Evaluation of the Visitation Rate in the Park by the Travel Cost Method in Parque Do Sabiá Complex, Uberlândia, Minas Gerais, Brazil

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Abstract— *Urban parks play a key role in improving the environmental quality standard of cities, whether for the ecological service provided or the promotion of people's health and well-being. The objective of this study was to estimate the variables that determine the frequency of visits to Parque do Sabiá complexin Uberlândia municipality, Minas Gerais state, Brazil, based on the Travel Cost Method. Were conducted 385 interviews, being 206 valid, and described a logit model, expressed by the variable response rate of visitation (rv) and the independent variables, which spanned the socioeconomic aspects, the costs of travel and visits to the site, and the individual perceptions. Among the statistically significant variables, the profile that declares the male sex, with a higher level of schooling, and that travels alone to the site is more predisposed to visit the park. The extent to which departs for residential areas more distant, is reduced by 3.3% the rate of visitation, and 11% if the option is per vehicle, propelled by influencing the cost of travel of users. The individual perceptions of users influenced the rate of visitation, due to their ecological role partner (9,3%), the benefits in improving the quality of life (6,8%) and the sports practice (20,7%). The demand for the park can be increased with improvements in access and reducing the cost of travel, making the option of visitation more attractive. However, the demand for the functions of the park competes with the perception of improvement of squares, gyms and outdoor walking tracks at other points of the city.*
Keywords— *Economic valuation, urban parks, TCM, urban ecology.*

I. INTRODUCTION

The process of urbanization of Brazilian cities, especially in the center-south of the country since the 1990s, supported by the heating of the construction sector, access to real estate credit and the gradual improvement of the purchasing power of the population, imposed a new paradigm on quality of life. Nucci (2008) and Moraes et al. (2011), describe the deterioration in basic sanitation, air quality, urban mobility and occurrence of emergencies and environmental calamities, to the detriment of infrastructure, concentrated in large cities.

In addition, attention to natural components, investments and maintenance of green spaces in urban areas are still incipient (TYRVAINEN; VAANANEN, 1998; CHIESURA, 2004). The low value of these spaces is also reflected in the recent cuts in the maintenance of

the budget of many cities, or the extinction of the municipal secretariats of the environment and transferring their attributions to the departments of urban services and urban planning. However, it is known that urban parks and open green spaces are of strategic importance for the quality of life of the increasingly urbanized society.

This is because the presence of environmental assets (urban parks, green areas, fountains and squares of contemplation) and natural components (water, trees, lawns) in urban areas contribute to people's quality of life in many ways. In addition to environmental services such as air and water purification, noise and wind blockage, and stabilization of the microclimate, natural areas offer social and psychological services that are fundamental to the livability of modern cities and to the well-being of urban dwellers. Hartig et al. (1991) and West et al.(2006)

discuss benefits such a stress reduction and physical and mental health improvement in reasonably assiduous park and urban greenlanders compared to the non-frequent group.

The crucial point in this context is that investments in the implementation and maintenance of parks, forests and other green areas also compete with investments in education, health, basic sanitation and public safety, which almost makes almost unimportant a place on the agenda of public management of cities. On the other hand, the need to invest in urban parks and green areas needs to be based on aspects of quality of life, and their environmental, social and aesthetic functions, minimizing the undesirable effects of the urbanization process.

In a broad understanding, the usufruct of a park or urban green area, whatever the practice of the patron, is related to obtaining benefits that contribute to the economic value of the park, and multiplicity of environment-society relations (MORE, 1988).

From the point of view of the valuation of urban environmental assets based on the experiences of users and regulars, two important methodological procedures are used: Travel Cost (TCM) and Contingent Valuation (CVM). The first, rather simplified, questions the users of the park "how much they traveled to visit the park," assuming that the economic value of the experience is the same for all users and that the user who traveled the longest distance to get to the park is the marginal user. The second model estimates the consumer's surplus, directly by asking users "what they would be willing to pay in various contingencies" (DWYER et al., 1983; MOORE 1995; NASCIMENTO et al., 2013; FREEMAN III et al., 2014).

