Bibliometric Analysis of Flood Vulnerability Assessment

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Introduction

Flood vulnerability assessment (FVA) is a critical aspect of hazard risk management, which affords pertinent insights into sundry factors and indicators of vulnerability, and properly dimensions the indicators along the lines of susceptibility, exposure, and resilience. This study aims to leverage bibliometric technique to evaluate the trends, patterns, and intellectual structure of researches relating to FVA. Areas examined by the study include: publications' profile, influential institutions, citation networking (CN), and keywords co-occurrence analyses (KCO). This endeavour of literature synthesis ultimately culminates in the distillation of gaps, and highlighting of future work agenda with respect to FVA.

Methodology

This study employed a bibliometric methodology to analyze the metadata (including authorship, keywords, abstracts, and citations) of 214 publications. Publications' inclusion was limited to peer-reviewed journal articles in Scopus database, written in English language, and published between 2005 and 2025. While the search analyse facility on Scopus afforded key infographics relating to publicationprofile, leading authors, influential institutions, and funding, VOS viewer was employed for mapping networks and statistical analysiss.

Results and Discussion

The study reveals that out of the 214 studies conducted with respect to flood vulnerability index, 76.6% are original articles. While the Year 2024 accounts for the most publications with about 32, the triad of Lian J, Tam T.H, and Xu K, as authors, account for the greatest number of publications, with each contributing to 4 publications relating to FVA. The work, 'Integrated FVA approach based on TOPSIS and Shannon entropy methods', by Yang et al. (2018), with about 169 citations, has the greatest number of citations among other FVA studies. While China emerges as the leading country contributing to FVA studies, with National Natural Science Foundation of China, (NSFC) turning out to being the funding agency with the most impact on FVA studies, the University Teknologi Malaysia in Malaysia emerged as the institution where most of the works based on FVA are affiliated. Further analysis revealed that, with respect to CN, the strongest links were observed between the groups: Remus P, Cristain P, and Julian M (purple cluster); Roxana I, Lulia C, Tien B, Alireza A (green cluster); and lastly Thi Thu L, Beta C and Ajim A (yellow cluster). Nnotable keywords identified during the KCO analysis include the terms climate change, flood, floods, flood vulnerability, flood vulnerability assessment, flood vulnerability index, GIS, remote sensing, and vulnerability assessment. Based on the cluster analysis, the research landscape on FVA is mainly highlighted by four (4) broad hotspots or themes, namelyy: application of GIS and remote sensing to flood vulnerability; application of the flood vulnerability index to FVA; flood vulnerability; and flood vulnerability assessment.

Conclusion

This study provides a comprehensive overview of FVA research, highlighting key contributors, themes, and emerging trends. The findings underscore the need for interdisciplinary, technology-driven, and community-focused approaches to enhance flood risk mitigation and adaptation strategies. Future research should address existing gaps relating to the integration of machine learning to vulnerability assessment and the need to focus research lens on African case studies.

Keywords

Analysis, Bibliometric, Flood Vulnerability.