



SMART POQUEIRA

A PIONEERING PROJECT
IN EUROPE EXPERIMENTING
WITH **SMART TECHNOLOGY**

SUSTAINABLE MOBILITY
MANAGEMENT IN ENVIRONMENTALLY
SENSITIVE AREAS



What is **SMART POQUEIRA?**

It is a project consisting of the **analysis and implementation of digital technology** for a more sustainable management of tourist activities in rural areas in the **Sierra Nevada National Park**.



The project combines research, experimentation, and implementation through the creation of a "**digital living lab**" in **Pampaneira, Bubión, and Capileira**. These three municipalities are located in one of the most visited areas of the Sierra Nevada National Park and the Alpujarra region, Granada.

The main areas of interest for the project are related to **mobility and tourist activities in the area**, including traffic control, crowd control, visitor characterization, economic impact, waste management, and intelligent information and dissemination.

Digital technologies used in the project include:

- Smart cameras
- Mobility counters
- Augmented reality systems
- Sensors in waste containers
- Sensors in public establishments
- Dashboards

SMART TERRITORIES



A photograph of a tall, cylindrical stone chimney or kiln structure built on a rocky, arid hillside. The structure is made of stacked stones and has a dark opening at the top. The background shows a dry, hilly landscape under a clear sky.

A **smart territory** is one that uses digital communication technologies to **improve the quality of life of its inhabitants and visitors**, efficient use of resources, and the sustainability of the territory, fostering new models of governance.

WHY SMART TERRITORIES?

The idea of smart territories comes from the first approach to "smart cities," where the emphasis is usually placed on **organizing systems related to high-density populations**.

Smart territories should focus on sustainable development, connecting local populations, visitors, technology, and the natural environment.

Applications for Smart Poqueira's

Smart Territories

Smart Poqueira has enabled the development of multiple analytical services **based on much more precise and faster digitized data collection.**

Detailed visitor characterization

The fusion of data from different sources and its multivariate analysis through advanced analytical procedures has given us a much more accurate insight into who visits the area, how often they do so, and how long they stay for.

Evaluation of the natural space

The rigorous application of the cost-of-travel analytical methodology has offered an economic valuation of the territory and its importance. The precise identification of visitors and their behavior has been a key element for appropriate valuation.

Smart and sustainable parking pricing

The available systems for vehicle parking have important implications for visitor and resident behavior. Smart Poqueira has analyzed pricing and availability scenarios based on criteria related to the sustainable development of the territory and, therefore, different from traditional approaches linked exclusively to parking time.

Payment of entry fees and smart tolls

Managing the circulation of private vehicles in environmentally sensitive or congested areas can be supported by pricing systems based on sustainable behaviors. Smart Poqueira allows the income that different alternatives could generate and their potential consequences to be evaluated.



Impact of visits on economic activity

A high number of visitors is not necessarily linked to generating wealth for the territory. Smart Poqueira has installed a pilot system for automatic measurement and a dashboard that provides real-time information to business managers and political officials on economic activity in various business activities in the area, their evolution, and comparison with visitor presence.



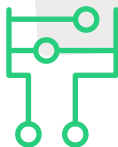
Visitor flow orientation

Visitors to rural or protected areas tend to concentrate in small spaces with a risk of degradation. Additionally, this concentration can make the visit less enjoyable and limit the distribution of wealth in the territory. Measuring and analyzing flows facilitates the design of systems that allow visits to be orientated in a more sustainable way.



Waste generation analytics

Accurately measuring generated waste allows for a more effective and efficient design of collection and treatment. Additionally, Smart Poqueira has highlighted the possibilities of using generated waste as an indicator of the type of economic activity being performed and as a reference for awareness programs.



Augmented reality, outreach, and control

It is difficult to cover natural spaces with a conventional network of information and control. Smart Poqueira has installed an augmented reality-based system and a mobile application that enables the orientation, information, and control of visitor traffic on walks through natural spaces.

Who is involved?

This initiative is part of the project "Thematic Center on Mountain Ecosystem & Remote sensing, Deep learning-AI e-Services University of Granada-Sierra Nevada" (LIFEWATCH-2019-10-UGR-4), which has been co-funded by the Ministry of Science and Innovation through the FEDER funds from the Spanish Pluriregional Operational Program 2014-2020 (POPE), LifeWatch-ERIC action line. The project has also been co-financed by the Provincial Council of Granada.



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The municipalities of Pampaneira, Capileira, and Bubión have helped coordinate Smart Poqueira's initiatives. In addition, the project has had the valuable operational collaboration of the Sierra Nevada National Park, the General Directorate of Infrastructure of the Ministry of Innovation of the Junta de Andalucía, and the General Directorate of Traffic of the Government of Spain and the Provincial Traffic Headquarters of Granada.



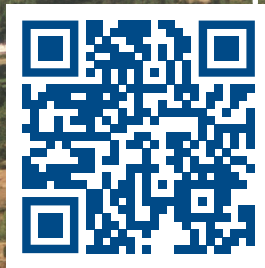


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