

Planning urban green in island environments: The residents' perceptions of a Mediterranean city

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Urban green spaces are pivotal areas for human wellbeing holding a key role in maintaining mental and physical health for devastated urban environments. Their inclusion in climate mitigation strategies should be enhanced in Mediterranean urban cities. Parks and green infrastructures in densely populated areas should enhance the citizens' quality of life and efficiently meet the standards of proper allocation, number, size, architectural design, and safety especially for children, maintenance of vegetation and accessibility. These features were investigated in the case study, from the residents' perspective, in Paphos, Cyprus, and by the use of factor analysis and hierarchical log-linear analysis. The findings revealed a low performance of allocation and number of urban green spaces, which reasons their poor impacts on citizens' wellbeing. The most significant identified problems are correlated with the presence of animals, unpleasant odours and noise pollution. Strategic improvements for decision makers and urban planning professionals are suggested.

Keywords: Urban parks; Green spaces; Green infrastructures; Residents' perceptions; Wellbeing; Urban planning; Quality of life; Paphos; Cyprus Island

Introduction

Enhanced economic and social opportunities have affected the largest proportion of human population to move into urban environments (Navarrete-Hernandez, 2019). The accompanied development and intense expansion of built environment provoked serious pressures on green spaces, which were significantly reduced, also affecting the living standards for urban dwellers (Song et al., 2020). In turn, rapid global urbanization generated certain inequalities in the allocation of the remaining green spaces and created a new unsustainable status in urban environments by small-scale green areas, especially down town (Gerrish et al., 2018).

Insights into urban climate performance indicate that urban environments have developed a special urban micro climate, which may intensify climate change impacts, such as worsening heat stress throughout the heat waves (Caluwaerts et al., 2020). This means that urban centres are now more vulnerable than ever to climate change affecting weather, air quality and microclimate, which consequently influence human health and wellbeing. While, heat effects in island urban environments, especially in Mediterranean Region, have proven to have devastating impacts on the residents' quality of life.

Therefore, the existing unstained planning of limited green urban spaces demands a strategic shift to effective policies, able to enhance climate resilience. To this end, some lessons learned identify the importance of vegetation and permeable surfaces in urban settings; as green spaces support microclimate balance and increase thermal comfort in urban centers (Teixeira, 2021). There is a need for proper environmental design supported by the respective legislation for urban planning, which will substantially improve the citizens' well-being.

In light of this perspective, green spaces comprised by trees, shrubs and flowers, provide the environmental components for improving the citizens' quality of life in urban areas. Kabisch, et al., (2021) have very recently found that there are beneficial effects on cardiovascular health of elderly urban dwellers, when they have contact with urban green spaces. Taking into consideration that 2020 was the year, when the globe experienced a tremendous outburst of a pandemic disease SARS-CoV-2 (COVID 19), it should be stressed the critical role of green infrastructures in mediating infectious disease spread. According to Gottdenker, et al., (2014) habitat availability for vector and zoonotic reservoir populations and biodiversity services can affect disease risk. Not to mention their contribution to urban communities in maintaining mental health during the lockdown. The citizens visited urban parks as they perceived to be safe places for social interaction and well-being (Xie et al., 2020).

More specifically, human well-being can be improved by the sufficient allocation of green spaces in urban environments. Coutts, et al. (2015) argue that physiology of trees in urban green, transforms them into carbon reservoirs. Functions and services of green infrastructures alleviate negative health impacts arising by enhanced climate effects in urban centres. Thus, assessing green infrastructures and parks in urban settings -from the users' point of view- will help policy makers and urban planners, to rethink the emerging challenges of urban planning and prioritize the creation and proper maintenance of green spaces, in densely populated areas.

