International Conference 2025:
Towards Resilient and Sustainable Cities and Communities

Climate Vulnerability and Urban Resilience in Seville: Bioregional Interdependencies and Strategies Towards 2030

Carlos Tapia-Martín[1†]

[1] Higher Technical School of Architecture (ETSAS), Department of History, Theory and Composition in Architecture, University of Seville, Spain.

† ctapia@us.es https://orcid.org/0000-0002-4868-0178

Abstract: Climate change is intensifying the vulnerability of urban and ecological systems in Southern Europe, with Seville facing rising temperatures, frequent heatwaves, and deteriorating air quality. These challenges are compounded by the degradation of the Doñana National Park, a vital bioregional ecosystem suffering from declining rainfall and water overexploitation. This paper explores the interdependence between Seville's urban resilience and the ecological health of its surrounding territory, drawing on climate data, scientific literature, and case studies. Using a bioregional lens and a dynamic relational matrix, the study assesses the synergistic effects of environmental stressors on urban habitability and evaluates current institutional and technical responses, such as urban greening, shading infrastructure, and nature-based solutions. The findings reveal a lack of integration between urban planning and ecosystem conservation, highlighting the need for coordinated governance across administrative boundaries. The paper argues that Seville's climate adaptation strategies must be aligned with ecological restoration efforts to ensure thermal sustainability, water security, and environmental justice by 2030.

Keywords: Urban resilience, Bioregional planning, Climate adaptation, Doñana National Park, Environmental justice

Main highlights:

Seville and Doñana National Park form an interdependent ecological and climatic system.

Urban heat and water stress share structural territorial causes.

Climate vulnerability is exacerbated by social inequality and institutional fragmentation.

Local policies do not yet integrate bioregional scale or environmental justice criteria.

The restoration of Doñana requires effective metropolitan co-responsibility.

Polycentric governance and local climate action are key to shared resilience.