutionalism. It is currently one of the fastest-growing trends in modern economics, which arouses the interest of many social sciences, including political science, sociology and law. Public choice theory is also referred to as economic theory of politics. This relatively new field of economic sciences uses the methods and methodological assumptions of standard economics to analyze people's behavior in political activities and other areas of the public sphere. The area of political decision-making, public order formation and the mechanism of providing public goods are the sphere of research and analysis of public choice theory. The academic literature emphasizes that the inclusion of the category of institutions in the analysis not only enriches economic science, but also brings economics closer to other areas of science, such as law, psychology, sociology or political sciences (Wilkin, 2005).

City park as a public space organized in the city area is an example of public goods. It completes recreational functions, often also sports or other, depending on the particular park layout. The precursors of the concept of public goods were economists who deal with the problems of the purpose and scope of state expenditure and taxation, among them David Hume (1739), John Stuart Mill (1848), Richard Musgrave (1939), as well as Erik Lindahl, Emil Sax and Knut Wicksell. One of the first definitions regarding the theory of public goods, however, was created by Paul Samuelson in 1954, who in his work "The Pure Theory of Public Expenditure" considers goods that are not consumed and are non-scattering. Public goods also have a useful function for individuals, no one is excluded from the benefits resulting from their use, they can be used by a large number of business entities.

R. Musgrave (1959) pointed out that the non-digestive character of consumption means the existence of positive externalities. He noted, however, that this does not mean that every beneficiary of such a good obtains the same subjective satisfaction - utility, and even that the good or service thus obtained will have the same quality in each individual case. R. Musgrave noted that a public good or service does not have to be of the same quality

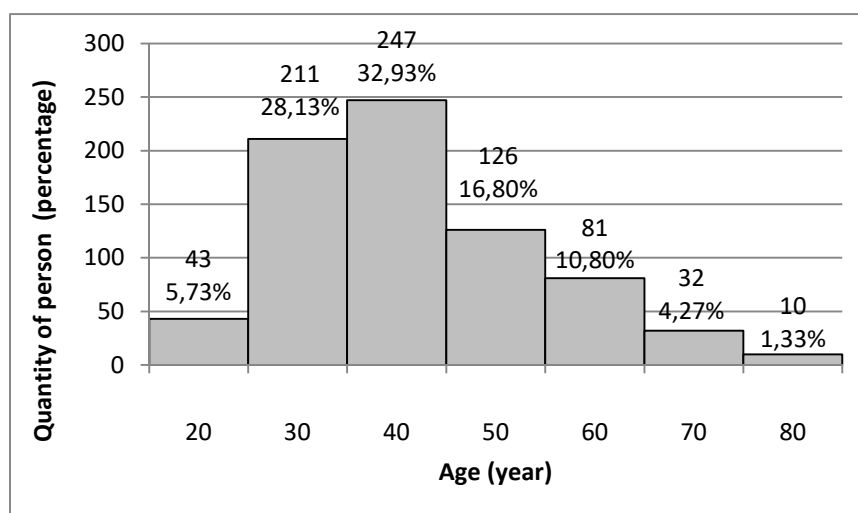
for every recipient, and that beneficiaries of an equally public good may be subject to a different subjective satisfaction - utility (Musgrave, 1959). An example of this observation are city parks. They are available to the public, while the assessment of their quality and satisfaction of residents from what they look like and the assessment of how a given local government unit manages them may differ from each other. In addition, the inhabitants of a given territorial unit may have access to unequal quantities and quality of goods supplied by the local self-government, because some will have closer and others will continue to the given park assumption. In the case of the need to test the availability and satisfaction of these goods from the recipient - demand, and not only from the side of supply, a survey is necessary.

The city park is one of the elements of green areas, ie areas developed primarily with the help of vegetation, for relaxation (Niemirski, 1973). M. Siewniak and A. Mitkowska (1998) describe the park as a variation of garden composition, as part of the basic division into gardens and parks. The park in comparison with the garden is characterized by a much larger area intended for plant compositions, as well as "blurring the boundaries of the composed band and neighboring areas", is intended for the general residents of the city. From the city garden, it is distinguished by the larger surface area and the complexity of the function it performs. In most cases, the park has designated paths and paths for walking, as well as landscaping facilities, playgrounds, gazebos, monuments, fountains or other water elements. The described parks, especially those with large areas, are a substitute for the forest in the city, thus moving the visitor beyond the mental boundaries of the metropolis (Rogers, 2001).

