Assessing Community Disaster Reduction Capacity in Megacities Using Risk Census Data: A Case Study of Shanghai, China

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SUMMARY

With socio-economic development, disaster risk response strategies in megacities gradually transform from emergency management to disaster mitigation. Communities constitute the essential building blocks of megacities' disaster risk prevention systems. Strengthening their disaster prevention and mitigation capacity constitutes a foundational strategy for mitigating disaster impacts. Community-level disaster reduction capacity assessments are vital for pinpointing weaknesses in local risk management and for strengthening grassroots capabilities. These assessments form a foundational strategy for enhancing disaster risk governance and advancing resilient city development. The first National Comprehensive Risk Survey of Natural Disasters in China (2020-2022) provided critical data for comprehensive assessments of community-level disaster reduction capacity. Based on natural disaster risk survey data for a district in Shanghai, we employed the TOPSIS evaluation model to calculate and classify the district's composite community disaster reduction capacity index and corresponding grades, enabling a quantitative assessment of the district's overall community disaster reduction capacity. Then, we analyzed the spatial distribution of this capacity and explored the influencing factors. Furthermore, we revealed the extent of impact—including disaster risk maps, material reserves, hazard point investigations, and the distribution of medical stations—on the composite community disaster reduction capacity. Consequently, this study assesses the community disaster reduction capacity in megacities, providing scientific support for improving disaster reduction capacity, advancing the philosophy of urban resilience, and fulfilling the Sustainable Development Goals (SDGs).

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