

# NATURBANIZATION AND URBAN PATTERNS IN NATIONAL PARKS IN ANDALUSIA

**M<sup>a</sup> José Prados Velasco**

Departamento de Geografía Humana. Universidad de Sevilla  
mjprados@us.es

Over the last three decades research on rural spaces has established synergies with concepts and methodologies conceived at the place of origin as an explanation of metropolitan dynamics. The concept of naturbanization is based on the appeal that protected spaces have for a sector of the population that wishes to live, work and enjoy its leisure time in surroundings of great environmental and landscape value. These processes form part of the counterurbanization urban deconcentration model that ensues from the changes in the urban population's mobility; contrary to counterurbanization, naturbanization stresses the spatial consequences of these changes on the areas of influence of protected spaces. As a result, the concept of naturbanization can be considered to be a hybrid that analyzes the differences between inhabitants, economic activities and the environment, the spatial changes that result from them, and the degree to which they might influence the implementation of the tools necessary for managing protected rural spaces. This article formulates some of the explanatory reasons for the new urban patterns that have their origins in naturbanization processes. Specifically, urban development is addressed in municipalities that comprise the areas of socio-economic influence in two national parks in Andalusia (Spain): Doñana and Sierra Nevada. Doñana National Park covers an area of 54,252 hectares in a coastal/river region that is subject to vibrant dynamics as a result of the population's socio-economic development. In an area of high mountains, the Sierra Nevada National Park occupies 86,208 h. and is the highest part of the Iberian Peninsula. A total of nineteen municipalities have been selected in the two protected areas for this research.

This general objective of this article is to identify, analyze, monitor and compare the built-up space in the areas of influence of the two national parks. The initial hypothesis is that people are attracted to protected spaces and an analysis is carried out of the way urbanized space has evolved based on their behaviour. The research has been conducted using information consisting of digital orthophotographs (taken between 1956 and 2007) available on the municipal scale; building certificates approved by the Granada, Huelva and Seville Colleges of Architects (taken from computer records from 1988 to 2010); and census information on population and housing (1981-2001). Municipal maps have been prepared

showing how urbanization has evolved in each of the two parks and information on building certificates processed by the Colleges of Architects for the various municipalities has simultaneously been analyzed. Correlation between the two sources provides very interesting findings on the relationship between spatial information and building certificates and also enables future hypotheses to be addressed. This has also allowed the different behaviours of naturbanization processes to be contrasted and the protection mechanisms in the two parks to be adapted and adjusted to this new reality.

The first step in the analysis of urban patterns was to identify new builds in the cartography that have resulted from the growth of urban space. Our research enabled us to identify three urban patterns characterized by the following behaviours:

- reduced dispersion and reinforcement of urban nucleus (pattern a)
- reinforcement and growth of urban nucleus (pattern b)
- reinforcement of both urban nucleus and dispersion with identification of emergence of new urban nuclei (pattern c).

Pattern a) corresponds to a less-evolved naturbanization processes. In this case, the behaviour of urban uses is marked by the loss of traditional habitat as is demonstrated by the reduction in dispersion and degraded urban nuclei. Inland municipalities that follow this pattern have experienced a heavy downturn in population and primary sector-based economic activities. The result was the population breaking from traditional land use with a consequent fall in demand for urban land. Pattern b) corresponds to mixed behaviour. There has been a steep rise in urban uses in the municipalities identified for this pattern and a heavy concentration in the main nucleus, which is highly compacted; at the same time, dispersion has been weakened although it does not disappear all together. The municipalities following this pattern comply with two conditions: firstly, the areas of influence are located around the periphery of the area and, secondly, they are in the vicinity of large urban enclaves outside the park. It is for this reason that the behaviour needs to be classified as mixed, since the scale of urban growth cannot be explained solely by the value that the inhabitants place on the residential environment, but also by the proximity of densely populated metropolitan areas. Pattern c) is characterized by the reinforcement of both the main urban nucleus and dispersion, with new emerging urban nuclei being identified. This pattern corresponds to developed naturbanization processes where the growth of urban uses is accompanied by the revival of extensive activities and the occupation of new parts of the protected spaces' areas of influence. These behaviours are explained by improved conditions of accessibility to the enclaves and the technological advances for exploiting as yet unexploited natural resources, which have attracted new inhabitants.

There is a correlation between these three patterns and the building certificates authorized for each of the municipalities. The building certificate authorization timeline mirrors the building dynamics in the national parks' areas of influence in key years. Although the records for building certificates covers a shorter period of time than the orthophotos, the information is invaluable for explaining urban development over the last fifteen years. As far as the evolution of building certificates for the municipalities in the areas under study is concerned, there were more certificates in Doñana than in Sierra Nevada; 10,369 certificates were processed in Doñana between 1998 and 2010 while in Sierra Nevada the number was 3,347. This confirms the steep rise in the urbanization process over the last decade with

annual averages of 797 certificates in Doñana and 279 in Sierra Nevada. Logically, this also responds to a greater growth of new builds and redevelopment in Doñana compared to Sierra Nevada. Nevertheless, there are major similarities between the annual evolution of the number of certificates and the typologies most applied for in the two areas. The lowest number of certificates is around 200/year, while 2006 is the year when the highest numbers were recorded, conforming closely to the so-called «real-estate bubble». This is the year when building certificates peaked, although not to the same extent in the two places: 2,054 certificates were registered in Doñana while in Sierra Nevada there were 670. Secondly, with respect to their typologies, certificates for the construction of dwellings and new builds clearly dominated. This is logical if it is borne in mind that housing redevelopment depends on the amount of housing available in the municipalities under study. Finally, when read spatially this evolution is very interesting as it highlights significant differences depending on the municipalities' urban patterns. Broadly-speaking, the municipalities that come under pattern c) present double the average number of certificates for the area, while pattern a) municipalities are below average.

