Periódico Eletrônico
Fórum Ambiental da Alta Paulista
ISSN 1980-0827 – Volume 18, número 3, 2022

System of green areas and perception of quality of life in the city of Sousa - PB

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ISSN 1980-0827 – Volume 18, número 3, 2022

SUMMARY

Urban green spaces which many consider to be an important element of the quality of life (QV) urban environment, still have a nebulous assessment by their subjectivity. This study examines the perception of society about the quality of urban life associated with the system of green areas and trees with a focus on the city of Sousa-PB, Brazil. For this, we sought to examine the system of green areas, size, quality aspects, and, together, the perception of the quality of urban life because of the residents of the city. Rating documentaries' cartographic and iconographic and field evaluation questionnaires were used. As a result, the city of Sousa meets its indices of vegetation and green areas below the minimum suggested by SBAU. Regarding agreement as to definitions of quality of life, it was found that the elements: of good relationships, services, urban infrastructure, provision of employment and workplace environment, and also healthier and pleasant green areas indicate that there is a consensus among people that these aspects represent the quality of urban life.

KEYWORDS: Quality of life. System of green areas. Perception.

INTRODUCTION

Urban green spaces constitute, in the modern vision of urbanism, one of the important elements for the urban and environmental quality of life. The influence of green spaces on the urban environment depends on several factors such as the size and structure of green spaces, local and regional climatic conditions, and the characteristics of urban morphology of the neighborhoods where they are located (UPMANIS *et al*., 1998). The extensive and rapid growth of cities and the focus on road structure and buildings rather than on spaces for human use can create problems for the population.

In Sousa, the city chosen as the object of study, located in the sertão of Paraíba - Brazil, it is observed that, in recent decades, there has been serious environmental neglect aggravated by rapid population growth. The infrastructure is not sufficient to meet the demand, and the means for planning and control of the city do not exist or are inadequate, allowing an urban-environmental degradation whose most evident aspect is related to the inadequate use of the soil and the abandonment of green areas and squares.

From this perspective, it is observed a growing urban expansion and dispersion of the city of Sousa, making it essential to analyze its urban composition, especially its green areas, for its environmental qualification and to achieve a sustainable and harmonic development process focused on quality of life. While other elements of the urban system present more specific benefits, the public green areas present multiple benefits and are recognized by most people: improvement of the environmental quality, improvement of the landscape, of social relations, of the tourist attraction potential, of the population's sense of well-being, etc. In this sense, few urbanistic and engineering interventions present such a positive cost-benefit ratio in the urban context.

The relevance of the study done in the city of Sousa - PB is in the search for knowledge about the real contributions of parks and public green areas to the quality of life of the urban population and a proposal for an environmental public policy on this sector that can contribute to a better quality of life for the population.

GREEN URBAN AREAS

According to Laerdent (1982), green areas, zones, spaces or green equipment are free spaces where planted areas of vegetation predominate, corresponding, in general, to parks, squares, and gardens. Lima *et al*. (1994) tried to define what green areas are and whose conceptualization was adopted in this study. In this case, a green area is one where arboreal vegetation is predominant, including squares, public gardens, and urban parks; the central flowerbeds, interchanges, and traffic circles; an urban park is a green area with ecological, esthetic, and leisure function, however, with a larger extension than the squares; a square, as a green area, has a main leisure function; and urban afforestation refers to the arboreal vegetal elements within the city, particularly referring to the trees in the road system.

Concerning the functions of urban green areas, Guzzo (1999) considers three main ones: ecological, aesthetic, and, social. The ecological contributions occur to the extent that the natural elements minimize the impacts resulting from industrialization and urbanization, such as the urban heat island and global warming. The aesthetic function is based on the integration between the built spaces and those destined for circulation, as well as on the offer of well-being. In this context, the social function is also inserted, which is directly aimed at offering spaces for socialization and leisure for the population.

Among the indicators that express a city's environmental quality, Oliveira (2001) highlights the treated green area indexes, basically referring to parks, wooded squares, and urban gardens; the vegetal coverage indexes, corresponding to the entire "mask" occupied by vegetation, in the orthogonal projection of the urban space; and also the tree coverage indexes, in this case corresponding not only to urban forestation (predominantly roads) but the entire urban area covered by vegetation, including private areas and areas of permanent preservation.

The National Recreation Association of the USA, in the International Recreation Congress held in Philadelphia in 1956, suggests that the green areas index (IAV) should be between 28 to 40m2/inhabitant (MILANO, 1990). The World Health Organization, in turn, suggests a 9m2/inhab. index to be adopted as the basis for Latin America and the Caribbean (IDB, 1997). The Brazilian Society of Urban Afforestation (SBAU) has proposed a minimum index of 15m2/inhab. The lack of a widely accepted definition and the different methodologies for obtaining the indexes make it difficult to compare the data obtained in different Brazilian cities and those in foreign cities (GUZZO, 1999).

