

# Cross-European challenges for multi-risk assessment and management: insights from the first two years of MYRIAD-EU

NEEDS Conference 2023

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The MYRIAD-EU project has received funding from the European Union's Horizon 2020 research and innovation programme call H2020-LC-CLA-2018-2019-2020 under grant agreement number 101003276



# Outline

- Introduction to MYRIAD-EU
- Five major challenges for multi-hazard risk assessment and management in Europe
- How can MYRIAD-EU help in tackling these challenges: some examples

# Introduction to MYRIAD-EU

The MYRIAD-EU project has received funding from the European Union's Horizon 2020 research and innovation programme call H2020-LC-CLA-2018-2019-2020 under grant agreement number 101003276



# Everyday examples of multi-hazard events

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ALJA

NATURE AND ENVIRONMENT | SLOVENIA

## Storms and landslides claim lives in Slovenia, Austria

08/07/2023

Slovenia, Austria and Croatia grapple with deadly storms and landslides. At least seven people have died after extreme weather hit the region, causing power outages and travel delays.

f X v



er

prompting

Unrelenting rain had caused the banks of the Sava, Drava and Mura rivers in Slovenia to burst and lakes to overflow

Image: Fedja Grulovic/REUTERS

# Multiple hazards can have interrelated effects on risk

## · **Triggering**



## · **Amplifying**



How can risk be better managed by considering these interrelated effects?



## · **Compound**



Dudley

Eunice

Franklin

## · **Consecutive**

DRM measures for one hazard may increase risk (as synergies) from other hazards



How can we better account for these dynamic feedbacks between risk drivers?



*Photo credit: Fernando Martínez Torres  
López et al., 2020. Temblor, <http://doi.org/10.32858/temblor.064>*

# Interrelated effects have impacts across sectors



How can we account for these trade-offs and synergies across sectors, regions, and hazards?



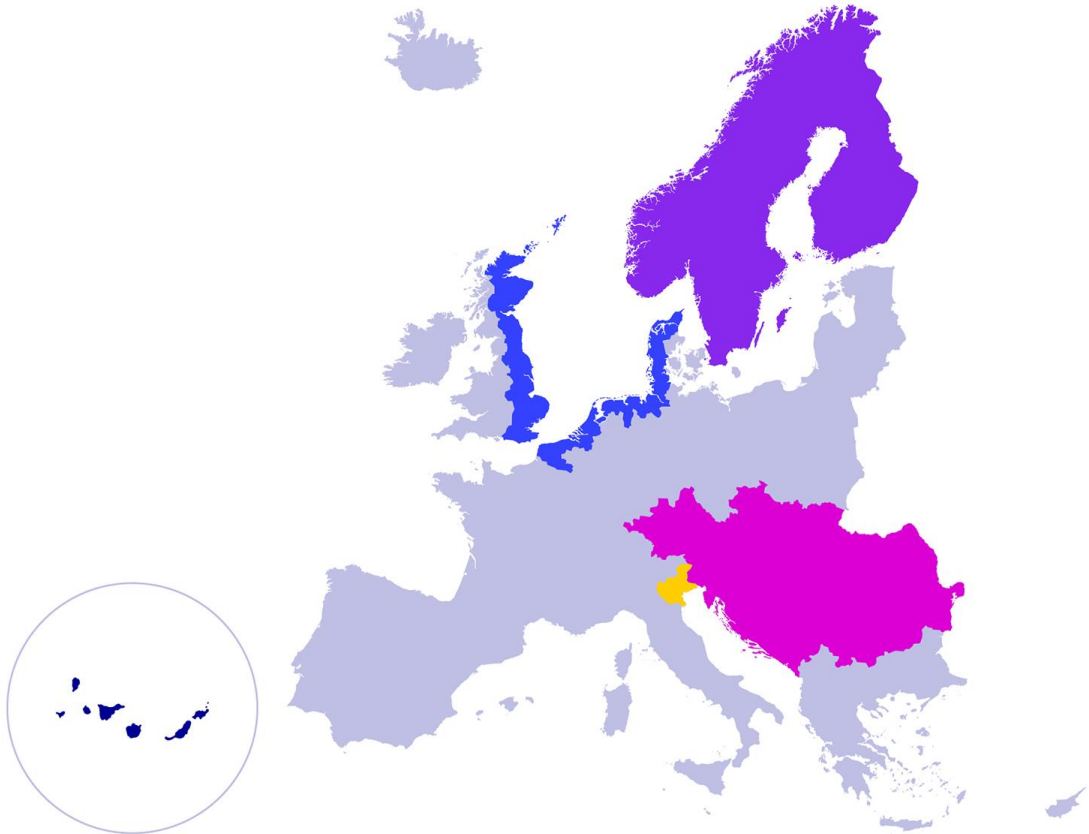
*Photo credit: Russell Neches. CC-BY-2.0*

