HOW URBAN IMAGE COULD BE ANALYSED USING QUANTITATIVE AND QUALITATIVE APPROACHES?

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Abstract

This paper represents a theoretical and applicative diagnosis analysis of an urban space: the 2nd District of Bucharest. The theoretical research is realized by comparing different demographic characteristics (gender, age, education, etc.). The theoretical analysis is completed by an applicative diagnosis. The research method employed is the questionnaire, applied on the field through random sampling of population. This way, the different perceptions of space created at a mental level by urban actors are represented through mental maps, images and symbols. By comparing the results of the two territorial analyses, topo-phile (attractive), topo-phobic (repulsive) and topo-indifferent spaces are emphasized, along with the factors that lead to those spatial configuration differences. Moreover, by linking the theoretical and applicative analyses' results, there is a special attention drawn to some classical urban planning and organization problems, like center-periphery discrepancies and segregation (ethnical, social, economic etc.). This way, this type of research can be used as a diagnosis instrument for planning the future model of spatial organization, an instrument that can accompany in an efficient and effective way the territorial development policy created by the local authorities.

Keywords: *urban image, demographic analysis, spatial organization, District 2, Bucharest.*

1. Introduction

Urban spaces are some of the most dynamic spaces of the world and they undergo daily constant changes. In order to effectively and efficiently plan them, urban planners, architects and other specialists need as much knowledge they can gather on all dimensions of the city, so that they can make informed decisions and draw a good city master plan (Martinez, 2007; Wentz, 2018).

Quantitative data has long been used in order to identify strengths, weaknesses and needs of urban spaces, but the rapid changes that occur in the evolution of cities make the use of this data insufficient for a complete, detailed analysis. Census data collection takes a long time and usually happens only once every 10 years, which is a too long period of time to measure the fast dynamics of today's settlements. Also, quantitative data does not measure the

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sense of attachment, the public values, knowledge and perspectives, which are necessary for a complete interpretation of space (Boland, 2008; Bridge and Watson, 2003; Gertner and Kotler, 2004).

The costs of overlooking social factor and qualitative analysis can be very high (Verbrugge, 2018), as policies that run counter to residents' attitudes or planned developments that fail to meet their needs are less likely to gather public support and, in turn, fail in their objectives (McCunn, 2018). Moreover, the city and the citizens are mutually influencing each other, by determining different behaviors of the population and strong dynamic of urban components.

This qualitative analysis is usually measured with the help of an urban image, which can be represented in a mental map or through different graphs. When an urban actor is able to create a cognitive image,*"urban space* turns into *urban place"* (Topan, 2012) and it becomes part of the collective memory and develops a strong sense of attachment (Krishnomurthy, 2016).

Urban image represents an essential reality that is centered on a city, filtered by a subject and put into circulation in the form of information (Ianos, 2004). This definition has some elements that need further clarification. The reality is the life lived in that urban space, with all the feelings and sensations generated by everyday events. The subject is the individual person or social group that perceives the physical space, while the information synthesizes the general impression that people have about a place.

Thus, as Marius Neacsu (2010) identifies too, the urban image can be considered an integrative interface that mediates the conflict between perceptions and accretions of urban space, an interface between the physical, real city and the human perception (of all involved actors) of it.

1.1. Study area

Bucharest is the capital and the largest city of Romania (as both surface and population). Located in the south-eastern part of the country, in Vlasiei Plain, the city is drained by Colentina and Dambovita rivers, Bucharest represents the political, administrative, economic, financial, cultural, scientific, educational, transport, informational, and touristic center of Romania.

The city is undergoing constant changes, both regarding the demographic characteristics and the socio-spatial evolutions (Fig. 1). Administratively, it is divided into 6 districts with similar populations and surfaces.