The green areas, in the urban environment, are important because they provide several benefits such as the protection of water quality, attenuation of pollution, thermal, sound, and light comfort, breaking the monotony of cities, shelter for fauna, and easing the psychological discomfort caused by the built masses, among others (RIBEIRO, 2008).

Thus, green areas can be a relevant indicator in the perception of quality of life by their users.

URBAN QUALITY OF LIFE

The concept of quality of life is even more diversified and broad than the concept of free and green areas, due to its multifaceted aspect and the subjectivity that also composes it.

The analysis of urban quality of life, specifically, must consider two issues: the first has to do with individuals' need to relate to the social, economic, and cultural context in which they live. The second is related to the characterization of a space in terms of existing goods and services, as well as their accessibility and ease of use in the urban context.

In general terms, in order to measure the contribution of green areas to the quality of life of citizens, it is known that estimating the amount of vegetation or green areas *per capita* allows inference on quantitative aspects, but in order to define influences on environmental quality, one must evaluate the environmental services that such areas have, as well as to evaluate their influence on the quality of life of citizens, one must evaluate the environmental and social functions that such areas perform and how such environmental and social services are perceived and appropriated by the urban community.

The city is the historical product of human activity in a given place: it is the material memory built with buildings, road networks, basic service systems, facilities, and artifacts for public and private use. The city is also shaped by the social and psychological conditions it creates and transmits to people. All of this constitutes the environment for urban society, which is becoming ever larger on the planet.

People and human communities experience the environment differently. This diversity comes mainly from diverse cultural backgrounds that cause the quality of the environment to be appreciated with different sensibilities and expectations. The difficulties in establishing general environmental criteria lie precisely in the diversity of cultural values and geographical and historical circumstances.

Environmental quality results, in practice, from dialectical relations between what can be called environmental demands and a very particular kind of supply of housing goods and services that can be called the supply of environmental and urban services. Neither demands nor environmental offers are the same for everyone. Some of the significant relationships between environmental demand and supply have an affective and psychosocial character and are expressed in symbolic values of great importance to affirm people's sense of belonging and cultural identity.

CHARACTERIZATION OF THE CITY UNDER STUDY

The area chosen for this study was the municipality of Sousa - PB, Brazil, because it was observed that in recent decades there has been a rapid population and urban growth, without the evolution of its infrastructure and urban subsystems, including green areas, keeping pace with the growth of its demography and economy.

The municipality of Sousa is located in the sertão of Paraíba with a surface area of 842km^2, a population of 63,783 inhabitants, and a density of 75.45 inhabit./ km^2, semi-arid climate, the age annual temperature of 30^{0}C, and annual rainfall of 700mm, and it is located 420 km from the city of João Pessoa, the capital of Paraíba.

OBJECTIVE OF THIS RESEARCH

The general objective of this study is to identify and analyze the public green and leisure spaces in the city of Sousa, with a focus on urban life quality and environmental quality, taking as reference the existing theories, the recommendations of specialized technical institutions, and the perception of the population.

MATERIALS AND METHODS

Research on urbanistic data and indexes was carried out, using spatial analysis through maps and satellite photos, dimensions and quantification of the areas, and comparison with qualitative indexes adopted. Next, a social perception survey was elaborated through a descriptive, quantitative study, with the application of a questionnaire and the use of statistical criteria for the interpretation of its results.

Universe and sample population for social research

The universe was the population of the urban perimeter of the city of Sousa. The sample for the questionnaires was 595 users randomly selected by the method and program of Triola (1998) with an estimation error of 4%, confidence level of 95% and stratified by urban sector.

The inclusion criteria for the responders were: voluntarily agreeing to answer the questionnaire and being users of the city's green areas. And the exclusion criteria were: not returning the questionnaire duly filled out, and refusing to hand in the questionnaire after answering it. Thus, there was a sample loss of 217, leaving 378 people for analysis, because they did not meet the criteria.

OBSERVED RATES

- Treated Green Areas Index (IAVT): sum of the total areas of parks and squares, expressed per square meter and divided by the number of inhabitants in the urban area;
- IAV= ∑ total area urban green areas/inhabitants (in m2);
- IAVU = ∑ total area urban green areas /urban area (in %);
- Vegetation Cover Index (ICV and ICVU): Sum of the total vegetation cover areas by population (ICV) (in m2) or by urban area (ICVU) (in %);
- ICVU=∑ total vegetation cover area / urban area;
- Tree Cover Index (ICA and ICAU): sum of canopy areas by population (ICA) and the sum of canopy areas by urban area (ICAU);
- ICA=∑ canopy area/inhabitants (in m2) and ICAU= ∑ canopy area/urban area (in %).