# MYRIAD-EU: Vision and aim

- **Vision:** to catalyse the paradigm shift required to move towards a multi-risk, multi-sector, systemic approach to risk assessment and management.
- **Aim:** by the end of MYRIAD-EU policy-makers, decision-makers, and practitioners will be able to develop forward-looking disaster risk management pathways that assess trade-offs and synergies across sectors, hazards, and scales



# MYRIAD-EU Pilots



## CANARY ISLANDS

### SUSTAINABILITY ISSUE

How can island regions with a strong dependence on tourism become more resilient to multi-hazard risk?

### SECTOR

- ENERGY
- FOOD & AGRICULTURE
- TOURISM

### HAZARDS

- Earthquake
- Flood
- Landslide
- Storm
- Tsunami
- Volcano

## VENETO

### SUSTAINABILITY ISSUE

How can diverse natural landscapes from the mountains to the sea achieve a forward-looking perspective conducive to multi-risk planning?

### SECTOR

- ECOSYSTEMS & FORESTRY
- FINANCE
- TOURISM

### HAZARDS

- Biological hazard
- Drought
- Fire
- Flood
- Landslide
- Snow

## NORTH SEA

### SUSTAINABILITY ISSUE

How can spatial planning at the interface of the land and sea environments be optimised in the face of increasing and interrelated risk?

### SECTOR

- ECOSYSTEMS & FORESTRY
- ENERGY
- INFRASTRUCTURE & TRANSPORT

### HAZARDS

- Biological hazard
- Extreme wind
- Flood
- Heat
- Storm
- Thunder and hail

## SCANDINAVIA

### SUSTAINABILITY ISSUE

How can we maintain healthy ecosystems under climate-related risks while meeting increasing demands for energy, food, and other ecosystem services, and what is the role of nature-based solutions?

### SECTOR

- ECOSYSTEMS & FORESTRY
- ENERGY
- FOOD & AGRICULTURE

### HAZARDS

- Biological hazard
- Drought
- Fire
- Flood
- Heat
- Snow

## DANUBE

### SUSTAINABILITY ISSUE

How can we increase resilience to multiple disasters that impact several interconnected countries with strong macro-economic relations?