In this sense, some studies discuss the political-social-environmental-academic concerns in order to define strategic actions coherent with the needs and demands of green areas, urban parks, reserves and environmental preservation areas (CIRINO; LIMA, 2008; BRUGNARO, 2010). Therefore, the objective of this work is to estimate the socio-ecological variables that influence the visitation rate of the Parque do Sabiá complexusers in Uberlândia municipalty, Minas Gerais state, Brazil, using the Travel Cost Method (TCM).

II. METODOLOGY

For the development of the research were adopted methodological instruments that consider the characterization of the study area and procedures of data collection, tabulation and analysis, in order to interpret them and discuss the possible unfolding and applications.

2.1 Planning of data collection, tabulation and statistical analysis

The study is supported by a quantitative spatial survey, structured from an interview form and later transcribed and tabulated for a database. The sample of respondents, and, or users of the park, was estimated using an approximation function proposed by Gil (2008), for finite populations - below 100.000 observations, according to equation 1:

$$n = \frac{\delta^2 * p * q * N}{e^2 * (N-1) + \delta^2 * P * Q} \text{(Equation 1)}$$

where n is the sample size; δ^2 is the confidence level estimate defined in the survey; p is the probability of occurrence of the phenomenon; q is the complementary probability; N is the population size and e^2 is the maximum tolerable error. It was considered the monthly average of visitors of the Parque do Sabiá complex (N) around 30.000 people. The level of confidence (δ) and accuracy (e) sought in the survey was 95% and 5%, respectively. The probability of occurrence of correct responses was determined in 70% (P), and by difference, the expected error of the answers in 30% (Q). This probabilistic bias concerns the respondent's ability to understand the question, respond assertively, and not generate vicious responses.

On-site information collection planning therefore considered 319 possible questionnaires, applied in the period from May to August 2016, on random days, including Saturday, Sunday and holidays, totaling about 20 interviewees per day of site visit. The approaches were carried out at random locations in the Park - Zoo, entrance to the "Recanto do Sabiá", circulation ways, gyms, hiking trail and kiosks - always instructing the interviewees orally that it was a research for academic purposes.

The questions proposed in the form were presented individually, that is, the interviewer directed the questions in a clear and continuous way. Twelve questionnaire topics were proposed to identify socioeconomic aspects of the interviewees initially, the frequency and motivation to visit the park, and perceptions about the environmental attributes of the site. As for the estimated cost of travel, it was pointed out in the questionnaire the locality where it resides (neighborhood, district, other municipality), the amount paid by the user in the transportation to the park, and the average cost inside the park.

Based on the data collection, the visit rate of each zone i (V_i) of the sample of interviewees (for example, visits per thousand inhabitants) is estimated, which should be statistically correlated with the sample data of the average cost of travel of the zone (CT) and other zonal socioeconomic variables (X_i) in equation 2:

$$V_i = f(CV, X_1, ..., X_n)$$

(Equation 2)

which allows us to determine the impact of the travel cost on the expected visitation rate of each zone based on the zonal information of the users interviewed. Based on this estimated zonal visitation rate, the expected number of visitors per zone was obtained, and an estimate of the demand (f') for local recreational activities (FREEMAN III et al, 2014).

For the dependent variable of the model, the frequency of visits of the users in the interval of 30 days,

three ranges were established (1-daily, 2-eekly, 3-fortnightly, sporadically once per month). The terminology used for each of the items evaluated in the research, already described, is shown in Table 1. The acronyms of each of the questions considered in the interview are identical to the set described in the logit model used in the data analysis. For the construction of the model, 179 forms were disregarded, those who showed an unwillingness to report costs, or chose not to complete the questionnaire based on this interview question.

Table 1 - Terminologies used for each question asked during the interview with users of the Parque do Sabiá complex, in Uberlândia municipality, Minas Gerais state, Brazil.

