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Introduction

In 2019, the Faculty of Civil and Geodetic Engineering of the University of Ljubljana (UL FGG) is celebrating its centennial: The precursor of the faculty was the Technical Faculty established in 1919 as one of five founding faculties of the university.

UL FGG, covering technical disciplines of civil and geodetic engineering, as well as water science and technology, has been involved in landslide risk reduction activities at the national level in Slovenia (former Yugoslavia, until 1991) for decades (Fig. 1). In 2008, UL FGG became a full ICL member and has gradually developed its ICL engagement. UL FGG has been awarded the title of the World Centre of Excellence (WCoE) in Landslide Risk Reduction for 4 consecutive periods (2008–2011, 2011–2014, 2014–2017, 2017–2020). Together with the Geological Survey of Slovenia, another ICL member in Slovenia, UL FGG hosted the 4th World Landslide Forum in Ljubljana, Slovenia, from May 29 to June 2, 2017. UL FGG strongly supports numerous activities of the International Consortium on Landslides, Kyoto, Japan, and thus contributes to the 2030 Agenda for Sustainable Development, as well as to the Sendai Framework for Disaster Risk Reduction 2015–2030.

In 2019, UL FGG hosted, together with the Slovenian Chamber of Engineers, the World Construction Forum 2019 (WCF 2019; www.wcf2019.org) in Ljubljana under the forum motto "Buildings and Infrastructure Resilience." The Forum with one of the themes on Disaster Risk Management and Governance for Resilient Communities was co-organized by the World Federation of Engineering Organizations (WFEO) in support to the implementation of the 2030 Agenda for Sustainable Development. All lectures given at the WCF2019 are available for free on the forum web page, as a contribution to Open Science efforts.

In the field of capacity building, UL FGG offers several courses for graduate and postgraduate students in landslide mechanics and dynamics, landslide stabilization and landslide risk mitigation. In this paper, a short overview of the successful first decade of UL FGG membership in ICL is shown.

World Centre of Excellence on Landslide Risk Reduction and IPL projects

WCoE activities

The title of World Centre of Excellence (WCoE) on Landslide Risk Reduction is given to a governmental or non-governmental entity, which contributes to the landslide disaster risk reduction at a regional and/or global level in a specific unique field of expertise, as well as helps promoting International Programme on Landslides (IPL) and landslide research intellectually, practically and financially. UL FGG was granted the title of WCoE four consecutive times:

- WCoE 2008–2011: Mechanisms of landslides in over-consolidated clays and flysch
- WCoE 2011–2014: Mechanisms of landslides in over-consolidated clays and flysch
- WCoE 2014–2017: Mechanisms of landslides and cr eep in over-consolidated clays and flysch
- WCoE 2017–2020: Landslides in Weathered Flysch: from activation to deposition

The research efforts at UL FGG were focused on:

- Mechanisms of triggering such landslides (mud flows) (Mikoš et al. 2009, 2014; Petkovšek et al. 2011, 2013), estimation of debris-flow magnitudes triggered as shallow or deep-seated landslides (debris slides) (Sodnik et al. 2018a, b), and triggering of shallow rainfall-induced landslides using advanced statistical methods (Bezak et al. 2016, 2018)
- Field and laboratory investigations of suction in over-consolidated clays and flysch, such as to improve the understanding of softening in stiff over-consolidated clays and marls (Maček et al. 2011), using soil matrix suction as an indicator for mudflow occurrence (Petkovšek et al. 2014), and executing suction long-term monitoring of the Slano Blato landslide (Maček et al. 2016)
- Laboratory investigations of coarse debris-flow rheological parameters (Maček et al. 2017) and soil-water characteristic curve of residual soil from a flysch rock mass (Peranić et al. 2018)
- Mathematical modelling of debris flows (hazard assessment in deposition areas) (Fidej et al. 2015), using different numerical models and different digital terrain models (Sodnik and Mikoš 2018)

The WCoE activities were supported by the Slovenian Research Agency through the Research Programme P2-0180 "Water Science and Technology, and Geotechnical Engineering: Tools and Methods for Process Analyses and Simulations, and Development of Technologies," as well as by several national and international (bilateral) research projects (for a review, see Mikoš et al. 2017b).

