

ABSTRACT**Incorporating Risk Perceptions into Disaster Multi-Risk Models**

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Multiple theories have been proposed to assess hazards, vulnerability, and risk of disasters in the existing literature. A debated issue is the inadequacy of solely assessing the multidimensional aspects of risk through rigid formulas and statistical summaries. A perspective that has emerged is the critical role of people's intuitive thinking, also known as risk perception, in assessing risk. Despite published literature's recognition of risk perception's critical role, it has been predominantly used in risk communication phases and is overlooked in the identification and assessment phases. The dependency on rigid formulas and statistical summaries have resulted in unrealistic optimism towards low probability hazards. When low probability disasters do occur, the effects are catastrophic as mitigation measures are minimal.

A more effective approach is to broaden the latitudes of risk perception in multi-risk models. A key characteristic of this research is the use of local risk perception in the identification, communication and assessment phases of a multi-risk assessment. This research seeks to contribute to the existing body of knowledge by assessing risk through the synthesis of three main components: local risk perception, biogeophysical characteristics, and social infrastructure. Local risk perception was used to rank hazard probability, social vulnerability indicators, preparedness, response, and impact as an indication of relative threat. A Spatial Decision Support Model (SDSM) was then used to integrate these findings with biogeophysical characteristics and social infrastructure to spatially define multi-hazard susceptibility, composite social vulnerability, and multi-risk. The proposed Multi-Risk Decision Support Model (MRDSM) was applied and tested in two Caribbean islands, Trinidad and Grand Cayman.

Results indicate that risk perception can positively influence risk modelling since pertinent information concerning potential risks, excluded by past statistical summaries, can now be included, analysed and modelled. This research intends to provide a knowledge base from which reduction strategies can be implemented, thereby increasing resilience.

Keywords: Risk Perception; Multi-Hazard; Composite Social Vulnerability; Multi-Risk; Risk Reduction Strategies