Some indicators that express in a better way the contribution to the environmental quality of a city were adopted, such as the treated Green Areas Index (IAVT), which expresses the amount of green area (m^2) treated and equipped for public use and the population living in a given city, the Green Areas Index (IAV) which expresses numbers of areas destined to be green areas per urban inhabitant; the Vegetation Cover Index (ICV) which represents the relation of vegetation cover (m^2) and the urban area, without distinction between vegetation typologies. Generally, the quantitative and qualitative measurement of the urban green areas is done with the use of these appropriate indexes. A city can have a large absolute or effective area of gardens and urban parks and can have a lower quality of green areas since its evaluation must be relative to the user population or even the urban dimension, distribution, or spatial composition.

Analyzed Variables

- Independent variable - Green areas system - quantitative and qualitative aspects.
- Dependent variable – Collective perception about the quality of urban life, including the perception of the influence of the green areas system.

DATA COLLECTION AND PROCEDURES

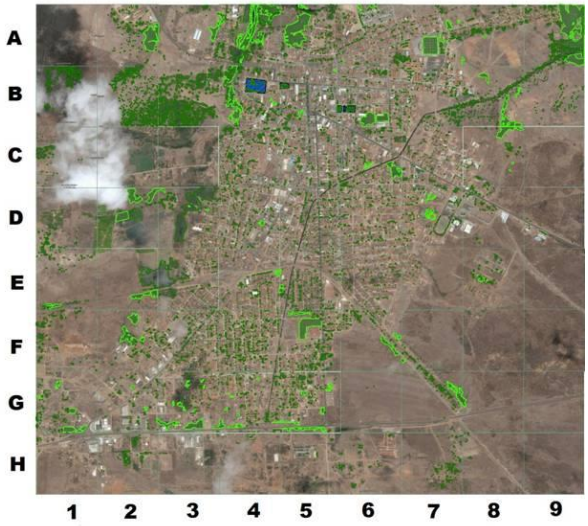
The data were collected during the months of August 2009 to April 2010. An inventory of the tree vegetation of some neighborhoods was made using the minimum crown diameter of 2.50 meters. To locate the tree vegetation, satellite images from *Google Earth* were used and the images were inserted in the graphic program AutoCAD 2009. Thereafter, a matrix with 8 rows and 9 columns representing the module was created. Each module was separated into independent files to obtain better area solutions, ensuring greater scanning fidelity in the AutoCAD program. Once in AutoCAD, the following procedures were performed, respectively per module:

1- Insertion of each module in AutoCAD;

2- Digitization of tree elements, green areas, public roads, and blocks, obeying the matrix numbering;

3- Assembling the modules, as indicated in the matrix; (Figure 1).

Figure 1: Mosaic of the city of Sousa with the location of the vegetation cover



Source: ANDRADE, 2011, based on *Google maps*, 2010.

4- Scaling of the image made from the graphic scale. For this, the *scale* command was used as a reference option, taking into account the converted value of the graphic scale from feet to meters. The measure of the module was found. The measure of the module is 392.50mx392.50m.

Instruments for data collection

- AutoCAD 2009 program: for spatial and dimensional analysis on maps over *Google Earth* satellite images;
- 50-meter tape measure: measurement of squares, and canopies;
- Structured questionnaire of objective questions: perception about the quality of life and urban aspects of green areas, socioeconomic aspects and characteristics use of green areas;
- Unstructured questionnaire to be applied among traditional residents to obtain oral history;
- Digital camera, to record physical, social, and behavioral observations in the field.

RESULTS AND DISCUSSION

RESULTS OF THE DIMENSIONAL ASPECTS AND VEGETATION AND TREE COVER

Table 1 shows the dimensioning of the urban area and the areas of vegetation cover, grass floor, and canopy mask found *in loco* surveys and through *Google Earth*, digitalization and, insertion in AutoCAD program, using the "AREA" command.

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Table 1. Dimensional aspects of the city of Sousa

Aspectos Dimensionais	
Estimated population	63.783 inhabitants (IBGE 2007)
Urban Area	17.992.141,70 m²
Tree area (canopy masking area)	418.656,28 m²2,30 %
Grassed floor area	294.523,56 m²
Area of vegetation cover	713.179.84 m²

Source: ANDRADE, 2011
Note: Population estimated by IBGE 2007

The calculation of the vegetation cover index per inhabitant was obtained by considering the area of vegetation cover divided by the estimated population, as well as the urban area.

