

A Combinatorial STI Solution for a Disaster Management Framework towards Stakeholder Engagement

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**PH-US-UNCTAD HARNESSING
STI FOR DRR WORKSHOP**

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Prevention and Reduction of Disaster Risk

Several Scientific Issues need to be addressed:

- Extreme weather events
- Impact of cascading effects by natural hazards
- Multi-hazard risk reduction

Existing Technology could and need to be further improved:

- Risk assessment
- Simulation tools
- Precise prediction, forecast and early warning systems

Science, Technology & Innovation (STI) Challenge:

An integrated disaster management system with monitoring, warning and simulation, response and reconstruction is **lacking**




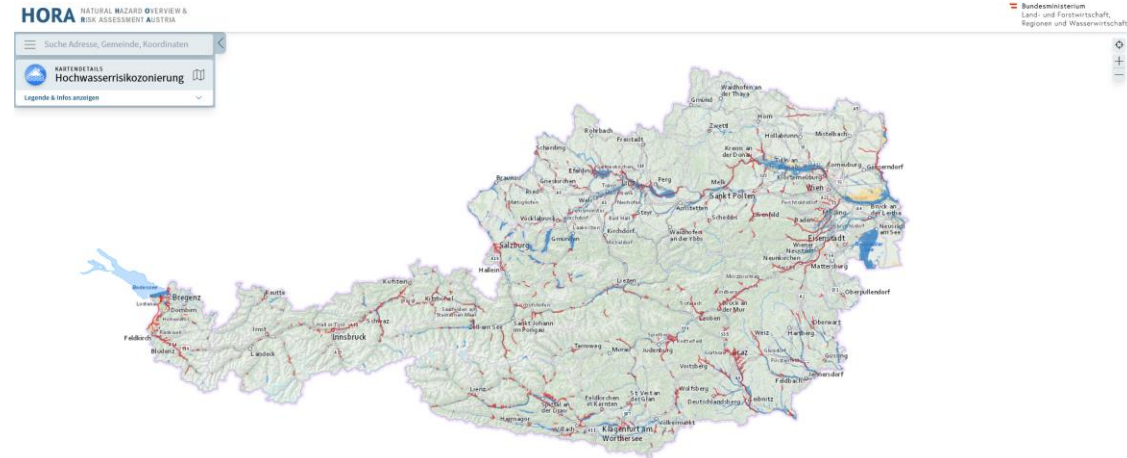
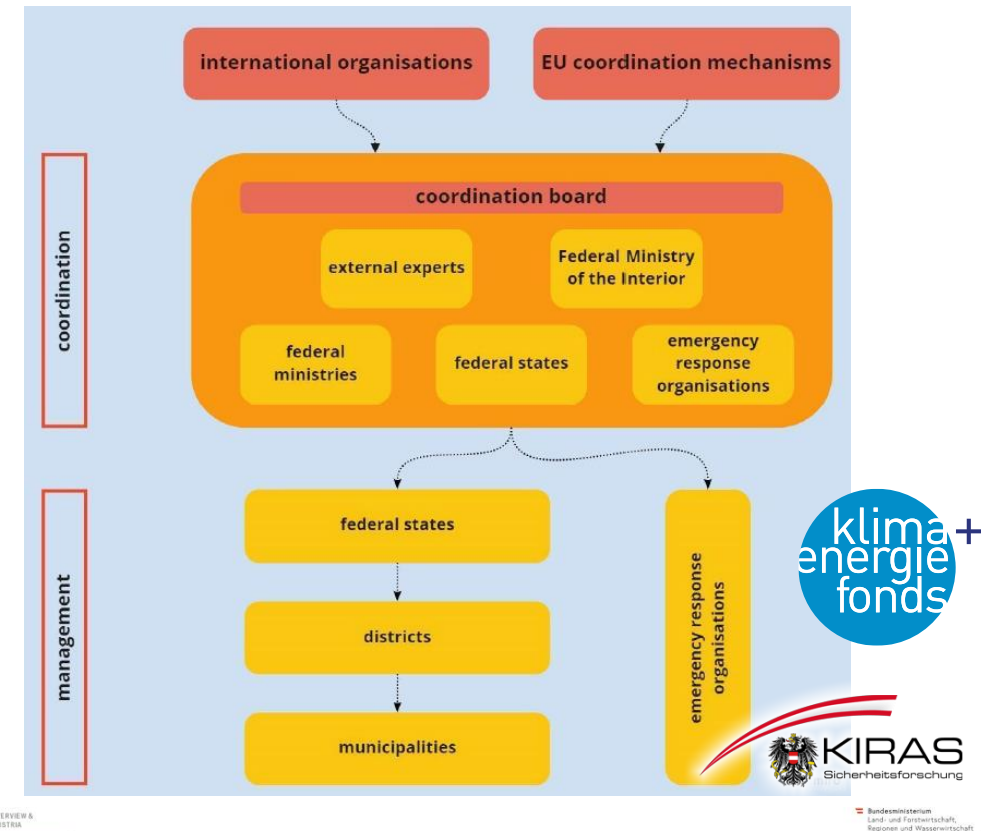
DRR Landscape in Austria

