

## **Territorial Vulnerability. From an Interdisciplinary Systematic Literature Review to a Compounded Index**

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A territory's level of exposure to challenges and the features that can heighten the impact of crises is commonly referred to as Vulnerability. Measuring vulnerability requires disentangling the concept across several dimensions, which usually are the socio-economic and the environmental ones. Nonetheless, the political-institutional dimension of vulnerability stands out, since it determines a territory's ability to effectively deliver policies and provide timely responses to crises through effective and democratic institutions (EC, SFR 2020). And it is instead, more often than not, neglected.

This article aims to fill this gap by constructing a novel composite index of territorial vulnerability based on all three dimensions (environmental, socio-economic, and political-institutional). To this end, we conducted a systematic literature review (SLR) focused on empirical studies on the concept of vulnerability – and also on the complementary concept of resilience - when directly linked to a territorial dimension.

The SLR covers different areas of study and applies the PRISMA approach to a selection of 261 academic articles. A quantitative and qualitative analysis of these papers is conducted to identify definitions of vulnerability and resilience, and highlight some key features of the scientific production on these concepts - including the types of crisis/external event they are usually linked with, the territorial level more often analyzed, the method employed, etc. Furthermore, we aim to detect some possible gaps that could be filled to include the political-institutional dimension in a more comprehensive understanding of the concept of territorial vulnerability.

Further, one of the main goals of this SLR is to identify effective indicators used by previous studies to build a novel compounded index that encompasses the socio-economic, environmental, and primarily the political-institutional dimensions of the vulnerability of territories.

Our systematic review revealed that these indicators must be directly related to the event or the crisis the region, the municipality, or the country is vulnerable to. Accordingly, in this paper, we present different indices to measure the vulnerability of Italian municipalities to current and future challenges (such as health emergencies, green transition, and environmental hazards, with a specific focus on hydrogeological risk). These indices are composed of both general, broad indicators of social, economic, ecological, and political vulnerability, and other socio-economic, environmental, and political indicators, which are instead 'specific' to the particular hazard or risk. Thus, these indices - as well as the methodology to build them, discussed in this article - can be applied and adjusted to assess a territory's vulnerability to several other challenges and countries, thus being highly up-scalable and replicable.

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