Vegetation cover index (ICV)= ∑vegetation cover area (ACV) number of inhabitants (H). Therefore, LCI=∑ACV/H. Figure 2 shows the vegetation cover patch obtained from *in loco* observations and digitized in computer programs.

Figure 2: Vegetation cover patch of the city of Sousa.

Source: ANDRADE, 2011

It was found that the city of Sousa has a vegetation cover of 713,179.84m^2. The vegetation cover index is 11.18m^2/inhab., based on the population of 63,783 inhabitants, data from IBGE, 2007. The vegetation cover index (urban) is 3.96%. This index was calculated considering the area of vegetation cover divided by the urban area (Table 2).

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Tabela 2: Índice de Cobertura Vegetal, Arbórea e Áreas Verdes

Vegetation and Tree Cover Indices and Treated Green Areas Indices in the city of Sousa - PB	
Vegetation Cover Index per inhabitant (ICV)	11,18m2/inhab.
Vegetation Cover Index (concerning the urban area) – (ICVU) (without squares)	3,96%
Tree Cover Index (ICA)	6,56 m2/inhab.
Tree Cover Index (ICAU)	2,30 %
Total Vegetation Cover Index (ICVT) including squares	11,39 m2/inhab.
Treated Green Areas Index (IAVT)	0,24 m2/inhab.

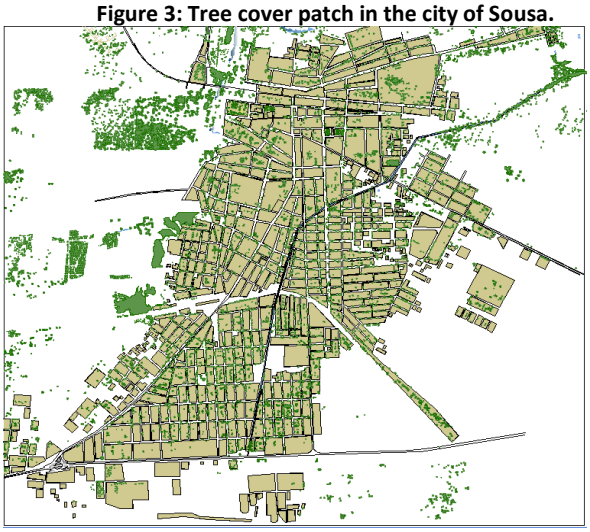
Source: ANDRADE, 2011

The ICV index is not directly related to the provision of treated green areas in the city, but the surface covered by vegetation concerning the urban area has a more effective contribution to the issue of urban climate. The vegetation cover index verified in Sousa, which is 11.18%, reveals a very small percentage of the urban area covered by vegetation, because according to the Brazilian Society of Urban Afforestation (SBAU), for the standards of quality of urban life and environment, the minimum index would be 15 m^2/inhabit. Thus, the city of Sousa is below the normatized standards.

The tree cover index was obtained by considering the area of trees (canopy mask) divided by the estimated population.

Tree cover index = ∑area of the canopy mask (ACA)/estimated population (H). ICA= ∑ACA/H 418656.28/63783. Thus, ICA=6.56 m2/inhab. and correspond to 2.30 % of the total urban area. Figure 3 below presents the results of the tree cover indexes.

Figure 3: Tree cover patch in the city of Sousa.



Source: ANDRADE, 2011

Figure 4 shows the comparison between the indexes obtained with the indexes proposed by the different relevant institutions.

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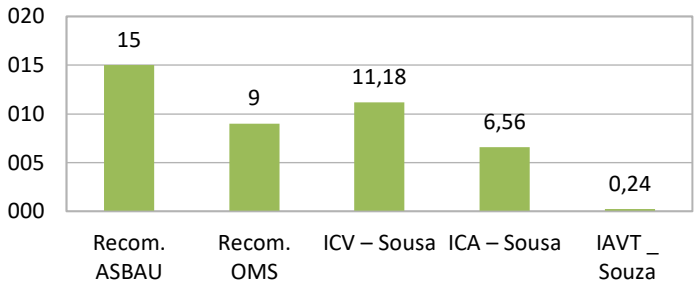
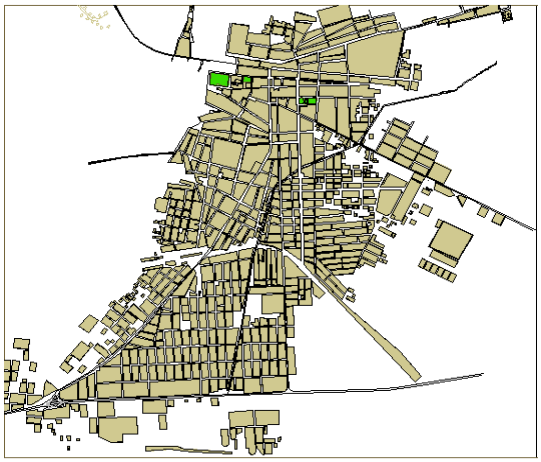
Figure 4. Comparison of the Indices obtained with SBAU and OMS recommendations



