

LOCALIZATION AND ACCESSIBILITY TO URBAN GREEN SPACES IN SALAMANCA (SPAIN)

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I. INTRODUCTION AND OBJECTIVES

Urban green spaces are one of the most representative components of urban environment. They have an important duality because they live according to biological laws while their existence in the city is determined by social objectives (Corona, 2001). This category is composed mainly of public parks and gardens which are managed and maintained by the different administrations.

Citizens appreciate the benefits generated by these spaces and some authors have identified the five major categories of their value: ecological value, economic value, social value, planning value and multidimensional value (Baycan-Levent *et al.*, 2004). Unfortunately, not all people can enjoy these benefits because green areas have an irregular distribution in the cities.

The aim of this paper is to analyze the state of these spaces in a medium-sized Spanish city and to estimate the number of people who have difficulties to use these facilities using the distance from their homes. We have tried to define clearly urban green areas paying special attention to their distribution around town but for that purpose it has been necessary to delimit the city first.

Another objective is to analyze the historical evolution of urban parks to explain why there are so many differences in the accessibility to these facilities in certain neighborhoods. In order to do that, we have analyzed the period and the reason that have caused the appearance of each one of these spaces. Finally, with the maximum distance that a person would be able to walk to reach a park we have identified those parts of urban tissue without a connection to urban nature.

The city of Salamanca is located in the North Submeseta of Iberian Peninsula, at the shore of the river Tormes. INE data shows that the municipality had 153.472 inhabitants in 2011 and is the capital of one of the provinces of the autonomous community of Castile and Leon.

II. METHODOLOGY

Studies have not solved the problem of the minimum dimension of urban green areas, so we created a new methodology using the size of each of the cities to determine the dimension of the urban green areas. More specifically we have employed a fixed coefficient to multiply it by the scale of the image. With this method we can compare studies in different cities and we can avoid some problems generated by the use of an identical minimum size. In this category are also included all green spaces of the city independently of the organization which is responsible for its maintenance.

The scale obtained by this process for the city of Salamanca was 1/30.000. Then we multiplied it by a factor of 0,3 m² and finally we obtained 0,9 ha as the minimum size of a park. The green system of the city in 2007 was composed by thirty-four spaces, including eight areas that can not be visited by all citizens.

Naturally, when we calculated the accessibility we only used public spaces. People are able to walk for a long distance to get to the biggest gardens, so we have used an average distance of 800 m from green spaces with a greater surface than 10 ha, while in those with a smaller size we have used 400 m. We also included a maximum distance of 100 m from parks with facilities for children.

III. RESULTS

A historical analysis shows that the majority of Salamanca's green areas have been built during the last three decades. More specifically, the General Urban Plan of 1984 consolidated urban planning as a tool to manage the balanced growth of the city. Since that time and until 2007 there has been an increase of the indicators of urban green spaces per inhabitant and per surface, due to the fact that local governments began to build facilities in the new urban tissue. The city has continued to grow and new neighborhoods have appeared in the periphery without high densities and with large public gardens.

In Spain, and in Castile and Leon to be precise, a minimum standard for green areas has not been fixed by the local urban planning. In accordance with the autonomous legislation (RUCYL), master plans should assign not less than five square meters of green spaces per inhabitant, and on the other hand, partial planning should assign a percentage of the new urban pieces to build parks. Other countries have solved this problem, at least from a theoretical point of view. For example, in Portugal they propose ten square meters per inhabitant which should be accompanied by other areas in the periphery of the city too. In Salamanca the ratio is only 6,41 m² of public green spaces per inhabitant, a figure significantly below the minimum fixed by other countries.

This kind of indexes can hide an unequal distribution of parks and gardens inside the urban tissue because they are general values for the whole city. If we want to evaluate the opportunity people have to use the parks, it would be necessary to complement this information with other indicators. However, these ratios can give us a very valuable piece of information about the recent past, especially regarding certain growth periods of the cities. For example, it is remarkable that until 1971 Salamanca only had 0,22 m² of green public spaces

per inhabitant because the city had the same number of parks as at the beginning of twentieth century, when it had an official population of twenty five thousand people.

But this kind of indication should be complemented by the position of the parks inside the urban tissue. We have calculated the possibility for people to use green public spaces and we have concluded that 253,3 ha of urban tissue, which is equivalent to 17,4% of the city, is located far from the parks. We estimated in 20.688 the number of citizens who lived in this space, distributed among eighteen of the forty-five neighborhoods of Salamanca.

Ratios that relate green surface with the number of inhabitants or with the extension of the city have been very useful to analyze the progressive growth of the city and its parks during the last fifty years. We have identified three periods in the evolution of green areas: the first starts at the beginning of the greatest growth episode in the city and ends in 1971, when the minimum of urban green per inhabitant was reached. The second extends until the approval of the first democratic General Plan in 1984 and during this time the local government tried to reduce the deficiencies inherited from the previous stage creating some public parks. From this year on, the number of green urban spaces has increased, especially in new neighborhoods due to present urban planning regulation.

IV. DISCUSSION

Salamanca shares a common evolution with other Mediterranean cities. For example, Rodríguez y Díaz (2003) in their analysis of Madrid green areas, they also identified three different periods in the creation of these spaces which largely coincides with the results obtained in our study although it has specific characteristics for being a capital city. But it is not only a national phenomenon, since Sanesi y Chiarello (2006) have identified the same historical progress in an Italian city and it makes us think that the same evolution of green urban spaces in Southern Europe cities could exist: in historic city centers there usually are few parks and gardens while in the part of the city built until the twentieth century, which is the most populated, the majority of the existing parks were built in the last thirty years.

Some studies demonstrate that the absence of effective urban planning, during the decades of highest demographic and territorial growth in the main Spanish cities, has caused deficiencies in some facilities. This fact is very interesting because in certain neighborhoods democratic municipal corporations could not solve this problem. Rodríguez y Díaz (2003) emphasize the role of green urban spaces as an indicator of deficits in urban expansion, because it is very difficult to repair their absence inside the city.

V. CONCLUSION

The main problem of this kind of research is the lack of a common definition of urban green areas and consequently the great difficulty when trying to compare and to discuss similar publications. This paper has used an operational delimitation of green spaces for a specific geographical area but it should be tested in cities with different dimension.

We found that a small number of the largest parks and gardens represent a significant percentage of the green system. Specifically, in Salamanca 26 public spaces are equivalent to

46% of the surface that the local government has to maintain and this figure would increase a 10% if we compute all green areas analyzed in this research.

Moreover, indicators that relate green surface with the number of inhabitants have proved to be useful to make an analysis of the evolution of these areas since they allow us to identify the periods when these facilities were created.

We have identified a model of a Mediterranean city, different from the center and from Northern Europe, where public parks have begun to emerge in very recent times.

In Salamanca, urban orchards have been used to build some urban green areas in order to solve some deficits inside the consolidated urban tissue.

Accessibility to urban green areas is a very valuable indicator to estimate the population that does not have these spaces close to their homes and, therefore, this information could be very useful for local authorities when they project the future city.