Comprehensive Flood Early Warning Systems: From Modelling to Policy Making Perspectives

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Introduction

- > Early warning systems are widely applied in real-time flood forecasting operations as valuable non-structural tools for mitigating the impacts of floods [1].
- Current review papers tend to focus narrowly on specific perspectives, such as water quantity or quality [2].
- > There is a pressing need for a more comprehensive and multi-disciplinary approach that not only explores various potential aspects of flood early warning system applications but also reveals the interconnections between these aspects [3].

Aim and Objectives

This paper aims to bridge this gap by mapping out diverse applications and presenting significant trends, past initiatives, and future directions across a wide range of domains. By adopting such an approach, our goal is to provide a more holistic understanding of flood early warning systems and pave the way for further exploration in this critical field.

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Remote sensing



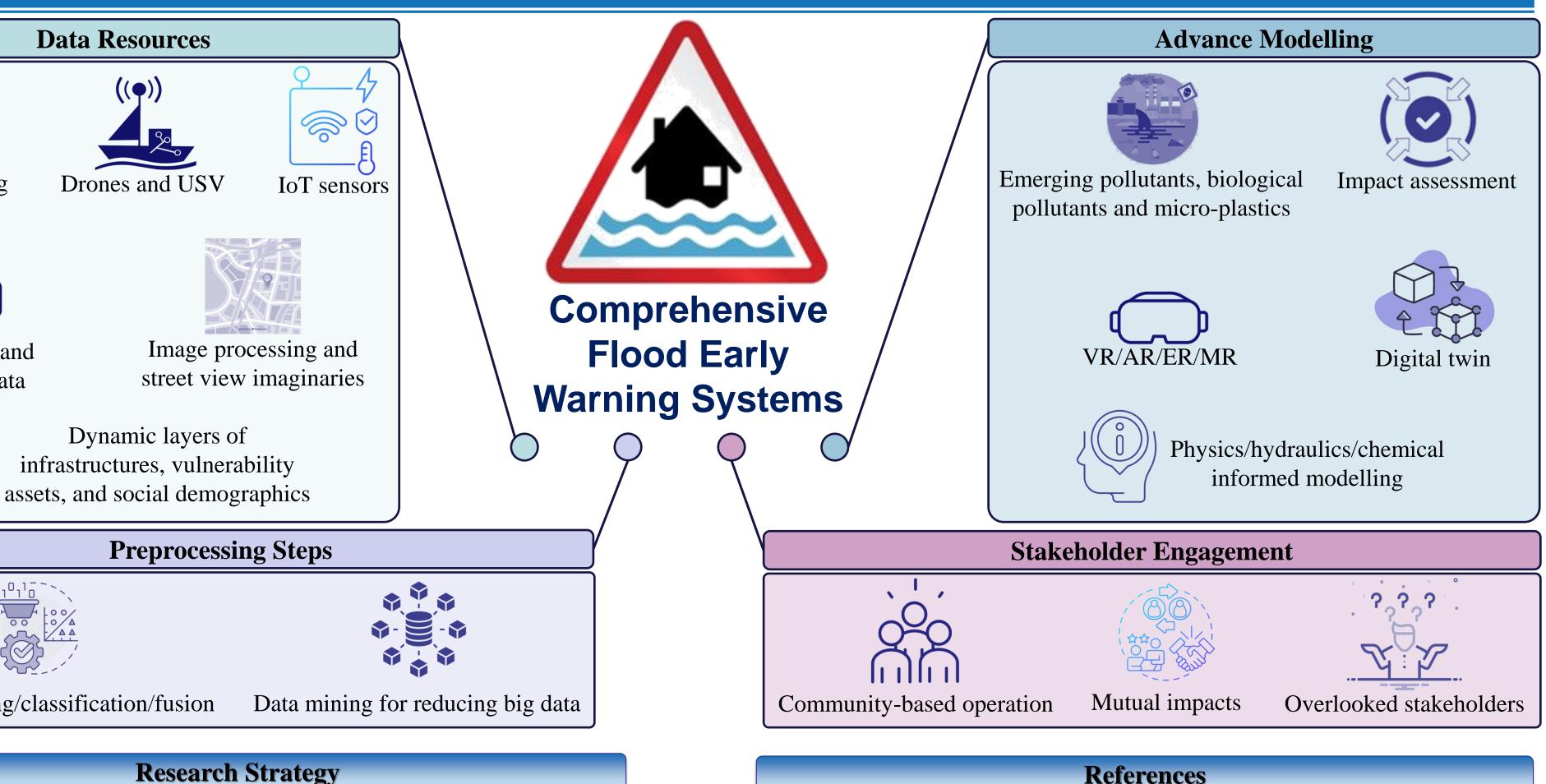
Social media and qualitative data





Smart clustering/classification/fusion

The research database was collected from the Scopus search engine covering the last decade (2013-2023) and was based on keywords "early warning system", "storm water", "heavy rainfall", "extreme weather", "flash", "fluvial", "pluvial", "coastal", "flood". Also, expert knowledge is applied to map the characteristics of the comprehensive early warning system.



[1] Piadeh, F., Behzadian, K., Chen, A.S., et al (2023). Enhancing urban flood forecasting in drainage systems using dynamic ensemble-based data mining. Wat. Res., 247, p.120791. [2] Piadeh, F., Behzadian, K., Chen, A.S., et al. (2023). Eventbased decision support algorithm for real-time flood forecasting in urban drainage systems using machine learning modelling. Env. Mod. Soft., 167, p.105772. [3] Ringo, J., Sabai, S., Mahenge, A. (2024). Performance of early warning systems in mitigating flood effects. A review. J. Afr. Ear. Sci., 210, p.105134.









References

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