It can be observed that, from the quantitative point of view, the city presents very deficient indexes, notably regarding the index of green areas treated and usable as leisure areas, as recommended by SBAU and OMS with recommended indexes of 15,00 m2/inhab. and 9,00 m2/inhab., respectively (Figure 4). In this index, the city presents only 0.24 m2/inhab. and still with an inadequate spatial distribution, as shown in Figure 5, indicated below.

Figure 5. Patch of Treated Green Areas



Source: ANDRADE, 2011

Figure 5, the patch of treated green areas, shows that the treated green areas are concentrated only in the central area of the city.

The areas of squares in the urban perimeter of Sousa are 15539.32 m^2 distributed with the following denominations:

- Praça Bento Freire known as Praça da Matriz, with an area of 10328.11 m^2;
- Bom Jesus Eucarístico Square, with an area of 3418.49 m^2;
- Capitão Antônio Vieira Square, with a total area of 1792.72 m^2.

IAVT= ∑AVT/H

IAVT= 15539.32/63783. Thus, IAVT=0,2436m^2/inhab.

Without the inclusion of the area of the squares, the tree cover index (ICA) would be only 6.56 m2/inhabitants.

The index of treated green areas was obtained by considering the total areas of the squares, divided by the estimated population (Table 3).

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Tabela 3: Índice de Cobertura Vegetal, Arbórea e Áreas Verdes

Treated Green Areas	
BENTO FREIRE SQUARE AREA	10.328,11 m²
BOM JESUS EUCARÍSTICO SQUARE AREA	3.418,49 m²
CAPITÃO ANTÔNIO VIEIRA SQUARE AREA	1.792,72 m²
TOTAL SQUARE AREA	**15.539,32 m².**
TREATED GREEN AREAS INDEX (IAVT)	**0,2436m2/inhab.**

Source: ANDRADE, 2011

RESULTS ON THE PERCEPTION OF THE QUALITY OF URBAN LIFE AND THE ELEMENTS THAT REPRESENT THE SYSTEM OF GREEN AREAS IN THE CITY OF SOUSA

Facing the demonstrated indexes, the residents of the city of Sousa were inquired about issues involving green areas and quality of life and positioned themselves in the manner presented here.

Table 4 has the data related to the Chi-Square significance (p (χ^2)) between the answers obtained in each question. It is observed that there are differences between the percentages of answers for almost all questions, except for the questions: 'have leisure areas decreased?' yes (52.9%) and no (47.1%) (p=0.280), 'are the sidewalk trees, regarding location, well distributed?' (54.0%), 'poorly located' (46.0%) (p=0.136) indicating, with this, that the population finds itself with divided opinions.

Tabela 4: Percentuais relativos e significância *Qui*-Quadrado da percepção acerca da Qualidade de Vida e Áreas Verdes e de lazer.

QUESTIONS	PERCENTAGE OF RESPONSES	P (X^2)	
Have you noticed changes in the green areas of the city?	Yes	71,4%	
	No	28,6%	0,000*
Have the trees, flowers, and gardens decreased?	Yes	68,8%	0,000*
	No	31,2%	
Has the heat increased?	Yes	89,7%	0,000*
	No	10,3%	
Have the leisure areas diminished?	Yes	52,9%	0,280
	No	47,1%	
Was there depredation and no preservation of green areas?	Yes	68,5%	0,000*
	No	31,5%	
Do you think green urban areas (gardens, trees, etc.) are important for the population's quality of life?			0,000*
	Yes	96,3%	
	No	3,7%	
The number of squares currently existing in the city is	Very good	19,3%	0,000*
	Sufficient	56,9%	
	Insufficient	17,2%	
	Precarious	6,6%	
Is the existing equipment in the leisure areas sufficient and adequate?	Yes	29,1%	0,000*
	No	70,9%	
Urban green areas in public spaces are:	In great quantity	20,4%	0,000*
	Serves the population	50,1%	
	Scarce	24,7%	
	Non-existent	4,8%	
What kind of place do you prefer to be, in your leisure time?	Square	46,5%	0,000*
	Parks	22,9%	
	Stores	11,2%	