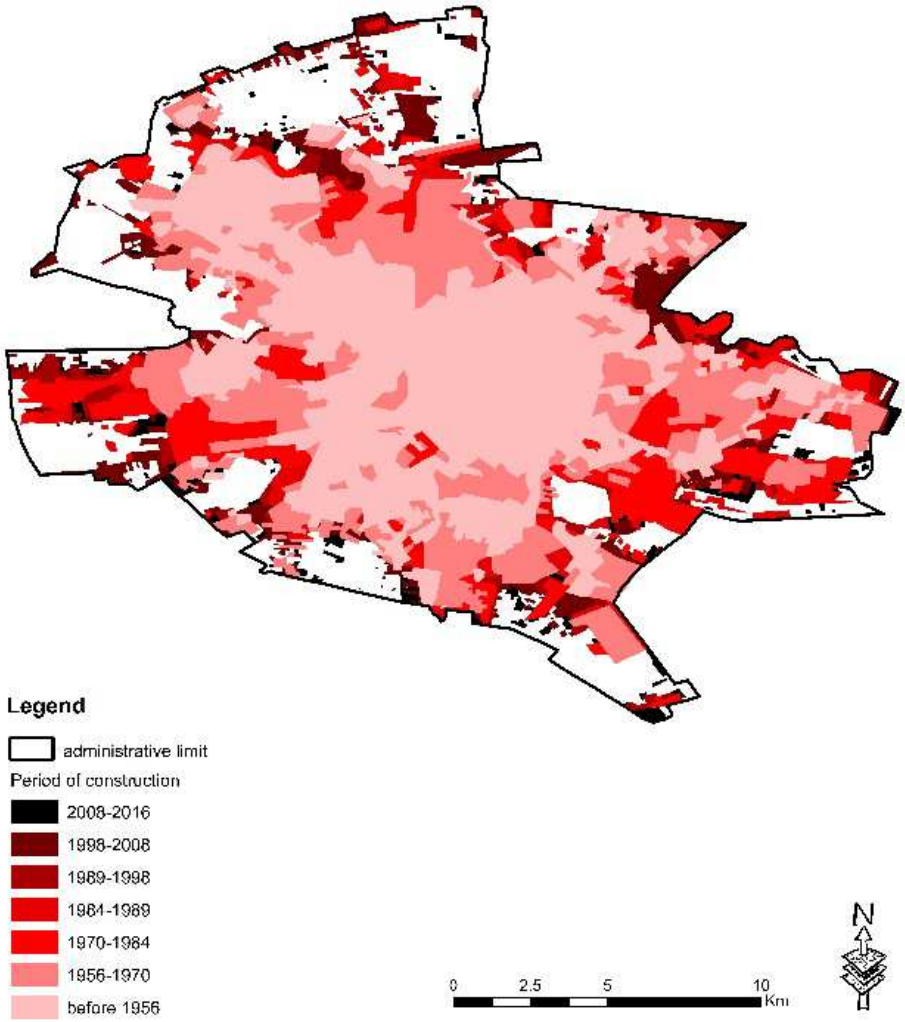

Fig. 1. The evolution of built space in Bucharest in the 1956-2016 period (*Data source:* 1956 and 1970 PUG, satellite images from Google Earth Pro for 1984, 1989, 1998, 2008, 2016)

The 2nd District of Bucharest, the one analyzed in this paper, is situated in the north-northeast part of the city. Compared with the other districts, it has median values regarding the surface (32 km^2 – 14% of the total surface of Bucharest) and the population (380,934 citizens – 18% of the total population of Bucharest). Its main characteristics can be highlighted through statistical analysis of demographic data, as well as through qualitative information. This paper represents a theoretical and applicative diagnosis analysis of this District of Bucharest.

2. Methodology

2.1. Data and materials

This research used different statistical and geographical information. Statistical data from the 2011 national population census were processed and analyzed for each census circumscriptions (23 circumscriptions in total). The data was taken from the Romanian National Institute for Statistics and, even though it does not represent the most recent data available, it is the most reliable and detailed for smaller surfaces, like a circumscription census. Thus, demographic indicators like the age distribution, activity sector, and education level were analyzed to allow for a comparison between the different parts of the district.

Other qualitative and quantitative information were provided by applying a significant number of questionnaires. Having an adequate structure, the questionnaire has offered an important data base for the analysis.

2.2. Methods

For the analysis and evaluation of the urban image in the 2nd District of Bucharest, a questionnaire was designed and applied between July and September 2017. A total of 230 questionnaires, 10 for each census circumscription, were applied. The sampling technique was randomly applied on the street, and the obtained data were then processed, analyzed and compared.

In terms of the sample's representativeness, it can be noticed that the proportions regarding age and gender distribution are similar to those of the population across the whole district (Table 1) so the selected sample is statistically significant and representative from this point of view. The breakdown of the sample based on last graduated form of education and economic sector of activity shows higher differences between the whole population of the district and the respondents to the questionnaire. Thus, with regard to the distribution according to the level of education (Table 2), the differences refer mainly to higher values in the categories of gymnasium, high school and university graduates.

Table 1

Respondents profile
(comparison regarding age and gender of the sample and the 2nd District's population)

	Gender		**Age (years)**			
	masculine	**feminine**	**< 25**	**25-40**	**4160**	**> 60**
Sample (no. people)	108	122	48	63	64	55
Sample (%)	47%	53%	21%	27%	28%	24%
District 2	46%	51%	17%	28%	31%	24%

Data source: questionnaire analysis and 2011 population census data.