### III THE ROLE OF CITY PARKS IN WARSAW IN THE OPINION OF THEIR USER

In order to characterize the sample of users of city parks in Warsaw, the author conducted surveys in the districts of Warsaw, in which there are city parks, ie in 15 districts out of 18. In urban parks located in each of the surveyed districts, surveys were conducted among 50 people, that is, in total 750 people. The sample was selected so that diverse sample of sex, age, marital and family status were represented.

The age of the respondents was divided into 10 year-old age groups (with intervals closed right-handed). Most of the respondents were aged 30 to 40 (about one in three), 28% were of 20 to 30 years old, and 17% - from 40 to 50 years. About every tenth respondent was between 50 and 60 years old, around 6% - from 18 to 20 years, 4% - from 60 to 70 years and 1.3% - from 70 to 80 years (Figure 1).



**Figure 1. Age of total respondents (N = 750)**

Source: Own research based on completed questionnaires

According to the results of the research, the most important reason for respondents to go to city parks was a walk with a close person and / or a meeting with friends (Table 1). As the main reason, it was definitely declared by almost half of the respondents (48.8%), and about every third respondent (34.67%) giving the answer of "rather yes". Another of the reasons for the importance of attending city parks in Warsaw by respondents was enjoying the bench time, rest and communing with nature. This was indicated as definitely the main reason by 35.47% of respondents and as the main one - by 30.13%. Further, the main reason for attending city parks was to take bicycle ride or roller-blading, which was indicated by 21.5% of respondents and as the main one - around 27% of them. Similarly, the main reasons for attending city parks were indicated by the respondents as: reading a book or press (definitely yes - about 12% of respondents and yes - about 30% of them) and running (definitely

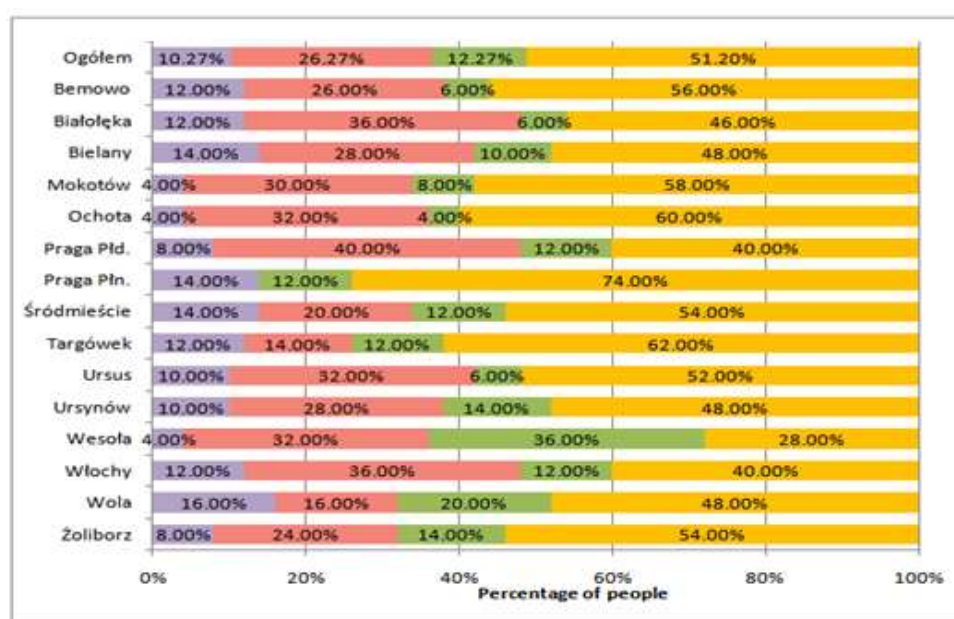
yes - about 14% of respondents and rather yes - about 23% of them). However, walking with a dog was indicated the least frequently as the main reason for attending city parks by respondents in Warsaw (indicated as definitely the main reason of only by 8% and as the main one – by 15% of the respondents).