	Bar or restaurant	19,4%	
How often do you use the square?	1 to 2 times/week	44,2%	0,000*
	3 to 4 times/week	22,5%	
	1 time every 15 days	14,8%	
	1 time a week	18,5%	
In what shift do you frequently use it?	Morning	14,3%	0,000*
	Afternoon	18,0%	
	Evening	67,7%	
What activities do you practice most often in the square?	Physical activity	29,6%	0,000*
	Meeting friends	38,9%	
	To pass the time	17,2%	
	To flirt	8,2%	
	More than two	6,1%	
What equipment and furniture do you use most in a square?	Banks	46,8%	0,000*
	Bandstand	11,6%	
	Amphitheater	3,2%	
	Playground	5,0%	
	Sports court	8,5%	
	Walking track	4,8%	
	Trash garbage cans	3,2%	
	Mailbox/public telephone /Water fountains	1,1%	
	Fountains	5,8%	
	Bar/Snackbar	7,7%	
	Kiosks	1,1%	
	More than five	1,4%	
How do you use the square?	Alone	19,1%	0,000*
	With friends	47,2%	
	With family	17,2%	
	With wife/girlfriend	10,6%	
	With children	2,1%	
	With co-workers	1,1%	
	With school students	2,7%	
By what means of transportation do you get to the square?	I don't use it, I walk	49,2%	0,000*
	Bicycle	10,1%	
	Motorbike	26,2%	
	Collective transport	3,7%	
	Car	9,8%	
	Animals	1,1%	
The tree-planting of the sidewalks, in your opinion, is:	Very good	18,0%	0,000*
	Sufficient	53,7%	
	Insufficient	17,7%	
	Precarious	10,6%	
The type of sidewalk tree (vegetation) is	Adequate	44,2%	0,000*
	Inadequate	41,5%	
	Insufficient	14,3%	
The sidewalk trees, regarding their location, are	Well located	54,0%	0,136
	Poorly located	46,0%	

Note: Questions expressing the perception about quality of life and green areas and leisure (N=378) (2010) * p<0.05 Significant. Source: ANDRADE, 2011

Table 5 presents the agreement of the definitions of quality of life addressed in the literature and adapted, by the researchers, to verify the understanding of the population. It can be seen that the elements 'good social relationships' - 45.5% (p=0.089), 'good services and good urban infrastructure' - 46.8% (p=0.136), 'good job offer and workplace' - 49.5% (p=0.877), 'healthy and pleasant environment- 46.8% (p=0.237), do not differ considerably, thus indicating that there is a consensus among people that these aspects represent the quality of urban life.

Table 5. Relative percentages and Chi-square significance of agreement of the definitions of Quality of Life

QUESTIONS	PERCENTAGE OF RESPONSES	P (X^2)	
Do you agree that quality of life is physical, mental, psychological, and emotional well-being, as well as social relationships such as family and friends, health, education, purchasing power, and other circumstances of life? This is not to be confused with the standard of living.	Yes	79,9%	0,001*
	No	20,1%	
Do you agree that quality of life is: mental, psychological, emotional, and social well-being, absence of disease, with a decent education and health care system, as well as financial and wage support that enables the acquisition of necessary goods and services?			0,001*
	Yes	82,5%	
	No	17,5%	
In your opinion, what are the best elements to represent the quality of life in your city?	Physical, mental, emotional, social, and financial well-being	61,4%	0,000*
	Good social relations	45,5%	0,089
	Good health care	71,7%	0,000*
	Good education and good schools	71,4%	0,000*
	Good income and purchasing power		
	Good services and urban infrastructure	29,9%	0,000*
	Good job offer and workplace		
	Good environmental quality	46,8%	0,136
	Good accessibility to the things I need		
	Good nutrition	49,5%	0,877
	Health and pleasant environment	42,6%	0,005
		25,9%	0,000*
		33,9%	0,000*
		46,8%	0,237

Note: Concordance of the definitions of Quality of Life (N=378) (2010) * p<0.05 Significant Significant. Source: ANDRADE, 2011

Table 6 describes the relative percentages and Chi-square significance of the agreement of definitions about quality of life by age group, and no differences were obtained in any of the definitions. This represents that, regardless of age group, people think the same about the agreement of definitions of quality of life.

