MULTI-RISK ANALYSIS AND INFORMATION SYSTEM COMPONENTS FOR THE ANDES REGION

Research towards improved management of natural disasters including strategies to reduce cascading effects

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Motivation

In recent decades, the **risk to society due to natural hazards has increased** around the globe. To counteract this trend, an efficient risk management is necessary, for which reliable information is essential.

However, most of the existing hazard and risk information systems in practice address only individual components within the complex risk assessment chain, as for instance focusing on specific hazards or simple loss measures.

Complex interactions, such as cascading effects, are typically not considered, as well as many of the underlying sources of uncertainty. This can lead to incomplete or underestimated assessments of risk, which in turn might hinder the undertaking of efficient prevention and mitigation measures and ultimately even decrease the resilience of the exposed communities.

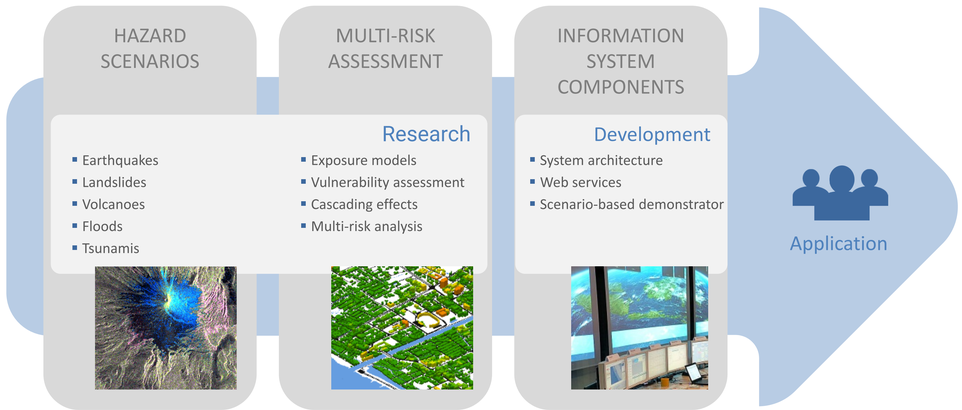
Objectives

RIESGOS (Multi-risk analysis and information system components for the Andes region; 11/2017 - 10/2020) will tackle these issues and elaborate novel scientific approaches related to the **assessment of multi-hazards compound risk,** including **dynamic multi-hazard exposure** and **vulnerability analysis**, aimed at the modelling of **cascading and interaction effects** for the Andean region in Chile, Ecuador and Peru.

Methodology

Modular, interactive web services will be designed and demonstrated in a flexible and scalable multi-risk information system. The **prototype demonstrator** platform shall allow end-users from civil protection and disaster management authorities **to simulate and analyse complex compound risk scenarios** with the ultimate goal of risk reduction and enhanced disaster management. The project team is considering scenarios for floods, landslides, volcanic eruptions, earthquakes, tsunamis and their mutual dependencies from the perspective of 'what would happen if…?'. This **scenario-based approach** can be integrated into a probabilistic risk assessment framework to ensure the cost-effectiveness of recommended strategies.

The process is supported by the development and application of new approaches on risk communication. Guidelines for the integration of multi-risk information into land use planning and emergency response plans are also going to be developed and tested for their applicability. The **RIESGOS** project is cooperating with South American research partners and will be guided by the needs of the potential users and the practical applicability.



Multi-Scale Study

Research and development activities of **RIESGOS** will be carried out on two different spatial scales for:

Regional / National level
Hazard and multi-risk analysis on a broader scale

Local level (pilot regions)
Focused analyses in terms of spatial resolution and thematic detail for specific hazard types for

Quito

Earthquakes, Floods, Landslides, Volcanoes

Lima

Earthquakes, Tsunamis, Floods, Landslides

Santiago – Valparaíso

Earthquakes, Tsunamis, Landslides, Floods, Volcanoes

Expected Impact

RIESGOS is aiming at:

- Strengthening research on multi-hazard scenarios and multi-risk assessment,
- Improving risk and multi-risk assessment capabilities of civil protection and national/ local administration,
- Widening and initiating research capacities and collaboration,
- Fostering the development of modular and standardized information system components to serve a wide range of applications,
- Increasing scientific exchange between countries,
- Identifying application potentials for economic utilization.

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