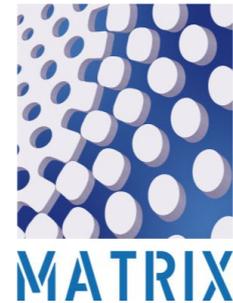


MATRIX – New Multi-Hazard and Multi-Risk Assessment Methods for Europe



Introduction

MATRIX is a collaborative research project, coordinated by the German National Research Centre for Geosciences, that aims to develop multi-type hazard and risk assessment and mitigation tools suited to the European context. MATRIX is supported by the European Union's Seventh Framework Program (FP7), and is an international consortium of 12 institutions from 10 countries, including one from outside of Europe, as well as partners from the private and disaster reduction sectors. Its total funding is 4.314.417€, of which 3.395.871€ is provided by the EU.

MATRIX began in October, 2010, and will continue until September, 2013.

Natural Hazards and Europe

Many parts of Europe are potentially under threat from a combination of natural hazards, namely earthquakes, volcanic eruptions, landslides, tsunamis, wildfires, winter storms, and both fluvial and coastal flooding. While these hazards are usually treated individually by scientists, engineers and civil protection and disaster management authorities, they also sometimes occur in combination with each other, either occurring at the same time, or when one type of event is triggered by another, e.g., landslides triggered by heavy rains or earthquakes. In addition, owing to their physical nature, these natural phenomena cover a range of spatial and temporal scales while at the same time are affected by very different sources of uncertainty.

MATRIX will therefore endeavour to develop methods and tools to tackle multi-type natural hazards within a common framework, focusing on methodologies that are suited to the European context. Of particular importance will be assessing and harmonising the associated uncertainties.

Multi-type hazard: What does it mean?

When one speaks of multi-type hazards, one must consider the following:

- *Comparability of hazards and risks.* MATRIX will deal with this issue by developing methods that allow quantitative comparisons of individual risks from different hazard origins.
- *Domino (cascade) effects.* As mentioned, a specific event may trigger another. Such relationships between different types of event need to be understood and quantified.
- *Time-dependent vulnerability.* This issue is especially important when one considers, for example, that different types of extreme events may follow one another, with the later events potentially inflicting increased levels of damage upon an area whose vulnerability has already been increased by the earlier event.

Considering these issues will allow future analysts to optimise the risk assessment process, contribute to rationalising data management for hazard and vulnerability reduction, and will support cost-effective decision making with respect to structural and non-structural mitigation/adaptation measures within a multi-hazard perspective.

Main goals of MATRIX

- Determine and demonstrate under what conditions multi-type risk assessment provides better (or not) results compared with considering only single-type hazards.
- Provide tools for analysing multi-type risk problems within a European context.
- Establish a European knowledge base on multi-type risk in Europe.
- Disseminate multi-type risk concepts to potential end-users and other relevant members of the broader community.
- Provide support for the decision making necessary by civil protection and disaster management authorities on the basis of probabilistic information.

Expected results and outcomes of MATRIX

- Multi-type risk assessment tools, tuned to the European context that may be exploited by researchers, disaster management and civil protection authorities.
- Characteristic multi-type risk scenarios for Europe for research and planning purposes.
- A knowledge base of the multi-risk situation in Europe that is accessible to researchers, disaster managers and other interested parties.
- Reports outlining guidelines and recommended best practices for multi-type risk and its assessment in Europe.
- Training for potential end users.

Role of and benefits to National Platforms

The National Platforms will be contacted early in the project's time frame where they will be called upon to indicate their willingness to interact with MATRIX. This interaction will be led by the German Committee for Disaster Reduction (DKKV). Those platforms who are interested are therefore asked to contribute the following:

- Their views on the needs of end users. This will lead to a better understanding on the part of the project's partners of the practical requirements for multi-hazard and multi-risk assessments from the user's perspective.
- Information that would be relevant to the MATRIX knowledge database.
- Their comments on the MATRIX reference reports.
- Assist in the development of training programs for disaster management specialists on multi-type risk assessment concepts and decision making.
- An active role in the dissemination of the goals and results of MATRIX.

The interested National Platforms will also be invited to participate in end-user workshops held in conjunction with the MATRIX annual project meetings, the first of which will be in Paris, France, in October, 2011.

The benefits for the participating platforms include (but are not limited to) the following:

- Close interaction with the international scientific community in the field of multi-type hazard and risk assessment, and with other disaster management communities.
- Facilitation of international network activities.
- Active shaping of multi-type hazard and risk assessment methodologies and tools through their feedback to the MATRIX consortium.
- The possibility of reviewing the requirements for multi-type hazard and risk approaches at a national level within the context of their specific national requirements.

The MATRIX Consortium

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Bureau de Recherches Geologiques et Minieres	France
Stiftelsen Norges Geotekniskeinstitutt	Norway
Internationales Institut für Angewandte Systemanalyse	Austria
Aspinall William Phillip – Aspinall & Associates	United Kingdom
Karlsruher Institut für Technologie	Germany
Technische Universiteit Delft	Netherlands
Eidgenössische Technische Hochschule Zürich	Switzerland
Instituto Superior de Agronomia	Portugal
Deutsches Komitee Katastrophenvorsorge e.V.	Germany
University of British Columbia	Canada

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