Reasons	Answers									
	absolutely no		rather no		neither yes neither no		rather yes		absolutely yes	
	n	%	n	%	n	%	n	%	n	%
Walk with friend/meet with friends	14	1,87	28	3,73	82	10,93	260	34,67	366	48,80
Walk dog	345	46,00	106	14,13	127	16,93	112	14,93	60	8,00
Bike paths	83	11,07	157	20,93	149	19,87	202	26,93	159	21,20
Jogging	147	19,60	143	19,07	187	24,93	170	22,67	103	13,73
Reading a book, newspaper	139	18,53	136	18,13	164	21,87	223	29,73	88	11,73
Resting, sitting, looking nature	36	4,80	73	9,73	149	19,87	226	30,13	266	35,47

**Table 1. The main reasons for responding to urban parks in Warsaw  
n - number of people, % - percentage of people.**

Source: Own research based on completed questionnaires

Thanks to the carried out research, the answer was given to the question of which green areas are the most valued among residents and which are best managed by the city. The largest number of respondents who asked what greenery areas in the city are the most valued were urban parks (51% of respondents). Further 26% of the respondents indicated residential greenery, 12% for squares, orchards, small informal vegetation communities, while the least studied exchanged street greenery (10%) (Figure 2).



**Figure 2. The most valued areas of greenery in the city by respondents according to the districts of using urban parks in Warsaw (structure of responses)**

Source: Own study

Answers to the question about the most valued green areas in the city differed significantly between respondents from individual districts ( $\chi^2 = 89.046$ ,  $p < 0.001$ ). City parks as the most valued areas of greenery in the city were indicated by the largest number of respondents in the Praga Północ district (74% of city park users in this district). They were less often reported as the most prized in the Targówek district (62% of city park users in this district), Ochota (60%), Mokotów (58%), Bemowo (56%), Żoliborz and Śródmieście (54% each), in Ursus (52%), Ursynów, Wola and Bielany (48% each), Białołęka (46%) and Praga Południe and in Italy (40% each). The least number of respondents gave city parks as the most valued areas of greenery in the city in the Wesoła district (28%), which could be due to the fact that this district does not have large, old parks as such.

#### IV FUNCTIONS OF CITY PARKS IN WARSAW ACCORDING TO THEIR USERS

In the survey, the users of city parks in Warsaw were asked how important are the various functions of parks, how individual elements of parks affect them and how important they are for the functioning of parks, and finally what can and should be done in parks. Of the park functions listed in the survey (Table 2), the respondents considered the walking function to be the most important one. Almost half of the respondents (49.07%) replied that this function of parks is definitely important and 37.33% - that it is rather important, ie a total of 86.40% of respondents considered it important. In terms of importance of ranking, next was indicated the seating function of parks (through a large number of benches). It was decidedly important by 33.47% of respondents and 42% - rather important, that is, it was jointly valid for ¾ of the respondents. Then, the importance of two parks' functions was similarly assessed: the recreation (through the availability of "open lawns" on which one may sit) and sport activities. These functions were definitely important for 33.6% and 30% of respondents, respectively, rather important for 35% and 38% of the respondents, respectively, meaning jointly for 2/3 of the respondents. Cultural function of parks was the least important (cultural events, concerts, movie evenings). It was decidedly important by 23% of respondents and rather important 36.27%, which means that it was important for more than half of the respondents(58.91%).

Park functions	Validity									
	definitely unimportant		definitely unimportant		or important or unimportant		rather important		definitely important	
	n	%	n	%	n	%	N	%	n	%
Recreation - through a large number of benches	13	1,73	43	5,73	129	17,20	314	41,87	251	33,47
Resting - through the availability of "open lawns" on which you can sit	20	2,67	61	8,13	157	20,93	260	34,67	252	33,60
Recreation and sports	11	1,47	61	8,13	168	22,40	286	38,13	224	29,87
Walking	4	0,53	12	1,60	86	11,47	280	37,33	368	49,07
Cultural (cultural events, concerts, movie nights)	23	3,07	88	11,73	197	26,27	272	36,27	170	22,67

**Table 2. Functions of city parks according to their users in Warsaw  
n - number of people, % - percentage of people, % in lines add up to 100.00.**

Source: Own research based on completed questionnaires

Elements of parks	Validity									
	definitely unimportant		definitely unimportant		or important or unimportant		rather important		definitely important	
	n	%	n	%	n	%	n	%	n	%
elements of small architecture (benches, gazebos, waste baskets)	6	0,80	22	2,93	100	13,33	292	38,93	330	44,00
condition of vegetation	1	0,13	12	1,60	86	11,47	328	43,73	323	43,07
walking paths	1	0,13	12	1,60	98	13,07	313	41,73	326	43,47
bike paths	22	2,93	59	7,87	164	21,87	284	37,87	221	29,47
playgrounds for children	18	2,40	43	5,73	150	20,00	275	36,67	264	35,20
water reservoirs - ponds, lakes, etc.	9	1,20	55	7,33	210	28,00	294	39,20	182	24,27
location of the park, city center, district, good access	8	1,07	33	4,40	124	16,53	323	43,07	262	34,93
low noise level in the park	13	1,73	22	2,93	83	11,07	234	31,20	398	53,07
meeting places in the park, cafes, etc.	19	2,53	83	11,07	192	25,60	285	38,00	171	22,80

**Table 3. Elements of city parks according to their users in Warsaw n - number of people, % - percentage of people, % in lines add up to 100.00.**

Source: Own research based on completed questionnaires

Comparing the importance of various park functions between respondents from individual districts of using urban parks in Warsaw (Table 3), respondents assessed the importance of two functions differently: recreational, sport and cultural in individual districts, but similarly assessed the validity of the three remaining the functions of parks in question in all the districts studied.

