„Research and Education of Environmental Risks“

A natural disaster is a major adverse event resulting from natural processes of the Earth; examples include floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, and other geologic processes.

Due to population growth and its concentration in densely populated areas there is an increasing need for modern society to be vigilant of the impact of catastrophic natural events. Every year, the number of disasters in the world is increasing. It causes more and more damage and deaths. Floods, forest fires and droughts, which do not choose either the place or time when to occur, have been causing irreparable damage, often threaten the lives of people, cultural, material resources and the environment. There are many areas, including towns and cities that are already at risk. Therefore, it is necessary to develop earthquake, tsunami or flood damage scenario by utilizing appropriate vulnerability assessment criteria, topographical information, building and infrastructure inventories, demographical data and other relevant facts.

Disaster risk assessments and risk management can become essential inputs for planning and creating policies in a number of areas of public and private activity when carried out at a national level. By improving the awareness and understanding of the risks a government faces, stakeholders, decision makers and interested parties are in a better position to agree on the preventive measures to take and to prepare in ways to avoid the most severe consequences of natural and man-made hazards and of other adverse events.

Earthquakes are amongst the strongest and most destructive forces in nature. Seismic risk represents the degree of possible loss of human life and material assets in case of earthquake occurrence of a certain intensity in a given area and is usually expressed in relative numbers (in relation to the maximum possible loss).

Seismic Risk Management is a process of systematic application of policies, procedures, treatments and monitoring of seismic risk. Managing risks means looking into the future, thinking ahead about the potential events, actions and consequences that one can be faced with in the future as a result of earthquakes, and taking timely measures to minimize risks, thereby avoiding or reducing adverse effects.

Risk management includes: formal, quantitative evaluation of potential damage or loss at a given time interval; observation and correction of security deficiencies.

The main objective is to provide sustainability in three crucial segments: development of leadership (human resources), capacity development (funds), raising public awareness (information, training and education).

Assessment of seismic risk is a process in which priority risk management is performed and this is done by assessing and comparing the level of seismic risk with the level of acceptable (targeted) risk, which represents the level of protection that the society can accept according to its economic capabilities. Therefore, for a different development of countries acceptable risk will be different.

Additionally, some of the natural disasters may not happen at the same time, like wind and earthquake, however, if the region is prone to both disasters this increases the potential risk to structures. On the other hand, some natural disasters are interconnected, and as such should be taken into account, for example earthquake induced landslides, earthquake and floods as a scour effect on the piers of bridges, floods and landslides, etc. A structure could be subjected to more than one critical type of hazards during its service life – multi hazard

It is only at the beginning of the 21st century that the need for multi-hazard design started. In the last decades, the importance of multi-hazard effect on structures has emerged and this is seen in the development of the multi-hazard design. It is essential for improving the safety of structures, reducing building life cycle costs and increasing efficiency in design of structures.

Frequent occurrences of natural disasters, both in the world and in our area, are becoming one of the most important world problem and factor affecting further sustainable development of human civilization. Natural disasters have become a source of permanent threat to the community and the environment as a whole. The damage they cause exceeds all acceptable measures. We are witness that exposure to the effects of natural disasters (droughts, floods,

landslides, earthquakes) has been greatly increased due to the low level of knowledge of the cause of the occurrence, mechanisms of action and protection.
The aim is to educate students to apply methods and current knowledge about natural hazards and risk assessment by integrating research and practical application on actual construction structures or facilities - special risk analysis and decision making. Students will become familiar with various methods of analysis, techniques and tools for assessing sensitivity, modern methods of predicting and tracking disorders or accidents - modeling, simulation and GIS technology etc

The basic aim of the aforementioned network is to establish a university network (cooperating faculties, departments and institutes, as well as staff) in which every participant offers similar study programmes in engineering education, particularly in the field of environmental risks. Moreover, another goal to strive for is joining efforts to develop joint research projects for international grants in the time to come.
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The next objectives are as follows:
- improvement of regional cooperation, especially in education and research, between the Serbian, Croatian, Macedonian and B&H territories.
· the fields of common interest are to have an advanced transfer and exchange of regional information and knowledge.
- to create a framework for an increased international cooperation in both research and education between all the participating institutions.
- to establish pioneering approaches for teaching principal subjects that are related to network's topics in agreement with the modern tendencies and needs of the future.
- to make the common participation in PhD thesis evaluation commissions possible in the topics covered within the framework of the project.
- the utilization of unique laboratory equipment and devices in the participating universities is to be given broader possibilities for research work. The ones who would mostly benefit from this are young lecturers working on their dissertations as well as PhD students and those working on their theses