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Research brief: Proposing DAPP-MR as a disaster risk management pathways framework for complex, dynamic multi-risk

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Dynamic Adaptive Policy Pathways for Multi-Risk (DAPP-MR): Proposing DAPP-MR as a disaster risk management pathways framework for complex, dynamic multi-risk

Highlights

- We emphasise the growing complexity of natural hazards due to overlapping risks across different sectors, highlighting a gap in Disaster Risk Management (DRM) strategies to address these interconnected, uncertain risk drivers for strategic planning.
- We propose a novel approach, Dynamic Adaptive Policy Pathways for Multi-Risk (DAPP-MR), tailored and proposed to design DRM pathways catering to dynamic multi-risk, handling multi-hazard and multi-sector challenges.
- Using a stylised case, DAPP-MR is shown to guide analysis processes in a stepwise manner towards integrating knowledge essential for multi-risk DRM.

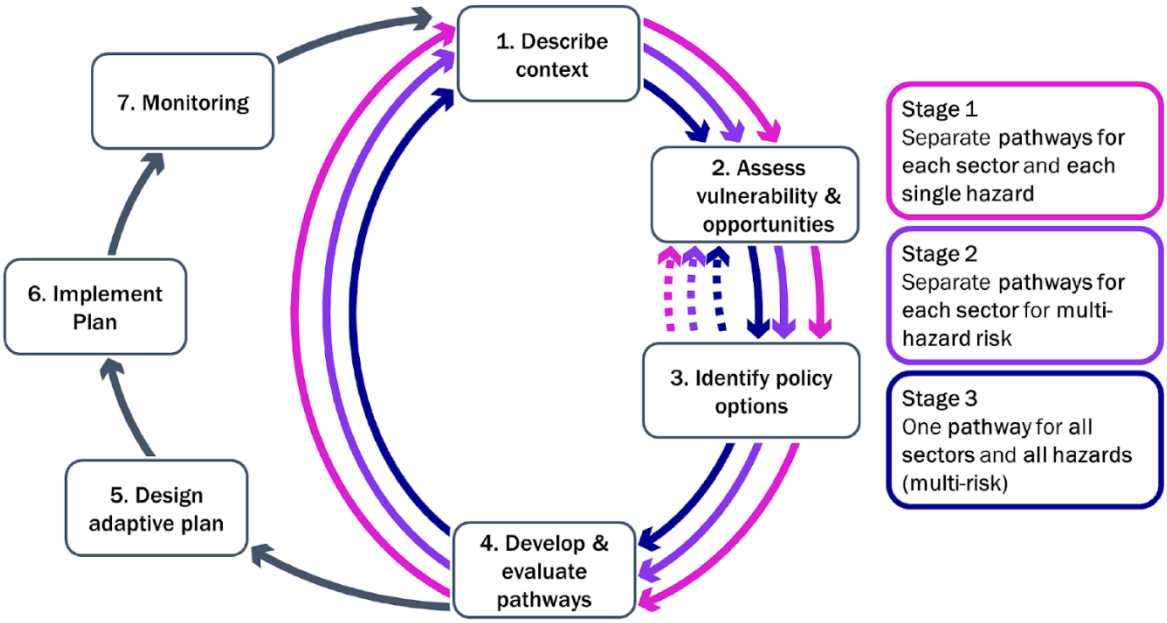
Recommendations

- **Interdisciplinary Collaboration:** Successful multi-risk DRM requires an inter- and transdisciplinary approach, integrating insights from natural, technical, social, and political sciences alongside local knowledge and practices. This collaboration can foster better understanding and management of complex multi-risk systems, and promote the co-production of knowledge and new risk governance practices.
- **Practical Implementation and Testing:** Real-world testing of DAPP-MR, involving stakeholders, is necessary to validate the framework. This includes investigating how to deal with contested objectives, complex dependencies, and accounting for institutional characteristics to ensure fairness, practicality and effectiveness of the proposed framework. The DAPP-MR approach is now being tested within the MYRIAD-EU project in several Pilot regions, namely: North Sea, Canary Islands, and Scandinavia.
- **Engagement and Representation:** The operationalisation of DAPP-MR demands further research, especially in identifying the limits of complexity and managing uncertainties inherent in multi-risk systems. Research should also explore how to embed DAPP-MR in practical decision-making processes, aiming for an effective operational decision support tool for complex multi-risk DRM.

