New international master study program in the field of environmental geotechnics and geohazards

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Geohazards are defined as potentially damaging geological events (e.g., earthquakes, volcanic eruptions, landslides, floods, tsunamis), which "may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation". A geohazard event is characterized by its location, magnitude/intensity, time, and probability of occurrence. Triggered by geohazard event(s), a disaster (that is, a severe disruption of the normal functioning of a community/society) causes widespread human, economic, and/or environmental losses, which exceed the ability of the affected community/ society to cope using its resources. In some cases, anthropic activities are behind triggering events. Also, the increasing frequency of extreme precipitation and drought events caused by global warming also impacts geohazards such as landslides and floods. Many countries face environmental challenges marked by increasing geohazard frequency due to climate change impact. This increased risk landscape is compounded by limited specialized expertise in environmental resilience, creating a critical capacity gap. A significant disconnect exists between current academic programs and industry requirements for specialized geohazard management skills.

Therefore, Master Study of Environmental Resilience to Geohazards (MaStER_G) represents a groundbreaking innovative educational initiative addressing critical regional needs across the Western Balkans and beyond. Thie proposed master's program will tackle the intersection of environmental resilience and geohazard management, responding to escalating geological challenges and climate-related risks that demand sophisticated cross-border expertise. Through its integrated focus on environmental adaptation and geotechnical risk assessment, MaStER_G will develop specialized professionals capable of building regional resilience to natural hazards.

The program will develop professionals with enhanced digital skills, entrepreneurial capabilities, and cross-cultural competencies, fostering increased regional and world-wide cooperation in environmental risk management. The curriculum architecture synthesizes pioneering geotechnical solutions with strategic risk assessment frameworks, tackling the territory's exposure to, e.g., slope failures, seismic events, soil deterioration etc.

By integrating the distinguished expertise of the Faculty of Geotechnical Engineering, University of Zagreb (Croatia), Institute of Earthquake Engineering and Engineering Seismology and Faculty of Civil Engineering, Ss. Cyril and Methodius University in Skopje (North Macedonia), Faculty of Mining and Geology, University of Belgrade (Serbia), Iran University of Science and Technology (Iran) and Federal University of Bahia (Brazil) the program establishes a pioneering knowledge hub that exemplifies the unique value of EU-facilitated cooperation.

The program will establish a robust inter-regional cooperation framework while fostering practice-research integration through strategic industry partnerships. Emphasizing inclusive access, it promotes social mobility. The program's learning outcomes are meticulously mapped to European qualification standards, ensuring graduates possess internationally recognized competencies in environmental resilience and geohazard management. This highly integrated approach ensures:

- Direct response to regional environmental threats
- Enhanced employability through industry-aligned skills
- Strengthened institutional cooperation
- Knowledge transfer across institutions
- Sustainable capacity building in risk management

The program's objectives will establish quantifiable milestones strategically aligned with key ESCO occupational profiles, including Engineering Geologist (2114.4.3), Geotechnical Engineer (2142.1.4), Environmental Engineer (2143.1), Geological Engineer (2146.1.2) and Natural Hazard Management Specialist (2133.4.1). By implementing standardized geo-risk assessment protocols across six international laboratories within 24 months, the program will develop competencies specifically mapped to these professional pathways. The unified curriculum with 120 ECTS credits will focus on regional geotechnical challenges while incorporating the essential knowledge, skills and competences defined in the ESCO framework for each occupational profile. This includes specialized expertise in geological surveying, soil mechanics, rock mechanics and environmental engineering.