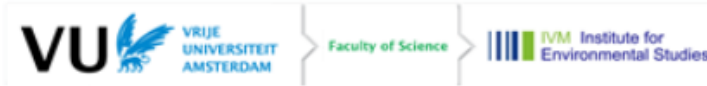
### SECTOR

- FINANCE
- FOOD & AGRICULTURE
- INFRASTRUCTURE & TRANSPORT

### HAZARDS

- Drought
- Earthquake
- Flood
- Heat
- Landslide
- Thunder and hail

# Consortium



# Five major challenges for multi-hazard risk assessment and management in Europe



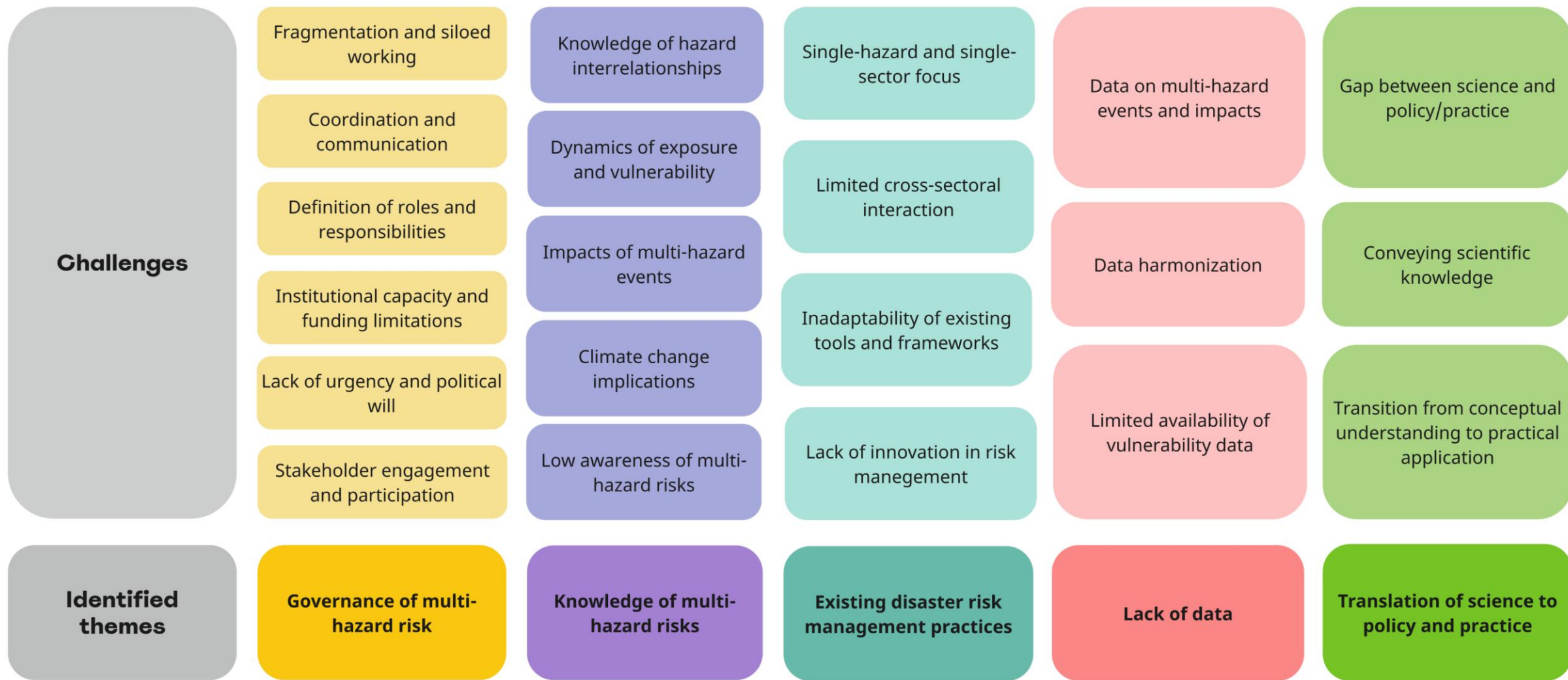
# Series of stakeholder workshops in 2022