STI-related Data Points and Tools (AT)

- **SKKM:** National Crisis and Disaster Protection Management
- **HORA:** Natural Hazard Overview & Risk Assessment Austria
- **CESARE:** Collection, Standardization and Attribution of Robust disaster Event information
- **ÖKS15:** Climate scenarios for Austria
- Natural hazard and climate change check for municipalities

Policy Information and Stakeholder Integration (AT)

- **ASDR:** Austrian Strategy for Disaster Risk Reduction 
- **Team Austria by Red Cross and Ö3:** mobilization of **trained volunteers** in emergencies (~ 400.000 people)
- Austrian Strategy for Adaptation to Climate Change
- **EUSDR:** aiming to collectively increase disaster response and implement flood risk management
- **EUSALP Action Group 8:** risk governance of Alpine countries

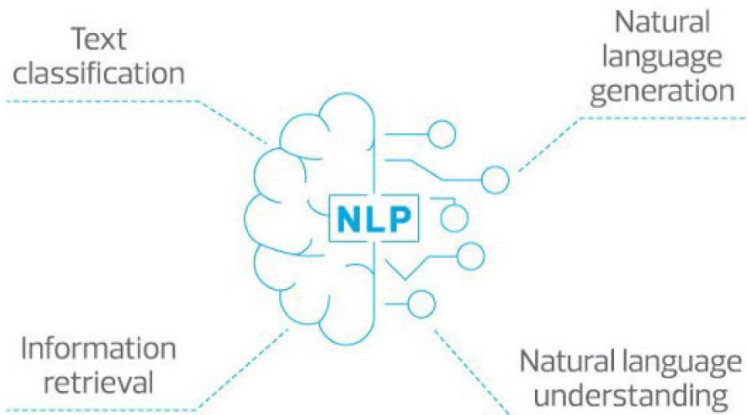


Science

Sequence Covering Array

A	B	C	D	E	F	G	H	I	J	K	L
B	A	L	K	J	I	H	G	F	E	D	C
C	L	A	B	D	K	E	J	F	I	G	H
D	L	C	H	B	G	A	I	J	K	E	F
...
...

Progress of scenario



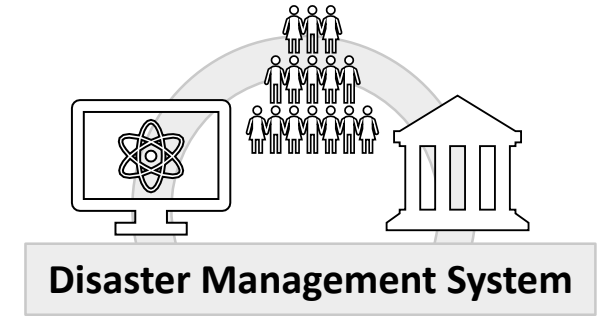
Technology

The screenshot shows the Copernicus Emergency Management Service interface. At the top, it features the European Commission logo and the text 'COPERNICUS Emergency Management Service'. Below this is a navigation breadcrumb: 'European Commission > JRC EU Science Hub > DRM > Copernicus EMS > EFFIS > Applications > Current Situation Viewer'. The main content area is divided into several sections: 'Map Options' with checkboxes for 'Human Settlement Layer', 'Protected Areas Layer', 'Corine Land Cover', and 'FUELS'; 'Forecasts' with a 'FIRE DANGER FORECAST' section showing 'Source: ECMWF (8 km res.)', 'Index: Fire Weather Index (FWI)', and 'Date: 15 Aug 2023'; and 'Rapid Damage Assessment' with a date range selector set to 'From: 20 Feb 2024 To: 21 Feb 2024' and checkboxes for 'ACTIVE FIRES' (MODIS, VIIRS) and 'BURNT AREAS' (MODIS/SENTINEL2, MODIS & VIIRS NRT). The background is a map of Europe with a color-coded fire risk overlay.