To complete the analysis of information on certificates, correlations with other explanatory factors for naturbanization processes were evaluated. Correlation was carried out for the 19 municipalities using information aggregated with the following ratios:

- certificate rate: coefficient between the total number of certificates and the number of dwellings (2001 census).
- certificate rate for new builds: coefficient between the total number of certificates for new builds and the number of dwellings (2001 census).
- certificate rate for redevelopment: coefficient between the total number of certificates for housing redevelopment and the number of dwellings (2001 census)
- growth rate of population between first and last years (1998 and 2010)
- net migration rate as an annual average (annual number of migrants per 1000 inhabitants)
- non-Spanish immigration rate as an annual average 2007 and 2010 (number of foreign immigrants per 1000 inhabitants)
- growth rate for housing between 1991 and 2001.

Three of these are taken as dependent variables: the certificate rate, the certificate rate for new builds and the certificate rate for redevelopment. The other four rates were considered as independent variables. The mathematical model was first implemented in an initial general correlation taking the sum of all the municipalities for each dependent variable, and then on a second level taking the Doñana and Sierra Nevada municipalities separately. The goodness of fit score was established on the basis of the following hypotheses and questions:

- 1 To what extent is the evolution in the population and in building certificates related?
- 2 Building certificate behaviour in the areas of influence of the two parks may be dependent on the arrival of new inhabitants and economic development induced by naturbanization.
- 3 There is a direct relationship between the rate of non-Spanish immigration and housing redevelopment, as residents prefer to live in a traditional environment.
- 4 Applications for certificates for new builds are for the most part for residential use and their number is proportional to the numbers of existing dwellings in the municipalities.

The results of the analysis do not fully support all the hypotheses as there is only very weak correlation between the variables, as demonstrated by the coefficients of determination:  $R^2$  stands at around 0.273 to 0.291. For this reason, the swings in building certificate behaviour cannot be explained solely by the independent variables. The standardized  $\beta$  coefficients nevertheless allow some qualifications to be made. Firstly, with respect to the first two hypotheses, it cannot be stated that the evolution of the population and the net migration rate explain the strong building certificate application dynamics in Doñana. However, if redevelopment certificates are taken as a dependent variable, the model is proven for non-Spanish immigration: the arrival of immigrant inhabitants from overseas is a determinant of housing redevelopment. The availability of empty housing has enabled the foreign population to be accommodated and has contributed to the internal redevelopment of available housing in some municipalities. The foreign population corresponds to people of a working age who began as temporary workers but then progressed to becoming residents during a second phase. Once settled, they could become a driving force for the dynamics of certificates for new builds. Finally, the existing number of dwellings only partially explains the building certificate behaviour in Doñana. The relationships between building certificates and the chosen variables in the first hypothesis are more conclusive in the Sierra Nevada than in Doñana, but the same is not true for the others. The evolution of the population acts as a driving force in the development of new builds but does not seem to have the same effect on internal redevelopment. The model used to explain this rate is moderately robust when the population growth rate is constant; this behaviour is in turn substantiated by the rate of building certificates for new builds, but not for housing redevelopment. With respect to the influence that migration has, it can be concluded that it only provides a weak explanation for the behaviour of certificates, perhaps slightly stronger in the case of certificates for new builds but with such low coefficients that it barely warrants consideration. The same can be said of the growth rate of housing and non-Spanish immigration. This seems to indicate that the naturbanization processes in Sierra Nevada are not as strong as in Doñana, and although they exist, their dynamics are not so forceful. An examination therefore needs to be undertaken of how the chosen demographic and socio-economic variables evolve in coming years.

To conclude, the naturbanization processes confirm an increase in constructed surface area, mainly for residential use, and a rise in population. It is not clear whether the two processes are linked in all cases and, therefore, whether the increase in urbanisation is in response to a real demand or whether it is, rather, a demand induced by the over-supply of housing. Cartography for the 1950s and 1970s-80s shows built-up space evolving in a relaxed way. To the contrary, the time-sections for 1998 and 2004 show steep rises in urban growth that the records for building certificates have shown has continued up to 2006. The growth in urban fabric and isolated buildings is interesting as it shows a process with building concentrated in the nuclei. This process is a consequence of the rural exodus and ageing, two factors that determine that the population concentrates in the municipalities after abandoning the dispersed habitat when farming activities go into crisis. But it has been proven that this trend towards concentration is on some occasions not incompatible with ongoing dispersal and even its expansion. Accessibility has been shown to play a fundamental role in this behaviour. When investments are made in improving accessibility, by improving or

developing infrastructure, for example, it always results in expansive dynamics. And as this research shows, this can be read in many ways: the attraction of population, new activities, land occupation, the exploitation of resources, etc. Limiting the correlation analysis to the demographic and socio-economic variables may have had a bearing on the confirmation of these behaviours. It is important to find out how they evolve in the coming years and to even include more variables linked to extensive dynamics (the evolution of built-up space and other changes in land use, for example). Because all these processes are clearly involved and have an effect on the way protected spaces develop, even when they occur at a slow pace. National parks' strength lies in the length of time that they have existed in the areas and the way that they have adapted to the conditions of the physical environment. And, as such, they possess extraordinarily important environmental and landscape values. And if these values are changed or changes are made to the foundations that underpin them, they could lose their worth as the history and legacy of the regions that they are in.

