

## 9.2. Temporal analysis of wellbeing in the municipalities of Sierra Nevada

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### Abstract

Wellbeing in municipalities of the Sierra Nevada Protected Area Space has been characterized. For this, information was compiled from 22 socioeconomic indicators belonging to 8 dimensions of wellbeing. A diachronic analysis was performed between two temporal points: in 1989 (before the declaration of the natural protected area) and 2009. The results show that the wellbeing has increased in the municipalities of the Sierra Nevada Protected Area between 1989 and 2009. Comparisons with other studies reveal that the improvement in wellbeing is greater in municipalities belonging to protected areas.

### > Aims and methodology

To analyse wellbeing in the municipalities of the Sierra Nevada Protected Area, the approach used was based on compound weighted indices [6]. The synthetic index of wellbeing,  $DP_2$ , which combines different simple indicators that characterize wellbeing, was used [7]. This indicator enables comparisons between spatial and temporal entities and has been broadly used in the measurement of wellbeing at different scales [8]. For this, the information from 22 socioeconomic indicators representing different dimensions of wellbeing were used (Table 1). This information comes from the compilation of socioeconomic information from several sources, which has been integrated into the information system of the Sierra Nevada Global Change Observatory (<https://linaria.obsnev.es>). For each municipality, the  $DP_2$  index was calculated in 1989 and 2009, using a free software algorithm [10]. For each municipality, a well-being ratio (WR) was computed as the ratio between the well-being in 2009 and well-being in 1989. A value of WR greater than 1 indicates well-being improvement whereas a value less than 1 indicates worsening over the time period considered.

**Table 1**

Indicators	
Population	Births Population growth Interior emigration Interior immigration Ageing index
Health	Healthcares centres
Employment	Employed population Unemployed population
Economy and income	Business activities Personal income Buses Lorries Vans Cars
Infrastructures	Hotels Phones lines
Education	Schools Elementary teachers
Culture and leisure	Public libraries Restaurants
Social participation	Voter turnout

Indicators used in calculating the wellbeing of each municipalities.  
The dimension of wellbeing to which each belongs is indicated.

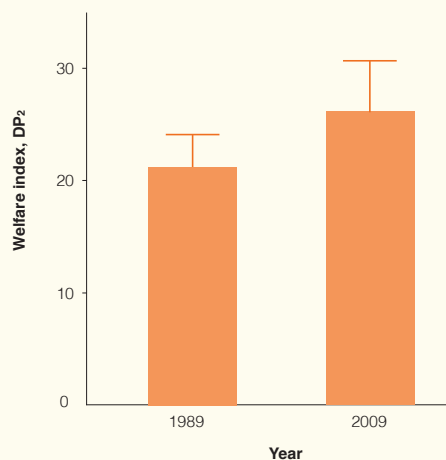
## > Results

For the municipalities of the Sierra Nevada Protected Area, a significant increase in wellbeing was noted between 1989 and 2009 (Figure 1). Of the 56 municipalities for which data are avail-

able, a decline in the wellbeing index was found in only 3 municipalities (values of the wellbeing ratio below 1). On the other hand, no relation was found between the increase in wellbeing

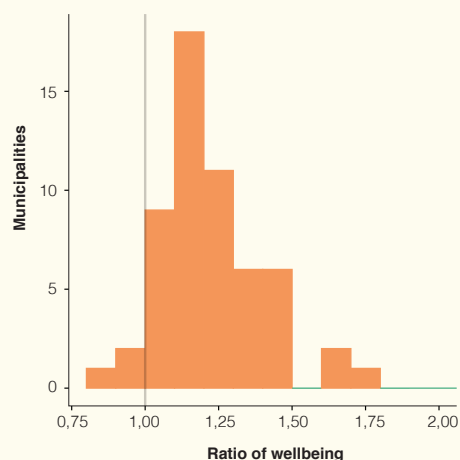
and the percentage of belonging to a municipality in a protected area.

**Figure 1**



Synthetic indicator of wellbeing DP2 (mean ± standard error) for the municipalities of the Sierra Nevada Protected Area between 1989 and 2009.

**Figure 2**



Histogram of the number of municipalities against the ratio of wellbeing.

## > Discussion and conclusions

The data for the increase in wellbeing between 1989 and 2009 found for the municipalities of the Sierra Nevada Protected Area agree with those found for all of Andalusia for this period [9]. The results at a regional scale indicate that the municipalities belonging to the natural park presented a greater increase in wellbeing between 1989 and 2009 than did those outside the park.

Our results stress the importance of protected areas, not only from the standpoint of conservation of biodiversity, but as generators of ecosystem services that are beneficial to society for their socioeconomic relevance.



Hikers trekking to "Lavaderos de la Reina"