Initials	Interview of Variables	Classes
sx	**Sex**	1 (male), 2 (female)
ag	**Age**[1]	1 (young people between 18 and 30 years old), 2 (young adults between 31 and 45 years old) and 3 (elderly adults between the ages of 46 and 60)
fi	**Family Monthly Income**[2]	1 - Class E (up to 2 minimum wages), 2 - Class D (from 2 to 4), 3 - Class C (from 4 to 10), 4 - Class B (from 10 to 20) and 5 - of 20 minimum wages)
sc	**Schooling**[2]	1-incomplete elementary education, 2-complete elementary education, 3- incomplete secondary education, 4-complete secondary education, 5-incomplete higher education, 6-complete higher education, 7-full graduate (regardless of level)
ra	**Residential Area**[3]	1-East Zone, 2-Central, 3- outh, 4-North, 5-West and 6-for interviewees residing in other municipalities
uv	**Usual Visit**	1-Alone; 2-Friends; 3-Family
sm	**Shift Mode (round trip)**[4]	1-Walking; 2-Car; 3-Motorcycle or Bicycle; 4-Bus
tc	**Transportation Costs (round trip)**[4]	0-from R$ 1 to R$ 10; 1-between R$11 and R $ 25.
cp	**Cost in the Park Dependencies**	0 - from R$ 1 to R$ 10; 1-between R$ 11 and R$ 25.
ap	**Activity Exercising in the Park**	1-Recreation and walk in the woods, aquariums and zoo; 2-Sports practice and use of the courts, fields and fitness equipment; 3-hiking, contemplation and activities in the area surrounding the lagoon
ip	**Importance Attributed to the Park**	1 - Social, like leisure and recreation; 2 - Environmental, highlighting the green area integrated to the urban area and; 3 - Tourist and Economic
ql	**What is the Relationship with Quality of Life?**	1-Leisure, with recreational and sports activities; 2-Environmental, due to the presence of flora and fauna, with contemplation activities; and 3-Economic, when there is prominence for free and unrestricted use of the various areas of the park

[1]According to Botti (2010). [2]According to IBGE methodology (2010). [3]The smaller numeric value is the zone or neighborhood closest to the park, and it increases as the zone or the neighborhood is further from the park and the access routes more difficult. [4]The spending limits were established based on the respondents' spontaneous responses, that is, none of them reported spent over R$ 25, on the trip to the place or in the park, at each visit made.

The choice of the logit regression model is to allow the evaluation of the significance of the described variables and to relate variables of different responses to the same dependence, ie, it is possible to analyze how many other variables influence the visitation rate (demand function), which turn is the limited dependent variable of the model. Another important aspect concerns data output, which is generally robust, for information ranging from coefficient of variation to likelihood tests and standard error estimation (CARSON, 2012).

The model-dependent variable is non-metric and assumes values equal to 0, when the "no travel cost" option is accepted and limited to R$ 10.00, and to 1, when the same option is accepted, and is higher to R$ 10.00, limited to R$ 25.00. The criterion for assigning the values in these terms refers to the frequency distribution, where Ni is the user group, of which ni admits the cost of a minimum range to the park ($n_i \leq Ni$). We obtain, P_i, as an estimate of the true $\hat{P}i$ corresponding to each variable (X_i), described in equation 3:

$$\hat{P}_i = \frac{n_i}{N_i} \text{(Equation 3)}$$

Therefore, the estimated logit for the dependent variable - travel cost (TC) is obtained by equation 4:

$$\hat{L}_i = ln\left(\frac{\hat{P}_i}{1- \hat{P}_i}\right) = \hat{\beta}_1 + \hat{\beta}_2 X_i \text{(Equation 4)}$$

which will be a reasonable estimate of the true *logit* $\hat{L}_i$, if the number of N_i observations at each X_i is similarly reasonably large (GUJARATI, 2000). From this

equation, we have the econometric model, described in equation 5:

$$\hat{L}_i = \hat{\beta}_1 + \hat{\beta}_2 sx + \hat{\beta}_3 id + \hat{\beta}_4 es + \hat{\beta}_5 re +$$
$$\hat{\beta}_6 zn + \hat{\beta}_7 ac + \hat{\beta}_8 tr + \hat{\beta}_9 cv + \hat{\beta}_{10} cp + \hat{\beta}_{11} at +$$
$$\hat{\beta}_{12} im + \hat{\beta}_{13} qv + \varepsilon_{i,} \text{ (Equation 5)}$$

where $\hat{\beta}_i$ (i = 1 to 13) are the parameters to be estimated; $\hat{L}_i$, the estimated logit of the individuals, and the terminologies of the variables employed in the model. It should be noted that, for the hypothetical value conception, it is understood that the respondents necessarily have an interest in usufruct of the park.