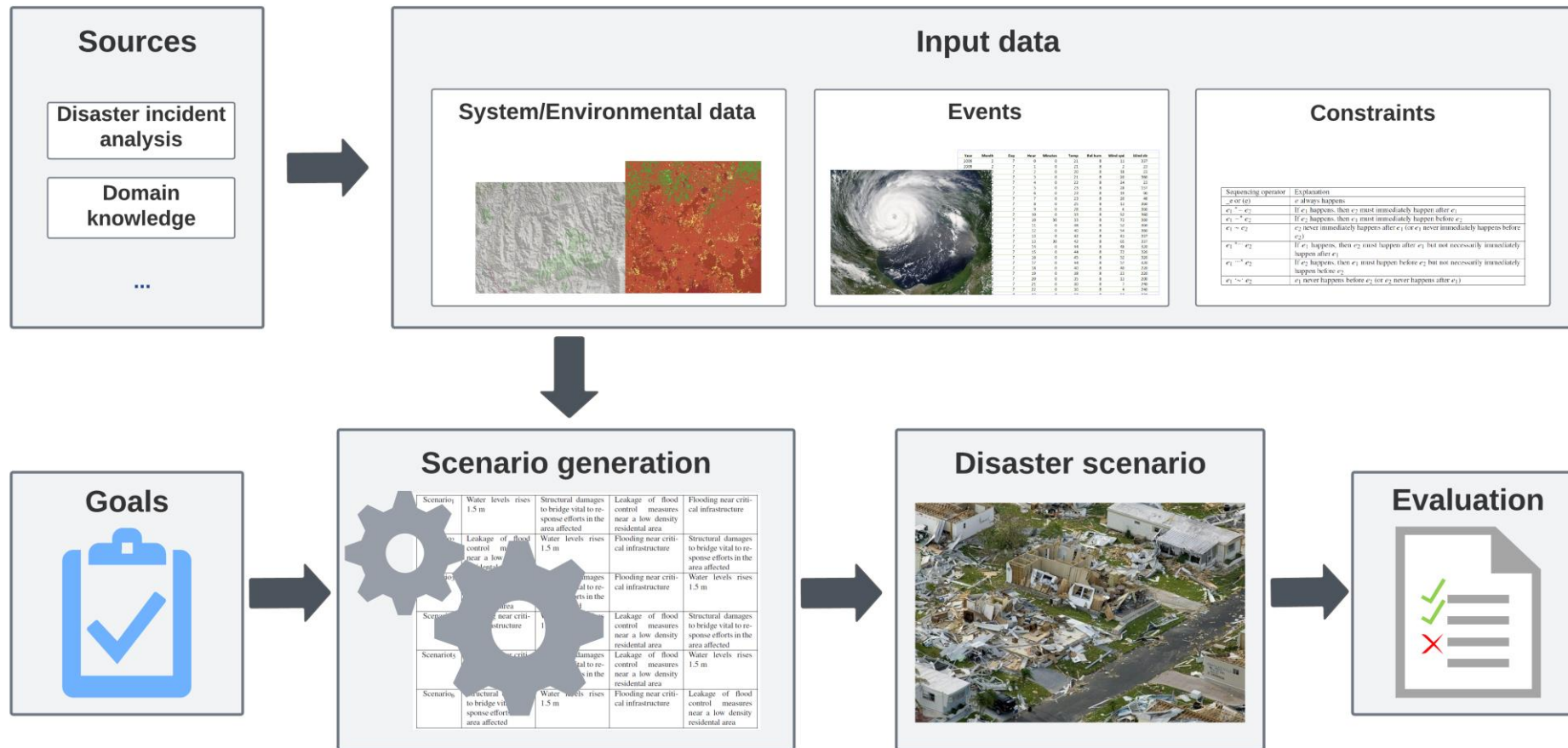


KATWARN Österreich/Austria