Table 6. Relative percentages and Chi-square significance of agreement of definitions about Quality of Life by age group

Conceptual agreement about quality	Percentage of the responses (total sample)	% by age group			p (χ^2)
		Young people	Adult	Elderly	
Do you agree that quality of life is: physical, mental, psychological, and emotional well-being, as well as relationships such as family and friends, also health, education, purchasing power and other circumstances of life? It's not to be confused with the standard of living	Yes= 79,9% No= 20,1%	15,6% 14,5%	82,7% 83,0%	1,7% 1,6%	0,945
Do you agree that quality of life is: physical, mental, psychological, emotional, and social well-being, absence of disease, with a decent educational and health care system, as well as financial and wages that enable the acquisition of necessary goods and services?	Yes= 82,5% No= 17,5%	14,8% 18,2%	83,3% 81,8%	1,9% 0%	0,429

Note: Concordance of the definitions of Quality of Life (N=378) (2010) * p<0.05 Significant
Significant. Source: ANDRADE, 2011

However, Table 7 shows that this agreement of definitions about quality of life, found in the literature, presents differences between social classes, as opinions diverge. Yet, in the adapted definition which includes "financial conditions and wages that allow the acquisition of necessary goods and services", no statistical differences are found, indicating that material goods are desired by all classes and, therefore, should be included in the definition of quality of life.

Table 7. Relative percentages and Chi-square significance of conceptual agreement about Quality of Life by socioeconomic level

Conceptual agreement of quality	% of responses	% by socioeconomic level Classes conforme ANEP						p (χ^2)
		E	D	C	B2	B1	A2	
Do you agree that quality of life is: physical, mental, psychological, and emotional well-being, as well as social relationships such as family and friends, and health, education, purchasing power, and other life circumstances? It's not to be confused with the standard of living.	YES=79,9	24,5	29,1	39,1	5,0	1,7	0,7	0,002*
	NO=20,1	40,8	36,8	15,8	6,6	0	0	
Do you agree that quality of life is: physical, mental, psychological, emotional, and social well-being, freedom from disease, with a decent educational and health care system, as well as finances and wages that enable the acquisition of necessary goods and services?	YES= 82,5	28,2	28,5	34,6	6,4	1,6	0,6	0,127
	NO=17,5	25,8	40,9	33,3	0	0	0	

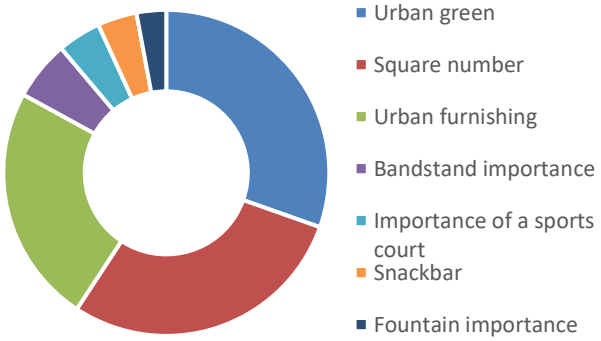
Note: Concordance of the definitions of Quality of Life by economic level (N=378) (2010) * p<0.05 Significant.
Source: ANDRADE, 2011

The green area systems and perception of quality of life in the city of Sousa are emerging themes, because its urban evolution has also been occurring along with the occupation and use of the soil, without proper planning, and also directed to the public green

areas. The decharacterization of the natural environment, a result of the inharmonious urban growth and its use of the soil, has generated environmental imbalances such as an increase in temperature, increase in air pollution and unbalance of the fauna and flora, besides many other impacts.

However, according to the survey results, the favorable perception of the population related to the importance of urban greenery is still 60%. When considering the number of squares, 56.9% of the population understood that it is at a 'good' level. Regarding urban equipment, street furniture, and benches, they represented 'satisfaction' at a percentage of 46.8% on the scale of importance. Use of the square, followed by the bandstand, with 11.6%, the sports court with 8.5%, the bar and snack bar with 7.7%, and the fountain with 5.8% (Figure 6).