## 5 Pilot Workshops

## Multi-hazard risk expert workshop



# Five groups of challenges

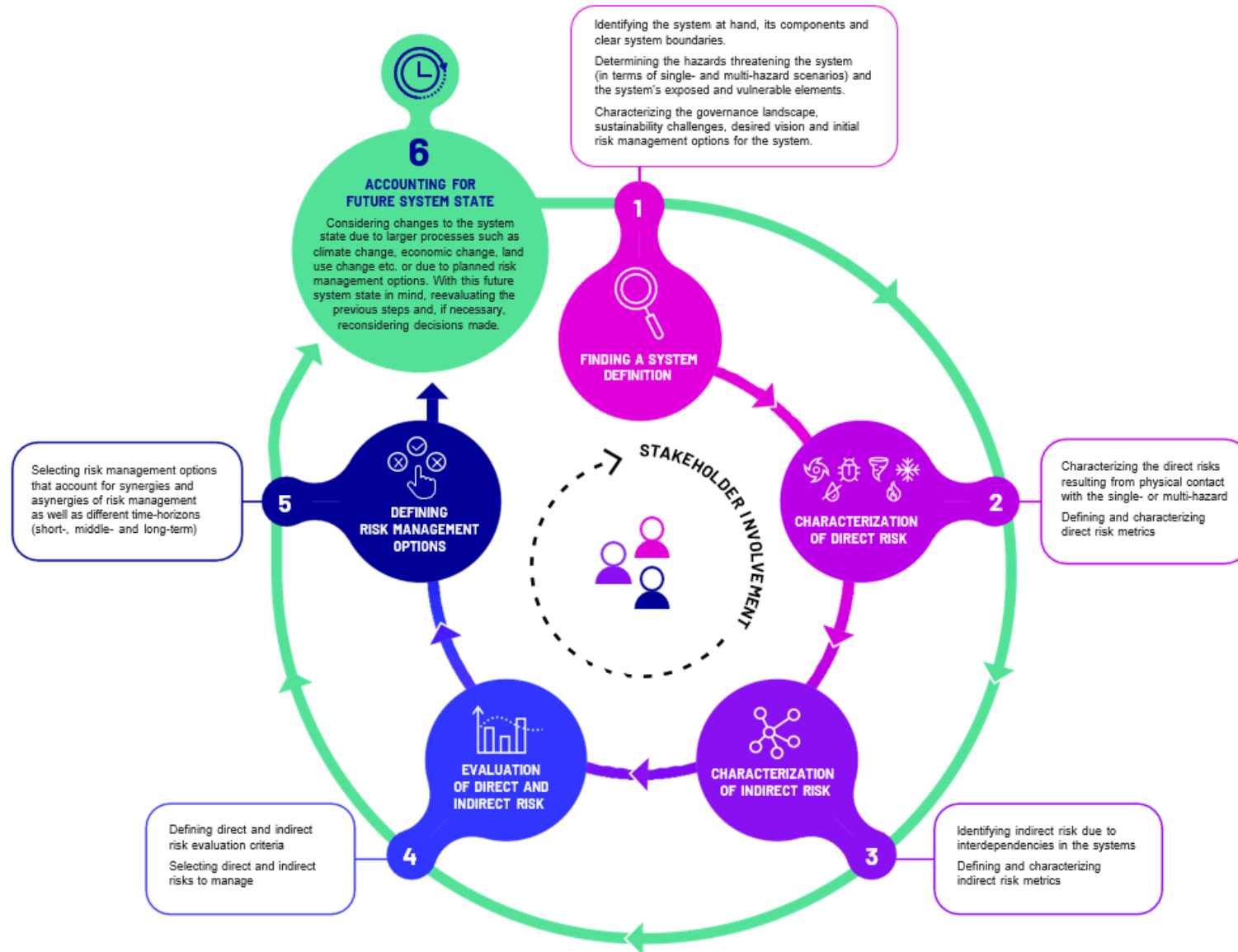


Sakic Trogrlic et al. (under review)

