

Modelling urban sustainability to support policy design: the example of Aveiro Coastal Lagoon Region

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Sustainability is a key factor in today's society. Nowadays, urban settings are greatly pressured in order to maintain or even guarantee their sustainable development, especially when considering the climate change scenario the world is presently facing. Consequences are dire in the environmental, social and economic spheres: loss of ecological assets, detriment in human health in consequence of various forms of pollution, large economic losses, ... When the majority of European citizens live in coastal urban areas, the importance of suitably developing these cities is great. Rapidly changing land uses and natural environmental disrupts (otherwise known as urban sprawl) are a frequent occurring process in urban life. Policy enforcement has an important role in controlling urban growth, where proper knowledge of the city's complex processes and relationships – or urban metabolism – have to be grasped. By adequately defining these issues, a city's development direction may be properly traced, by using helpful, long-term tools, in order to attain the ever-so-wanted urban sustainability.

The Aveiro Lagoon is home to several coastal natural and semi-natural habitats (fauna and flora), being considered the most important wetland of Northern Portugal. This delicate area stretches across approximately 83km² and is surrounded by major urban areas, being the most important Aveiro. Due to the ecological importance of this territorial feature, an analysis will be made as to understand this region's sustainability and analyse what key variables influence different reactions as to aid decision making processes.

Geographic Information Science plays an important role in these studies where, cutting across disciplinary boundaries such as remote sensing and Volunteered Geographic Information (VGI), agent based models may be created to test policy scenarios to evaluate the suitability of a given policy. Integrating the study area's urban/regional processes with these techniques, different scenarios may be produced, being an innovative combination of factors that aim to determine urban sustainability for the Aveiro Lagoon study area.