The titles of the WCoE were handed over during World Landslide Forums (WLF1 in Tokyo in 2008, WLF2 in Rome in 2011, WLF3 in Beijing in 2014, and WLF4 in Ljubljana in 2017), organized by ICL. Together with the Geological Survey of Slovenia, UL FGG was selected to organize the 4th World Landslide Forum (WLF4; www.wlf4.org) in Ljubljana between May 29 and June 2, 2017 (Fig. 2), followed by a three-day field study tour to see the variety of landslide forms in Slovenia and in its immediate NW surroundings (Jemec Auflič et al. 2017). With over 600 participants from 49 countries and 5 international organizations (Mikoš et al. 2017a), WLF4 was promoting the culture of living with natural hazards (Alcántara-Ayala et al. 2017).

IPL projects

An important ICL activity is IPL projects. The IPL Evaluation Committee examines the submitted proposals of ICL members by carefully reading the written proposals and by listening to their presentations at annual ICL conferences. The initially accepted proposals by the IPL Evaluation Committee are discussed and

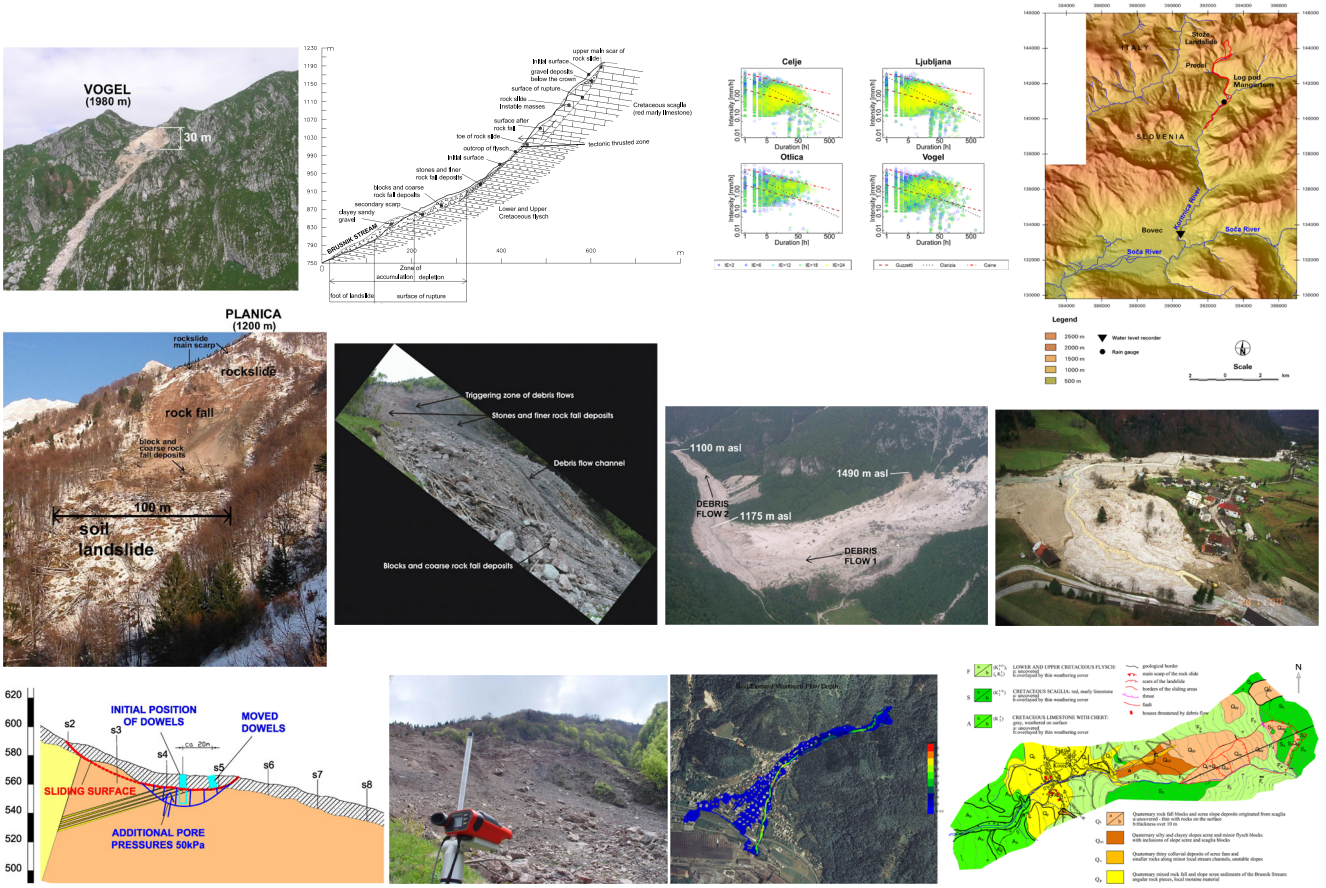

Fig. 1 A collage of landslides in Slovenia and their investigation performed by UL FGG

then approved at the annual Board of Representatives meeting of ICL members (Annual Assembly). Finally, the IPL projects are approved annually by the IPL Global Promotion Committee. UL FGG has successfully submitted several proposals for IPL projects and has been so far actively involved in the following ones:

- IPL-151 Soil matrix suction in active landslides in flysch—the Slano Blato landslide case (2010–2012) (Mikoš et al. 2014; Maček et al. 2016)
- IPL-225 Recognition of potentially hazardous torrential fans using geomorphometric methods and simulating fan formation (2017–2020) (Bezak et al. 2019a)
- IPL-226 Studying landslide movements from source areas to the zone of deposition using a deterministic approach (2017–2020)—coordinated by the Geological Survey of Slovenia (Sodnik et al. 2018a, b; Bezak et al. 2019b)

ICL thematic and regional networks

Following the ICL Strategic Plan 2012–2021, several thematic networks and regional networks have been established (for an overview, see http://icl.iplhq.org/category/icl/icl-networks/).

Landslide Monitoring and Warning Thematic Network

In 2012, UL FGG proposed the ICL landslide monitoring and warning thematic network (abbr. LaMaWaTheN), and almost 10 ICL members joined the initiative (Mikoš 2012). The general objective of the proposed network was to compare experiences in the field of landslide monitoring and installed early warning systems for active landslides in various regions of the world. A proposal for landslide monitoring techniques database was prepared (Maček et al. 2014). The network was later coordinated by the Croatian Landslide Group from the Faculty of Civil Engineering, University of Rijeka, Croatia, and the Faculty of Mining, Geology and Petroleum, University of Zagreb, Croatia. Lately, we contributed to the network activities by preparing practice guidelines on monitoring and warning technology for debris flows (Mikoš and Hübl 2018).

The idea of the network was partially taken over by the ICL World Report on Landslides (for details, see http://iplhq.org/ls-world-report-on-landslide/), a web database created to be a platform to share landslide case studies among the global landslide community, with monitoring and warning systems being a part of the story.

ICL Adriatic-Balkan Network

Jointly with other ICL members from Croatia and Serbia, in 2013, UL FGG proposed to establish an ICL Adriatic-Balkan Regional Network (ICL ABN; https://www.klizista-hr.com/en/organization/about-us/icl-abn/). Various network activities were proposed (Mihalić Arbanas et al. 2013), the most active being the organization of biennial regional symposia on landslide risk reduction in the Adriatic-Balkan Region (called ReSyLAB). UL FGG supported the 1st Symposium in Zagreb (Croatia) in 2013 (March 6–9), and the 2nd in Belgrade (Serbia) in 2015 (May 14–16), and jointly

Fig. 2 At the WLF4 press conference in Ljubljana—from left to right: Qunli Han (UNESCO), Miloš Bavec (Geological Survey of Slovenia), Matjaž Mikoš (University of Ljubljana, ICL), Peter Bobrowsky (ICL) (from www.wlf4.org)

organized the 3rd in Ljubljana (Slovenia) in 2017 (October 11–13) together with the Geological Survey of Slovenia (also an ICL member) (Jemec Auflič et al. 2018).

In the last decade, UL FGG has signed bilateral research projects with the ICL members in the region: "Adriatic-Balkan Regional Network: Landslide Risk Mitigation for Society and Environment" (2012–13 with University of Belgrade, Serbia), "Study of landslides in flysch deposits: sliding mechanisms and geotechnical properties for landslide modelling and landslide mitigation SoLiFlyD" (2014–15 with University of Rijeka, Croatia), and "Laboratory investigations and numerical modelling of landslides in flysch deposits in Croatia and Slovenia" (2016–17 with the University of Rijeka, Croatia). This joint research has helped strengthen regional cooperation within the ICL ABN regional network.

Other ICL-related international activities

UL FGG has been strongly supporting the journal *Landslides: Journal of the International Consortium on Landslides*, published by Springer (https://link.springer.com/journal/10346) since its launch in 2004. UL FGG works for the journal in the roles of reviewers and editors, and regularly publishes its top research results in the journal, as well as disseminates information important for capacity building in landslide risk reduction in the journal. UL FGG followed the development of the journal from its bibliometric perspective (Sassa et al. 2009, 2015; Mikoš 2011, 2017), and compared scientometric impacts of the journal with the other ICL publications (monographs, volumes from World Landslide Forums) in the field of landslide research (Mikoš 2018).