In the Island Cyprus, the notion of urban planning in the past decades, left aside the inclusion of parks and green spaces. Nowadays, there are certain deficiencies as regards the number of green spaces in Cyprus and their allocation, in line with urban population and tourists (Karanikola et al., 2017). The city of Paphos follows the same unsustainable urban planning, where the existing green infrastructures are limited (Georgi et al., 2014). Whereas, Paphos is an urbanized environment on the Eastern Mediterranean coast and faces high climate change risks (Pantavou et al., 2019). The case study aims to survey the perceptions of local people about performance, operation and maintenance of urban green environments in Paphos, on the Island of Cyprus, and

suggest management improvements. The survey was based on the residents' preferences and level of satisfaction about the existing urban parks and green infrastructures along with their services. It was also examined how the users assess the contribution of urban green areas on their wellbeing. The results of the present study include useful insights to support the challenging issues of planning, design and manage urban green spaces. It also intends to promote the involvement and active participation of local residents in decision making; as it considered of outmost importance, in order for local administration and relative authorities to efficiently manage urban green spaces (Panagopoulos et al., 2009).

Materials and Methods

Study area

Paphos, is a coastal city in the southwest of the Island of Cyprus (34°46'N 32°25'E) and lies on the Eastern Mediterranean coast, about 50 km west of Limassol, which is the biggest port on the island. The island environment of Paphos shows temperate and dry Mediterranean climate with six, hot and dry months per year. The city of Paphos with more than 35,961 inhabitants has a limited number of parks and green spaces. It seems that decision makers in primary spatial planning of the city disregarded the importance of green spaces. While it should be noted that existing urban planning is characterized by degraded public spaces, including a unified system of green spaces. Whereas, it is a fact that the creation, reconnecting and proper maintenance of parks and green spaces in the city would significantly improve micro-climate and preserve biodiversity in the island (Georgi et al., 2014).

Methodology

Kalamatianou (2000) it is a simple method that provides unbiased representation of a group while, it demands little information about the data population. Based on SRS formulas the population size and the respective standard error were calculated (Filiis et al., 2000). Therefore, before sampling the total population size, a pre-sampling procedure took place addressing 50 residents of the Paphos Municipality. Following, by the use of SRS formulas, the estimation of the total sample size indicated 400 residents of Paphos Municipality, for possibility $(1-\alpha)100=95\%$, $e=0,049$.

Then, there were examined the anticipated frequencies in the contingency table, in order to apply hierarchical log-linear analysis (Siardos, 1999). The classes produced by hierarchical log-linear analysis were jointly grouped to meet Tabachnick & Fidell criteria. The multivariate "Characteristics of the parks and green spaces in the Municipality of Paphos" comprised by 17 questions, was also checked by reliability analysis. In particular, this analysis was used to investigate the internal reliability of the questionnaire (Frangos, 2004), i.e. if that data tend to measure the same thing. Thus, alpha coefficient (Cronbach's alpha reliability coefficient) was selected. According to Howitt, et al., (2003) alpha coefficient values equal to 0.70 or higher are satisfactory and respectively higher than 0.80 are very satisfactory. Furthermore, lower reliability coefficients with values less than 0.60 are also accepted (Siardos, 1999).

Reliability and validity in the research is essentially to be ensured by the application of factor analysis (Siardos, 1999). Factor analysis is a statistical method which aims to discover the existence of common factors within a group of variables (Sharma, 1996). This analysis is a multivariate statistical method based on highly correlated variables (Çamdevýren et al., 2005). The principal component analysis method was also used. Regarding the significance of the principal components, the criterion which was used, was the one suggested by Guttman & Kaiser (Frangos, 2004). According to this criterion, the limit for the collection of the appropriate number of the principal components is determined by the values of typical roots, which are equal or higher to one. Furthermore, the matrix rotation of the main factors was applied as well as Kaiser's method of maximum variance rotation. The survey was conducted in 2017 and for the data analysis the Statistical Package for Social Sciences (SPSS 25) was employed.

Results and Discussion

The residents of Paphos municipality socioeconomics

The socioeconomic profile of the residents of Paphos was firstly examined during the interviews. Table 1 depicts the distribution of the population demographics and socio-economic characteristics. They are mainly men, public servants with upper secondary education.

Table 1. Demographic features of the respondents.