The data from the survey in the park were tabulated admitting the ranges of response values for the discrete values. For the statistical study, the Model with Independent Limited Variable and the Logit function of the Gretl software were used (v.2017).

2.2 Characterization of the Study Area

The Parque do Sabiá complex, located at the geographical coordinates of 18° 55'S and 48° 17'W between José Migliorini Avenue and Haia Street, in the Tibery neighborhood of the municipality of UberlândiaMinas Gerais state, Brazilis the one with the highest area of 1,850,000 m², with 350,000 m² of green area (Figure 1). Its creation is given by Municipal Law No. 1,925, dated June 28, 1971, but only in 1977 began to be built, and inaugurated on November 7, 1982.

Fig.1 - Limit of Virgílio Galassi Municipal Estadium, which involves the Parque do Sabiá complexin Uberlândia municipality, Minas Gerais state, Brazil.
Adapted from Google Earth (accessed September 25, 2017).

In May 2009, by means of Decree 11.666/2009, the park's green area is regulated, whose purpose is to protect nature, reconciling the preservation of flora, fauna,

soil, water, other resources and scenic beauties natural or not, directing their use for scientific, cultural, recreational, sporting and tourist purposes (MUNICIPAL CITY OF

UBERLANDIA, 2009). The Municipal Conservation Unit comprises the Virgílio Galassi Municipal Park (Figure 1), which includes the João Havelange Municipal Stadium, the Presidente Tancredo Neves Arena (Sabiazinho), the Water Park (under construction) and the Ecological and Cultural Space.

The vegetation is native to the Cerrado, with a predominance of xeromorphic forest cover, which serves as support and shelter for insects, mammals and mainly birds. Within the park there are ecological trails, places of socialization and socialization, and points of contemplation in the forest and direct contact with nature (Figure 2).

The visitor of the park has contact with more than 300 species of native trees, some centenarians, like the copaíba (*Copaifera langsdorffii* Desf.), the jatobá (*Hymenaea courbaril* Hayne) the araticum (*Annona montana* Mart.), jacarandá (*Jacaranda mimosifolia* D. Don), pequis (*Caryocar brasiliense* Camb.), sucupiras (*Pterodon emarginatus* Vogel) and caviúnas (*Machaerium scleroxylon* Tul.).

Fig.2: *Ecological trail in the forest area of Parque do Sabiá complex (left) and view of one of the springs inside the park (right).*

Authors' collection.

The hydrographic complex consists of three springs (Figure 2) that form eight smaller lakes and one larger located in the central area of the park, totaling 1,000,000m³ of surface water. In the central dam of the park, users have the option of pedal boat ride (Figure 3) and enjoy the area of coexistence in an artificial beach of 300 m in length. In addition, the dam assists in the drainage of rainwater from surrounding areas, especially during periods of high rainfall.

Fig.3 - Pedal boats on the dam of Parque do Sabiá complex (left) and a specimen of maned-Wolf Chrysocyon brachyurus Illiger, 1815)at the zoo (right)

Authors' collection.

Other options for individual or group leisure are visits to the zoo, tanks and fish aquariums. There are still in the park complex, two swimming pools used for swimming pool classes bringing together children, adolescents and adults and a playground with more than 100 toys that are divided by age group, known as "The World of the Child" (Figure 4). The majority of the toys were made using raw materials such as steel, wood, tires and rubber, some in the process of recycling, greatly reducing the amount invested (MELO; ORLANDO, 2014).

Fig.4: Main entrance and view of playground.
Authors' collection.

The park's greatest attraction is the availability of a jogging and walking track that comprises about 5.100 meters, in addition to the outdoor gymnasium points (Figure 5). Add to this offer, available soccer fields, sports and sand courts, sanitary assemblies, sports locker rooms, cafeterias and various contemplative corners (MUNICIPAL CITY OF UBERLANDIA, 2017).

Fig.5-Point of "open-air academy" and view of one of the stretches of the race track, path and bike path of Parque do Sabiá complex.
Authors' collection.