# How can MYRIAD-EU help in tackling these challenges: some examples



# Framework for multi- and systemic risk assessment and management

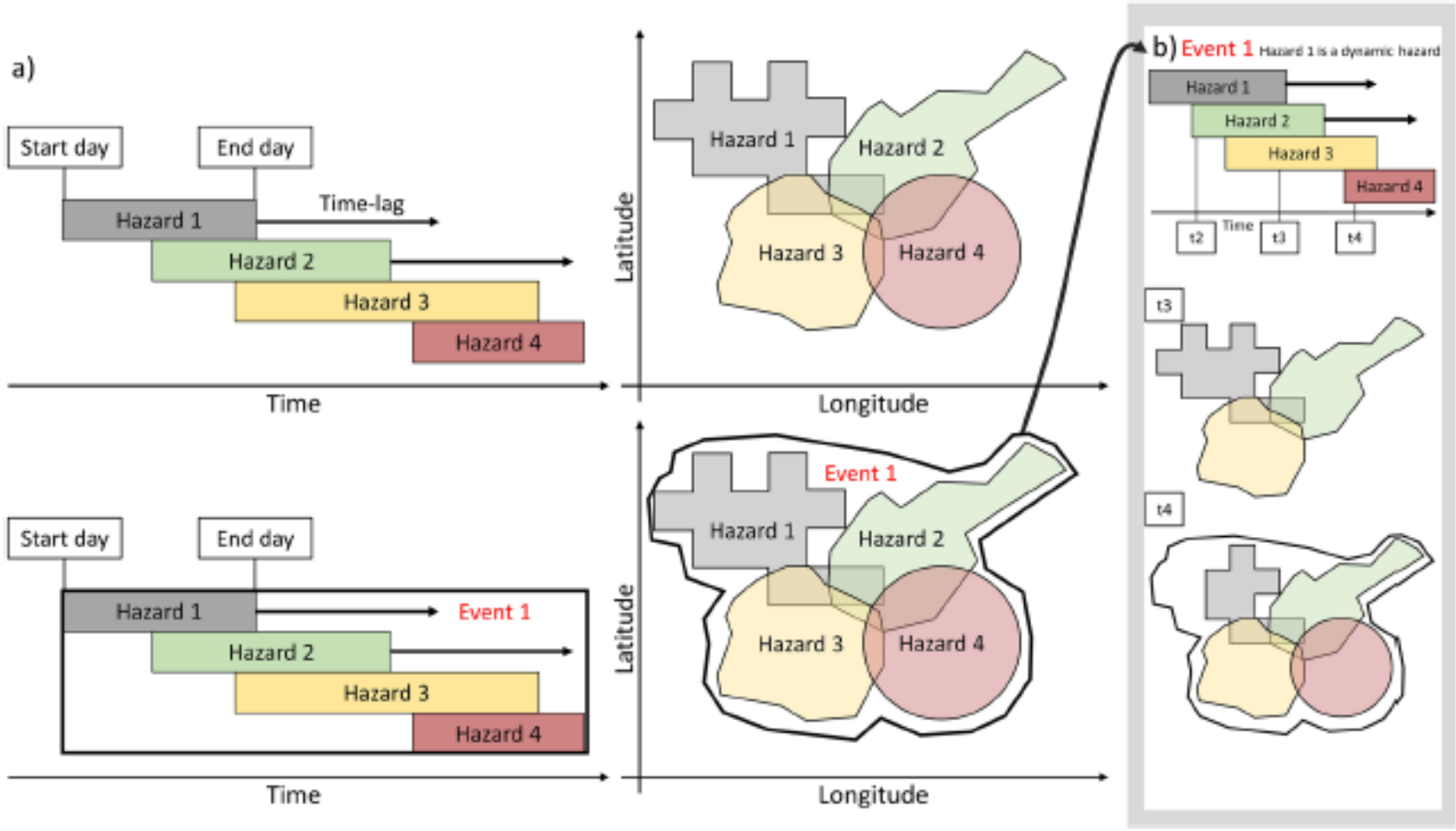


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FRAMEWORK  
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# MYRIAD-HESA: A new method to compile multi-hazard event sets