Gender	Male	female			
	65.3%	34.8%			
Age	18-30	31-40	41-50	> 50	
	49.3%	25.8%	15.0%	10.0%	
	Marital status	unmarried	married	divorced or widowed	
		47.8%	45.3%	7.0%	
Childhood	without children	one child	two children	three children	more than three
	49.8%	15.8%	17.5%	12.0%	5.0%
	Educational level	primary school	lower secondary	technical school	
		3.3%	1.8%	10.8%	
		upper secondary	technological ed.	university	
	45.3%	7.3%	31.8%		
Profession	private employee	public servants	self-employed	farmers or live-stock farmers	

	24.5%	33.0%	7.5%	3.0%
	students	pensioners	housewives	unemployed
	17.3%	3.3%	1.0%	10.5%
Annual income	≤ 5.000 €	5.001-10.000 €	10.001-20.000 €	
	14.3%	12.5%	21.3%	
	20.001-30.000 €	> 30.000 €	No answer	
	12.3%	8.0%	31.8%	

Parks and green spaces, a critical opportunity to engage with nature and advance the residents' quality of life

It is presumed that urban dwellers can be positively affected by urban and peri-urban green spaces (Lafortezza et al., 2009). While, through their experiences in green spaces rich in biodiversity, they are able to improve their well-being towards a more sustained lifestyle (Carrus et al., 2015), and enhance their quality of life (Karanikola et al., 2016).

To this end, residents of Paphos Municipality were asked to evaluate the existing parks and urban green spaces. Most of the responders (43.5%) believe they are average, followed by 26.3% who regard them as good, while very good (6.8%) and very poor (6.5%) evaluation receive lower percentages.

The frequency and length of visits to urban parks and green spaces could serve as indicators about the users' experience, especially as regards psychological benefits and their perceived restorative potential on urban settings (Hansmann et al., 2007). In Paphos it was evident that about 3 in ten (34%) visit urban green spaces rarely or sometimes per month (26.5%). The 21% of the responders visit green spaces sometimes per week and 18.5% more than once per year. As regards length of visits, it is usually short and lasts 15' to 30' (32.3%) or 30' to 60' (32.8%). Less visitors (16.5%) state that they stay in the park for more than an hour having leisure time with their children. Some visitors (15%) stop at the park for less than thirty minutes of isolation and walking while 3.5% provide no answer.

The residents considered that the ideal season for visiting green spaces is majorly in spring 66%. While less answered that they visit parks in summer (19.5%), followed by even less visiting the green spaces of Paphos in autumn (8.8%) and winter (5.8%).

Furthermore the residents' satisfaction with their perceived wellbeing in their municipality was investigated. The findings revealed that almost half of them (54.3%) are satisfied, 18.8% very satisfied and 5% absolutely satisfied. Albeit, two in ten (22.1%) respondents consider themselves as less satisfied (15.3%) or not at all satisfied (6.8%).

Before the implementation of log-linear analysis on the above four cases, cross tabulation was checked and the observed frequency in the cells is lower than 5, which reasoned the acceptance of lower expected frequencies. Therefore the hypothesis of full independence among the 3 criteria is incorrect. Through the application of hierarchical log-linear analysis, in the above four cases, after the removal of the third-class degree of correlation, it was established that the most appropriate model was the one - which included the impact and the interaction of the variables divided by two.

Concerning the variables "Evaluation of green spaces", "Length of visit" and "Satisfaction with wellbeing", hierarchical log-linear analysis was applied. While, there is no interaction per 3 criteria, because the X² for Pearson's test is 0.164 with probability (p)=0.921, also because the X² likelihood ratio is 0.166 with probability (p)=0.920. According to findings emerged by the application of hierarchical log-linear analysis the correlations are the following:

- Residents who assess green spaces as very good to good, state that they visit them sometimes during the week or month. Instead, those who believe the green spaces are average to very poor, visit them sometimes a year or rarely.
- Residents who evaluate green spaces as very good to good, believe that they have a satisfactory to very satisfactory quality of life. While, those who think green spaces are average to very poor share the view that the existing standards for their quality of life in the Municipality of Paphos, are average or not at all satisfactory.

Additionally, residents were asked to express their opinion as regards the sense of crowding and potential molestation they feel and it derives from the presence of other visitors in the park. Almost 3 in 5 (62.8%) state that they are amused by the presence of other visitors, while about 1 in 5 (22%) state to be indifferent about the crowd. Only 10.5% of the residents declare that they feel disturbance of the presence of other visitors, and only few (4.8%) claim that they feel disturbed by another reason.