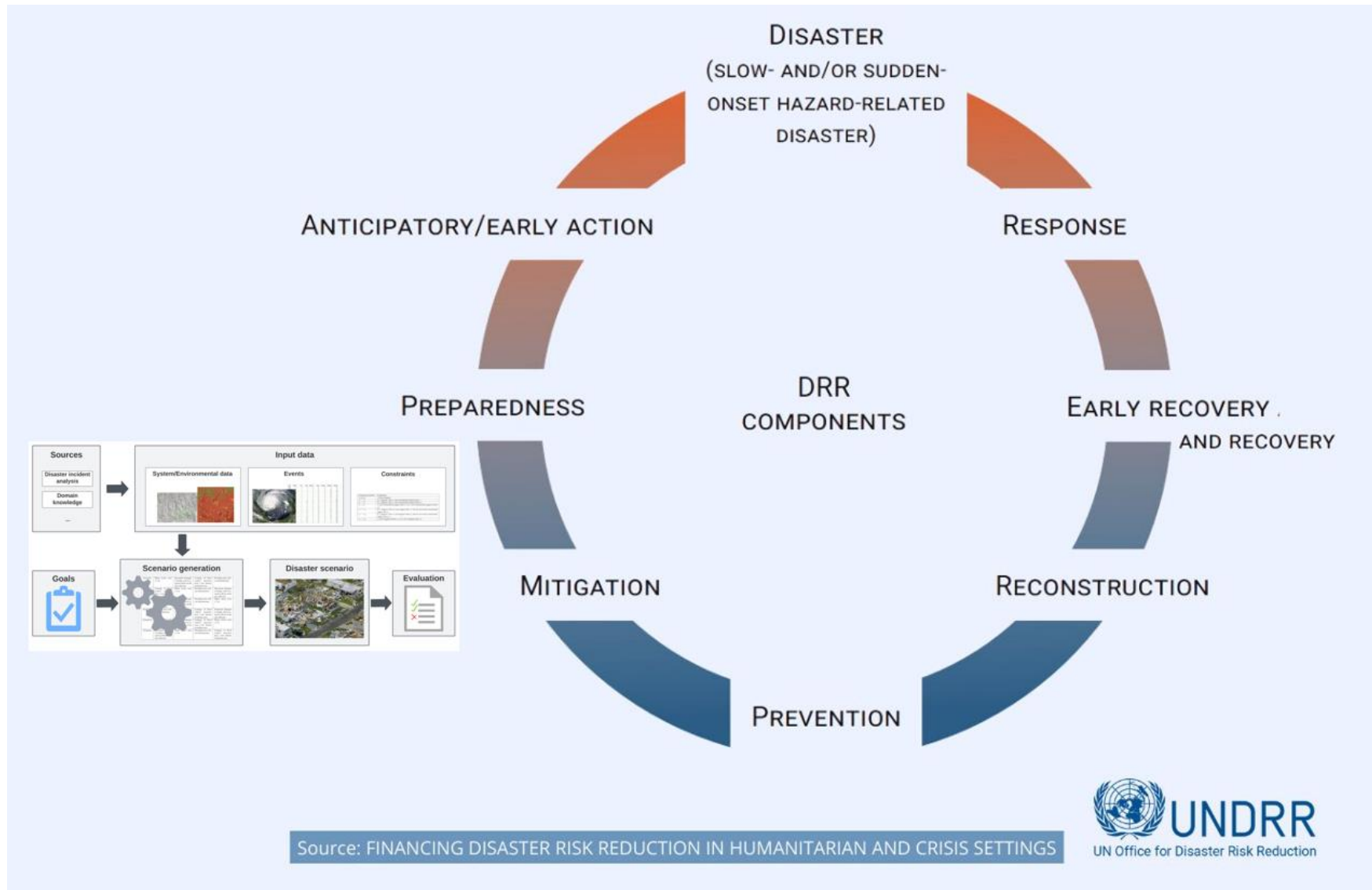
Innovation?