Table 2

Respondents profile
(comparison regarding level of education of the sample and the 2nd District's population)

	Primary school	Middle school	High school	University	Post-university	Other/No answer
Sample (no. people)	4	13	72	86	50	5
Sample (%)	2%	6%	31%	37%	22%	2%
District 2	1%	24%		18%	22%	35%

Data source: questionnaire analysis and 2011 population census data.

When it comes to sector of activity (Table 3), the sample presents a lower share in industrial (secondary) activities and a higher share in services (tertiary) sector. Those differences do not question the representativeness of the sample, as the population weights at the sector level for level of education and economic sector of activity are calculated by taking into account all population, including the category 0-18 years old, which is excluded from the questionnaire sample.

Table 3

Respondents profile
(comparison regarding sector of economic activity of the sample and the 2nd District's population)

	Primary sector	Secondary sector	Tertiary sector	Others[2]
Sample (no. people)	3	25	122	80
Sample (%)	1%	11%	53%	35%
District 2	1%	19%	26%	54%

Data source: questionnaire analysis and 2011 population census data

One of the main downsides of the questionnaire is that in the second part not all people had the geographical knowledge to be able to locate a certain place on a map, so the census circumscriptions had to be replaced with the name of the neighbourhoods, names that respondents could easily locate in their minds and regarding which they were able to express a certain perception. The neighbourhoods correspond only partially to the census circumscriptions, as some extend on two or more of them, while others have smaller surfaces or extend in the nearby districts too. Thus, the correlation between the neighbourhoods and the circumscriptions is the following: Colentina – 2, Iancului – 15, Floreasca – 3, Fundeni – 4 and 7, Mosilor – 16 and 17, Obor – 5,

[2] In this category are included unemployed people, people working from home, non-active population (children, scholars, pensioners etc.).

6, 8, 9, 10, and 14, Pantelimon – 12, 13, 18, 19 and 23, Pipera – 1 (partially), Stefan cel Mare – 11, Tei – 1 (partially), Vatra Luminoasa – 20, 21 and 22.

For mapping the results, GIS tools and other cartographic methods were used for increasing the spatial analysis capacity. For geographers the spatial dimensions for the analysis of urban image is crucial because they offer the possibility for an integrated interpretation of collected data.

Our study makes a correlation between the demographic indicators and urban image, making a rigorous analysis of territorial distribution and the people perception. In this approach the statistical methods are frequently used. The statistical data was taken from the Romanian National Institute of Statistics public data base, interpreted and inserted into graphical and cartographical representations, thus making the numbers easier to understand and the territorial discrepancies easier to observe.

3. Results

3.1. Intra-urban demographic analysis

The demographic characteristics of the 2nd District of Bucharest show the same tendencies as the rest of the Romanian territory. The resident population is decreasing due to negative natural and migratory balances, from 393,523 citizens in 2000 to only 372,913 citizens in 2017 (National Institute of Statistics, 2018). The decrease was stronger in the 2010-2015 period, when, due to world economic crisis and weaken national economic context, the emigration increased. The 2nd District of the capital could not attract new population and the young people moved away, which lead to a decreasing and ageing population.

Regarding the age and gender repartition of population, the 2nd District presents the same descendent trend. Young people (aged between 0 and 15 years) represent only 11.3% of the total population, while old people (aged over 65 years) 14.2%. This highlights the strong ageing trend of the district's population. The high percentage of old people represents a problem that must be solved by authorities in the near future, as the dependency rate is increasing faster than the revenue sources of the public administration.

During the 2011 census, the district was divided into 23 circumscriptions by representatives of the National Institute of Statistics, depending on the demographic and spatial criteria and the possibilities of facilitating the data collection process. Thus, all 23 areas within the analysed area have approximately equal populations, although the surfaces are more varied depending on the presence of green spaces (e.g. Plumbuita park in district 1), the type of dominant type of buildings (blocks or houses) etc. The division of District 2 in the 23 constituencies can be seen in Fig. 2 below.