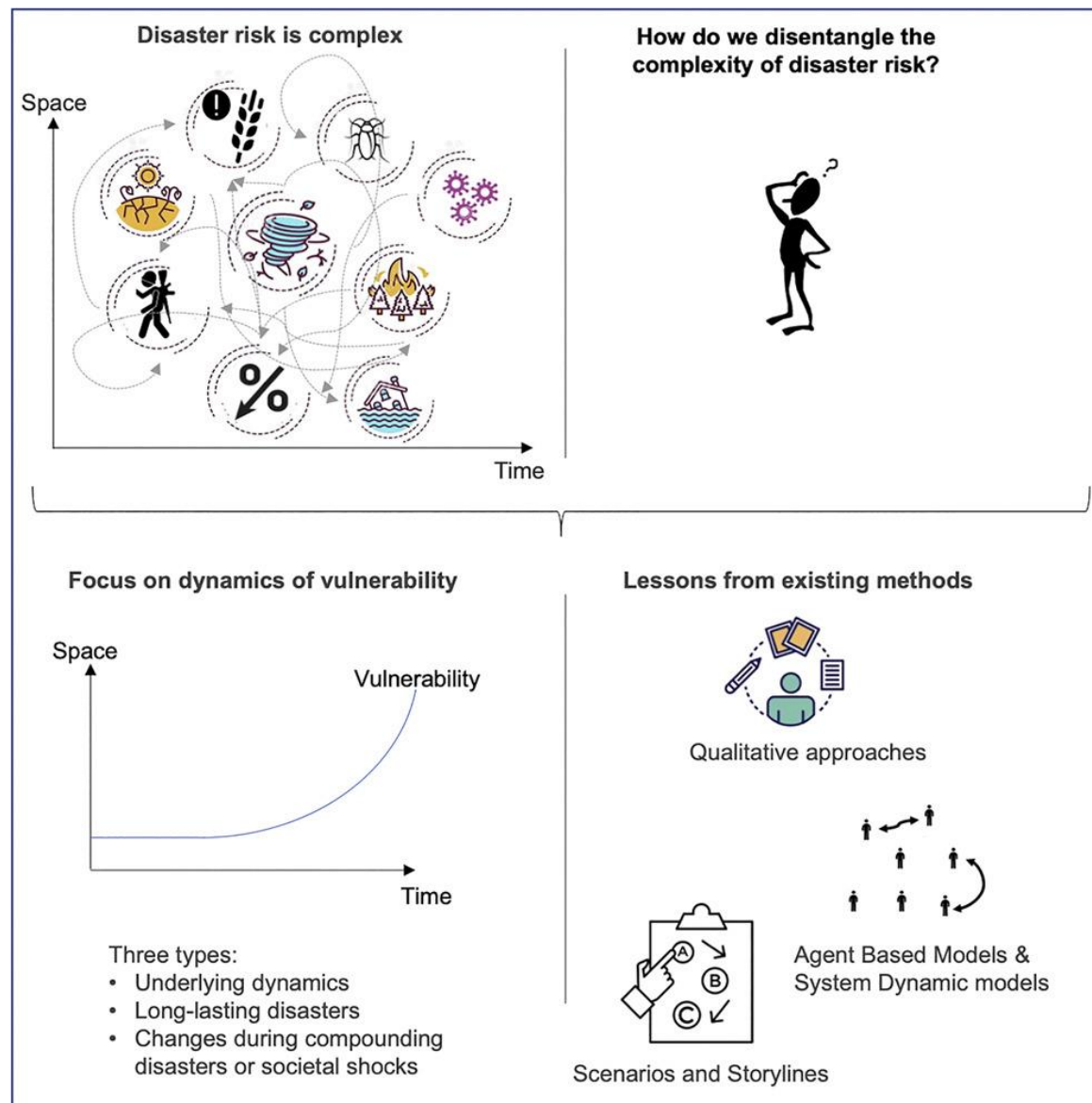
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Claassen et al. (2023), *Scientific Reports*