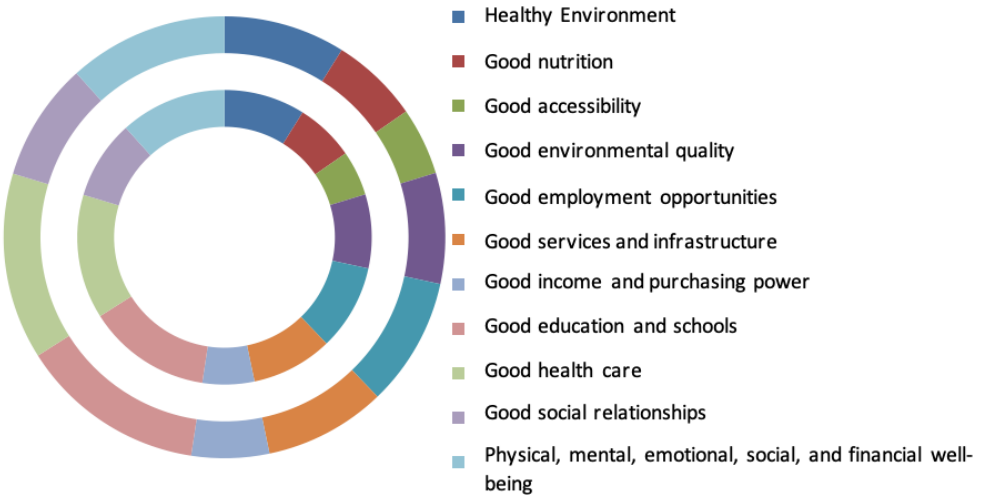
Figure 6: Perception of Urban Life Quality, 2010



Source: ANDRADE, 2011

As shown in Figure 7, it was evident in the study of the collective perception of the population's quality of life that, despite the perceived deficiencies in green areas and urban forestation by the population of Sousa-PB, the elements considered most necessary, such as employment, income, education, health, general accessibility, supply of goods and services, and other aspects were more valued as more necessary components for quality of life.

Figure 7: Perception of Urban Life Quality, 2010



Source: ANDRADE, 2011

Finally, the population perceives that the heat has increased, by a considerable percentage of 89.7%, but does not relate this increase to the scarcity of urban greenery in the city, perhaps due to a lack of knowledge or for not understanding the importance of green areas system in improving the urban microclimate. However, they consider it important for moments of relaxation and leisure, and enjoyment, through the landscape, for the quality of urban life in the city of Sousa in Paraíba.

CONCLUSIONS

According to the objective and sample studied, it was possible to conclude that: the city of Sousa is with its indexes of vegetation cover and green areas well below the minimum of 15 m2/ inhab., which is the one suggested by the Brazilian Association of Urban Afforestation for the standards of urban and environmental quality of life, as well as it does not have a structured system of treated free and green areas, consisting mainly of old squares implanted in the initial phase of the city. The most unfavorable index was precisely the one that could attribute a better quality of urban life, that is, the index of treated green areas (parks and squares) / inhabitant = 0.24 m2/inhabitant. In the same way, its distribution and accessibility are quite unequal in the context of the city, and is practically restricted to the central areas. In quantitative terms, all the urban indexes were quite deficient.

As for the social perception of quality of life and, particularly, the quality of urban life, it was verified, through the questionnaires applied, that the elements of good social relationships, good services and urban infrastructure, good job offers and workplace, healthy and pleasant environment are presented in the same way to society, indicating that there is a consensus among people that these aspects represent the quality of urban life. Urban greenery was considered important in this aspect. In the case study, the perception of the concept of quality of life had little difference between the age groups (young people, adults, and the elderly), but showed different forms concerning social segments and location in the urban context.

Regarding the use of the treated green areas (squares), it was verified that, due to their central location, they present a good level of use, being more used by classes C, D, and E (due to the preference of classes A and B for more private spaces) and, especially at night (due to the local climate and the relative scarcity of trees in the squares concerning the climate requirements) and, in the case of the predominant age groups among the universe researched, for taking advantage of leisure time. The most commonly declared form of use was meeting friends and family, also revealed in the most commonly used elements: benches, bandstands, and paths. The use of active recreation (playgrounds and courts) comes next. The perception of the population about the urban green areas is that they are getting worse, probably because they are not keeping up with the new urban expansion. The importance of afforestation and green areas was demonstrated, but they expressed a not very positive evaluation regarding the quality of green spaces and recreational areas. In general, they considered them to be just sufficient or to meet the expected minimum standards.

In the survey of the population one can see that, in practice, they consider the good contribution of green areas and afforestation to the quality of life, but do not reach the understanding that it would be an important urban policy.

Although there is a large number of studies demonstrating the importance of green areas within a urban context for the environmental quality in urban areas and consequently the quality of life regulating the urban climate, improving the urban landscape, providing positive hydrological and climatic effects, allowing the improvement of biodiversity in urban environments, positively influencing human health, and promoting well-being. Urban managers, in general, tend not to take good advantage of the final product of these studies, commonly giving little importance to green areas and their prerogatives for a better quality of life.

It is suggested that a public policy could be implemented to implant a system of urban green areas with new green areas with different purposes (leisure, microclimate, landscape, comfort, sport, social gathering, etc.) spatially distributed in the urban area deconcentrating the traditional areas, improving and making their positive effects more universal.

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