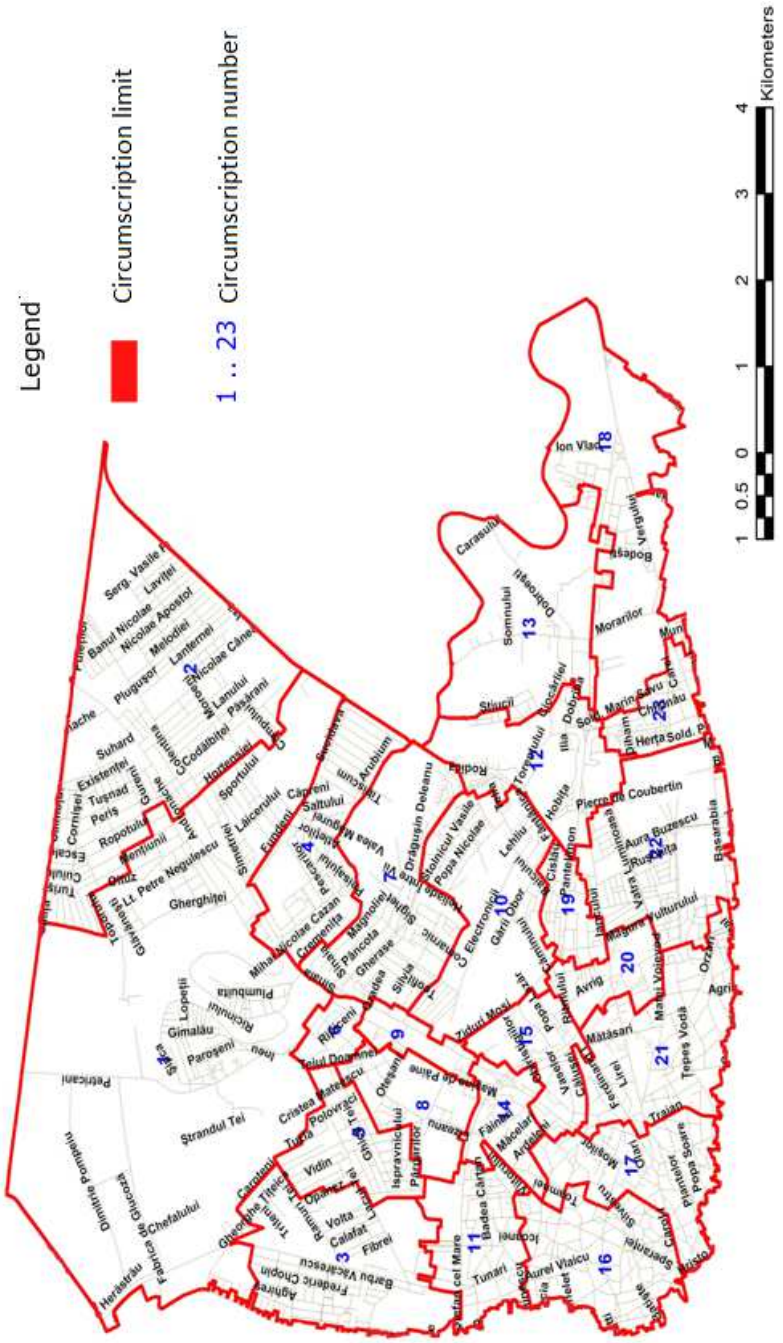

Fig. 2. The census circumscriptions in 2nd District of Bucharest
(*Data Source:* 2011 census, National Institute for Statistics)

Regarding the number of citizens from each circumscription, it can be noted that most have between 5000 and 9000 citizens from the active population category (Figure 3). Exceptions are circumscriptions 16 and 9 (from the western and south-western part, which have below 5000 active citizens) and circumscriptions 13, 23 and 18 (from the south-eastern part, with over 10,000 active citizens each). Those differences appear because of the differences in type of buildings. The central area of the capital (the south-western part of the district) has mainly collective buildings with a high seismic risk, very narrow streets and a high crime rate, as well as an aged and poor population, which makes data collection difficult and determines the National Institute for Statistics officials to choose smaller statistic surfaces. In the same time, Pantelimon neighbourhood (circumscriptions 13, 23 and 18) is very densely populated because of the numerous collective buildings and the family friendly spaces, as well as because of the easy access towards the centre of the city.

When it comes to the age distribution, Figures 4 and 5 highlight a strong differentiation between centre and periphery. The circumscriptions situated near the periphery of the city (4, 13, 18, 23 etc.), as well as the Obor Market area (8) have a small percentage of old people in the total population (below 5%), while the central areas (9, 16, 17) and the ones with a strong historic residential heritage (3, 20, 22) confront with an ageing population (over 11%). The same differences are emphasized when analysing the percentage of youngsters, with north-eastern circumscriptions (1, 2, 4) having over 14% of the total population below 15 years old, while in central and historic areas (15, 20) youngsters represent below 10% of the total population.