Table 2 depicts the evaluation of parks in the Municipality of Paphos correlated with their companion during their visit. Parks are regarded as poor for almost half or the respondents for visiting them with family (45.3%) or friends (44.5%) followed by residents visiting them alone (41.3%) or with their mate (38.8%).

Table 2. Evaluation of the parks in the Municipality of Paphos according to the type of companionship at the moment of the visit.

Type of companionship	Very good	Good	Poor	Very poor	No answer
Visits alone	9.0%	32.3%	40.0%	15.3%	3.3%
Visits with mate	10.3%	28.5%	38.3%	18.8%	4.3%
Visits with friends	10.0%	34.5%	44.5%	9.0%	2.0%
Visits with family	12.5%	32.8%	35.5%	13.0%	6.3%

Assessment of parks, green spaces and outdoor infrastructures

Importance of green environments for human well-being and their performance in terms of user-based satisfaction, were surveyed by a 5-level Likert scale assessment of Paphos residents (1 represents the most negative value and 5 the most positive value). The finding reveal a poor status and inadequate standards as regards the existing parks and green areas in the Municipality (Table 3). More specifically, most residents share the view that the number of urban green spaces are average and insufficient (41.3% and 30% respectively). While, similar findings address the overall land of existing green spaces (average 38.5% and insufficient 42.3%) and their architectural design (42.5% average and insufficient 28.3%). However, their perceptions tend to be more positive concerning the allocation of green spaces in the municipality (41% average and 21.5% good), easy access to green spaces (good

39.8% and average 38%), and concerning the actions taken by the municipality for the proper management of parks (*i.e.*, maintaining, and enhancing green infrastructures) (44% very satisfied and 24.5% average satisfied).

Table 3. Evaluation of special characteristics in the existing parks and green spaces in the Municipality of Paphos.

Total number of the existing green spaces				
absolutely insufficient	Sufficient	average	insufficient	completely insufficient
5.0%	16.8%	41.3%	30.0%	7.0%
Overall land of the existing green spaces				
absolutely sufficient	Sufficient	average	insufficient	completely insufficient
2.5%	16.0%	50.3%	25.3%	6.0%
Allocation of green spaces in Paphos Municipality				
very good	good	average	Poor	very Poor
3.8%	21.5%	41.0%	28.5%	5.3%
Easy access to green spaces				
very good	good	average	Poor	very Poor
6.3%	39.8%	39.0%	11.3%	3.8%
Number of visitors				
very large	large	average	restricted	very restricted
3.0%	14.5%	37.8%	30.0%	14.8%
Architectural design				
absolutely satisfied	very satisfied	average	less satisfied	not at all satisfied
2.5%	17.3%	42.5%	28.3%	9.5%
Available infrastructures (<i>i.e.</i> picnic shelters, outdoor seats and benches)				
very good	good	average	poor	very poor
2.5%	17.5%	47.3%	26.0%	6.8%
Cleanliness issues				
very good	good	average	poor	very poor
4.8%	21.8%	44.3%	23.3%	6.0%
Plant care				
very good	good	average	poor	very poor
4.0%	25.0%	45.0%	19.3%	6.8%
Outdoor playgrounds for children				
very good	good	average	poor	very poor
3.3%	20.5%	48.5%	19.3%	8.5%
Outdoor sports areas and facilities				
very good	good	average	poor	very poor
3.5%	11.8%	40.5%	28.3%	16.0%
Safety issues especially for children				
very good	good	average	poor	very poor
2.8%	19.8%	40.8%	23.3%	13.5%
Special facilities - adapted for people with disabilities				
very good	good	average	poor	very Poor
2.8%	12.0%	36.5%	28.3%	20.5%
Presence of stray or accompanied animals, pets				
not important problem	less important problem	average	important problem	very important problem
15.8%	22.5%	32.3%	23.5%	5.8%
Noise pollution				
unimportant problem	less important problem	average	important problem	very important problem
5.5%	26.0%	38.5%	22.3%	7.8%
Unpleasant odors				
unimportant problem	less important	average	important problem	very important problem
6.3%	21.3%	36.8%	26.5%	9.3%
Actions taken by Paphos Municipality for the proper management of parks (<i>i.e.</i> maintaining, and enhancing green infrastructures)				
absolutely satisfied	very satisfied	average	a little satisfied	not at all satisfied
9.5%	24.5%	44.0%	19.8%	2.3%