Currently, the park receives visitors from 05:00a.m. to 10:00p.m. daily, for various scheduled activities, such as dance, guided walking, sport fishing and trails, covering practically all age groups and genders. In 2015 the bike lane was restored in the park and the hours of use were defined between 10:00a.m. and 4:00p.m., daily. In the lagoon, part of the bank was revitalized with planting native tree seedlings and lawn.

III.   RESULTS AND DISCUSSION

The period of application of the questionnaire and data analysis of the research confers on the improvements in the Parque do Sabiá complex, considering that most of these changes and new programs implemented by the PMU (City Hall of Uberlândia) through FUTEL (Uberlandian Foundation of Tourism, Sports and Leisure) had already been noticed by park users.

The model adopted was the logit for the dependent variable (*vr*), based on 206 forms of interviewees who admitted that there was travel cost and

proposed to provide information to the interviewer. The significance of the independent variables in the model was obtained at 10%, 5% and 1% according to the Table 2. Ten variables were statistically significant (*sx, sc, ra, uv, sm, tv, cp, ap, ip, ql*), five of which are significant at

1% (*sx, ag, ra, ap, ip*). Only the variables age and income of the respondents (*ag, fi*) were not significant in the model and therefore disregarded its marginal effect. The percentage of correct predictions of the model was 75.7%.

Table 2-Results of the logit model for estimation of Visitation Rate (VR), according to the socioeconomic variables and individual behavior about the Parque do Sabiá complex, in Uberlândia municipality, Minas Gerais state, Brazil.

Variables	Coefficients	Standard Error	z	p-value	Marginal Effect
Intercept	−3,73946	1,81119	−2,065	0,0390 **	-
sx	−1,22286	0,475821	−2,570	0,0102 ***	[0,226405]
ag	−0,02360	0,334664	−0,070	0,9438 ns	-
fi	0,05432	0,177413	0,306	0,7595 ns	-
sc	0,65802	0,154969	4,246	<0,0001 ***	[0,024015]
ra	-0,46781	0,146900	-3,185	0,0014 ***	[0,033525]
uv	−0,57068	0,275744	−2,070	0,0385 **	[0,076034]
sm	−0,63922	0,332140	−1,925	0,0543 *	[0,110317]
tc	−0,67646	0,709081	−1,954	0,0540 *	[0,502796]
cp	−1,11946	0,527624	−2,122	0,0339 **	[0,059164]
ap	1,53551	0,515191	2,980	0,0029 ***	[0,203784]
ip	−0,05339	0,364854	−2,711	0,0067 ***	[0,093217]
ql	−0,25704	0,261275	−1,983	0,0322 **	[0,068264]

* significant coefficient at 10%, ** at 5% and *** at 1%. Number of 'correctly predicted' cases = 156 (75.7%). Likelihood ratio test: Chi-square (12) = 116.936 [0.0000].

The variable 'sex' presented a negative coefficient, indicating that there is a higher frequency of visitation by individuals of the male group. The marginal effect suggests a 22.6% increase in the visitation rate in the park, only according to the group of interviewees declared masculine (Table 2). This fact is expected when we analyze the presence of a greater number of individuals of this public and a greater predisposition to the trip to the park.

The security aspect in the surroundings and inside the park, mainly regarding the visitation at night time (after 7:00pm) or just before dawn (between 05:00am and 06:30am) is decisive for the lesser demand for usufruct by the female audience. Among the reasons mentioned are the risks of assaults and accidents, and low lightness on the walking trail at these times.

As for the variable 'schooling', the positive coefficient in the regression model suggests that the rate of visitation and usufruct of the park increases with the level of education of the interviewee. The marginal effect estimates that the increase of a level of education of the respondent, is responsive to the frequency of visits at 2.4%.

In the survey, the rate of visitation in the park decreases, in the group of respondents who usually go with friends or family. The marginal effect in the model suggests that the fact of choosing to visit with friends or family, instead of individual usufruct, has a negative impact on the visitation rate, at 7.6% for each option level (Table 2). This is because, according to some interviewees, the ease of individual visit and in a more practical way, the displacement at any available time are arguments that support the option.