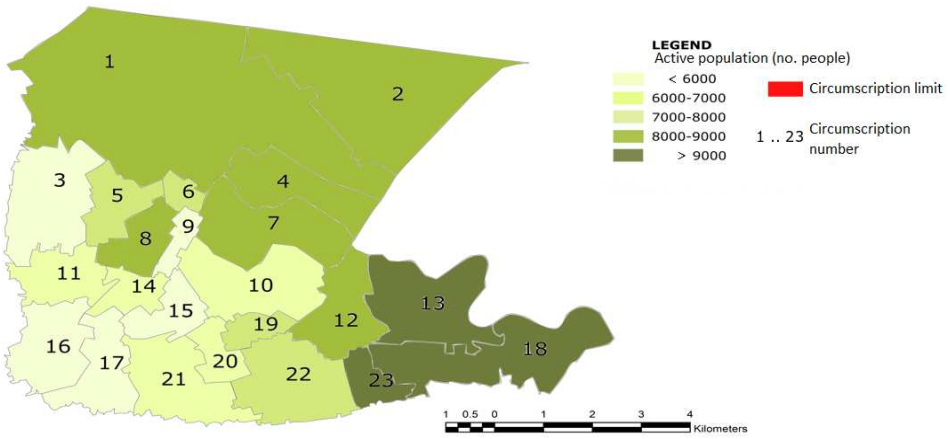

Fig. 3. The active population of 2nd District of Bucharest for every census circumscription (*Data source:* 2011 census, National Institute for Statistics)

When it comes to sectors of the economy, the primary sector has very low percentages (between 0.93% and 1.58% of the total population for each circumscription), thus not being representative of the social and economic configuration of the district. However, it can be noted that the lowest percentages are registered in the most industrialized areas (10, 4, 23) and the highest in highly commercial areas (9, 15, 22). The secondary sector presents higher differences from one circumscription to another, from 30.4% to 50.5%. The most industrialized areas are in the eastern side of the district (2, 4, 13, 18), while the lowest percentage of people working in the industry can be found in the western side (3, 16, 17, 20). Services represent between 45.2% and 66.5% of the active population of each circumscription and present a negative correlation with the percentage of the population occupied in industry, with the periphery having the lowest percentages and the central parts of the city the highest.

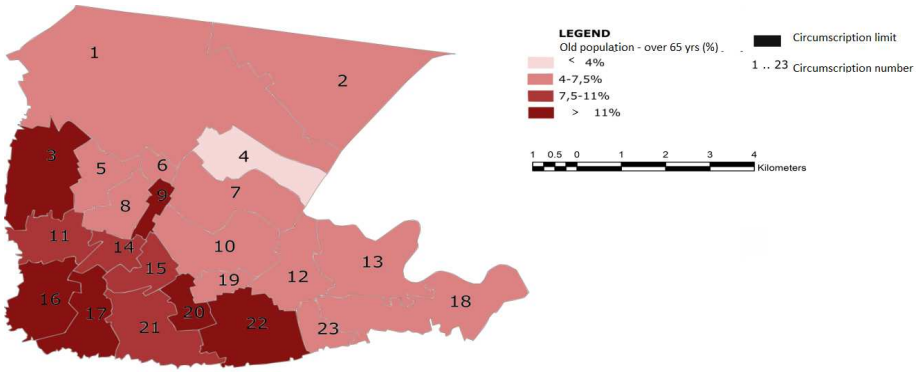

Fig. 4. The percentage of old people (over 65 years old) of 2nd District of Bucharest for every census circumscription (*Data source:* 2011 census, National Institute for Statistics)

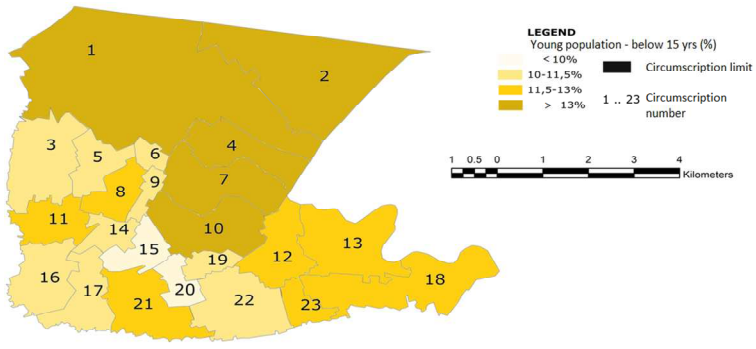

Fig. 5. The percentage of young people (below 15 years old) of 2nd District of Bucharest for every census circumscription (*Data source:* 2011 census, National Institute for Statistics)

3.2. Applicative diagnosis of urban image

This part of the paper is based on the questionnaire and it represents the results and analysis of the urban image reflected in the minds of the respondents on both the space in their close proximity and the whole district.

The first part of the questionnaire was designed to capture the urban image regarding the area in close proximity to respondent's home. Thus, it measured their perception regarding the characteristics of the census circumscription in which their residence is located. In order to do that, the respondents were asked to determine their degree of satisfaction regarding different elements (security, infrastructure, education system, medical services, public spaces etc.) on a scale from 1 to 5, with 1 being the minimum value and 5 the maximum value. As the maximum recorded value was 3.8 the graphs below have a scale that stops at 4 as the maximum values. After all data was collected, the mean of the values for each circumscription was calculated and used for the analysis.

