A new GIS tool to study human-environment interactions in past landscapes: the Iron Age societies of NW Iberia as a case study

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Abstract:

The MAPAR plugin (Mapping Agricultural Potential in Archaeological Research) is a QGIS tool designed for studying human-environment interactions in landscape archaeology. The maps generated with MAPAR aim to capture the structural properties of the land, following the FAO land evaluation guidelines. The tool creates, classifies, and combines at least four layers (elevation, slope, soil erosion, and wetness) to produce a map of potential agricultural productivity that is suitable for archaeological spatial analysis. There is also a machine learning option to detect specific landscape features, such as areas that are unsuitable for cultivation or modern artificial elements that would be inappropriate for modelling premodern landscapes. Additional layers, such as temperature or geology, can also be included by the user.

One of the strengths of the MAPAR plugin is that it was programmed with flexibility, so it could be adapted to different agrarian societies. Perhaps more importantly, it also allows users to experiment with different parameters to reflect their prior assumptions about the level of technical and productive development of the societies under study. In this sense, the tool provides multiple possibilities to test hypotheses emerging from social theory. Site catchment analysis, point process modelling, and the assessment of settlement hierarchy are among its most useful applications, and the extensive spatial analysis of Iron Age hillforts in north-western Iberia offers an excellent case study to illustrate this.

Keywords: Landscape Archaeology; Site Catchment Analysis; Settlement Patterns; Land Use; European Iron Age.