Climate adaptation strategies in small municipalities. A GISbased approach for the definition of priority actions.

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Abstract This paper proposes an approach aimed at bridging the gap between the most advanced technological solutions (AI, digital twin) and the operational reality of peripheral local authorities, offering a practical and scalable framework.

In dealing with the effects of climate change, the most marginal areas, i.e. small municipalities, contribute the least to atmospheric emissions (compared to larger cities) but have the least capacity to respond effectively.

In these areas, the activation of adaptation strategies and actions is particularly complex due to the scarce availability of data, technical resources and adequate operational tools. In order to try to tackle this problem, a methodology was developed based on the construction of a DSS hinged on a Geographical Information System that makes it possible to elaborate a synthetic index for the identification of priority intervention areas.

This methodology was applied to the case study of the Neto Valley in Calabria, developing an integrated territorial decision support system (DSS) that combines official open data sources (ISTAT, ISPRA, CORINE Land Cover, Natura 2000 Network, EFFIS, etc.) and geospatial analyses on a sub-municipal scale (census sections). The thematic indicators, representative of socio-demographic fragility, environmental vulnerability, anthropic pressure and natural risk, were processed in a GIS environment and normalised to construct composite indices capable of supporting hierarchies of planning priorities.

The methodology employs a percentage or binary approach to structuring the indicators, with calculations performed using geoprocessing tools and Python scripting in an open-source environment, favouring replicability, even in the absence of proprietary software.

The results show how, with technically simple tools that are within the reach of even municipalities with limited resources, it is possible to produce spatial representations suitable for identifying priority areas of intervention for the launch of localised adaptation policies and for resource management in line with the aims of the PNACC.