One of the measured characteristics was the residential spaces quality (Fig. 6). The respondents said they were influenced by their standards, aspirations, as well as the technical quality of the buildings when giving a mark for this element of the urban space. Thus, Colentina (2), Fundeni (7) and Pantelimon (12, 18) neighborhoods have mainly old, collective buildings, while the few individual houses are often insalubrious, poorly maintained and with a high seismic risk, which are all factors determining a low degree of satisfaction regarding their quality. The newly built neigborhoods (Vatra Luminoasa – 21 and 22, as well as some areas of Pantelimon – 13, 18 and 23) present the highest degree of satisfaction regarding residential buildings, as they have all facilities available, the exterior aspect is a pleasant one from an esthetic point of view, and the safety degree is high. The only exception is the Floreasca neighborhood (3), where the low degree of satisfaction regarding built spaces is not related to exterior characteristics of buildings, but to the aspirations of the residents. Thus, even though some of the best buildings in Bucharest are located here, Floreasca's residents want even better conditions and facilities.

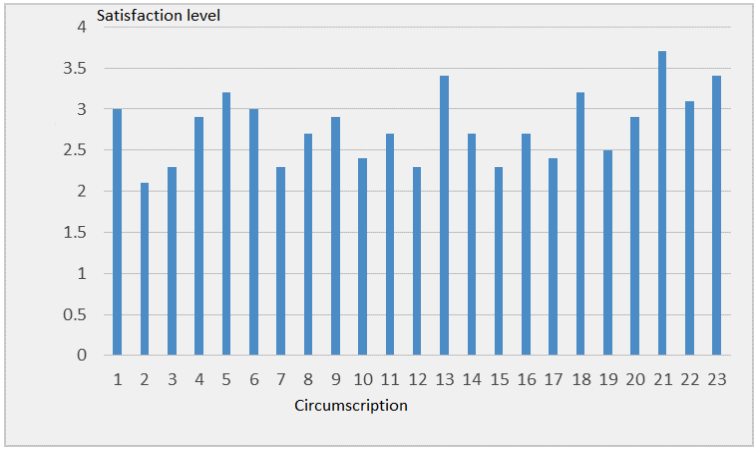

Fig. 6. Degree of satisfaction regarding residential spaces of the District 2 of Bucharest by census circumscription (*Data source:* own data)

The cultural institutions (Fig. 7) represent one of the main problems of the 2nd District of Bucharest not due to their low quality, but because of their absence. Thus, a high degree of dissatisfaction predominates here, with the minimum values recorded in periphery areas (Colentina 2, Fundeni 7). The only values that are over 3 (which represent the indifference level, with a population that is neither content, or dissatisfied) is recorded in the central areas of the capital, which are the south-western circumscriptions of the district (Mosilor 16 and 17, Vatra Luminoasa 21), as well as in the cultural and social center of the district, Obor Square (6).

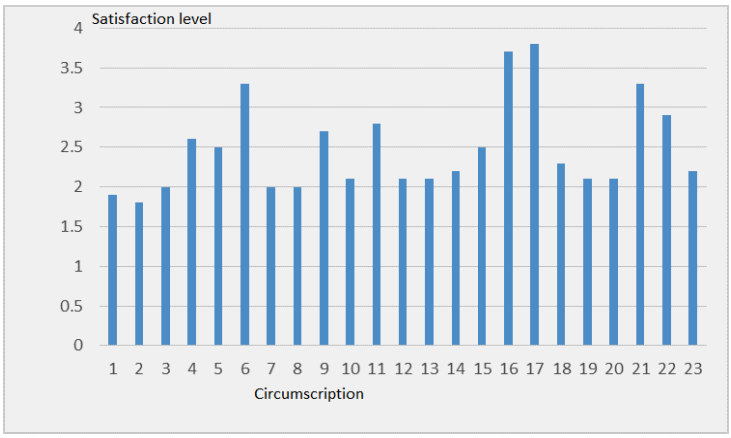

Fig. 7. Degree of satisfaction regarding cultural institutions of the District 2 of Bucharest by census circumscription (*Data source:* own data)

Data was collected regarding transport infrastructure, as well as pedestrian and bicycle facilities. A correlation between the degrees of satisfaction of all three elements can be observed, as well as a general decrease of population's content from the infrastructure to the pedestrian facilities, and with the lowest degree of satisfaction, to the bicycle facilities. Also, the differences between the lowest and highest values are larger for bicycle and pedestrian facilities than for transport infrastructure. The minimum values are recorded in the periphery, where infrastructure is still poorly developed, and public transport and bicycle tracks are not a priority for state authorities (Colentina 2, Pantelimon 19 and 23), as well as in very crowded neighborhoods, where already existent facilities are not enough to deal with the daily traffic of people and vehicles (Obor 9 and 15). The highest degrees of satisfaction are recorded in areas with easy access to the underground transport system and around the big boulevards, that also have bicycle tracks and large pedestrian pavements (Stefan cel Mare 11, Mosilor 16 and 17, Pantelimon 12 and 13).