Hierarchical Log-linear analysis was applied for the variables "Number of green spaces", "Allocation of green spaces in the municipality" and "Number of visitors" and "Actions taken by the municipality for the proper management of parks (*i.e.* maintaining, and enhancing green infrastructures)". There is no interaction per 3 or 4 criteria, because the X2 for Pearson's test is 9.716 with

probability (p)=0.137 and because the X2 likelihood ratio is 7.734 with probability (p)=0.258. According to findings emerged by the application of hierarchical log-linear analysis the correlations are the following:

- Residents who are absolutely or very satisfied with the actions taken by the municipality as regards proper management of the existing parks, regard the number of parks is sufficient to absolutely sufficient. Whilst, those who declare average to not at all satisfy with the actions of the municipality, state that the number of parks is average to completely insufficient.
- Residents who feel absolutely or very satisfied with the actions of the municipality, consider the allocation of parks is good to very good. Albeit, the ones being average or not at all satisfied with the actions of the municipality, evaluate parks allocation respectively as average or very poor.
- Residents who believed to be absolutely or very satisfied with the actions of the municipality, also think that there is large to very large number of visitors in the parks. While, the ones who are less to not all satisfied, perceive there is average to very restricted number of visitors.
- Residents who consider the allocation of parks is good to very good, also perceive there is sufficient or absolutely sufficient number of parks in Paphos. However, there are citizens who consider the parks allocation as average to very poor, who also declare an average to absolutely insufficient number of parks.
- Residents who argue that the allocation of parks is good to very good also think there is large and very large number of visitors in parks. While, the responders who evaluate parks allocation as average to very poor, respectively perceive that numbers of visitors are restricted to very restricted in them.

The parks of the municipality received poor evaluation from the residents about their infrastructure facilities. More specifically available infrastructures in the parks (sits, kiosks etc.) were assessed as average (47.3%) and poor (26%), cleanliness as average (44.3%) and good (25%), plant care as average (45%) and good (25%), children's playgrounds as average (48.5%) and poor (40.5%), (28.3%), sports facilities as average (40.5%) and poor (28.3%). Moreover, safety for children were also perceived as average (40.8%) and poor (28.3%), while the citizens share a common view as regards facilities for people for disabilities (average 36.5% and poor 28.3%) (Table 3).

Hierarchical log-linear analysis was applied for the variables "Cleanliness", "Plant care", "Safety for children" and "Sports facilities". In particular, there was no interaction per 3 or 4 criteria, because the X2 for Pearson's test is 2.741 with probability (p)=0.740 and also due to the X2 likelihood ratio which is 2.862 with probability (p)=0.721.

The correlations that emerged are the following:

- Residents who assess very good and good the existing conditions on safety for children, believe that plant care operations are also very good and good. On the contrary, the ones who evaluate as average to very poor safety for children, hold the same negative opinion for plant care in the parks
- Residents who perceive safety for children in the parks as very good and good, have the same opinion for cleanliness conditions. Albeit, the ones who declare that safety for children is average to very poor in parks, share the same negative view on cleanliness.
- Residents who think that safety for children in parks is very good and good have the same opinion for the sports facilities in parks. While, those who evaluate safety issues as average to very poor, hold also the same opinion as regards the existing sports facilities in parks.
- Residents who perceive cleanliness as very good and good, consider also that plant care is very good and good in the parks of Paphos. Whereas, the ones who assess cleanliness as average to very poor, believe as well that plant care is average to very poor.
- Residents who claim that cleanliness in parks is very good and good, hold the same opinion for sports facilities in them. On the contrary the ones who evaluate cleanliness as average to very poor, respectively characterize as average to very poor the existing sports facilities in parks.
- Eventually, residents who believe that plant care is very good and good, share the same opinion for sports facilities in parks. While, the responders who assess plant care as average to very poor, provide the same evaluation for the existing sports facilities in park of Paphos.

Regarding the existing problems in the parks, the residents evaluate them under a different concept (Table 4). The level of "average problem" prevails in their responses concerning common disturbances in parks. As relatively important problems in the parks of Paphos are believed to be the unpleasant odors, followed by the presence of stray or accompanied animals, pets. As less important problem in parks is perceived noise pollution.