As for the mode of transport used for the visit to the park, the negative coefficient obtained in the model shows that as the user uses means of transportation such as vehicle, motorcycle or bicycle, or the bus, reduces the frequency by 11.0% visiting the park. Likewise, the variables *tc* (travel cost) and *cp* (park cost) also suggest negative impacts on the dependent variable, due to the increase in spending in these groups. In general, the transport variable is one of the main obstacles to a relative increase in the visitation rate in the park, representing a good part of the usufruct costs of the place.

As for the costs in the park were attributed to the purchase of coconut water, mineral water juices, soft drinks, meals and various snacks. There isn't charge for

use of facilities, entrances or visits to specific sectors. This variable is relevant mainly for residents in more distant zones of the park, considering that depending on the distance traveled to the place and less frequency of visitation, this profile of users admits to staying longer in the park. In this way, they are more likely to consume food (purchased or prepared at home) and, therefore, assume a higher cost to enjoy the park.

The fact of residing in more distant areas impacts the rate of visitation in the park. The variable *ra* (area where it resides) represents a marginal effect of up to 3.3% for each zonal level of park distance (Table 2). In a broader understanding, the longer distance in general, conditions higher cost of travel to the user, especially regarding transportation. The visitation method can also be explained, at least empirically, due to the higher cost of moving a family, even in a hypothesis of residing in areas further away from the park, in favor of more frequent individual visits.

However, there are urban policy instruments that can reduce the impact of travel costs on the visitation rate in urban parks. In the specific case of the Parque do Sabiá complex, the implantation of access lanes to the three ordinances (Central by Anselmo Alves dos Santos Avenue, Neighborhood Tibery, Haia Street, s/n; World of the Child and Fish Farming, José Roberto Migliorini Street, 850), from the Rondon Pacheco Avenue. Cycleway allows greater security and mobility for users residing in the Central, West and South zones of the city.

Another initiative would be the exclusive bus lines and direct to the park, at times of great demand, and at a differentiated rate. In public activities in the park with appeal to health and well-being, sporting events and promotion of visits in attractive points (playground, fish farm, zoo) the popular participation and visibility of improvements and improvements of the park could be much wider.

Safety in the surroundings and inside the park's facilities is still a critical aspect that impacts the visitation rate, especially at night time. In this sense, investments in security in the portarias, accesses and walking lane and adjustments in lighting in the traffic areas inside the park could increase the visitation rate, including users residing in more distant areas.

However, the revitalization of leisure areas, squares, linear parks and open-air academies in various neighborhoods of Uberlândia can impact the rate of visitation in the Parque do Sabiá complex, reducing the visit of users residing in areas farther away from the site. This fact isn't important only to approach the leisure activities of the people and awaken them to the

appreciation for this practice, but also to regulate a possible increase in the demand for the Parque do Sabiá complex usufruct, which could lead to an acceleration of the depreciation of its facilities, and deterioration of internal services, leisure and sports practices.

As for the personal aspects of the activity developed in the place and the functional perception of the whole structure, the results reaffirm the social and ecological character of the park and the importance of the value and attribute perceived by the users. The variable corresponding to the 'main activity developed by the interviewee in the park' was positive. According to the data output of the variable in the model, the option of prioritizing sports activities such as running, gymnastics and walking, increases the possibility in 20.3% of the probability of the individual being willing to pay for the usufruct of the park. The relationship between sports and the park's esteem is very evident due to the various activities - individual or collective - that can be developed in the so-called "sports complex" of Parque do Sabiá complex. The walking and running track, which covers a total distance of 5 km, currently offers at least six places with stretching and gym equipment and five hydration points, making it quite attractive to users.

However, the variable 'importance assigned to the park' assumed a negative coefficient in the regressive model. It implies that the fact that the park is given a tourist and economic importance instead of a social and environmental role, decreases the user's probability of increasing his availability to visit it by 9.3%. In practice, the participants approached by the survey recognized the importance of the park due to the social, environmental and ecological functions that it plays for the urban context of the municipality, as opposed to the appeal to the tourist and economic profile observed in the internal commercial activities and the surroundings and real estate speculation.