UL FGG also contributed to the two-volume set of Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools (LITT),

Fig. 3 The 2030 Agenda for Sustainable Development enshrines 17 Sustainable Development Goals (SDGs) and the UNESCO Chair on Water-related Disaster Risk Reduction at the University of Ljubljana is focused on the above 5 SDGs

namely to Volume 1: Fundamentals, Mapping and Monitoring (Sassa et al. 2018a) by practice guidelines on monitoring and warning technology for debris flows (Hübl and Mikoš 2018), and to Volume 2: Testing, Risk Management and Country Practices (Sassa et al. 2018b) by a state-of-the-art overview on landslide disaster risk reduction in Slovenia (Mikoš et al. 2018), a study on two-dimensional debris-flow modelling and topographic data (Sodnik and Mikoš 2018), and by study on intensity-duration-frequency curves for rainfall-induced shallow landslides and debris flows using copula functions (Bezak et al. 2018).

UNESCO Chair on Water-related Disaster Risk Reduction

In 2016, a UNESCO Chair on Water-related Disaster Risk Reduction (WRDRR Chair; www.unesco-floods.eu) was established at the University of Ljubljana, hosted by the Faculty of Civil and Geodetic Engineering (UL FGG). Experiences and knowledge accumulated in the past decades at the Chair on Hydrology and Hydraulic Engineering at UL FGG in the field of (applied) hydrology in experimental basins (Šraj et al. 2016), landslide research (Mikoš et al. 2004), landslide risk reduction (Logar et al. 2005; Mikoš and Majes 2010; Pulko et al. 2013), and flood risk management, culminated in the establishment of the UNESCO WRDRR Chair.

Water-related disasters such as floods are getting deadlier all over the world, causing more damage, while due to droughts, the available water resources are becoming increasingly scarce. The UNESCO WRDRR Chair objectives are in line with the Strategic Plan 2014–2021 of the International Hydrological Programme (IHP) VIII Phase "Water Security: Responses to local, regional and global challenges," especially with its "Theme 1: Water-related Disasters and Hydrological Change." One of the main objectives of IHP VIII is to put science into action, by promoting the process of transformation of information and experience into answering local and regional needs for tools for Adaptive Integrated Water Management (AIWM) (UNESCO 2012). The UNESCO WRDRR Chair will follow several IHP VIII objectives, especially:

- Supporting member states to increase the resistance to water-related disasters and promote risk management
- Developing the knowledge on past natural disasters, with insight into the changing nature of hazards and vulnerability

The UNESCO WRDRR Chair supports 5 out of 17 Sustainable Development Goals of the 2030 Agenda for Sustainable Development (Fig. 3).

The UNESCO Chair and UL FGG as WCoE will support the following actions of the Kyoto 2020 Commitment (Sassa 2019):

- Action 2: Advance hazard and vulnerability mapping, including vulnerability and risk assessment with increased precision, as well as reliability as part of multi-hazard risk identification and management.
- Action 5: Promote open communication with local governments and society through integrated research, capacity building, knowledge transfer, awareness-raising, training, and educational activities, to enable societies and local communities to develop effective policies and strategies for reducing landslide disaster risk, to strengthen their capacities for preventing hazards from developing into major disasters, and to enhance the effectiveness and efficiency of relief programs.
- Action 6: Investigate the effect of climate change on rainfall-induced landslides and promote the development of effective rainfall forecasting models to provide earlier warning and evacuation especially in developing countries.
- Action 9: Foster new initiatives to study research frontiers in understanding and reducing landslide disaster risk by promoting joint efforts by researchers, policymakers, and funding agencies.
- Action 10: Facilitate and encourage monitoring, reporting on, and assessing progress made, through the organization of progress report meetings at the regional and national level, to take place in respective countries, in order to show delivery and performance on progress made towards achieving the Kyoto 2020 Commitment priority actions no. 1–9.

The UNESCO WRDRR Chair contributes to the UNESCO/KU/ICL Landslide and Water-related Disaster Risk Management for Society and the Environment Cooperation Programme, signed in 2010.

Conclusions

Faculty of Civil and Geodetic Engineering, University of Ljubljana, as one of World Centres of Excellence in Landslide Risk Reduction, hosts the UNESCO Chair on Water-related Disaster Risk Reduction. UL FGG strongly supports ISDR-ICL Sendai Partnerships 2015–2025 for global promotion of understanding and reducing landslide disaster risk. UL FGG strongly supports the Kyoto 2020 Commitment for Global Promotion of Understanding and Reducing Landslide Disaster Risk to be signed during the forthcoming 5th WLF in Kyoto in November 2020 (Sassa 2019).

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