Hierarchical Log-linear analysis was applied for the variables "Perceived sense of crowding", "Presence of stray or accompanied animals, pets", "Noise pollution", and "Unpleasant odours". There was no interaction per 3 or 4 criteria, because the X2 for Pearson's test is 3.995 with probability (p)=0.780 and also due to the X2 likelihood ratio, which is 4.049 with probability (p)=0.774.

The correlations that emerged are the following:

- Residents who admit that the perceived sense of crowding amuses them, list noise pollution as an average to unimportant problem. Whereas, the ones who declare the perceived sense of crowding as disturbing or as indifferent for them, experience noise pollution as an important and very important problem in parks.
- Residents who assess the presence of stray or accompanied animals, pets as average to unimportant problem, disregards in the same way the problem of noise pollution in parks. Albeit, those who regard that the presence of pet accompanied animals is an important or very important problem, share the same views for noise pollution respectively.
- Residents who evaluate the presence of stray or accompanied animals, pets as average to unimportant problem, have the same opinion for the problem of unpleasant odors in parks. However, the ones who regard that the presence of pet accompanied animals is important and very important problem consider the same for the problem of or unpleasant odors.
- Residents who believe that noise pollution is an average to unimportant problem in parks, hold the same opinion as regards unpleasant odors in them. While, those who list noise pollution as important and very important problem, evaluate unpleasant odors as important and very important problem as well.

After the necessary checks reliability analysis was applied to the above multivariate. The value of the alpha coefficient is 0.907. This is a strong indication that scale degrees are reasonably consistent, meaning that data tends to measure the same thing. This is also supported by the significantly high individual alpha coefficients. Especially, after deleting any variable, there no increase is observed on the coefficient value.

Moreover, before proceeding with the application of factor analysis, all the necessary checks were conducted. The Keiser-Meyer-Olkin index has a value of 0.931. Also, Bartlett's sphericity test rejects the null hypothesis, which means that the correlation matrix is

not equal to the identity matrix. Furthermore, the measures of the sampling suitability are high to very high, proving that the extracted factors hold high explanatory power. Therefore, three factors were obtained. Table 4 illustrates the loads, which are correlation coefficients of the seventeen variables with each of the three factors emerged. The higher the load of a variable on a factor, the more that factor is responsible for the total variance of the degrees in the respected variable.

Table 4. Table with the loads of the factors after the rotation.

Variable	Factor burdens after the rotation		
	1	2	2
Total number of the existing green spaces	0.772	0.248	0.111
Overall land of the existing green spaces	0.804	0.204	0.166
Allocation of green spaces in Paphos Municipality	0.81	0.27	0.077
Easy access to green spaces	0.411	0.356	0.305
Number of visitors	0.585	0.412	-0.021
Architectural design	0.643	0.453	0.156
Available infrastructures (<i>i.e.</i> picnic shelters, outdoor seats and benches)	0.526	0.498	0.107
Cleanliness issues	0.178	0.773	0.123
Plant care	0.243	0.676	0.117
Outdoor playgrounds for children	0.481	0.567	0.193
Outdoor sports areas and facilities	0.514	0.545	-0.014
Safety issues especially for children	0.303	0.739	0.118
Special facilities - adapted for people with disabilities	0.252	0.718	0.097
Presence of stray or accompanied animals, pets	0.081	0.051	0.621
Noise pollution	0.029	0.179	0.815
Unpleasant odors	0.132	0.065	0.756
Actions taken by Paphos Municipality for the proper management of parks (<i>i.e.</i> maintaining, and enhancing green infrastructures)	0.378	0.553	0.091

Three factors were extracted from 17 special characteristics in the existing parks and green spaces in the Municipality of Paphos. Regarding the first factor, it includes the variables "Number of green spaces", "Total area of existing green spaces", "Allocation of green spaces in the municipality", "Easy access to green spaces", "Number of visitors", "Architectural design" and "Available infrastructures". This factor could be termed Spatial planning of parks. In addition, the variables "Children's playgrounds" and "Sports facilities" receive loadings almost reaching 0.5. Thus, it is acceptable that they belong to the first factor.