A Combinatorial Disaster Management Framework (CODOD)



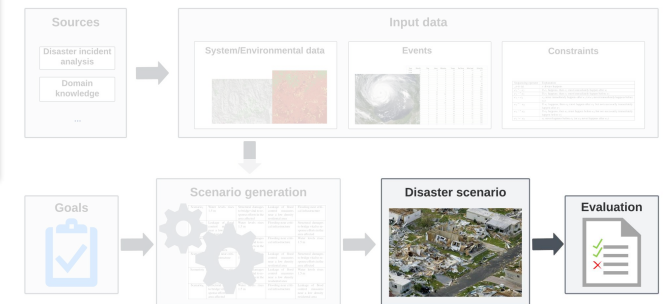
Placement within the *Disaster Risk Management (DRM) Cycle*



Simulation: Comparison of two flood scenarios

MATRIS

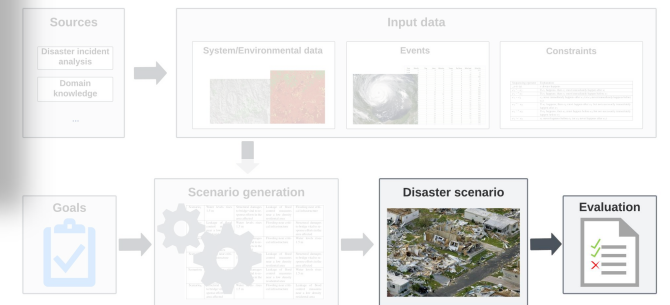
Comparison of Combinatorial Flood Scenarios



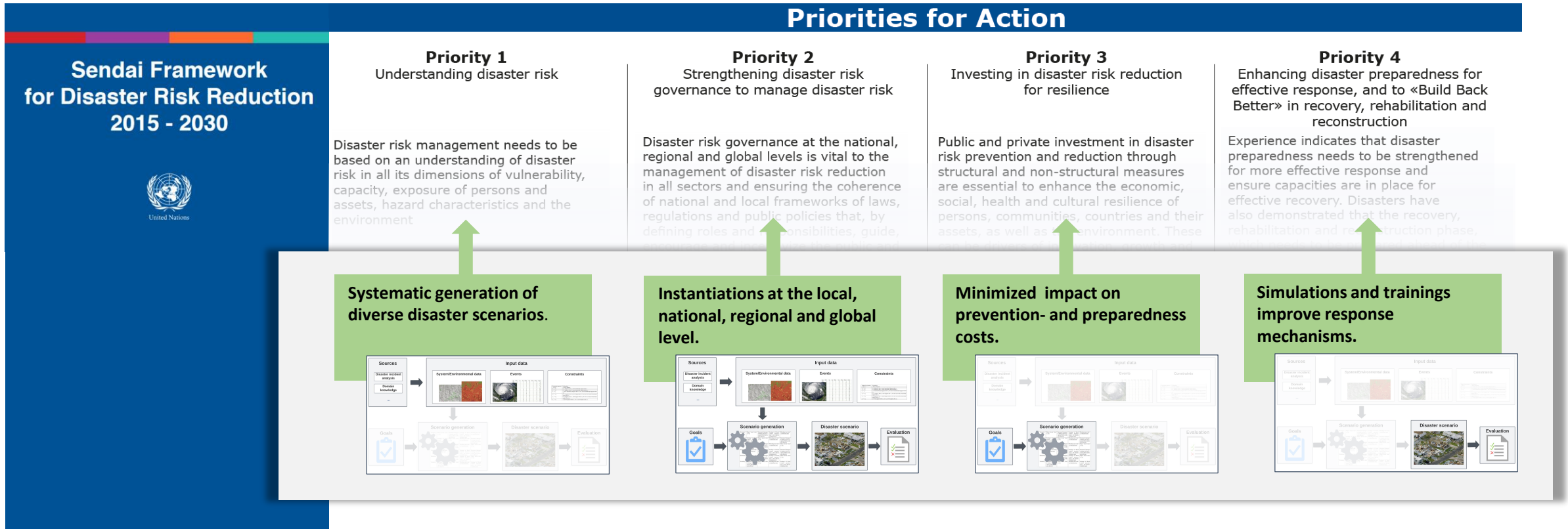
Simulation: Comparison of two bushfire scenarios