The second part of the questionnaire comprises questions related to people's perception of the other neighborhoods of the district, thus identifying topo-phobic, topo-indifferent and topo-phile attitudes for different areas of the district. Thus, the respondents were asked to mention which of the districts' neighborhoods they consider to be developed and which they consider to be underdeveloped compared with their own. This way the urban image of the whole district, as well as the differences perceived by population between the areas in their close proximity and the rest of the district can be measured. The total number of mentions of each neighborhood was calculated and a total value resulted by making the difference between the positive (developed) and negative (underdeveloped) mentions, thus reflecting the overall perception, as it can be seen in Figure 8.

The topo-phile attitudes are recorded mainly in Floreasca, Mosilor, Vatra Luminoasa and Stefan cel Mare neighborhoods, which are old residential spaces, with a rich history and a high class resident population. They are close to central area and have their own cultural identity. The population is selective when integrating people belonging to different social, ethnical or demographic groups. Also, the services available here are diversified and high class, which is reflected in the high prices. Those neighborhoods are characterized by a certain degree of economic segregation that makes them look inaccessible and desirable in the mind of the other residents of the district.

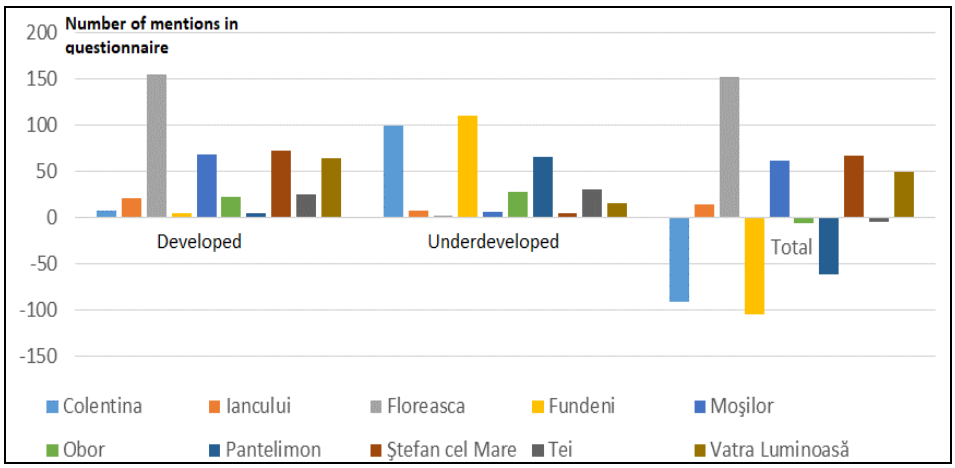

Fig. 8. Residents' perception regarding degree of development of 2nd District neighbourhoods (*Data source:* own data)

The topo-phobic attitudes are concentrated in three neighborhoods: Colentina, Fundeni and Pantelimon. They are situated in the periphery and they have a deficient infrastructure, a low accessibility, low quality technical and residential facilities, numerous ethnic minority groups, a low level of education of the population, and very few services available. The price of land is low and the population generally belongs to the first generation of migrants, with a low income.

The topo-indifferent attitudes are registered in Iancului, Obor and Tei neighborhoods. Those are areas developed from the point of view of services and residential spaces and facilities, but present different factors that affect their urban image, like crowded spaces, traffic jams, low security level, large minority groups, etc. Also, it can be noted that even though the total result says those neighborhoods generate an indifferent perception for the population, actually they generate extreme attitudes, either topo-phile or topo-phobe attitudes, so we cannot actually speak about indifference. The reason why this happens can be easily noticed only by looking at one of the areas, Obor. Here topo-phile attitudes are generated by the large number of commercial services and their quality and by the easy access to central areas of Bucharest, while topo-phobe attitudes are determined by the high crime rate, the low safety level, the frequent traffic jams, and the large number of garbage deposited illegally on the streets.

4. Discussion

By combining the questionnaire results with the statistical data, the 23 circumscriptions of the district can be grouped in 5 large functional categories that

reflect the specific functions of each area (Fig. 9): business area, transport area, commercial area, cultural and touristic area, residential area (low class, middle class, and high class). Also, it can be noted the way the perception of a certain function is diffused. For instance, even though Obor Square is situated at the border between 8th and 9th circumscriptions, all neighboring circumscriptions are perceived as commercial.