According to the respondents, the most important for the functioning of parks are: low noise in the park, vegetation, footpaths and elements of small architecture (benches, gazebos, waste bins) (Table 3). The low noise level was definitely important for more than half of the respondents (53.07%) and rather important for 31.2%, ie in total this element was important for 84.27% of respondents. The condition of vegetation was considered as a definitely important element of the park's operation by 43.07% of respondents and rather important -by 43.73%, which in total was important for 86.8% of respondents. Pedestrian paths were definitely important for 43.47% of respondents and rather important for 41.73%, that is, they were important for 85.2% of the respondents. Elements of small architecture (benches, gazebos, waste baskets) were definitely important for 44% of respondents and rather important for 39%, ie in total they were valid for 83% of respondents.

The smallest weight respondents attached to the existence of the following elements of parks: meeting places (cafes), water reservoirs (ponds, lakes) and bicycle paths. Meeting places in the park were definitely important for 23% of respondents and rather important for 38% of respondents, that is, important for 61% of people. The existence of water reservoirs in parks was definitely important for 24% of respondents and rather important for 39.2%, which is collectively important for 63% of respondents. Bike paths were definitely important for 29.5% of respondents and rather important for 37.87%, that is, they were important for 2/3 of the surveyed sample.

The regularities described above reflect the average of the responses given. The highest average (over 4) were obtained for the following park elements: low noise in the park, vegetation condition, footpaths and elements of small architecture (benches, gazebos, litter bins), which means that these elements were the average between the most important for respondents or rather important. Lower average (about 4) was obtained for the park's location (city center, district, good access) and having playgrounds for children, i.e. that these items were, on average, according to the respondents, rather important. The lowest average (between 3 and 4) was obtained for the following park elements: meeting places (cafes, etc.), water reservoirs (ponds, lakes, etc.) and bicycle paths, which means that these elements were, on average, between "rather important" for respondents and "neither valid nor invalid." When asked what can be done and what should be in the parks (Table 4), the respondents frequently indicated the gyms in the open air. 87.6% of respondents noticed the need of their existence in the city, while in parks - 80.4%. Then, about 2/3 of respondents answered that water in the park is needed in the form of drinking water spas (small fountains from which one could drink drinking water). About 60% of the respondents believe that cyclists should be able to ride a bike in the park, and 51% - that dogs should have access to the park.

The opinion	Yes, agree		No, disagree		No opinion	
	n	%	n	%	n	%
cyclists should be allowed to ride a bicycle through the park	453	60,40	216	28,80	81	10,80
dogs should have access to the park	380	50,67	298	39,73	72	9,60
outdoor gyms are needed	657	87,60	52	6,93	41	5,47
outdoor gyms should be in parks	603	80,40	72	9,60	75	10,00
water in the park in the form of drinking water spas (small fountains from which one could drink drinking water) is needed	487	64,93	141	18,80	122	16,26

**Table 4. Respondents' opinions on the elements of city parks n - number of people, % - percentage of people. % in lines add up to 100.00.**

Source: Own research based on completed questionnaires

Answers to the question what can be done and what should be in the parks differed significantly between respondents from individual districts with city parks. Respondents were also asked how they rate management in relation to the maintenance of city parks in terms of selected elements. Respondents rated the maintenance of municipal parks best in terms of greenery care (lawns, weed control, mowing of grass) and the condition of vegetation (trees, shrubs) (Table 5). Greenery care was rated very well by 15% of respondents and rather well by 46%, that is, 61% of respondents rated it well. The condition of vegetation was rated very well by 11.2% of respondents and rather well by 47.6%, which is a total estimate of 59% of the surveyed people. However, the worst respondents assessed the maintenance of city parks in terms of water in parks (ponds, lakes, ponds). Every fourth respondent assessed the maintenance of this element of parks rather badly, and 35% chose option of neither good nor bad. On average, the maintenance of the remaining 4 elements of the parks, i.e. the flowering state (flowers in pots, annual flowering plants - exchanged every year), cleaning parks - general cleanliness, park infrastructure (benches, rubbish bins, other small garden architecture) and the presence and equipment of yards playgrounds for children. The state of the flowering was rated very well by 11% of the respondents and rather well - by 37%, i.e. altogether well by 48% of the respondents. Cleaning of parks - general cleanliness was assessed very well by 10% of respondents and rather well - by 38.4%, that is altogether well by 48% of respondents.

