1st Regional Symposium on Landslides in the Adriatic-Balkan Region

3rd Workshop of the Croatian-Japanese Project 'Risk Identification and Land-Use Planning for Disaster Mitigation of Landslides and Floods in Croatia'

Landslide and flood hazard assessment

March 6-9, 2013 / Zagreb / Croatia

ABSTRACT PROCEEDINGS

Editors: Snježana Mihalić Arbanas and Željko Arbanas

1st Regional Symposium on Landslides in the Adriatic-Balkan Region

3rd Workshop of the Croatian-Japanese Project 'Risk Identification and Land-Use Planning for Disaster Mitigation of Landslides and Floods in Croatia'

LANDSLIDE AND FLOOD HAZARD ASSESSMENT

Zagreb, Croatia, 6-9 March 2013

Organized by

International Consortium on Landslides (ICL)
ICL Adriatic-Balkan Network (ICL ABN)
University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering
City of Zagreb, Emergency Management Office
University of Zagreb
University of Rijeka, Faculty of Civil Engineering
Niigata University, Research Institute for Natural Hazards and Disaster Recovery
Kyoto University, Disaster Prevention Research Institute (DPRI)
City of Zagreb, City Office for the Strategic Planning and Development of the City
City of Zagreb, City Office for Physical Planning, Construction of the City, Utility Services and Transport

Supported by

Ministry of Science, Education and Sports of the Republic of Croatia
Japan International Cooperation Agency (JICA)
Japan Science and Technology Agency (JST)

Organizing committee

Snježana Mihalić Arbanas (Symposium Chair)
Željko Arbanas (Symposium Chair)
Hideaki Marui (Workshop Chair)
Nevenka Ožanić (Workshop Chair)
Kyoji Sassa
Pavle Kalinić
Jadranka Veselić Bruvo
Vinko Purgar

ISBN 978-953-7479-28-2

Published by: City of Zagreb, Emergency Management Office
For publisher: Pavle Kalinić
Edited by: Snježana Mihalić Arbanas, Željko Arbanas
Cover design: Studio 2M d.o.o.
Issued: March 2013, 200 copies

1st Regional Symposium on Landslides in the Adriatic-Balkan Region
3rd Workshop of the Croatian-Japanese Project 'Risk Identification and Land-Use Planning for Disaster Mitigation of Landslides and Floods in Croatia'
'Landslide and Flood Hazard Assessment'
Zagreb, Croatia, 6-9 March 2013

Abstract Proceedings

Editors:
Snježana Mihalić Arbanas
Željko Arbanas

International Consortium on Landslides (ICL)
ICL Adriatic-Balkan Network (ICL ABN)
University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering
City of Zagreb, Emergency Management Office
University of Zagreb
University of Rijeka, Faculty of Civil Engineering
Niigata University, Research Institute for Natural Hazards and Disaster Recovery
Kyoto University, Disaster Prevention Research Institute (DPRI)
City of Zagreb, City Office for the Strategic Planning and Development of the City
City of Zagreb, City Office for Physical Planning, Construction of the City, Utility Services and Transport

International Scientific Committee

Biljana Abolmasov
Faculty of Mining and Geology, University of Belgrade, Serbia

Željko Arbanas
Faculty of Civil Engineering, University of Rijeka, Croatia

Primož Banovec
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Përparim Hoxha
Faculty of Geology and Mining, Polytechnics University of Tirana, Albania

Milorad Jovanovski
Faculty of Civil Engineering, Ss. Cyril and Methodius, University, Skopje, Macedonia

Janko Logar
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Barbara Karleuša
Faculty of Civil Engineering, University of Rijeka, Croatia

Marko Komac
Geological Survey of Slovenia, Ljubljana, Slovenia

Boris Kompare
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Matej Maček
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Bojan Majes
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Hideaki Marui
Research Institute for Natural Hazards and Disaster Recovery, Niigata University, Niigata, Japan

Snježana Mihalić Arbanas
Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Croatia

Matjaž Mikoš
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Ylber Muceku
Institute of Geosciences, Energy, Water and Environment, Polytechnics University of Tirana, Albania

Nevenka Ožanić
Faculty of Civil Engineering, University of RIjeka, Croatia

Ana Petkovšek
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Boštjan Pulko
Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia

Kyoji Sassa
International Consortium on Landslides and Kyoto University, Kyoto, Japan

Alexander Strom
Geodynamics Research Centre – branch of JSC "Hydroproject Institute", Moscow, Russia

Fawu Wang
Research Center on Natural Disaster Reduction, Shimane University, Matsue, Japan

Yosuke Yamashiki
Disaster Prevention Research Institute, Kyoto University, Kyoto, Japan

Robert Župan
Faculty of Geodesy, University of Zagreb, Croatia

"Risk Identification and Land-Use Planning for Disaster Mitigation of Landslides and Floods in Croatia", a physical model of debris flow propagation will be created at the Faculty of Civil Engineering, University of Kyoto (Japan). Such physical model will provide some of the most significant quantitative values of input model parameters used to create numerical models of debris flow.

The paper will also define and describe the impact of rainfall on incoherent coarse and fine grain rock mass movement triggering. The paper gives a description of the seismic activity which can drastically affect the formation of debris flows.

WG2-06 – Development of Hydro-Debris 2D and 3D applicable for stony debris flow

Y. Yamashiki, S. Kurokawa
Disaster Prevention Research Institute, Kyoto University, Kyoto, Japan
E. Žic
Faculty of Civil Engineering, University of Rijeka, Rijeka, Croatia
T. Takahashi
Association for Disaster Prevention Research, Kyoto, Japan
M. Ramy Rozainy M. A. Z.
School of Civil Engineering, Universiti Sains Malaysia, Penang, Malaysia
I. Sušanj
Faculty of Civil Engineering, University of Rijeka, Rijeka, Croatia
S. Fujiki
Disaster Prevention Research Institute, Kyoto University, Kyoto, Japan

ABSTRACT: The aim of this survey is to develop numerical prediction method "Hydro-Debris 2D" and "Hydro-Debris 3D" applicable for Croatian catchment. They are Euler-Lagrangian Coupling method for stony debris flow with particle sizes, applicable both for experimental field and estimation of real rock movement.

We investigate velocity of each sediment movement through steep-slope channel experimental study, and then compared with numerical simulation results using Hydro-Debris 2D. We employed three different slope angles (15, 20, and 25 degrees) both for experimental and numerical studies. The average velocity values are well simulated in numerical study within 10% difference, in most cases, while some specific case differs much, especially at the last part of debris flow.

Based on these results, Hydro-Debris 3D model has also developed and applied for Grohovo Landslide zone. Although there is no "experimental" study for the landslide zone, our model may predict movement of individual particles, as we assumed that the grain sizes are uniform.