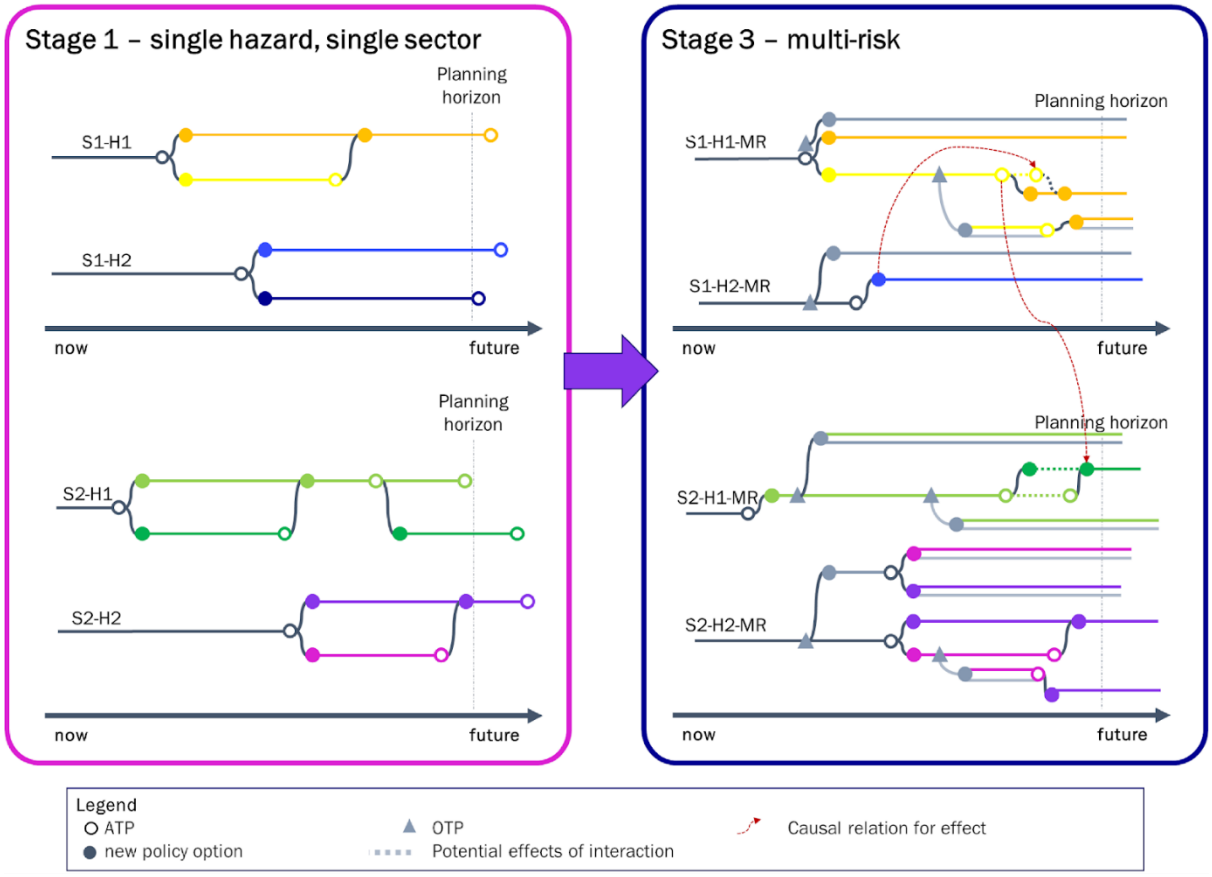
Context

Pathways thinking can help design robust and flexible long-term DRM strategies, broken down into manageable steps, to navigate the complexity of unknown future states of the world and interaction of multiple hazards, various sectors, and measures. It embraces the dynamism between hazards and sector responses, tackling uncertainties head-on. The intertwining of hazards and sectors could result in cascading impacts, magnifying the challenges and requiring a broader, more integrated approach to DRM. This cooperative

approach could both help to unravel these intricacies and also better equip stakeholders in planning and responding to risks in a collective, more informed manner. The DAPP-MR approach was developed as a tool to assist in this process.



Caption: The proposed DAPP-MR framework for the analysis of DRM pathways in a multi-risk setting



Caption: Exemplary pathways and their changes depending on whether they are developed for single-hazard risks or multi-risk (bottom).

Want to know more?

- **Full reference**: Schlumberger, J., Haasnoot, M., Aerts, J., & De Ruiter, M. (2022). Proposing DAPP-MR as a disaster risk management pathways framework for complex, dynamic multi-risk. Iscience, 25(10), 105219.
- **Link to paper**: https://doi.org/10.1016/j.isci.2022.105219

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