



4th PROJECT WORKSHOP

**Japanese-Croatian Project
on Risk Identification and
Land-Use Planning for
Disaster Mitigation
of Landslides
and Floods in Croatia**

BOOK OF ABSTRACTS

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Disaster Mitigation of Floods and Debris Flow at Rijeka Region through Croatian-Japanese Collaboration

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This paper presents the objectives, activities and research results as outcomes from the bilateral Croatian – Japanese project „Risk Identification and Land-Use Planning for Disaster Mitigation of Landslides and Floods“, with the accent on the Faculty of Civil Engineering University of Rijeka activities within mud flow and flash flood working group (Working group 2 – WG2).

The Project „Risk Identification and Land-Use Planning for Disaster Mitigation of Landslides and Floods in Croatia was launched in 2008. when this project was elected as one of the projects in Science and Technology Research Partnership for Sustainable Development, SATREP funded by Japan Agency for Science and Technology - JST and Japan International Cooperation Agency - JICA. The Project is worth about 4 mill. US\$ with duration of 5 years, and it involves about 20 researchers from Japan and 20 from the Croatia. Project leader from the Japanese side is Prof. Hideaki Marui - University of Niigata, a leader of the Croatian side is Prof. Nevenka Ožanić - University of Rijeka. One of the main goals of the project is hazard analysis and development of guidelines for the application of the project results in the spatial planning system. Project activities are carried out in the pilot areas which are located near Rijeka, Split and Zagreb.

The main activities of the research groups involved in the Croatian–Japanese joint research project on „Risk Identification and Land-Use Planning for Disaster Mitigation of Landslides and Floods in Croatia“ include investigations of recent landslides using landslide monitoring, the establishment and development of early warning systems for landslides, flash-flood and debris-flow simulation models, development of early warning systems adapted to hydrological and geological conditions in Croatia and the definition of hazard zones using a methodology for assessing susceptibility and hazards based on local geological and landslide conditions. The final objective of the joint research is the development of risk mitigation measures that can be instituted through urban planning. Dissemination and use of the results should ensure significant benefits for the local and regional communities that are directly and indirectly threatened by landslides, flash-floods and with debris-flow.

At the Working Group II (WG2), activities were conducted by systematic observations of meteorological and hydrological parameters in the planed catchment areas and river basin (rivers, flash floods and torrential areas) in real time, numerical and hydrological analysis of the measured parameters, and preparing simulation models of floods, mud flows and flow to the areas analysed for the purpose of making an early warning system for these phenomena, all adapted to the hydrological and geological conditions in Croatia. Necessary measuring and research equipment, software programs, systems and equipment for meteorological and hydrological observations for the most part were donate from the Government of Japan for the analysis of selected research areas in the vicinity of Rijeka. Some equipment were provided by the Faculty of Civil Engineering, University of Rijeka.

The Working Group II (WG2) has chosen three pilot areas are different in hydrological and geological characteristics, but partly also by the possible consequences: Rječina river catchment area - downstream profile near landslide Grohovo, catchment area of Dubračina river and Moščenička Draga near Opatija. Flood waters from these pilot areas can significantly affect the development of the area in which they are located. In fact, the flood waters of the river Rječina, river Dubračina and debris flow of Moščenička Draga can cause (and in history they are) significant damage to downstream urban areas (Rijeka, Crikvenica and Moščenička Draga), and pose a high risk of possible future occurrence. Hydro analysis on these pilot areas of research will be conducted based on the results of an integrated monitoring system in real time. The establishment of early warning system will enable the safe operation of existing urban areas and their further development.

The benefits of the project are multifaceted because the results of research will contribute to the mitigation of natural disasters in Croatia. With these results are realized and other uses, such as better collaboration of scientists, experts and local communities. Involving and informing the public through the various stages of the project through public presentations and media, as well as in direct contact, turned out as extremely important and useful in collecting data and in implementation of the obtained solutions. In the integral paper will be given a detailed overview of research results for each of the pilot areas covered by these projects within WG2.

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