The second factor titled Functionality of green spaces, consists of the variables "Cleanliness", "Plant care", "Children's playgrounds", "Sports facilities", "Safety for children", "Facilities for people with disabilities" and "Actions taken by the municipality for the proper management of parks (*i.e.* maintaining, and enhancing green infrastructures)". In particular, it could be acceptable that two additional variables belong to this factor as they receive loadings up to 0.5-namely "Architectural design" and "Available infrastructures (*i.e.* picnic shelters, outdoor seats and benches)". These variables seem to bridge the first and second factor, which reveals that spatial planning and functionality of parks are closely affiliated.

The third factor entitled Challenges in parks and consists of the variables "presence of stray or accompanied animals, pets", "Noise pollution" and "Unpleasant odors".

In a similar survey in the Municipality of Kalamaria, Thessaloniki, in which a four-point evaluation scale was used (*i.e.* the mean-the neutral attitude was a point of separation so that respondents answered even slightly positively or negatively), the three above factors were also obtained including almost common variables case (Karanikola et al., 2016).

Conclusion

The study aimed to investigate the status and performance of green infrastructures on an island, yet urban environment, of a Mediterranean city. The survey was based on the residents' perspective, who comprise the users of parks and green infrastructures in the Municipality of Paphos, Cyprus, and reasoned the need for significant improvements.

It has been already discussed that urban planners of Paphos dismissed to attribute the due importance of urban green (Georgi et al., 2014), something also confirmed in this study. In particular, the application of hierarchical log-linear analyses revealed that the existing parks and green spaces in Paphos present important deficiencies in number, size, design, infrastructures, sports and children's sites and as regards their allocation within the Municipality.

In addition, the findings unfold the citizens' disapproval on the existing few urban green spaces and parks. Most of them evaluate them as average, poor and very poor. Sanesi, et al., (2006) argue that this is an indicator of unsustainable urban planning, which took place in many cities in Europe, such as Italy. However, Italy as well as Cyprus, are both located in southern Europe, in the Mediterranean Region, which is strongly affected by climate change. Therefore, sufficient coverage of green environments in urban settings, are considered as vital in these areas.

Another point to consider is that one in two residents in Paphos believe that their life quality meets quite low standards. While, important findings correlate the residents' perceived well-being, with poor evaluation on the existing urban green infrastructure in this area. Especially, it became apparent that conceptualization of poor quality of life, mainly characterizes citizens who visit parks and green spaces less frequently and for shorter periods - compared to citizens who believe they have a better quality of life. Despite the

fact that the impact of green spaces in the citizens' well-being and in upgrading their living standards, is something highly acknowledged.

Moreover, the presences of stray animals or pets, as well as unpleasant odors -possibly due to animal waste-are recognized as the main challenges in parks. Hierarchical log-linear analysis reveals also a correlation between disturbance from noise pollution and the above mentioned problems, which is also something that accompanies the presence of animals in open spaces, and it is difficult to be controlled by pet owners and visitors. The results of factor analysis audit the validity of the above issues. Therefore, the municipal authorities should promote raising awareness campaigns, and place informational signs addressing pet owners in order to avoid pet waste disposal. Furthermore, there should be municipal shelters for abandoned and homeless companion animals, in order to reduce their presence in parks and compile with the European priorities about animal welfare.

Urban planners in many Mediterranean cities have failed to contemplate with the notion of re-design smart cities with sufficient green spaces, able to restore natural elements in the acceleration of urban sprawl. It is undisputable that transforming urban environments and create urban green areas has proven to be a challenging issue. In fact, it requires the introduction of effective policies aiming to achieve two major goals: 1) to attain the ambiguous climate targets and restorative performance of natural dynamics in dense urban areas, especially in the vulnerable Mediterranean; 2) to boost urban social resilience and well-being and improve citizens' quality of life. Some of the proposed measures include the creation of parks and greener urban structures such squares, pavements, kiosks, schools and hospitals. While, the establishment of greener and smarter-oriented institutional framework for urban planning, is critical, to catalyze transformational change. Eventually, it should be stressed that the introduction of the respective legislative framework is the basis to efficiently implement green urban policies both on a European and national level.

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