The estimation of an urban park from the point of view of the socio-ecological attribute is in fact a relevant opinion of the research, enabling some developments in the field of environmental education, oriented conservation practices and proposals for sustainable management of the park, so little served by municipal public authority. In this sense, the municipal public policies are derisory as to the revitalization of the environmental and ecological role of the park, being almost entirely based on investments in the areas of leisure, sports and coexistence.

In general, the mature fund resources for services from urban parks are on the margins of investment and revitalization, within the scope of public policies for urban parks. The incomprehension of the complex

ecosystem functions and the unwillingness of the local public power to detail ecosystem services and the functions of these areas in favor of society can justify to some extent the apparent wear and tear of these natural resources or the difficulty of making visible users and parkgoers.

The perception of users, residents and visitors of urban parks about ecological services and the benefits provided to the urban environment are widely observed and discussed by Hartig et al. (1991); Klijn et al. (2000); Chiesura (2004). In these works, the authors analyzed with great wealth of details the benefits of urban green areas to society, especially in the field of collective health, human-nature interaction, individuals' contemplative capacity, restorative experiences and perceptions and relationships learning established.

However, as discussed in Thompson (2002), the main obstacle to sudden changes in the prioritization of urban green areas lies precisely in the fact that natural services are mostly intangible and immaterial. However, the author points out that such services offer clear benefits to people, and loss or depreciation leads to serious socioeconomic consequences. Lack of provision of restorative and psychological benefits through access to ecological elements in the city, for example, could have substantial long-term health costs.

Although there is a reasonable perception of the ecological attributes on the part of users and regulars, there is obviously no clarity of a small part of the numerous services provided by the park. The ecological attributes of the park are perceived by people in a very individualized way, without there being a detailed perception of the "ecosystem functions that determine value for humans" and yet diverse, "emerging phenomena through the interaction of the elements of ecosystem structure"(DALY; FARLEY, 2016). And further, on the waste absorption capacity of urban microclimatic regulation and the cycling and stocking capacity of organic compounds in the soil (DALY; FARLEY, 2016).

Due to the fact that the variable ql (quality of life) presented negative coefficient, it can be affirmed that the social and environmental importance of the park is in fact, indissociated from the perception of the health benefits and quality of life of the users. By establishing a relationship between the environmental patrimony of the park and the benefit of improving the quality of life for society, according to the survey, implies a 6.8% increase in the visitation rate of the park.

The affirmation of the expressive improvement of the quality of life, by the park visitors, is associated with the highest frequency in a period of 30 days,

according to the research data. In this sense, the frequency and assiduity of usufruct of the dependencies of the Parque do Sabiá complex is related to the perception of socio-ecological importance and the quality of life, especially for users residing in nearby areas and of better access to the place, such as the east zone and central.

However, the cost of travel, the difficulty of access at times of greater visitation and the use of other places for sports (outdoor gyms, public squares, linear park, clubs and private gyms) decisively affect the user's response in increase the rate of visitation and frequency.

In addition, the security aspect in the surrounding areas of the park, including portarias and the illumination of hiking trails are aspects that are highly criticized by the users and that, in a certain way (although they are not evidenced in the research), they can negatively influence the decision to attend with more assiduity the park.

IV. CONCLUSION

The study allowed to conclude that the predisposition to the greater visitation of the park is more evident in the profile of users composed of males, with higher level of education and who go alone to the Parque do Sabiá complex. The visitation rate reduces by 3.3% for each zonal level, and 11.0% if the option is by means of automobile transportation. The cost of travel of the users of more distant zones was determinant for the lower frequency of visits in the park, and the perception of the socio ecological role of the park and the relation with the quality of life of the users, influence the frequency of visitation in the park, in 9.3%, 6.8% and 20.7%, respectively.

The low quality of the direct services to the demand of the park was pointed out as an important aspect of the decision to use the local facilities and, together with the cost of travel and costs inside the park, can reduce the rate of visitation. The investments in the revitalization of the park, contribute to the reduction of the frequency of visitation, mainly for the inhabitants of zones more distant of the park. If there were improvements in access to the park and reduction of the cost of travel, with the extension of cycle paths to the ports, it would allow better mobility and attractiveness for users from more distant areas.

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