Maintaining park infrastructure (benches, bins for garbage, other small garden architecture) rated very good 8.67% of respondents and rather well - by 34.13%, that is, in total 42.84% of respondents rated it well.

Maintenance of city parks in terms of:	Evaluation									
	very bad		rather bad		neither good nor bad		rather good		very good	
	n	%	n	%	n	%	n	%	n	%
greenery (lawns, weeding, moving the grass)	7	0,93	58	7,73	230	30,67	345	46,00	110	14,67
condition of vegetation (trees, shrubs)	7	0,93	67	8,93	235	31,33	357	47,60	84	11,20
flowering state (flowers in pots, annual flowering plants - exchangeable every year)	19	2,53	138	18,40	233	31,07	278	37,07	82	10,93
cleaning of parks - general cleanliness	18	2,40	128	17,07	242	32,27	288	38,40	74	9,87
park infrastructure (benches, litter bins, other small garden architecture)	19	2,53	132	17,60	278	37,07	256	34,13	65	8,67
water in parks (ponds, lakes, ponds)	50	6,67	189	25,20	264	35,20	191	25,47	56	7,47
presence and equipment of playgrounds for children	27	3,60	107	14,27	258	34,40	271	36,13	87	11,60

**Table 5. Assessment of the maintenance of city parks in Warsaw according to their users  
n - number of people, % - percentage of people. % in lines add up to 100.00.**

Source: Own research based on completed questionnaires

## V CONCLUSION

Based on literature review and analysis of current economic theories, including the theory of public goods shows that urban parks are sample of public goods and should be recognized as such. They are financed from common funds coming mainly from budgets of local governments and are available to all users. Analyzes carried out for this work indicate that urban parks play a significant role in shaping the city and the life of its inhabitants as public goods.

The author has presented that green areas play an important role in the life of the city and in the life of its residents, among others through the fact that they have a positive impact on the quality of life and on everyday well-being. City parks as public goods provide rest for many residents and a place where they can find an oasis of peace, feel a kind of microclimate in relation to the polluted urban climate, the hustle and bustle of everyday life. Residents going to the park, although they know that it is created by a man, have the impression that they are surrounded by nature, a natural landscape in which they feel much better than sometimes a few hundred meters away amid the street hustle and bustle. These are places that, in the residents' opinion, deserve them, should simply be in the city as many as possible, moreover they should be neat, clean and systematically nurtured. The respondents considered the walking function to be the most important function of city parks, while the least important function was cultural (cultural events, concerts, movie evenings). Other functions of parks: leisure - through the availability of "open lawns" on which to sit, recreation, sports and leisure - through a large number of benches are, on average, important in the assessment of users of city parks in Warsaw.

As the most important elements of the city park, the respondents indicated low noise levels, walking paths, vegetation condition and small architecture (benches, gazebos, waste bins). As less important elements of the city park, the respondents indicated: the existence of meeting places (cafes), water reservoirs and bicycle paths.

Thanks to the analysis carried out in various parks among residents of all districts, as well as comparing the importance of various park functions between respondents from individual districts of using city parks in Warsaw, it was shown that for respondents the most important functions are recreational, sports and cultural. The worst respondents assessed the management of water reservoirs such as ponds and lakes in parks, which shows that the city as a body supervising park management should take it into consideration in the future. Conducted surveys with residents, park users, surveys and performed statistical analyzes showed which functions of city parks are the most important for residents, which are well managed and which are not. The research results showed which functions in the parks are managed in a way that is not satisfactory for residents, which should change in city management in terms of green areas.

The research has a chance to support the development of the city and green areas through savings and better management of public funds. They will expand issues related to the issues of city management and economic approach to the problem of green areas. The next topic for research will be the analysis of the functioning and activities from the economic point of view of the new body dealing with city parks in Warsaw - the Green Board, when it will take over individual green areas and when it will be in a different way than it has financed them. Deepening knowledge about the functioning of green areas as an example of public goods and

understanding how other cities in the world manage and finance their green areas are possible topics for future research.

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