MATRIS

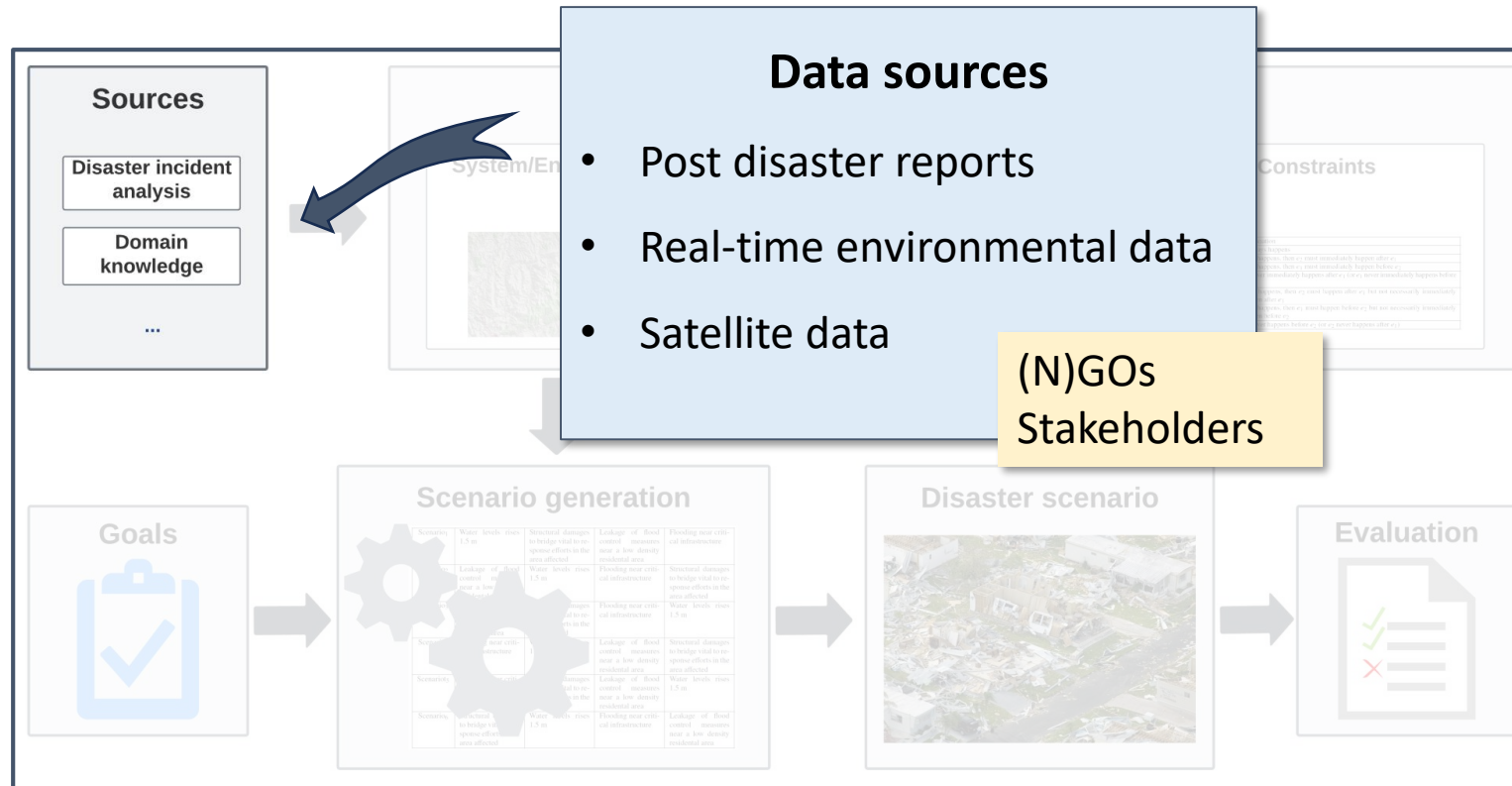
Comparison of Combinatorial Fire Scenarios