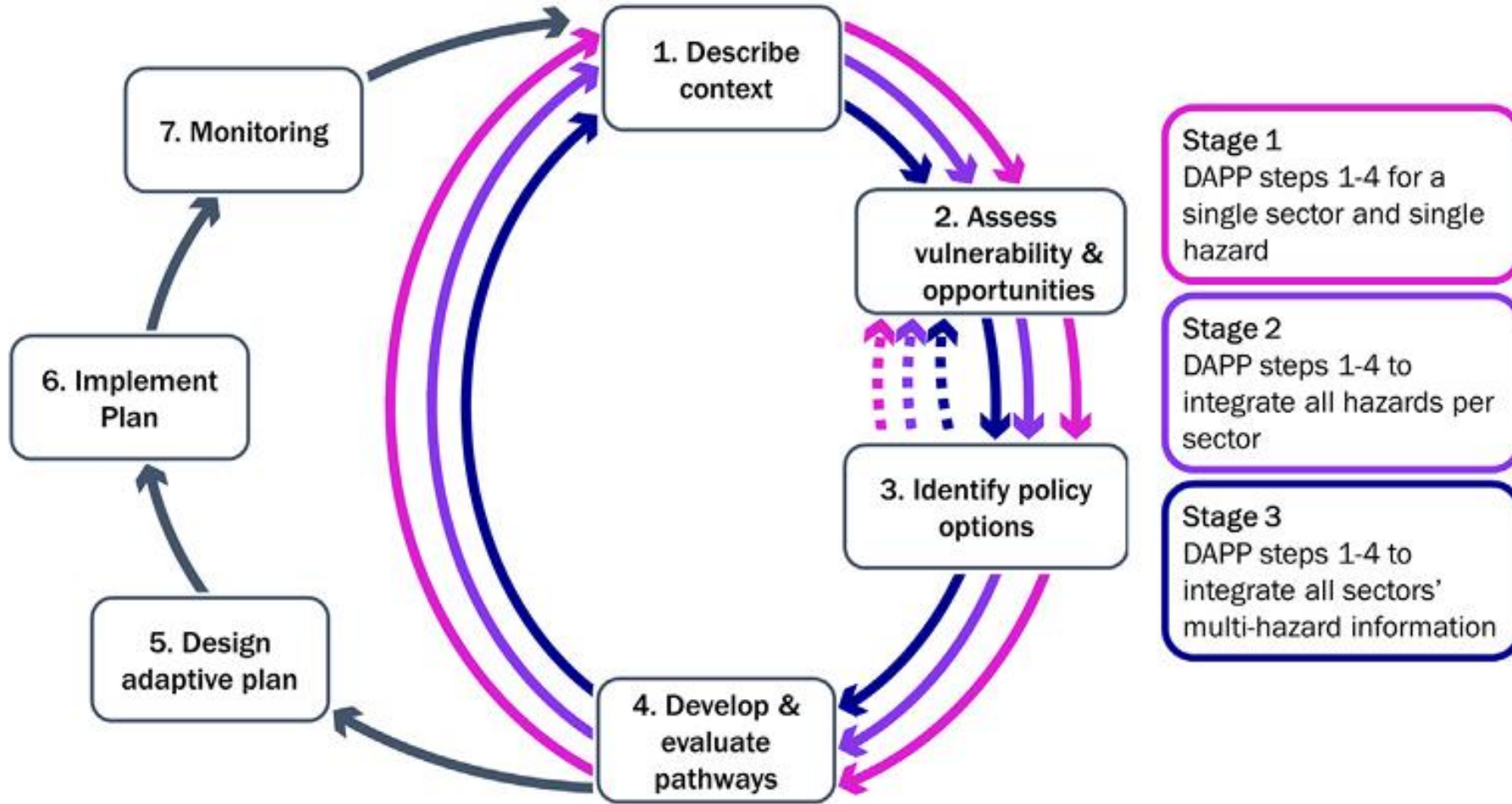


# Enhanced understanding of vulnerability dynamics



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# DAPP-MR: forward looking DRM pathways



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Schlumberger et al. (2022), *iScience*

# WIKI of multi-hazard risk assessment and management



ACCESS THE  
WIKI HERE

Welcome to your toolbox for Disaster Risk. Here you can find and share existing approaches for understanding, analysing and managing **multi-hazard** and **multi-hazard risks**. This catalogue has been developed as part of the **MYRIAD-EU project**, which aims to change the way risks are currently assessed and managed through the development and promotion of tools and solutions as well as knowledge sharing.

The purpose of this wiki is to serve as an information resource and starting point to encourage engagement between different actors involved in disaster risk assessment and management, to promote interdisciplinary research and for research activities within MYRIAD-EU and other future projects. The platform aims to support the wider hazard and risk management community to increase their understanding of what is currently possible, and how this knowledge can be applied to different disaster risk (including multi-hazard, multi-risk) challenges.

The wiki is hosted by the **British Geological Survey**, and we welcome **contributions** from across the disaster risk community.

Browse by clicking on the icon text below, or search directly for specific keywords.



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Assessment**

Understanding Disaster Risk



**Multi-hazard Risk  
Management**

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myriad.eu  
Reducing risks together

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## Reducing Risks Together

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### About MYRIAD-EU

Droughts can cause forest fires or food and water shortages. When it rains heavily on the dried soil, floods can occur, making shortages worse or triggering the outbreak of diseases. Risks don't come in the singular. They are interconnected. They can trigger or amplify each other. In today's world, nature, health, and the economy rely on each other. Being able to anticipate how risks interact is essential in preventing and mitigating disasters.

MYRIAD-EU's mission is to catalyse a paradigm shift in how risks are currently assessed and managed. Instead of addressing risks and hazards one by one, leading scientists from across Europe will co-develop the first harmonised framework for multi-hazard, multi-sector, and systemic risk management. The interlinkages between the different hazards and economic sectors will be studied in 5 pilots.

- [www.myriadproject.eu](http://www.myriadproject.eu)
  - You can register for updates

- Active Twitter account
  - Follow @Myriad\_EU

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1,441 Volgers

ActiveScore @ActiveScore

Thomas Martens @prof\_martens

Lothar H. Wieler



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