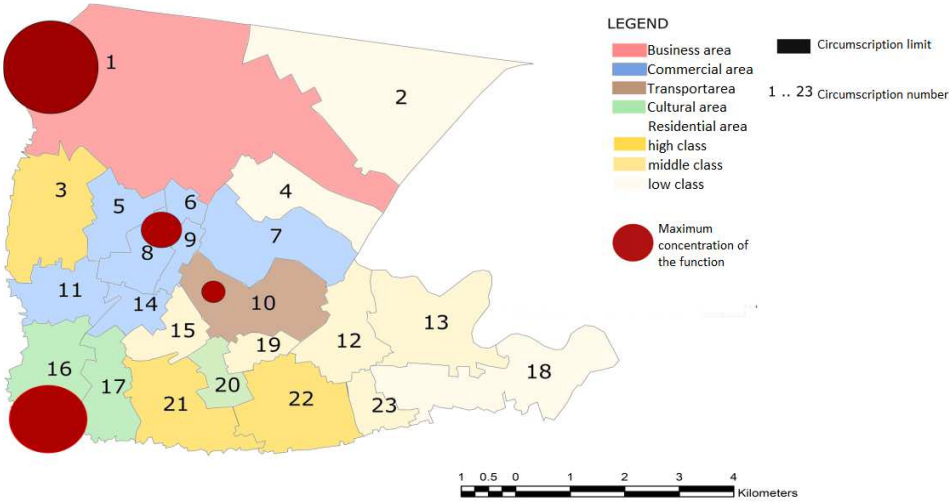

Fig. 9. Functional areas of 2nd District of Bucharest
(*Data source:* own data)

In the case of residential areas, this function is perceived mainly through the absence of others, as they are only used for housing purposes. Their quality is determined by comparing the degrees of satisfactions regarding residential spaces and existent services, as well as existent facilities and safety degrees. This way, major differences are recorded between Vatra Luminoasa (21 and 22), Floreasca and Stefan cel Mare (3) areas and Colentina (2), Fundeni (4) and Pantelimon (18).

Those results can be used to highlight detailed territorial discrepancies in urban planning of space that cannot be observed by analyzing the statistical data. Thus, involving the population in the decision making process when it comes to spatial organization and administration can provide a more in depth diagnosis analysis and can help prioritize the problems of the community and identify the development opportunities based on the strengths of the territory. Also, urban image can be used to the populations' expectations regarding facilities, built spaces, services etc. so that the public authorities can take the necessary measures to meet them. All in all, it represents an efficient diagnosis method and should become an integrated part of all urban planning projects and studies in order to effectively highlight the details of spatial organization, configuration, perception, and meaning.

5. Conclusions

Through statistical data analysis a series of differences between different parts of the 2nd District of Bucharest are identified, especially between centre and periphery. Thus, in central areas of the district the population is aged, has a higher level of education, and works mainly in service sector. In contrast, the periphery has a lower age mean, a higher percentage of youngsters, a lower level of education, and a high percentage of residents working in industrial sector.

This quantitative, statistical analysis is complemented by a qualitative, applicative, questionnaire based analysis that had as a main goal capturing the urban image and perception of residents and observing the details of the social configuration of space. Thus, the three previously identified areas (centre, periphery and transition zone) are diversified, becoming five, all easily identified through their main perceived function (cultural, residential, business, transport and commercial). This way, characteristics like the high degree of ethnic segregation in the cultural area, the low security level in the transport area, the low quality residential spaces in central area, the accessibility problems of the periphery etc. are highlighted. Some characteristics are common for the whole district's areas, like the high number of beggars, the low coverage with green spaces etc. Also, there are strengths of the district identified this way, like the commercial coverage and the access to services. Based on the combined analysis of statistical data and questionnaires analysis, attractive (Floreasca, Vatra Luminoasa, Mosilor, Stefan cel Mare), repulsive (Colentina, Fundeni, Pantelimon) and indifferent (Obor, Tei, Iancului) spaces were identified.

The results obtained by testing the applicability of the urban image concept in spatial organization in the 2nd District of Bucharest led also to a series of conclusions like the fact that the urban image can be quantified with the use of questionnaires. The similarities of the results obtained through analysis and interpretation of statistical data and of questionnaires confirms the fact that individual perception can create a general view over the whole city. Also, urban image has a high degree of accuracy and can depict detailed territorial realities that cannot be quantified through statistical data. Also, it highlights the statistical distortions that need to be corrected in order to obtain a correct and objective image of the territory. Thus, the urban image can become a method for the diagnosis of the urban space organization.

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