Placement of CODOD within the UN *Sendai Framework*

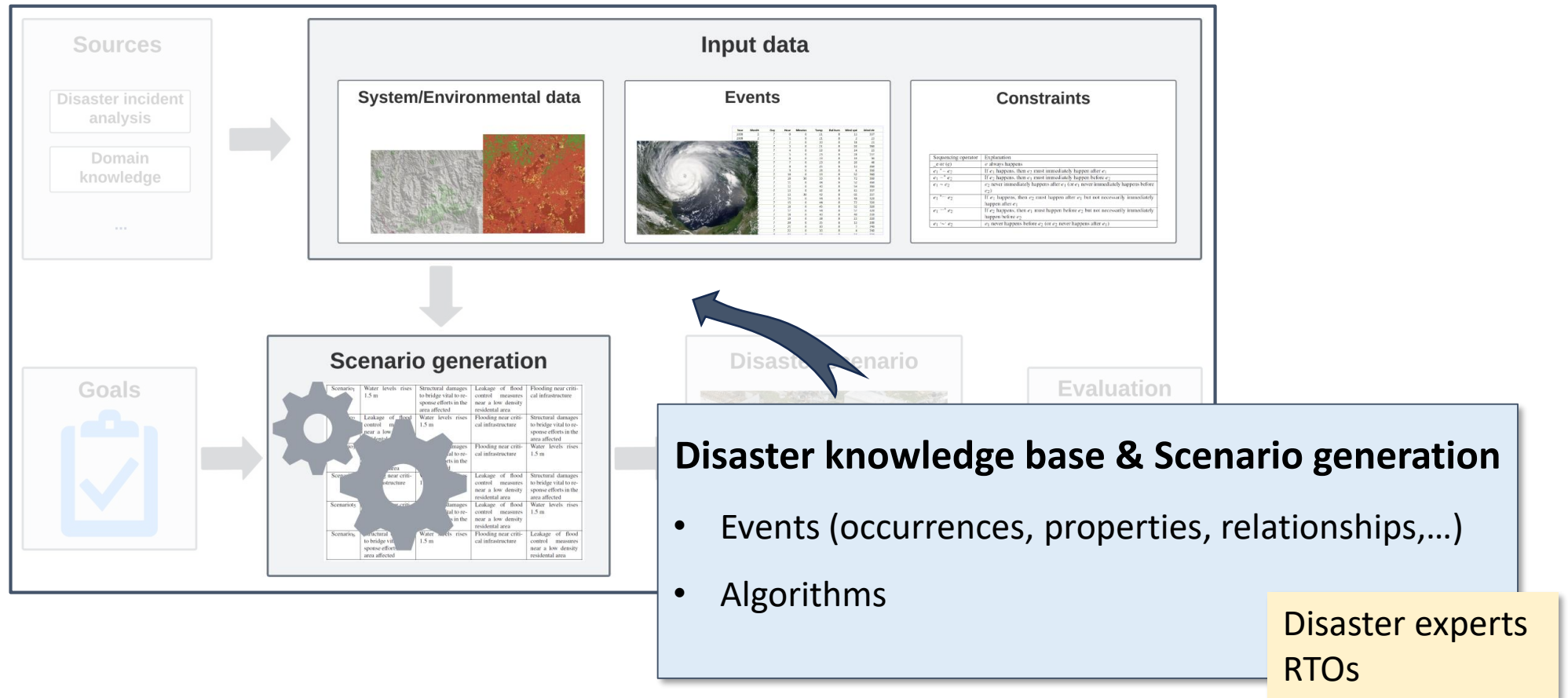


Towards an STI Solution for RTOs and Stakeholder Engagement

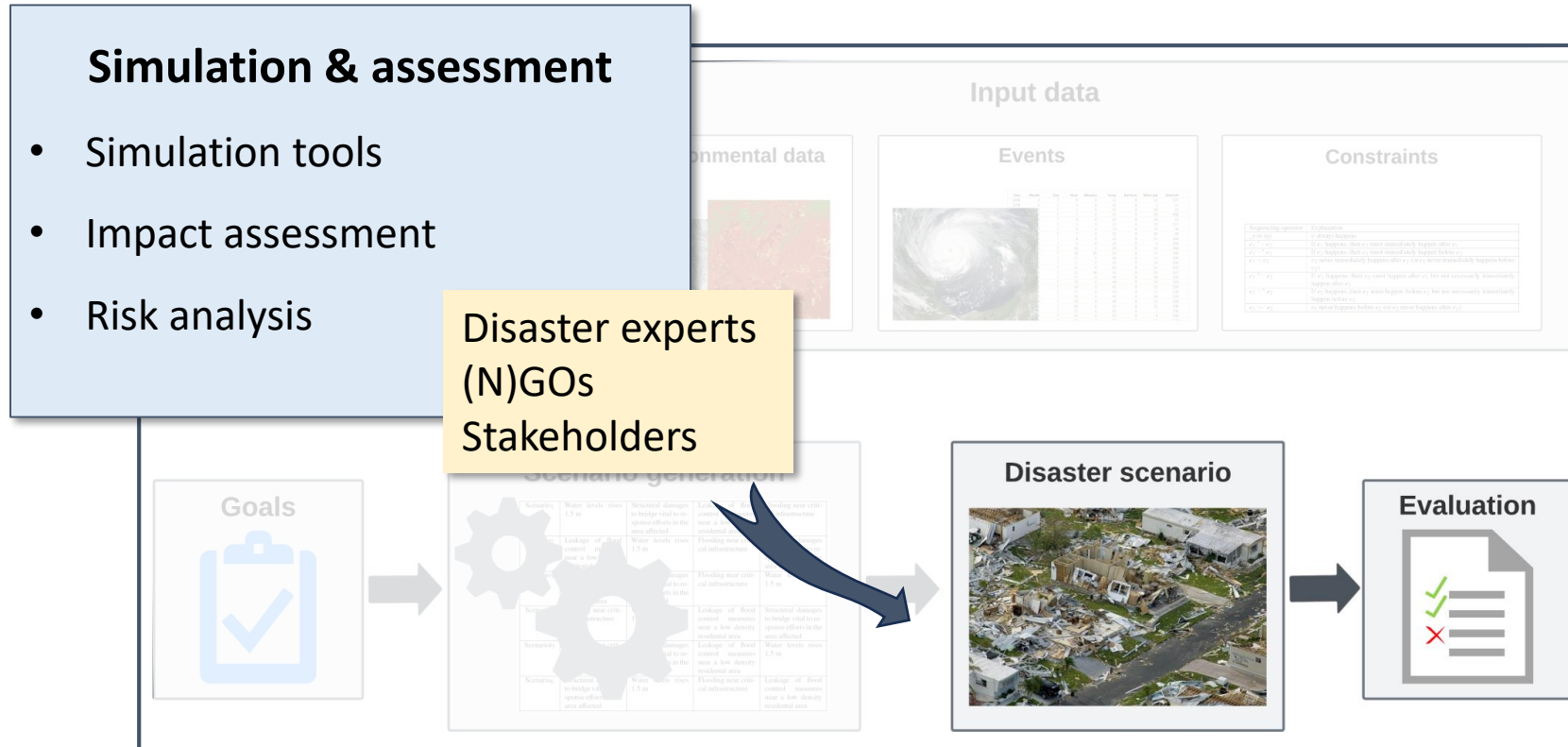


Potential partners: National Disaster Management Centers, UNESCO, UNDRR, UNCTAD etc.

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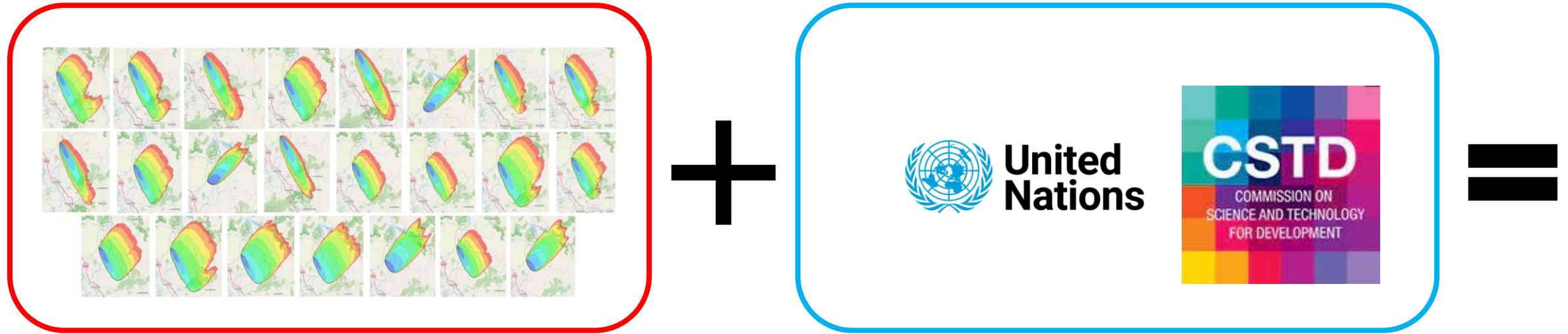


Towards an STI Solution for RTOs and Stakeholder Engagement



Potential partners: GADRI research organizations, National Disaster Management Centers, UNESCO, UNDRR, UNCTAD etc.

Conclusion and Outlook: A Holistic STI Solution to DRR



The mathematical concept of **sequential coverage** can lead to an **integrated disaster management strategy**, encompassing diverse simulations, complex exercises and resilient response plans, implemented across **participating stakeholders**.