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Assessing Climate (in)justice through the Vulnerability Lens: an Exposure Concentration Approach

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Abstract

Climate (in)justice is a relatively recent field of research, yet scientific literature recognizes the disproportionate impacts of climate change on social minorities, homeless people, people with disabilities, single mothers, and the poor. These injustices occur through greater exposure, greater sensitivity, and/or lower adaptive capacity. Although such conceptual recognition exists, there remains a lack of empirical studies that explicitly demonstrate these injustices in practice. This research aims to address this gap by testing several methodological approaches to examine whether specific social markers influence the differential exposure of population groups to climate hazards, namely floods and landslides. It hypothesizes that the most marginalized populations are disproportionately exposed to such risks. As case studies, we will analyze the municipalities of São Sebastião and São Vicente (São Paulo, Brazil), both of which have recently suffered severe impacts from extreme rainfall events. To test this hypothesis, we will employ a spatial concentration method, combining geospatial analysis with socioeconomic indicators to determine whether areas of higher social vulnerability coincide with zones of greater disaster susceptibility. By comparing the proportion of each social group living within and outside high-risk zones, the study will statistically assess whether exposure is unevenly distributed across income and social categories, thereby revealing patterns of climate (in)justice at the local level.

Keywords: Climate Change, Concentration Metrics, Social Inequalities, Sustainability Indicators